Region of Peel

Beach Street Sewage Pumping Station Diversion Municipal Class Environmental Assessment

Project File Report

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Region of Peel

Final
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Table of Contents

Executive Summary 9

1 Introduction 10

1.1 Study Purpose and Objectives 10

1.2 Description of the Study Area 10

1.3 Background 11

1.4 Problem Statement 11

1.5 Public Review and Next Steps 11

2 Municipal Class Environmental Assessment Planning Process 13

2.1 Municipal Class Environmental Assessment 13

2.2 Principles of Environmental Planning 16

2.3 Confirmation of MCEA Schedule 16

3 Planning Context 17

3.1 Provincial Policy Statement (2020) 17

3.2 A Place to Grow – Growth Plan for the Greater Golden Horseshoe (2020) 18

3.3 Region of Peel Official Plan 18

3.4 Region of Peel Water and Wastewater Master Plan. 19

3.5 City of Mississauga Official Plan 19

4 Existing Conditions 21

4.1 Existing Linear Infrastructure 21

4.2 Existing Beach Street Pumping Station 21

4.3 Natural Environment 23

4.3.1 Vegetation 23

4.3.2 Designated Features 26

4.3.3 Wildlife 26

4.3.4 Species at Risk 27

4.3.5 Aquatic Habitat 28
4.4 Source Water Protection 29
4.5 Site Contamination 30
4.6 Geotechnical Analysis 30
4.7 Geomorphology 31
4.8 Archaeological Assessment 31
4.9 Built and Cultural Heritage 34
5 Phase 2: Alternative Solutions 35
5.1 Identification of Alternative Strategies 35
5.1.1 Alternative 1 36
5.1.2 Alternative 2 40
5.2 Comparative Evaluation of Alternative Solutions 44
5.2.1 Approach to Evaluation of Alternative Solutions 44
6 Evaluation Summary 50
6.1 Preferred Solution 50
6.2 Construction Cost Estimate 50
7 Consultation Process 52
7.1 Contact List 52
7.2 Study Commencement 53
7.3 Virtual Engagement Opportunity 53
7.4 Project Website 54
7.5 Notice of Completion 54
7.6 Indigenous Consultation 54
7.7 Stakeholder Consultation 55
7.7.1 Credit Valley Conservation Consultation 55
7.7.2 City of Mississauga Consultation 55
7.7.3 City Councillor Consultation 55
7.8 Summary of Comments Received 55

8 Potential Impacts, Mitigation Measures and Commitments to Future Work 57
8.1 Natural Environment 57
8.1.1 Vegetation 57
8.1.2 Designated Features 58
8.1.3 Wildlife and Species at Risk 58
8.1.4 Fish and Fish Habitat 60
8.1.5 Groundwater 61
8.2 Cultural Environment 62
8.2.1 Archaeological Resources 62
8.3 Traffic 62
8.4 Air Quality, Noise and Vibration 62
8.5 Site Contamination and Excess Soils 63
8.6 Utilities 63
8.7 Climate Change Considerations 64
9 Implementation 65
9.1 Review Agency Approvals 65
9.1.1 Ministry of the Environment, Conservation and Parks 65
9.1.2 Credit Valley Conservation 65
9.1.3 City of Mississauga 65
9.2 Site Specific Permits and Approval 65
9.3 Property Requirements 66
10 Conclusions 67
11 Next Steps 68
12 Bibliography 69

Tables

Table 4-1: Wildlife Observations within Study Area 26
Table 4-2: Fish Community Distribution in Cooksville Creek By Reach Location 29
Table 5-1: Screening of Alternative Strategies.....35
Table 5-2: Evaluation Criteria Descriptions.....44
Table 5-3: Criteria for Evaluating Alternative Solution ..45
Table 5-4: Evaluation Legend 46
Table 5-5: Evaluation Matrix.....47
Table 6-1: Beach St Upgrades Construction Cost Estimate 50
Table 6-2: Construction Cost Estimate (Linear) 51
Table 9-1: Permits and Approvals 66

Figures

Figure 1-1: Key Map of the Study Area.....10
Figure 2-1: Municipal Class Environmental Assessment Process (Municipal Class Ea Document, October 2000, As Amended In 2015 and 2023).....15
Figure 3-1: Region of Peel Land Use Designation (Region of Peel Official Plan, Schedule E-1) 19
Figure 3-2: City of Mississauga Land Use Designations (City of Mississauga Official Plan, Schedule 10).....20
Figure 4-1: Beach Street SPS (Google Maps, 2020) 22
Figure 4-2: Natural Environment Existing Conditions within the Study Area.....25
Figure 4-3: Archaeological Potential 33
Figure 5-1: Alternative 1 - Key Plan 39
Figure 5-2: Alternative 2 - Key Plan 43

APPENDICES

A Existing Conditions Reports

A-1 Natural Environment Report

A-2 Arborist Report and Tree Preservation Plans

A-3 Phase One and Two Environmental Site Assessments

A-4 Geotechnical Studies

A-5 Geomorphic Assessment

A-6 Stage 1 Archaeological Assessment

A-7 Cultural Heritage Report

B Technical Memos

B-1 Beechwood SPS And Beach Street SPS Operating Scenarios Analysis

B-2 Beach Street SPS Operational Considerations Memorandum

B-3 Technical Memorandum 2 – Analysis of Alternative Options for the Beach Street Pumping Station Diversion EA

C Design Drawings

D Construction Cost Estimates

E Consultation Material and Comments Received

E-1 Notice of Commencement

E-2 Comments Received

E-3 Notice of Virtual Engagement Opportunity

E-4 Notice of Completion

F Draft Traffic Analysis Memorandum

Executive Summary

WSP Canada Inc. (WSP) has been retained by the Regional Municipality of Peel (Region) to complete a Schedule B Municipal Class Environmental Assessment to review existing sanitary sewer infrastructure and evaluate options for diverting the flow from the Beach Street Sewage Pumping Station (SPS) to the new Beechwood SPS in the City of Mississauga.

This Project File Report has been prepared to document the planning and decision-making process followed to evaluate and select the preferred solution for the study. Agencies and the public have been engaged throughout the study through stakeholder meetings, public notices, and one Public Information Centre (Virtual Engagement Opportunity).

Two alternative solutions were identified and evaluated as part of the study. The alternatives were evaluated based on technical feasibility, natural environmental impacts, social and cultural impacts as well as economic/financial impacts. The final preferred solution consists of the installation by microtunnel of a new trunk gravity sewer with a 1200mm dia. tunnel from the existing Beach Street SPS along Aviation Road and Lakeshore Road East to the Beechwood SPS, and tunnels ranging from 900mm-1200mm diameter on Lakeshore Road East from Aviation Road to East Avenue. It also includes the open cut replacement of an existing gravity sewer on Lakeside Avenue from Aviation Road to Hampton Crescent and required upgrades to the Beach Street SPS to meet current Region standards. The modifications will allow the Beach Street SPS to function as emergency capacity for Beechwood SPS, to facilitate monthly maintenance on the pumps to ensure reliability, including required routine maintenance to ensure the system is available for service when required.

In further evaluation of the preferred solution, key design and construction considerations were identified and mitigation measures were developed.

The following Project File Report provides detailed information on the Municipal Class Environmental Assessment (MCEA) process followed for this project, existing conditions within the project limits, feedback received through consultation activities, the alternative solutions developed and evaluation process followed, identification of the preferred solution, potential environmental impacts and proposed mitigation measures.

1 Introduction

The Region of Peel has undertaken a Schedule B Municipal Class Environmental Assessment (MCEA) study to review existing sanitary sewer infrastructure and evaluate options to divert flow from the Beach Street Sewage Pumping Station (SPS) to the new Beechwood SPS in the City of Mississauga.

1.1 Study Purpose and Objectives

The overall purpose of this MCEA study is to review existing sanitary sewer infrastructure and evaluate options to divert flow from the aging Beach Street SPS to the modernized Beechwood SPS. The objectives of the study are as follows:

- Provide flows via a gravity sewer from Beach Street SPS area to Beechwood SPS in order to repurpose the Beach Street SPS from continuous operation to contingency operation only.
- Provide additional capacity to accommodate development east of Aviation Road.
- Rehabilitate the Beach Street SPS to modernize the station to meet current Region design standards (separate construction project from gravity sewer construction).
- Modify the Beach Street SPS so that it can be used in contingency operations such as major equipment and/or utility failure or extreme wet weather events.

1.2 Description of the Study Area

The study area includes the Beach Street sanitary catchment area which could be impacted by the work and is bounded by Beechwood Avenue in the west, Lagoon Street and Lakeshore Road East in the north, East Avenue in the east and Lake Ontario in the south, as illustrated in **Figure 1-1**.

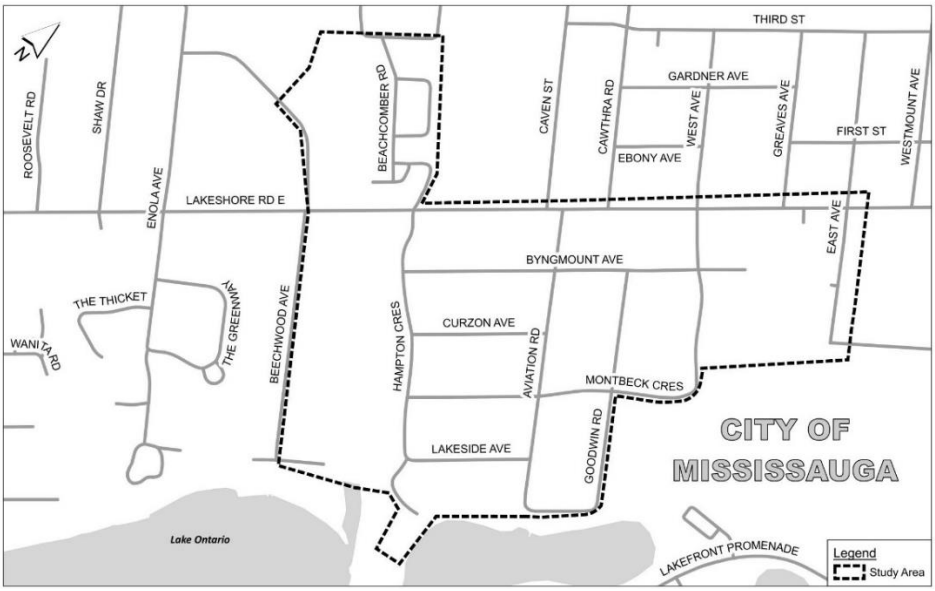

Figure 1-1: Key Map of the Study Area

1.3 Background

The Region of Peel is working to protect the environment and address high risk areas in their sewer networks with more sustainable long-term approaches. This includes decommissioning pumping stations where possible, and retrofitting current system deficiencies which can cause significant risk of back-ups or expensive and time-consuming operator interventions. To address these issues, the Region is undertaking multiple projects involving sewer system and pumping station upgrades.

The Beach Street Pumping Station is located at Beach St. and Aviation Road and is in need of refurbishment, and several local sewers that drain to the PS are at risk of surcharging during significant wet weather events. Aviation Road is a residential street located in the City of Mississauga, west of Cawthra Road and between Hampton Crescent and the Lakeview Water Treatment Plant situated south of Lakeshore Road East. The Aviation Road sanitary sewer network collects flows from all sanitary lateral connections on Aviation Road, as well as some local sewers north and south of Lakeshore Road East. These flows drain to the Beach St. SPS and are pumped through the forcemains running north along Aviation Rd to Lakeshore Road East and ultimately to the GE Booth Wastewater Treatment Plant.

Beach Street SPS previously serviced the communities of Port Credit and Lakeview in southern Mississauga, including the Aviation Road sewer network; however, the majority of these flows are now being directed to the modernized Beechwood SPS. This presents a unique opportunity to repurpose and upgrade the Beach Street SPS to serve as an overflow station for Beechwood SPS during contingency operations such as major equipment and/or utility failure or extreme wet weather events. This will help decrease the risk of basement flooding within the area.

1.4 Problem Statement

The problem statement for the Beach Street Pumping Station Diversion Class EA is defined as follows:

The Beach Street SPS previously received flows from the communities of Port Credit and Lakeview in southern Mississauga; however, these flows are now directed to the modernized Beechwood Sewage Pumping Station.

The Beach Street SPS, while in relatively good condition, requires upgrades to be in compliance with the Region's current Wastewater Pumping Station Standards.

As a result, the flow received by the Beach Street SPS needs to be diverted to the Beechwood SPS. To achieve this, gravity sewers located around the facility need to be optimized to convey flows to the Beechwood SPS from the Beach Street SPS. Diverting flows to the Beechwood SPS also presents a unique opportunity to repurpose the upgrades Beach Street SPS to serve as an overflow facility during major equipment and/or utility failure and extreme wet weather events.

To address the problem statement, the Region has initiated this MCEA planning process which evaluates alternative solutions to solve the problem identified above. This Project File Report has been prepared to document the planning and decision-making process followed to evaluate and select a preferred solution.

1.5 Public Review and Next Steps

This Project File Report meets the requirements of a Schedule 'B' MCEA study. Filing of this Project File Report initiates the 30-day comment period starting on **April 9, 2024,** and ending on **May 9, 2024**. To facilitate public review of this document, an electronic copy of the Project File Report will be made available online at:

www.peelregion.ca/public-works/environmental-assessments/mississauga/beach-street-sewage-station.asp

The Project Team is available to discuss information provided within this report or other project-related inquiries and can be contacted as follows:

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If a hard copy of the Project File Report is required for review purposes, please contact the Region's Project Manager (listed above).

If there are concerns raised during the 30-day comment period that cannot be resolved through discussions with Peel Region, then stakeholders, agencies, Indigenous Peoples or members of the public may request the Minister of the Environment, Conservation and Parks to issue a Section 16 Order for the project. A request can only be made on the grounds that the order may prevent, mitigate or remedy adverse impacts on Constitutionally protected Aboriginal or treaty rights. For more information and specific instructions regarding Section 16 Order requests, please review the Notice of Completion in **Appendix E-4**, or visit: https://www.ontario.ca/page/class-environmental-assessments-section-16-order

2 Municipal Class Environmental Assessment Planning Process

2.1 Municipal Class Environmental Assessment

Ontario's *Environmental Assessment Act,* R.S.O. 1990 was passed in 1975 and proclaimed in 1976. Class EAs were approved by the Minister of the Environment in 1987 for municipal projects having predictable and preventable impacts. The Class EA approach streamlines the planning and approvals process for municipal projects which have the following characteristics:

- Recurring;
- Similar in nature;
- Usually limited in scale;
- Predictable range of environmental impacts; and,
- Environmental impacts are responsive to mitigation.

The Municipal Class Environmental Assessment document, prepared by the Municipal Engineers Association (MEA) (October 2000, as amended in 2007, 2011, 2015 and 2023), outlines the procedures to be followed to satisfy Class EA requirements for municipal water, wastewater and road projects (MEA, 2023). The process includes five phases:

- Phase 1: Problem Definition;
- Phase 2: Identification and Evaluation of Alternative Solutions to Determine a Preferred Solution;
- Phase 3: Examination of Alternative Methods of Implementation of the Preferred Solution;
- Phase 4: Documentation of the Planning, Design and Consultation Process; and
- Phase 5: Implementation and Monitoring.

Since projects undertaken by municipalities can vary in their complexity and potential environmental impacts, projects are classified in "Schedules". The following provides a high-level overview of the current MCEA Schedules:

Exempt Projects

On March 3, 2023, the Government of Ontario enacted Amendments to the MCEA process approved under the *Environmental Assessment Act*. Under the amendments, projects that were formerly Schedule A and A+ projects, including various municipal maintenance, operational activities, rehabilitation works, minor reconstruction or replacement of existing facilities and new facilities that are limited in scale and have minimal adverse effects on the environment are now exempt from the requirements of the *Environmental Assessment Act*. These projects may now proceed without fulfilling the requirements of the MCEA.

Schedule B

Schedule B projects have the potential for some adverse environmental effects. As such, the proponent is required to undertake a screening process, involving mandatory contact with directly affected public and relevant review agencies, to ensure that they are aware of the project and that their concerns are addressed through the planning and decision-making process.

Schedule B projects must complete Phases 1 and 2 of the MCEA process to proceed to implementation. At the completion of the Schedule B MCEA process, a Project File Report is made available for public and stakeholder review for a period of 30 days.

Schedule B projects generally include improvements and minor expansions to existing facilities. Examples include the construction of new water storage facilities and water/wastewater conveyance facilities (pumping stations), among others.

Schedule C

Schedule C projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified by the MCEA process.

Schedule C projects must complete Phases 1, 2, 3 and 4 of the MCEA process to proceed to implementation. At the completion of the Schedule C MCEA process, an Environmental Study Report is made available for public and stakeholder review for a period of 30-days.

Schedule C projects generally include the construction of new facilities and major expansions to existing facilities. Examples of a Schedule C project include construction of a new water system including water supply & distribution system and expansion of a wastewater treatment plant.

Agreements or commitments to further study and mitigation measures identified as part of the MCEA process must be followed through and implemented during later stages of design and construction.

Eligibility for Exemption

Under the 2023 MCEA amendments, projects that are identified as “eligible for screening” in the Project Tables of the MCEA may be exempt from the requirements of the *Environmental Assessment Act* based on the results of the Archaeological Screening Process and/or the Collector Roads Screening Process. Proponents must fully and accurately complete the screenings for a project to be considered exempt. Completing the screening process is voluntary and proponents may choose to proceed with a Schedule B or C process instead.

Public and agency consultation are integral to the Class EA planning process. It is important to note that the Schedule assigned to a particular project is proponent driven. For example, if a project has been designated as Schedule ‘B’, the proponent can decide to comply with the requirements of a Schedule ‘C’ of the MCEA process based on the magnitude of anticipated impacts or the special public and agency consultation requirements specific to that particular project. However, projects that are considered Exempt from the MCEA process are not eligible for a bump-up to a Schedule ‘B’ or ‘C’ project (MEA, 2023).

The MCEA process flowchart is provided in **Figure 2-1**.

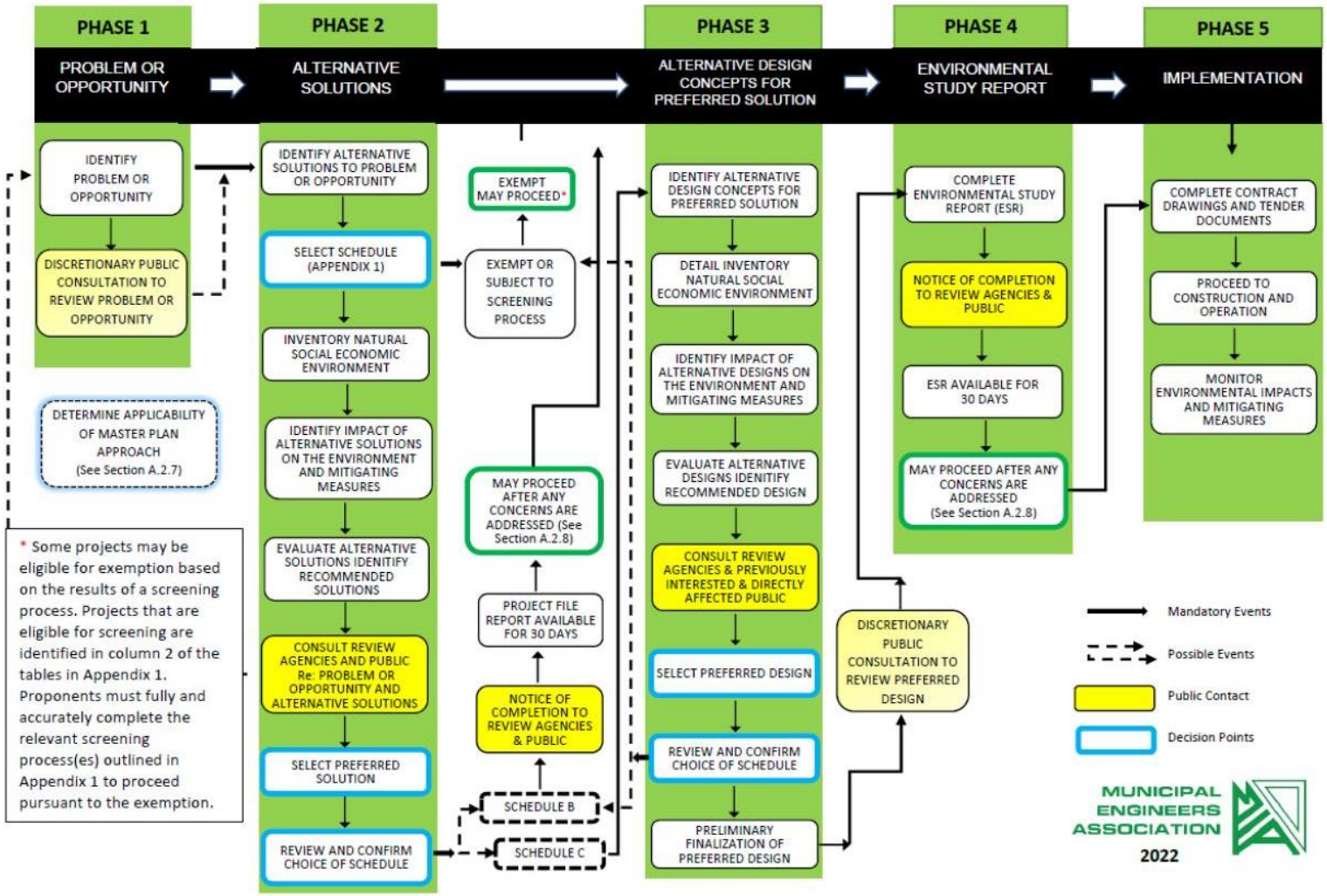


Figure 2-1: Municipal Class Environmental Assessment Process (Municipal Class EA Document, October 2000, as amended in 2015 and 2023)

2.2 Principles of Environmental Planning

The *Environmental Assessment Act* sets a framework for a systematic, rational and replicable environmental planning process that is based on five key principles, as follows:

- **Consultation with affected parties** – Consultation with the public and government review agencies is an integral part of the planning process. Consultation allows the proponent to identify and address concerns cooperatively before final decisions are made. Consultation should begin as early as possible in the planning process.
- **Consideration of a reasonable range of alternatives** – Alternatives should include functionally different solutions to the proposed undertaking and alternative methods of implementing the preferred solution. The "do nothing" alternative must also be considered.
- **Identification and consideration of the effects of each alternative on all aspects of the environment** – This includes the natural, social, cultural, technical, and economic environments.
- **Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects** – The evaluation shall increase in the level of detail as the study moves from the evaluation of alternatives to the proposed undertaking to the evaluation of alternative methods.
- **Provision of clean and complete documentation of the planning process followed** – This will allow traceability of decision-making with respect to the project. The planning process must be documented in such a way that it may be repeated with similar results.

2.3 Confirmation of MCEA Schedule

The Beach Street Pumping Station Diversion study is proceeding in accordance with the Class EA process in the MEA document (MEA, 2023) as a Schedule 'B' project. This project generally fits the description listed under Item 22c for Schedule 'B' Wastewater Projects in Appendix 1 of the MEA Class EA document, without the opportunity for Exemption:

> 22c. Establish, extend or enlarge a sewage collection system and all works necessary to connect the system to an existing sewage outlet where such facilities are not located in an existing road allowance, or existing utility corridor

Schedule 'B' projects require the completion of Phases 1 and 2, after which they can proceed to Phase 5 (implementation).

As required for Schedule 'B' projects, this Project File Report documents requirements of Phases 1 and 2 of the MCEA Planning and Design Process.

3 Planning Context

This section provides an overview of the planning and policy framework applicable to the study area. The planning and policy framework guides infrastructure planning, land use planning, and strategic investment decisions to support Provincial, Regional and Local objectives in growth.

The identification of the study area problems and opportunities considered this policy framework, to ensure that the final recommendations are consistent with Provincial, Regional and Local policies and objectives.

3.1 Provincial Policy Statement (2020)

The Provincial Policy Statement (PPS), 2020 provides overall policy directions on matters of provincial interest related to land use and development in Ontario. The PPS was prepared under the authority of the *Planning Act* but may be considered in the planning and policy context of infrastructure planning completed under the *Environmental Assessment Act*.

The PPS provides policy direction for the use and management of land, as well as infrastructure while protecting the environment and resources and to ensure opportunities for employment and residential development. The sections of the PPS applicable to the planning of public service facilities are as follows:

Part V: Policies – Specifically, Section 1.6.1 Infrastructure and Public Service Facilities and Section 1.6.6 Sewage, Water and Stormwater outline the policies for infrastructure and public service facilities, sewage, water and stormwater. The policies state that:

- Infrastructure and public service facilities shall be provided in an efficient manner that prepares for the impacts of a changing climate while accommodating projected needs. Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning and growth management so that they are:
  - Financially viable over their life cycle, which may be demonstrated through asset management planning; and
  - Available to meet current and projected need.
- Planning for sewage and water services shall:
  - Accommodate forecasted growth in a manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and private communal sewage services and private communal water services, where municipal sewage services and municipal water services are not available or feasible;
  - Ensure that these systems are provided in a manner that can be sustained by the water resources upon which such services rely; prepares for the impacts of a changing climate; is feasible and financially viable over their lifecycle; and protects human health and safety, and the natural environment; promote water conservation and water use efficiency; integrate servicing and land use considerations at all stages of the planning process; and
- Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety. Within settlement areas with existing municipal sewage services and municipal water services, intensification and redevelopment shall be promoted wherever feasible to optimize the use of the services.

Planning for the Beach Street Pumping Station Diversion study is consistent with the policy directions as prescribed by the PPS by accommodating forecasted growth in a manner that promotes the efficient use and optimization of existing municipal sewage services, is financially viable and aids in the Region's preparation for the impacts of a changing climate through planning for extreme wet weather events and major equipment and/or utility failure.

As of the writing of this Project File Report, the Ministry of Municipal Affairs and Housing (MMAH) is consulting on a combined PPS and A Place to Grow – Growth Plan for the Greater Golden Horseshoe (2020) into a new land use policy for public feedback. Through this proposed new PPS, the government is proposing policies grouped under five pillars: generate an appropriate housing supply, make land available for development, provide infrastructure to support development, balance housing with resources and implementation.

3.2 A Place to Grow – Growth Plan for the Greater Golden Horseshoe (2020)

A Place to Grow: Growth Plan for the Greater Golden Horseshoe ("Growth Plan"), 2020, was prepared and approved under the Places to Grow Act (2005) as a legal framework to implement the Province's vision for managing growth within the Greater Golden Horseshoe (GGH). The City of Mississauga is located within the GGH.

The GGH is a dynamic and diverse area, and one of the fastest growing regions in North America. By 2041, this area is forecast to grow to 13.5 million people and 6.3 million jobs. The magnitude and pace of this growth necessitates a plan for building healthy and balanced communities and maintaining and improving our quality of life while adapting to the demographic shift underway.

To better co-ordinate planning for growth across the region, the Growth Plan provides population and employment forecasts for all upper- and single-tier municipalities in the GGH. The Growth Plan is about accommodating forecasted growth in complete communities by providing guidance on transportation, infrastructure planning, land-use planning, urban form, housing, natural heritage and resource protection. Complete communities support quality of life and human health by encouraging the use of active transportation and providing high quality public open space, adequate parkland, opportunities for recreation, and access to local and healthy food.

Policy 3.2.6 (2) of the Growth Plan provides direction on Water and Wastewater Systems. The following excerpted policies are applicable to this study:

— Municipal water and wastewater systems and private communal water and wastewater systems will be planned, designed, constructed, or expanded in accordance with opportunities for optimization and improved efficiency within existing systems will be prioritized and supported by strategies for energy and water conservation and water demand management; the system will serve growth in a manner that supports achievement of the minimum intensification and density targets in the Growth Plan.

Planning for the Beach Street Sewage Pumping Station Diversion study is consistent with the policy direction of the Growth Plan through optimizing and improving efficiency within existing wastewater systems.

3.3 Region of Peel Official Plan

The Official Plan of the Region of Peel (Region Official Plan), 2022, provides a long-term regional strategic policy framework for guiding growth and development while having regard for protecting the environment, managing the renewable and non-renewable resources, and outlining a Regional Structure that manages this growth in the most effective and efficient manner.

The Beach Street Pumping Station Diversion study area is designated as Urban System as per Schedule E-1 – Regional Structure of the Region Official Plan, as shown in **Figure 3-1**. The Urban System is composed of a variety of communities that contain diverse living, working and cultural opportunities. The objective of the Urban System is to plan for the provision and financing of Regional facilities and services so as to efficiently use existing services and infrastructure, and encourage a pattern of compact built forms of urban development and redevelopment.

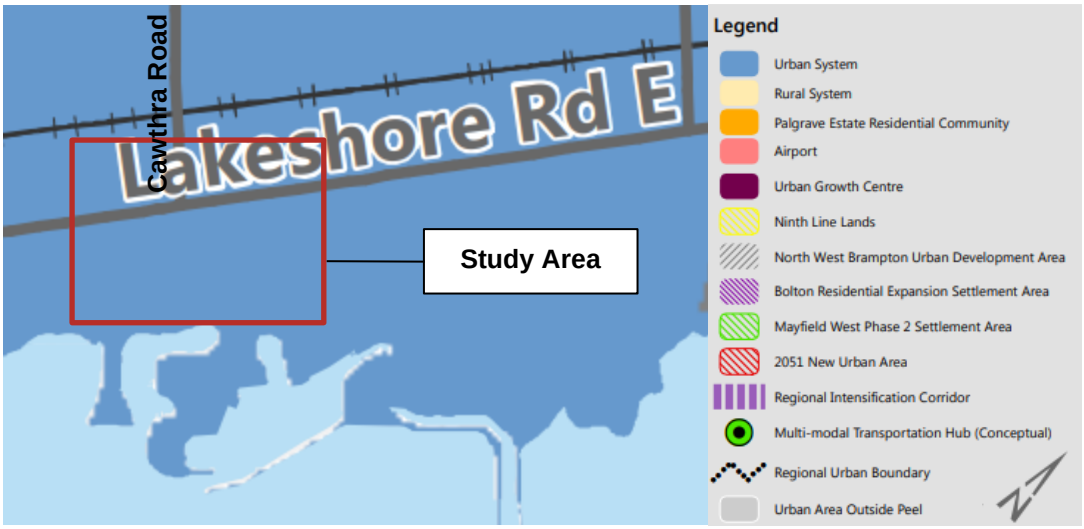


Figure 3-1: Region of Peel Land Use Designation (Region of Peel Official Plan, Schedule E-1)

3.4 Region of Peel Water and Wastewater Master Plan

The Region of Peel's Water and Wastewater Master Plan for the Lake-based Systems (2020) (Master Plan) is a comprehensive document that describes the planning, evaluation, and decision-making process for developing the long-term water and wastewater strategies in the Region of Peel.

The Beach Street Pumping Station Diversion project is identified in Section 5.3.3.16 – Inspiration Lakeview of the Master Plan. The Master Plan identified the need for the construction of a new network of local gravity sewers and construction of a new on-site local sewage pumping station and forcemain discharging to Lakeshore Road East sanitary trunk sewer to direct flows in the southern portion of the study area to the new local sewage pumping station (Beechwood SPS).

3.5 City of Mississauga Official Plan

The City of Mississauga Official Plan, 2023, provides a policy framework to create successful places where people, businesses and the natural environment will collectively thrive.

The majority of the study area is designated as Residential Low Density II as per Schedule 10 of the Official Plan, with areas designated as Mixed Use along Lakeshore Road East, Residential High Density adjacent to East Avenue, Residential Medium Density near Lagoon Street and Residential Low Density I adjacent to Beechwood Avenue, as illustrated in **Figure 3-2**. The areas located adjacent to Cooksville Creek are designated as Greenlands and as Public Open Space near Lake Ontario.

As per Section 11.2.1 of the Official Plan and City of Mississauga Zoning By-law 0225-2017, a structure required for the purpose of providing wastewater management facilities or piped services is a permitted use in all land use designations and zones.

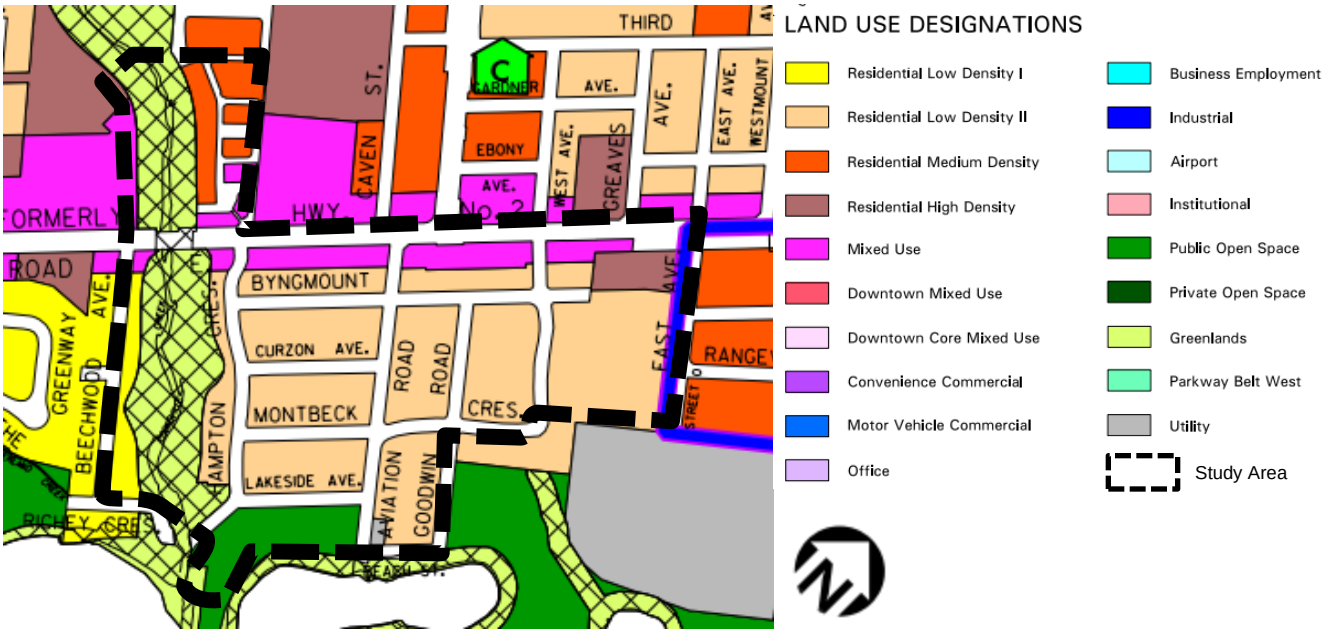


Figure 3-2: City of Mississauga Land Use Designations (City of Mississauga Official Plan, Schedule 10)

4 Existing Conditions

The following section describes the existing conditions within the study area, including the existing wastewater servicing system, utilities, natural environment and cultural environment conditions. The information described in this section was considered when reviewing potential effects of the alternative solutions developed for the study.

4.1 Existing Linear Infrastructure

The study area is fully developed and is serviced by sanitary sewers and watermains owned and operated by the Region of Peel. Additionally, the study area is primarily serviced with storm sewers owned and operated by the City of Mississauga, however some roads are still serviced by roadside ditches, Enbridge operates gas lines throughout the study area, and hydro-electric servicing is provided by Alectra Utilities with both overhead and buried cables.

4.2 Existing Beach Street Pumping Station

The Beach Street SPS is located at 639 Beach Street in the City of Mississauga. The current firm capacity of the Beach Street pumping station is 756 L/s. Components of the SPS include a wet well/dry well structure, two duty pumps, one standby pump, and two forcemains. The site consists of the following:

1. Inlet trunk sewer of 900 mm in diameter supplying sewage to the wet well, measuring 12.2m x 5.2m, in addition to a 375mm Vitrified Clay inlet sewer.
2. The wet well supplies sewage through a special suction casting to the dry well measuring 12.2m x 3.7m.
3. Three (3) dry pit submersible pumps located in the dry well pump the sewage through the system, with one pump out of service to provide the firm capacity.
4. Rectangular brick clad pumping station building which houses the piping, valves, HVAC, and all electrical & instrumentation/control equipment.
5. Two (2) discharge forcemains measuring 450 mm & 500 mm in diameter, discharging the sewage to a 1650mm trunk sanitary sewer at Lakeshore Rd E & Lakefront Promenade ultimately discharging to the GE Booth Wastewater Treatment Plant.

Figure 4-1: Beach Street SPS (Google Maps, 2020)

4.3 Natural Environment

A Natural Environment Report was prepared for the study to document the existing natural environment conditions within the study area and provide a preliminary impact assessment of the alternatives considered and preferred solution. Additionally, an Arborist Report and Tree Preservation Plans were completed by WSP in January 2024, which included a tree inventory within the right-of-way (ROW) and adjacent trees on private or city property that could be impacted by the proposed works.

Preliminary mitigation recommendations are provided as well as recommendations for further study during later design stages. The following provides an overview of the existing conditions within the study area, as documented in the Natural Environmental Report and the Arborist Report. The Natural Environment Report is provided in **Appendix A-1,** and the Arborist Report and Tree Preservation Plans are provided in **Appendix A-2**.

4.3.1 Vegetation

Vegetation and Ecological Land Classification (ELC) surveys were conducted in May 2022 to document vegetation communities within the study area. The study area support a variety of terrains as well as natural and cultural vegetation communities. Deciduous Lowland forest dominates the majority of the Cooksville Creek valley within the project limits, while the lakeshore of Lake Ontario is dominated by culturally influenced recreational lands.

None of the vascular plants identified during field investigations were considered Species at Risk (SAR). One species, Shagbark Hickory (*Carya ovata*), present in the recreational park areas is considered rare in the Greater Toronto Area (GTA). One species, Rough Bedstraw (*Galium asprellum*), present in cultural woodland and forested areas is Uncommon in the GTA and Peel Region. One species, White Spruce (*Picea glauca*), which was planted in the restoration area, is considered Uncommon in the GTA and Peel Region and locally rare by the Credit Valley Conservation Authority (CVC).

Five vegetation community types were identified and delineated within the study area, as illustrated in **Figure 4-2** and described generally below.

Mineral Open Beach / Bar Ecosite (BBO1)

Two BBO1 communities are present in the study area associated with the shoreline of Lake Ontario on either side of the mouth of Cooksville Creek. To the east of Cooksville Creek, this beach/bar has no vegetation. However, on the west side of the mouth of Cooksville Creek there are a few large (>50 cm diameter at breast height (DBH)) White Willow (*Salix alba*) and/or Crack Willow (*Salix euxina*) (or their hybrid, *Salix ×fragilis*) in the canopy. Sparse trees can be found in the subcanopy and the understory consists of Manitoba Maple (*Acer negundo*) and American Elm (*Ulmus americana*) with sparse Multiflora Rose (*Rosa multiflora*). This feature is characterized as a rocky to sandy beach with sparse tolerant species including Wild Carrot (*Daucus carota*), Tall Goldenrod (*Solidago altissima*), and Eurasian black bindweed (*Fallopia convolvulus*) is present in the ground layer. A few Field Wormwood (*Artemisia campestris*) were observed, but not enough to support the designation of the rare S2S3 Wormwood Gravel Beach Type community.

Mineral Cultural Woodland Ecosite (CUW1)

Two areas of CUW1 are present in the study area. One area is located at the mouth of Cooksville Creek and consists of a narrow strip of disturbed vegetation between the beach and a maintained recreational area. This area contains Manitoba Maple, American Elm, White Willow and a few Cottonwood (*Populus deltoides*) in the partially open canopy and subcanopy. No cavity trees were observed and minimal potential for SAR bats is anticipated. The understory contains Multiflora Rose, Red Osier Dogwood (*Cornus sericea*), invasive honeysuckles (*Lonicera sp*.) and Common Buckthorn (*Rhamnus cathartica*). The ground layer contains Tall Goldenrod, various Grasses, Common Buttercup (*Ranunculus acris*) and

Burdock species (*Arctium sp.*). Northwest of Lakeshore Road East and east of Cooksville Creek, a second narrow strip of younger successional CUW1 is present and is dominated by Manitoba Maple, Black Walnut (Juglans nigra) and White Ash (*Fraxinus americana*).

Recreational (CGL-4)

The areas around the Waterfront Trail are maintained with large trees and Turfgrass. The trees in the recreation areas include planted large (>50cm DBH) Silver Maple (*Acer saccharinum*), Red Oak (*Quercus rubra)* and Shagbark Hickory (*Carya ovata*) which offer suitable habitat for SAR bats. Additional planted trees include Spruce species (*Picea sp*.), White Willow, White, Red, Scots and Austrian Pine (*Pinus strobus, P. sylvestris, P. nigra*.). A small section east of Cooksville Creek and just south of the bridge is undergoing naturalization but is mostly dominated by non-native or weedy native species. The small area of naturalization includes American Elm, Silver and Manitoba Maple on the stream bank with Winged Euonymus (*Euonymus alatus*) and Chokecherry (*Prunus virginiana*). The naturalizing ground layer includes Common Dandelion (*Taraxacum officinale*), Burdock species, and various sedges and grasses, as well as the invasive species Garlic Mustard (*Alliaria petiolata*).

Fresh – Moist Willow Lowland Deciduous Forest Type (FOD7-3)

This community is present on the banks of Cooksville Creek. The canopy contains frequent large trees (25-50 cm DBH) and rare larger trees including White Willow, Manitoba Maple, Silver Maple and occasional American Elm. No cavity trees were observed. The sparse subcanopy contains similar species including Manitoba Maple, Silver Maple and American Elm. The understory is moderately dense with Manitoba Maple, Chokecherry, Multiflora Rose and American Elm. The highly disturbed ground layer contains multiple Avens species, Dandelion, Garlic Mustard and Burdock. However, typical native floodplain species are present as well such as Jerusalem Artichoke (*Helianthus tuberosus*), Common Bedstraw (*Galium aparine*) and Field Horsetail (*Equisetum arvense*). A large patch of the invasive Japanese knotweed (*Reynoutria japonica*) measuring approximately 12 m by 3 m was observed. Northwest of Lakeshore Road East there was a sparser canopy due to a higher abundance of dead Ash species with dominant downed woody debris and standing snags. Giant Hogweed (*Heracleum mantegazzianum*) was more prevalent in this area as well.

Tree Planting Restoration

As documented in the Arborist Report, the total number of trees inventoried were 447, twenty-nine of which are outside the scope of this study, and are a mixture of native and non-native, deciduous and coniferous species. Trees of any size within the ROW and within city parks or other public areas were included in the inventory. Trees 10 cm DBH or greater on adjacent private property were also included.

As noted in the Natural Environment Report, two tableland areas northwest of Lakeshore Road East are cultural meadows with planted trees scattered throughout appearing as a restoration project associated with the Special Management Area V5SMA identified in the Mississauga Natural Areas Inventory. Planted trees 3 to 5 cm DBH included Basswood (*Tilia americana*), Sugar Maple, Trembling Aspen (*Populus tremuloides*), White Spruce (*Picea glauca*), Red Maple and White Birch (*Betula papyrifera*). The few shrubs present included European Red Raspberry (*Rubus idaeus subsp. strigosus*), Willow species, Red Osier Dogwood and planted Staghorn Sumac (*Rhus typhina*). The ground layer contained typical tolerant meadow species including Tall Goldenrod, Canada Thistle (*Cirsium arvense*), Burdock species and Kentucky Bluegrass (*Poa pratensis*). Several patches of the invasive Common Reed (*Phragmites australis subsp. australis*) were present.

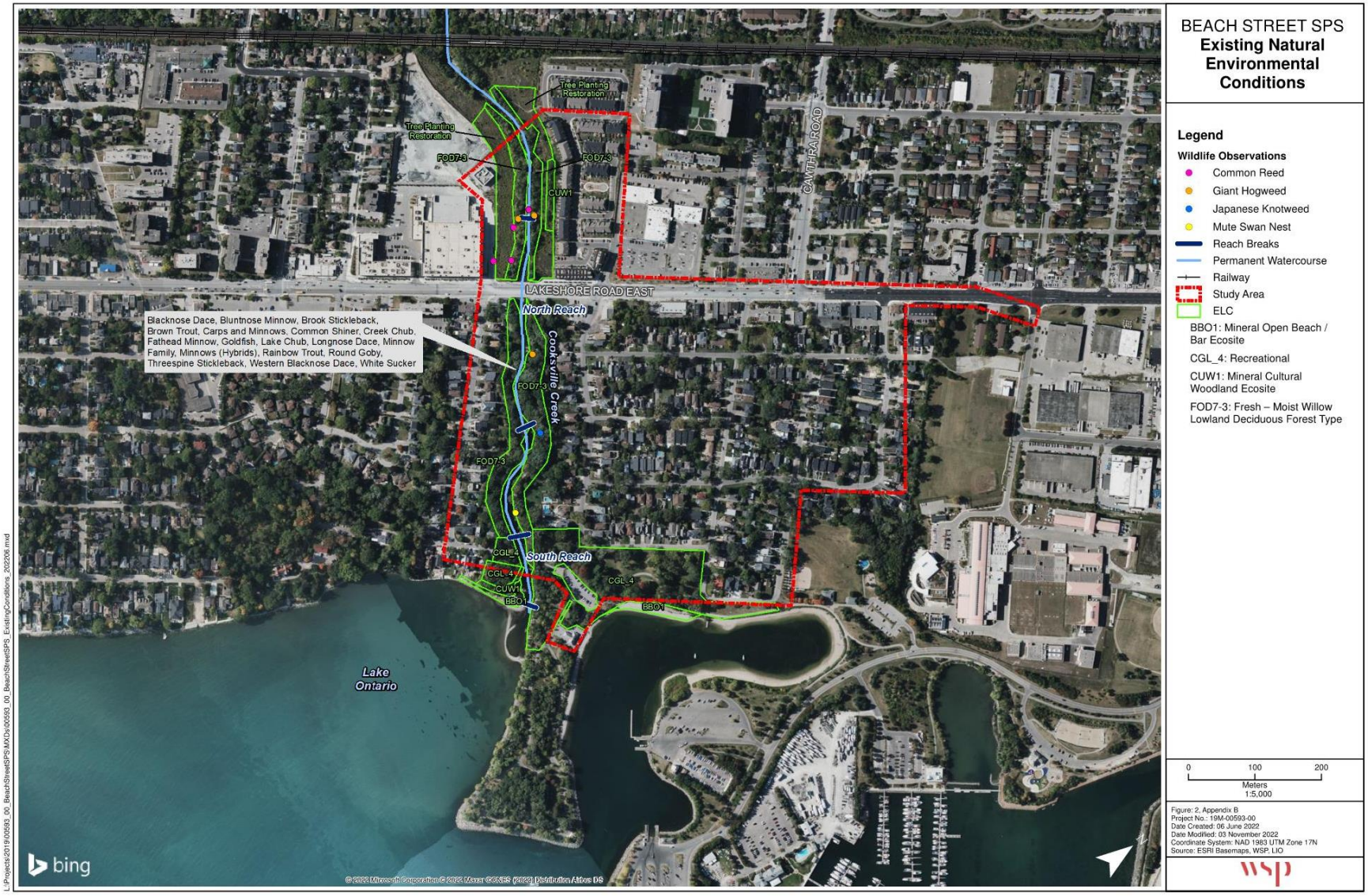


Figure 4-2: Natural Environment Existing Conditions within the Study Area

4.3.2 Designated Features

No Provincially Significant Wetland (PSW), Area of Natural or Scientific Interest (ANSI), Greenbelt Plan Area or Significant Wildlife Habitat (SWH) have been identified within and adjacent to the study area.

Natural Area LV4 and LV5 as identified in the City of Mississauga Official Plan are located within the study area.

Natural Area LV4 is associated with the floodplain of Cooksville Creek south of Lakeshore Road and is entirely composed of fresh-moist willow lowland deciduous forest. It has no significant plant communities or fauna but does support two plant species considered rare within the City, three plant species considered uncommon within the City, and 22 flora species considered Species of Conservation Concern by CVC.

Natural Area LV5 is also associated with the floodplain of Cooksville Creek but includes a broader collection of five vegetation communities including the fresh-moist willow lowland deciduous forest associated with LV5, as well as mineral cultural woodland, mineral open beach/bar, open aquatic and manicured parks. It has no significant plant communities but does support one provincially significant plant species, two plant species considered rare within the City, four plant species considered uncommon within the City, and 36 flora species considered Species of Conservation Concern by CVC. In addition, two provincially significant fauna species and 17 SCC species considered by CVC have also been noted in this area.

The study area is also located within the CVC Regulated Area associated with the Lake Ontario shoreline and Cooksville Creek.

4.3.3 Wildlife

A general wildlife and wildlife habitat survey was completed within the study area in May 2022. Direct wildlife observations and wildlife signs (including animal browse, tracks/trails, scat, bird nesting activities, tree cavities, burrows, excavated holes and vocalizations) were recorded. Particular attention was also given to assessing the potential for habitat to support SAR known to the area generally, or to potentially qualify as Significant Wildlife Habitat (SWH). A list of wildlife species observed during the field surveys is provided in **Table 4-1**.

Table 4-1: Wildlife Observations within Study Area

Common Name	*Scientific Name*	Grank	Srank	SARO (ESA) Status	SARA Status	CVC (2010)	Area Sensitive Birds - Ecoregion 7E	Protected Under MBCA
Amphibians								
American Toad	*Anaxyrus americanus*	G5	S5			3		
Birds								
American Goldfinch	*Spinus tristis*	G5	S5B					✓
Barn Swallow	*Hirundo rustica*	G5	S4B	THR	THR	1		✓
Blue Jay	*Cyanocitta cristata*	G5	S5					✓
Common Grackle	*Quiscalus quiscula*	G5	S5B					✓
Downy Woodpecker	*Picoides pubescens*	G5	S5					✓

Common Name	*Scientific Name*	Grank	Srank	SARO (ESA) Status	SARA Status	CVC (2010)	Area Sensitive Birds - Ecoregion 7E	Protected Under MBCA
Amphibians								
Killdeer	*Charadrius vociferus*	G5	S5B,S5N					✓
Mallard	*Anas platyrhynchos*	G5	S5					✓
Mute Swan	*Cygnus olor*	G5	SE					✓
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S4					✓
Yellow Warbler	*Setophaga petechia*	G5	S5B				X	✓

4.3.4 Species at Risk

The term Species at Risk (SAR) includes species that are listed as Endangered, Threatened, or Special Concern under Ontario's Endangered Species Act (O. Reg. 230/08, ESA 2007) or the federal Species at Risk Act (SARA). It also includes species assessed as the above designations by the Committee on the Status of Species at Risk in Ontario (COSSARO) and/or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Prior to field investigations, a screening of SAR with potential to be present or use habitat within the vicinity of the study limits was completed. The SAR screening table incorporates background information collected, as well as the results of the in-field habitat assessment and is included in **Appendix A-1**. The table lists potential SAR, habitat preferences for each species, an assessment of habitat within the study limits and provides an assessment of the likelihood and magnitude of impacts to each species considering mitigation measures to be implemented.

The background information review generated a list of 13 potential SAR to occur within the study area. This list includes SAR known to occur in the City of Mississauga generally, as well as those with records specifically near the study limits. During the field investigations habitat conditions were assessed in terms of potential suitability for those species considered to have ‘moderate’ to ‘high’ potential to occur in the vicinity of the study area.

One SAR was observed during the field investigations completed by WSP. Barn Swallow (*Hirundo rustica;* Special Concern, ESA and SARA), were noted on two separate occasions during the vegetation surveys. This species is widespread, and foraging habitat is present over natural areas in the study limits. It is likely that this species will be present throughout the study limits during the breeding season as a foraging visitant. The pedestrian bridge on the waterfront trail, and the Lakeshore Road culvert could provide suitable nesting habitat for this species, although no nests were observed during the field investigations.

No other SAR were observed during the May 2022 field investigations; however, the following four SAR have moderate to high potential to be present or to use habitat in the vicinity of the project limits based on habitat suitability:

- **Bank Swallow** (*Riparia riparia*; Threatened, ESA and SARA): This species is widespread, and foraging habitat is present over natural areas in the study limits. It is likely that this species will be present throughout the study limits during the breeding season as a foraging visitant. No nesting habitat (e.g., steep, exposed banks) is present within the study area.
- **Little Brown Bat, Northern Long-eared Bat, and Small-footed Bat** (*Myotis lucifugus, M. septentrionalis,* and *Perimyotis leibii*; Endangered, ESA and SARA): These species have moderate to high potential to reside and breed in forested areas, and forage over all forests, forest edges and watercourses. Suitable maternity roost trees were not observed by WSP within the study limits (no

cavity trees) and fissures in the Willow bark were not suitable for roosting. However, a detailed cavity tree assessment was not completed for all trees and there may be some mature trees that do provide suitable habitat.

The above four species were assessed for likelihood of the proposed works to impact individuals or habitat in the study limits based on the type of habitat to be impacted, availability of habitat in the local landscape and mitigation measures to be implemented.

4.3.5 Aquatic Habitat

Cooksville Creek is a permanent watercourse within the western limits of the study area, that is being managed by the Ministry of Natural Resources and Forestry (MNRF) as warmwater, with a diverse forage and baitfish community. It originates as a large online stormwater management (SWM) pond north of Matheson Boulevard West near Britannia approximately 11 km upstream of the study area and flows mainly through an urban valley system in a southern direction to its outlet into Lake Ontario within the project limits at RK McMillan Park.

Due to the length of Cooksville Creek within the study area, the assessment of Cooksville Creek was divided into two reaches, the North Reach and South Reach, as illustrated in **Figure 4-2**. An overview of the existing conditions of each reach is provided below.

North Reach

This reach of Cooksville Creek started approximately 100 m upstream of Lakeshore Road East and extended for 300 m to approximately 200 m downstream of Lakeshore Road East.

This reach displayed a mix of runs (10%), pools (30%), riffles (60%) and flats (20%). At the time of field investigations, the wetted width of the creek ranged from 4.7 m to 10 m, with depths ranging from 0.1 to 0.5 m. The bankfull width ranged from 7.7 m to 15 m, with an average bankfull depth of 1.0 m. The riffles and runs displayed a coarse mix of cobble (70%), gravel (20%) and sand (10%), whereas the pools and flats displayed a finer mix of Silt (30%), sand (20%) and then a scattering of gravel and cobbles (50%). Instream cover was comprised of sparse amounts of undercut banks, overhanging vegetation and woody debris, and a moderate amount of rocks/boulders. Riparian vegetation consisted of a mix of trees, shrubs and grass/forb species throughout the valley. Banks were relatively stable, displaying some armouring (rip rap and gabion baskets) and some areas of bank erosion.

A number of storm sewer outlets were observed along the reach, entering from both sides of the channel. No groundwater or seepage was evident at the time of the field investigations. There were no barriers to the upstream movement of fish within the reach assessed, and schools of White Sucker (*Catostomus commersonii*) were observed creating nests/spawning in the pools and near the riffles throughout the reach.

South Reach

This reach of Cooksville Creek started approximately 50 m upstream of the Waterfront Trail pedestrian bridge and extended for 50 m downstream of the pedestrian bridge to the mouth of Cooksville Creek at Lake Ontario.

This reach displayed homogenous channel morphology dominated by flats (100%). At the time of field investigations, the average wetted width measured 15 m, with an average water depth of 1.3 m. The bankfull width averages 20 m, with an average bankfull depth of 1.7 m. The substrates were dominated by sand (65%), with smaller amounts of silt (5%), gravel (5%) and cobble (20%). Instream cover was comprised of sparse amounts of overhanging vegetation and woody debris. Riparian vegetation consisted of a mix of deciduous trees, shrubs and grass/forb species throughout the valley. Banks were relatively stable and steep, displaying some armouring (rip rap and gabion baskets) and areas of bank erosion.

There were storm sewer outlets observed on both banks in the reach assessed, however no groundwater or seepage was evident at the time of the field investigations. There were no barriers to the upstream movement of fish within the reach assessed.

Fish community information for Cooksville Creek is provided in **Table 4-2** and includes information from Land Information Ontario, community sampling results from CVC, and confirmation of community assemblage provided by MNRF and CVC.

Table 4-2: Fish Community Distribution in Cooksville Creek by Reach Location

Species Common Name	Species Latin name	Cooksville Creek at Lakeshore Rd	Cooksville Creek at CN Rail Bridge
Blacknose Dace	*Rhinichthys obtusus*	X	X
Bluntnose Minnow	*Pimephales notatus*	X	X^
Brook Stickleback	*Culaea inconstans*	X	X^
Brown Trout	*Salmo trutta*	X	X
Common Shiner	*Luxilus cornutus*	X	X^
Creek Chub	*Semotilus atromaculatus*	X	X
Fathead Minnow	*Pimephales promelas*	X	X^
Goldfish	*Carassius auratus*	X	X^
Lake Chub	*Couesius plumbeus*	X	X
Longnose Dace	*Rhinichthys cataractae*	X	X
Rainbow Trout	*Oncorhynchus mykiss*	X	X
Round Golby	*Neogobius melanostomus*	X	X
Threespine Stickleback	*Gasterosteus aculeatus*	X*	
White Sucker	*Catostomus commersonii*	X	X

*Source: * - species only caught by CVC records and not recorded on LIO, ^ - species reported in LIO but not observed by CVC*

4.4 Source Water Protection

According to the MECP's Source Protection Information Atlas website:

- The study area is located within the Credit Valley Source Protection Area.
- There are no Wellhead Protection Areas (WHPA) close to the study area.
- There are no significant ground water recharge areas at the site except south of Hampton Crescent.
- The site is located within a region of highly vulnerable aquifers.

A Hydrogeological Impact Assessment (HIA) was competed by Peto MacCallum Ltd. (PML) as part of the study to determine the potential dewatering requirements for the project.

The results of the assessment concluded that the construction dewatering is expected to have a negligible impact on the flow of groundwater to local watercourses (surface water), such as the Cooksville

Creek. Since pumped water required as part of construction will likely be directed (after appropriate treatment) to storm sewers and thus to local watercourses or Lake Ontario, the overall effect will be insignificant. Also, due to the size of the Cooksville Creek, it is not expected to be significantly impacted by the dewatering directly. In addition, even though the site is located over highly vulnerable aquifers, the dewatering rates are relatively shallow and of low magnitude, and thus are expected to have minimal impacts on aquifer recharge.

The HIA can be made available upon request from the Region's Project Manager.

4.5 Site Contamination

A Phase One Environmental Site Assessment (ESA) and a Phase Two ESA were completed by Peto MacCallum Ltd. (PML) as part of the study to identify and verify the potential sources of contamination in accordance with Ontario Regulation 153/04 (amended).

The results of the Phase One ESA identified twenty-eight Potentially Contaminating Activities (PCAs) within thirteen properties adjacent to the study area. The PCAs were related to auto repair shops; paint shops; diesel, gasoline; hydraulic oils and sewage spills; operation of dry-cleaning equipment; historical use of gasoline and associated products; storage in fixed tanks; chemical manufacturing, processing and storage; metal fabrication; electricity generation/transformation; solvent manufacturing, processing and storage; foam manufacturing and processing and railway tracks.

The above-noted PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC) on the site. Twelve of the 28 PCAs were considered APECs since they were located up-gradient or in close proximity to the site.

A Phase Two ESA was completed within the 12 APECs within the study area to ascertain the presence or absence of contaminating activities. The Phase Two ESA included advancement of twenty boreholes, with ground water monitoring wells in eleven of the borehole locations. The results of the Phase Two ESA determined a portion of the boreholes exceeded MECP's Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses for Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR), polycyclic aromatic hydrocarbons (PAHs) and arsenic.

The Phase One ESA and Phase Two ESA are provided in **Appendix A-3**.

4.6 Geotechnical Analysis

A desktop geotechnical analysis was undertaken by WSP to characterize the general geotechnical conditions of the investigation area, to provide a preliminary interpretation of the ground and groundwater conditions as relevant to the overall geotechnical design and construction of the proposed infrastructure.

The desktop geotechnical investigation included the review of previous environmental and geotechnical reports for other projects within the study area and determined that the sewer alignments are underlain by gravelly sand to silty sand over silty clay to clayey silt, which is underlain by the bedrock of Georgian Bay Formation which is a grey shale with light grey siltstone and/or limestone interbeds. Generally, bedrock is expected to lie at 2 m to 4 m below the ground surface. Additional geotechnical investigations are recommended to be completed during detailed design to determine site conditions prior to construction.

The geotechnical desktop study in addition to the geotechnical data report (GDR) completed by PML are provided in **Appendix A-4**.

4.7 Geomorphology

A Cooksville Creek Geomorphic Assessment was complete by PARISH Aquatic Services (PARISH) in 2015 for the Cooksville Creek within the study area. The key findings and recommendations are summarized below.

- The channel valley corridor is approximately 35 m wide, extending for a couple metres into the floodplain beyond the top-of-bank.
- Bankfull widths measured across riffle sections ranged from 12 m to 15 m wide. The measured bankfull widths measured were narrower than previously recorded values due to ice-cover limiting measurement capabilities.
- Bankfull depths measured ranged from 0.4 m to 0.55 m deep. Pool depths were not measured due to ice-cover.
- Rapid Stream Assessment Technique results yielded an overall score of 24 out of 50; Cooksville Creek is classified to be in Moderate condition.
- Rapid Geomorphic Assessment results yielded a Stability Index of 0.32; Cooksville Creek is classified to be in Transitional condition.
- Erosion along the bed was estimated at a maximum of 1.14 m to a minimum of 0.43 m over the course of 50 years.
- The proposed sewer pipe shall be placed at a depth of 2 m below the channel bed, assuming a continued erosion rate of 0.01 m per year. The timeline for this extent of bed erosion well exceeds the 100-year planning horizon.
- The existing maintenance hole (MH1783491), located along the right bank, immediately upstream of the storm sewer outfall, is at risk for exposure within the next 10 to 15 years should current conditions continue. The proposed maintenance hole shall be located 6 m away from the existing top of bank. The bank is expected to erode into the proposed maintenance hole within the 100-year planning horizon, thus secondary protection measures shall be installed.

The geomorphic assessment is provided in **Appendix A-5**.

4.8 Archaeological Assessment

A Stage 1 Archaeological Assessment was completed in September 2022 for the study and is included in **Appendix A-6.**

Archaeological activities were carried out in accordance with the Standards and Guidelines for Consultant Archaeologists (MCM 2011). The assessment involved a review of documents pertaining to the property including historic maps, aerial photographs and local histories. A property inspection was conducted on May 11, 2022.

The Stage 1 Archaeological Assessment determined that there is potential for the presence of pre- and post contact Indigenous and Euro-Canadian archaeological resources to be present within the parts of the study area that could not be confirmed to have been previously disturbed. The potential for the presence of pre- and post-contact Indigenous resources is high within areas not previously disturbed due to the proximity to a known Indigenous archaeological site within 1 km of the study area, as well as the proximity of the study area to Cooksville Creek, Lake Ontario, the Credit River, and Etobicoke Creek, which would have provided significant food resources and convenient transportation for pre- and post-contact populations.

Based on the results of the property inspection, archaeological potential has been removed from the majority of the study area as a result of extensive deep disturbance associated with the construction of roadways, residential and commercial developments, significant landscaping and grading, ditching, and the installation of underground water and electrical utilities. Additionally, the southern portion of the study

area was developed as a result of lake-filling activities and, therefore, does not hold archaeological potential.

The results of the Stage 1 Archaeological Assessment includes the following recommendation, should any disturbances be proposed within areas shown in green in **Figure 4-3**:

— All areas found to retain archaeological potential (identified in **Figure 4-3**) must be subject to test pit survey at 5 m intervals as per Section 2.1.2 of the Standards and Guidelines for Consultant Archaeologists (2011) prior to any ground disturbance. This recommendation includes areas such as wood lots, bush lots, manicured lawns, and areas of scrub overgrowth. Test pit survey can be increased to 10 m intervals in areas of confirmed disturbance based on professional judgement.

Since the proposed works will occur within areas identified as being previously disturbed, as identified in **Figure 4-3**, no further archaeological assessment is required as part of the study. The Stage 1 Archaeological Assessment report was accepted into the Ontario Public Register of Archaeological Reports on November 4, 2022.

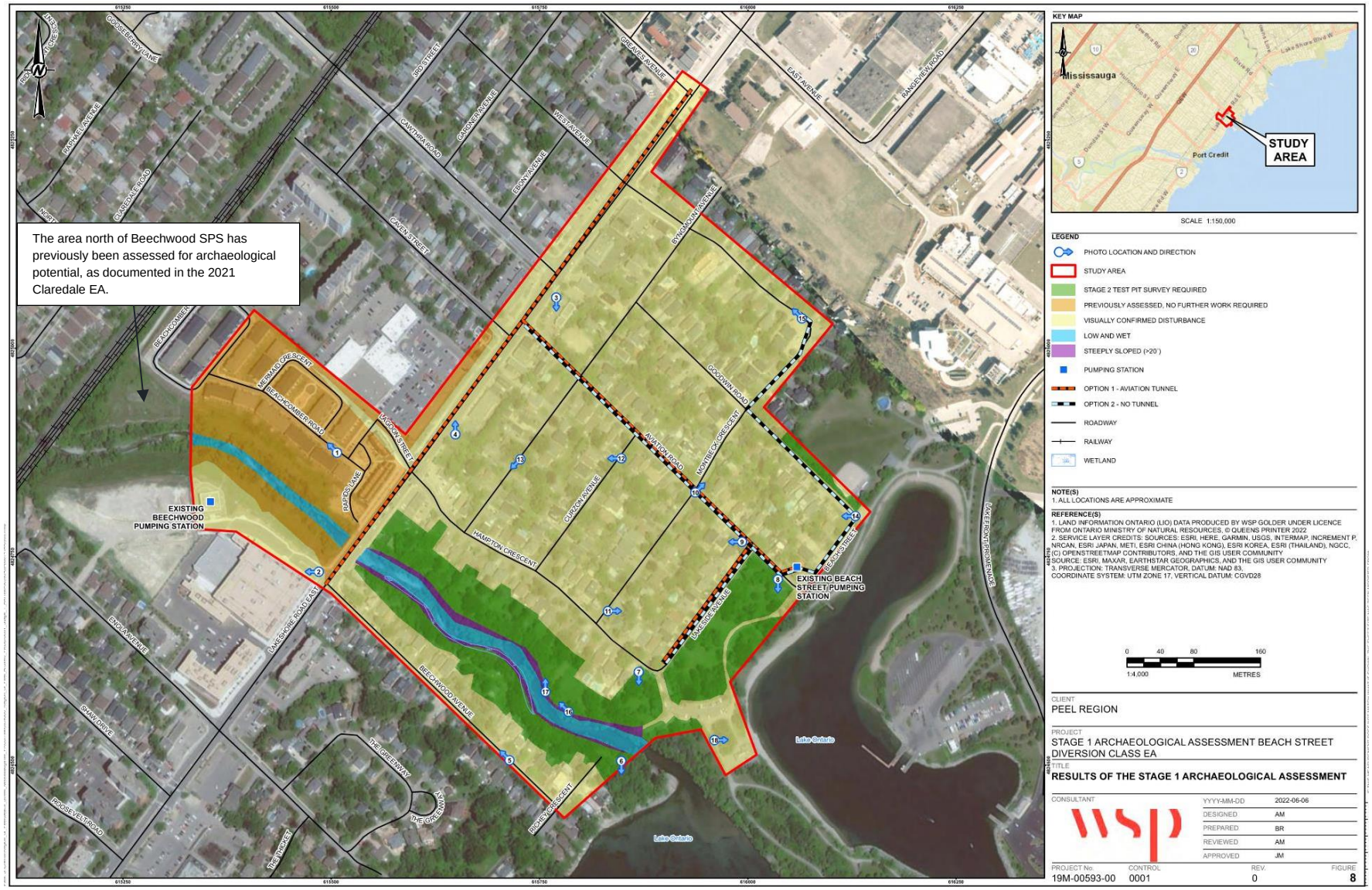


Figure 4-3: Archaeological Potential

4.9 Built and Cultural Heritage

A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment was completed in January 2023 for the study area and is provided in **Appendix A-7**.

The assessment was carried out in accordance with the Draft Existing Conditions and Preliminary Impact Assessment Report Guidelines provided by the Ministry of Citizenship and Multiculturalism (MCM, 2019). In addition, best practice in heritage identification and assessment were also used, as outlined in the Standards and Guidelines for the Conservation of Provincial Heritage Properties (MCM, 2010), Identification and Evaluation Process (2014) and the Ontario Heritage Toolkit (2006a).

A property visit was conducted on July 25, 2022, which confirmed that there are no built heritage resources (BHRs) and one cultural heritage landscape (CHL) within the study area, the Lakefront Promenade Park. The preliminary impact assessment determined that there will be no impacts to the Lakefront Promenade Park as part of the project.

The report has resulted in the following recommendations:

- Staging and construction activities should be appropriately located and/or planned to avoid impacts to the Lakefront Promenade Park.
- Construction activities should seek to avoid direct impacts to Lake Ontario, including the shoreline as well as direct impacts to trees and medicinal plants. Where avoidance is not possible, mitigation measures should be developed in consultation with Indigenous Communities.
- Should future work require expansion of the study area or the alternative alignments are changed, a qualified heritage consultant should be contacted to confirm the impacts of the proposed work on known or potential BHRs and CHLs.

The Cultural Heritage Report was reviewed by the Ministry of Citizenship and Multiculturalism on January 23, 2023.

5 Phase 2: Alternative Solutions

As discussed in **Section 2**, Phase 1 of the MCEA process involves the identification of the problems and/or opportunities being addressed by the study. Phase 2 of the MCEA process involves identifying alternative solutions (planning alternatives) to address the problem/opportunity.

Alternatives solutions represent reasonable means of addressing the stated problems and opportunities, as well as achieving the project objectives. The alternative planning solutions are assessed against their ability to reasonably address the identified problems and opportunities, with consideration of the constraints identified in the early stages of the study, to identify a preferred solution.

The following sections provide an overview of the process followed to identify the alternative solutions carried forward for evaluation as part of the study.

5.1 Identification of Alternative Strategies

Various high-level options ("Alternative Strategies") to address the problem were identified. The strategies are described in **Table 5-1**.

Table 5-1: Screening of Alternative Strategies

STRATEGY	DESCRIPTION	SCREENING
Do Nothing	The MCEA document indicates that the "Do Nothing" option should be considered. In the "Do Nothing" option, no improvements or changes would be made to solve the identified problem or opportunity (MEA, 2023).	Do Nothing does not address current condition, capacity, and operational issues and was not carried forward for further consideration.
Limit Growth	This strategy involves limiting growth within the study area. No improvements or changes would be made to solve the identified problem or opportunity.	Limiting growth does not address current condition, capacity, and operational issues and was not carried forward for further consideration.
Upgrade Existing Infrastructure*	This strategy involves upgrading and replacing existing infrastructure.	Upgrading existing infrastructure addresses operational issues; however, does not address capacity issues related with increased development in the area. This alternative was carried forward for further evaluation.
Addition of New Infrastructure*	This strategy involves installing a new sewer to reroute flows from the Beach Street SPS to the Beechwood SPS.	The addition of new infrastructure addresses the concerns related to condition, capacity and operation. This alternative was carried forward for further evaluation.

*incudes necessary upgrades to the Beach Street SPS.

The two strategies carried forward include the upgrade existing infrastructure and addition of new infrastructure. In combination, these solutions meet the objectives of the project and address the problem statement.

Alternatives solutions were developed for each strategy carried forward and are identified in the following sections.

5.1.1 Alternative 1

5.1.1.1 *General*

Alternative 1 includes the following components and is illustrated in **Figure 5-1**:

- Installation of a new gravity sewer,1200mm dia. and approximately 380 m in length, between Caven Street and Beechwood Ave on Lakeshore Road East, discharging to the 1500mm dia. inlet sewer to the Beechwood SPS. Launch Shaft is located on Caven Street, with receiving shaft at the intersection of Lakeshore Road East and Beechwood Ave.
- Installation of a new gravity sewer, 1200mm dia. and approximately 346 m in length, between Caven Street and Greaves Ave on Lakeshore Road East to intercept flows from existing local sewers north of Lakeshore Road to alleviate sewer capacity concerns south of Lakeshore Road towards the Beach St. SPS. Launch Shaft is located on Caven Street, with receiving shaft east of Lakeshore Road East.
- Installation of new 900mm dia. gravity sewer, approximately 119 m in length, between Greaves Ave and East Ave, on Lakeshore Road East to intercept flows from existing local sewers to reduce local sewer capacity concerns south of Lakeshore Road towards the Beach St. SPS, and to provide servicing for future developments.
- Installation of a new 1200 mm dia. gravity sewer on Aviation Road, approximately 450m in length to divert flows from the Beach St. SPS.
- Replacement of existing gravity sewer on Lakeside Avenue and Hampton Cres with 375mm sewer, approximately 300m in length at a higher elevation to permit the flows to be conveyed into the proposed Aviation Road gravity sewer as the existing sewer is too deep to be intercepted by gravity.
- Upgrades to Beach Street SPS to bring it up to current Region of Peel Pumping Station standards.

The addition of the new sewers will provide increased capacity to alleviate risks of surcharging and basement flooding in the local sewer network and will also support future development in the area. The new sewers will also provide system redundancy during extreme wet weather events and/or in the event of operational issues to help prevent basement flooding in the area by allowing the Beach St. SPS to act as a backup pumping station to the new Beechwood PS.

5.1.1.2 *Construction Methodology*

Due to the required depth of installation (5.0 to 10.0 m below ground surface), and to limit disruption to traffic and existing utilities, microtunneling is proposed for the installation of the new gravity sewer along Aviation Road and Lakeshore Road East. A Micro-Tunnel Boring Machine (MTBM) with an inside pipe diameter of 900mm and 1200mm will be required to complete the proposed tunnel drive lengths and negotiate the proposed curved alignments. The length of the proposed sewer in combination with the invert elevation of the inlet sewer to the Beach St. SPS and the invert elevation of the connection to the 1500mm dia. inlet sewer to the Beechwood SPS mean the proposed sewer is quite flat and the slope and subsequent sewer velocities will not meet the Region Peel sewer design standards. In order to account for the slope of the pipe and the velocity of the flow not meeting Region standards, WSP has proposed a low flow channel cross section for all microtunnelled pipes to increase the velocities during periods of low flow.

In order to complete the microtunnel construction a series of temporary MTBM launch and exit shafts are required. The shafts will additionally serve to complete the construction of maintenance holes for future access to the sewer and provide connection points for local sewers. It is proposed that the microtunnel launch shafts be located at the intersection of Caven Street and Lakeshore Road East, and East Avenue and Lakeshore Road East. The exit shafts are proposed to be located at the intersection of Beechwood Avenue and Lakeshore Road East, and at the Beach St. SPS. Temporary lane closures during construction are required along Lakeshore Road East at the Beechwood Avenue intersection. Temporary

full road closure of Caven Street at the Lakeshore Road East intersection is required to accommodate the microtunneling shaft.

Due to the short connection distance and the shallower elevations, open cut construction would be utilized for replacement of the existing gravity sewers of Lakeside Avenue and Hampton Crescent. Access to residential properties along Lakeside Avenue will be maintained at all times.

The estimated duration of construction work is approximately 18 months.

5.1.1.3 *Beach Street SPS Upgrades*

The Beechwood SPS has a firm pumping capacity of 1500L/s and does not currently have a backup pumping system or overflow outlet. Under Alternative 1, in the event of station failure at Beechwood SPS, the flows going to Beechwood SPS will backup through the proposed sewers to Beach St SPS wet well. This will allow the Beach St. SPS to function as a backup pumping station to the Beechwood SPS (for more information on this, refer to **Appendix B-1** for the Beechwood SPS and Beach Street SPS Operating Scenarios Analysis). With the current configuration, Beach St SPS is able to pump 756 L/s to G.E. Booth WWTP, with any excess incoming flows overflowing through the outfall to Lake Ontario. There is concern for residential or commercial basements being flooded with sewage if Beach St SPS remains in 'flooded' conditions for long periods of time. It was confirmed that overflow into Lake Ontario is acceptable, given that the likelihood of Beechwood SPS failure is low and overflow to the lake would only occur in the event that the capacity of Beach St. SPS was simultaneously exceeded.

Beach St SPS has been reviewed for any required upgrades to comply with existing Region of Peel 2022 standards for sewage pumping station design. The existing standards have classified Beach St SPS as a Type IV station due to rated capacity of 756 L/s. While a Type IV station typically requires four (4) pumps per standards, WSP recommends excluding and exempting the inclusion of the fourth pump, as it is deemed less critical and unnecessary, given its standby and backup status. Exclusion of the fourth pump will also void any required modifications to the electrical, instrumentation and control, and structural designs to accommodate for the additional equipment.

The following upgrades have been categorized between major and minor upgrades, dependent on impacts to station process piping and operability:

Required Major Station Upgrades

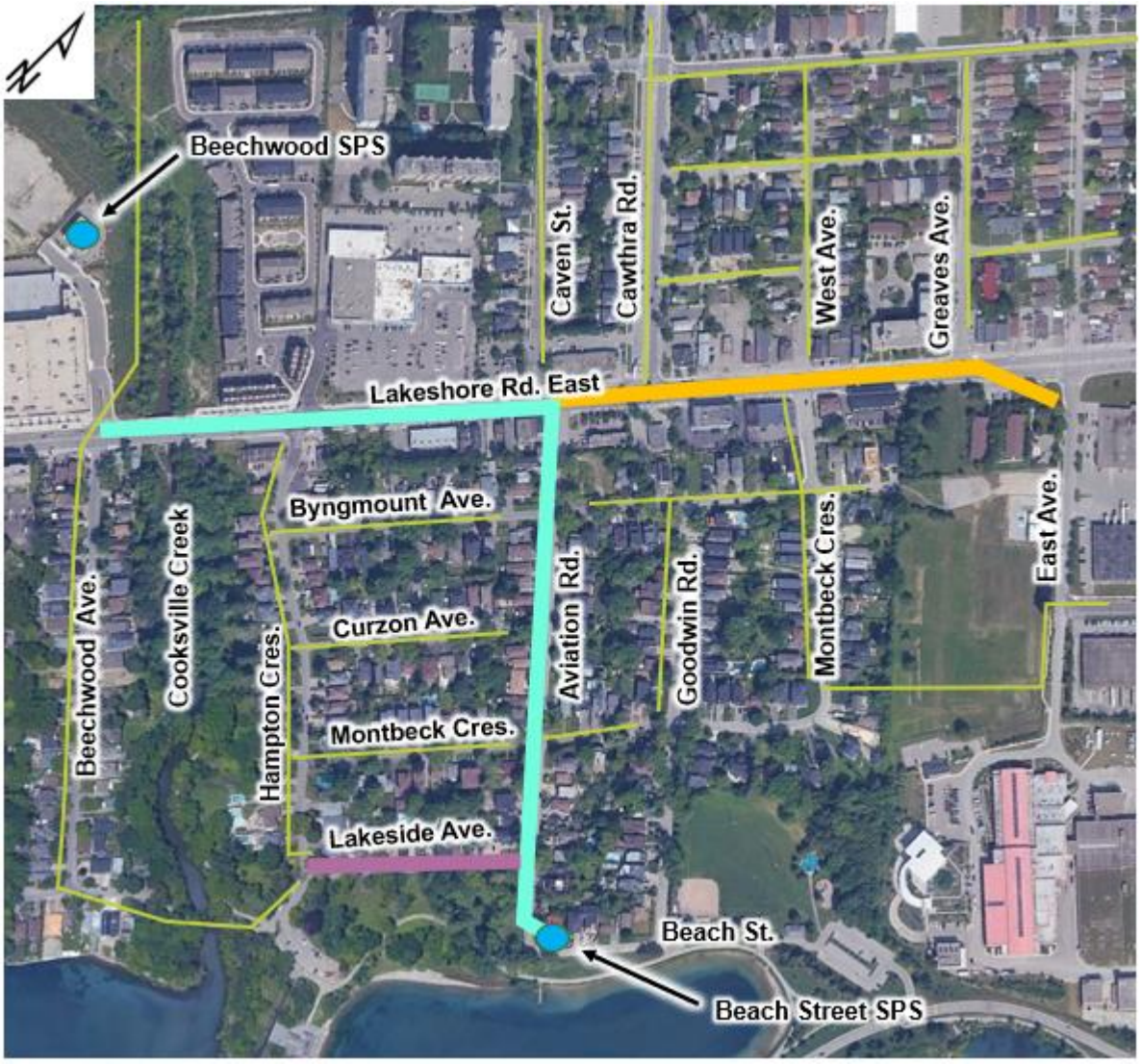
- Upsize the pump suction piping from 400mm meet acceptable velocity ranges as required by Region 2022 standards.
- Upsize the pump discharge piping from 400mm to meet acceptable velocity ranges as required by Region 2022 standards.
- Bypass connections on process piping to be provided for forcemain bypass through tanker truck into discharge header.
- Wet well to include submersible propeller mixer for active wet well mixing in each cell c/w equipment removal lifting bail.
- Replacement of all gate valves with plug valves. There is preference by Region for plug valves at pipe diameters lower than 450mm, and 2022 Standards notes gate valves are not acceptable for wastewater piping.
- Automatic transfer switch for standby generator to be provided.

Required Minor Station Upgrades

- Provision of access ladder from wet well grinder access walkway to wet well floor.
- Wet well benching to be modified to allow for better flows towards pump suction piping. Where possible, a 60° slope around the suction piping bells is to be provided.
- Wet well benching to be modified to allow for self cleaning of wet well during manual pump down operation.
- Process piping to be modified for access ports for pump cleaning and unclogging.

- Washdown lines to be provided for cleaning of the wet well.
- Drain lines from twin forcemains to wet well to be provided, allowing forcemains to be emptied prior to maintenance or repair efforts.
- Air valves to be provided at each pump discharge prior to check valves. Piping layout may require modification to ensure sufficient space for air valves.
- Vibration sensors to be provided for pumps and be connected to SCADA.
- Valve operators on existing sluice gates located within inlet channel to be extended to grade for access at surface.
- Upgrade of existing water service and plumbing from existing 12mm to 50mm. All plumbing within station to be impacted.
- Dry well floor drains c/w drain traps and automatic primers to be provided.
- Sump pump within dry well, discharging to inlet manhole or wet well, to be provided.
- The following instrumentation is missing from the existing pumping station and is to be included per standards:
  - Floats for flood/high level monitoring, pump backup control, and overflowing monitoring.
  - Temperature transmitters for building condition monitoring.

Beach St SPS shall be kept as a standby station with option to be used as a training facility for Operational staff. Occasional exercising of the equipment will be required to ensure the longevity of the equipment within the standby pumping station. As discussed in the Operational Considerations Memorandum, dated May 12, 2022 (available in **Appendix B-2**), flushing the forcemains and draining the forcemains are sufficient to properly maintain the functionality of the station. This would approximately take 16 hours over 3 days for a total of $6,600 of labour for each month. It is understood that this is the most cost-efficient solution in ensuring that Beach St SPS remains operational in the event of failure at Beechwood SPS.



Legend:

- Existing sanitary infrastructure
- New gravity sewer to be installed via microtunneling
- New gravity sewer to be installed via microtunneling
- Gravity sewer replacement via open cut methods

Figure 5-1: Alternative 1 - Key Plan

5.1.2 Alternative 2

5.1.2.1 General

Alternative 2 includes the following components, as illustrated in **Figure 5-2**:

- Replacement of existing gravity sewers including pipe upgrades on Goodwin Avenue and Montbeck Crescent via open cut methods, to 450mm PVC pipes (See **Appendix B-1** for more details from the East Ave Servicing Report).
- Installation of 300 m of 375mm sewer on Hampton Cres and Lakeside Ave.
- Installation of 441m of 525mm sewer on Lakeshore Rd E from East Ave to Aviation Rd to address existing sewer surchargeing risks, and to provide additional capacity for servicing future developments.
- Replacement of ex. 300mm sanitary sewer to 450mm sewer on Lakeshore Rd E from Cawthra to Caven.
- Upsizing of existing sewer on Aviation Road to 525 mm sewer from a 300 mm sewer.
- Installation of a new gravity sewer on Lakeshore Road East from Aviation Road to East Avenue via open cut methods.
- Upgrades to Beach Street SPS.

5.1.2.2 Construction Methodology

Construction is proposed to be undertaken using open-cut construction methods for all proposed gravity sewers, including sewer replacement and upgrades on Goodwin Avenue and Montbeck Crescent, in addition to the replacement of the existing sewer on Lakeside Ave. Furthermore, the existing sewer on Aviation Road & Lakeshore Road East will also be upsized via open cut methods.

The maximum depth of the sewer along Lakeshore Road and Aviation Road will be in the range of 6.0m below ground surface which is approaching the maximum feasible depth for open cut construction. It is anticipated that construction of this sewer will cause significant disruption to local residents, to the mature trees along Aviation Road, and traffic along the proposed alignment. Long term lane closures along Aviation Road and Lakeshore Road East are required to accommodate construction.

The aging Beach Street SPS would remain in full time service with this alternative and therefore require upgrades to bring the station up to the Region's standards and ensure long term reliability. As the sanitary flows will continue to flow to the station, the station will require to remain operational during construction. Therefore, the station upgrades will require the construction of a long duration temporary bypass of the Beach Street SPS in order to complete the upgrades to the station. This will result in a large cost to construct temporary infrastructure, rather than investing in permanent infrastructure which will also increase system redundancy provided in Alternative 1.

5.1.2.3 Beach Street SPS Upgrades

Under Alternative 2, Beach St. SPS will remain fully operational as it is currently, where it is able to pump 756 L/s to G.E. Booth WWTP directly. Any overflows, in the event of Beach St SPS failure, will be directly discharged into Lake Ontario through the outfall. This results in Beechwood SPS having less sewage inflows despite the firm pumping capacity of 1500L/s. If Beechwood SPS experiences a power outage or failure, an existing siphon under Cooksville Creek will direct flows to Beach St. SPS once it reaches the overflow elevation however this will result in basement flooding within the local area.

Beach St SPS has been reviewed for any required upgrades to comply with existing Region of Peel 2022 standards for sewage pumping station design. The existing standards have classified Beach St SPS as a Type IV station due to rated capacity of 756 L/s. WSP proposes excluding the fourth pump required under Type IV stations, as it is unfeasible due to constraints of the existing building footprint. The station must be expanded or structurally modified to accommodate for the additional pump, as well as any additional electrical and control equipment. Building modifications will be difficult to complete and design due to

limited site space and proximity to residential buildings. If Beach St. SPS is to be fully operational and compliant with standards as part of Alternative 2, the fourth pump must be included unless officially exempted by Region.

The following upgrades have been categorized between major and minor upgrades, dependent on impacts to station process piping and operability.

Required Major Station Upgrades

- Potential replacement of all dry well submersible pumps as the pumps may be nearing the end of their service life.
- Inclusion of 4th dry well submersible pump as the station is classified as a Type IV based on existing firm capacity. Process piping shall be provided for the 4th pump.
- Provide variable frequency drive (VFD) for the 4th dry well submersible pump to provide equal operational flexibility to the existing three (3) pumps.
- Upgrade of standby generator to accommodate for 4th pump within load capacity. The existing generator is likely only sized for two (2) duty pump scenario.
- Upsize the pump suction piping from 400mm meet acceptable velocity ranges as required by Region 2022 standards.
- Upsize the pump discharge piping from 400mm to meet acceptable velocity ranges as required by Region 2022 standards.
- Bypass connections on process piping to be provided for forcemain bypass through tanker truck into discharge header.
- Wet well to include submersible propeller mixer for active wet well mixing in each cell c/w equipment removal lifting bail.
- Replacement of all gate valves with plug valves. There is preference by Region for plug valves at pipe diameters lower than 450mm, and 2022 Standards notes gate valves are not acceptable for wastewater piping.
- Automatic transfer switch for standby generator to be provided.
- Potential expansion of the existing superstructure building to accommodate required spacings and clearances for additional equipment (4th pump, additional VFD, bypass connections, and upsizing of suction/discharge piping).

Required Minor Station Upgrades

- Provision of access ladder from wet well grinder access walkway to wet well floor.
- Wet well benching to be modified to allow for better flows towards pump suction piping. Where possible, a 60° slope around the suction piping bells is to be provided.
- Wet well benching to be modified to allow for self cleaning of wet well during manual pump down operation.
- Process piping to be modified for access ports for pump cleaning and unclogging.
- Washdown lines to be provided for cleaning of the wet well.
- Drain lines from twin forcemains to wet well to be provided, allowing forcemains to be emptied prior to maintenance or repair efforts.
- Air valves to be provided at each pump discharge prior to check valves. Piping layout may require modification to ensure sufficient space for air valves.
- Vibration sensors to be provided for pumps and be connected to SCADA.
- Valve operators on existing sluice gates located within inlet channel to be extended to grade for access at surface.
- Upgrade of existing water service and plumbing from existing 12mm to 50mm. All plumbing within station to be impacted.
- Dry well floor drains c/w drain traps and automatic primers to be provided.

- Sump pump within dry well, discharging to inlet manhole or wet well, to be provided.
- The following instrumentation is missing from the existing pumping station and is to be included per standards:
  - Floats for flood/high level monitoring, pump backup control, and overflowing monitoring.
  - Temperature transmitters for building condition monitoring.

With Beach St. SPS in full operation, occasional exercising of the equipment is not required. The operating and maintenance costs required to ensure Beach St. SPS remains fully operational would be similar to the same costs incurred by the Region to maintain the existing facility under current conditions. A high-level cost estimate was determined based on current operating and maintenance requirements for Beach St. SPS, which includes electrical usage, maintenance costs, and labour efforts. On average, the total monthly cost to operate and maintain the critical process and electrical equipment is approximately $16,000.

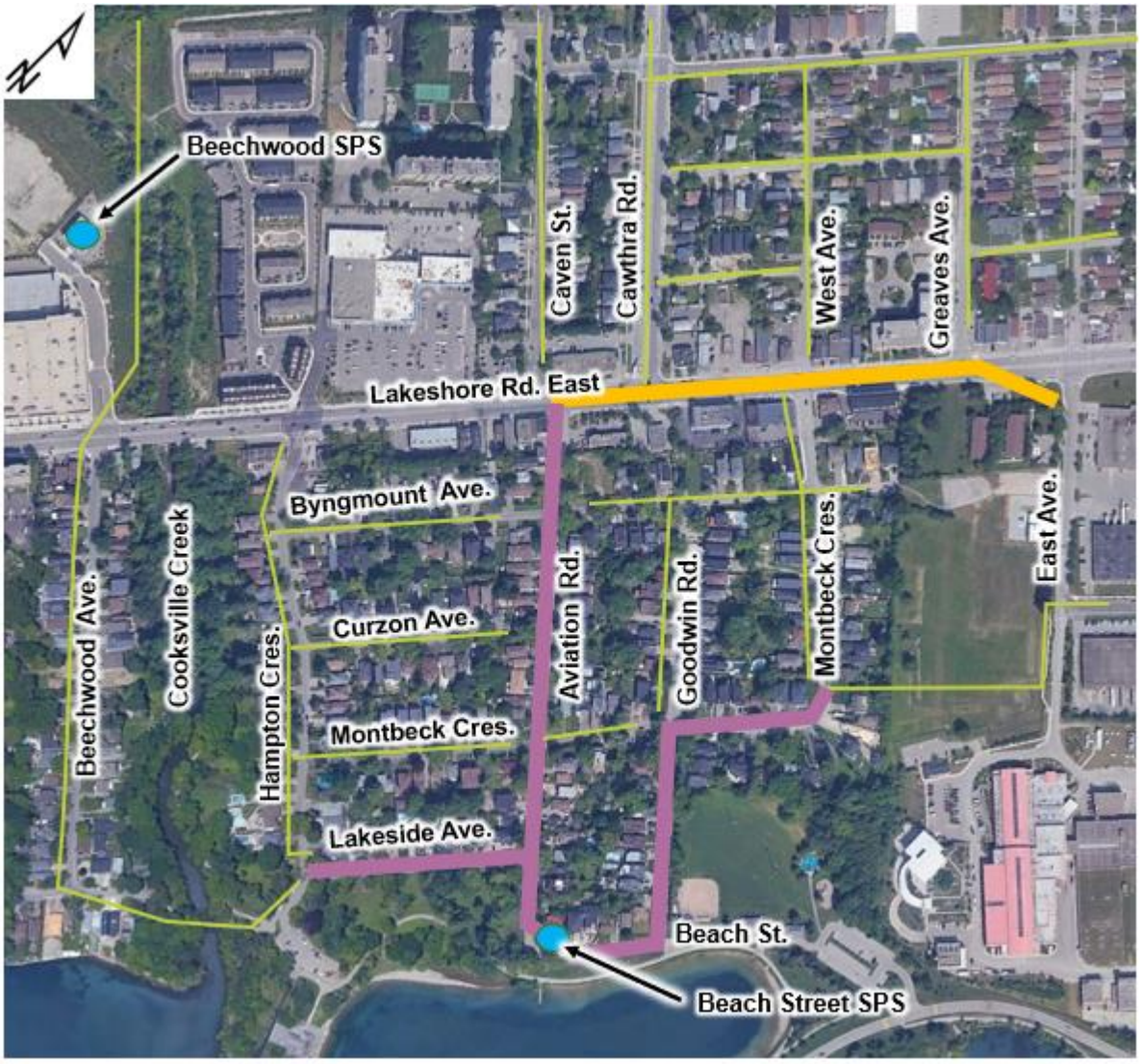


Figure 5-2: Alternative 2 - Key Plan

5.2 Comparative Evaluation of Alternative Solutions

The following sub-sections describe the evaluation process that was used to select the preferred alternative. Also included is an overview of how each alternative solution was evaluated, including a summary of the advantages, disadvantages or key considerations for each alternative solution.

5.2.1 Approach to Evaluation of Alternative Solutions

The objective of the evaluation process is to identify and recommend a preferred solution. The preferred solution is the alternative that best satisfies the Problem Statement based on the evaluation criteria. The evaluation of the alternatives is presented in the following sections. A more detailed technical evaluation is documented in Technical Memorandum 2 – Analysis of Alternative Options for the Beach Street Pumping Station Diversion EA (WSP, December 2023) and can be referred to **Appendix B-3.**

A set of evaluation criteria were identified based on various technical inputs and grouped under four main categories as identified in **Table 5-2**.

Table 5-2: Evaluation Criteria Descriptions

EVALUATION CRITERIA	DESCRIPTION
Technical	Component that considers the technical suitability and other engineering aspects of the sanitary system.
Natural Environment	Component having regard for protecting the natural and physical components of the environment (i.e., air, land, water and biota), including natural heritage and environmentally sensitive areas.
Social / Cultural	Component that evaluates potential effects on residents, neighbourhoods, businesses, community character, social cohesion, community features and historical/archaeological and heritage components.
Economic / Financial	Component that compares the potential financial costs.

Under each of the four main categories, specific criteria were developed. A list of criteria and corresponding definitions is provided in

Table 5-3.

Each criterion was assigned a weighting relative to its importance to the project. A criterion with a higher weighting was considered to have greater importance to the project.

Based on an assessment of expected impacts and existing studies, the alternatives were then comparatively evaluated. Under each criterion, the alternatives were assigned a numerical score, ranging from one (1) to three (3). An alternative assigned a score of 1 is least preferred, while a score of 3 is most preferred.

Table 5-4 shows the colour-coded evaluation legend for the evaluation matrix in **Table 5-5**.

Under each criterion, the weighted score was calculated as the product of the assigned weighting and score. The final score for each alternative was calculated as the sum of all weighted scores. The alternative with the higher final score was determined to be the preferred solution.

Table 5-3: Criteria for Evaluating Alternative Solution

EVALUATION CRITERIA	DEFINITION
Natural Environment Considerations	
Proximity to Environmentally Sensitive Areas including Impact to Species at Risk	Means potential for adverse impact(s) to features and areas, which may include significant wetlands, fish habitat, significant woodlands, habitat of endangered species and threatened species, wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social value as a legacy of the natural landscape area.
Impact to Watercourses	Means potential for adverse impact(s) to watercourses and associated tributaries, including ground water and surface water features, to ensure hydrologic functions and linkages are maintained.
Impact to Shrubbery and Other Vegetation	Means the potential for disruption or removal of shrubbery and other vegetation to accommodate the proposed works.
Potential for Contamination	Means the potential for contamination for each alternative.
GHG Emissions & Carbon Footprint	Means the potential for greenhouse gas emissions and overall carbon footprint of the work.
Social & Cultural Environment Considerations	
Impact to Cultural Heritage Resources	Means the potential for adverse impacts identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may involve features such as structures, spaces, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association.
Land Use / Zoning Compliance	Means the compliance with Provincial, Regional, Municipal, and other agency policies, plans, and regulations. This framework controls the use of land and directs development to appropriate locations. This criterion will also consider the extent of any required amendments to land use or zoning regulations.
Traffic Impacts during Construction	Means the severity of adverse construction impacts on adjacent land uses, specifically traffic congestion.
Noise Impacts during Construction	Means the severity of adverse construction impacts on adjacent land uses, specifically noise pollution.
Dust Impacts during Construction	Means the severity of adverse construction impacts on adjacent land uses, specifically dust.
Removal of Recreational Space (Private or Public)	Means the amount of private or public recreational space which will be removed to accommodate construction.
Economic Considerations	
Capital Costs	Means the capital costs required to acquire land, obtain necessary approvals and permits, and construct each option.
Life Cycle (Maintenance) Costs	Means the project life cycle (maintenance) costs of each alternative including operational costs such as electricity usage.
Technical Considerations	
Constructability	Means challenges or risks associated with undertaking construction.
Impact to Existing Utilities	Means the impact of each alternative to existing utilities. An alignment within an existing road right-of-way will have a greater impact on existing utilities.
Permits and Approvals	Means the ability to obtain and number of required permits and approvals for the project (e.g., conservation authority).

Table 5-4: Evaluation Legend

SCORE	DEFINITION AND COLOUR-CODING
1	Least Preferred
2	Less Preferred
3	Most Preferred

Table 5-5: Evaluation Matrix

		ALTERNATIVE 1			ALTERNATIVE 2		
	Weighting	**Rationale**	**Score**	**Weighted Score**	**Rationale**	**Score**	**Weighted Score**
Natural Environment Considerations							
Proximity to Environmentally Sensitive Areas including Impact to Wildlife and Species at Risk	3	The majority of the vegetation impacted will be on the residential lands and urban trees adjacent to the existing roads. Although unlikely, there may be some negligible impacts to the natural areas LV4&5 and the Natural Hazards area associated with Cooksville Creek along Lakeshore Road east for the microtunnelling option and associated access shafts. The majority of the habitat to be impacted is already disturbed in nature and does not provide specialized wildlife habitat. Potential impacts to Species at Risk (SAR) Bats and Barn Swallow are negligible.	2	6	The majority of the vegetation impacted will be on the residential lands and urban trees adjacent to the existing roads. The majority of the habitat to be impacted is already disturbed in nature and does not provide specialized wildlife habitat. Potential impacts to Species at Risk (SAR) Bats and Barn Swallow are negligible.	3	9
Impact to Watercourses	3	Direct impacts to fish and fish habitat within Cooksville Creek as a result of the microtunneling works are not anticipated. The only works within close proximity to Cooksville Creek include the micro-tunneling of the 198 m of 375 mm sewer addition along Lakeshore Road East. This microtunneling will cross below the channel bed of Cooksville Creek, with standard mitigation measures in place to prevent tunneling related concerns (i.e., frac out).	3	9	Although some of the Alternative 2 pipe work will occur within close proximity of Lake Ontario (< 30m), standard mitigation measures such as robust Erosion and Sediment control plans will minimize impacts to fish and fish habitat along the shoreline. There are no direct impacts to Lake Ontario anticipated.	3	9
Impact to Vegetation	2	Impacts to the vegetation communities are similar for both alternatives. The southern stretch of both options has the potential to impact the manicured nature of the recreational lands (CGL-4), including potential impacts to a number of mature trees lining Lakeside Avenue. There is also the potential for indirect impacts to the adjacent retained vegetation during construction. Mitigation measures aimed at protecting the mature trees will be implemented during construction. Although Alternative 1 crosses Cooksville Creek at Lakeshore Road East, the works involve micro-tunnelling under the creek bed for the pipe installation. As such, impacts to the fresh-moist willow lowland deciduous forest on the north and south side of the bridge Lakeshore Road East bridge are not anticipated. Shaft locations are located outside of natural vegetation communities.	2	4	Impacts to the vegetation communities are similar for both alternatives. The southern stretch of both options has the potential to impact the manicured nature of the recreational lands (CGL-4), including potential impacts to a number of mature trees lining Lakeside Avenue. There is also the potential for indirect impacts to the adjacent retained vegetation during construction. Mitigation measures aimed at protecting the mature trees will be implemented during construction.	2	4
Potential for Contamination	3	There is an inherent potential for contamination associated with construction of a new sanitary sewer and decommissioning of existing sanitary sewers.	3	6	There is an inherent potential for contamination associated with construction of a new sanitary sewer and decommissioning of existing sanitary sewers.	2	4

		ALTERNATIVE 1			ALTERNATIVE 2		
Climate Change Adaptation GHG Emissions & Carbon Footprint	2	The installation of a new gravity sewer will provide system redundancy during extreme wet weather events and operational issues to help prevent basement flooding in the area to adapt to a changing climate and increased storm frequency. Greenhouse gases will be emitted by the operation of heavy construction vehicles throughout the duration of construction. Low emission concrete will be utilized during construction. Trenchless operations do not require as much excavation and therefore decreases the amount of excess fill generated to be disposed of off site.	3	6	Replacement of existing infrastructure does not provide climate change adaptation or resiliency as the Beach Street SPS would remain in full operation and would not provide a redundant system during extreme wet weather events and operational issues. Greenhouse gases will be emitted by the operation of heavy construction vehicles throughout the duration of construction. Low emission concrete will be utilized during construction. Open cut construction results in a greater amount of excess fill material generated that will require disposal off site.	2	4
Sub-Total		**31**			**30**		
Social & Cultural Environment Considerations							
Impact to Cultural Heritage and Archaeological Resources	2	The Lakefront Promenade Cultural Heritage Landscape (CHL) is located south of study area. No impacts to the CHL is anticipated as part of construction. Impacts to archaeological resources are not anticipated as part of construction.	3	6	The Lakefront Promenade Cultural Heritage Landscape (CHL) is located south of study area. No impacts to the CHL is anticipated as part of construction. Impacts to archaeological resources are not anticipated as part of construction.	3	6
Land Use / Zoning Compliance	2	Per Section 2.1.1 of the City of Mississauga Zoning By-law 0225-2007, the proposed sewer construction works are generally exempt from the requirements of the By-law.	3	6	Per Section 2.1.1 of the City of Mississauga Zoning By-law 0225-2007, the proposed sewer construction works are generally exempt from the requirements of the By-law.	3	6
Traffic Impacts during Construction	3	Alternative 1 will include long term lane closures on Lakeshore Road East at the Beechwood Avenue intersection for approximately 2-3 months and a full closure of Caven Street at the Lakeshore Road East intersection for approximately 8 months to accommodate the microtunneling shafts.	2	6	Open cut operations will require lane closures on local roads and Lakeshore Road East. Impacts will require mitigation through scheduling and traffic management.	1	3
Noise Impacts during Construction	3	Noise impacts associated with Alternative 1 are proposed to be longer in duration than that of Alternative 2 due to tunneling operations which may require 24 hour operations, to be determined in detail design.	1	3	Noise impacts include day-to-day construction operations associated with open cut construction methods.	2	4
Dust Impacts during Construction	3	Potential dust impacts are considered relatively minor due to microtunneling operations.	3	6	Dust impacts are proposed to be greater with Alternative 2 due to open cut operations which will include backfilling and compaction activities that could result in greater dust creation than that of microtunneling operations in Alternative 1.	1	2
Property Requirements	2	Temporary public property requirements are required to accommodate tunnel entry and exit shafts and construction staging. A permanent easement from City of Mississauga is required to accommodate the tunnel shaft near Greaves Street on the south side of Lakeshore Avenue.	2	4	Temporary public property requirements are required to accommodate construction staging.	2	4
Removal of Recreational Space (Private or Public)	2	No removal of recreational space, either private or public, is anticipated. Temporary use of City of Mississauga property is required to accommodate the tunnel shaft near Greaves Street on the south side of Lakeshore Avenue. The property is designated as Mixed Use as per the Schedule 10 of the City of Mississauga's Official Plan.	3	6	No removal of recreational space, either private or public, is anticipated.	3	6

		ALTERNATIVE 1			ALTERNATIVE 2		
Sub-Total		**37**			**33**		
Economic Considerations							
Capital Costs	2	Sewer construction: $19,922,454 (detailed cost estimate available in **Appendix D**) Beach St. SPS upgrades: $850,000	2	4	Sewer construction : The high-level conceptual construction cost estimate for the proposed works, including permitting and traffic management is approximately $9,327,600 (detailed cost estimate available in **Appendix D**). Beach St. SPS upgrades: $2,870,000	3	6
Life Cycle (Maintenance) Costs	2	As the design life of a gravity sewer is typically between 80 and 100 years, life cycle (maintenance) costs for a gravity sewer are negligible. As per Operations Analysis memo, $6,600/month is estimated for monthly wet well cleaning & general FM maintenance.	3	6	As the design life of a gravity sewer is typically between 80 and 100 years, life cycle (maintenance) costs for a gravity sewer are negligible. On average, the total monthly cost to operate and maintain the critical process and electrical equipment is approximately $16,000.	2	4
Sub-Total		**10**			**10**		
Technical Considerations							
Constructability	3	-1 tunneling shaft location is located within Lakeshore Road East, which will result in traffic disruptions for extended durations during construction. -There is limited clearance between bridge footings and pipe alignment (1.1m-1.3m) -Tunnel Slope and velocity are less than region standards. Low flow channel proposed to improve velocities during low flow periods. -Local sewers on Lakeside and Hampton will be open-cut installed, requires closures.	3	9	-Open cut replacements on Lakeshore Road East and Aviation will require long term road closures, which will result in heavy traffic disruptions for the entire duration of construction and is not likely to gain approval from the City of Mississauga or Region of Peel. - Significant utility relocations are anticipated in order to complete construction. - Deep open cut excavations along Lakeshore Road East and Aviation Road approaching limit of feasibility. - Crossing ex. 2100mm dia. water feedermain at Lakeshore/Greaves Ave. presents a conflict and may require the sewer to go over top of the feedermain. This could potentially raise the sewer to be too high to fully service future developments by gravity alone. - Feasibility of installing a 4th pump in Beach St. SPS to bring the station up to Region standards is uncertain	2	6
Impact to Existing Utilities	3	Relocation of utilities are required to accommodate microtunneling entry and exit shafts. Microtunneling operations to occur below utilities within the Lakeshore Road East corridor.	2	6	Open cut construction would require the relocation of utilities within the existing roadway right-of-ways along the alignment.	1	3
Permits and Approvals	2	Permits and approvals will be required of the MECP for construction of a new sanitary sewer, Region of Peel and City of Mississauga for road occupancy, and an easement for construction on City-owned property, and the CVC for works within the CVC regulated areas.	3	6	Permits and approvals will be required of the MECP for construction of a new sanitary sewer, Region of Peel and City of Mississauga for road occupancy, and the CVC for works within the CVC regulated areas.	3	6
Sub-Total		**21**			**12**		
TOTAL		**99**			**85**		

6 Evaluation Summary

6.1 Preferred Solution

Based on the results of the evaluation process, Alternative 1 has an overall higher score than Alternative 2. Thus, Alternative 1 is the preferred alternative solution. Alternative 1 better addresses the overall project objectives of providing a connection between the two pumping stations, provides system redundancy during extreme wet weather events and operational issues to help prevent basement flooding in the area, and increased capacity for future development. Design drawings for review purposes can be found in **Appendix C.**

6.2 Construction Cost Estimate

A construction capital cost estimate was completed for the preferred solution. No land acquisition costs are expected for Alternative 1, although a sewer easement will need to be arranged with the City of Mississauga for the works on City-owned property. A high-level conceptual construction cost estimate is presented in **Table 6-1**. Permitting and traffic management costs are not included. Additionally, as the design life of a gravity sewer is typically between 80 and 100 years, life cycle (maintenance) cost for a gravity sewer is negligible.

A high-level construction capital cost estimate was also completed for the proposed major and minor upgrades at the existing Beach St SPS (**Table 6-2**), in order to ensure compliance with the latest Region standards.

Table 6-1: Beach St Upgrades Construction Cost Estimate

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL COST
Alternative 1 - Beach St. SPS Upgrades				
Beach St SPS - Major Upgrades	N/A	LS	$580,000	$580,000
Beach St SPS – Minor Upgrades	N/A	LS	$270,000	$270,000
Total				**$850,000**

Table 6-2: Construction Cost Estimate (Linear)

Linear Cost Estimate		
Part A (General Items)	$726,800.00	
Part B (Tunnelling Items)	$14,873,000.00	
Part C (Open Cut & Manholes)	$977,245.00	
Part D (Watermain Construction)	$25,000	
Total		**$16,602,045.00**

A more detailed cost estimate for the preferred alternative is available in **Appendix D**.

7 Consultation Process

Consistent with the requirements for Schedule 'B' projects under the MCEA, consultation with provincial agencies, the City of Mississauga, the Credit Valley Conservation Authority (CVC), Indigenous communities, local elected representatives, interest groups, and members of the public was on-going throughout all stages of the project.

A comprehensive Consultation Plan was developed at the start of the study, which placed emphasis on consultation with stakeholders and members of the public that have the potential to be most directly affected by the project. The Consultation Plan was designed to involve stakeholders and the public early and throughout the study, identify public concerns and assist in the identification and refinement of the preferred solution.

Stakeholders and the public were kept informed of the study and were asked for input through the use of conventional, effective consultation methods including:

- Newspaper notices to advise of study commencement and a virtual engagement opportunity published in local newspapers;
- Direct letter mailings to local elected representatives, Indigenous communities, and external agencies (provincial agencies, emergency services, school boards, interest groups and local businesses);
- Correspondence with local elected officials, Indigenous communities, external agencies and members of the public;
- A virtual engagement opportunity;
- Meetings held with stakeholders, as required; and
- Filing of the Project File Report for a 30-day comment period.

7.1 Contact List

A contact list of local elected officials, Indigenous communities, provincial and federal agencies, local municipal government, emergency services, utilities, school boards, and interest groups and local businesses was developed at study commencement. Over the course of the study, any individuals or organizations expressing interest in the project were added to the contact list. The contact list includes the following individuals and organizations:

Local Elected Representatives	City of Mississauga – Ward 1 Councillor
Indigenous Communities	Haudenosaunee Confederacy Mississaugas of the New Credit First Nation Six Nations of the Grand River Nation Huronne-Wendat
External Agencies and Interest Groups	City of Mississauga Credit Valley Conservation Authority (CVC) Lakeview Ratepayer's Association Peel Condominium Corporation 1001: Malvern Condominium Property Management Kingsmen Group Inc. Stronghold Property Management Peel Public Health Ministry of Citizenship and Multiculturalism Ministry of Municipal Affairs and Housing

	Ministry of Natural Resources and Forestry Ministry of Transportation GO Transit and Metrolinx CN Rail Hydro One Alectra Utilities City of Mississauga Fire and Emergency Services Peel Regional Police Residents and businesses within the study area

7.2 Study Commencement

The Notice of Commencement was distributed to all stakeholders and Indigenous communities included in the contact list on June 15, 2022, and advertised in the Mississauga News on June 16, 2022. The Notice of Commencement was also sent via Canada Post Neighbourhood mail to approximately 4,900 residents and businesses within the vicinity of the study area and posted on the Region of Peel's project website.

A copy of the Notice of Commencement can be found in **Appendix E-1.**

7.3 Virtual Engagement Opportunity

A Virtual Engagement Opportunity (VEO) was held on the Region of Peel's project specific website starting April 17, 2023. The purpose of the VEO was to present findings and provide stakeholders, Indigenous communities and the public with an opportunity to review and comment on the following elements:

- An overview of the study purpose and objectives;
- The steps in the MCEA process;
- A description of the Recommended Plan, including proposed construction staging;
- Environmental impacts and mitigation measures; and
- Next steps in the study process.

The VEO was presented online in static form with display materials that could be downloaded for offline viewing. A pre-recorded video presentation was also made available for viewing. Stakeholders, Indigenous communities and members of the public were encouraged to submit comments directly to the Project Team by phone, mail, email by May 19, 2023.

During the four-week period following the posting of the VEO display materials (April 17, 2023, to May 19, 2023), the website had **123** visits, while the video presentation had 17 views.

One comment was received during the comment period which required a response. The comment was related to inquiring about impacts to traffic, noise, etc. during construction.

Comments received are provided in **Appendix E-2.** Public consultation was arranged online by posting a project overview presentation on the Region of Peel's project website.

Notice of Virtual Engagement Opportunity

The Notice of Virtual Engagement Opportunity was distributed to all stakeholders and Indigenous communities included in the contact list and to local residents and businesses on **April 13, 2023.** The notice was also sent via Canada Post Neighbourhood mail to approximately 4,900 residents and businesses within the vicinity of the study area and posted on the Region of Peel's project website.

A copy of the Notice of Virtual Engagement Opportunity can be found in **Appendix E-3**.

7.4 Project Website

A project specific website was created on the Region of Peel's website (**www.peelregion.ca/public-works/environmental-assessments/mississauga/beach-street-sewage-station.asp**) to provide project information, updates and documents to the public and interested stakeholders. The website includes information on the project background, study area, study process, public involvement and Project Team contact information to submit questions or comments throughout all stages of the study.

7.5 Notice of Completion

The Notice of Completion was distributed to all stakeholders and Indigenous communities included in the contact list and to local residents and businesses on **April 9, 2024**. The Notice of Completion was also sent via Canada Post Neighbourhood mail to approximately 5,310 residents and businesses within the vicinity of the study area and posted on the Region of Peel's project website.

A copy of the Notice of Completion can be found in **Appendix E-4**.

7.6 Indigenous Consultation

A Notice of Commencement was sent to the Ministry of Environment, Conservation and Parks (MECP) to confirm the list of Indigenous communities that are to be contacted in order to comply with the Duty to Consult. In the letter received from the MECP, dated July 19, 2022, the MECP identified the following Indigenous communities:

- Mississaugas of the Credit First Nation;
- Six Nations of the Grand River: Haudenosaunee Confederacy Chiefs Council the Haudenosaunee Development Institute.

The Notice of Commencement was sent electronically and via regular mail to the Indigenous groups identified by the MECP on June 15, 2022.

The Notice of Virtual Engagement Opportunity was sent was sent electronically and via regular mail to the Indigenous groups identified by the MECP on April 13, 2023.

The Notice of Completion was sent electronically and via regular mail on **April 9, 2024**, to the Indigenous groups identified by the MECP**.**

The letter received from the MECP can be referred to in **Appendix E-2**.

7.7 Stakeholder Consultation

7.7.1 Credit Valley Conservation Consultation

As a portion of the study area is located within the CVC's regulated area, the need to consult with the CVC was identified early in the process. A meeting was held with CVC on May 24, 2022, to introduce the study and solicit CVC's initial feedback on the study, including feedback on potential shaft locations for microtunneling operations noting that shafts should be located outside of the CVC regulated area and Cooksville Creek crossing, and that there should be adequate clearance between creek bed and potential pipe location. In addition, the CVC noted that the majority of the study area is located within the Cooksville Creek floodplain and CVC regulated area, as such, impacts to upstream and downstream residents should be avoided.

A shaft at the intersection of Lakeshore Road East and Beechwood Ave is located within the regulatory floodplain for the Cooksville Creek Crossing. CVC noted through e-mail on March 22, 2024 that as long as existing grades within the floodplain are matched post-construction to avoid any negative offsite impacts to the floodplain, the location of the shaft can be maintained.

An additional meeting was held with CVC on August 16, 2022, to provide an update on the study and to discuss a potential new outfall location into Lake Ontario to minimize risk of basement flooding.

CVC has also reviewed and provided comments on the technical reports prepared for the study.

7.7.2 City of Mississauga Consultation

As the project is located within the City of Mississauga, the need to consult with the City was identified early in the process. The project team reached out to the City starting in March 2022. An introductory meeting was held on March 24, 2022, with City of Mississauga staff. As the study progressed, meetings were held with City of Mississauga departments to discuss project specific (such as traffic and road closures, property requirements, etc.) on an as needed basis. Feedback received was utilized to refine the preferred solution, including construction staging.

7.7.3 City Councillor Consultation

Meetings were held with the City of Mississauga Ward 1 Councillor throughout the study to advise of the project and solicit feedback on the alternatives developed and preferred solution.

The first meeting was held on May 30, 2022, to introduce the study. The second meeting was held on January 31, 2023, to provide an update and present the information to be shared as part of the Virtual Engagement Opportunity. At that meeting, the Councillor expressed concerns related to the traffic impacts on Lakeshore Road East as a result of lane closures required to accommodate the tunnel entry shaft near Caven Street. The Project Team then revised the location of the entry shaft onto Caven Street to reduce lane closures required on Lakeshore Road East. A third meeting was held on February 24, 2023, to present the revised shaft location for Councillor endorsement.

7.8 Summary of Comments Received

A total of 23 comments were received from the public and stakeholders over the course of the study. A summary of all comments received and how they were addressed is provided in **Appendix E-2**.

In general, comments received were regarding:

- Archaeological assessments and cultural heritage assessments being completed for the project;
- Shaft falling within floodplain associated with Cooksville Creek;
- Noise impacts during construction;
- Traffic impacts during construction; and
- Overall purpose of the study.

8 Potential Impacts, Mitigation Measures and Commitments to Future Work

Based on the review of existing conditions and the preferred alternative, potential impacts associated with the construction of the proposed sanitary sewers and upgrades to the Beach Street SPS were identified. The potential impacts and mitigation measures to be carried forward into detailed design and construction to eliminate or lessen the potential impacts are provided in the following sections.

Through application of the following mitigation measures and recommendations, impacts to the environment will be minimized.

8.1 Natural Environment

8.1.1 Vegetation

Potential Impacts

The southern portion of the preferred solution has the potential to impact the manicured nature of the recreational lands (CGL-4), including potential impacts to a number of mature trees lining Lakeside Avenue. There is also the potential for indirect impacts to the adjacent retained vegetation during construction.

Although the preferred solution crosses Cooksville Creek at Lakeshore Road East, the works involve micro-tunnelling under the creek bed for the pipe installation. As such, impacts to the fresh-moist willow lowland deciduous forest on the north and south side of the bridge Lakeshore Road East bridge are not anticipated. Shaft locations are intended to be located outside of natural vegetation communities wherever possible.

There are no other vegetation units that will be impacted by either alternative; the remainder of the alternatives are located within road Rights-of-Way and residential areas with urban trees and manicured lawns.

The proposed works will also require the removal of 95 trees, with the majority of trees being less than 10 cm DBH. In addition to the tree removals, 16 trees will be injured and will require mitigation measures.

Mitigation Measures

The following mitigation measures are recommended to minimize effects to the local vegetation communities and their associated habitat functions across the study limits:

- Shaft locations should be located outside of natural vegetation communities wherever possible.
- Exposed surfaces should be re-stabilized and re-vegetated as soon as possible following disturbance, specifically within 15 days near Cooksville Creek and the Lake Ontario shoreline, and within 45 days in other graded areas. It is recommended that all disturbed habitats be re-vegetated with a native seed mix.
- All temporary erosion and sediment control measures should be maintained in an effective, functioning, and stable condition. This will require routine inspections, including after storm events, and repair as required. Erosion and sediment control measures will remain in place until all site restoration activities are completed and disturbed areas are no longer susceptible to erosion and sedimentation.
- Vegetation clearing zones, vegetation retention zones, and vegetation that does not require removal should be clearly delineated on both the Contract Drawings and in the field with the Contractor prior

to clearing and grading. Equipment, materials and other construction activities should not be permitted in vegetation retention zones.

- Appropriate vegetation clearing techniques shall be used (e.g., felling trees away from retained natural areas and watercourses).
- Cut and grubbed material shall be disposed of through chipping or other appropriate means.
- Avoid all unnecessary traffic, dumping and storage of materials over tree root zones adjacent to natural areas.
- Dust control shall be completed using water, not chemical suppressants.
- Conduct equipment maintenance and refueling at the designated and properly contained maintenance areas in the works yard or at commercial garages located well away from the creek banks and outside retained vegetation areas. The Contractor should have a Spills Prevention Plan and required materials on site at all times.
- Environmental inspection during construction is recommended to ensure that all mitigation measures are implemented properly, maintained and repaired. Remedial measures should be initiated in a timely manner where warranted.
- Tree protection measures as identified in any Tree Preservation and Removal Plans shall be implemented.
- To control the establishment and/or proliferation of non-native or invasive species during construction, adhere to the Clean Equipment Protocol for Industry (Halloran et al., 2013).
- Mitigation measures to protect trees from construction activities include using light duty machinery, restoring disturbed areas, maintaining tree protection fencing through construction, and more. A detailed mitigation plan can be found in the Arborist Report and the Tree Preservation Plans **(Appendix A-2).**

8.1.2 Designated Features

Potential Impacts

As outlined in **Section 4.3.2**, the study area support three Significant Natural Areas according to the City of Mississauga Official Plan – Natural Areas LV4 and LV5, and Natural Hazard lands.

The natural hazard areas as identified in the City of Mississauga Official Plan are encapsulated within the limits of both LV4 and LV5.

The majority of the vegetation impacted will be on the residential lands and urban trees adjacent the existing roads. Although unlikely, there may be some negligible impacts to the natural areas LV4 and LV5 and the Natural Hazards area associated with Cooksville Creek along Lakeshore Road east for the micro-tunnelling option and associated access shafts.

Mitigation Measures

Mitigation measures identified in **Section 8.1** will minimize impacts to designated features within the study area.

8.1.3 Wildlife and Species at Risk

Potential Impacts

Wildlife habitat impacts are generally similar to those described for vegetation; given that the majority of the impacts will be on the residential areas and existing infrastructure, the vegetation supports primarily common and disturbance tolerant wildlife communities. The majority of the habitat to be impacted is already disturbed in nature and does not provide specialized wildlife habitat. Exceptions include potential impacts to sensitive species and habitats, as described below.

There will be a loss of wildlife habitat associated with the vegetation removals along Lakeside Avenue adjacent to the roadway. This area likely provides habitat that generally supports common, disturbance-tolerant wildlife species; there is potential for various wildlife (e.g., turtles, snakes, small mammals, etc.) to wander through the proposed work areas during construction.

There is potential for the proposed works to impact birds during the breeding season. Although no nests were found during the field survey, migratory birds are likely to nest in trees or other vegetation, as well as under the Lakeshore Road bridge during the year of construction. Therefore, there is potential to impact birds, including disturbance to nesting birds or possibly loss of nests or young, if nests are present. Barn Swallow, an avian SAR, was observed to be foraging in the project limits during field investigations. There is the potential that this species will nest on the Lakeshore Road crossing, or the pedestrian bridge associated with the Waterfront Trail during the period of construction. Barn Swallow were down-listed to Special Concern in August 2022 and as such, no longer receive protection under the Endangered Species Act. However, as a migratory bird, individuals and their nests are protected under the federal Migratory Birds Convention Act (MBCA, 1994).

Impacts to SAR bats are anticipated to be negligible, and dependent on the impacts to the mature trees lining Lakeside Avenue. However, overall, there is only a small number of trees that could be impacted, and based on field investigations, none of them appear to support good quality maternity roosting habitat.

Mitigation Measures

For the protection of wildlife in general, the contractor should ensure that:

- Any wildlife incidentally encountered during construction will not be knowingly harmed and will be allowed to move away on its own. In the event that an animal encountered during construction does not move from the construction zone and construction activities are such that continuing construction in the area would result in harm to the animal, all activities that could potentially harm the animal will cease immediately and the Contract Administrator will be notified.
- Any equipment parked overnight in the area will also be inspected to ensure no wildlife have climbed into or beneath it.
- All disturbed areas will be restored to pre-construction conditions.

Nesting migratory birds are protected under the MBCA 1994. No work is permitted to proceed that would result in the destruction of active nests (i.e., nests with eggs or young birds), or the wounding or killing of bird species protected under the MBCA and/or Regulations under that Act.

In order to protect nesting migratory birds, in accordance with the MBCA, the contractor should ensure that:

- No vegetation clearing (including grubbing and removal of trees, shrubs, plants and grasses) will occur during the Regional Nesting Period (April 1 to August 31), unless preceded by a nest search survey conducted by a qualified ecologist.
- No active nests (nests with eggs or young birds) will be removed or disturbed in accordance with the MBCA.
- If a nesting migratory bird is identified within or adjacent to the construction site and the construction activities are such that continuing construction in that area would result in a contravention of the MBCA, all activities will stop and Environment Canada will be contacted to discuss mitigation options.

SAR Birds

- Adhere to mitigation measures outlined for MBCA compliance to avoid impacts to SAR bird species potentially nesting in the work area or vicinity.
- If any works are required on or adjacent to the Lakeshore Road Bridge over Cooksville Creek, a nest search should be conducted by a qualified biologist prior to works within the nesting season, to identify any nests on the structure.

SAR Bats

- No tree removals should occur between April 1 and September 30, to protect the sensitive period for bat breeding/maternity roosting.
- It there is the potential for tree removals, MECP should be contacted to confirm permitting requirements under the ESA.

Other SAR

- In the event that a SAR, or potential SAR, is found within the construction limits, the Contractor should immediately cease all work that could potentially harm the animal and it will be given time to move away on its own. In the event that the animal does not move from the construction zone or is injured the Contract Administrator will be notified. The Contract Administrator or Environmental Inspector can then contact the MECP SAR Biologist for direction, as these animals are protected under the ESA (2007).
- Contractor Awareness and Encounter protocols will be implemented within the Contract documents and specifications to identify the potential for SAR to be encountered during construction and the procedures to be followed in the event of an encounter.

8.1.4 Fish and Fish Habitat

Potential Impacts

The proposed microtunneling works are unlikely to result in direct impacts to Cooksville Creek and its associated fish and fish habitat.

Mitigation Measures

The following mitigation measures are recommended to minimize effects to Cooksville Creek:

Construction Design

- A warmwater permissible in-water construction timing window of July 1 to March 31 should be implemented for works within close proximity to Cooksville Creek, including the micro-tunneling, to avoid potential negative impacts on the resident species during tunneling works (i.e., in the event a frac out occurs). No in-water works should be permitted between April 1 and June 30 of any given year.
- Any temporarily stockpiled soil, debris or other excess materials, and any construction-related materials, shall be properly contained (e.g., within silt fencing) in areas separated at least 30 m from Cooksville Creek and the Lake Ontario Shoreline. All construction materials, excess materials and debris should be removed and appropriately disposed of following construction.
- The shafts required for the micro-tunneling work should be located outside of the floodplain of Cooksville Creek to avoid potential flooding of the shaft during storm events, and in case the shafts need to be de-watered (exception made for shaft at intersection of Lakeshore Road East and Beechwood Avenue, as noted in **Section 7.7.1**).
- If dewatering is required, appropriate energy dissipation and settling / filtration measures shall be designed and used for discharge of dewatering water to ensure no erosion or sediment release occurs into Cooksville Creek or Lake Ontario.
- The contractor will be responsible for providing a specific plan to address the potential for frac out occurring during tunneling under Cooksville Creek. All materials required to address frac out will be kept onsite during tunneling exercises, including measures to address impacts of frac out should it occur within Cooksville Creek. This plan should also include a section on Duty to Notify with direction on who to call and when.
- The Contract Administrator's team should include an Environmental Inspector experienced in working around watercourses, who can be responsible for ensuring the erosion and sediment control measures are functioning effectively, being maintained and that all of the other general mitigation

measures are being implemented as intended. The Environmental Inspector should also ensure all environmental mitigation and design measures are properly installed / constructed and maintained. Appropriate contingency and response plans should be in place and implemented as required.

- If the Contractor wishes to alter any of the mitigation plans as outlined in the Contract Documents, then the associated approval agency will need to be made aware of and approve the changes prior to construction.

Sediment and Erosion Control Measures

- The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be completed by the Contractor as identified in the contract.
- All excess materials in and around Cooksville Creek and Lake Ontario shall be managed by the contractor.
- The Contractor will follow all erosion and sediment control measures identified in the contract and prevent / control potential for erosion and sediment caused by their construction methods and operations so as to meet all legislative requirements, to prevent entry of sediment into Cooksville Creek or Lake Ontario, and to prevent damage to features and property adjacent the proposed works.

Shoreline/Bank/Vegetation Stabilization

- Removal of riparian vegetation in and around Cooksville Creek and Lake Ontario shall be completed by the Contractor as identified in the contract.
- Vegetation protection and rehabilitation shall be completed by the Contractor as identified in the contract.
- The construction access, work areas and associated requirements for removal of riparian vegetation will be minimized to the extent required for the construction activities, and these areas then delineated in the field using properly installed protective silt fencing. All temporarily disturbed areas will be re-stabilized following construction using appropriate means as outlined in the restoration plans.

Operation and Machinery

- Use of equipment in and around Cooksville Creek and Lake Ontario shall be monitored by the Contractor as identified in the contract.
- All construction-related activities should be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants / deleterious substances, in addition to sediment as outlined above, to Cooksville Creek and Lake Ontario.

8.1.5 Groundwater

Proposed Impacts

Anticipated dewatering rates are low and water taking permitting is not anticipated to be required during construction.

Mitigation Measures

- Discharging into sewers should only be used with the permission of the City of Mississauga (storm) and/or Region of Peel (sanitary).

8.2 Cultural Environment

8.2.1 Archaeological Resources

Potential Impacts

The Stage 1 Archaeological Assessment determined the preferred solution is within previously disturbed areas and no further archaeological assessment is required.

Mitigation Measures

- If deeply buried archaeological deposits are discovered in the course of construction, MCM (416-314-1177) should be notified immediately. Should previously undocumented archaeological resources be discovered, they may be new archaeological sites and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out a determination of their nature and significance.
- If human remains are encountered during construction, the Cemeteries Regulation Unit of the Ministry of Consumer Service (1-800-889-9768) should be notified. In situations where, human remains are associated with archaeological resources, MCM should also be contacted to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

8.3 Traffic

Potential Impacts

Lane closures are required along Lakeshore Road East at the Beechwood Avenue intersection to accommodate a micro tunneling exit shaft on Lakeshore Road East. Full closure of Caven Street at the Lakeshore Road East and Caven Street intersection is required to accommodate a microtunneling entry shaft.

Mitigation Measures

The following mitigation measures will be employed to minimize impacts to traffic during construction:

- A Traffic Management Plan should be developed to minimize interference with the flow of traffic due to construction activities. The plan may include advance public notice of routing, signage, scheduling operations affecting traffic for off-peak hours, and providing a flag person to guide traffic properly and ensure safety at construction sites. The plan will be completed prior to construction, in accordance with the Highway Traffic Act 1990.
- Construction works impacting roadways will be minimized wherever possible. This includes having discussions with CoM to ensure all possible measures are taken to minimize traffic impacts in the project area.

WSP has also completed a Draft Traffic Analysis Memorandum, available in **Appendix F**, which determines traffic operation and queueing impact at the affected intersections during construction staging.

8.4 Air Quality, Noise and Vibration

Potential Impacts

If not managed properly, stockpiled and excess materials and construction waste have the potential to contaminate the surrounding environment. Dust emissions may result from construction activities. Noise

and vibration as a result of construction activities may impact nearby residential areas and other sensitive receptors.

Mitigation Measures

The following mitigation measures will be implemented during construction to minimize impacts to air quality, noise and vibration:

- A Noise and Vibration assessment will be completed during detailed design to identify noise and vibration mitigation measures and monitoring requirements during construction.
- The Contractor will control the emission of dust and other pollutants and prevent them from leaving the work site.
- All equipment onsite shall be clean and in good working order (no leaks of fuel, grease or oils).
- Construction equipment is to be in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts. Idling equipment should be kept to the minimum necessary to complete the work.

8.5 Site Contamination and Excess Soils

Potential Impacts

There are twelve APECs located within or adjacent to the study area, which may result in encountering contaminated soil and groundwater during construction. If not managed properly, stockpiled and excess materials and construction waste have the potential to contaminate the surrounding environment. Excess soils may be generated during construction.

Mitigation Measures

The following mitigation measures will be implemented to manage site contamination and excess soils:

- Excess materials will be managed in accordance with O Reg. 406/19, including completion of an Assessment of Past Uses, Sampling and Analysis Plan and Soil Characterization Report in detailed design.
- Excess earth managed as disposable fill will be managed by the Contractor, taking into account the possibility of salt impacts.
- The Contractor will control the emission of dust and other pollutants and prevent them from leaving the work site.
- All equipment onsite shall be clean and in good working order (no leaks of fuel, grease or oils).
- Vehicle maintenance and refueling shall be confined to designated areas a minimum of 30 m away from any natural features, and all activities shall be controlled to prevent entry of petroleum products or other deleterious substances into the natural environment.
- A Spill Control and Response Plan will be developed and implemented to prevent deleterious substances from entering the natural environment.
- An emergency spill kit will be kept on-site in case of spills during activities or fluid leaks or spills from equipment.
- When spills occur, the Ministry of the Environment Spills Action Centre should be contacted and all reasonable corrective action should be taken to contain and clean the spill immediately.

8.6 Utilities

Potential Impacts

Utility relocations are required to accommodate tunnel entry and exit shafts.

Mitigation Measures

The following mitigation measures will be implemented to minimize utility impacts during construction:

— If utilities are impacted during construction, they will be protected or relocated, as required. Advance coordination with utility companies will be undertaken during detailed design.

8.7 Climate Change Considerations

Climate change considerations were taking into account for both the construction and operation of the preferred solution.

In order to reduce Greenhouse gas (GHG) emissions, WSP will consider and evaluate the possibility of utilizing low carbon concrete during construction. In addition, the generation of excess soils and waste will be minimized through trenchless technologies. Additional ways to minimize GHGs and the carbon footprint of the project will be explored during detailed design.

The preferred solution will provide system redundancy during extreme wet weather events and operational issues to help prevent basement flooding in the area to adapt to a changing climate and increased storm frequency.

9 Implementation

The following section identified the necessary permits and approvals required from various agencies during detailed design and prior to construction. These agencies include the MECP, CVC, and the City of Mississauga.

9.1 Review Agency Approvals

9.1.1 Ministry of the Environment, Conservation and Parks

Ministry of the Environment, Conservation and Parks (MECP) approvals will be required including:

- An Environmental Compliance Approval (ECA) is required as the proposed wastewater diversion sewer is considered a “substantial addition to the existing system.”
- If tree removals are required along Lakeside Avenue for the works, MECP should be contacted concerning potential impacts to SAR Bats.

9.1.2 Credit Valley Conservation

CVC requires a permit under O.Reg. 160/06 if development is within the vicinity of a:

- Watercourse;
- Floodplain;
- Valley Slope;
- Wetland;
- Lake Ontario; and/or,
- Hazardous Lands.

As a portion of the study area is located within CVC’s regulated area, a permit from the CVC will be required prior to construction.

9.1.3 City of Mississauga

As the proposed works will be conducted within the City of Mississauga lands, an easement agreement will be required. The proposed easement is located east of intersection of Lakeshore Road East and Greaves Ave, at the edge of Lakeside Park, and will be approximately 53 m in length and 10 m in width. Additionally, the area is scheduled to be turned into a part of the ROW as a part of the future Bus Rapid Transit (BRT) project.

9.2 Site Specific Permits and Approval

A review of site-specific permits and approvals will be dependent on the final design of the project works and should be reviewed during detailed design. **Table 9-1** provides a list of probable permits and approvals to be considered.

Table 9-1: Permits and Approvals

ORGANIZATION	PERMIT / APPROVAL
Ministry of the Environment, Conservation and Parks (MECP)	✓ Sanitary sewer ECA ✓ Potential SAR permitting requirements for SAR bats (Tree removals are to be coordinated outside of the active period for bats (e.g., up to the end of September))
City of Mississauga – Planning and Building Department	✓ Permit the Injury or Destruction of Trees on Public and Private Property, should tree removals be required during construction.
Credit Valley Conservation	✓ Notification of Project Start ✓ Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Permit for work adjacent to Cooksville Creek for the Lakeshore Crossing.
Electrical Safety Authority (ESA)	N/A
Occupational Health and Safety Act	✓ Pre-Start Health and Safety Review (PSR)
Region of Peel / City of Mississauga	✓ Public Utilities Coordination Committees (PUCC) ✓ Easement agreement for construction in City-owned lands

9.3 Property Requirements

The preferred gravity sewer alignment and the potential construction compounds and shaft locations have been identified and are located either within City of Mississauga lands or lands under which the Region has a pre-existing easement in place. The City of Mississauga has been involved throughout the project and has provided input for the sewer alignment alternatives. This will facilitate negotiations for the easements required in City of Mississauga property. Temporary use of private property may be required to facilitate construction staging. Property negotiations will occur during detailed design and will be secured prior to construction.

10 Conclusions

This MCEA Project File Report has been prepared to confirm that the proposed Beach Street Pumping Station Diversion project meets the requirements of the *Environmental Assessment Act*.

The preferred solution includes the following components:

- Installation of a new gravity sewer between Beach Street SPS and Beechwood SPS along Aviation Road and Lakeshore Road East and on Lakeshore Road East from Aviation Road to East Avenue.
- The new sewers are proposed to be installed through microtunneling construction methods. Microtunneling is a trenchless construction method in which a shaft is excavated, soil is mined and immediately displaced with the pipes being jacked in.
- Replacement of an existing gravity sewer on Lakeside Avenue from Aviation Road to Hampton Crescent using open-cut construction methods.
- Completion of the required upgrades to the Beach Street SPS.

The preferred solution provides increased capacity to support future development as well as provides system redundancy during extreme wet weather events and operational issues to help prevent basement flooding in the area.

In addition, proposed modifications to Beach Street SPS will allow it to function as emergency capacity for Beechwood SPS, to facilitate monthly maintenance on the pumps to ensure reliability, including required routine maintenance to ensure the system is available for service when required.

11 Next Steps

If no Section 16 Orders are received, the detailed design of the proposed works as presented within this Project File will proceed. During detailed design, the following will be completed:

- Plan and profile design drawings for the proposed linear infrastructure and pumping stating upgrades works, including contract specifications;
  - Construction management drawing package for all areas of work, including a staging plan, access routes, removals plan, preservation/protection plan, and complete landscape restoration documenting restoration:
  - Following submission of the construction management package, a site inspection shall be completed with the City of Mississauga, CVC, and Region of Peel present for the review of impacts and necessary restoration
- Obtain any required permits and approvals prior to construction.
- Inform City of Mississauga Community Services of the project schedule and phases

12 Bibliography

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A Existing Conditions Reports

APPENDIX

A-1 Natural Environment Report

REGION OF PEEL

BEACH STREET SEWAGE PUMPING STATION RECONFIGURATION

NATURAL ENVIRONMENT REPORT

NOVEMBER 03, 2022

BEACH STREET SEWAGE PUMPING STATION RECONFIGURATION

NATURAL ENVIRONMENT REPORT

REGION OF PEEL

DRAFT

PROJECT NO.: 19M-00593-00
DATE: NOVEMBER 03, 2022

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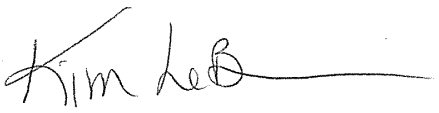

November 3, 2022

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TABLE OF CONTENTS

1 INTRODUCTION 1

2 APPROACH 3

2.1 Background Review 3

2.1.1 Planning, Legislation and Policy Documents 3

2.1.2 Mapping and Database Resources 3

2.1.3 Online Species Observation Databases 4

2.1.4 Agency Correspondence 4

2.2 Field Assessments 4

2.2.1 Vegetation and Ecological Land Classification (ELC) 4

2.2.2 Wildlife Surveys 5

2.2.3 Fish Habitat 5

3 EXISTING CONDITIONS 6

3.1 Designated Features 6

3.1.1 City of Mississauga Significant Natural Areas 6

3.2 Vegetation and ELC 7

3.2.1 Mineral Open Beach / Bar Ecosite (BBO1) 7

3.2.2 Mineral Cultural Woodland Ecosite (CUW1) 7

3.2.3 Recreational (CGL_4) 7

3.2.4 Fresh – Moist Willow Lowland Deciduous Forest Type (FOD7-3) 8

3.2.5 Tree Planting Restoration 8

3.3 Wildlife 8

3.4 Species at Risk 9

3.5 Significant Wildlife Habitat 10

3.6 Aquatic Habitat and Fisheries 11

3.6.1 Cooksville Creek – North Reach 11

3.6.2 Cooksville Creek – South Reach 12

3.6.3 Fish Community 12

4 PROPOSED WORKS 14

5 IMPACT ASSESSMENT 15

5.1 Designated Features 15

5.1.1 Significant Natural Areas - City of Mississauga Official Plan 15

5.2 Vegetation 15

5.3 Wildlife and SAR 15

5.4 Fish Habitat 16

6 MITIGATION MEASURES 17

6.1 Vegetation 17

6.2 Wildlife 17

6.3 Species At Risk 18

6.4 Aquatic Habitat and Fisheries 19

6.4.1 Standard Construction-Related Mitigation Measures 19

7 CONCLUSSIONS AND RECOMMENDATIONS 21

BIBLIOGRAPHY 22

TABLES

Table 1. Table of Wildlife Observations collected during field investigations. 9

Table 2. Candidate Significant Wildlife Habitat types within project limits. 10

FIGURES

Figure 1. Key map showing study area and alternatives under consideration. .. 2

APPENDICES

A AGENCY CORRESPONDENCE

B MAPPING

C REPRESENTATIVE PHOTOGRAPHS

D SPECIES AT RISK ASSESSMENT

E PLANT LIST

1 INTRODUCTION

WSP has been retained by the Region of Peel to provide engineering and environmental services for the Beach Street Sewage Pumping Station (SPS) reconfiguration and associated gravity sewer works in the City of Mississauga. This Natural Environment study has been completed in support of the Schedule B Environmental Assessment (EA) requirements to characterise the natural heritage features, assess potential impacts to natural heritage features of the proposed works, and identify design and mitigation measures to minimize impacts.

The Beach Street SPS is located at the corner of Beach Street and Aviation Road, adjacent to the shore of Lake Ontario and RK McMillan Park. Proposed gravity sewer alignments connect the existing Beechwood SPS to the Beach Street SPS along alternatives either following Aviation Road and Lakeshore Road East, or Beechwood Avenue. The alternatives include a potential crossing location of Cooksville Creek. The Study Area for the Natural Environment Study includes the Beach Street SPS, and gravity sewer alignment alternatives along with a 20 m radius around the proposed alignments where natural vegetation or habitats occur, and property access allows.

The study incorporates existing background data from publicly available databases and natural heritage mapping. To confirm and supplement background data, environmental agencies were contacted to request additional comment and data, and WSP undertook field investigations in spring of 2022.

Beach Street Diversion Alternatives

Legend

- Pumping Station

Alternatives

Options:

- Option 1 - Aviation Tunnel
- Option 2 - No Tunnel
- Existing Sanitary Infrastructure

wsp

Beach Street Diversion Class EA

Key Alternatives

0 0.3 Kilometers

September 2022

2 APPROACH

2.1 BACKGROUND REVIEW

2.1.1 PLANNING, LEGISLATION AND POLICY DOCUMENTS

The following planning, legislation, and policy documents are relevant to the Beach Street SPS EA and relevant sections have been reviewed in the context of the project:

FEDERAL

- Species at Risk Act (Government of Canada 2002)
- Migratory Birds Convention Act (Government of Canada 1994)
- Fisheries Act (Government of Canada 1985)

PROVINCIAL

- Provincial Policy Statement (Ontario Ministry of Municipal Affairs and Housing 2020)
- Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement (Ontario Ministry of Natural Resources 2010)
- Endangered Species Act (Government of Ontario 2007)
- Ontario Regulation 242/08 under Endangered Species Act (Government of Ontario 2008)
- Growth Plan for the Greater Golden Horseshoe (Government of Ontario 2020)
- Greenbelt Plan (Ontario Ministry of Municipal Affairs and Housing 2017)
- Lake and Rivers Improvement Act (Government of Ontario 1990)
- Public Lands Act (Government of Ontario 1990)
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (Ontario Ministry of Natural Resources and Forestry 2015)

REGIONAL / LOCAL

- Region of Peel Official Plan (Region of Peel, Office Consolidation 2021)
- Mississauga Official Plan (City of Mississauga, Office Consolidation 2021)
- Credit Valley Conservation Watershed Planning and Regulation Policies (2010)

For a complete list of information sources consulted, please refer to the References section.

2.1.2 MAPPING AND DATABASE RESOURCES

- Region of Peel Natural Areas Inventory
- City of Mississauga Natural Areas Survey (2020)
- Credit Valley Conservation Regulation Mapping (CVC)
- Land Information Ontario (LIO) Mapping (Government of Ontario 2020)

- Department of Fisheries and Oceans (DFO) Aquatic Species at Risk (SAR) Mapping (Government of Canada 2021)
- Google Maps Current and Historical Aerial Photography (Google 2021)

2.1.3 ONLINE SPECIES OBSERVATION DATABASES

- Ontario Reptile and Amphibian Atlas (Ontario Nature 2021)
- eBird (Cornell Lab of Ornithology 2021)
- iNaturalist (Canadian Wildlife Federation et.al. 2021)
- Ontario Butterfly Atlas (Toronto Entomologists Association 2021)

2.1.4 AGENCY CORRESPONDENCE

Natural heritage information for the study area was requested from the Credit Valley Conservation Authority (CVC), the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (MNRF), and the Ontario Ministry of the Environment, Conservation and Parks (MECP) on January 10, 2022. Correspondence is included in Appendix A.

- Ministry of Environment, Conservation and Parks (MECP)
  - A response was received from MECP Species at Risk Branch on January 11, 2022, providing a list of 9 additional SAR with potential to be present in the study area which should be screened for.
- Credit Valley Conservation (CVC) – Response received January 11, 2022 indicated that WSP needed to enter into a data sharing agreement with the CVC in order to get the background information. The data sharing agreement was signed and CVC provided the background information on May 25, 2022.
  - Data layers included floodplain mapping and layers, flora and fauna data point locations, natural heritage system polygons and fish collection records.

2.2 FIELD ASSESSMENTS

Field survey components are described below. Data analysis and evaluation has included preparation of species inventories, habitat assessments, and evaluations of significance and sensitivity using relevant guidelines and policy, as described herein.

Most of the study area is along existing residential roadways and bordered by private residential properties. Some of the natural environment features, including crossings of Cooksville Creek and adjacent vegetated areas are within public lands. Therefore, field assessments were conducted for natural areas within 20 m of the pumping station and alignments where accessible from roadways and on public land.

2.2.1 VEGETATION AND ECOLOGICAL LAND CLASSIFICATION (ELC)

Surveys were conducted by a qualified ecologist certified in Ecological Land Classification (ELC) for Southern Ontario. These surveys documented the characteristics of the natural and culturally influenced vegetation communities. Vegetation fieldwork and associated data assessment involved:

- Botanical inventory and preparation of a vascular plant species list
- Evaluation of plant species status using the List of the Vascular Plants of Ontario's Carolinian Zone Ecoregion 7E (Oldham 2017) for regional significance; the NHIC website for provincial rarity ranks (i.e., S-Ranks); the Species at Risk in Ontario list (MECP; updated periodically) for provincial status designations; and the

Canadian Species at Risk list (COSEWIC; updated periodically) for national status designations. Nomenclature generally follows NHIC and VASCAN (2021)

- A targeted search for significant or sensitive flora, including SAR
- Analysis of floristics of all inventoried plant species was completed by using their *Coefficient of Conservatism* (CC) and *Coefficient of Wetness* (CW), per the Floristic Quality Assessment System for Southern Ontario (Oldham et. al. 1995), which uses an objective, quantitative method to compare the relative quality of two or more vegetation communities. The quality of a particular vegetation community can be reflected in the richness of conservative species within the community (Oldham et. al. 1995)
- Classifying, mapping and evaluating vegetation communities within the study area. Vegetation communities were classified using the Ecological Land Classification for Southern Ontario (ELC) (Lee et. al. 1998) and ELC Ecosystem Catalogue: 2008 Version (Lee 2008), where applicable
- Evaluation of vegetation community significance using Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1996; NHIC website)
- Taking general notes on community health and site disturbance; and representative site photos.

2.2.2 WILDLIFE SURVEYS

General wildlife surveys and habitat assessments were undertaken during the field survey, as follows:

- Recording all direct wildlife observations and wildlife signs (including browse, track / trails, animal scat, bird nesting activity, tree cavities, burrows and vocalizations) and identifying potential wildlife usage and habitat functions associated with vegetation communities
- Assessing SAR habitat availability
- Inspecting structures for evidence of use by nesting migratory birds
- Assessing potential for *Significant Wildlife Habitat* (SWH) features within the study area, as defined provincial and municipal policy documents.

2.2.3 FISH HABITAT

Fish habitat was assessed in Cooksville Creek at proposed crossing locations. The assessment was conducted visually from the shoreline and in wadeable depths, and included collection of representative photographs and general notes on the following:

- Flow condition, clarity, general gradient and velocities
- Channel dimensions and general character
- Morphology (e.g., riffles, pools) and substrate type
- Cover opportunities (i.e., woody debris, undercut banks, boulders, aquatic vegetation)
- Bank height, character and stability / evidence of erosion
- Riparian vegetation (general)
- Physical barriers to fish movement
- Potential specialized and important habitat areas including potential spawning habitat, good nursery cover, holding habitat (deeper refuge pools)
- Evidence of groundwater discharge
- Disturbances, habitat limitations and potential habitat enhancement opportunities

3 EXISTING CONDITIONS

3.1 DESIGNATED FEATURES

The previously listed planning and policy documents from the provincial, regional and municipal levels, online mapping resources, and agency consultation were reviewed to determine existing natural heritage land use designations within the study area. The review of relevant designations within the study area are summarized below. Available mapping layers are delineated on Figure 1 (Appendix B).

- Provincially Significant Wetland (PSW): **None Present**
- Area of Natural or Scientific Interest (ANSI): **None Present**
- Greenbelt Plan Area: **None Present**
- Significant Wildlife Habitat (SWH): None are identified in LIO, in the City of Mississauga Official Plan or the Region of Peel Official Plan
    - A SWH assessment has been completed as part of this study. See Section 3.5.
- City of Mississauga Official Plan
    - Significant Natural Areas: **Present**
        - Natural Area LV5 – Floodplain of Cooksville Creek north of Lakeshore Road.
            - Special Management Area LV5SMA – East of Cooksville Creek
        - Natural Area LV4 – Floodplain of Cooksville Creek south of Lakeshore Road
        - Fish Habitat – Cooksville Creek (Type 2 fishery)
        - Natural Hazards – Cooksville Creek valley and Lake Ontario shoreline
- Credit Valley Conservation Authority Regulated Area: **Present**
    - Lake Ontario Shoreline
    - Cooksville Creek

3.1.1 CITY OF MISSISSAUGA SIGNIFICANT NATURAL AREAS

Natural Area LV5 is associated with the floodplain of Cooksville Creek south of Lakeshore Road and is entirely composed of fresh-moist willow lowland deciduous forest. It has no significant plant communities or fauna, but does support two plant species considered rare within the City, three plant species considered uncommon within the City, and 22 flora species considered Species of Conservation Concern by CVC.

Natural Area LV4 is also associated with the floodplain of Cooksville Creek but includes a broader collection of five vegetation communities including the fresh-moist willow lowland deciduous forest associated with LV5, as well as mineral cultural woodland, mineral open beach/bar, open aquatic and manicured parks. It has no significant plant communities but does support one provincially significant plant species, two plant species considered rare within the City, four plant species considered uncommon within the City, and 36 flora species considered Species of Conservation Concern by CVC. In addition, two provincially significant fauna species and 17 SCC species considered by CVC have also been noted in this area.

3.2 VEGETATION AND ELC

The vegetation and Ecological Land Classification (ELC) surveys were completed for the project limits along the shore of Lake Ontario from Goodwin Road to Beechwood Avenue, and from Lake Ontario north along Cooksville Creek to the CN rail line. The ELC delineations in the Mississauga Natural Areas Inventory for the Cooksville Creek area were reviewed, and the plant species and communities identified through WSP field investigations is consistent with the previously defined communities. The lands support a variety of terrains as well as natural and cultural vegetation communities. Deciduous Lowland forest dominates the majority of the Cooksville Creek valley within the project limits, while the lakeshore is dominated by culturally influenced recreational lands.

A complete Plant List is included in Appendix E. None of the vascular plants identified during field investigations are considered SAR. One species, Shagbark Hickory (*Carya ovata*), present in the recreational park areas is considered rare in the GTA (Oldham 2017); One species, Rough Bedstraw (*Galium asprellum*), present in cultural woodland and forested areas is uncommon in the GTA (Oldham 2017) and Peel Region (Varga et al. 2000); and one species, White Spruce (*Picea glauca*), which was planted in the restoration area, is considered Uncommon in the GTA and Peel Region and locally rare by the CVC. It is assumed that rare plants identified in the Significant Natural Areas descriptions above were not observed due to the early spring timing of the site visit, reduced survey effort as compared to CVC natural heritage surveys.

Five (5) vegetation community types were identified and delineated within the project limits. All communities delineated are common in Ontario (Bakowsky, 1996). Each of the vegetation units are depicted on Figure 2 in Appendix B and described generally below.

3.2.1 MINERAL OPEN BEACH / BAR ECOSITE (BBO1)

Two (2) BBO1 communities are present in the study area associated with the shoreline of Lake Ontario on either side of the mouth of Cooksville Creek. To the east of Cooksville Creek, this beach/bar has no vegetation. However, on the west side of the mouth of Cooksville Creek there are a few large >50 cm DBH White Willow (*Salix alba*) and/or Crack Willow (*Salix euxina*) (or their hybrid, *Salix ×fragilis*) in the canopy. Sparse trees can be found in the subcanopy and the understory consists of Manitoba Maple (*Acer negundo*) and American Elm (*Ulmus americana*) with sparse Multiflora Rose (*Rosa multiflora*). This feature is characterized as a rocky to sandy beach with sparse tolerant species including Wild Carrot (*Daucus carota*), Tall Goldenrod (*Solidago altissima*), and Eurasian black bindweed (*Fallopia convolvulus*) present in the ground layer. A few Field Wormwood (*Artemisia campestris*) were observed, but not enough to support the designation of the rare S2S3 Wormwood Gravel Beach Type community.

3.2.2 MINERAL CULTURAL WOODLAND ECOSITE (CUW1)

Two (2) areas of CUW1 are present in the project limits. One area is located at the mouth of Cooksville Creek and consists of a narrow strip of disturbed vegetation between the beach and a maintained recreational area. This area contains Manitoba Maple, American Elm, White Willow and a few Cottonwood (*Populus deltoides*) in the partially open canopy and subcanopy. No cavity trees were observed and minimal potential for SAR bats is anticipated. The understory contains Multiflora Rose, Red osier Dogwood (*Cornus sericea*), invasive honeysuckles (*Lonicera sp.*) and Common Buckthorn (*Rhamnus cathartica)*. The ground layer contains Tall Goldenrod, various Grasses, Common Buttercup (*Ranunculus acris*) and Burdock species (*Arctium sp.*). Northwest of Lakeshore Road East and east of Cooksville Creek, a second narrow strip of younger successional CUW1 is present and is dominated by Manitoba Maple, Black Walnut (*Juglans nigra)* and White Ash (*Fraxinus americana*).

3.2.3 RECREATIONAL (CGL_4)

The areas around the Waterfront Trail are maintained with large trees and Turfgrass. The trees in the recreation areas include planted large >50cm DBH Silver Maple (*Acer saccharinum*), Red Oak (*Quercus rubra*) and Shagbark

Hickory (*Carya ovata*) which offer suitable habitat for SAR bats. Additional planted trees include Spruce species (*Picea sp.*), White Willow, White, Red, Scots and Austrian Pine (*Pinus strobus, P. sylvestris, P. nigra*.). A small section east of Cooksville Creek and just south of the bridge is undergoing naturalization but is mostly dominated by non-native or weedy native species. The small area of naturalization includes American Elm, Silver and Manitoba Maple on the stream bank with Winged Euonymus (*Euonymus alatus*) and Chokecherry (*Prunus virginiana*). The naturalizing ground layer includes Common Dandelion (*Taraxacum officinale*), Burdock species, and various sedges and grasses, as well as the invasive species Garlic Mustard (*Alliaria petiolata*).

3.2.4 FRESH – MOIST WILLOW LOWLAND DECIDUOUS FOREST TYPE (FOD7-3)

This community is present on the banks of Cooksville Creek. The canopy contains frequent large trees 25-50 cm DBH and rare larger trees including White Willow, Manitoba Maple, Silver Maple and occasional American Elm. No cavity trees were observed. The sparse subcanopy contains similar species including Manitoba Maple, Silver Maple and American Elm. The understory is moderately dense with Manitoba Maple, Chokecherry, Multiflora Rose and American Elm. The highly disturbed ground layer contains multiple Avens species, Dandelion, Garlic Mustard and Burdock. However, typical native floodplain species are present as well such as Jerusalem Artichoke (*Helianthus tuberosus*), Common Bedstraw (*Galium aparine*) and Field Horsetail (*Equisetum arvense*). A large patch of the invasive Japanese knotweed (*Reynoutria japonica*) measuring approximately12 by 3 m was observed. Northwest of Lakeshore Road East there was a sparser canopy due to a higher abundance of dead Ash species with dominant downed woody debris and standing snags. Giant Hogweed (*Heracleum mantegazzianum*) was more prevalent in this area as well.

3.2.5 TREE PLANTING RESTORATION

Two tableland areas northwest of Lakeshore Road East are cultural meadows with planted trees scattered throughout appearing as a restoration project associated with the Special Management Area V5SMA identified in the Mississauga Natural Areas Inventory. Planted trees 3 to 5 cm DBH included Basswood (*Tilia americana*), Sugar Maple, Trembling Aspen (*Populus tremuloides*), White Spruce (*Picea glauca*), Red Maple and White Birch (*Betula papyrifera*). The few shrubs present included European Red Raspberry (*Rubus idaeus* subsp. *strigosus*), Willow species, Red Osier Dogwood and planted Staghorn Sumac (*Rhus typhina*). The ground layer contained typical tolerant meadow species including Tall Goldenrod, Canada Thistle (*Cirsium arvense*), Burdock species and Kentucky Bluegrass (*Poa pratensis*). Several patches of the invasive Common Reed (*Phragmites australis* subsp. *australis*) were present.

3.3 WILDLIFE

The general wildlife and wildlife habitat survey was completed concurrently with the vegetation and aquatic habitat surveys. Direct wildlife observations and wildlife signs (including animal browse, tracks/trails, scat, bird nesting activities, tree cavities, burrows, excavated holes and vocalizations) were recorded. Particular attention was also given to assessing the potential for habitat to support SAR known to the area generally, or to potentially qualify as Significant Wildlife Habitat (SWH). A list of wildlife species observed during the field surveys is provided in Table 3.1 below.

Table 1. Table of Wildlife Observations collected during field investigations.

Common Name	*Scientific Name*	Grank[1]	Srank[2]	SARO (ESA) Status[3]	SARA Status[4]	CVC (2010)[5]	Area Sensitive Birds - Ecoregion 7E[6]	Protected Under MBCA
Amphibians								
American Toad	*Anaxyrus americanus*	G5	S5			3		
Birds								
American Goldfinch	*Spinus tristis*	G5	S5B					✓
Barn Swallow	*Hirundo rustica*	G5	S4B	THR	THR	1		✓
Blue Jay	*Cyanocitta cristata*	G5	S5					
Common Grackle	*Quiscalus quiscula*	G5	S5B					✓
Downy Woodpecker	*Picoides pubescens*	G5	S5					
Killdeer	*Charadrius vociferus*	G5	S5B,S5N					✓
Mallard	*Anas platyrhynchos*	G5	S5					✓
Mute Swan	*Cygnus olor*	G5	SE					✓
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S4					✓
Yellow Warbler	*Setophaga petechia*	G5	S5B				X	✓

3.4 SPECIES AT RISK

For the purpose of this report, the term Species at Risk (SAR) includes species that are listed as Endangered, Threatened, or Special Concern under Ontario's *Endangered Species Act* (O. Reg. 230/08, ESA 2007) or the federal *Species at Risk Act* (SARA). It also includes species assessed as the above designations by the Committee on the Status of Species at Risk in Ontario (COSSARO) and/or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Prior to field surveys, a screening of SAR with potential to be present or use habitat within the vicinity of the study limits was completed. The SAR screening table (**Appendix D**) incorporates background information collected, as well as the results of the in-field habitat assessment. The table lists potential SAR, habitat preferences for each species, an assessment of habitat within the study limits and provides an assessment of the likelihood and magnitude of impacts to each species considering mitigation measures to be implemented.

The background information review generated a list of 13 potential SAR for the study limits. This list includes SAR known to occur in the City of Mississauga generally, as well as those with records specifically near the study limits. During the field investigations habitat conditions were assessed in terms of potential suitability for those species considered to have 'moderate' to 'high' potential to occur in the vicinity of the study limits. Surveys for the species themselves were not conducted as part of this assignment.

One SAR was observed during the field investigations completed by WSP. Barn Swallow (*Hirundo rustica*; Threatened, ESA and SARA), were noted on two separate occasions during the vegetation surveys. This species is widespread, and foraging habitat is present over natural areas in the study limits. It is likely that this species will be present throughout the study limits during the breeding season as a foraging visitant. The pedestrian bridge

conveying the waterfront trail, and the Lakeshore Road culvert could provide suitable nesting habitat for this species, although no nests were observed during the field investigations.

No other SAR were observed during the May 2022 field survey. However, the following four SAR have moderate to high potential to be present or to use habitat in the vicinity of the project limits based on habitat suitability:

- Bank Swallow (*Riparia riparia*; Threatened, ESA and SARA): This species is widespread, and foraging habitat is present over natural areas in the study limits. It is likely that this species will be present throughout the study limits during the breeding season as a foraging visitant. No nesting habitat (e.g., steep, exposed banks) is present within the project limits.
- Little Brown Bat, Northern Long-eared Bat, and Small-footed Bat (*Myotis lucifugus*, *M. septentrionalis*, and *Perimyotis leibii*; Endangered, ESA and SARA): These species have moderate to high potential to reside and breed in forested areas, and forage over all forests, forest edges and watercourses. Suitable maternity roost trees were not observed by WSP within the study limits (no cavity trees) and fissures in the Willow bark were not suitable for roosting. However, a detailed cavity tree assessment was not completed for all trees and there may be some mature trees that do provide suitable habitat.

The above four species were assessed for likelihood of the proposed works to impact individuals or habitat in the study limits based on the type of habitat to be impacted, availability of habitat in the local landscape and mitigation measures to be implemented. Potential impacts of the proposed works and mitigation recommendations are discussed in **Sections 5.3** and **6.3** respectively.

3.5 SIGNIFICANT WILDLIFE HABITAT

Significant Wildlife Habitat (SWH) is defined and identified by MNRF and other relevant planning authorities. As outlined in their Significant Wildlife Habitat Technical Guide (OMNR, 2000), SWH is broadly categorized as:

- Seasonal concentration areas (i.e., conifer forests for deer wintering),
- Rare vegetation communities or specialized habitats for wildlife,
- Habitats of species of conservation concern, excluding the habitats of endangered and threatened species, and
- Animal movement corridors.

A review of potential SWH in the study limits, based on evaluation criteria in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015), has been completed using available secondary sources of information and field data applied to the study limits described herein.

In total, four Candidate SWH types were noted as summarized in Table 2 below.

Table 2. Candidate Significant Wildlife Habitat types within project limits.

Habitat Type	Candidate Sites	Habitat Criteria Potentially Met by Habitat Features in Vicinity of the Project Limits	Conclusions
Shorebird Migratory Stopover Area	Shoreline of Lake Ontario and Cooksville Creek	Candidate SWH is present in the BB01 communities at the mouth of Cooksville Creek.	No Confirmed SWH is present. Candidate habitat will not be impacted. Vegetation and wildlife mitigation measures are sufficient to address potential concerns.
Bat Maternity Colonies	Forest community located along shoreline of Cooksville Creek.	Candidate SWH is present in the FOD7-3 community along Cooksville Creek.	No Confirmed SWH is present. Some staging works may impact trees that have the potential to support

Habitat Type	Candidate Sites	Habitat Criteria Potentially Met by Habitat Features in Vicinity of the Project Limits	Conclusions
			maternity roosting, although none were observed during WSP's field investigations.
Turtle Wintering Areas	Cooksville Creek	Candidate SWH is present within Cooksville Creek	Candidate habitat will not be impacted.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Forest Communities along Lake Ontario Shoreline and Cooksville Creek.	Candidate habitat is present in the FOD7-3 community along Cooksville Creek.	No Confirmed SWH is present. Some staging works may impact trees that have the potential to support nesting and perching habitat, but suitable trees were not specifically observed during field investigations.

3.6 AQUATIC HABITAT AND FISHERIES

Cooksville Creek is a permanent watercourse within the limits of the project, that is being managed by MNRF as warmwater, with a diverse forage and baitfish community. It originates as a large online stormwater management (SWM) pond north of Matheson Boulevard West near Britannia approximately 11 km upstream of the study area, and flows mainly through an urban valley system in a southern direction to its outlet into Lake Ontario within the project limits at RK McMillan Park.

Due to the length of Cooksville Creek within the project limits, and the long list of alternatives including crossing locations of Cooksville Creek near the waterfront trail as well as along Lakeshore Road East, WSP broke the field investigations up into two reaches- North Reach and South Reach. The southern crossing alternative is no longer being considered, but fish habitat conditions assessed in this reach are reported for assessment of potential downstream impacts. Details regarding fish and fish habitat associated with these two reaches has been provided below.

3.6.1 COOKSVILLE CREEK – NORTH REACH

This reach of Cooksville Creek started approximately 100 m upstream of Lakeshore Road East and extended for 300 m to approximately 200 m downstream of Lakeshore Road East. A map depicting the reach breaks has been included in Figure 2 of Appendix B.

This reach displayed a mix of runs (10%), pools (30%), riffles (60%) and flats (20%). At the time of field investigations, the wetted width of the creek ranged from 4.7 m to 10 m, with depths ranging from 0.1 to 0.5 m. The bankfull width ranged from 7.7 m to 15 m, with an average bankfull depth of 1.0 m. The riffles and runs displayed a coarse mix of cobble (70%), gravel (20%) and sand (10%), whereas the pools and flats displayed a finer mix of Silt (30%), sand (20%) and then a scattering of gravel and cobbles (50%). Instream cover was comprised of sparse amounts of undercut banks, overhanging vegetation and woody debris, and a moderate amount of rocks/boulders. Riparian vegetation consisted of a mix of trees, shrubs and grass/forb species throughout the valley. Banks were relatively stable, displaying some armouring (rip rap and gabion baskets) and some areas bank erosion.

A number of storm sewer outlets were observed along the reach assessed, entering from both sides of the channel. No groundwater or seepage was evident at the time of the field investigations. There were no barriers to the

upstream movement of fish within the reach assessed, and schools of White Sucker (*Catostomus commersonii*) were observed creating nests/spawning in the pools and near the riffles throughout the reach. Representative photos of the reach have been included in the photo appendix in Appendix C.

3.6.2 COOKSVILLE CREEK – SOUTH REACH

This reach of Cooksville Creek started approximately 50m upstream of Waterfront Trail pedestrian bridge and extended for 50m downstream of the pedestrian bridge to the mouth of Lake of Cooksville Creek at Lake Ontario. A map depicting the reach breaks has been included in Figure 2 of Appendix B.

This reach displayed homogenous channel morphology dominated by flats (100%). At the time of field investigations, the average wetted width measured 15 m, with an average water depth of 1.3 m. The bankfull width averages 20 m, with an average bankfull depth of 1.7 m. The substrates were dominated by sand (65%), with smaller amounts of silt (5%), gravel (5%) and cobble (20%). Instream cover was comprised of sparse amounts of overhanging vegetation and woody debris. Riparian vegetation consisted of a mix of deciduous trees, shrubs and grass/forb species throughout the valley. Banks were relatively stable and steep, displaying some armouring (rip rap and gabion baskets) and areas of bank erosion.

There were storm sewer outlets observed on both banks in the reach assessed, however no groundwater or seepage was evident at the time of the field investigations. There were no barriers to the upstream movement of fish within the reach assessed. Representative photos of the reach have been included in the photo appendix in Appendix C.

3.6.3 FISH COMMUNITY

WSP was able to gather fish community information from a number of background resources which was considered sufficient to classify the community present within Cooksville Creek. This data collection included gathering information from Land Information Ontario, community sampling results from CVC, and confirmation of community assemblage provided by MNRF and CVC. Table 3.1 below outlines the species reported in Cooksville Creek at the various capture locations/sources.

Table 3.2 Fish Community Distribution in Cooksville Creek by Reach Location

SPECIES COMMON NAME	SPECIES LATIN NAME	COOKSVILLE CREEK @ LAKESHORE RD	COOKSVILLE CREEK AT CN RAIL BRIDGE
Blacknose Dace	*Rhinichthys obtusus*	X	X
Bluntnose Minnow	*Pimephales notatus*	X	X^
Brook Stickleback	*Culaea inconstans*	X	X^
Brown Trout	*Salmo trutta*	X	X
Common Shiner	*Luxilus cornutus*	X	X^
Creek Chub	*Semotilus atromaculatus*	X	X
Fathead Minnow	*Pimephales promelas*	X	X^
Goldfish	*Carassius auratus*	X	X^
Lake Chub	*Couesius plumbeus*	X	X
Longnose Dace	*Rhinichthys cataractae*	X	X

SPECIES COMMON NAME	SPECIES LATIN NAME	COOKSVILLE CREEK @ LAKESHORE RD	COOKSVILLE CREEK AT CN RAIL BRIDGE
Rainbow Trout	*Oncorhynchus mykiss*	X	X
Round Golby	*Neogobius melanostomus*	X	X
Threespine Stickleback	*Gasterosteus aculeatus*	X*	
White Sucker	*Catostomus commersonii*	X	X

*Source: * - species only caught by CVC records and not recorded on LIO, ^ - species reported in LIO but not observed by CVC*

4 PROPOSED WORKS

The Beach Street SPS is located at the corner of Beach Street and Aviation Road, adjacent to the shore of Lake Ontario and RK McMillan Park. Proposed gravity sewer alignments connect the existing Beechwood SPS to the Beach Street SPS along alternatives either following Aviation Road and Lakeshore Road East, or Beechwood Avenue.

Alternative 1 will involve a micro-tunnel along existing road alignments, as well as under Cooksville Creek near lakeshore. These works will include:

- 847 m of pipe within a 1200 mm microtunnel between Beach Street SPS and Beechwood SPS via Aviation Road and Lakeshore Road East
- 420 m of additional 1200 mm microtunnel along Lakeshore Road East from Aviation Road east to East Avenue
- 198 m of 375 mm sewer addition on Lakeshore Road East
- Replacement of 200 m of existing 250 mm sewer on Lakeside Avenue
- Necessary Beach St. WWPS station upgrades

Alternative 2 will follow along existing road corridors but will not require any tunnelling; works will be done using existing infrastructure. This option will not involve crossing Cooksville Creek. These works will include:

- Replacement of 374 m of existing 375 mm pipe with 450 mm pipe on Goodwin Avenue and Montbeck Crescent
- Replacement of existing 200 m of 250 mm sewer on Lakeside Avenue.
- Upsizing of existing sewer on Aviation Avenue
- Necessary Beach St. WWPS station upgrades

5 IMPACT ASSESSMENT

5.1 DESIGNATED FEATURES

5.1.1 SIGNIFICANT NATURAL AREAS - CITY OF MISSISSAUGA OFFICIAL PLAN

As outlined in Section 3.1 above, the project limits support three Significant Natural Areas according to the City of Mississauga Official Plan – Natural Areas LV4 and LV5, and Natural Hazard lands.

The natural hazard areas as mapped by the City of Mississauga Official Plan are encapsulated within the limits of both LV4 and LV5.

The majority of the vegetation impacted by either alternative will be on the residential lands and urban trees adjacent the existing roads. Although unlikely, there may be some negligible impacts to the natural areas LV4&5 and the Natural Hazards area associated with Cooksville Creek along Lakeshore Road east for the micro-tunnelling option and associated access shafts.

5.2 VEGETATION

Impacts to the vegetation communities are similar for both alternatives. The southern stretch of both options has the potential to impact the manicured nature of the recreational lands (CGL-4), including potential impacts to a number of mature trees lining Lakeside Avenue. There is also the potential for indirect impacts to the adjacent retained vegetation during construction. Mitigation measures aimed at protecting the mature trees will be implemented along the alterative route.

Although Alternative 1 crosses Cooksville Creek at Lakeshore Road East, the works involve micro-tunnelling under the creek bed for the pipe installation. As such, impacts to the fresh-moist willow lowland deciduous forest on the north and south side of the bridge Lakeshore Road East bridge are not anticipated. Shaft locations are intended to be located outside of natural vegetation communities wherever possible.

There are no other vegetation units that will be impacted by either alternative; the remainder of the alternatives are located within road Right-of-Ways and residential areas with urban trees and manicured lawns.

5.3 WILDLIFE AND SAR

Wildlife habitat impacts are generally similar to those described for vegetation; given that the majority of the impacts will be on the residential areas and existing infrastructure, the vegetation supports primarily common and disturbance tolerant wildlife communities. The majority of the habitat to be impacted is already disturbed in nature and does not provide specialized wildlife habitat. Exceptions include potential impacts to sensitive species and habitats, as described below.

There will be a loss of wildlife habitat associated with the vegetation removals along Lakeside Avenue adjacent the roadway. This area likely provides habitat that generally supports common, disturbance-tolerant wildlife species; there is potential for various wildlife (e.g., turtles, snakes, small mammals, etc.) to wander through the proposed work areas during construction, however implementation of the mitigation measures outlined in **Section 6.3** will reduce the potential for direct wildlife impacts.

There is potential for the proposed works to impact birds during the breeding season. Although no nests were found during the field survey, migratory birds are likely to nest in trees or other vegetation, as well as under the Lakeshore Road bridge during the year of construction. Therefore, there is potential to impact birds, including disturbance to

nesting birds or possibly loss of nests or young, if nests are present in the year of construction. Barn Swallow, an avian SAR, was observed to be foraging in the project limits during field investigations. There is the potential that this species will nest on the Lakeshore Road crossing, or the pedestrian bridge associated with the Waterfront Trail during the period of construction. Barn Swallow are anticipated to be down-listed to Special Concern in August 2022 following their recent re-assessment as Special Concern under COSSARO, and as such, will no longer receive protection under the ESA. However, as a migratory bird, individuals and their nests are protected under the federal Migratory Birds Convention Act (MBCA, 1994). Measures to mitigate impacts to breeding birds are outlined in **Section 6.2** below.

Impacts to SAR bats are anticipated to be negligible, and dependent on the impacts to the mature trees lining Lakeside Avenue. However, overall, there is only a small number of trees that could be impacted, and based on WSP's field investigations, none of them appear to support good quality maternity roosting habitat. Standard timing windows for construction will minimize impacts to any potential bats residing in the area.

5.4 FISH HABITAT

WSP does not anticipate any direct impacts to fish and fish habitat within Cooksville Creek. The only works within close proximity to Cooksville Creek include the micro-tunneling of the 198 m of 375 mm sewer addition along Lakeshore Road East. This micro-tunneling will cross below the channel bed of Cooksville Creek, with standard mitigation measures in place to prevent tunneling related concerns (i.e., frac out).

Although some of the Alternative 2 pipe work will occur within close proximity of Lake Ontario (< 30m), standard mitigation measures such as robust Erosion and Sediment control plans will minimize impacts to fish and fish habitat along the shoreline. There are no direct impacts to Lake Ontario anticipated.

6 MITIGATION MEASURES

6.1 VEGETATION

The following mitigation measures are recommended to minimize effects to the local vegetation communities and their associated habitat functions across the study limits:

- Exposed surfaces should be re-stabilized and re-vegetated as soon as possible following disturbance, specifically within 15 days near Cooksville Creek and the Lake Ontario shoreline, and within 45 days in other graded areas. It is recommended that all disturbed habitats be re-vegetated with a native seed mix.
- All temporary erosion and sediment control measures should be maintained in an effective, functioning, and stable condition. This will require routine inspections, including after storm events, and repair as required. Erosion and sediment control measures will remain in place until all site restoration activities are completed and disturbed areas are no longer susceptible to erosion and sedimentation.
- Vegetation clearing zones, vegetation retention zones, and vegetation that does not require removal should be clearly delineated on both the Contract Drawings and in the field with the Contractor prior to clearing and grading. Equipment, materials and other construction activities should not be permitted in vegetation retention zones.
- Appropriate vegetation clearing techniques shall be used (e.g., felling trees away from retained natural areas and watercourses).
- Cut and grubbed material shall be disposed of through chipping or other appropriate means.
- Avoid all unnecessary traffic, dumping and storage of materials over tree root zones adjacent to natural areas.
- Dust control shall be completed using water, not chemical suppressants.
- Conduct equipment maintenance and refueling at the designated and properly contained maintenance areas in the works yard or at commercial garages located well away from the creek banks and outside retained vegetation areas. The Contractor should have a Spills Prevention Plan and required materials on site at all times.
- Environmental inspection during construction is recommended to ensure that all mitigation measures are implemented properly, maintained and repaired. Remedial measures should be initiated in a timely manner where warranted.
- Tree protection measures as identified in any Tree Preservation and Removal Plans shall be implemented.
- To control the establishment and/or proliferation of non-native or invasive species during construction, adhere to the Clean Equipment Protocol for Industry (Halloran et al., 2013).

6.2 WILDLIFE

The mitigation measures outlined above are designed to minimize effects to vegetation and protect adjacent vegetation areas, which in turn protect the associated wildlife habitat functions. However, it is also necessary to ensure the protection of breeding birds, as well as other wildlife that may breed or otherwise use areas where construction is proposed. Wildlife-specific mitigation measures are outlined below, as well as specific measures to address potential for incidental SAR encounters.

For the protection of wildlife in general, the contractor should ensure that:

- Any wildlife incidentally encountered during construction will not be knowingly harmed and will be allowed to move away on its own. In the event that an animal encountered during construction does not move from the construction zone and construction activities are such that continuing construction in the area would result in

harm to the animal, all activities that could potentially harm the animal will cease immediately and the Contract Administrator will be notified.

- Any equipment parked overnight in the area will also be inspected to ensure no wildlife have climbed into or beneath it.
- All disturbed areas will be restored to pre-construction conditions.

Nesting migratory birds are protected under the MBCA 1994. No work is permitted to proceed that would result in the destruction of active nests (i.e., nests with eggs or young birds), or the wounding or killing of bird species protected under the MBCA and/or Regulations under that Act.

In order to protect nesting migratory birds, in accordance with the MBCA, the contractor should ensure that:

- No vegetation clearing (including grubbing and removal of trees, shrubs, plants and grasses) will occur during the Regional Nesting Period (**April 1 to August 31**), unless preceded by a nest search survey conducted by a qualified ecologist.
- No active nests (nests with eggs or young birds) will be removed or disturbed in accordance with the MBCA.
- If a nesting migratory bird is identified within or adjacent to the construction site and the construction activities are such that continuing construction in that area would result in a contravention of the MBCA, all activities will stop and Environment Canada will be contacted to discuss mitigation options.
- Additional measures for SAR migratory birds (e.g., Barn Swallow) are outlined below.

6.3 SPECIES AT RISK

Four (4) SAR have reasonable potential to be encountered incidentally and impacted within the study limits, and therefore there is some risk of harm to these species (i.e., three SAR bats, and Barn Swallow) and/or their habitat. Only Endangered and Threatened species have legal protection under the provincial ESA, therefore if Barn Swallow get down-listed to Special Concern, then only the three SAR bats will receive protection under the ESA. To protect these species and any other SAR generally, the following mitigation measures are recommended for implementation and will be specified within the Contract documents:

SAR Birds:

- Adhere to mitigation measures outlined in **Section 6.2** for MBCA compliance to avoid impacts to SAR bird species potentially nesting in the work area or vicinity.
- If any works are required on or adjacent to the Lakeshore Road Bridge over Cooksville Creek, a nest search should be conducted by a qualified biologist prior to works within the nesting season, to identify any nests on the structure.

SAR Bats:

- No tree removals should occur between **April 1 and September 30**, to protect the sensitive period for bat breeding/maternity roosting.
- It there is the potential for tree removals, MECP should be contacted to ensure that there are not permitting requirements under the ESA for impacts to potential bats.

Other SAR:

- In the event that a SAR, or potential SAR, is found within the construction limits, the Contractor should immediately cease all work that could potentially harm the animal and it will be given time to move away on its own. In the event that the animal does not move from the construction zone or is injured the Contract Administrator will be notified. The Contract Administrator or Environmental Inspector can then contact the MECP SAR Biologist for direction, as these animals are protected under the ESA (2007).

- Contractor Awareness and Encounter protocols will be implemented within the Contract documents and specifications to identify the potential for SAR to be encountered during construction and the procedures to be followed in the event of an encounter.

6.4 AQUATIC HABITAT AND FISHERIES

The proposed works for the micro-tunnelling for the pipeline works are unlikely to impact Cooksville Creek and its associated fish and fish habitat if the following mitigation measures are properly implemented.

6.4.1 STANDARD CONSTRUCTION-RELATED MITIGATION MEASURES

The following mitigation measures are recommended for implementation based on the specific works and characterization of Cooksville Creek, in order to minimize potential impacts to fish and fish habitat during and following construction activities.

Construction Design

- A warmwater permissible in-water construction timing window of **July 1st to March 31st** should be implemented for works within close proximity to Cooksville Creek, including the micro-tunneling, to avoid potential negative impacts on the resident species during tunneling works (i.e., in the event a frac out occurs). No in-water works should be permitted between April 1st and June 30th of any given year.
- Any temporarily stockpiled soil, debris or other excess materials, and any construction-related materials, shall be properly contained (e.g., within silt fencing) in areas separated at least 30 m from Cooksville Creek and the Lake Ontario Shoreline. All construction materials, excess materials and debris should be removed and appropriately disposed of following construction.
- The shafts required for the micro-tunneling work should be located outside of the floodplain of Cooksville Creek to avoid potential flooding of the shaft during storm events, and in case the shafts need to be de-watered.
    - If dewatering is required, appropriate energy dissipation and settling / filtration measures shall be designed and used for discharge of dewatering water to ensure no erosion or sediment release occurs into Cooksville Creek or Lake Ontario.
- The contractor will be responsible for providing a specific plan to address the potential for frac out occurring during tunneling under Cooksville Creek. All materials required to address frac out will be kept onsite during tunneling exercises, including measures to address impacts of frac out should it occur within Cooksville Creek. This plan should also include a section on Duty to Notify with direction on who to call and when.
- The Contract Administrator's team should include an Environmental Inspector experienced in working around watercourses, who can be responsible for ensuring the erosion and sediment control measures are functioning effectively, being maintained and that all of the other general mitigation measures are being implemented as intended. The Environmental Inspector should also ensure all environmental mitigation and design measures are properly installed / constructed and maintained. Appropriate contingency and response plans should be in place and implemented as required.
- If the Contractor wishes to alter any of the mitigation plans as outlined in the Contract Documents, then the associated approval agency will need to be made aware of and approve the changes prior to construction.

Sediment and Erosion Control Measures

- The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be completed by the Contractor as identified in the contract.
- All excess materials in and around Cooksville Creek and Lake Ontario shall be managed by the contractor.

- The Contractor will follow all erosion and sediment control measures identified in the contract and prevent / control potential for erosion and sediment caused by their construction methods and operations so as to meet all legislative requirements, to prevent entry of sediment into Cooksville Creek or Lake Ontario, and to prevent damage to features and property adjacent the proposed works.

Shoreline/Bank/Vegetation Stabilization

- Removal of riparian vegetation in and around Cooksville Creek and Lake Ontario shall be completed by the Contractor as identified in the contract.
- Vegetation protection and rehabilitation shall be completed by the Contractor as identified in the contract.
- The construction access, work areas and associated requirements for removal of riparian vegetation will be minimized to the extent required for the construction activities, and these areas then delineated in the field using properly installed protective silt fencing. All temporarily disturbed areas will be re-stabilized following construction using appropriate means as outlined in the restoration plans.

Operation and Machinery

- Use of equipment in and around Cooksville Creek and Lake Ontario shall be monitored by the Contractor as identified in the contract.
- All construction-related activities should be controlled so as to prevent entry of any petroleum products, debris or other potential contaminants / deleterious substances, in addition to sediment as outlined above, to Cooksville Creek and Lake Ontario.

7 CONCLUSSIONS AND RECOMMENDATIONS

WSP was retained by the Region of Peel to provide engineering and environmental services for the Beach Street Sewage Pumping Station (SPS) reconfiguration and associated gravity sewer works in the City of Mississauga. This Natural Environment study has been completed in support of the Schedule B Environmental Assessment (EA) requirements by characterizing the natural heritage features, assessing potential impacts to natural heritage features of the proposed works, and identifying design and mitigation measures to minimize impacts.

The study incorporates existing background data from publicly available databases and natural heritage mapping, as well as results from a single season field investigation of the natural features located within the project limits. To confirm and supplement background data and field investigations, environmental agencies were contacted to request additional comment and data.

The Beach Street SPS is located at the corner of Beach Street and Aviation Road, adjacent to the shore of Lake Ontario and RK McMillan Park. Proposed gravity sewer alignments connect the existing Beechwood SPS to the Beach Street SPS along alternatives either following Aviation Road and Lakeshore Road East, or Beechwood Avenue. Alternative 1 will involve a microtunnel along existing road alignments, as well as under Cooksville Creek near Lakeshore Road East. Alternative 2 will follow along existing road corridors but will not require any tunnelling or crossing of Cooksville Creek; works will be done using existing infrastructure.

Potential impacts related to the works include the negligible removal of vegetation along the project limits, potential removal/disturbance of mature trees along Lakeside Avenue that potentially provide habitat for SAR bats, and the indirect impacts of tunneling under Cooksville Creek (i.e., frac out). WSP has determined that the impacts to the natural features can be minimized with the proper implementation of mitigation measures as outlined in Section 6. If tree removals are required along Lakeside Avenue for the works, WSP recommends that MECP be contacted concerning potential impacts to SAR Bats. Timing windows will address the remainder of the potential impacts to natural features and fauna.

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- Snell, Shamus (pers. com.). Acting Management Biologist, Species at Risk Branch, Ministry of Environment, Conservation, and Parks. January 11, 2022
- Wallis, Derry (pers. com.). Planning Technician, Planning and development Services, Credit Valley Conservation. January 11, 2022

APPENDIX

A AGENCY CORRESPONDENCE

CREDIT VALLEY CONSERVATION AUTHORITY

From: LeCraw, Robin <Robin.LeCraw@wsp.com>
Sent: Monday, January 10, 2022 2:03 PM
To: Slaght, Tyler <Tyler.Slaght@cvc.ca>
Cc: Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>; Garland, Jade <jade.garland@wsp.com>; Stephen, Chad <Chad.Stephen@wsp.com>
Subject: [External] Beach Street SPS Diversion EA - Information Request

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Hi Tyler,

I have another request for information for an EA project. This is for a sewer diversion EA between the Beach Street SPS and Beechwood SPS, crossing Cooksville Creek. Please see the attached request letter and location figure.

Please feel free to forward to the appropriate contact if not you, and don't hesitate to contact me with any clarifications or questions.

Thank you for your help!

Robin

Robin LeCraw, Ph.D.
(She/her)
Project Ecologist
Ecology & Environmental Impact Assessment (EIA)

T+ 1 519-904-1788

294 Rink Street, Unit 103
Peterborough, Ontario
K9J 2K2 Canada

wsp.com

From: Wallis, Derry <derry.wallis@cvc.ca>

Sent: January 11, 2022 10:00 AM

To: LeCraw, Robin
Cc: Slaght, Tyler; Ahmad, Iftekhar; Stephen, Chad; Garland, Jade; Hinsperger, Kelsey
Subject: FW: [External] Beach Street SPS Diversion EA - Information Request
Attachments: Beach St SPS_Info Request_CVC.pdf; Beach St SPS_Existing Config_Location.pdf

Hi Robin,

Tyler has forwarded your request to me as I will help to organize the data request and be your point of contact for receiving the data.

Please provide/confirm the following information so I can proceed with a data sharing agreement. If possible, please also send a map outlining the entire study area/area of interest in a box to allow our staff to easily find all of the requested data.

- **Project name**:
- Proponent: Region of Peel
- User: WSP
- **Intended use and publications**:
- Requested data:
    - In-water work timing windows for Cooksville Creek
    - Natural heritage feature limits and GIS data
    - Flora and fauna records
    - Floodplain/hazard lands mapping including GIS data

Please feel free to get in touch if you have any questions.

Best regards,

I'm working remotely. The best way to reach me is by email.

Derry Wallis | she/her
Planning Technician, Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 350 | M: 437-980-9759
derry.wallis@cvc.ca | cvc.ca

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GREATER TORONTO'S TOP 2021 EMPLOYERS

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From: LeCraw, Robin <Robin.LeCraw@wsp.com>
Sent: Tuesday, January 11, 2022 2:25 PM
To: Wallis, Derry <derry.wallis@cvc.ca>
Cc: Slaght, Tyler <Tyler.Slaght@cvc.ca>; Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland, Jade <jade.garland@wsp.com>; Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request

[CAUTION] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt contact help211@cvc.ca

Hi Derry,

Thanks for your quick response! See my fill-ins in red in your email below. Also attached is a map showing the outline of the full study area.

Cheers
Robin

Robin LeCraw
(She/her)
Project Ecologist

T+ 1 519-904-1788

From: Wallis, Derry <derry.wallis@cvc.ca>
Sent: Tuesday, January 11, 2022 10:00 AM
To: LeCraw, Robin <Robin.LeCraw@wsp.com>
Cc: Slaght, Tyler <Tyler.Slaght@cvc.ca>; Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland, Jade <jade.garland@wsp.com>; Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>
Subject: FW: [External] Beach Street SPS Diversion EA - Information Request

Hi Robin,

Tyler has forwarded your request to me as I will help to organize the data request and be your point of contact for receiving the data.

Please provide/confirm the following information so I can proceed with a data sharing agreement. If possible, please also send a map outlining the entire study area/area of interest in a box to allow our staff to easily find all of the requested data.

- **Project name**: Beach Street SPS Diversion EA
- Proponent: Region of Peel

- User: WSP
- **Intended use and publications**: Natural Environment Assessment and Report
- Requested data:
    - In-water work timing windows for Cooksville Creek
    - Natural heritage feature limits and GIS data
    - Flora and fauna records
    - Floodplain/hazard lands mapping including GIS data

Please feel free to get in touch if you have any questions.

Best regards,

I'm working remotely. The best way to reach me is by email.

Derry Wallis | she/her
Planning Technician, Planning and Development Services | Credit Valley Conservation
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From: Wallis, Derry <derry.wallis@cvc.ca>
Sent: Monday, January 17, 2022 2:05 PM
To: LeCraw, Robin <Robin.LeCraw@wsp.com>
Cc: Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland, Jade <jade.garland@wsp.com>; Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request

Hi Robin,

Thank you for providing that information. Are you interested in the Hec-RAS model for this area as well?

Thank you,

I'm working remotely. The best way to reach me is by email.

Derry Wallis | she/her
Planning Technician, Planning and Development Services | Credit Valley Conservation

905-670-1615 ext 350 | M: 437-980-9759
derry.wallis@cvc.ca | cvc.ca

Credit Valley Conservation
inspired by nature

2021 CANADA'S GREENEST EMPLOYERS

GREATER TORONTO'S TOP 2021 EMPLOYERS

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From: LeCraw, Robin <Robin.LeCraw@wsp.com>
Sent: Monday, January 31, 2022 9:21 AM
To: Wallis, Derry <derry.wallis@cvc.ca>
Cc: Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland, Jade <jade.garland@wsp.com>; Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request

[CAUTION] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt contact help211@cvc.ca

Hi Derry,

So sorry for the delayed response! We have concluded that we don't need the Hec-RAS model for this project.

Thank you!
Robin

Robin LeCraw
(She/her)
Project Ecologist

T+ 1 519-904-1788

From: Wallis, Derry <derry.wallis@cvc.ca>
Sent: Friday, February 4, 2022 9:37 AM
To: LeCraw, Robin <Robin.LeCraw@wsp.com>
Cc: Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland,

Jade <jade.garland@wsp.com>; Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request

Hi Robin,

Happy Friday 😊

Thank you for clarifying the requested data. I have put in a request with our technical staff to obtain the data. Once the data is ready to be released, I will send the Data Sharing Agreement to you to sign.

Please note that it can take up to four weeks to collect all the necessary data.

Should you have any questions, please contact me.

Thank you,

I'm working remotely. The best way to reach me is by email.

Derry Wallis | she/her
Planning Technician, Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 350 | M: 437-980-9759
derry.wallis@cvc.ca | cvc.ca

View our privacy statement

From: LeCraw, Robin <Robin.LeCraw@wsp.com>
Sent: Friday, February 4, 2022 9:39 AM
To: Wallis, Derry <derry.wallis@cvc.ca>
Cc: Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland, Jade <jade.garland@wsp.com>; Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request

[CAUTION] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt contact help211@cvc.ca

Ok, thank you for the update Derry!

Happy Friday! 😊

Robin

Robin LeCraw, *she/her*
Project Ecologist, Ph.D

T+ 1 519-907-1788

WSP GOLDER

From: Wallis, Derry
Sent: Tuesday, May 10, 2022 3:46 PM
To: LeCraw, Robin <Robin.LeCraw@wsp.com>
Cc: Ahmad, Iftekhar <iftekhar.ahmad@cvc.ca>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland, Jade <jade.garland@wsp.com>; Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request

Hi Robin,

Sorry for the delay in getting you the data; we appreciate your patience.

Please complete Schedule 2, sign, and return the attached Data Sharing Agreement (DSA) at your earliest convenience. Staff who need direct access to the data should be included on Schedule 2. A representative from the proponent will also need to sign the DSA before we can release any data.

Please let me know if you have any questions at all.

Best regards,

I'm working remotely. The best way to reach me is by email.

Derry Wallis | she/her
Planning Technician, Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 350 | M: 437-980-9759
derry.wallis@cvc.ca | cvc.ca

Credit Valley Conservation
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2021 CANADA'S GREENEST EMPLOYERS

GREATER TORONTO'S TOP 2021 EMPLOYERS

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From: LeCraw, Robin <Robin.LeCraw@wsp.com>
Sent: Tuesday, May 24, 2022 11:25 AM
To: Paudel, Elizabeth <Elizabeth.Paudel@cvc.ca>
Cc: Wallis, Derry <derry.wallis@cvc.ca>
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request

> You don't often get email from robin.lecraw@wsp.com. Learn why this is important

[CAUTION] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt contact help211@cvc.ca

Hi Elizabeth,

Please see the attached Data Sharing Agreement signed by the user (WSP) and proponent (Peel Region).

Thank you very much!
Robin

Robin LeCraw, *she/her*
Project Ecologist, Ph.D

T+ 1 519-904-1788

WSP GOLDER

From: Paudel, Elizabeth <Elizabeth.Paudel@cvc.ca>
Sent: May 25, 2022 1:23 PM
To: LeCraw, Robin
Subject: RE: [External] Beach Street SPS Diversion EA - Information Request - DR 22/002

Hi Robin,

Thank you for the signed DSA. The data can be accessed here: DR22002

If you have any questions or concerns, please contact me.

Kind regards,

I'm working remotely. The best way to reach me is by email, mobile phone or Microsoft Teams.

Elizabeth Paudel | MES | she/her/hers
Planner (Acting), Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 236 | M: 437-339-3201
elizabeth.paudel@cvc.ca | cvc.ca

View our privacy statement

MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS

From: LeCraw, Robin <Robin.LeCraw@wsp.com>
Sent: January 10, 2022 2:08 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Hinsperger, Kelsey <Kelsey.Hinsperger@wsp.com>; Stephen, Chad <Chad.Stephen@wsp.com>; Garland, Jade <jade.garland@wsp.com>
Subject: Beach Street SPS Diversion EA - SAR Information Request

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hello,

WSP has been retained by Peel Region for a class EA for a sewer diversion between the Beach Street SPS and Beechwood SPS, crossing Cooksville Creek. We would like to request any additional information on potential SAR available from MECP. Please see the attached request letter and location figure.

Please don't hesitate to contact me with any clarifications or questions.

Thank you for your help!

Robin

Robin LeCraw, Ph.D.

(She/her)

Project Ecologist

Ecology & Environmental Impact Assessment (EIA)

T+ 1 519-904-1788

294 Rink Street, Unit 103

Peterborough, Ontario

K9J 2K2 Canada

wsp.com

From: Snell, Shamus (MECP) <Shamus.Snell@ontario.ca>
Sent: January 11, 2022 11:08 AM
To: LeCraw, Robin
Subject: MECP SARB Review: Information Request - Beach Street
Attachments: Bat Survey Standards Note 2021.pdf; Treed Habitats - Maternity Roost Surveys.docx; SAR Bat Building Exit and Roost Survey Protocols.docx

Hi Robin,

The Ministry of Environment, Conservation and Parks (MECP), Species at Risk Branch (SARB) has reviewed the study area for the Beach Street Sewage Pumping Station Diversion and found the following additional Species at Risk (SAR) which need to be considered as part of your SAR list.

- American Eel (*Anguilla rostrata*);
- Bank Swallow (*Riparia riparia*);
- Butternut (*Juglans cinerea*)
- Chimney Swift (Chaetura pelagica);
- Eastern Meadowlark (Sturnella magna);
- Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)(*Acipenser fulvescens* pop. 3);
- Eastern Small-footed Myotis (*Myotis leibii*);
- Little Brown Myotis (*Myotis lucifugus*);
- Northern Myotis (*Myotis septentrionalis*).

While this review represents MECP's best currently available information, it is important to note that a lack of information for a location does not mean that SAR or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in areas not previously surveyed. On-site assessments will need to be conducted to better verify site conditions, identify and confirm presence of SAR and/or their habitats.

Should vegetation removal be required as part of the proposed project, MECP recommends that a qualified biologist with botany expertise be retained to survey for SAR plants and to conduct habitat studies for the remaining species.

A copy of the “2021 Bat Survey Standards Note” along with the associated protocols has been attached for your use and reference.

It is the responsibility of the proponent and their consultant to ensure that SAR are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the proposed activities to be carried out on the site. If the proposed activities can not avoid impacting protected species and their habitats then the proponent will need to apply for a authorization under the Endangered Species Act.

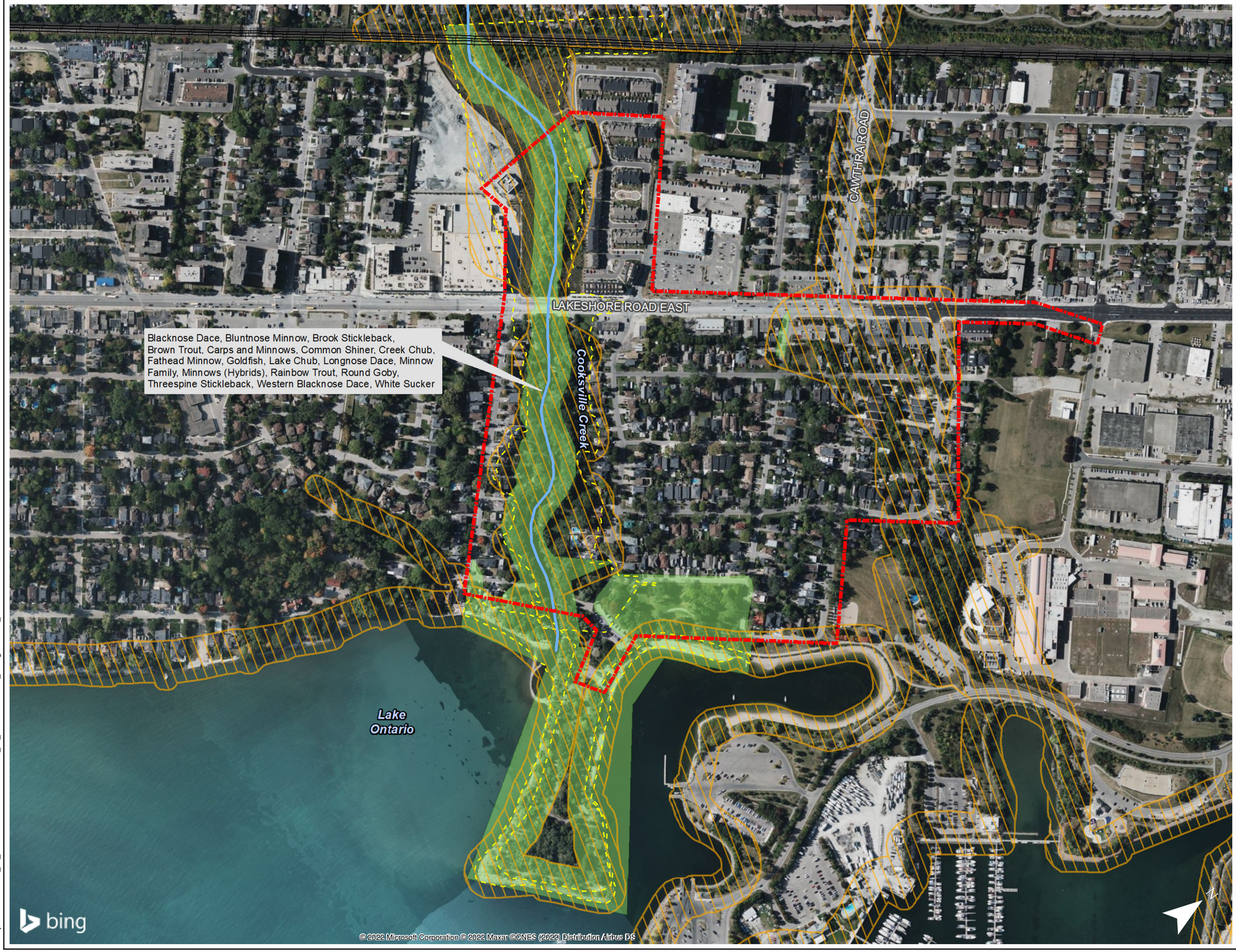
Regards,

Shamus Snell
A/ Management Biologist
Species at Risk Branch
Ministry of Environment, Conservation and Parks
Email: shamus.snell@ontario.ca

APPENDIX

B MAPPING

BEACH STREET SPS
Background Information



Legend

- Railway
- Permanent Watercourse
- Study Area
- Regulation Limit (CVC)
- Floodline (CVC)
- Natural Heritage System Area (CVC)

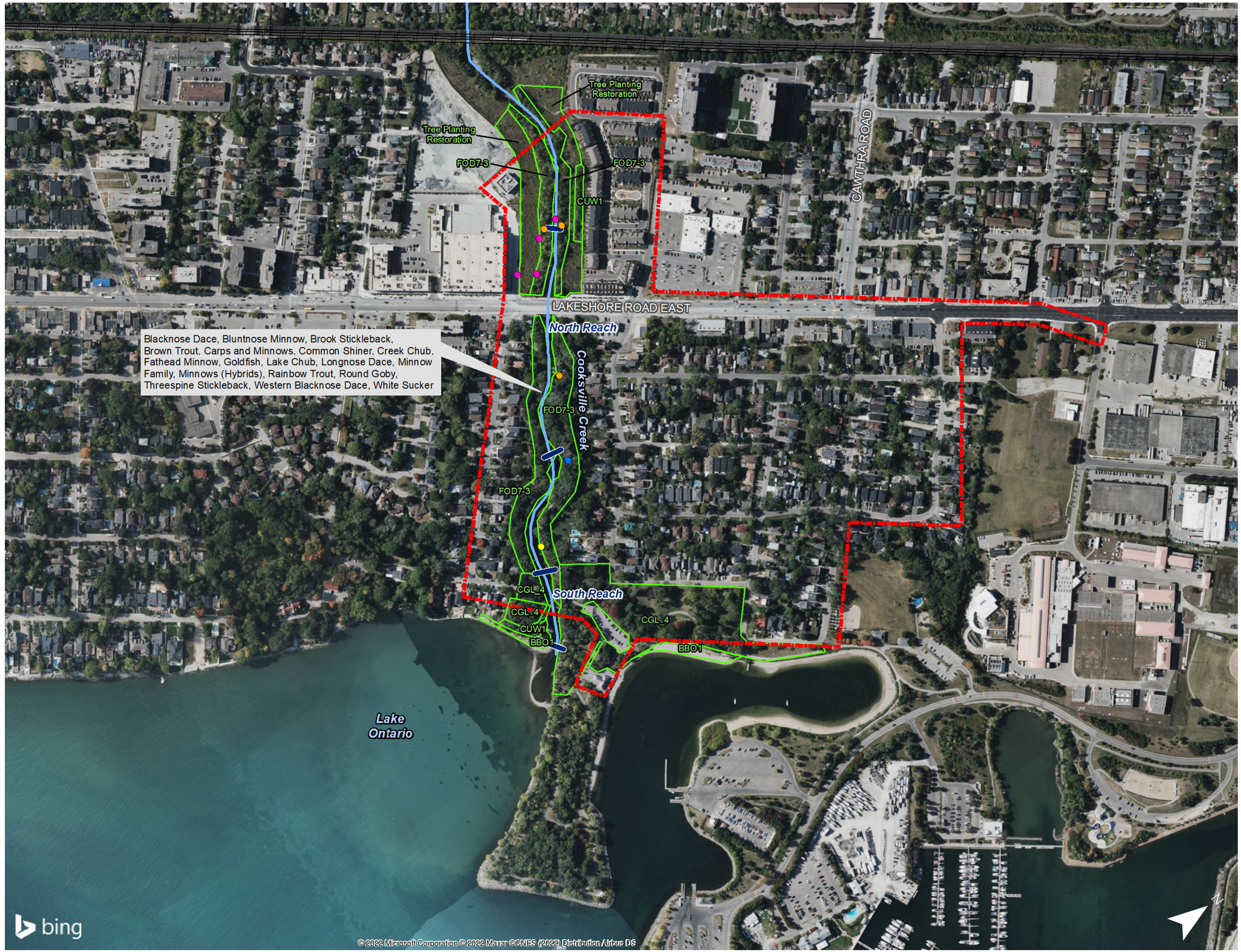
0 100 200
Meters
1:5,000

Figure: 1, Appendix B
Project No.: 19M-00593-00
Date Created: 06 June 2022
Date Modified: 03 November 2022
Coordinate System: NAD 1983 UTM Zone 17N
Source: ESRI Basemaps, WSP, LIO

wsp

L:\Projects\2019\00593_00_BeachStreetSPS\MXDs\00593_00_BeachStreetSPS_BackgroundInfo_202206.mxd

BEACH STREET SPS
Existing Natural Environmental Conditions



Legend

Wildlife Observations

- Common Reed
- Giant Hogweed
- Japanese Knotweed
- Mute Swan Nest
- Reach Breaks
- Permanent Watercourse
- Railway
- Study Area
- ELC

BBO1: Mineral Open Beach / Bar Ecosite

CGL_4: Recreational

CUW1: Mineral Cultural Woodland Ecosite

FOD7-3: Fresh – Moist Willow Lowland Deciduous Forest Type

0 100 200
Meters
1:5,000

Figure: 2, Appendix B
Project No.: 19M-00593-00
Date Created: 06 June 2022
Date Modified: 03 November 2022
Coordinate System: NAD 1983 UTM Zone 17N
Source: ESRI Basemaps, WSP, LIO

wsp

L:\Projects\2019\00593_00_BeachStreetSPS\MXDs\00593_00_BeachStreetSPS_ExistingConditions_202206.mxd

APPENDIX

C REPRESENTATIVE PHOTOGRAPHS

Photo 1. Looking upstream from mouth of Cooksville Creek along west bank with Waterfront Trail Pedestrian bridge in the background.

Photo 2. Looking across Cooksville Creek at armouring of East bank.

Photo 3. Looking along Lake Ontario Shoreline west of Cooksville Creek.

Photo 4. Looking along east bank within the North reach of Cooksville Creek at low bank and trail access..

Photo 5. Looking at west bank at one of the many SWM outlets into Cooksville Creek.

Photo 6. Looking downstream within North Reach at bank conditions and general channel cross section.

Photo 7. Looking downstream within Cooksville Creek at the large substrate and low flows observed on the day of field investigations.

Photo 8. Looking at substrate and pool in North Reach with spawning White Sucker in the middle of the frame.

Photo 9. Photo showing the Mineral Open Beach / Bar Ecosite (BB01).

Photo 10. Photo of the Mineral Cultural Woodland Ecosite (CUW1).

Photo 11. Photo of the Recreational land use (CGL-4).

Photo 12. Photo of the naturalizing recreational area. Within CGL-4.

Photo 13. Photo of the Fresh-Moist Willow Lowland Deciduous Forest Type ecosite (FOD7-3)..

Photo 14. Photo looking north from Lakeshore Road east at the general valley setting for Cooksville Creek.

Photo 15. Photo looking along west bank at the restoration area beyond the deciduous forest adjacent Cooksville Creek.

Photo 16. Photo taken on east bank at Mute Swan nesting activity.

APPENDIX

D SPECIES AT RISK ASSESSMENT

Species At Risk Designations
ENDANGERED
THREATENED
SPECIAL CONCERN
EXTIRPATED

Species	ESA Status[1] and Regional Occurrence	ESA Protection[2]	Source of Record (Date)	Key Habitats Used by Species in Ontario	Reasonable Likelihood of Presence in Study Area	Surveys Undertaken	Results of Field Surveys	Likelihood and Magnitude of Impacts to Species or Habitat
Birds								
Barn Swallow (Hirundo rustica)	THR	Species and General Habitat Protection	MECP (Jan 2021); Ebird (2020)	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc. (MNRF Guelph - Waterloo List, 2014)	High - likely to occur as foraging visitant in fields or over watercourses throughout study area. Potential nesting habitat available on pedestrian bridge and culverts.	General wildlife surveys	Observed during field investigations.	Low - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Bank Swallow (Riparia riparia)	THR	Species and General Habitat Protection	MECP (Jan 2021)	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers (MNRF Guelph - Waterloo List, 2014)	Moderate - likely to occur as foraging visitant in fields within the study area. No potential nesting habitat within or adjacent to the project area.	General wildlife surveys	Not observed.	None - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Bobolink (Dolichonyx oryzivorus)	THR	Species and General Habitat Protection	Ebird (2019)	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands (MNRF Guelph - Waterloo List, 2014)	Low - preferred habitat (i.e. grasslands and hay fields) not present within subject lands.	General wildlife surveys	Not observed.	None - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Chimney Swift (Chaetura pelagica)	THR	Species and General Habitat Protection	NHIC (Feb 2021)	Historically found in deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys (MNRF Guelph - Waterloo List, 2014)	Low - Marginal habitat is available in the Mineral Cultural Woodland and Lowland Deciduous Forest, however occurences of this species are rare across the province.	General wildlife surveys	Not observed.	None - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Eastern Meadowlark (Sturnella magna)	THR	Species and General Habitat Protection	NHIC (Feb 2021)	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps (MNRF Guelph - Waterloo List, 2014)	Low - no suitable habitat is available within the subject lands..	General wildlife surveys	Not observed.	None - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Henslow's Sparrow (Ammodramus henslowii)	END	Species and General Habitat Protection	MECP (Jan 2021)	Generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material (MNRF Guelph - Waterloo List, 2014)	Low - no suitable habitat is available within the subject lands..	General wildlife surveys	Not observed.	None - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Peregrine Falcon anatum/tundrius (Falco peregrinus anatum/tundrius)	SC	N/A	MECP (Jan 2021) and NHIC (Feb 2021)	Generally nest on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated downtown areas (MNRF Guelph - Waterloo List, 2014)	None - No suitable habitat of adequate size present within or adjacent to the study area.	General wildlife surveys	Not observed.	None - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.

Mammals								
Small-footed Bat (Myotis leibii)	END	Species and General Habitat Protection	MECP (Jan 2021)	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark (MNRF Guelph - Waterloo List, 2014)	Low - low potential for this species to occur throughout study area as foraging visitant (generally less common than other bat species in Southern Ontario); low potential for maternity roost habitat in forested areas (preferred habitat in cliff faces or exposed rock outcrops is not present)	General wildlife surveys; Incidental cavity trees recorded	Not observed.	Low - direct impacts to habitat will be minimal and timing windows for vegetationand tree clearing will minimize impacts during the maternity roosting period.
Little Brown Bat (Little Brown Myotis) (Myotis lucifugus)	END	Species and General Habitat Protection	MECP (Jan 2021)	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh) (MNRF Guelph - Waterloo List, 2014)	High - Likely to occur as foraging visitant over fields and forests; Low potential for maternity roost habitat in forested habitat within study area (typical roosting habitat in suitable buildings is not present)	General wildlife surveys; Incidental cavity trees recorded	Observed during field investigations.	Low - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Northern Long-eared Bat (Northern Myotis) (Myotis septentrionalis)	END	Species and General Habitat Protection	MECP (Jan 2021)	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)(MNRF Guelph - Waterloo List, 2014)	High - Likely to occur as foraging visitant over fields and forests; Low potential for maternity roost habitat in forested habitat within study area (typical roosting habitat in suitable buildings is not present)	General wildlife surveys; Incidental cavity trees recorded	Observed during field investigations.	Low - direct impacts to habitat are not anticipated. Timing windows will protect the species during the breeeding season.
Plants								
Butternut (Juglans cinerea)	END	Species and General Habitat Protection	Conservation Halton (Dec 2020)	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldom, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone o in small groups in deciduous forests as well as in hedgerows	High - Suitable habitat is present throughout the broader landscape and in the vicinity of the proposed works.	ELC and One Season General Botanical Inventory	Not observed during vegeetation surveys.	Low - direct impacts to individuals are not anticipated as none have been observed in the project limits.
Fish								
American eel (Anguilla rostrata)	END	Species and General Habitat Protection	MECP (Jan 2021)	All fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean; 12 Mile Creek Watershed and Lake Ontario (MNRF Guelph - Hamilton List 2013)	Low - minimial suitable aquatic habitat present within the study area; Cooksville Creek has sparse aquatic vegetation.	Habitat Assessments	Not observed.	None - there are no records of this species in background information, and there are no proposed in-water works that would impact this species.
Lake Sturgeon (Great Lakes-Upper St. Lawrence) (Acipenser fulvescens)	END	Species and General Habitat Protection	MECP (Jan 2021); Conservation Halton (Dec 2020)	Freshwater lakes and rivers with soft bottoms of mud, sand or gravel at depths of five to 20 m. Spawning usually occurs in shallow, fast flowing water below dams, waterfalls or rapids with gravel and boulders (MNRF Species Profile Online 2014).	None - there is not preferred habitat within Cooksville Creek that would support this species.	Habitat Assessments	Not observed.	None - there are no records of this species in background information, and there are no proposed in-water works that would impact this species.

[1]**ESA (Endangered Species Act) Status** (provincial status from MNRF May 2014)

[2]**ESA (Endangered Species Act) Protection** (provincial status from MNRF May 2014)

[3]**COSEWIC (Committee on the Status of Endangered Wildlife in Canada)** (federal status from COSEWIC)

[4]**SARA (Species at Risk Act) Status** (federal status - listed)

APPENDIX

E PLANT LIST

BEACH STREET SPS EA – PLANT LIST

SCIENTIFIC NAME	COMMON NAME	CC [1]	CW[1]	OWES WETLAND PLANT LIST[2]	S_RANK[3]	SARO[4]	ECODISTRICT 7E4 (GTA) (Oldham 2017)[5]	PEEL REGION (Varga et al. 2000)[6]	PEEL/CVC (Kaiser, 2001)[7]	BBO1	CGL_4	CUW1	FOD7-3	Restoration Area
Acer negundo	Manitoba Maple	0	0	X	S5		IC	X	X	X	X	X	X	
Acer rubrum	Red Maple	4	0	X	S5		C	X	X					X
Acer saccharinum	Silver Maple	5	-3	X	S5		X	X	X		X		X	
Acer saccharum	Sugar Maple	4	3		S5		C	X	X					X
Ajuga reptans	Creeping Bugleweed		5		SNA		IR	X	X				X	
Alliaria petiolata	Garlic Mustard		0		SNA		IC	X	X		X	X	X	X
Apocynum sp.	Dogbane sp.													X
Arctium sp.	Burdock sp.						IR				X	X	X	X
Artemisia campestris	Field Wormwood	8	5		S5					X			X	
Barbarea vulgaris	Bitter Wintercress		0		SNA		IC	X	X					X
Betula papyrifera	Paper Birch	2	3	X	S5		C	X	X					X
Calystegia sepium ssp. americana	American False Bindweed	2	0		S5				X	X				
Carduus sp.	Thistle sp.											X		
Carex sp.	Sedge sp.												X	
Carya ovata	Shagbark Hickory	6	3	X	S5		U	X	X		X			
Cirsium arvense	Canada Thistle		3		SNA		IC	X	X					X
Cornus sericea	Red-osier Dogwood	2	-3	X	S5		C	X	X			X		X
Daucus carota	Wild Carrot		5		SNA		IC	X	X	X		X	X	X
Dipsacus fullonum	Common Teasel		3		SNA		IC	X	X			X		X
Equisetum arvense	Field Horsetail	0	0	X	S5		C	X	X				X	
Euonymus alatus	Winged Euonymus		5		SNA		IR	XSR	X		X			
Fraxinus americana	White Ash	4	3		S4		C	X	X			X		
Fraxinus sp.	Ash sp.												X	
Galium asprellum	Rough Bedstraw	6	-5	X	S5		U	U	X			X	X	
Geranium robertianum	Herb-Robert	2	3		S5		C	X	X				X	
Geum sp.	Avens sp.											X	X	
Helianthus tuberosus	Jerusalem Artichoke	1	0		SU		IC	X	X				X	
Hemerocallis fulva	Orange Daylily		5		SNA		IC	X	X				X	

Suite 103
294 Rink Street
Peterborough, ON, Canada K9J 2K2

T: +1 705 743-6850
F: +1 705 743-6854
wsp.com

SCIENTIFIC NAME	COMMON NAME	CC [1]	CW[1]	OWES WETLAND PLANT LIST[2]	S_RANK[3]	SARO[4]	ECODISTRICT 7E4 (GTA) (Oldham 2017)[5]	PEEL REGION (Varga et al. 2000)[6]	PEEL/CVC (Kaiser, 2001)[7]	BBO1	CGL_4	CUW1	FOD7-3	Restoration Area
Heracleum mantegazzianum	Giant Hogweed		0		SNA								X	
Hesperis matronalis	Dame's Rocket		3		SNA		IC	X	X			X		
Juglans nigra	Black Walnut	5	3		S4?		C	X	X			X	X	
Lonicera sp.	Honeysuckle sp.											X	X	
Medicago lupulina	Black Medick		3		SNA		IC	X	X				X	
Myosotis scorpioides	True Forget-me-not		-5	X	SNA		IC	X	X				X	
Oenothera sp.	Evening Primrose sp.											X		
Pastinaca sativa	Wild Parsnip		5		SNA		IC	X	X				X	
Phalaris arundinacea	Reed Canarygrass	0	-3		S5								X	
Phragmites australis	Common Reed	0	-3	X	S4?		IC	X	X					X
Picea abies	Norway Spruce		5		SNA		IX	X	X				X	
Picea glauca	White Spruce	6	3	X	S5		U	R3	L					X
Pinus nigra	Austrian Pine		5		SNA						X			
Pinus strobus	Eastern White Pine	4	3	X	S5		C	X	X		X			
Pinus sylvestris	Scots Pine		3		SNA		IC	X	X		X			
Plantago major	Common Plantain		3		SNA		IC	X	X				X	
Poa pratensis	Kentucky Bluegrass		3		S5									X
Poa pratensis ssp. pratensis	Kentucky Bluegrass		3		SNA		IC	X	X				X	
Populus deltoides	Eastern Cottonwood	4	0		S5							X		
Populus tremuloides	Trembling Aspen	2	0		S5		C	X	X					X
Prunus virginiana	Chokecherry	2	3		S5			X	X		X	X	X	
Quercus rubra	Northern Red Oak	6	3		S5		C	X	X		X			
Ranunculus abortivus	Kidney-leaved Buttercup	2	0		S5		C	X	X				X	
Ranunculus acris	Common Buttercup		0	X	SNA		IC	X	X			X		
Reynoutria japonica	Japanese Knotweed		3		SNA		IC	X	X				X	
Rhamnus cathartica	European Buckthorn		0	X	SNA		IC	X	X			X		
Rhus typhina	Staghorn Sumac	1	3		S5		C	X	X					X
Rosa multiflora	Multiflora Rose		3		SNA		IC	X	X	X		X	X	
Rubus idaeus	Red Raspberry	2	3		S5									X
Rumex crispus	Curled Dock		0	X	SNA		IC	X	X				X	
Rumex sp.	Dock sp.												X	
Salix alba	White Willow		-3	X	SNA		IC	X	X	X	X	X	X	
Salix euxina	Crack Willow		0		SNA		IC			X			X	
Salix sp.	Willow sp.												X	X
Solidago altissima	Tall Goldenrod	1	3		S5		C	X		X		X	X	X
Symphytum officinale	Common Comfrey		5		SNA		IR	X	X				X	
Taraxacum officinale	Common Dandelion		3		SNA		IC	X	X		X	X	X	

SCIENTIFIC NAME	COMMON NAME	CC [1]	CW[1]	OWES WETLAND PLANT LIST[2]	S_RANK[3]	SARO[4]	ECODISTRICT 7E4 (GTA) (Oldham 2017)[5]	PEEL REGION (Varga et al. 2000)[6]	PEEL/CVC (Kaiser, 2001)[7]	BBO1	CGL_4	CUW1	FOD7-3	Restoration Area
Tilia americana	Basswood	4	3		S5		C	X	X				X	X
Typha sp.	Cattail sp.			X									X	X
Ulmus americana	White Elm	3	-3	X	S5		C	X	X	X	X	X	X	
Ulmus pumila	Siberian Elm		3		SNA		IC	X	X				X	
Viola odorata	English Violet		5		SNA		IR	X	X				X	
Vitis riparia	Riverbank Grape	0	0		S5		C	X	X			X	X	
Xanthium strumarium	Rough Cockleburr	2	0	X	S5		C	X	X				X	

PLANT LIST LEGEND

[1] Coefficient of Conservatism, Coefficient of Wetness, Weediness, and Physiology/Habit

Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

CC and CW values reflect updates by NHIC, current as of February 28, 2020).

CC: Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

CW: Coefficient of Wetness. Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories. *NOTE*: NHIC has simplified the values, and includes only -5, -3, 0, 3 and 5.

[2] OWES Wetland Plant List

Ontario Ministry of Natural Resources. 2013. Ontario Wetland Evaluation System Southern Manual. 3rd Edition, Version 3.3

Ontario Ministry of Natural Resources. 2013. Ontario Wetland Evaluation System Northern Manual. 1st Edition, Version 1.3

[3] S-Ranks (Provincial)

Provincial Status from the NHIC (February 28, 2020)

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

S1: Critically Imperiled – At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2: Imperiled – At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

S3: Vulnerable – At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

S4: Apparently Secure – At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

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S5: Secure – At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

SX: Presumed Extirpated – Species or ecosystem is believed to be extirpated from the jurisdiction (province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [equivalent to "Regionally Extinct" in IUCN Red List terminology]

SH: Possibly Extirpated (Historical) – Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.

SNR: Unranked – subnational conservation status not yet assessed.

SU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities (e.g., long distance aerial and aquatic migrants, hybrids without conservation value, and non-native species.

?: Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

T#: Infraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the subnational rank of a critically imperiled subspecies of an otherwise widespread and common species would be S5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species, for example, a S1T2 subrank should not occur. A vertebrate animal population may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.

[4] SARO (Species At Risk in Ontario)

Provincial status from MNRF (Status as of February 28, 2020)

https://www.ontario.ca/environment-and-energy/species-risk-ontario-list

The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Natural Resources and Forestry that assesses the status of species at risk of extinction.

EXP: Extirpated – Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.

END: Endangered – Lives in the wild in Ontario but is facing imminent extinction or extirpation.

THR: Threatened – Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.

SC: Special Concern – Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

[5] Ecodistrict 7E4 (comprising the City of Toronto, and southern portions of York, Peel, and Halton Regional Municipalities)

Oldham, Michael J. 2017. List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E). Carolinian Canada and Ontario Ministry of Natural Resources and Forestry. Peterborough, ON. 132 pp.

Rankings are based on "previous lists, personal communications, and the author's knowledge of the Carolinian Zone flora."

Codes are defined as follows:

H: Historic. Native and no known records for at least 30 years.

R: Rare

U: Uncommon

C: Common

X: Present. Native but no status assigned because of lack of information, often due to confusion with similar species.

I: Introduced. A non-native (exotic) species that is established (or was formerly established) outside of cultivation.

[6] Halton, Peel, Toronto, York, Durham, GTA, 6E7, 7E4

Varga, S., et. al. 2000. The Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources, Aurora, ON. 103 pp.

"Plant rarity is based on the number of locations for a native plant species" and also takes into account native species restricted to specialized rare habitats. For the Greater Toronto Area column, "A species is considered rare in the Greater Toronto Area if it is rare or uncommon in a least four of... Halton, Peel, Toronto, York, and Durham".

Codes are defined as follows:

X:	Present
U:	Uncommon native species
R:	Rare native species
R#:	Number of stations for a rare native species
E:	Extirpated native species
+ or I:	Introduced species
X+:	Introduced in municipality
SR:	Sight record
LR:	Literature record

[7] Peel and/or CVC

Kaiser, Jeff. 2001. The Vascular Plant Flora of the Region of Peel and the Credit River Watershed. Prepared for Credit Valley Conservation, The Regional Municipality of Peel, and the Toronto and Region Conservation Authority.

R: Regionally Rare (GTA), fewer than 40 locations

L: Locally Rare (Peel and Credit River Watershed), fewer than 11 stations

APPENDIX

A-2 Arborist Report and Tree Preservation Plans

REGION OF PEEL

BEACH STREET & BEECHWOOD SPS GRAVITY SEWER

ARBORIST REPORT

JANUARY 16, 2024

BEACH STREET & BEECHWOOD SPS GRAVITY SEWER

ARBORIST REPORT

REGION OF PEEL

PROJECT NO.: 19M-00593-00
DATE: JANUARY 16, 2024

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1 INTRODUCTION 4
1.1 Study Limits 4
1.2 Report Framework 5
2 EXISTING CONDITIONS 7
2.1 Built Form and Naturalized areas 7
2.2 Vegetation 7
2.2.1 Public Trees 7
2.2.2 Private Trees 8
2.2.3 Park Trees 8
2.3 Condition 8
3 POLICY CONTEXT 10
3.1 City of Mississauga Public Tree Protection By-law 10
3.2 City of Mississauga Private Tree Protection By-law 10
3.3 City of Mississauga Parks By-law 10
3.4 Region of Peel Woodland Managemnt 11
3.5 Credit Valley Conservation Authority Guidelines 11
3.6 Endangered Species Act, 2007 12
3.7 Canada Food and Inspection Agency 12
3.8 Migratory Birds Convention Act, 1994 13
4 DEFINITIONS 14
5 FIELD SURVEYS 16
5.1 Tree Inventory Methodology 16
5.2 Tree Inventory Results 16
6 DISCUSSION 18
6.1 Proposed Works 18
6.2 Tree Recommendations / Assumptions 18
6.2.1 Tree Removal 18
6.2.2 Tree Injury 18
6.2.3 Tree Preservation 19
6.2.4 Tree Retention 19
6.3 Tree Removals 19
6.5 Tree Injury 20
6.6 Tree Protection Zone Encroachment (No Injury) 22

6.7 Tree Pruning 22
6.8 Tree Preservation 22
7 MITIGATION MEASURES 25
7.1 General Mitigation Measures 25
7.2 Air-Spade / Hydro-Vacuum Excavation 26
7.3 Horizontal Root Protection 26
7.4 Root Pruning Practices 27
7.5 Branch Pruning Practices 27
7.6 Migratory Bird Protection 28
7.7 Construction Implementation 28
8 TREE REMOVALS / INJURY / COMPENSATION 30
8.1 City of Mississauga Compensation Notes 30
8.1.1 Private Property 30
8.1.2 Public Property 31
8.2 CVC Compensation Notes 32
8.3 Compensation Summary Table 33
8.4 Compensation Exemptions 33
8.5 Overall Compensation Notes 34
9 CONCLUSION 35
10 LITERATURE CITED 36
11 LIMITATIONS OF ASSESSMENT 37

TABLES

TABLE 4.1 – DEFINITIONS..... 14
TABLE 4.2 – TREE ASSESSMENT CRITERIA 15
TABLE 5.1 – TREE LOCATION..... 16
TABLE 6.1 – TREE REMOVAL TABLE 19
TABLE 6.2 – TREE INJURY SUMMARY TABLE 20
TABLE 6.3 – ROOT PRUNING AND MITIGATION TABLE..... 20
TABLE 6.5 – MINIMUM TREE PROTECTION ZONE DETERMINATION..... 22
TABLE 6.6 – TREE PRESERVATION TABLE 23
TABLE 7.1 – AIR-SPADE EXCAVATION TABLE..... 26
TABLE 8.1 – COMPENSATION CRITERIA TABLE – PRIVATE TREES 30
TABLE 8.2 – REMOVAL AND COMPENSATION TABLE – PRIVATE TREES 30
TABLE 8.3 – COMPENSATION CRITERIA TABLE – PUBLIC TREES..... 31
TABLE 8.4 – REMOVAL AND COMPENSATION TABLE – PUBLIC TREES..... 31
TABLE 8.5 – CVC REMOVAL AND COMPENSATION TABLE..... 32
TABLE 8.6 – REMOVAL AND COMPENSATION SUMMARY TABLE 33
TABLE 8.7 – EXEMPTIONS TABLE..... 33

FIGURES

FIGURE 1: STUDY AREA 5

APPENDICES

A TREE PRESERVATION TABLES

B APPLICATION TO PERMIT THE INJURY OR DESTRUCTION OF TREES ON PUBLIC AND PRIVATE PROPERTY

C SITE PHOTOS

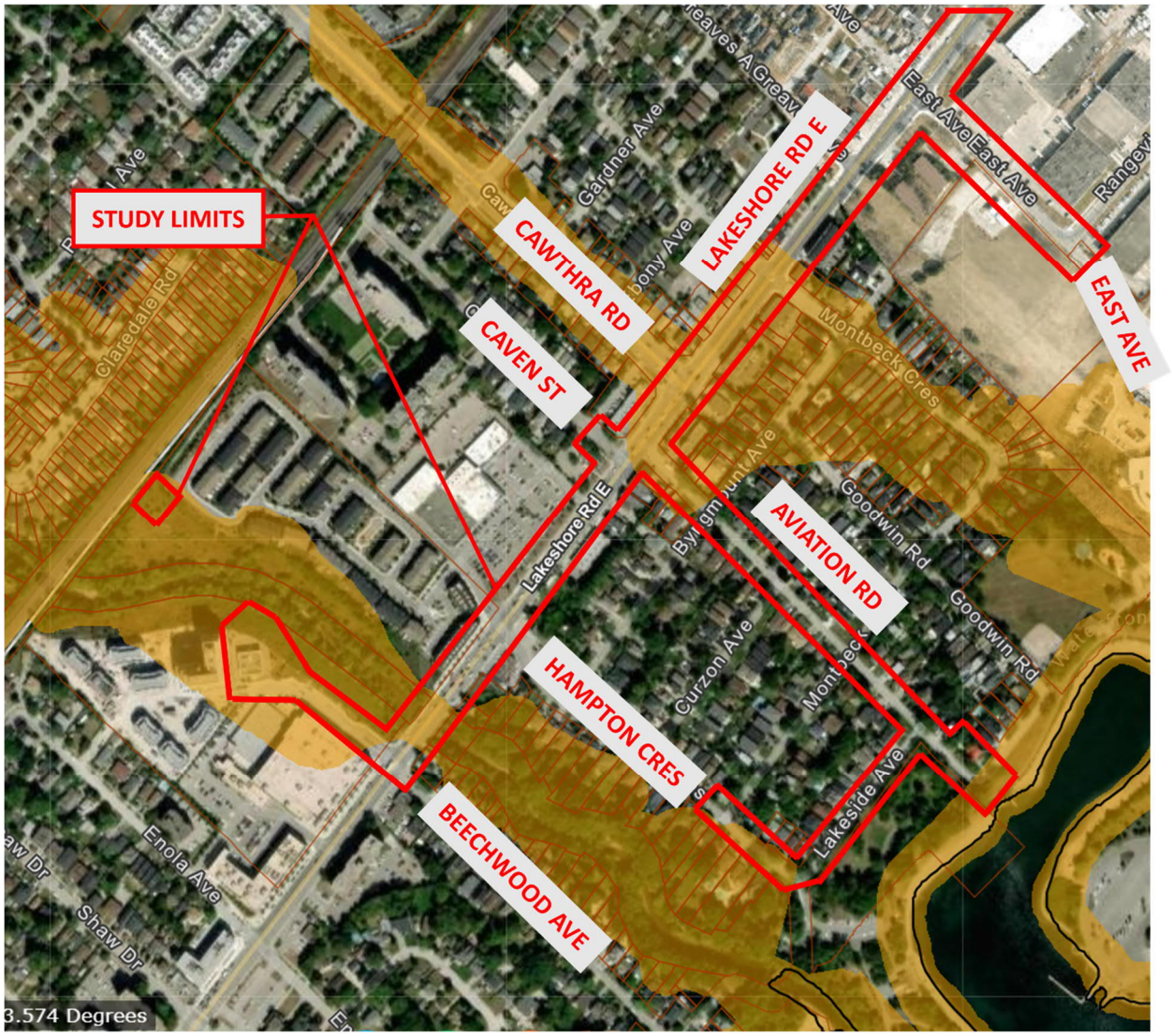
1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Region of Peel to undertake detailed design services for a proposed sanitary sewer on Lakeshore Road East from Beechwood Avenue to Hampton Crescent in Mississauga. As part of the 60% design submission, WSP Landscape Architecture has completed an inventory of trees within the right-of-way (ROW) and adjacent trees on private or city property that could be impacted by the proposed works. The purpose of the inventory was to assess vegetation for health and location and potential impacts related to the proposed design. Tree Preservation Plans have been prepared in association with this report.

1.1 STUDY LIMITS

- The study limit for this site consists of approximately 2.2km of road and additional natural / park areas in Mississauga. Streets included in the study limits are:
    - Lakeshore Road East;
    - Hampton Crescent;
    - Lakeside Avenue;
    - Beach Street;
    - Aviation Road;
    - East Avenue;
    - Caven Street;
- Trees of any size within the right-of-way (ROW) and within city parks or other public areas were included in the inventory;
- Trees 10cm DBH (diameter at breast height) or greater on adjacent private property were also included;
- Refer to Figure 1, which illustrates the study area.

Figure 1: Study Area



Note: The Study Limit is outlined in red. The Credit Valley Conservation Authority (CVC) Regulated Area limits are shown in an orange hatch. Image taken from the CVC Regulation Mapping (last accessed October 2023).

1.2 REPORT FRAMEWORK

This report details the results of the tree inventory; provides an overview of the relevant policy and legislation in relation to the proposed works; and makes recommendations for tree protection, tree injury, mitigative measures and removals based on the proposed works.

- The study area limits are located within the limits of three (3) City of Mississauga by-laws: Public Tree Protection, Private Tree Protection, and Parks by-laws;
- Several sections of the study area reside on CVC Regulated Areas and will therefore have to follow CVC guidelines;

- The tree inventory included:
    - Individual trees of any size on public property;
    - Trees 10cm DBH or greater on private property within 6m of the property line;
    - Trees with a canopy that continuously overlapped or within naturalized areas were assessed as groupings;

This report is to be read in conjunction with:

- Appendix A: Tree Preservation Tables;
- Appendix B: Application to Permit the Injury or Destruction of Trees on Public and Private Property;
- Appendix C: Site Photos;
- Tree Preservation Plans (TP-1 to TP-12).

2 EXISTING CONDITIONS

Vegetation was observed within the study area limits. The area consists of medium to high-density residential, commercial, parkland, and natural area.

2.1 BUILT FORM AND NATURALIZED AREAS

- Lakeshore Road East is a major four-lane roadway with commercial businesses, sidewalks, and bus stops;
- Other roads within the study limits are local two-lane side streets, many of which do not have curbs or sidewalks;
- The are three parks within the study area (RK McMillan Park, Waterworks Park, and Lakeside Park) as well as the Waterfront Trail along Lake Ontario.

2.2 VEGETATION

Vegetation consists of planted public and private trees within maintained areas, and some naturally occurring clusters of trees.

Vegetation composition and tree size are detailed below by location.

2.2.1 PUBLIC TREES

- Trees are mixture of native and non-native, deciduous and coniferous species;
- Inventoried trees range in size from <10 to 140cm DBH with the vast majority being 20cm or less (young to semi-mature);
- There was a total of 33 tree species identified within the study area and an additional 6 genera that could not be identified to species-level. Species composition within the study limits includes:
    - Abundant: Ash species (*Fraxinus sp.*), Honey-locust (*Gleditsia triacanthos*), Siberian Elm (*Ulmus pumila*);
    - Frequent: Manitoba Maple (*Acer negundo*), Serviceberry sp. (*Amelanchier sp.*), Silver Maple (*Acer saccharinum*), White Spruce (*Picea glauca*), Norway Maple (*Acer platanoides*), Sugar Maple (*Acer saccharum*), White Cedar (*Thuja occidentalis*), American Basswood (*Tilia americana*);
    - Occasional: Willow sp. (*Salix sp.*), Freeman's Maple (*Acer x freemanii*), Trembling Aspen (*Populus tremuloides*), Bur Oak (*Quercus macrocarpa*), Ornamental Pear (*Pyrus calleryana*), Japanese Tree Lilac (*Syringa reticulata*), Blue Spruce (*Picea pungens*), Ginkgo (*Ginkgo biloba*), Rose-of-Sharon (*Hibiscus syriacus*), Tree of Heaven (*Ailanthus altissima*);
    - Rare: Black Walnut (*Juglans nigra*), Red Oak (*Quercus rubra*), Red Maple (*Acer rubrum*), Paper Birch (*Betula papyrifera*), Red Cedar (*Juniperus virginiana*), Cherry / Plum sp. (*Prunus sp.*), Japanese Maple (*Acer palmatum*), Austrian Pine (*Pinus nigra*), Chokecherry (*Prunus virginiana*), Elm sp. (*Ulmus sp.*), Weeping Nootka Cypress (*Callitropsis nootkatensis 'pendula'*), Norway Spruce (*Picea abies)*, White Pine (*Pinus strobus*), Green Ash (*Fraxinus pennsylvanica*), Cucumber Tree (*Magnolia acuminata*), American Elm (*Ulmus americana*), Pine sp. (*Pinus sp.*).

2.2.2 PRIVATE TREES

- Trees are mixture of native and non-native, deciduous and coniferous species;
- Inventoried trees range in size from <5 to 80cm DBH;
- There was a total of 27 tree species identified within the study area and an additional 5 genera that could not be identified to species-level. Species composition within the study limits includes:
    - Abundant: Emerald White Cedar (*Thuja occidentalis* 'emerald'), White Pine (*Pinus strobus*);
    - Frequent: White Cedar (*Thuja occidentalis*), Manitoba Maple (*Acer negundo*), White Spruce (*Picea glauca*), Serviceberry sp. (*Amelanchier sp*.), Sugar Maple (*Acer saccharum*), Norway Maple (*Acer platanoides)*;
    - Occasional: Crabapple sp. (*Malus sp.*), Silver Maple (*Acer saccharinum*), European Hornbeam (*Carpinus betulus*), European Birch (*Betula pendula*), Siberian Elm (*Ulmus pumila*), Blue Spruce (*Picea pungens*), Bur Oak (*Quercus macrocarpa*), Ash sp. (*Fraxinus sp.*), White Mulberry (*Morus alba*), Ornamental Pear (*Pyrus calleryana*), Trembling Aspen (*Populus tremuloides*), Freeman's Maple (*Acer x freemanii*), Red Maple (*Acer rubrum*), Maple sp. (*Acer sp*.), Austrian Pine (*Pinus nigra*);
    - Rare: Norway Spruce (*Picea abies*), Weeping White Mulberry (*Morus alba* 'pendula'), Weeping Nootka Cypress (*Callitropsis nootkatensis* 'pendula'), Spruce sp. (*Picea sp.*), Common Cherry (*Prunus avium*), Common Hackberry (*Celtis occidentalis*), Eastern Cottonwood (*Populus deltoides*), Little-leaf Linden (*Tilia cordata*), Red Oak (*Quercus rubra*), Saucer Magnolia (*Betula pendula*).

2.2.3 PARK TREES

- Trees are mixture of native and non-native, deciduous and coniferous species;
- Inventoried trees range in size from <10 to 125cm DBH;
- There was a total of 33 tree species identified within the study area and an additional 6 genera that could not be identified to species-level. Species composition within the study limits includes:
    - Abundant: Serviceberry sp. (*Amelanchier sp.*), Austrian Pine (*Pinus nigra*), Ornamental Pear (*Pyrus calleryana*);
    - Frequent: Norway Maple (*Acer platanoides*), Silver Maple (*Acer saccharinum*), White Pine (*Pinus strobus*), White Spruce (*Picea glauca*), Ash sp. (*Fraxinus sp.*);
    - Occasional: Red Oak (*Quercus rubra*), White Willow (*Salix alba*), Manitoba Maple (*Acer negundo*), Red Maple (*Acer rubrum*), Red Cedar (*Juniperus virginiana*);
    - Rare: Blue Spruce (*Picea pungens*), Horse Chestnut (*Aesculus hippocastanum*), Weeping Willow (*Salix babylonic*a), Black Locust (*Robinia pseudoacacia*), Black Walnut (*Juglans nigra*), Siberian Elm (Ul*mus pumila*), Green Ash (*Fraxinus pennsylvanica*), Norway Spruce (*Picea abies*).

2.3 CONDITION

Tree health ranges between good and poor; the majority observed to be in good condition overall. Several of the trees in poor condition were Ash trees, affected by Emerald Ash Borer (*Agrilus planipennis*). Signs of decline and defects were observed on some trees including:

- Lean;
- Exposed and damaged roots;

- Mower damage;
- Co-dominant stems;
- Trunk wounds;
- Broken leader;
- Peeling / absent bark;
- Small and/or yellow needles or leaves;
- Early leaf fall;
- Watersprouting / epicormic growth;
- Girdling wires;
- EAB;
- Dieback 25 to 40%
- Dead / dying.

3 POLICY CONTEXT

This section summarizes the various municipal, regional, provincial and federal planning policies and regulations related to the tree inventory and applicability to the project. Thus, they provide the policy context for this Arborist Report.

3.1 CITY OF MISSISSAUGA PUBLIC TREE PROTECTION BY-LAW

The Public Tree Protection By-law (0020-2022) applies to all public property within the City of Mississauga. The By-law aims to protect and enhance the City's existing tree cover by protecting all City trees and their respective Tree Protection Zones.

- A permit is required from the City's Parks & Forestry division if the applicant proposes to injure, prune, or remove a Public Tree of any size, per calendar year.

Applicability to project

- **Applicable**. Trees inventoried within the City ROW will be impacted by proposed works and staging areas. A list of public trees to be injured and removed is included on the *'Application to Permit the Injury or Destruction of Trees on Public and Private Property'* in Appendix B.

3.2 CITY OF MISSISSAUGA PRIVATE TREE PROTECTION BY-LAW

The Private Tree Protection By-law (0254-2012) applies to all private property within the City of Mississauga. The By-law aims to protect and enhance the City's existing tree cover while considering landowner requests to make changes to the landscape of their property.

- A permit is required from the City's Parks & Forestry division if the applicant proposes to remove 3 or more trees that are 15cm (6 inches) or greater in diameter, including dead and/or dying trees, per calendar year.

Applicability to project

- **Applicable**. Trees inventoried on private property will be impacted from the proposed works and staging areas. A list of private trees to be injured and removed is included on the '*Application to Permit the Injury or Destruction of Trees on Public and Private Property'* in Appendix B.

3.3 CITY OF MISSISSAUGA PARKS BY-LAW

The City of Mississauga Parks By-law (By-law 0197-2020) regulates activities within parkland that is owned or made available to the City of Mississauga by lease, agreement, or otherwise, and that is established, dedicated, set apart or made available for use as public open space (excluding marinas, golf courses, and cemeteries) It prohibits the planting, pruning, removal, or damage of trees and shrubs of any size unless authorized by the Commissioner of Community Services or their designate. The by-law does not apply to the City, its vehicles, and its employees or agents acting within the scope of their duties as employees or agents of the City.

Applicability to Project

- **Applicable**. Trees inventoried within City parkland (Lakeside Park, Helen Molasy Memorial Park) will be impacted from the proposed works and staging areas. A list of park trees to be injured and removed is included on the '*Application to Permit the Injury or Destruction of Trees on Public and Private Property'* in Appendix B.

3.4 REGION OF PEEL WOODLAND MANAGEMNT

The Region of Peel By-law # 106-2005 delegates all power respecting the destruction or injuring of trees in woodlands, within the jurisdictional boundaries of the City of Mississauga, to the City of Mississauga, passed: December 15, 2005.

- This By-law states that:
  - 'Whereas the Regional Municipality of Peel has the authority pursuant to section 135(8) of the Municipal Act, 2001, as amended (hereinafter referred to as the "Act"), to delegate all or part of its power to pass a by-law respecting the destruction or injuring of trees in woodlands to one or more of its lower-tier municipalities with the agreement of the lower-tier municipality or municipalities, as the case may be;'
  - 'and whereas "woodlands" means woodlands as defined in the Forestry Act that are one hectare or more in area;'
  - 'and whereas the City of Mississauga requests the Regional Municipality of Peel to delegate its power to pass a by-law respecting the destruction or injuring of trees in woodlands to the City of Mississauga;'
- NOW THEREFORE the Council of the Regional Municipality of Peel enacts as follows:

  1. That all power to pass a by-law respecting the destruction or injuring of trees in woodlands, within the jurisdictional boundaries of the City of Mississauga, is hereby delegated to the City of Mississauga.

Applicability to Project

- **Not applicable** as there are no woodlands within or adjacent to the study area.

3.5 CREDIT VALLEY CONSERVATION AUTHORITY GUIDELINES

The Credit Valley Conservation Authority (CVC), as mandated under O.Reg. 160/06 CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, regulates and may prohibit work that may take place within a regulated area. A regulated area is defined as, "an area that represents the greatest physical extent of the combined hazards, plus a prescribed allowance, as set out in the Conservation Authorities Act". This includes valley and stream corridors, wetlands and associated areas of interference with the Lake Ontario waterfront.

The CVC prohibits development in or on the areas within the CVC's jurisdiction that are:

- Adjacent or close to the Great Lakes-St. Lawrence River System or to inland lakes that may be affected by flooding, erosion or dynamic beaches;
- River or stream valleys with depressional features associated with a river or stream;
- Hazardous lands; and,
- Wetlands.

Development is prohibited within areas delineated as the Regulation Limit under the mapping titled, "Ontario Regulation 97/04: Regulation for Development, Interference with Wetlands and Alterations to Shorelines and

Watercourses". O. Reg. 57/13, s. 1 (4). The CVC's online interactive mapping tool illustrates this Regulation Limit (accessed October 2021).

Permission is required from the CVC for undertaking development in or on the areas listed above if it is determined by the CVC that flood control, erosion, dynamic beaches and land conservation will not be altered.

At a minimum, woody tree species greater than 10 cm DBH are required to be inventoried for projects within a regulated area.

Applicability to Project

- **Applicable.** Several sections of the study area fall within CVC's Regulation Limit (see **Figure 1**); therefore, the CVC's guidelines and policies will apply.

3.6 ENDANGERED SPECIES ACT, 2007

Species designated as Threatened or Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO), otherwise known as Species at Risk in Ontario (SARO), and their habitats (i.e., areas essential for breeding, rearing, feeding, hibernation and migration) are automatically afforded legal protection under the Endangered Species Act, 2007 (ESA) (Government of Ontario 2007). The ESA (Subsection 9 (1)) states that:

- "No person shall,
  - a) kill, harm, harass, capture or take a living member of a species that is listed on the SARO List as an extirpated, endangered or threatened species;
  - b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade;
    - (i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;
    - (ii) any part of a living or dead member of a species referred to in subclause (i);
    - (iii) anything derived from a living or dead member of a species referred to in subclause (i); or,
  - c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii)".
- Clause 10(1) (a) of the ESA states that:
- "No person shall damage or destroy the habitat of a species that is listed on the SARO list as an endangered or threatened species".

Applicability to Project

No woody species at risk were observed within the study area.

3.7 CANADA FOOD AND INSPECTION AGENCY

Canada Food and Inspection Agency (CFIA) Directive D-03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer (EAB), *Agrilus planipennis* (Fairmaire), applies to Ash (*Fraxinus* sp.) species observed on properties that are located within the EAB Regulated Areas of Canada, prepared by the CFIA and dated June 2019. This area covers all south and central Ontario and western Quebec. Ash trees that require removal are subject to this directive.

Applicability to Project

- The CFIA restricts the movement of all Ash material including wood, bark, chips or bark chips from being transported outside of the Regulated Area. A Movement Certificate is required by the CFIA for any Ash material leaving the Regulated Area.
- Ash are permitted to be chipped on site and / or removed or cut down and removed from site. Chipped Ash material that is to remain on site must be ground or chipped to a size of less than 2.5cm in any two dimensions. All Ash material chipped or whole that is to be removed from site must be disposed of within the Regulated Areas of Canada.
- Refer to the CFIA website for a current map of the *'Emerald Ash Borer Regulated Areas of Canada'*.
- Twenty-seven (27) Ash trees, in good to fair condition, were observed within the study limits. Trees range in size from <5 to 27cm DBH. Evidence of EAB was observed in the larger trees.
    - Fifteen (15) of the twenty-seven (27) inventoried Ash trees will require removal. The 15 trees to be removed must follow the above guidelines.

3.8 MIGRATORY BIRDS CONVENTION ACT, 1994

The Migratory Birds Convention Act, MBCA (1994) and Migratory Birds Regulations, MBR (2014) protect most species of migratory birds anywhere they are found in Canada, including surrounding ocean waters, regardless of ownership. General prohibitions under the MBCA and MBR protect migratory birds, their nests and eggs and prohibit the deposit of harmful substances in waters / areas frequented by them.

- The MBR includes an additional prohibition against incidental take, defined by Environmental Canada as:

    "*The inadvertent harming, killing, disturbance or destruction of migratory birds, nests and eggs.*"

- Environment Canada implements policies and guidelines to protect migratory birds, their eggs and their nests. There is guidance on the Environment Canada website to minimize the risk of incidental take effects on migratory birds, achieve compliance with the law and maintain sustainable populations of migratory birds.
- Compliance with the MBCA and MBR is best achieved through a due diligence approach, which identifies potential risk, based on a site-specific analysis in consideration of the Avoidance Guidelines and Best Management Practices information on the Environment Canada website.

Applicability to Project

- The MBCA and its regulations are applicable to the project. Migratory bird species subject to the MBCA may be present within the study area and may use various habitats within the study area (e.g. trees, grass and other herbaceous material, buildings). Recommended measures to reduce the possibility of contravention to the MBCA and its regulations are provided in Section 7.6.
- Tree removals are to be coordinated outside of the Migratory Bird Nesting Season (**April 1 to August 31**) and the active period for bats (e.g. up to the end of September). Overall clearing of trees would be permitted between **October 1 to March 31**.

4 DEFINITIONS

The following are the definitions of the assessment categories utilized in our tree assessment:

Table 4.1 – Definitions

ACRONYM / DEFINITION	DESCRIPTION
Tree Number	This number refers to the number on the on the tree tag or alpha-numeric, alphabetical or tree grouping label listed in Appendix A: Tree Inventory Tables and labelled on the Tree Preservation Plans (e.g. P29, 1216, A or TG-1).
Tree Grouping	A tree grouping is more than one (1) tree located within proximity of other trees with no separation between the canopies.
DBH	“Diameter at breast height” and refers to the diameter of the stem of a tree measured outside the bark at a point 1.37 metres (4.5 feet) above the highest point on the tree where the ground meets the stump.
Tree Protection Zone (TPZ)	This is the area around a tree that is to be protected through tree protection measures e.g. hoarding. No construction activities are to be undertaken within this zone.
Suppressed	Refers to trees that have their crowns completely overtopped by adjacent trees and received limited to very limited sunlight.
Co-dominant Stem	Stems equal in size and relative importance that make up the overall crown of the tree.
Union	Junction point where two or more stems meet. A ‘U’ shaped junction indicates a well-formed union. A ‘V’ shaped junction indicates a weakly formed union, whereas stems grow and increase in girth, weak bark called ‘included bark’ forms within the junction and stems start to push apart causing vertical cracks and loss of structure.
Compartmentalization	This is a naturally occurring process by which chemical and physical barriers are synthesized to prevent the spread of decay and disease in trees.
Irregular Tree Form	Refers to branches and stems that have formed irregularly often resulting in contorted growth, weak attachments, weakly formed unions and codominant stems. The irregular growth of scaffold (lateral) branches typically leads to damage to other scaffold branches.
Imminently Hazardous Tree	Refers to a destabilized or structurally compromised tree that is in imminent danger of causing damage or injury to life or property.
Injure and Injury	Described as failure to protect a tree’s health in any manner. This includes but is not limited to: wounding the trunk, canopy, or roots; breaking branches; compacting soil within a tree’s TPZ; or not following mitigation measures outlined in this report.
Root Zone	Refers to the subterranean area around the tree measured from the trunk to up to 2-3m beyond the dripline.
Critical Root Zone	The minimum area of the root system necessary to maintain vitality or stability of the tree. Typically, this area extends to the drip line of the tree. The severing of one root can cause approximately 5-20% loss of the root system. A reduction of this area by greater than 30% can pose stability concerns for the tree.
Public Tree	Any tree which has 50 percent or more of their main stem situated on a public park or a Town street.

Table 4.2 – Tree Assessment Criteria

DEFINITION	DESCRIPTION
Trunk Integrity (T.I.)	This is an assessment of the trunk for any defects or weaknesses. It is measured on a scale of poor, fair, good.
Canopy Structure (C.S.)	This is an assessment of the scaffold branches, unions and the canopy of the tree. This is measured on a scale of poor, fair, good.
Canopy Vigour (C.V.)	This is an assessment of the health of the tree and assesses the amount of deadwood and live growth in the crown as compared to a 100% healthy tree. The size, colour and amount of foliage are also considered in this category. This is measured on a scale of poor, fair, good.
Good	Tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI, CS, CV).
Fair	Tree displays 15%-40% deficiency/defect within the given tree assessment criteria (TI, CS, CV).
Poor	Tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI, CS, CV).

5 FIELD SURVEYS

5.1 TREE INVENTORY METHODOLOGY

The field observations were conducted on September 27, October 6, and November 5, 2023 within the study limits. Trees were inventories as per the following criteria:

- Trees were assessed for species, quantity, DBH, dripline radius, and general health condition;
- Tree locations were identified using a combination of aerial photography and a topographic survey;
- Representative photographs were taken, which are on file at WSP. Refer to Appendix C for a photographic inventory'
- Trees were assessed in accordance with City of Mississauga By-laws;
- Trees were not tagged and instead labelled alphanumerically. Trees with existing tags were used to identify individual trees when present.

5.2 TREE INVENTORY RESULTS

A total of **447 trees** were assessed for this report:

- 218 individual trees:
  - Trees with alphanumerical identifiers T27 to T221, T47.1, T47.2, T47.3, T65.1, T158.1, and T158.2;
  - Trees with aluminum tags 1 to 9, 307, 309, 313, 314, 315, 343, 370, and 371;
- 229 trees in 28 tree groupings:
  - TG5 to TG32.

Refer to Section 2.2 for a detailed description of trees and location and Appendix A for details on the inventory of each tree.

Refer to the following table for a breakdown of trees by location.

Table 5.1 – Tree Location

Property Type	Jurisdiction	Tree Numbers	Subtotal
Public	Region of Peel	T106, T107, T108, T109, T110, T116, T117, T118, T119, T120, TG16, TG16, T131, T132, T134, T136, T137, T138, T139, T140, T141, T142, T145, T146, T147, T163, T164, T165, TG22, TG22, TG22, TG22, T167, T169, T172, 343, T214, T213, T212, T211, T210, TG30, TG29,	66

	City of Mississauga	T27, T28, T31, T32, T33, T34, T35, T37, T41, T42, T46, T47, T47.3, T53, T63, T64, T65, T68, T69, T71, T72, T73, T78, T79, T81, T82, T83, T85, T87, T88, T89, T90, T91, T92, TG10, T94, T96, T97, T98, TG12, T149, T150, T151, T152, T153, T154, T155, T156, T157, T171, 1, 2, 3, 4, 5, 6, 7, 8, 9	62
Park	City of Mississauga	T44, T45, T47.1, T47.2, T48, T49, T50, T51, T52, T55, TG7, T56, T57, T58, TG8, T59, T60, T124, 313, 314, 315, T125, T126, 309, T127, T128, 307, TG18	44
	CVC / City of Mississauga	T158.2, T159, T160, T161, T162, TG19, TG20, TG21, T195, T196, T197, T198, T199, T200, T201, T202, T203, TG28	51
Private	Private	T29, T30, TG5, T36, T38, T39, T40, TG6, T43, T54, T61, T62, T65.1, T66, T67, TG9, T70, T74, T75, T76, T77, T80, T84, T86, T93, T95, TG11, T99, T100, T101, T102, T103, T104, T105, TG13, T111, T112, T113, T114, T115, T121, T122, T123, TG14, TG15, T129, T130, TG17, T133, T135, T143, T144, T148, T158, T158.1, T170, T209, T208, T207, T206, T205, T204, 370, 371, T215, T216, T217, T218, T219, TG31, TG32, T220, T221,	144
	CVC / Private	T166, T168, TG23, T173, T174, T175, T176, T177, TG24, T178, T179, T180, TG25, T181, T182, T183, T184, T185, T186, TG26, T187, TG27, T188, T189, T190, T191, T192, T193, T194	80
Totals			**447**

6 DISCUSSION

This section is a discussion of the retention potential, preservation and / or impacts to trees within the limits of the proposed site development. Proposed works, vegetation recommendations, impacts and preservation are detailed in the following sections.

6.1 PROPOSED WORKS

Proposed works are shown on the Tree Preservation Plans**.** The anticipated proposed works related to the sanitary sewer infrastructure include:

- Proposed 375mm PVC sanitary sewer installed through open cut trench on Lakeside Road and Hampton Street including sanitary services to be replaced or rehabilitated;
  - Microtunnel installation at all other locations.
- Proposed 900mm and 1200mm sanitary sewer installed through microtunnel;
- Proposed laydown and staging areas;
- Proposed entry / exit shafts.

6.2 TREE RECOMMENDATIONS / ASSUMPTIONS

The design, infrastructure installation and grading works have been proposed as part of preliminary design drawings prepared by WSP Canada Inc. The site plan elements have been illustrated on the Tree Preservation Plans.

The following recommendations / assumptions apply to trees that are to be removed, preserved, or retained.

6.2.1 TREE REMOVAL

- Tree removal is based on the degree of excavation / disturbance within the TPZ, considering tree species, size, condition and the amount of critical roots that would be impacted that are vital to sustaining the trees overall health and stability. This amount of impact and above is likely to cause a significant and irreversible decline in health of the tree.
- Where an encroachment into the root zone is equal to or greater than 3x the DBH, trees will be removed (e.g. 30cm DBH tree x 3 = 90cm. Any encroachment into this limit will result in the removal of the tree, as the impact within the root zone will be too severe).
- This designation also may be applied to trees that are dead, in poor condition or trees that could pose future safety concerns and trees dying because of a disease or insect infestation.
- Tree injury is based on encroachments into the Tree Protection Zone (TPZ).
- Tree injury will occur where a TPZ will be reduced and construction activity will impact roots and/or branches.
- Mitigative measures may be recommended to minimize the damage to existing roots.

6.2.2 TREE INJURY

- Tree injury is based on encroachments into the Tree Protection Zone (TPZ).
- Tree injury will occur where a TPZ will be reduced and construction activity will impact roots and/or branches.

- Mitigative measures may be recommended to minimize the damage to existing roots.

6.2.3 TREE PRESERVATION

- Preservation of trees is considered where an encroachment, excavation or disturbance into the TPZ is expected to be minor or nil and that tree health and stability will not be adversely impacted;
- The implementation of mitigation measures will reduce potential impacts to the tree therefore allowing the tree to be preserved e.g. air-spade excavation and / or horizontal root protection.

6.2.4 TREE RETENTION

- Proposed works will occur beyond the TPZ and the dripline with no impacts to the tree. Trees can be retained and do not require tree protection hoarding.

6.3 TREE REMOVALS

Where the impact to the root zone and/or branch removal will be significant and is likely to cause an irreversible decline in health of the tree from the removal or damage of structural and critical roots, tree removal is recommended.

- Impacts to trees will occur where trees are located within the limits of the proposed staging areas;
- A total of **101 trees** are recommended for removal;
- Many trees are not protected due to size and are excluded from compensation and permit application.
- A total of **34 trees** will be included on the Permit Application '*Application to Permit the Injury or Destruction of Trees on Public and Private Property*' in Appendix B;
- Refer to **Section 8** for removal compensation requirements;
- The following table provides details on the location of trees to be removed.

Table 6.1 – Tree Removal Table

Property Type	Jurisdiction	Tree Numbers	Subtotal
Public	Region of Peel	T131, T132, TG16	7
	City of Mississauga	4, 5, 6, 7, 8, 9, T63, T64, T65	9
Park		307	1
	CVC / City of Mississauga	T195, T196, T197, T198, T199, T200, T201, T202, T203, TG28	35
Private	639 Beach St	T61, T62, T65.1, T66, T67, T220, T221, TG32	10
	CVC / 503 Lakeshore Rd E	T179, T180, T181, T182, T183, T184, T185, T186, TG25	14

	CVC / 1063 Douglas McCurdy Cmm	T178, T187, TG26, TG27	25
Totals			**101**

6.4 TREE REMOVALS - HEALTH

Trees that have been assessed in 'poor' condition or 'dead', are recommended to be removed based on condition only and the potential to become a 'hazard'. Removal is not related to construction activities.

- There are **0 trees** that pose a hazard within the study limits or work areas.

6.5 TREE INJURY

- Excavation and clearing for the proposed staging areas and entry shafts will encroach into and require a reduction of the TPZs of trees. In these locations the work will encroach into the dripline and root zone of trees and have the potential to damage roots and/or branches through excavation and mobilization of equipment.
- Specific mitigation measures e.g. Air Spade / Hydro-vacuum excavation or horizontal root protection may be recommended to be applied as detailed in Table 6.3 and Section 7 to reduce the potential for root damage and soil compaction from excavation and other construction activities;
- Any roots and branches encountered are to be pruned in accordance with the recommendations in Sections 7.4 and 7.5. Refer to the following tree injury details.
- Refer to the tables below that detail the number and severity of injuries and mitigation measures.

Table 6.2 – Tree Injury Summary Table

Property Type	Jurisdiction	Tree Numbers	Subtotal
Public	City of Mississauga	T27	1
Private	639 Beach St	T219, TG31	6
	645 Lakeshore Rd E	T215, T216	2
	958 / 960 East Ave	T128, TG17	7
Total			**16**

Table 6.3 – Root Pruning and Mitigation Table

TREE ID	SPECIES	DBH (cm)	INJURY (TPZ REDUCTION)	MITIGATION & SURVIVAL
T128	Austrian Pine	38	Slight TPZ encroachment from staging area.	Encroachment is very minor and use of horizontal root protection is not required.
T215	Honey-locust	25, 20, 20	TPZ encroachment from staging area.	**Horizontal root protection** to consist of geotextile placed on top of grass and 150mm clear stone on top of geotextile. No excavation. This measure will act as horizontal root protection and will reduce compaction. At completion of construction, scarify soil and restore with topsoil, sod or seed mix. See notes in Section 7.3.
T216	Honey-locust	30	TPZ encroachment from staging area.	Horizontal root protection. See notes for # T215.
T219	White Pine	60	TPZ encroachment from staging area.	Horizontal root protection. See notes for # T215.
T27	Silver Maple	140	TPZ encroachment from open cut trench for installation of sanitary sewer.	**Excavate using air-spade / hydro-vacuum excavation** prior to mobilization and excavation for replacement of value and value box. Exposed roots are to be pruned at the proposed limit of excavation required for the open cut trench to install the new value and valve box. This will allow for pruned roots ends to sprout new roots upon completion of construction and site has been restored. See Section 7.2 and 7.4.
TG17	Austrian Pine	30-50	Slight TPZ encroachment from staging area.	Encroachment is very minor and use of horizontal root protection is not required.
TG31	White Pine	25 to 35	TPZ encroachment from staging area.	Horizontal root protection. See notes for # T215.

6.6 TREE PROTECTION ZONE ENCROACHMENT (NO INJURY)

- There will be no injury where reductions of the tree protection hoarding will be required at the limits of existing paved surfaces, to not impede vehicular or pedestrian access / flow. These reductions are not construction related;
- There are **0 trees** where this measure is applicable.

6.7 TREE PRUNING

To facilitate the proposed works, some selective pruning will be necessary, specifically where work will affect low hanging branches that overhang the work area or road. Trees identified for pruning have branches at a height that would interfere with construction equipment and machinery during construction. Much of this work will be determined through a site walk with Urban Forestry. This includes trees identified as 'injured' (Sections 5.4). Pruning is to be undertaken by a Certified Arborist following proper arboricultural techniques and in conjunction with the guidelines in this report prior to the start of construction.

Pruning will be dependant on the location of the existing tree, canopy size and the equipment used during construction. It is to be noted that the contractor is to adjust the size of the equipment / excavators where feasible to accommodate low hanging trees or congested areas.

- Based on the criteria above, pruning is recommended for **0 trees**:

6.8 TREE PRESERVATION

Trees that are well beyond construction limits with no encroachment into the TPZ can be retained. These trees will not require tree protection hoarding. Trees where construction limits will either encroach into the TPZ or will be within proximity of the TPZ and / or dripline, will require tree protection hoarding. Table 6.6 details trees by category (retain or preserve), location, tree ID, and minimum TPZ distances for trees.

Table 6.4 – Minimum Tree Protection Zone Determination

TRUNK DIAMETER	MINIMUM PROTECTION ZONE (TPZ) DISTANCE FROM TRUNK (M)	MINIMUM TREE PROTECTION ZONE (TPZ) DISTANCE FROM TRUNK (M) FOR TREES IN OPEN SPACES AND WOODLANDS
<10cm	1.2	2.4
10 to 20cm	1.5	2.4
21 to 30cm	1.8	3.6
31 to 40	2.4	4.8
41 to 50	3.0	6.0
51 to 60	3.6	7.2
61 to 70	4.2	8.4
71 to 80	4.8	9.6

81 to 90	5.4	10.8
91 to 100	6.0	12.0
>100cm	6 cm per 1cm DBH	12cm per 1cm DBH

*City of Mississauga (May 15, 2017). *Tree Preservation and Protection Standards.* The Urban Tree Management Group.

Table 6.5 – Tree Preservation Table

CATEGORY	LOCATION	TREE NUMBERS	MIN. TPZ	QUANTITY
Retain	Public (City & Region)	T28, T31, T32, T33, T34, T35, T37, T41, T42, T46, T47, T47.3, T68, T71, T72, T73, T78, T79, T81, T82, T83, T85, T87, T88, T89, T90, T91, T92, TG10, T94, T96, T97, T98, TG12, T106, T107, T108, T109, T110, T116, T117, T118, T119, T120, T136, T137, T138, T139, T140, T141, T142, T145, T146, T147, T149, T150, T151, T152, T153, T154, T155, T156, T157, T163, T164, T165, TG22, T167, T169, T171, T172, 1, 2, 3, 343, T214, T213, T210, TG30, TG29	N/A	106
	Private	T29, T30, TG5, T36, T38, T39, T40, TG6, T43, T54, T70, T74, T75, T76, T77, T80, T84, T86, T93, T95, TG11, T99, T100, T101, T102, T103, T104, T105, TG13, T111, T112, T113, T114, T115, T121, T122, T123, TG14, TG15, T129, T130, T133, T135, T143, T144, T148, T158, T158.1, T166, T168, T170, TG23, T173, T174, T175, T176, T189, T190, T191, T192, T193, T194, T209, T208, T207, T206, T205, T204, 370, 371	N/A	96
	Park	T44, T45, T47.1, T47.2, T48, T49, T50, T51, T52, T55, TG7, T56, T57, T58, TG8, T59, T60, T124, 313, 314, 315, T158.2, TG18, T159, T160, T161, T162, TG19, TG20, TG21	N/A	54
Retain Total				**259**
Preserve	Public (City)	T53	1.2	1
		T69	2.4	1
		T134, T211, T212	3.6	3
		T27	8.4	1
	Private	T177, T188, TG9, TG24	1.2	63
		T216, T217, T218	1.8	3
		T215, TG31	2.4	6
		TG17	3.0	6

		T219	3.6	1
	Park	T125	1.5	1
		T127	1.8	1
		309, T126, T128	2.4	3
Preserve Total				**90**
Total				**346**

Tree protective hoarding is to be installed for **90 trees** listed above under 'Preserve' and per the minimum TPZ distance.

Tree protection fencing:

- Hoarding to be installed per City of Mississauga Tree Preservation Hoarding detail. Refer to plan TP-12:
    - Solid Hoarding (Solid board plywood) is to be used for Private trees;
    - Framed Hoarding (Snow fence) is to be used for City and Park trees.

City of Mississauga – Hoarding Notes

- Tree Protection hoarding is to be installed to minimize the impact on the trees to be preserved prior construction and is to remain until the construction is completed (applicable to Private and Public trees);
- No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the Tree Protection Zone;
- Tree protection & preservation methods must be followed according to City of Mississauga By-law (0254-2012 and 0020-2022;
- Tree protection shall be installed as outlined in the arborist report prior to the commencement of any construction/demolition activities;
- The applicant is responsible for ensuring that tree protection hoarding is maintained throughout all phases of demolition and construction in the location and condition as approved by the planning and building department. no materials (building materials, soil, etc.) may be stockpiled within the area of hoarding. failure to maintain the hoarding as originally approved or the storage of materials within the hoarding will be cause for the letter of credit to be held for two (2) years following completion of all site works.
- Hoarding must be inspected by the City of Mississauga prior to removal of any tree protection hoarding from the site. The contractor is responsible for arranging this inspection with the City of Mississauga
- Contractor to identity the location of all existing and proposed underground and above ground utilities prior to removal of trees and commencement of construction.

7 MITIGATION MEASURES

The survival rates for trees, which are in proximity to construction, are dependent on the resultant changes to a variety of environmental and anthropogenic factors. These construction activities bring about changes to a variety of environmental features such as the existing microclimate that includes winds, air temperature, soil moisture, amount of available sunlight, soil quality, and the level of the water table. Increased human activities may also damage the structure and/or physiological activities of the trees. The full effects of any damage that occurs may not appear until several years after its occurrence. Thus, it is essential that both vegetative clearing and preservation methods follow the guidelines below and those generally accepted as keeping with good horticultural and construction practices. The guidelines are subject to adjustments deemed reasonable and appropriate considering the proximity and number of trees involved and the site-specific servicing requirements.

7.1 GENERAL MITIGATION MEASURES

- Where mitigative measures are not feasible and cannot be implemented and excavation must be done mechanically, root and tree damage is to be minimized through light duty machinery i.e. bobcat, that can or excavate soil the same direction of the roots and not across and under the supervision of a qualified Arborist. Any roots exposed are too be pruned neatly and cleanly.
- Areas where excavation, grading and construction have compacted soil within a reduced TPZ, at the completion of construction, scarify soil to a depth of 100mm. Restore disturbed areas and apply the following methods below:
    - Water trees periodically during construction;
    - After construction apply a 75mm deep layer of mulch in a 2m radius around the tree trunks.
- The tree protection fencing will be maintained until all construction is completed, soils are stabilized, and all the equipment has been removed from the site.
- Prior to the commencement of tree removals, all limits of the locations of the tree preservation fencing must be clearly staked in the field, installed per approved plans, and approved by the contract administrator. All trees within the TPZ must be left standing. The tree removals must be coordinated in accordance and compliance with the Migratory Bird Convention Act (MBCA).
- All removals must be felled into the work area to ensure that damage does not occur to the trees within the TPZ.
- Upon completion of the tree removals, all felled trees are to be removed from the site, and all should be brush chipped. All brush, roots and wood debris must be shredded into pieces that are smaller than 25 mm in size to ensure that any insect pests that could be present within the wood are destroyed.
- The Canadian Food and Inspection Agency (CFIA) has issued a prohibition of movement where the Emerald Ash Borer (EAB) has been confirmed. EAB has been found within the City of Mississauga and it is within the EAB Regulated Area. This directive pertains to the movement of regulated materials (including but not limited to ash wood or bark and ash wood chips or bark chips) from a Regulated Area. EAB regulated materials moving out of a Regulated Area must be accompanied by a Movement Certificate issued by the CFIA. Refer to the EAB Regulated Areas of Canada found on the CFIA website.
- Tree protection fencing must be constructed and installed as per the details on the approved Tree Preservation Plan. Upon installation of the fencing, the contractor will contact the contract administrator to review and approve the fencing and its location prior to commencement of any grading work.
- Areas within the TPZ are not to be used for any type of storage (e.g. storage of debris, construction material, surplus soils, and construction equipment). No trenching for underground services shall be located within the TPZ or dripline of trees designated for preservation within or adjacent to the construction zone.

- No grade changes shall occur within TPZ unless approved as part of this report. If any grade changes may occur, either as a cut or fill situation, the consulting arborist must be notified prior to such work occurring to ensure that all precautions to preserve the tree are made.
- Trees shall not have any rigging cables or hardware of any sort attached or wrapped around them, nor shall any contaminants be dumped within the protective areas. Further, no contaminants shall be dumped or flushed where they may meet the feeder roots of the trees.
- If it is necessary to remove additional limbs or portions of trees after construction has commenced to accommodate the construction, the consulting arborist is to be informed and under their direction the removal is to be executed carefully and in full accordance with arboricultural techniques by a Certified Arborist.

7.2 AIR-SPADE / HYDRO-VACUUM EXCAVATION

Where excavation will occur within the softscape boulevard and TPZs will be reduced, air-spade excavation is recommended to minimize the damage to roots within a TPZ.

The following table lists trees where this measure has been recommended.

Table 7.1 – Air-Spade Excavation Table

Property Type	Jurisdiction	Tree #	Size	Condition	Quantity
Public	City of Mississauga	T27	140	Good	1
Total					**1**

The following measures are to be applied prior to excavation and construction:

- At the limit of the TPZ and proposed grading or construction activity, hydro-vacuum excavate to a depth of 300mm along the length of the TPZ distance and at a width of 0.5m to expose roots;
- Ensure that the pressure used from the air-spade / hydro-vacuum is such that it will not damage roots during excavation (500 to 3000 psi for hydro-vacuum and 70 to 90 psi for air-spade);
- Prune any roots in this area using good arboricultural practices per the guidelines in this report or under the supervision of a Certified Arborist;
- Backfill with excavated material and reinstate to original condition or better;
- Upon completion reinstate tree protection fencing to original location;
- Water trees periodically during construction;
- Restore disturbed areas with a layer of 75mm depth mulch in a 2m radius around the trees.
- It is recommended that this measure be applied while a Certified Arborist is present.

7.3 HORIZONTAL ROOT PROTECTION

Clear stone and geotextile has been proposed to be utilized within the temporary staging area. This measure can be used as a horizontal root protection measure for trees located outside of the work area that have a TPZ that extends into the area and where no excavation or construction will be required within a TPZ.

This measure is applicable to tree numbers **T215, T216, T219 and TG31**. The following steps / measures are to be applied to project this tree from injury.

- This area is protected by 1.8m high chain link fence.
- No excavation will be required to install the geotextile and clear stone layers. Therefore will be no excavation or construction required within the TPZ.
- Geotextile will be placed on top of grass.
- 150mm depth of clear stone of minimum 450mm diameter stone is to be placed on top of geotextile.
- This measure will allow use of vehicles, trucks and storage of equipment within the compound area without having to disturb the existing ground.
- After removal of temporary working compound area, clear stone and geotextile is to be removed. Where required areas will be restored with topsoil and sod.
- Compaction will be mitigated by clear stone and geotextile, thus eliminating tree injury.

7.4 ROOT PRUNING PRACTICES

- All approved root pruning is to take place by or under the supervision of an arborist and in accordance good arboricultural practices.
- Pruned root ends shall be neatly and squarely trimmed, and the area shall be backfilled with clean native fill as soon as possible to prevent desiccation and promote root growth.
- The exposed roots shall not be allowed to dry out and an appropriate watering schedule shall be undertaken (e.g. water bi-weekly to field capacity between **June 1 and September 15** so that the roots maintain optimum soil moisture during construction and backfilling operations.
- Backfilling shall occur immediately and shall be with clean uncontaminated topsoil from an approved source. It is recommended that texture of backfill be coarser than existing soils, and that backfill comes into clean contact with existing soils (i.e. remove air pockets, sod, etc.).
- Pruning to be conducted by an ISA Certified Arborist.

7.5 BRANCH PRUNING PRACTICES

- All limbs damaged or broken during construction should be pruned cleanly, utilizing by-pass secateurs in accordance with approved horticultural practices. Should there be a potential risk of transfer of disease from infected to non-infected trees, tools must be disinfected after pruning each tree by dipping in methyl hydrate. This practice is particularly important during periods of tree stress and when pruning many members of the same genera, within which a disease could be spread quickly (i.e., Verticillium Wilt on Maples or Fireblight on genera of the Rosaceae family).
- All pruning cuts should be made to a growing point such as a bud, twig or branch, cut just outside the branch collar (the swollen area at the base of the branch that sometimes has a bark ridge), and perpendicular to the branch being pruned rather than as close to the trunk as possible. This minimizes the site of the wound. No stubs should be left. Poor cut location, poor cut angle and torn cuts are not acceptable.
- Extensive pruning is best completed before plants break dormancy. Pruning should be limited to the removal of no more than 25% of the total bud and leaf bearing branches. Pruning should include the careful removal of:
    - Deadwood;
    - branches that are weak, damaged, diseased and those which will interfere with construction activity;

- secondary leaders of conifers;
- trunk and root suckers;
- trunk waterspouts;
- tight V-shaped or weak crotches (included unions).

- Any branches that overhang the work area and require pruning are to be pruned using good arboricultural practices utilizing by-pass secateurs in accordance with approved horticultural practices and/or American National Standard (ANSI) A300 (Part 1) – 2008 Pruning.
- The Contractor must report immediately any damage to trees such as broken limbs, damage to roots, or wounds to the main trunk or stem systems so that the damage can be assessed immediately.
- Pruning to be conducted by an ISA Certified Arborist.

7.6 MIGRATORY BIRD PROTECTION

- To reduce the possibility of contravention of the MBCA, vegetation removal should be scheduled to occur outside of the overall bird nesting season of **April 1 to August 31**. Some birds may nest before and after this peak bird nesting season due to annual seasonal fluctuations. If a nest of a migratory bird is found within the construction area outside of this nesting period, it still receives protection.
  - In addition to the bird nesting season, tree removals should also occur outside of the active period for bats (e.g. up to the end of September), therefore considering the bird nesting and bat active seasons, clearing of trees is permitted between **October 1 to March 31.**
- If vegetation must be removed during the overall bird nesting season:
  - Nest and nesting activity searches will be conducted in areas of simple habitat by a qualified avian Biologist no more than 24 hours prior to vegetation removal. For examples of simple and complex habitat please refer to the Environment and Climate Change Canada's Guidelines to Reduce Risk to Migratory Birds (ECCC 2019). Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by Ontario Breeding Bird Atlas criteria (Cadman 2009).
  - If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC 2019), which will be confirmed by a qualified avian Biologist, but will protect a minimum of 10 m around the nest or nesting activity.
  - The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites.
- If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same Best Management Practices (BMPs) such as nest and nesting activity searches described above will be undertaken.

7.7 CONSTRUCTION IMPLEMENTATION

- Prior to construction, a site meeting shall be held with the Contractor and Contract Administrator to review the clearing limits and confirm the installation location for the temporary tree protection fence.

- Tree protection barriers shall be clearly staked in the field and approved by Urban Forestry prior to construction to ensure correct positioning of fencing and avoid unnecessary disturbance.
- To avoid root zone impacts on trees to be retained, excavated material shall not be stored against the tree protection barrier.
- Inspection of the tree protection fencing, including photographic records and deficiency notes, shall be undertaken by the site supervisor and submitted to Urban Forestry prior to the commencement of construction, during construction and after construction is completed.
- All removals should be felled into the work area to ensure that damage does not occur to the trees within the tree preservation zone. Upon completion of the tree removals, all felled trees are to be removed from the site, and all brush chipped. All brush, roots and wood debris should be shredded into pieces that are smaller than 25 mm in size to ensure that any insect pests that could be present within the wood are destroyed.

8 TREE REMOVALS / INJURY / COMPENSATION

To facilitate the proposed works a minimal amount of tree removal will be required. Refer to the tables below that detail and removals.

8.1 CITY OF MISSISSAUGA COMPENSATION NOTES

The City of Mississauga has compensation requirements for tree removals on private and public property.

8.1.1 PRIVATE PROPERTY

The City of Mississauga website details compensation requirements for tree removals on private property. Replacement trees are required when three or more healthy trees > 15 cm DBH are removed from private property. If there is no space for replacement trees on the private property, 'cash-in-lieu' can be submitted to the City of Mississauga to plant replacement trees on City property.

The requirements for replacement tree planting for tree removals on private property:

- The replacement tree must be at least 1.8 m tall (if coniferous/evergreen) or at least 6 cm DBH if it's a deciduous tree;
- The replacement tree(s) must remain healthy for at least one year after being planted.

Table 8.1 – Compensation Criteria Table – Private Trees

CRITERIA	REPLACEMENT TREES REQUIRED
For each healthy tree removed that is 49cm DBH or less	1
For each health tree removed that is 50cm DBH or more	2

Table 8.2 – Removal and Compensation Table – Private Trees

COMPENSATION CATEGORY	QUANTITY	REPLACEMENT TREES REQUIRED	TOTAL REPLACEMENT TREES REQUIRED
15 to 49cm DBH	9	1	9
50cm+ DBH	1	2	2
Total	**10**	**-**	**11**

8.1.2 PUBLIC PROPERTY

The City of Mississauga's "Tree Preservation & Protection Standards" details compensation requirements for tree removals on public property. Replacement trees are required when trees 6 cm or more are removed.

- Trees within Parks and Region of Peel jurisdiction have been included within this section.
- Where a tree falls within more than one jurisdiction, the by-law or regulation that provides the greatest compensation has been applied.
- The requirements for replacement tree planting for tree removals on public property:
    - The replacement tree must be at least 1.8 m tall (if coniferous/evergreen) or at least 6 cm DBH if it's a deciduous tree

Table 8.3 – Compensation Criteria Table – Public Trees

CRITERIA	REPLACEMENT TREES REQUIRED
For each tree removed that is 6 to 15cm DBH	1
For each tree removed that is 16 to 30cm DBH	2
For each tree removed that is 31 to 45cm DBH	3
For each tree removed that is 46 to 60cm DBH	4
For each tree removed that is 61 to 75cm DBH	5
For each tree removed that is 76 to 90cm DBH	6
For each tree removed that is 91 to 105cm DBH	7
For each tree removed that is 106 to 120cm DBH	8
For each tree removed that is >120cm DBH	9

Table 8.4 – Removal and Compensation Table – Public Trees

COMPENSATION CATEGORY	JURISDICTION	QUANTITY	REPLACEMENT TREES REQUIRED	TOTAL REPLACEMENT TREES REQUIRED
6 to 15cm DBH	-	0	1	0
16 to 30cm DBH	City of Mississauga	6	2	12
31 to 45cm DBH	City of Mississauga	1	3	3
	Region of Peel	5		15
46 to 60cm DBH	Region of Peel	2	4	8
Totals		**14**	**-**	**38**

8.2 CVC COMPENSATION NOTES

- Trees within CVC Regulated Areas are subject to CVC guidelines including compensation for tree removals;
- Replacement trees are required for trees greater than 10cm DBH at a compensation ratio of 3:1;
- When two different compensation ratios are applicable (i.e. City of Mississauga and CVC), the higher of the two has been applied;
- Exempt trees including Buckthorn (*Rhamnus cathartica*) were removed from the below table as well as shrub species (e.g. Staghorn Sumac) and dead trees.

Table 8.5 – CVC Removal and Compensation Table

Tree #	DBH (cm)	Species	Quantity	Compensation Ratio	# of Replacement Trees
T182	11	White Spruce	1	3:1	3
T183	12	Freeman's Maple	1	3:1	3
T186	13	White Pine	1	3:1	3
T187	10 to 20	Manitoba Maple	1	3:1	3
T195	MS 10, 9, 5, 5	Green Ash	1	3:1	3
T196	20, 20	American Elm	1	3:1	3
T197	16	Manitoba Maple	1	3:1	3
T198	11, 12	Manitoba Maple	1	3:1	3
T199	10 to 20	Ash sp.	1	3:1	3
T200	10 to 20	Manitoba Maple	1	3:1	3
T201	10 to 20	Elm sp.	1	3:1	3
T202	10 to 20	Black Walnut	1	3:1	3
T203	12	Siberian Elm	1	3:1	3
Total					**39**

8.3 COMPENSATION SUMMARY TABLE

Table 8.6 – Removal and Compensation Summary Table

BY-LAW	JURISDICTION	TREES TO BE REMOVED	EXEMPT	TREES SUBJECT TO BY-LAW	REPLACEMENT RATIO	REPLACEMENT TREES REQUIRED
Public	City of Mississauga	9	3	6	See Table 8.3	12
	Region of Peel	7	0	7		23
Park	City of Mississauga	1	0	1		3
Private (15 -50cm)	Private	9	0	9	1:1	9
Private (≥50cm)	639 Beach St	1	0	1	2:1	2
CVC	CVC	74	61	13	3:1	39
Total		**101**	**64**	**37**	**-**	**88**

8.4 COMPENSATION EXEMPTIONS

The following trees have been excluded from the removal and compensation table as:

- The removal of trees under 6 cm DBH on private property are exempt from the Public Tree By-law
- The removal of trees under 15 cm DBH on private property are exempt from the Private Tree By-law
- The removal of less than 3 trees > 15 cm DBH on private property are exempt from the Private Tree By-law
- The removal of unhealthy trees (i.e. dead, dying, or hazardous trees) are exempt from compensation
- The removal of shrubs is not regulated by the Private or Public Tree By-law, or subject to the Tree Preservation & Protection Standards

Table 8.7 – Exemptions Table

Property Type	Jurisdiction	Tree ID	Reason	Quantity
Public	City of Mississauga	T63, T64, T65	Trees are <6cm DBH	3

Park	CVC	TG28	Trees are <10cm DBH	26
Private	CVC	T178, T179, T180, TG25, T181 T184, T185, TG26, TG27	Trees are <10cm DBH	35
Total				**64**

8.5 OVERALL COMPENSATION NOTES

- Total compensation for the proposed works is **88 trees:**
  - City of Mississauga compensation required for tree removals on City ROW is **12 trees**;
  - City of Mississauga compensation required for tree removals on parkland is **3 trees**;
  - City of Mississauga compensation required for tree removals on Region of Peel ROW is **23 trees**;
  - City of Mississauga compensation required for tree removals on Private property is **11 trees**;
- Compensation for trees to be removed in CVC Regulated Areas is **39 trees**.
- It is assumed at this point trees will be planted on site:
  - These replacement trees are recommended to be planted where possible within areas that were disturbed during construction and staging. If adequate space is not available for replacement planting in these areas, then planting can occur within areas adjacent to disturbed limits where vegetation cover is sparse;
  - If these areas still do not provide enough space for restoration planting than an alternate location will be agreed upon by Urban Forestry or cash in lieu could be considered. Replacement trees to be native species common to Mississauga.

9 CONCLUSION

Trees within the study area are a mix of deciduous and coniferous trees ranging from young, semi-mature and mature trees. Trees are primarily planted trees on public and private property, with some naturally occurring trees. There are also large sections of the study area within CVC Regulated Areas.

Impacts to trees in proximity to the proposed works will be low as works will be within the road or done using microtunelling techniques that will have little to no impact on trees. The greatest impacts will be from staging areas, and sanitary lateral replacements for OC sections. The proposed works will require the removal of one-hundred and one (101) trees, with the majority of trees being less than 10cm DBH. In addition to tree removals, sixteen (16) trees will be injured and will require mitigation measures. Given the implementation of the mitigation measures enclosed in this report, including protection of trees beyond the construction limits, significant impacts to trees to be preserved are not anticipated.

Vegetation has been recommended to be retained or preserved beyond the construction limits. Proposed mitigation measures will minimize the detrimental effects from construction activities and will help to ensure that good tree health will continue. Care should be taken to protect trees to be preserved with tree protection fencing as illustrated on the attached plans. Tree protection fencing shall be erected prior to the start of the proposed works and maintained for the duration of the work. Priority should be given to protecting vegetation that will not be impacted by grading and construction as this vegetation along property lines provides a visual barrier, shade, noise and wind buffer between properties.

10 LITERATURE CITED

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- Tree Care Industry Association. 2008. ANSI-A300-Part 1. Tree Shrub and Other Woody Plant Management – Standard Practices. Pruning.

11 LIMITATIONS OF ASSESSMENT

- It is our policy to attach the following clause regarding limitations. We do this to ensure that the client is aware of what is technically and professionally realistic in retaining trees.
- The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These include a visual examination of all the above ground parts of the tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the trees and the surrounding site, and the proximity of property and people. Except where specifically noted, the trees were not cored, probed or climbed and there was no detailed inspection of the root crowns involving excavations.
- Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms, and their health and vigour constantly change over time. They are not immune to changes in site conditions or seasonal variations in the weather conditions.
- While reasonable efforts have been made to ensure that the subject trees are healthy, no guarantees are offered, or implied, that these trees or any of their parts will remain standing. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree or its component parts under all circumstances. Inevitably, a standing tree will always pose some level of risk. Most trees have the potential for failure under adverse weather conditions, and the risk can only be eliminated if the tree is removed.

APPENDIX

A

TREE PRESERVATION TABLES

Appendix A: Tree Preservation Tables

Project: Beach St | Field Work Completed By: Nicole Bitter (ON-2979A) and Sky Carville | Date of Fieldwork: September 27, 29 and October 6, 2023 | Weather: sunny - cloudy, ~17°C

Tree Condition Assessment Criteria:
TI - Trunk Integrity: assessment of the trunk for any defects or weaknesses.
CS - Canopy Structure: assessment of scaffold branches, unions and canopy
CV - Canopy vigour: assessment of the health of the tree, based on the % of deadwood, disease, pests & live crown

Tree Condition:
Good (G): tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Fair (F): tree displays 15-40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Poor (P): tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)

Legend:
Trees to be Retained
Trees to be Preserved
Trees to be Removed
Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
Minimum TPZ reduction / Injury - Grading and Sodding

Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T27	Acer saccharinum	Silver Maple	1	140	G	G	G	11	City	8.4	Injure		hydro-vacuum excavation
T28	Acer saccharum	Sugar Maple	1	30	G	G	G	4	City	1.8	Retain		
T29	Acer platanoides	Norway Maple	1	32	F	G	G	4	Private	2.4	Retain		
T30	Picea glauca	White Spruce	1	24	G	G	G	3	Private	1.8	Retain		
T31	Picea glauca	White Spruce	1	21	G	G	G	3	City	1.8	Retain		
TG5	Picea glauca	White Spruce	3	30-40	G	G	G	4	Private	2.4	Retain		
T32	Picea pungens	Blue Spruce	1	40	G	F	G	5	City	2.4	Retain		
T33	Picea pungens	Blue Spruce	1	49	G	G	G	5.5	City	3	Retain		
T34	Picea pungens	Blue Spruce	1	54	G	F	G	6	City	3.6	Retain		
T35	Acer saccharum	Sugar Maple	1	27	G	G	G	3.5	City	1.8	Retain		
T36	Fraxinus sp.	Ash sp.	1	19	F	F	F	2	Private	1.5	Retain		
T37	Ailanthus altissima	Tree of Heaven	1	MS 9, 9, 16, 23	G	G	G	4	City	1.8	Retain	red X	
T38	Picea sp.	Spruce sp.	1	9	G	G	G	1	Private	1.2	Retain		
T39	Betula pendula	Saucer Magnolia	1	MS (7-14)	G	G	G	3	Private	1.5	Retain		
T40	Picea abies	Norway Spruce	1	23	G	G	G	3	Private	1.8	Retain		
T41	Thuja occidentalis	White Cedar	1	MS 5, 5, 9, 7	G	G	G	2	City	1.5	Retain		
TG6	Betula pendula	European Birch	3	5-21	G	G	G	3.5	Private	1.8	Retain	trees multistem	
T42	Acer saccharinum	Silver Maple	1	103	G	G	G	9	City	6.2	Retain		
T43	Acer negundo	Manitoba Maple	1	20	F	F	F	4	Private	1.5	Retain		
T44	Quercus rubra	Red Oak	1	43	G	G	G	5	Park	3	Retain		
T45	Acer saccharinum	Silver Maple	1	83	G	G	G	8	Park	5.4	Retain		
T46	Acer platanoides	Norway Maple	1	28	F	F	F	3.5	City	1.8	Retain		
T47	Acer saccharinum	Silver Maple	1	94	G	F	F	9	City	6	Retain		
T47.1	Quercus rubra	Red Oak	1	37	G	F	G	4.5	Park	2.4	Retain	exposed roots, lean	
T47.2	Quercus rubra	Red Oak	1	38	G	G	G	4.5	Park	2.4	Retain		
T47.3	Acer saccharinum	Silver Maple	1	76	G	F	F	8	City	4.8	Retain		
T48	Quercus rubra	Red Oak	1	48	G	F	G	5.5	Park	3	Retain		
T49	Aesculus hippocastanum	Horse Chestnut	1	37	F	F	G	4.5	Park	2.4	Retain		
T50	Acer negundo	Manitoba Maple	1	28	F	P	P	3.5	Park	1.8	Retain		
T51	Acer saccharinum	Silver Maple	1	90	G	G	G	9	Park	5.4	Retain		
T52	Juglans nigra	Black Walnut	1	33	G	F	G	4	Park	2.4	Retain		
T53	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	City	1.2	Preserve		

Appendix A: Tree Preservation Tables

Project: Beach St | Field Work Completed By: Nicole Bitter (ON-2979A) and Sky Carville | Date of Fieldwork: September 27, 29 and October 6, 2023 | Weather: sunny - cloudy, ~17°C

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Legend:
Trees to be Retained
Trees to be Preserved
Trees to be Removed
Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
Minimum TPZ reduction / Injury - Grading and Sodding

Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T54	Picea pungens	Blue Spruce	1	50	G	G	G	6	Private	3	Retain		
T55	Acer negundo	Manitoba Maple	1	53	G	G	G	6	Park	3.6	Retain		
TG7	Pinus strobus	White Pine	7	27-41	G	G	G	5	Park	3	Retain		
T56	Acer saccharinum	Silver Maple	1	39	G	G	G	4.5	Park	2.4	Retain		
T57	Robinia pseudoacacia	Black Locust	1	33	F	F	F	4	Park	2.4	Retain		
T58	Acer saccharinum	Silver Maple	1	102	G	G	G	9	Park	6.1	Retain		
TG8	Pinus nigra	Austrian Pine	6	22-44	G	G	G	4	Park	3	Retain		
T59	Acer saccharinum	Silver Maple	1	MS 11, 19, 13, 21	G	F	G	4.5	Park	1.8	Retain		
T60	Acer negundo	Manitoba Maple	1	43, 38	G	G	G	6	Park	3	Retain		
T61	Pinus strobus	White Pine	1	39	G	F	F	4.5	Private	2.4	Remove		
T62	Pinus strobus	White Pine	1	50	G	G	G	6	Private	3	Remove		
T63	Amelanchier sp.	Serviceberry sp.	1	5	F	G	G	0.5	City	1.2	Remove		
T64	Amelanchier sp.	Serviceberry sp.	1	4	G	G	G	0.5	City	1.2	Remove		
T65	Quercus rubra	Red Oak	1	4	G	G	G	0.5	City	1.2	Remove		
T65.1	Pyrus calleryana	Ornamental Pear	1	23	G	G	G	3	Private	1.8	Remove		
T66	Picea glauca	White Spruce	1	25	G	G	G	3.5	Private	1.8	Remove		
T67	Pinus strobus	White Pine	1	36	G	G	F	4.5	Private	2.4	Remove		
T68	Acer saccharinum	Silver Maple	1	121	G	G	G	10	City	7.3	Retain		
T69	Quercus rubra	Red Oak	1	35	G	F	G	4.5	City	2.4	Preserve		
TG9	Thuja occidentalis 'emerald'	Emerald White Cedar	50	<5	G	G	G	0.5	Private	1.2	Preserve	2.5 tall, newly planted	
T70	Fraxinus sp.	Ash sp.	1	27	F	F	F	3.5	Private	1.8	Retain		
T71	Pinus strobus	White Pine	1	27	G	G	G	3.5	City	1.8	Retain		
T72	Acer platanoides	Norway Maple	1	15	G	G	F	2	City	1.5	Retain		
T73	Amelanchier sp.	Serviceberry sp.	1	11	G	G	G	1	City	1.5	Retain		
T74	Acer x freemanii	Freeman's Maple	1	70	G	F	G	8	Private	4.2	Retain		
T75	Morus alba	White Mulberry	1	30	F	F	G	4	Private	1.8	Retain		
T76	Morus alba	White Mulberry	1	28, 25	F	F	G	5	Private	2.4	Retain		
T77	Pinus strobus	White Pine	1	40	G	F	G	5	Private	2.4	Retain		
T78	Picea abies	Norway Spruce	1	55	G	G	G	6	City	3.6	Retain		
T79	Callitropsis nootkatensis 'pendula'	Weeping Nootka Cypress	1	12	G	G	G	1	City	1.5	Retain		
T80	Prunus avium	Common Cherry	1	27	F	P	P	3.5	Private	1.8	Retain		

Appendix A: Tree Preservation Tables

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Legend:
Trees to be Retained
Trees to be Preserved
Trees to be Removed
Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
Minimum TPZ reduction / Injury - Grading and Sodding

Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T81	Prunus sp.	Cherry / Plum sp.	1	5	G	G	G	0.5	City	1.2	Retain		
T82	Magnolia acuminata	Cucumber Tree	1	5	G	G	G	0.5	City	1.2	Retain		
T83	Picea glauca	White Spruce	1	10	G	G	G	1	City	1.5	Retain		
T84	Thuja occidentalis 'emerald'	Emerald White Cedar	1	18	G	G	G	2	Private	1.5	Retain		
T85	Acer platanoides	Norway Maple	1	42	G	G	G	5	City	3	Retain	tag #1349	
T86	Callitropsis nootkatensis 'pendula'	Weeping Nootka Cypress	1	14	G	G	G	2	Private	1.5	Retain		
T87	Acer saccharinum	Silver Maple	1	100	F	F	F	9	City	6	Retain		
T88	Pinus nigra	Austrian Pine	1	55	G	G	G	6	City	3.6	Retain		
T89	Acer platanoides	Norway Maple	1	48	G	G	G	5.5	City	3	Retain		
T90	Picea pungens	Blue Spruce	1	42	G	G	G	5	City	3	Retain		
T91	Acer palmatum	Japanese Maple	1	MS (7) 4-13	F	G	F	2.5	City	1.8	Retain	trunk wound	
T92	Acer rubrum	Red Maple	1	15	G	G	G	2	City	1.5	Retain		
T93	Morus alba 'pendula'	Weeping White Mulberry	1	17	G	G	G	2	Private	1.5	Retain		
TG10	Hibiscus syriacus	Rose-of-Sharon	4	MS <10	G	G	G	0.5	City	1.2	Retain		
T94	Acer saccharum	Sugar Maple	1	26	G	G	G	3.5	City	1.8	Retain		
T95	Quercus rubra	Red Oak	1	80	G	G	G	8	Private	4.8	Retain		
T96	Acer rubrum	Red Maple	1	27	G	G	G	3.5	City	1.8	Retain		
T97	Acer saccharinum	Silver Maple	1	106	G	G	G	9	City	6.3	Retain		
TG11	Thuja occidentalis	White Cedar	1	MS <10	G	G	G	0.5	Private	1.2	Retain		
T98	Acer saccharinum	Silver Maple	1	110	F	G	G	10	City	6.6	Retain		
TG12	Thuja occidentalis	White Cedar	1	MS <10	G	G	G	0.5	City	1.2	Retain		
T99	Amelanchier sp.	Serviceberry sp.	1	MS<10	G	G	G	0.5	Private	1.2	Retain		
T100	Acer rubrum	Red Maple	1	10	F	G	F/P	1	Private	1.5	Retain		
T101	Acer rubrum	Red Maple	1	10	P	P	P	1	Private	1.5	Retain		
T102	Gleditsia triacanthos	Honey-locust	1	39	G	G	G	4.5	Private	2.4	Retain		
T103	Pinus nigra	Austrian Pine	1	40	G	G	G	5	Private	2.4	Retain		
T104	Fraxinus sp.	Ash sp.	1	MS <5	G	G	G	0.5	Private	1.2	Retain		
T105	Tilia cordata	Little-leaf Linden	1	19	G	G	G	2	Private	1.5	Retain		
T106	Gleditsia triacanthos	Honey-locust	1	11	G	G	G	1	Region	1.5	Retain		
T107	Gleditsia triacanthos	Honey-locust	1	8	F	F	G	1	Region	1.2	Retain		
T108	Ginkgo biloba	Ginkgo	1	8	G	G	G	1	Region	1.2	Retain		

Appendix A: Tree Preservation Tables

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Trees to be Retained
Trees to be Preserved
Trees to be Removed
Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
Minimum TPZ reduction / Injury - Grading and Sodding

Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T109	Ginkgo biloba	Ginkgo	1	12	G	G	G	1	Region	1.5	Retain		
T110	Acer negundo	Manitoba Maple	1	MS 4-12	F	P	G	1	Region	1.8	Retain		
TG13	Pyrus calleryana	Ornamental Pear	5	20-28	G	F	F	4.5	Private	2.4	Retain		
T111	Acer platanoides	Norway Maple	1	16	G	G	G	2	Private	1.5	Retain		
T112	Gleditsia triacanthos	Honey-locust	1	45	G	G	G	5.5	Private	3	Retain		
T113	Gleditsia triacanthos	Honey-locust	1	17	G	G	G	2	Private	1.5	Retain		
T114	Gleditsia triacanthos	Honey-locust	1	20	G	G	G	4	Private	1.5	Retain		
T115	Acer platanoides	Norway Maple	1	24	G	G	G	5	Private	1.8	Retain		
T116	Syringa reticulata	Japanese Tree Lilac	1	7	G	G	F	1	Region	1.2	Retain		
T117	Syringa reticulata	Japanese Tree Lilac	1	5	P	P	P	0.5	Region	1.2	Retain		
T118	Syringa reticulata	Japanese Tree Lilac	1	5	G	G	F	0.5	Region	1.2	Retain		
T119	Syringa reticulata	Japanese Tree Lilac	1	7	G	G	F	1	Region	1.2	Retain		
T120	Syringa reticulata	Japanese Tree Lilac	1	6	G	G	F	1	Region	1.2	Retain		
T121	Pyrus calleryana	Ornamental Pear	1	5	G	G	G	0.5	Private	1.2	Retain		
T122	Acer saccharum	Sugar Maple	1	25	G	G	G	3.5	Private	1.8	Retain		
T123	Acer saccharum	Sugar Maple	1	27	G	G	G	3.5	Private	1.8	Retain		
T124	Acer platanoides	Norway Maple	1	55	F	F	G	6	Park	3.6	Retain		
313	Acer platanoides	Norway Maple	1	34	G	F	G	4	Park	2.4	Retain		
314	Acer platanoides	Norway Maple	1	35	G	F	G	4.5	Park	2.4	Retain		
315	Acer platanoides	Norway Maple	1	25	G	G	G	3.5	Park	1.8	Retain		
T125	Acer platanoides	Norway Maple	1	16	G	G	G	2	Park	1.5	Preserve		Fence around staging area can act as tree protection
T126	Acer platanoides	Norway Maple	1	36	G	G	G	4.5	Park	2.4	Preserve		Fence around staging area can act as tree protection
309	Acer platanoides	Norway Maple	1	37	G	G	G	4.5	Park	2.4	Preserve		Fence around staging area can act as tree protection
T127	Acer platanoides	Norway Maple	1	23	G	G	G	5	Park	1.8	Preserve		Fence around staging area can act as tree protection
T128	Pinus nigra	Austrian Pine	1	38	G	G	G	4.5	Park	2.4	Injure	red X	
TG14	Malus sp.	Crabapple sp.	2	17-26	G	G	F/P	2.4	Private	1.8	Retain		
TG15	Malus sp.	Crabapple sp.	3	17-26	G	G	G	2	Private	1.8	Retain		
T129	Picea pungens	Blue Spruce	1	25	G	G	G	3.5	Private	1.8	Retain		
T130	Picea pungens	Blue Spruce	1	32	G	G	G	4	Private	2.4	Retain		
307	Pinus nigra	Austrian Pine	1	42	G	G	G	4	Park	2.4	Remove		
TG16	Pinus nigra	Austrian Pine	4	43-48	G	G	G	5	Region	3	Remove		

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Trees to be Preserved
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Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
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Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
TG16	Picea pungens	Blue Spruce	1	38	G	G	G	4.5	Region	2.4	Remove		
T131	Acer platanoides	Norway Maple	1	45	F	G	G	5.5	Region	3	Remove		
TG17	Pinus nigra	Austrian Pine	6	30-50	G	G	G	6	Private	3	Injure		
T132	Acer x freemanii	Freeman's Maple	1	31	G	G	G	4	Region	2.4	Remove	tag #78	
T133	Gleditsia triacanthos	Honey-locust	1	29	P	P	P	3.5	Private	1.8	Retain		
T134	Acer platanoides	Norway Maple	1	60	G	F	G	7	Region	3.6	Preserve	tag #77	
T135	Gleditsia triacanthos	Honey-locust	1	28	G	G	G	3.5	Private	1.8	Retain		
T136	Acer platanoides	Norway Maple	1	52	G	G	G	6	Region	3.6	Retain	tag#75	
T137	Acer platanoides	Norway Maple	1	52	G	G	G	6	Region	3.6	Retain	tag #76	
T138	Ginkgo biloba	Ginkgo	1	7	G	G	F	1	Region	1.2	Retain		
T139	Ginkgo biloba	Ginkgo	1	8	F	G	G	1	Region	1.2	Retain		
T140	Gleditsia triacanthos	Honey-locust	1	7	F	F	P	1	Region	1.2	Retain		
T141	Gleditsia triacanthos	Honey-locust	1	8	F	G	F	1	Region	1.2	Retain		
T142	Gleditsia triacanthos	Honey-locust	1	8	F	G	F	1	Region	1.2	Retain		
T143	Ulmus pumila	Siberian Elm	1	50	F	F	F	6	Private	3	Retain		
T144	Ulmus pumila	Siberian Elm	1	44	G	F	F	5	Private	3	Retain		
T145	Gleditsia triacanthos	Honey-locust	1	9	G	G	G	1	Region	1.2	Retain		
T146	Gleditsia triacanthos	Honey-locust	1	10	G	G	G	1	Region	1.5	Retain		
T147	Gleditsia triacanthos	Honey-locust	1	11	F	G	G	1	Region	1.5	Retain		
T148	Acer negundo	Manitoba Maple	1	46	F	F	G	5.5	Private	3	Retain		
T149	Amelanchier sp.	Serviceberry sp.	1	5	F	G	G	0.5	City	1.2	Retain		
T150	Amelanchier sp.	Serviceberry sp.	1	6	F	G	G	1	City	1.2	Retain		
T151	Amelanchier sp.	Serviceberry sp.	1	6	G	G	G	1	City	1.2	Retain		
T152	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	City	1.2	Retain		
T153	Amelanchier sp.	Serviceberry sp.	1	6	F	G	G	1	City	1.2	Retain		
T154	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	City	1.2	Retain		
T155	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	City	1.2	Retain		
T156	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	City	1.2	Retain		
T157	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	City	1.2	Retain		
T158	Ulmus pumila	Siberian Elm	1	MS 10, 9	F	F	G	1	Private	1.5	Retain		
T158.1	Acer negundo	Manitoba Maple	1	MS 12, 5, 7	F	F	F	1	Private	1.5	Retain		

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T158.2	Acer negundo	Manitoba Maple	1	20, 35	G	G	G	8	Park / CVC	3	Retain		
TG18	Quercus macrocarpa	Bur Oak	5	4 to 11	G	G	F	1	Park	1.5	Retain		
TG18	Acer x freemanii	Freeman's Maple	1	5	G	F	P	0.5	Park	1.2	Retain		
T159	Acer negundo	Manitoba Maple	1	28	p	p	G	5	Park / CVC	1.8	Retain	leader broken	
T160	Acer negundo	Manitoba Maple	1	23, 16	G	F	P	5	Park / CVC	1.8	Retain		
T161	Ulmus pumila	Siberian Elm	1	MS 13, 13, 16, 15	G	G	G	3	Park / CVC	1.8	Retain		
T162	Ulmus pumila	Siberian Elm	1	11	G	G	G	1	Park / CVC	1.5	Retain		
TG19	Fraxinus sp.	Ash sp.	4	<5	G	G	G	0.5	Park / CVC	1.2	Retain		
TG20	Ulmus pumila	Siberian Elm	3	10	G	G	G	1	Park / CVC	1.5	Retain		
TG20	Fraxinus sp.	Ash sp.	1	7, 8	G	G	G	0.5	Park / CVC	1.2	Retain		
TG21	Fraxinus sp.	Ash sp.	3	<10	G	G	G	0.5	Park / CVC	1.2	Retain		
T163	Acer saccharinum	Silver Maple	1	13	F	F	G	1	Region	1.5	Retain		
T164	Ulmus pumila	Siberian Elm	1	18	G	G	G	2	Region	1.5	Retain		
T165	Acer saccharinum	Silver Maple	1	8	G	F	G	1	Region	1.2	Retain		
TG22	Fraxinus sp.	Ash sp.	1	<10	G	G	G	0.5	Region	1.2	Retain		
TG22	Acer negundo	Manitoba Maple	4	<10	G	G	G	0.5	Region	1.2	Retain		
TG22	Salix sp.	Willow sp.	6	<10	G	G	G	0.5	Region	1.2	Retain		
TG22	Ailanthus altissima	Tree of Heaven	2	<10	G	G	G	0.5	Region	1.2	Retain		
T166	Ulmus pumila	Siberian Elm	1	20	G	G	G	3	Private / CVC	1.5	Retain		
T167	Acer x freemanii	Freeman's Maple	1	10	G	G	G	1	Region	1.5	Retain		
T168	Acer x freemanii	Freeman's Maple	1	10	G	G	G	1	Private / CVC	1.5	Retain		
T169	Acer x freemanii	Freeman's Maple	1	12	G	G	G	1	Region	1.5	Retain		
T170	Ulmus pumila	Siberian Elm	1	45	F	F	G	5.5	Private	3	Retain		
T171	Prunus virginiana	Chokecherry	1	<10	G	G	G	0.5	City	1.2	Retain		
TG23	Acer negundo	Manitoba Maple	8	<10	F	F	G	0.5	Private / CVC	1.2	Retain		
TG23	Acer saccharum	Sugar Maple	1	<10	P	P	P	0.5	Private / CVC	1.2	Retain		
TG23	Populus deltoides	Eastern Cottonwood	1	15	G	G	G	1	Private / CVC	1.2	Retain		
TG23	Populus tremuloides	Trembling Aspen	2	<10	G	G	G	0.5	Private / CVC	1.2	Retain		
TG23	Pinus strobus	White Pine	4	<10	G	G	G	0.5	Private / CVC	1.2	Retain		
T172	Gleditsia triacanthos	Honey-locust	1	6	G	G	G	1	Region	1.2	Retain		
T173	Acer saccharum	Sugar Maple	1	8	G	G	G	1	Private / CVC	1.2	Retain		

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Poor (P): tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)

Legend:
Trees to be Retained
Trees to be Preserved
Trees to be Removed
Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
Minimum TPZ reduction / Injury - Grading and Sodding

Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T174	Acer saccharum	Sugar Maple	1	7	G	G	G	1	Private / CVC	1.2	Retain		
T175	Acer saccharum	Sugar Maple	1	7	G	G	G	1	Private / CVC	1.2	Retain		
T176	Carpinus betulus	European Hornbeam	1	4	G	G	G	0.5	Private / CVC	1.2	Retain		
T177	Carpinus betulus	European Hornbeam	1	4	P	P	P	0.5	Private / CVC	1.2	Preserve	almost dead	Fence around staging area will act as tree protection
TG24	Acer negundo	Manitoba Maple	1	<10	F	F	G	0.5	Private / CVC	1.2	Preserve	growing through the fence	Existing chain link fence to act as tree protection
TG24	Tilia americana	American Basswood	7	<10	G	G	G	0.5	Private / CVC	1.2	Preserve		Existing chain link fence to act as tree protection
TG24	Acer saccharum	Sugar Maple	2	<10	G	G	G	0.5	Private / CVC	1.2	Preserve		Existing chain link fence to act as tree protection
TG24	Populus tremuloides	Trembling Aspen	1	<10	G	G	G	0.5	Private / CVC	1.2	Preserve	growing through the fence	Existing chain link fence to act as tree protection
T178	Acer negundo	Manitoba Maple	1	5	F	F	G	0.5	Private / CVC	1.2	Remove	growing through the fence	
T179	Carpinus betulus	European Hornbeam	1	4	G	G	G	0.5	Private / CVC	1.2	Remove		
T180	Carpinus betulus	European Hornbeam	1	8	G	G	G	1	Private / CVC	1.2	Remove		
TG25	Thuja occidentalis 'emerald'	Emerald White Cedar	6	MS <10	G	G	G	0.5	Private / CVC	1.2	Remove		
T181	Picea glauca	White Spruce	1	9	G	G	G	1	Private / CVC	1.2	Remove		
T182	Picea glauca	White Spruce	1	11	G	G	G	1	Private / CVC	1.5	Remove		
T183	Acer x freemanii	Freeman's Maple	1	12	G	G	G	1	Private / CVC	1.5	Remove		
T184	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	Private / CVC	1.2	Remove		
T185	Amelanchier sp.	Serviceberry sp.	1	5	G	G	G	0.5	Private / CVC	1.2	Remove		
T186	Pinus strobus	White Pine	1	13	G	G	G	1	Private / CVC	1.5	Remove		
TG26	Populus tremuloides	Trembling Aspen	4	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	Picea glauca	White Spruce	5	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	Thuja occidentalis	White Cedar	3	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	Betula papyrifera	Paper Birch	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	Acer saccharum	Sugar Maple	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
T187	Acer negundo	Manitoba Maple	1	10 to 20	G	G	G	1	Private / CVC	1.5	Remove		
TG27	Thuja occidentalis	White Cedar	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG27	Picea glauca	White Spruce	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG27	-	Deciduous sp.	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG27	Pinus sp.	Pine sp.	1	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
T188	Amelanchier sp.	Serviceberry sp.	1	<10	G	G	G	0.5	Private / CVC	1.2	Preserve		Existing chain link fence to act as tree protection
T189	Amelanchier sp.	Serviceberry sp.	1	<10	G	G	G	0.5	Private / CVC	1.2	Retain		
T190	Amelanchier sp.	Serviceberry sp.	1	<10	G	G	G	0.5	Private / CVC	1.2	Retain		

Appendix A: Tree Preservation Tables

Project: Beach St | Field Work Completed By: Nicole Bitter (ON-2979A) and Sky Carville | Date of Fieldwork: September 27, 29 and October 6, 2023 | Weather: sunny - cloudy, ~17°C

Tree Condition Assessment Criteria:
TI - Trunk Integrity: assessment of the trunk for any defects or weaknesses.
CS - Canopy Structure: assessment of scaffold branches, unions and canopy
CV - Canopy vigour: assessment of the health of the tree, based on the % of deadwood, disease, pests & live crown

Tree Condition:
Good (G): tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Fair (F): tree displays 15-40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)
Poor (P): tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI,CS,CV)

Legend:
Trees to be Retained
Trees to be Preserved
Trees to be Removed
Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
Minimum TPZ reduction / Injury - Grading and Sodding

Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T191	Amelanchier sp.	Serviceberry sp.	1	<10	G	G	G	0.5	Private / CVC	1.2	Retain		
T192	Acer saccharinum	Silver Maple	1	14	G	G	G	2	Private / CVC	1.5	Retain		
T193	Acer saccharinum	Silver Maple	1	12	G	G	G	1	Private / CVC	1.5	Retain		
T194	Gleditsia triacanthos	Honey-locust	1	12	G	G	G	1	Private / CVC	1.5	Retain		
T195	Fraxinus pennsylvanica	Green Ash	1	MS 10, 9, 5, 5	F	F	F	1.5	Park / CVC	1.5	Remove	EAB	
T196	Ulmus americana	American Elm	1	20, 20	G	F	G	5	Park / CVC	1.8	Remove		
T197	Acer negundo	Manitoba Maple	1	16	G	G	G	2	Park / CVC	1.5	Remove		
T198	Acer negundo	Manitoba Maple	1	11, 12	G	F	G	3	Park / CVC	1.5	Remove		
T199	Fraxinus sp.	Ash sp.	1	10 to 20	F	F	F	2	Park / CVC	1.5	Remove		
T200	Acer negundo	Manitoba Maple	1	10 to 20	G	G	G	2	Park / CVC	1.5	Remove		
T201	Ulmus sp.	Elm sp.	1	10 to 20	G	G	G	2	Park / CVC	1.5	Remove		
T202	Juglans nigra	Black Walnut	1	10 to 20	G	G	G	2	Park / CVC	1.5	Remove		
T203	Ulmus pumila	Siberian Elm	1	12	G	G	G	1	Park / CVC	1.5	Remove		
TG28	Fraxinus sp.	Ash sp.	13	<10	G	G	G	0.5	Park / CVC	1.2	Remove		
TG28	Juglans nigra	Black Walnut	1	<10	G	G	G	0.5	Park / CVC	1.2	Remove		
TG28	Juniperus virginiana	Red Cedar	1	<10	G	G	G	0.5	Park / CVC	1.2	Remove		
TG28	Ulmus pumila	Siberian Elm	11	<10	G	G	G	0.5	Park / CVC	1.2	Remove		
1	Gleditsia triacanthos	Honey-locust	1	13	G	G	G	1	City	1.5	Retain		
2	Gleditsia triacanthos	Honey-locust	1	16	F	G	G	1	City	1.5	Retain		
3	Gleditsia triacanthos	Honey-locust	1	16	F	G	G	1	City	1.5	Retain		
4	Gleditsia triacanthos	Honey-locust	1	19	F	F	G	2	City	1.5	Remove		
5	Gleditsia triacanthos	Honey-locust	1	21	F	G	G	3	City	1.8	Remove		
6	Gleditsia triacanthos	Honey-locust	1	21	F	G	G	3	City	1.8	Remove		
7	Gleditsia triacanthos	Honey-locust	1	19	F	G	G	3	City	1.5	Remove		
8	Gleditsia triacanthos	Honey-locust	1	23	F	G	G	3	City	1.8	Remove		
9	Gleditsia triacanthos	Honey-locust	1	25	F	G	G	3	City	1.8	Remove		
343	Gleditsia triacanthos	Honey-locust	1	11	F	G	G	1	Region	1.5	Retain		
T214	Gleditsia triacanthos	Honey-locust	1	9	G	G	G	1	Region	1.2	Retain		
T213	Acer platanoides	Norway Maple	1	52	F	G	G	6	Region	3.6	Retain		
T212	Acer platanoides	Norway Maple	1	52	F	G	G	6	Region	3.6	Preserve		
T211	Acer platanoides	Norway Maple	1	54	F	G	G	5	Region	3.6	Preserve		

Appendix A: Tree Preservation Tables

Project: Beach St | Field Work Completed By: Nicole Bitter (ON-2979A) and Sky Carville | Date of Fieldwork: September 27, 29 and October 6, 2023 | Weather: sunny - cloudy, ~17°C

Tree Condition Assessment Criteria:
TI - Trunk Integrity: assessment of the trunk for any defects or weaknesses.
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CV - Canopy vigour: assessment of the health of the tree, based on the % of deadwood, disease, pests & live crown

Tree Condition:
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Legend:
Trees to be Retained
Trees to be Preserved
Trees to be Removed
Tree location / grouping
Minimum TPZ reduction / Injury - Construction
Minimum TPZ reduction / No Injury
Minimum TPZ reduction / Injury - Grading and Sodding

Tree #	Botanical Name	Common Name	Qty.	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T210	Celtis occidentalis	Common Hackberry	1	<10	G	G	G	0.5	Region	1.2	Retain		
TG30	Quercus macrocarpa	Bur Oak	3	<10	G	G	G	0.5	Region	1.2	Retain		
TG29	Thuja occidentalis	White Cedar	10	<5	G	G	G	0.5	Region	no TPZ	Retain	1-2m tall	
T209	Pinus nigra	Austrian Pine	1	33	F	F	F	4	Private	2.4	Retain		
T208	Acer saccharinum	Silver Maple	1	38	F	F	F	5	Private	2.4	Retain	dieback 25-30%	
T207	Acer saccharinum	Silver Maple	1	55	D	D	D	-	Private	no TPZ	Retain		
T206	Acer platanoides	Norway Maple	1	23	G	G	G	5	Private	1.8	Retain		
T205	Gleditsia triacanthos	Honey-locust	1	55	G	G	G	7	Private	3.6	Retain		
T204	Acer saccharinum	Silver Maple	1	53	F	F	F	6	Private	3.6	Retain	broken leader, 30% dieback	
370	Acer platanoides	Norway Maple	1	32	F	G	G	5	Private	2.4	Retain		
371	Acer platanoides	Norway Maple	1	21	F	F	F	4	Private	1.8	Retain		
T215	Gleditsia triacanthos	Honey-locust	1	25, 20, 20	G	G	G	i	Private	2.4	Injure	boundary	horizontal root protection - mud mats
T216	Gleditsia triacanthos	Honey-locust	1	30	G	G	G	4	Private	1.8	Injure	boundary	horizontal root protection - mud mats
T217	Gleditsia triacanthos	Honey-locust	1	27	G	G	G	5	Private	1.8	Preserve		Fence around staging area can act as tree protection
T218	Gleditsia triacanthos	Honey-locust	1	29	G	G	G	5	Private	1.8	Preserve		Fence around staging area can act as tree protection
T219	Pinus strobus	White Pine	1	60	G	G	G	7	Private	3.6	Injure		horizontal root protection - mud mats
TG31	Pinus strobus	White Pine	5	25 to 35	G	F	G	5	Private	2.4	Injure		horizontal root protection - mud mats
TG32	Pinus strobus	White Pine	2	15	G	G	G	2	Private	1.5	Remove		
TG32	Picea glauca	White Spruce	1	10 to 20	G	G	G	2	Private	1.5	Remove		
T220	Acer sp.	Maple sp.	1	25	G	G	G	3.5	Private	1.8	Remove		
T221	Acer sp.	Maple sp.	1	25	G	G	G	3.5	Private	1.8	Remove		

APPENDIX

B

APPLICATION TO PERMIT THE INJURY OR DESTRUCTION OF TREES ON PUBLIC AND PRIVATE PROPERTY

Permit the Injury or Destruction of Trees on Public or Private Property Application

For a Tree Permit or Tree Removal Permission

Community Services Department
Forestry Section
950 Burnhamthorpe Road West
Mississauga, Ontario L5C 3B4
Tel.: 3-1-1 (905-615-4311 outside City limits)
FAX: 905-615-3098
www.mississauga.ca/forestry

MISSISSAUGA

Personal information on this form is collected under the authority of Section 135 of the *Municipal Act, 2001*, SO 2001, c25 and City of Mississauga By-law 0020-2022 & 0021-2022 and will be used for processing tree permit/permission applications. For the purpose of public access to information, a limited amount of information will be displayed on the City's website. Questions about the collection of personal information should be directed to the Private Tree Protection By-law Inspector at 3-1-1.

Important Information / Requirements regarding Application process

A separate application is required for each applicable address. Incomplete applications will not be processed.

- This is not a permit. Removal of one (1) tree or more each with a diameter of 15 cm or greater on private property before receiving an approved permit will put you in contravention of the Private Tree Protection By-law 0021-2022.
- Removing or injuring a public tree is a contravention of the Public Tree Protection By-law 0020-2022.
- Ensure you have read and understand the Private and Public Tree Protection By-law in its entirety before completing this application.
- If this application is signed by an applicant or agent other than the owner, written authorization of the owner is required.
- Provide two (2) copies of plans or drawings of the property showing the location of trees to be removed and those being preserved, and if replanting please include a replanting or landscaping plan. Additional copies may be requested.
- Provide an Arborist report completed by an Arborist as defined.
- Before removing any trees, written consent is required from an adjacent property owner where any portion of the tree trunk rests on the property line or the adjacent owner's property.
- All pages of this application must be completed to be accepted by Forestry for review.
- Mail or deliver this application and other supporting documentation to the Forestry Section at 950 Burnhamthorpe Road West.
- Applications may take up to 30 business days to be processed.
- Fee Requirements: As per #6.
- Base tree permit fee is non-refundable.
- All Ash trees are considered dead/dying.
- For PRIVATE ASH OR PRIVATE DEAD TREES ONLY applications please email applications to: privatetree@mississauga.ca. Any other applications or inquiries sent to this email address will not be accepted or will receive a response.

FOR APPLICATIONS WITH ASH OR DEAD TREES ONLY, APPLICANT MUST HAVE A CERTIFIED ARBORIST VERIFY AND SIGN OFF ON INFORMATION

Owner / Applicant / Municipal Address Information

◆ **Application to be completed by applicant** ◆ **Print clearly** ◆ **All fields are mandatory**

Provide all contact details where applicable, indicating your preferred contact method by checking ☑ the appropriate box.

Municipal Site Address _____ Ward # _____

Name of Applicant/Agent _____

☐ Phone _____ ☐ Cellphone _____

☐ Fax (if applicable) _____ ☐ Email _____

Name of Registered Owner _____

Mailing Address of Owner (if different than municipal address) _____

Existing land use _____

Declaration

◆ **If Owner's signature cannot be included, a separate Letter of Owner's Authorization must be provided** ◆

Declaration

I, the Applicant and the Owner, hereby declare that the statements made by me upon this application are, to the best of my belief and knowledge, a true and complete representation of the purpose and intent of this application.

Applicant Signature _____ Print name _____ Date (YYYY/MM/DD) _____

Owner Signature _____ Print name _____ Date (YYYY/MM/DD) _____

Peter McNamara / ON-1140A _____ Peter McNamara _____ _____

Arborist Name/Professional # Print name Date (YYYY/MM/DD)

OFFICE USE ONLY

Permit No. _____ Received by _____ Date (YYYY/MM/DD) _____

Fee $ _____ Official Receipt # _____ Received by _____ Date (YYYY/MM/DD) _____

Tree Detail

1. If applicable, provide the file number for any current development applications that have been submitted:

- ☐ Official Plan/Rezoning _____
- ☐ Access Modification Permit _____
- ☐ Building Permit _____
- ☐ Committee of Adjustment _____
- ☐ Demolition Permit _____
- ☐ Site Plan _____
- ☐ Pool Permit _____
- ☐ ROP _____
- ☐ PUCC _____

2. Number of trees proposed to be injured/removed:
   Private ____11_____ Public ___23_____
   Dead/Dying ____0_____ Healthy ___34_____

3. Indicate the species, ownership, diameter (cm) and reason for removal, as well as any additional comments on the Tree Removal Inventory Table below, and/or provide an Arborists Report.

4. Will you be planting replacement trees? X Yes ☐ No
   If yes, are copies of the replanting plan attached?
   ☐ Yes ☐ No

5. A site plan or drawing of the subject property is required and must include the following:
   - The location of any buildings on the property
   - The dimensions of the property and location of the streets
   - The location and size of trees being protected
   - The proposed location for replacement tree(s).
   - Other natural features on the property such as slopes and creeks.

6. Fee Requirements: At time of application submission, please provide only the base Tree Removal Permit Fee for the removal of one (1) healthy tree, with a diameter of 15 cm or greater on private property or base tree permit fee as defined in the Fees and Charges by-law. Please don't pay for any additional trees at this time. When applicable, after inspection of the property any further payments required will be communicated to the Applicant using their preferred method of communication.

   Trees which are dead, dying or hazardous are not subject to any fees but do require a permit.

Cheques payable to "City of Mississauga".
This fee is non-refundable.

Tree Removal Inventory

Indicate the species, ownership, diameter (cm, in), reason for removal or additional comments and tree condition.

Status	Species	Ownership	Diameter	Reason/Comments	Condition
☐ To be Removed ☐ To be Injured	See Attached Arborist Report				☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead
☐ To be Removed ☐ To be Injured					☐ Good ☐ Fair ☐ Poor ☐ Dead

APPENDIX

C SITE PHOTOS

Tree #s T61 and T62— Eastern White Pine trees to be removed at the corner of Beach St and Aviation Rd.

Tree #s 7, 8, 9 (foreground) and T211, T212, and T213 (background) — Honey-locust trees to be removed for staging area and Norway Maple trees to be preserved.

Tree #s T126, 125 (foreground, left) and T128 (background, right) — Norway Maple trees to be preserved and Austrian Pine to incur minor injury from staging area at Lakeside Park.

Tree # 307— Austrian Pine tree to be removed for staging area in Lakeside Park.

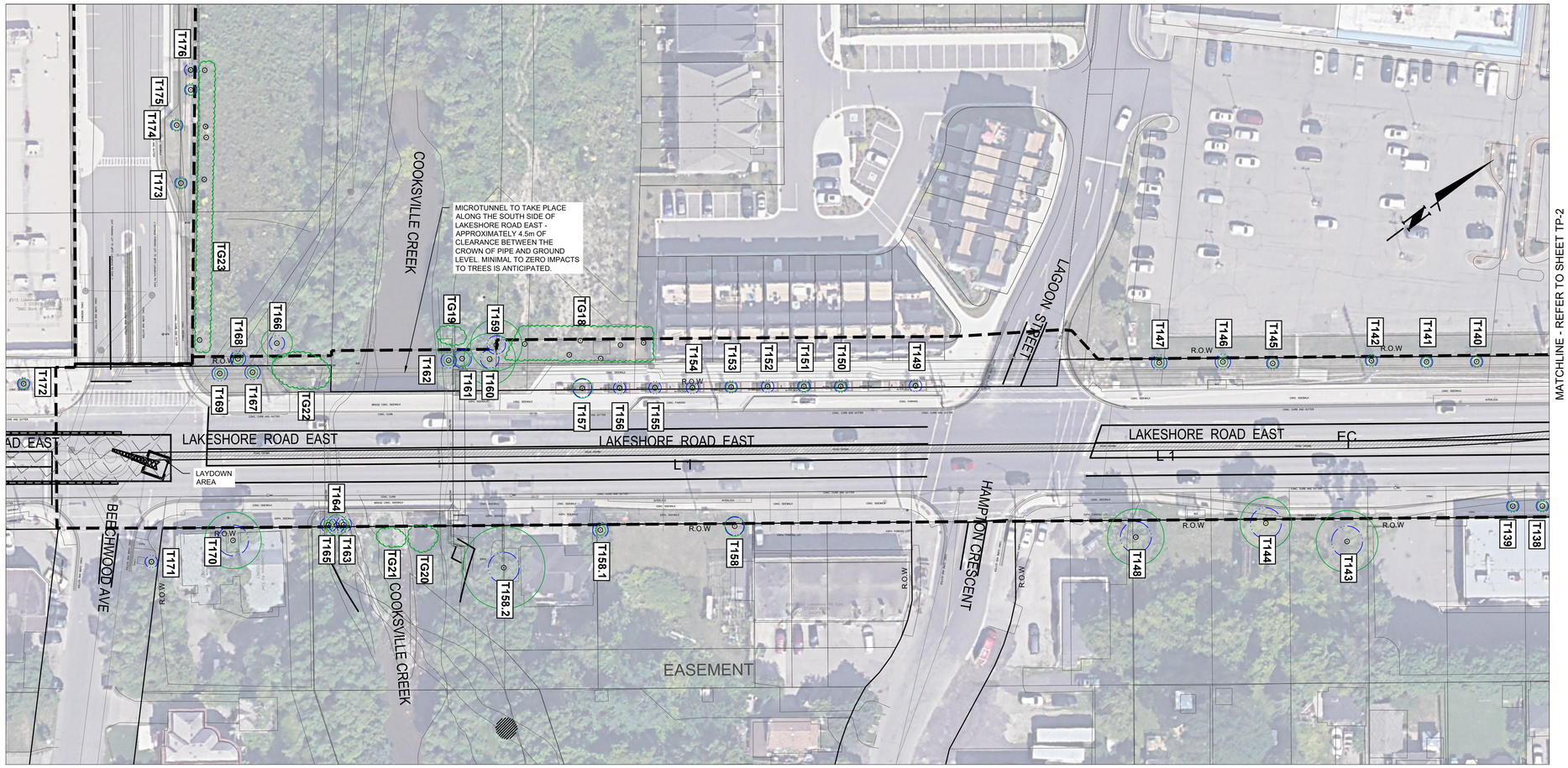
Tree grouping #s TG25 and TG26—Various species in maintained and naturalized areas to be removed for staging area.

Tree #s T183 to T186 — Newly planted Freeman's maple, Serviceberry sp., and White Pine trees within maintained landscaped area to be removed for staging area.

Tree # T195 and TG28 — Green Ash trees and small saplings to be removed in naturalized area.

Tree grouping # TG28 and tree #s T196 to T198 — Various species in naturalized area to be removed for staging area. Land is City of Mississauga parkland and CVC regulated.

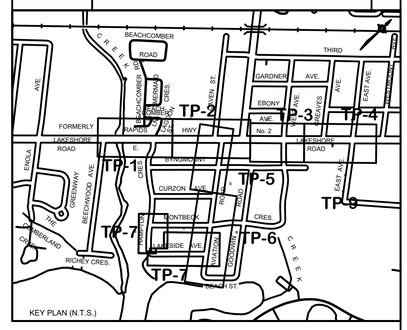
MATCHLINE - REFER TO SHEET TP-8



MATCHLINE - REFER TO SHEET TP-2

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS		
DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



T#	INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE RETAINED / PRESERVED
T#	INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE PRESERVED WITH INJURY
T#	INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE REMOVED
	EXISTING TREE - DECIDUOUS
	EXISTING TREE - CONIFEROUS
	EXISTING TREE GROUPING - TO BE RETAINED / PRESERVED
	EXISTING TREE GROUPING - TO BE REMOVED
	INDIVIDUAL TREE TO BE REMOVED
	PRESCRIBED TREE PROTECTION ZONE (TPZ)
	APPROXIMATE DRIPLINE
	TREE INVENTORY LIMIT
	PROPOSED TREE PRESERVATION FENCE
	PROPOSED CIVIL WORKS
	PROPOSED STAGING AREA

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

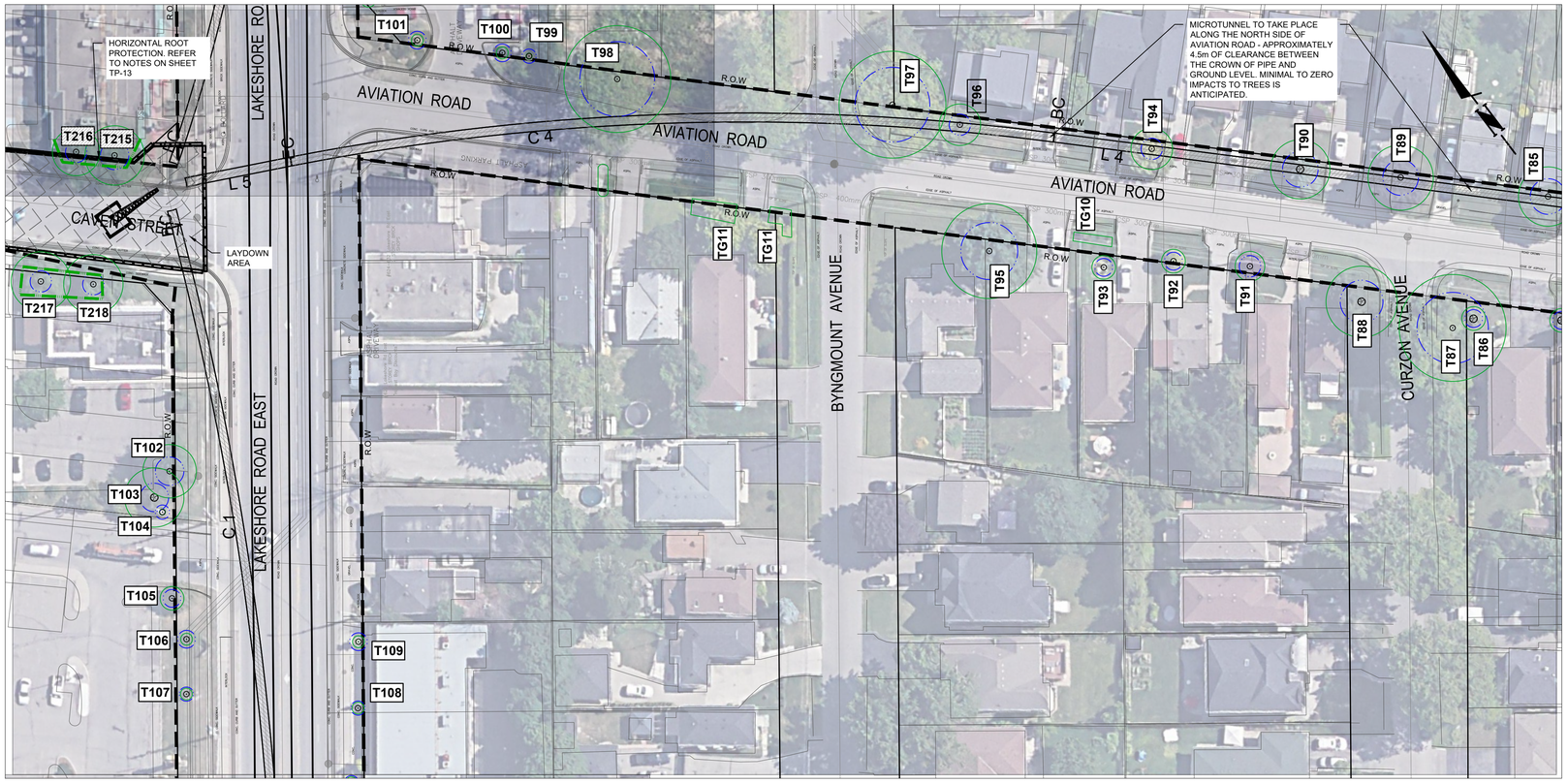
LAKESHORE ROAD EAST

FROM BEECHWOOD AVE TO HAMPTON CRES

PROP. 1200mm AND 600mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	1 of 12	Plan No.	**TP-1**

MATCHLINE - REFER TO SHEET TP-3



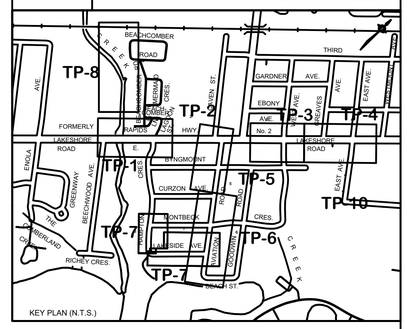
MATCHLINE - REFER TO SHEET TP-1

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



- T# — INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE RETAINED / PRESERVED
- T# — INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE PRESERVED WITH INJURY
- T# — INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE REMOVED
- EXISTING TREE - DECIDUOUS
- EXISTING TREE - CONIFEROUS
- EXISTING TREE GROUPING - TO BE RETAINED / PRESERVED
- EXISTING TREE GROUPING - TO BE REMOVED
- INDIVIDUAL TREE TO BE REMOVED
- PRESCRIBED TREE PROTECTION ZONE (TPZ)
- APPROXIMATE DRIPLINE
- TREE INVENTORY LIMIT
- PROPOSED TREE PRESERVATION FENCE
- PROPOSED CIVIL WORKS
- PROPOSED STAGING AREA

Designed by Chkd

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

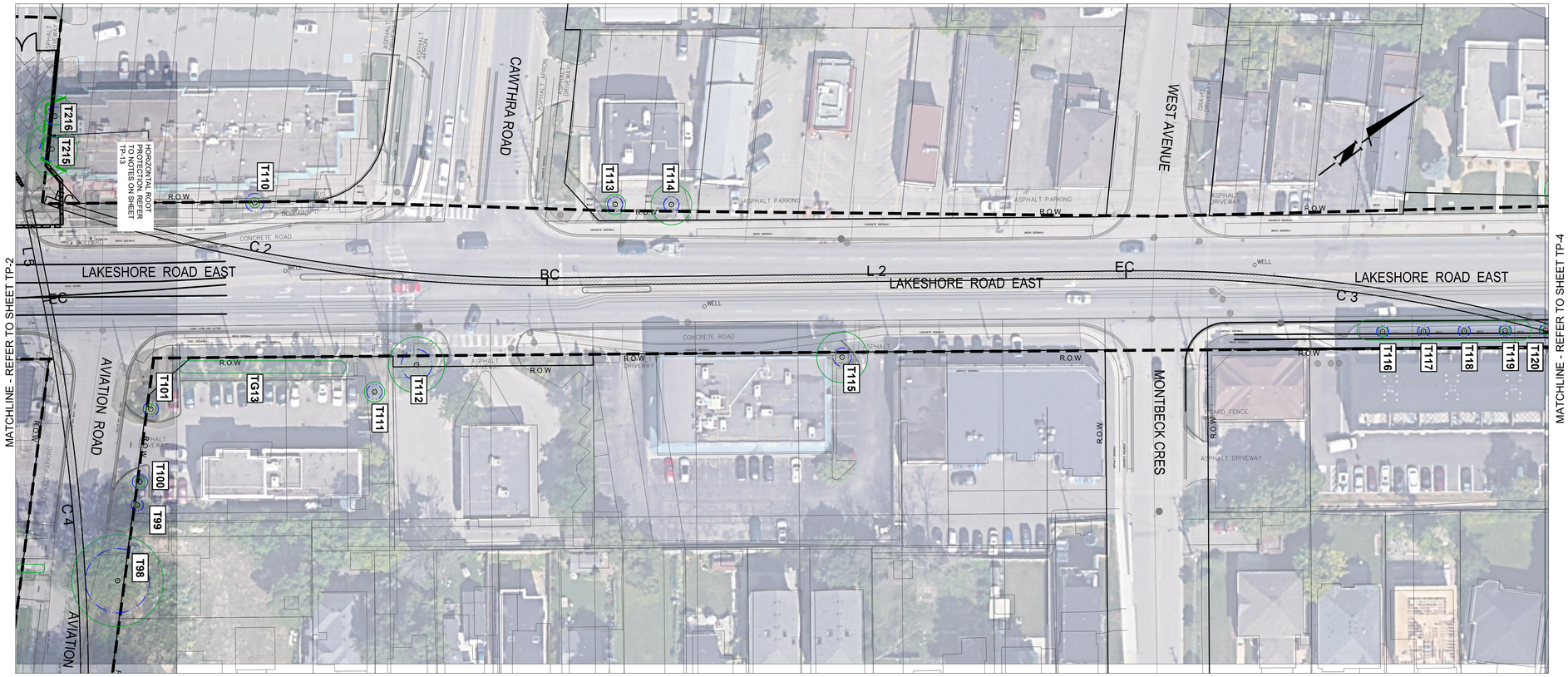
Region of Peel
working with you

LAKESHORE ROAD EAST

FROM HAMPTON CRES TO CAVEN STREET

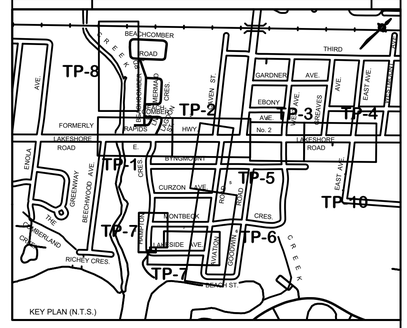
PROP. 1200mm AND 600mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	2 of 12	Plan No.	TP-2



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS		
DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



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EXISTING TREE - DECIDUOUS

EXISTING TREE - CONIFEROUS

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PRESCRIBED TREE PROTECTION ZONE (TPZ)

APPROXIMATE DRIPLINE

TREE INVENTORY LIMIT

PROPOSED TREE PRESERVATION FENCE

PROPOSED CIVIL WORKS

PROPOSED STAGING AREA

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

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FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

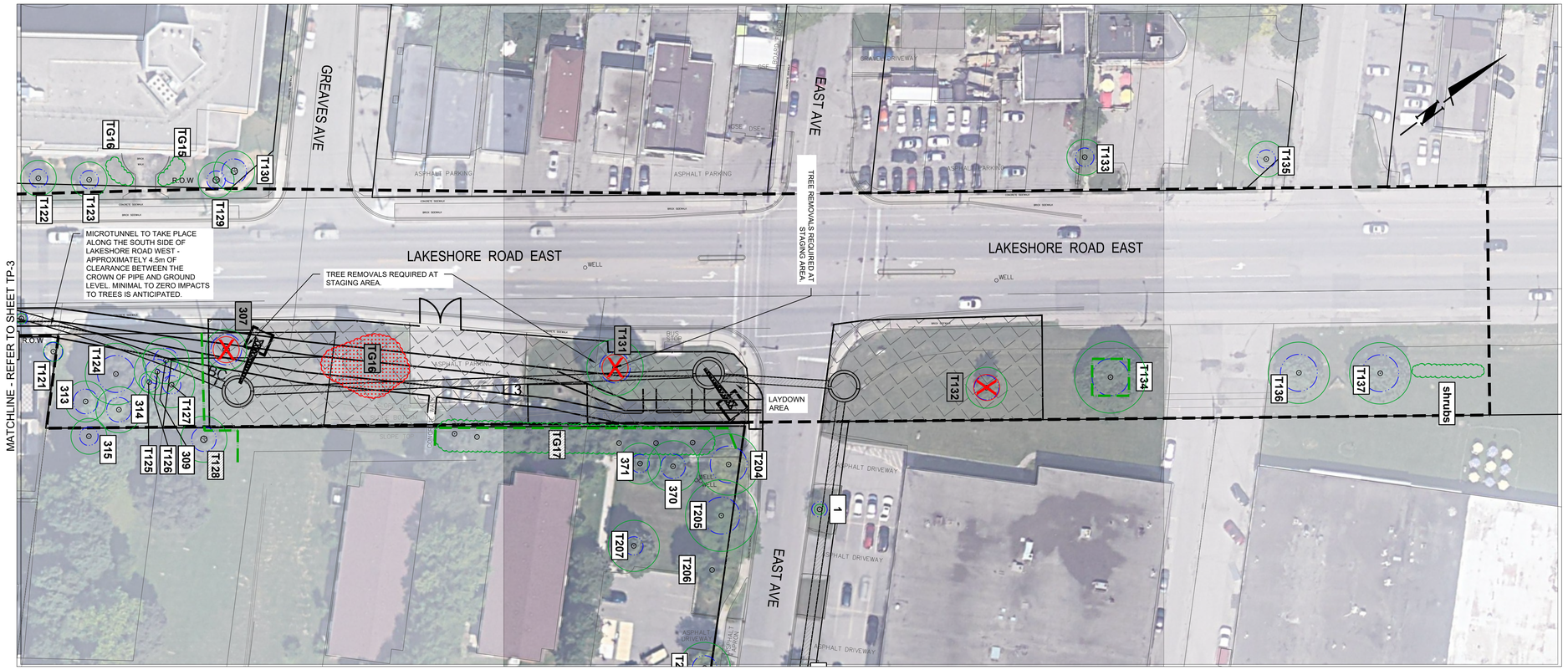
Region of Peel
working with you

LAKESHORE ROAD EAST

FROM AVIATION ROAD TO WEST AVENUE

PROP. 375mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	3 of 12	Plan No.	**TP-3**



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
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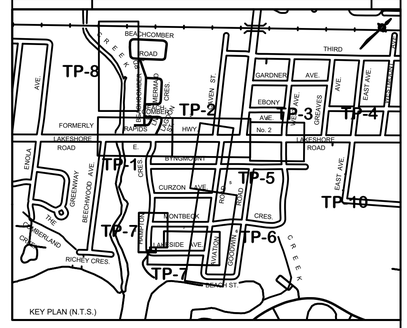
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



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	EXISTING TREE GROUPING - TO BE RETAINED / PRESERVED
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	APPROXIMATE DRIPLINE
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	PROPOSED STAGING AREA

Designed by Chkd

Approved by

NOTICE TO CONTRACTOR

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FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

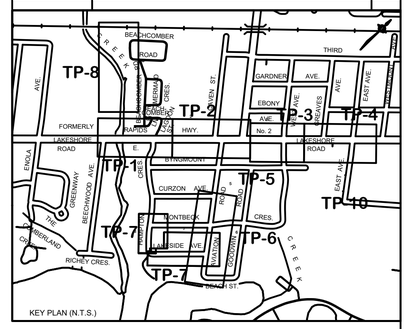
FROM GREAVES AVE TO EAST AVE

PROP. 375mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	4 of 12	Plan No.	**TP-4**

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS		
DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



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T#	INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE REMOVED
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	EXISTING TREE GROUPING - TO BE RETAINED / PRESERVED
	EXISTING TREE GROUPING - TO BE REMOVED
	INDIVIDUAL TREE TO BE REMOVED
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	APPROXIMATE DRIPLINE
	TREE INVENTORY LIMIT
	PROPOSED TREE PRESERVATION FENCE
	PROPOSED CIVIL WORKS
	PROPOSED STAGING AREA

Designed by

Chkd

Approved by

NOTICE TO CONTRACTOR

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ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

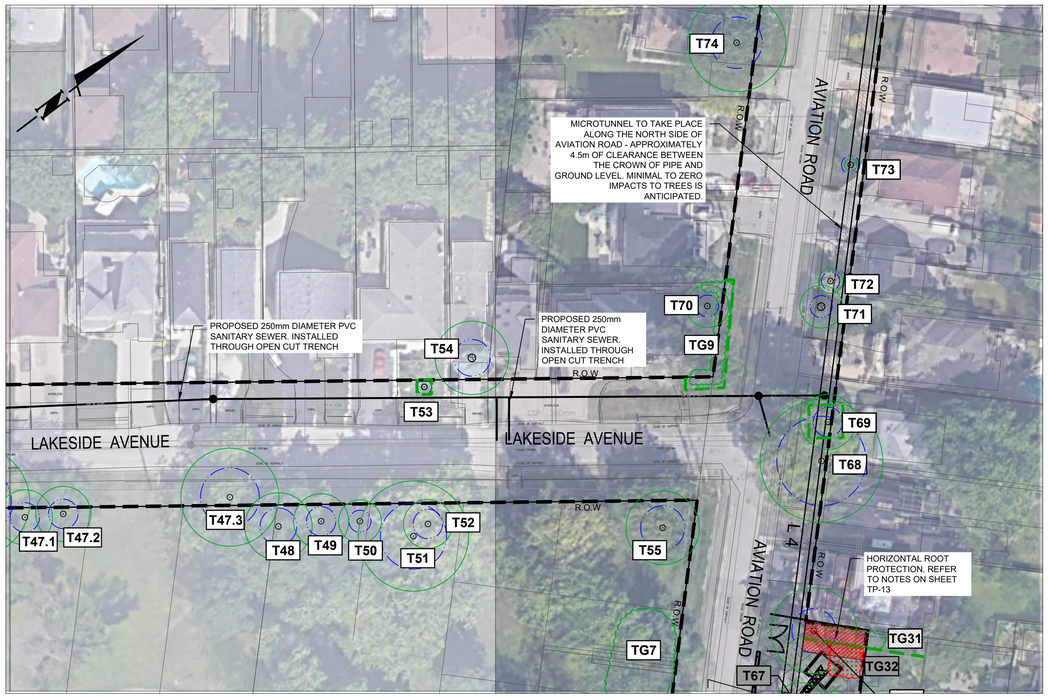
Region of Peel
working with you

AVIATION ROAD

FROM LAKESHORE ROAD E. TO BEACH STREET

PROP. 600mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	5 of 12	Plan No.	TP-5



MATCHLINE - REFER TO SHEET TP-5

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
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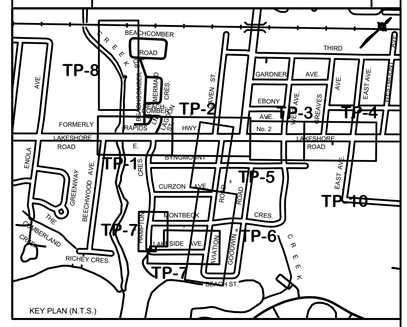
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



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	EXISTING TREE GROUPING - TO BE REMOVED
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	PROPOSED TREE PRESERVATION FENCE
	PROPOSED CIVIL WORKS
	PROPOSED STAGING AREA

Designed by Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
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CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

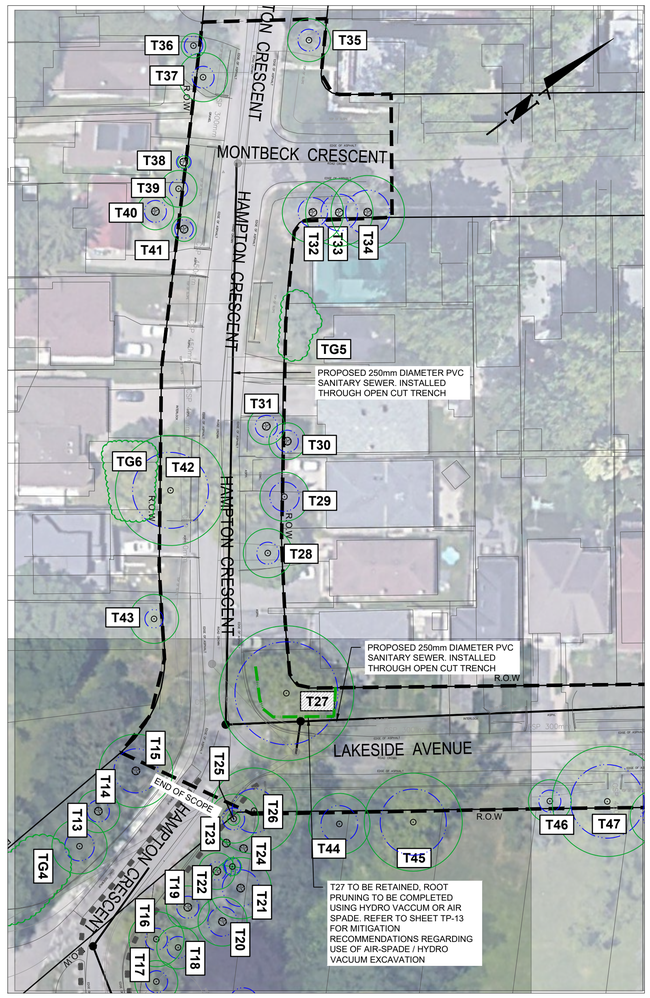
Region of Peel
working with you

LAKESIDE AVENUE

FROM HAMPTON CRESCENT TO AVIATION ROAD

PROP. 250 PVC SAN. SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	6 of 12	Plan No.	TP-6



END OF SCOPE

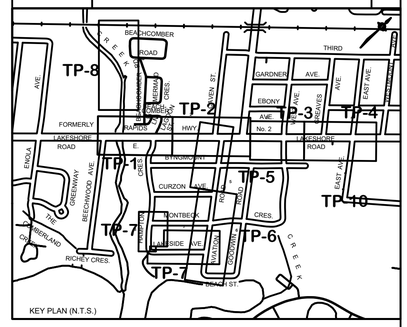
MATCHLINE - REFER TO SHEET TP-6

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



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	PROPOSED STAGING AREA

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

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ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

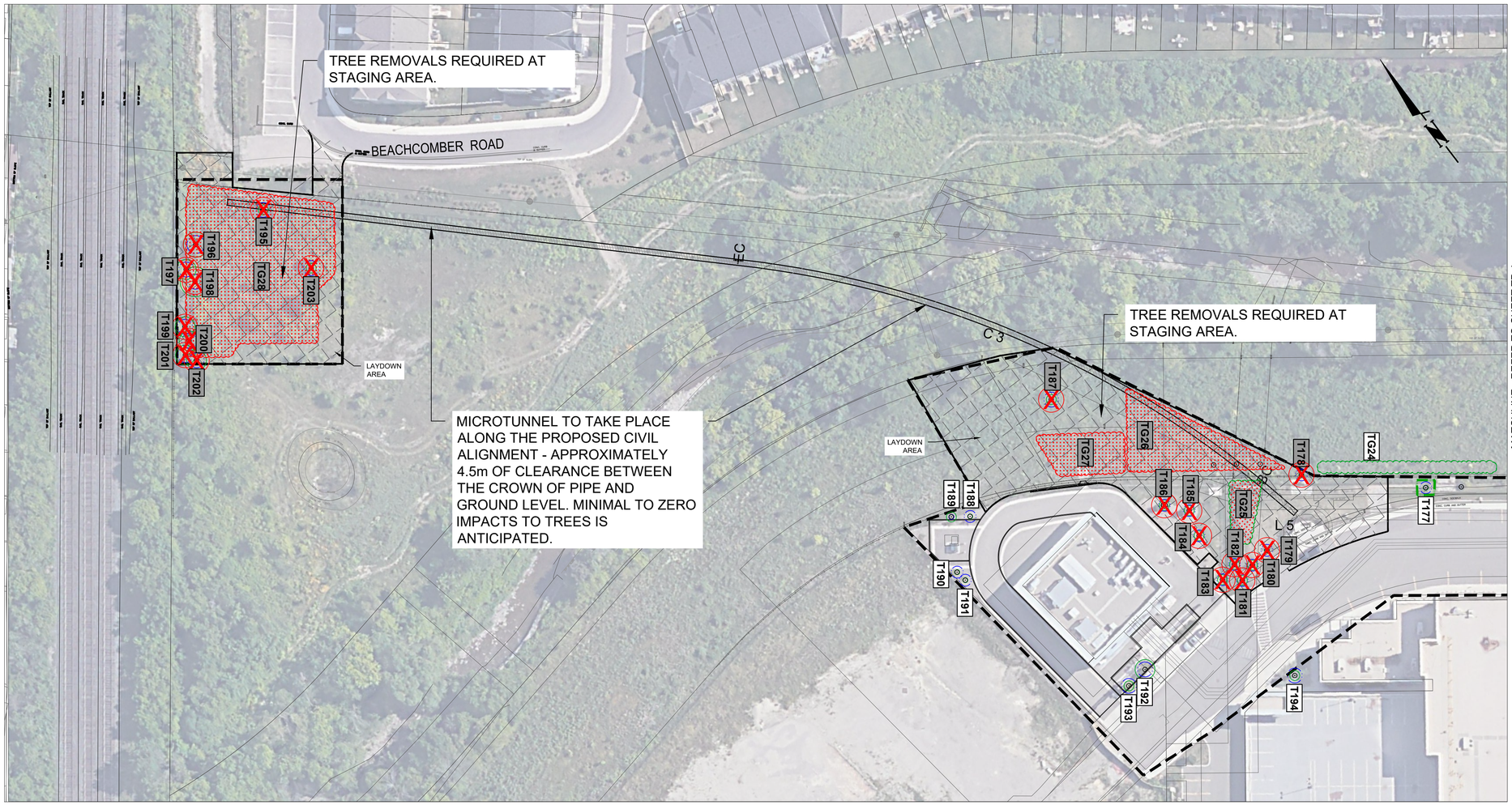
Region of Peel
working with you

HAMPTON CRESCENT

FROM MONBECK CRESCENT TO LAKESIDE AVE.

PROP. 250mm PVC SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	7 of 12	Plan No.	TP-7



SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
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ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS		
DATE	DETAILS	INIT.
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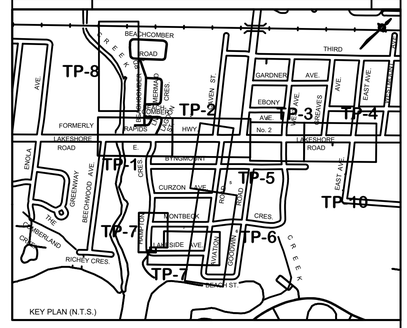
DEC 6, 2023	60% DETAIL DESIGN	J.A.



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HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

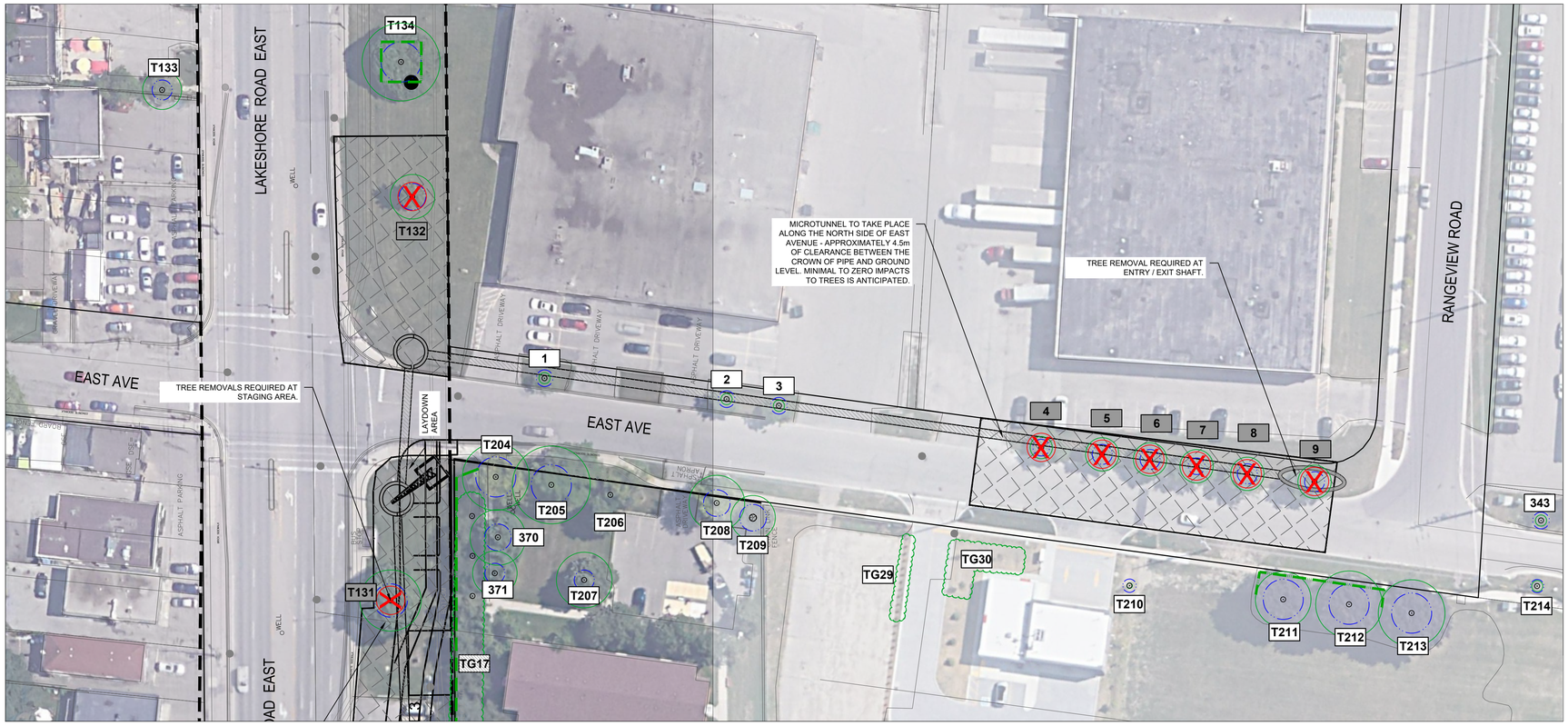
BEECHWOOD SPS

-

PROP. 300mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	8 of 12	Plan No.	TP-8

MATCHLINE - REFER TO SHEET TP-4



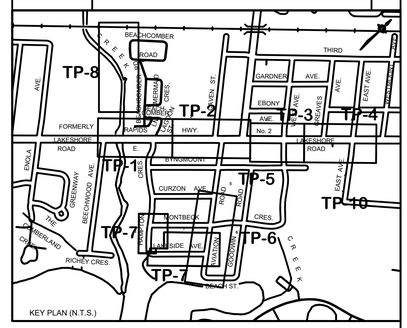
MATCHLINE - REFER TO SHEET TP-4

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



T#	INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE RETAINED / PRESERVED
T#	INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE PRESERVED WITH INJURY
T#	INDIVIDUAL TREE / TREE GROUP NUMBER - TREE TO BE REMOVED
	EXISTING TREE - DECIDUOUS
	EXISTING TREE - CONIFEROUS
	EXISTING TREE GROUPING - TO BE RETAINED / PRESERVED
	EXISTING TREE GROUPING - TO BE REMOVED
	INDIVIDUAL TREE TO BE REMOVED
	PRESCRIBED TREE PROTECTION ZONE (TPZ)
	APPROXIMATE DRIPLINE
	TREE INVENTORY LIMIT
	PROPOSED TREE PRESERVATION FENCE
	PROPOSED CIVIL WORKS
	PROPOSED STAGING AREA

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

EAST STREET

FROM LAKESHORE AVE E. TO RANGEVIEW ROAD

PROP. 900mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.		
Date	SEPTEMBER 2023	Sheet	9 of 12	Plan No.	**TP-9**

Tree	Botanical Name	Common Name	Qt'...	DBH (cm)	TI	CS	CV	Dripline Radius (m.)	Tree Location / Applicat'... By-law	Tree Protecti... Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T27	*Acer saccharinum*	Silver Maple	1	140	G	G	G	11	Public	8.4	Injure		hydro-vacuum excavation
T28	*Acer saccharum*	Sugar Maple	1	30	G	G	G	4	Public	1.8	Retain		
T29	*Acer platanoides*	Norway Maple	1	32	F	G	G	4	Private	2.4	Retain		
T30	*Picea glauca*	White Spruce	1	24	G	G	G	3	Private	1.8	Retain		
T31	*Picea glauca*	White Spruce	1	21	G	G	G	3	Public	1.8	Retain		
TG5	*Picea glauca*	White Spruce	3	30-40	G	G	G	4	Private	2.4	Retain		
T32	*Picea pungens*	Blue Spruce	1	40	G	F	G	5	Public	2.4	Retain		
T33	*Picea pungens*	Blue Spruce	1	49	G	G	G	5.5	Public	3	Retain		
T34	*Picea pungens*	Blue Spruce	1	54	G	F	G	6	Public	3.6	Retain		
T35	*Acer saccharum*	Sugar Maple	1	27	G	G	G	3.5	Public	1.8	Retain		
T36	*Fraxinus sp.*	Ash sp.	1	19	F	F	F	2	Private	1.5	Retain		
T37	*Ailanthus altissima*	Tree of Heaven	1	MS 9, 9, 16, 23	G	G	G	4	Public	1.8	Retain	red X	
T38	*Picea sp.*	Spruce sp.	1	9	G	G	G	1	Private	1.2	Retain		
T39	*Betula pendula*	Saucer Magnolia	1	MS (7-14)	G	G	G	3	Private	1.5	Retain		
T40	*Picea abies*	Norway Spruce	1	23	G	G	G	3	Private	1.8	Retain		
T41	*Thuja occidentalis*	White Cedar	1	MS 5, 5, 9, 7	G	G	G	2	Public	1.5	Retain		
TG6	*Betula pendula*	European Birch	3	5-21	G	G	G	3.5	Private	1.8	Retain	trees multistem	
T42	*Acer saccharinum*	Silver Maple	1	103	G	G	G	9	Public	6.2	Retain		
T43	*Acer negundo*	Manitoba Maple	1	20	F	F	F	4	Private	1.5	Retain		
T44	*Quercus rubra*	Red Oak	1	43	G	G	G	5	Park	3	Retain		
T45	*Acer saccharinum*	Silver Maple	1	83	G	G	G	8	Park	5.4	Retain		
T46	*Acer platanoides*	Norway Maple	1	28	F	F	F	3.5	Public	1.8	Retain		
T47	*Acer saccharinum*	Silver Maple	1	94	G	F	F	9	Public	6	Retain		
T47.1	*Quercus rubra*	Red Oak	1	37	G	F	G	4.5	Park	2.4	Retain	exposed roots, lean	
T47.2	*Quercus rubra*	Red Oak	1	38	G	G	G	4.5	Park	2.4	Retain		
T47.3	*Acer saccharinum*	Silver Maple	1	76	G	F	F	8	Public	4.8	Retain		
T48	*Quercus rubra*	Red Oak	1	48	G	F	G	5.5	Park	3	Retain		
T49	*Aesculus hippocastanum*	Horse Chestnut	1	37	F	F	G	4.5	Park	2.4	Retain		
T50	*Acer negundo*	Manitoba Maple	1	28	F	P	P	3.5	Park	1.8	Retain		
T51	*Acer saccharinum*	Silver Maple	1	90	G	G	G	9	Park	5.4	Retain		
T52	*Juglans nigra*	Black Walnut	1	33	G	F	G	4	Park	2.4	Retain		
T53	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Public	1.2	Preserve		
T54	*Picea pungens*	Blue Spruce	1	50	G	G	G	6	Private	3	Retain		
T55	*Acer negundo*	Manitoba Maple	1	53	G	G	G	6	Park	3.6	Retain		
TG7	*Pinus strobus*	White Pine	7	27-41	G	G	G	5	Park	3	Retain		
T56	*Acer saccharinum*	Silver Maple	1	39	G	G	G	4.5	Park	2.4	Retain		
T57	*Robinia pseudoacacia*	Black Locust	1	33	F	F	F	4	Park	2.4	Retain		
T58	*Acer saccharinum*	Silver Maple	1	102	G	G	G	9	Park	6.1	Retain		
TG8	*Pinus nigra*	Austrian Pine	6	22-44	G	G	G	4	Park	3	Retain		
T59	*Acer saccharinum*	Silver Maple	1	MS 11, 19, 13, 21	G	F	G	4.5	Park	1.8	Retain		
T60	*Acer negundo*	Manitoba Maple	1	43, 38	G	G	G	6	Park	3	Retain		
T61	*Pinus strobus*	White Pine	1	39	G	F	F	4.5	Private	2.4	Remove		
T62	*Pinus strobus*	White Pine	1	50	G	G	G	6	Private	3	Remove		
T63	*Amelanchier sp.*	Serviceberry sp.	1	5	F	G	G	0.5	Public	1.2	Remove		
T64	*Amelanchier sp.*	Serviceberry sp.	1	4	G	G	G	0.5	Public	1.2	Remove		
T65	*Quercus rubra*	Red Oak	1	4	G	G	G	0.5	Public	1.2	Remove		
T65.1	*Pyrus calleryana*	Ornamental Pear	1	23	G	G	G	3	Private	1.8	Remove		
T66	*Picea glauca*	White Spruce	1	25	G	G	G	3.5	Private	1.8	Remove		
T67	*Pinus strobus*	White Pine	1	36	G	G	F	4.5	Private	2.4	Remove		
T68	*Acer saccharinum*	Silver Maple	1	121	G	G	G	10	Public	7.3	Retain		
T69	*Quercus rubra*	Red Oak	1	35	G	F	G	4.5	Public	2.4	Preserve		
TG9	*Thuja occidentalis 'emerald'*	Emerald White Cedar	50	<5	G	G	G	0.5	Private	1.2	Preserve	2.5 tall, newly planted	
T70	*Fraxinus sp.*	Ash sp.	1	27	F	F	F	3.5	Private	1.8	Retain		
T71	*Pinus strobus*	White Pine	1	27	G	G	G	3.5	Public	1.8	Retain		
T72	*Acer platanoides*	Norway Maple	1	15	G	G	F	2	Public	1.5	Retain		
T73	*Amelanchier sp.*	Serviceberry sp.	1	11	G	G	G	1	Public	1.5	Retain		
T74	*Acer x freemanii*	Freeman's Maple	1	70	G	F	G	8	Private	4.2	Retain		
T75	*Morus alba*	White Mulberry	1	30	F	F	G	4	Private	1.8	Retain		
T76	*Morus alba*	White Mulberry	1	28, 25	F	F	G	5	Private	2.4	Retain		
T77	*Pinus strobus*	White Pine	1	40	G	F	G	5	Private	2.4	Retain		
T78	*Picea abies*	Norway Spruce	1	55	G	G	G	6	Public	3.6	Retain		
T79	*Callitropsis nootkatensis 'pendula'*	Weeping Nootka Cypress	1	12	G	G	G	1	Public	1.5	Retain		
T80	*Prunus avium*	Common Cherry	1	27	F	P	P	3.5	Private	1.8	Retain		
T81	*Prunus sp.*	Cherry / Plum sp.	1	5	G	G	G	0.5	Public	1.2	Retain		
T82	*Magnolia acuminata*	Cucumber Tree	1	5	G	G	G	0.5	Public	1.2	Retain		
T83	*Picea glauca*	White Spruce	1	10	G	G	G	1	Public	1.5	Retain		
T84	*Thuja occidentalis 'emerald'*	Emerald White Cedar	1	18	G	G	G	2	Private	1.5	Retain		
T85	*Acer platanoides*	Norway Maple	1	42	G	G	G	5	Public	3	Retain	tag #1349	

Tree	Botanical Name	Common Name	Qt'...	DBH (cm)	TI	CS	CV	Dripline Radius (m.)	Tree Location / Applicat'... By-law	Tree Protecti... Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T86	*Callitropsis nootkatensis 'pendula'*	Weeping Nootka Cypress	1	14	G	G	G	2	Private	1.5	Retain		
T87	*Acer saccharinum*	Silver Maple	1	100	F	F	F	9	Public	6	Retain		
T88	*Pinus nigra*	Austrian Pine	1	55	G	G	G	6	Public	3.6	Retain		
T89	*Acer platanoides*	Norway Maple	1	48	G	G	G	5.5	Public	3	Retain		
T90	*Picea pungens*	Blue Spruce	1	42	G	G	G	5	Public	3	Retain		
T91	*Acer palmatum*	Japanese Maple	1	MS (7) 4-13	F	G	F	2.5	Public	1.8	Retain	trunk wound	
T92	*Acer rubrum*	Red Maple	1	15	G	G	G	2	Public	1.5	Retain		
T93	*Morus alba 'pendula'*	Weeping White Mulberry	1	17	G	G	G	2	Private	1.5	Retain		
TG10	*Hibiscus syriacus*	Rose-of-Sharon	4	MS <10	G	G	G	0.5	Public	1.2	Retain		
T94	*Acer saccharum*	Sugar Maple	1	26	G	G	G	3.5	Public	1.8	Retain		
T95	*Quercus rubra*	Red Oak	1	80	G	G	G	8	Private	4.8	Retain		
T96	*Acer rubrum*	Red Maple	1	27	G	G	G	3.5	Public	1.8	Retain		
T97	*Acer saccharinum*	Silver Maple	1	106	G	G	G	9	Public	6.3	Retain		
TG11	*Thuja occidentalis*	White Cedar	1	MS <10	G	G	G	0.5	Private	1.2	Retain		
T98	*Acer saccharinum*	Silver Maple	1	110	F	G	G	10	Public	6.6	Retain		
TG12	*Thuja occidentalis*	White Cedar	1	MS <10	G	G	G	0.5	Public	1.2	Retain		
T99	*Amelanchier sp.*	Serviceberry sp.	1	MS<10	G	G	G	0.5	Private	1.2	Retain		
T100	*Acer rubrum*	Red Maple	1	10	F	G	F/P	1	Private	1.5	Retain		
T101	*Acer rubrum*	Red Maple	1	10	P	P	P	1	Private	1.5	Retain		
T102	*Gleditsia triacanthos*	Honey-locust	1	39	G	G	G	4.5	Private	2.4	Retain		
T103	*Pinus nigra*	Austrian Pine	1	40	G	G	G	5	Private	2.4	Retain		
T104	*Fraxinus sp.*	Ash sp.	1	MS <5	G	G	G	0.5	Private	1.2	Retain		
T105	*Tilia cordata*	Little-leaf Linden	1	19	G	G	G	2	Private	1.5	Retain		
T106	*Gleditsia triacanthos*	Honey-locust	1	11	G	G	G	1	Public	1.5	Retain		
T107	*Gleditsia triacanthos*	Honey-locust	1	8	F	F	G	1	Public	1.2	Retain		
T108	*Ginkgo biloba*	Ginkgo	1	8	G	G	G	1	Public	1.2	Retain		
T109	*Ginkgo biloba*	Ginkgo	1	12	G	G	G	1	Public	1.5	Retain		
T110	*Acer negundo*	Manitoba Maple	1	MS 4-12	F	P	G	1	Public	1.8	Retain		
TG13	*Pyrus calleryana*	Ornamental Pear	5	20-28	G	F	F	4.5	Public	2.4	Retain		
T111	*Acer platanoides*	Norway Maple	1	16	G	G	G	2	Private	1.5	Retain		
T112	*Gleditsia triacanthos*	Honey-locust	1	45	G	G	G	5.5	Private	3	Retain		
T113	*Gleditsia triacanthos*	Honey-locust	1	17	G	G	G	2	Private	1.5	Retain		
T114	*Gleditsia triacanthos*	Honey-locust	1	20	G	G	G	4	Private	1.5	Retain		
T115	*Acer platanoides*	Norway Maple	1	24	G	G	G	5	Private	1.8	Retain		
T116	*Syringa reticulata*	Japanese Tree Lilac	1	7	G	G	F	1	Public	1.2	Retain		
T117	*Syringa reticulata*	Japanese Tree Lilac	1	5	P	P	P	0.5	Public	1.2	Retain		
T118	*Syringa reticulata*	Japanese Tree Lilac	1	5	G	G	F	0.5	Public	1.2	Retain		
T119	*Syringa reticulata*	Japanese Tree Lilac	1	7	G	G	F	1	Public	1.2	Retain		
T120	*Syringa reticulata*	Japanese Tree Lilac	1	6	G	G	F	1	Public	1.2	Retain		
T121	*Pyrus calleryana*	Ornamental Pear	1	5	G	G	G	0.5	Private	1.2	Retain		
T122	*Acer saccharum*	Sugar Maple	1	25	G	G	G	3.5	Private	1.8	Retain		
T123	*Acer saccharum*	Sugar Maple	1	27	G	G	G	3.5	Private	1.8	Retain		
T124	*Acer platanoides*	Norway Maple	1	55	F	F	G	6	Park	3.6	Retain		
313	*Acer platanoides*	Norway Maple	1	34	G	F	G	4	Park	2.4	Retain		
314	*Acer platanoides*	Norway Maple	1	35	G	F	G	4.5	Park	2.4	Retain		
315	*Acer platanoides*	Norway Maple	1	25	G	G	G	3.5	Park	1.8	Retain		
T125	*Acer platanoides*	Norway Maple	1	16	G	G	G	2	Park	1.5	Preserve		Fence around staging area can act as tree protection
T126	*Acer platanoides*	Norway Maple	1	36	G	G	G	4.5	Park	2.4	Preserve		Fence around staging area can act as tree protection
309	*Acer platanoides*	Norway Maple	1	37	G	G	G	4.5	Park	2.4	Preserve		Fence around staging area can act as tree protection
T127	*Acer platanoides*	Norway Maple	1	23	G	G	G	5	Park	1.8	Preserve		Fence around staging area can act as tree protection
T128	*Pinus nigra*	Austrian Pine	1	38	G	G	G	4.5	Park	2.4	Injure	red X	
TG14	*Malus sp.*	Crabapple sp.	2	17-26	G	G	F/P	2.4	Private	1.8	Retain		
TG15	*Malus sp.*	Crabapple sp.	3	17-26	G	G	G	2	Private	1.8	Retain		
T129	*Picea pungens*	Blue Spruce	1	25	G	G	G	3.5	Private	1.8	Retain		
T130	*Picea pungens*	Blue Spruce	1	32	G	G	G	4	Private	2.4	Retain		
307	*Pinus nigra*	Austrian Pine	1	42	G	G	G	4	Park	2.4	Remove		
TG16	*Pinus nigra*	Austrian Pine	4	43-48	G	G	G	5	Park	3	Remove		
TG16	*Picea pungens*	Blue Spruce	1	38	G	G	G	4.5	Park	2.4	Remove		
T131	*Acer platanoides*	Norway Maple	1	45	F	G	G	5.5	Public	3	Remove		
TG17	*Pinus nigra*	Austrian Pine	6	30-50	G	G	G	6	Park	3	Injure		
T132	*Acer x freemanii*	Freeman's Maple	1	31	G	G	G	4	Public	2.4	Retain	tag #78	
T133	*Gleditsia triacanthos*	Honey-locust	1	29	P	P	P	3.5	Private	1.8	Retain		
T134	*Acer platanoides*	Norway Maple	1	60	G	F	G	7	Public	3.6	Retain	tag #77	
T135	*Gleditsia triacanthos*	Honey-locust	1	28	G	G	G	3.5	Private	1.8	Retain		
T136	*Acer platanoides*	Norway Maple	1	52	G	G	G	6	Public	3.6	Retain	tag#75	
T137	*Acer platanoides*	Norway Maple	1	52	G	G	G	6	Public	3.6	Retain	tag #76	
T138	*Ginkgo biloba*	Ginkgo	1	7	G	G	F	1	Public	1.2	Retain		
T139	*Ginkgo biloba*	Ginkgo	1	8	F	G	G	1	Public	1.2	Retain		
T140	*Gleditsia triacanthos*	Honey-locust	1	7	F	F	P	1	Public	1.2	Retain		
T141	*Gleditsia triacanthos*	Honey-locust	1	8	F	G	F	1	Public	1.2	Retain		
T142	*Gleditsia triacanthos*	Honey-locust	1	8	F	G	F	1	Public	1.2	Retain		
T143	*Ulmus pumila*	Siberian Elm	1	50	F	F	F	6	Private	3	Retain		
T144	*Ulmus pumila*	Siberian Elm	1	44	G	F	F	5	Private	3	Retain		
T145	*Gleditsia triacanthos*	Honey-locust	1	9	G	G	G	1	Public	1.2	Retain		
T146	*Gleditsia triacanthos*	Honey-locust	1	10	G	G	G	1	Public	1.5	Retain		
T147	*Gleditsia triacanthos*	Honey-locust	1	11	F	G	G	1	Public	1.5	Retain		
T148	*Acer negundo*	Manitoba Maple	1	46	F	F	G	5.5	Private	3	Retain		
T149	*Amelanchier sp.*	Serviceberry sp.	1	5	F	G	G	0.5	Public	1.2	Retain		
T150	*Amelanchier sp.*	Serviceberry sp.	1	6	F	G	G	1	Public	1.2	Retain		
T151	*Amelanchier sp.*	Serviceberry sp.	1	6	G	G	G	1	Public	1.2	Retain		
T152	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Public	1.2	Retain		
T153	*Amelanchier sp.*	Serviceberry sp.	1	6	F	G	G	1	Public	1.2	Retain		
T154	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Public	1.2	Retain		
T155	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Public	1.2	Retain		

SERVICE DATA

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STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
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DEC 6, 2023	60% DETAIL DESIGN	J.A.

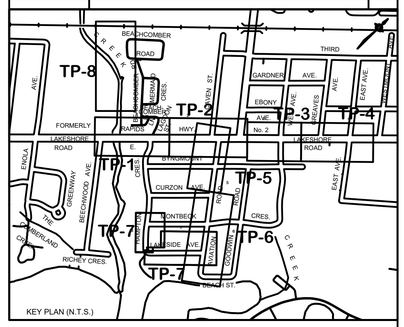

TABLE 1: LEGEND

- TREE TO BE RETAINED
- TREE TO BE PRESERVED
- TREE TO BE REMOVED
- TREE PROTECTION ZONE REDUCTION - INJURY - CONSTRUCTION

TREE INVENTORY & PRESERVATION CHART LEGEND

Tree Assessment Criteria:

Trunk Integrity (T.I.): this is an assessment of the trunk for any defects or weaknesses .It is measured on a scale of poor, fair, good.

Canopy Structure (C.S.): this is an assessment of the scaffold branches, unions and the canopy of the tree. This is measured on a scale of poor, fair, good.

Canopy Vigour (C.V.): this is an assessment of the health of the tree and assess the amount of deadwood and the live growth in the crown as compared to a 100% healthy tree. the size, colour and amount of foliage are also considered in this category. This is measured on a scale of poor, fair, good.

Tree Location:

Private: Stem of tree is located entirely on private property
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Tree Condition:

G Good - tree displays less than 15% deficiency / defect within the given tree assessment criteria (TI,CS,CV)
F Fair - tree displays 15-50% deficiency / defect within the given tree assessment criteria (TI,CS,CV)
P Poor - tree displays greater than 40% deficiency / defect within the given tree assessment criteria (TI,CS,CV)
D Dead - tree displays 100% deficiency / defect within the canopy vigour tree assessment criteria

Designed by

Chkd

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
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ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel working with you

LAKESHORE ROAD EAST

FROM BEECHWOOD AVE TO HAMPTON CRES

PROP. 1200mm AND 600mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.	Plan No.	TP-10
Date	SEPTEMBER 2023	Sheet	10 of 12		

Tree #	Botanical Name	Common Name	Qty	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
T156	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Public	1.2	Retain		
T157	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Public	1.2	Retain		
T158	*Ulmus pumila*	Siberian Elm	1	MS 10, 9	F	F	G	1	Private	1.5	Retain		
T158.1	*Acer negundo*	Manitoba Maple	1	MS 12, 5, 7	F	F	F	1	Private	1.5	Retain		
T158.2	*Acer negundo*	Manitoba Maple	1	20, 35	G	G	G	8	Public	3	Retain		
TG18	*Quercus macrocarpa*	Bur Oak	5	4 to 11	G	G	F	1	Public	1.5	Retain		
TG18	*Acer x freemanii*	Freeman's Maple	1	5	G	F	P	0.5	Public	1.2	Retain		
T159	*Acer negundo*	Manitoba Maple	1	28	p	p	G	5	Public	1.8	Retain	leader broken	
T160	*Acer negundo*	Manitoba Maple	1	23, 16	G	F	P	5	Public	1.8	Retain		
T161	*Ulmus pumila*	Siberian Elm	1	MS 13, 13, 16, 15	G	G	G	3	Public	1.8	Retain		
T162	*Ulmus pumila*	Siberian Elm	1	11	G	G	G	1	Public	1.5	Retain		
TG19	*Fraxinus sp.*	Ash sp.	4	<5	G	G	G	0.5	Public	1.2	Retain		
TG20	*Ulmus pumila*	Siberian Elm	3	10	G	G	G	1	Public	1.5	Retain		
TG20	*Fraxinus sp.*	Ash sp.	1	7, 8	G	G	G	0.5	Public	1.2	Retain		
TG21	*Fraxinus sp.*	Ash sp.	3	<10	G	G	G	0.5	Public	1.2	Retain		
T163	*Acer saccharinum*	Silver Maple	1	13	F	F	G	1	Public	1.5	Retain		
T164	*Ulmus pumila*	Siberian Elm	1	18	G	G	G	2	Public	1.5	Retain		
T165	*Acer saccharinum*	Silver Maple	1	8	G	F	G	1	Public	1.2	Retain		
TG22	*Fraxinus sp.*	Ash sp.	1	<10	G	G	G	0.5	Public	1.2	Retain		
TG22	*Acer negundo*	Manitoba Maple	4	<10	G	G	G	0.5	Public	1.2	Retain		
TG22	*Salix sp.*	Willow sp.	6	<10	G	G	G	0.5	Public	1.2	Retain		
TG22	*Ailanthus altissima*	Tree of Heaven	2	<10	G	G	G	0.5	Public	1.2	Retain		
T166	*Ulmus pumila*	Siberian Elm	1	20	G	G	G	3	Public	1.5	Retain		
T167	*Acer x freemanii*	Freeman's Maple	1	10	G	G	G	1	Public	1.5	Retain		
T168	*Acer x freemanii*	Freeman's Maple	1	10	G	G	G	1	Public	1.5	Retain		
T169	*Acer x freemanii*	Freeman's Maple	1	12	G	G	G	1	Public	1.5	Retain		
T170	*Ulmus pumila*	Siberian Elm	1	45	F	F	G	5.5	Public	3	Retain		
T171	*Prunus virginiana*	Chokecherry	1	<10	G	G	G	0.5	Public	1.2	Retain		
TG23	*Acer negundo*	Manitoba Maple	8	<10	F	F	G	0.5	Private	1.2	Retain		
TG23	*Acer saccharum*	Sugar Maple	1	<10	P	P	P	0.5	Private	1.2	Retain		
TG23	*Populus deltoides*	Eastern Cottonwood	1	15	G	G	G	1	Private	1.2	Retain		
TG23	*Populus tremuloides*	Trembling Aspen	2	<10	G	G	G	0.5	Private	1.2	Retain		
TG23	*Pinus strobus*	White Pine	4	<10	G	G	G	0.5	Private	1.2	Retain		
T172	*Gleditsia triacanthos*	Honey-locust	1	6	G	G	G	1	Public	1.2	Retain		
T173	*Acer saccharum*	Sugar Maple	1	8	G	G	G	1	Private	1.2	Retain		
T174	*Acer saccharum*	Sugar Maple	1	7	G	G	G	1	Private	1.2	Retain		
T175	*Acer saccharum*	Sugar Maple	1	7	G	G	G	1	Private	1.2	Retain		
T176	*Carpinus betulus*	European Hornbeam	1	4	G	G	G	0.5	Private	1.2	Retain		
T177	*Carpinus betulus*	European Hornbeam	1	4	P	P	P	0.5	Private	1.2	Preserve	almost dead	Fence around staging area will act as tree protection
TG24	*Acer negundo*	Manitoba Maple	1	<10	F	F	G	0.5	Private	1.2	Preserve	growing through the fence	Existing chain link fence to act as tree protection
TG24	*Tilia americana*	American Basswood	7	<10	G	G	G	0.5	Private	1.2	Preserve		Existing chain link fence to act as tree protection
TG24	*Acer saccharum*	Sugar Maple	2	<10	G	G	G	0.5	Private	1.2	Preserve		Existing chain link fence to act as tree protection
TG24	*Populus tremuloides*	Trembling Aspen	1	<10	G	G	G	0.5	Private	1.2	Preserve	growing through the fence	Existing chain link fence to act as tree protection
T178	*Acer negundo*	Manitoba Maple	1	5	F	F	G	0.5	Private / CVC	1.2	Remove	growing through the fence	
T179	*Carpinus betulus*	European Hornbeam	1	4	G	G	G	0.5	Private / CVC	1.2	Remove		
T180	*Carpinus betulus*	European Hornbeam	1	8	G	G	G	1	Private / CVC	1.2	Remove		
TG25	*Thuja occidentalis 'emerald'*	Emerald White Cedar	6	MS <10	G	G	G	0.5	Private / CVC	1.2	Remove		
T181	*Picea glauca*	White Spruce	1	9	G	G	G	1	Private / CVC	1.2	Remove		
T182	*Picea glauca*	White Spruce	1	11	G	G	G	1	Private / CVC	1.5	Remove		
T183	*Acer x freemanii*	Freeman's Maple	1	12	G	G	G	1	Private / CVC	1.5	Remove		
T184	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Private / CVC	1.2	Remove		
T185	*Amelanchier sp.*	Serviceberry sp.	1	5	G	G	G	0.5	Private / CVC	1.2	Remove		
T186	*Pinus strobus*	White Pine	1	13	G	G	G	1	Private / CVC	1.5	Remove		
TG26	*Populus tremuloides*	Trembling Aspen	4	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	*Picea glauca*	White Spruce	5	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	*Thuja occidentalis*	White Cedar	3	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	*Betula papyrifera*	Paper Birch	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG26	*Acer saccharum*	Sugar Maple	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
T187	*Acer negundo*	Manitoba Maple	1	10 to 20	G	G	G	1	Private / CVC	1.5	Remove		
TG27	*Thuja occidentalis*	White Cedar	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG27	*Picea glauca*	White Spruce	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG27	-	Deciduous sp.	2	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG27	*Pinus sp.*	Pine sp.	1	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
T188	*Amelanchier sp.*	Serviceberry sp.	1	<10	G	G	G	0.5	Private	1.2	Preserve		Existing chain link fence to act as tree protection
T189	*Amelanchier sp.*	Serviceberry sp.	1	<10	G	G	G	0.5	Private	1.2	Retain		
T190	*Amelanchier sp.*	Serviceberry sp.	1	<10	G	G	G	0.5	Private	1.2	Retain		
T191	*Amelanchier sp.*	Serviceberry sp.	1	<10	G	G	G	0.5	Private	1.2	Retain		
T192	*Acer saccharinum*	Silver Maple	1	14	G	G	G	2	Private	1.5	Retain		
T193	*Acer saccharinum*	Silver Maple	1	12	G	G	G	1	Private	1.5	Retain		
T194	*Gleditsia triacanthos*	Honey-locust	1	12	G	G	G	1	Private	1.5	Retain		
T195	*Fraxinus pennsylvanica*	Green Ash	1	MS 10, 9, 5, 5	F	F	F	1.5	Private / CVC	1.5	Remove	EAB	
T196	*Ulmus americana*	American Elm	1	20, 20	G	F	G	5	Private / CVC	1.8	Remove		
T197	*Acer negundo*	Manitoba Maple	1	16	G	G	G	2	Private / CVC	1.5	Remove		
T198	*Acer negundo*	Manitoba Maple	1	11, 12	G	F	G	3	Private / CVC	1.5	Remove		
T199	*Fraxinus sp.*	Ash sp.	1	10 to 20	F	F	F	2	Private / CVC	1.5	Remove		
T200	*Acer negundo*	Manitoba Maple	1	10 to 20	G	G	G	2	Private / CVC	1.5	Remove		
T201	*Ulmus sp.*	Elm sp.	1	10 to 20	G	G	G	2	Private / CVC	1.5	Remove		
T202	*Juglans nigra*	Black Walnut	1	10 to 20	G	G	G	2	Private / CVC	1.5	Remove		
T203	*Ulmus pumila*	Siberian Elm	1	12	G	G	G	1	Private / CVC	1.5	Remove		
TG28	*Fraxinus sp.*	Ash sp.	13	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG28	*Juglans nigra*	Black Walnut	1	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG28	*Juniperus virginiana*	Red Cedar	1	<10	G	G	G	0.5	Private / CVC	1.2	Remove		
TG28	*Ulmus pumila*	Siberian Elm	11	<10	G	G	G	0.5	Private / CVC	1.2	Remove		

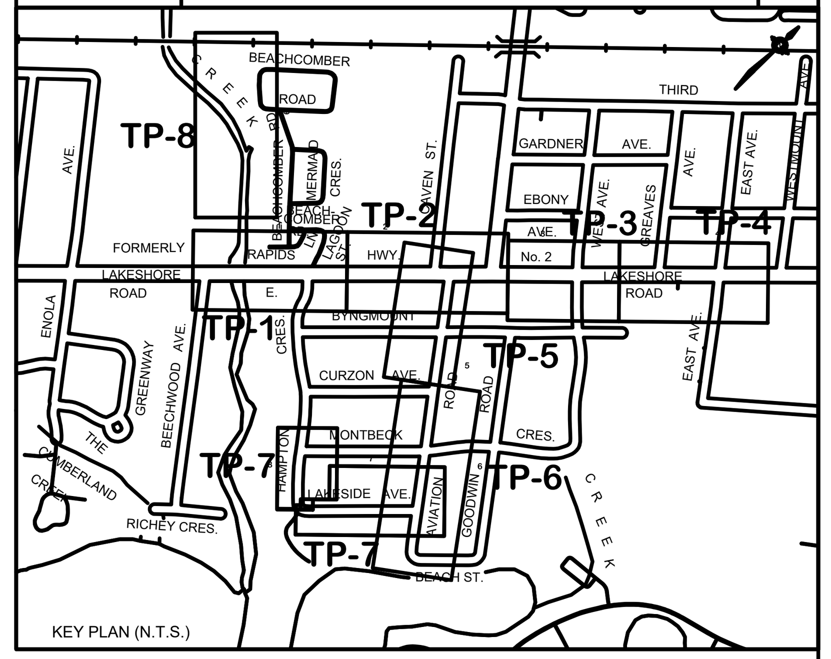
Tree #	Botanical Name	Common Name	Qty	DBH (cm)	TI	CS	CV	Dripline Radius (m)	Tree Location / Applicable By-law	Tree Protection Zone (m), Distance from Trunk	Recommendation	Comments - Health	Comments - Removal/Preservation
1	*Gleditsia triacanthos*	Honey-locust	1	13	G	G	G	1	Public	1.5	Retain		
2	*Gleditsia triacanthos*	Honey-locust	1	16	F	G	G	1	Public	1.5	Retain		
3	*Gleditsia triacanthos*	Honey-locust	1	16	F	G	G	1	Public	1.5	Retain		
4	*Gleditsia triacanthos*	Honey-locust	1	19	F	F	G	2	Public	1.5	Retain		
5	*Gleditsia triacanthos*	Honey-locust	1	21	F	G	G	3	Public	1.8	Retain		
6	*Gleditsia triacanthos*	Honey-locust	1	21	F	G	G	3	Public	1.8	Retain		
7	*Gleditsia triacanthos*	Honey-locust	1	19	F	G	G	3	Public	1.5	Retain		
8	*Gleditsia triacanthos*	Honey-locust	1	23	F	G	G	3	Public	1.8	Preserve		
9	*Gleditsia triacanthos*	Honey-locust	1	25	F	G	G	3	Public	1.8	Remove		
343	*Gleditsia triacanthos*	Honey-locust	1	11	F	G	G	1	Public	1.5	Retain		
T214	*Gleditsia triacanthos*	Honey-locust	1	9	G	G	G	1	Public	1.2	Retain		
T213	*Acer platanoides*	Norway Maple	1	52	F	G	G	6	Park	3.6	Retain		
T212	*Acer platanoides*	Norway Maple	1	52	F	G	G	6	Park	3.6	Retain		
T211	*Acer platanoides*	Norway Maple	1	54	F	G	G	5	Park	3.6	Retain		
T210	*Celtis occidentalis*	Common Hackberry	1	<10	G	G	G	0.5	Private	1.2	Retain		
TG30	*Quercus macrocarpa*	Bur Oak	3	<10	G	G	G	0.5	Private	1.2	Retain		
TG29	*Thuja occidentalis*	White Cedar	10	<5	G	G	G	0.5	Private	no TPZ	Retain	1-2m tall	
T209	*Pinus nigra*	Austrian Pine	1	33	F	F	F	4	Private	2.4	Retain		
T208	*Acer saccharinum*	Silver Maple	1	38	F	F	F	5	Private	2.4	Retain	dieback 25-30%	
T207	*Acer saccharinum*	Silver Maple	1	55	D	D	D	-	Private	no TPZ	Retain		
T206	*Acer platanoides*	Norway Maple	1	23	G	G	G	5	Private	1.8	Retain		
T205	*Gleditsia triacanthos*	Honey-locust	1	55	G	G	G	7	Private	3.6	Retain		
T204	*Acer saccharinum*	Silver Maple	1	53	F	F	F	6	Private	3.6	Retain	broken leader, 30% dieback	
370	*Acer platanoides*	Norway Maple	1	32	F	G	G	5	Private	2.4	Retain		
371	*Acer platanoides*	Norway Maple	1	21	F	F	F	4	Private	1.8	Retain		
T215	*Gleditsia triacanthos*	Honey-locust	1	25, 20, 20	G	G	G	i	Private	2.4	Injure	boundary	horizontal root protection - mud mats
T216	*Gleditsia triacanthos*	Honey-locust	1	30	G	G	G	4	Private	1.8	Injure	boundary	horizontal root protection - mud mats
T217	*Gleditsia triacanthos*	Honey-locust	1	27	G	G	G	5	Private	1.8	Preserve		Fence around staging area can act as tree protection
T218	*Gleditsia triacanthos*	Honey-locust	1	29	G	G	G	5	Private	1.8	Preserve		Fence around staging area can act as tree protection
T219	*Pinus strobus*	White Pine	1	60	G	G	G	7	Private	3.6	Injure		horizontal root protection - mud mats
TG31	*Pinus strobus*	White Pine	5	25 to 35	G	F	G	5	Private	2.4	Injure		horizontal root protection - mud mats
TG32	*Pinus strobus*	White Pine	2	15	G	G	G	2	Private	1.5	Remove		
TG32	*Picea glauca*	White Spruce	1	10 to 20	G	G	G	2	Private	1.5	Remove		
T220	*Acer sp.*	Maple sp.	1	25	G	G	G	3.5	Private	1.8	Remove		
T221	*Acer sp.*	Maple sp.	1	25	G	G	G	3.5	Private	1.8	Remove		

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



KEY PLAN (N.T.S.)

TABLE 1: LEGEND

- TREE TO BE RETAINED
- TREE TO BE PRESERVED
- TREE TO BE REMOVED
- TREE PROTECTION ZONE REDUCTION - INJURY - CONSTRUCTION

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P Poor - tree displays greater than 40% deficiency / defect within the given tree assessment criteria (TI,CS,CV)
D Dead - tree displays 100% deficiency / defect within the canopy vigour tree assessment criteria

Designed by ____ ____ ____ ____ Chkd. ____

Approved by ____ ____ ____ ____ ____

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ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

FROM BEECHWOOD AVE TO HAMPTON CRES

PROP. 1200mm AND 600mm SAN SEWER

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	P.M.	Drawn by	P.M.	Plan No.	TP-11
Date	SEPTEMBER 2023	Sheet	11 of 12		

TREE PRESERVATION NOTES AND GUIDELINES

ESTABLISHMENT OF TREE PROTECTION ZONE (TPZ):

- TREE PRESERVATION MEASURES, INCLUDING THE ESTABLISHMENT OF TREE PROTECTION ZONE (TPZ) SHALL APPLY TO THE VEGETATION IDENTIFIED TO BE RETAINED AND PROTECTED. THE TREE PROTECTION ZONE SHALL CONSIST OF TREE PROTECTION FENCING AS PER CITY OF MISSISSAUGA STANDARDS. REFER TO DETAILS ON THIS SHEET
- NO GRADE CHANGES SHALL OCCUR WITHIN TREE PROTECTION ZONE. IN THE EVENT THAT GRADE CHANGES OCCUR EITHER AS A CUT OR FILL SITUATION, THE CONSULTING ARBORIST MUST BE NOTIFIED SO THAT PRECAUTIONS TO PRESERVE THE TREE CAN BE DETERMINED PRIOR TO THE PLACEMENT OF FILL OR EXCAVATION ACTIVITIES.
- EVERY PRECAUTION MUST BE TAKEN TO PREVENT DAMAGE TO TREES AND ROOT SYSTEMS FROM DAMAGE, COMPACTION AND CONTAMINATION RESULTING FROM THE CONSTRUCTION TO THE SATISFACTION OF THE CONSULTING ARBORIST.
- TREES THAT REQUIRE PRUNING TO PERMIT CONSTRUCTION ACTIVITIES WILL BE DONE SO IN ACCORDANCE WITH GOOD ARBORICULTURAL PRACTICES. IN THE EVENT THAT IT IS NECESSARY TO REMOVE ADDITIONAL LIMBS OR PORTIONS OF TREES, AFTER CONSTRUCTION HAS COMMENCED, TO ACCOMMODATE CONSTRUCTION, THE CONSULTING ARBORIST IS TO BE INFORMED AND UNDER THEIR DIRECTION THE REMOVAL IS TO BE EXECUTED CAREFULLY AND IN FULL ACCORDANCE WITH ARBORICULTURAL TECHNIQUES, BY A CERTIFIED ARBORIST.
- ANY DAMAGE TO TREES SUCH AS BROKEN LIMBS, DAMAGE TO ROOTS, OR WOUNDS TO THE MAIN TRUNK OR STEM SYSTEMS ARE TO BE REPORTED TO THE CONSULTING ARBORIST SO THAT THE DAMAGE CAN BE ASSESSED IMMEDIATELY AND MITIGATION CAN BE PROMPTLY IMPLEMENTED.

TREE INJURY:

TYPICALLY TREE ROOTS EXTEND 1.5 TO 3 TIMES BEYOND THE DRIPLINE OF THE TREE AND ARE WITHIN THE TOP 150mm OF THE SOIL. TYPES OF DAMAGE FROM CONSTRUCTION INCLUDE:

- PHYSICAL INJURY
- SOIL COMPACTION
- SEVERING OF ROOTS
- SMOTHERING OF ROOTS
- SPLIT OR BROKEN BRANCHES
- EXCESSIVE PRUNING

SOIL COMPACTION REDUCES PORE SPACE, OXYGEN AVAILABLE TO ROOTS INCREASES CARBON DIOXIDE ACCUMULATION, RESTRICTS ROOT GROWTH AND THE ABILITY TO ABSORB WATER AND NUTRIENTS, AS WELL AS IMPAIRS DRAINAGE.
SMOTHERING OF ROOTS: 90% OF FINE ABSORBING ROOTS ARE WITHIN THE UPPER 150-300mm OF THE SOIL. SMOTHERING WITH THE ADDITION OF SOIL CAN KILL THE ROOTS AND STRESS THE TREE. PHYSICAL INJURY, SPLIT OR BROKEN BRANCHES HINDER THE TREES ABILITY TO COMPARTMENTALIZE (CLOSE) WOUNDS PROPERLY.

ROOT PRUNING PRACTICES:

- DURING EXCAVATION OPERATIONS IN WHICH THE ROOT AREA IS AFFECTED, THE CONTRACTOR IS TO PRUNE ALL EXPOSED ROOTS CLEANLY. PRUNED ROOT ENDS ARE TO BE NEATLY AND SQUARELY TRIMMED AND THE AREA IS TO BE BACKFILLED WITH CLEAN NATIVE FILL AS SOON AS POSSIBLE TO PREVENT DESICCATION AND PROMOTE ROOT GROWTH. THE EXPOSED ROOTS SHOULD NOT BE ALLOWED TO DRY OUT, AND THE CONTRACTOR SHALL DISCUSS WATERING OF THE ROOTS WITH THE CONSULTING ARBORIST SO THAT THE ROOTS SHALL MAINTAIN OPTIMUM SOIL MOISTURE DURING CONSTRUCTION AND BACKFILLING OPERATIONS, YET SO NOT TO INTERFERE WITH CONSTRUCTION OPERATIONS. BACKFILLING MUST BE WITH CLEAN UNCONTAMINATED TOPSOIL FROM AN APPROVED SOURCE. TEXTURE MUST BE COARSER THAN EXISTING SOILS, AND TO COME INTO CLEAN CONTACT WITH EXISTING SOILS (REMOVE AIR POCKETS, SOD, ETC.)
- TREE ROOTS SHOULD NOT BE EXCAVATED WITHIN THE CRITICAL STRUCTURAL ROOTING AREA. THIS IS THE MINIMUM AREA OF THE ROOT SYSTEM NECESSARY TO MAINTAIN VITALITY OR STABILITY OF THE TREE. TYPICALLY THIS AREA EXTENDS TO THE DRIPLINE OF THE TREE. THE SEVERING OF ONE ROOT CAN CAUSE APPROXIMATELY 5-20% LOSS OF THE ROOT SYSTEM. A REDUCTION OF THIS AREA BY GREATER THAN 30% CAN POSE STABILITY CONCERNS FOR THE TREE.
- A SLOW RELEASE FERTILIZER EG: BONE MEAL OR APPROVED EQUAL TO BE APPLIED TO TREES WHERE ROOT PRUNING OR ROOT DAMAGE HAS OCCURRED. APPLY PER MANUFACTURER'S RECOMMENDATIONS
- ROOTS OVER 2.5cm DIAMETER THAT ARE TO BE CUT SHOULD BE PRUNED RATHER THAN LEFT TORN OR CRUSHED
- AT THE COMMENCEMENT OF CONSTRUCTION PRUNE ROOTS CLEANLY USING ACCEPTABLE ARBORICULTURAL PRACTICES AND IMMEDIATELY BACKFILL WITH APPROPRIATE MATERIAL. THE FOLLOWING ARE GENERAL METHODS OF ROOT PRUNING TO TO UTILIZED WHEN GRADING / CONSTRUCTION WILL OCCUR WITHIN THE DRIPLINE OF TREES:

1. SOIL EXCAVATION USING SUPERSONIC AIR TOOLS, PRESSURIZED WATER OR HAND TOOLS, FOLLOWED BY SELECTIVE ROOT CUTTING
2. CUTTING THROUGH THE SOIL ALONG A PREDETERMINED LINE ON THE SURFACE USING TOOL SPECIFICALLY DESIGNED TO CUT ROOTS
3. MECHANICALLY EXCAVATING (e.g. BACKHOE) THE SOIL AND PRUNING WHAT IS LEFT OF THE EXPOSED ROOTS.
4. CUTS TO BE MADE WITH HAND PRUNING SHEARS, BY-PASS BLADE, PRUNING SAW. DO NOT USE ANVIL TYPE PRUNERS.

BRANCH PRUNING PRACTICES:

- ALL LIMBS DAMAGED OR BROKEN DURING THE COURSE OF CONSTRUCTION SHOULD BE PRUNED CLEANLY, UTILIZING BY-PASS SECATEURS IN ACCORDANCE WITH APPROVED HORTICULTURAL PRACTICES. SHOULD THERE BE A POTENTIAL RISK OF TRANSFER OF DISEASE FROM INFECTED TO NON-INFECTED TREES; TOOLS MUST BE DISINFECTED AFTER PRUNING EACH TREE BY DIPPING IN METHYL HYDRATE. THIS PRACTICE IS PARTICULARLY IMPORTANT DURING PERIODS OF TREE STRESS AND WHEN PRUNING MANY MEMBERS OF THE SAME GENERA, WITHIN WHICH A DISEASE COULD BE SPREAD QUICKLY (I.E., VERTICILLIUM WILT ON MAPLES OR FIRE BLIGHT ON GENERA OF THE ROSACEA FAMILY).
- ALL PRUNING CUTS SHOULD BE MADE TO A GROWING POINT SUCH AS A BUD, TWIG OR BRANCH, CUT JUST OUTSIDE THE BRANCH COLLAR (THE SWOLLEN AREA AT THE BASE OF THE BRANCH THAT SOMETIMES HAS A BARK RIDGE), AND PERPENDICULAR TO THE BRANCH BEING PRUNED RATHER THAN AS CLOSE TO THE TRUNK AS POSSIBLE. THIS MINIMIZES THE SITE OF THE WOUND. NO STUBS SHOULD BE LEFT. POOR CUT LOCATION, POOR CUT ANGLE AND TORN CUTS ARE NOT ACCEPTABLE.
- EXTENSIVE PRUNING IS BEST COMPLETED BEFORE PLANTS BREAK DORMANCY. PRUNING SHOULD BE LIMITED TO THE REMOVAL OF NO MORE THAN ONE THIRD (1/3) OF THE TOTAL BUD AND LEAF BEARING BRANCHES. PRUNING SHOULD INCLUDE THE CAREFUL REMOVAL OF
  DEADWOOD,
  BRANCHES THAT ARE WEAK, DAMAGED, DISEASED AND THOSE WHICH WILL
  INTERFERE WITH CONSTRUCTION ACTIVITY,
  SECONDARY LEADERS OF CONIFERS,
  TRUNK AND ROOT SUCKERS,
  TRUNK WATERSPOUTS, AND
  TIGHT V-SHAPED OR WEAK CROTCHES (INCLUDED UNIONS).
- THE CONTRACTOR MUST IMMEDIATELY REPORT ANY DAMAGE TO TREES SUCH AS BROKEN LIMBS, DAMAGE TO ROOTS, OR WOUNDS TO THE MAIN TRUNK OR STEM SYSTEMS SO THAT THE DAMAGE CAN BE ASSESSED IMMEDIATELY.
- THE TREE PROTECTION FENCING WILL BE MAINTAINED UNTIL ALL CONSTRUCTION IS COMPLETED, SOILS ARE STABILIZED AND ALL OF THE EQUIPMENT HAS BEEN REMOVED FROM THE SITE.
- ANY BRANCHES THAT OVERHANG THE WORK AREA AND REQUIRE PRUNING ARE TO BE PRUNED USING GOOD ARBORICULTURAL PRACTICES UTILIZING BY-PASS SECATEURS IN ACCORDANCE WITH APPROVED HORTICULTURAL PRACTICES AND/OR AMERICAN NATIONAL STANDARD (ANSI) A300 (PART 1) - 2008 PRUNING

WORK WITHIN A TREE PROTECTION ZONE:

IF WORK MUST BE CONDUCTED WITHIN A TREE PROTECTION ZONE THE CONTRACTOR SHOULD MINIMIZE SOIL COMPACTION AND MECHANICAL ROOT DAMAGE BY UTILIZING ONE OF THE FOLLOWING FOUR METHODS:

1. APPLYING 150-300mm OF MULCH TO AREA. UPON COMPLETION REMOVE EXCESS MULCH LEAVING A 100mm DEPTH LAYER OF MULCH.
2. LAYING 20mm THICK PLYWOOD OR 100X100mm WOOD BEAMS OVER A 100+MM THICK LAYER OF WOOD CHIP MULCH. UPON COMPLETION REMOVE PLYWOOD AND LEAVE MULCH LAYER IN PLACE.
3. APPLYING 100-150mm DEPTH OF GRAVEL OVER A TAUT, STAKED GEOTEXTILE FABRIC. UPON COMPLETION REMOVE GRAVEL AND GEOTEXTILE.
4. PLACING COMMERCIAL LOGGING OR ROAD MATS ON TOP OF A MULCH LAYER. UPON COMPLETION REMOVE MATS. STONE, GEOTEXTILE, AND MULCH EXCEEDING 100mm THICK WILL BE REMOVED FROM THE TREE PRESERVATION AREA ONCE THE THREAT OF SOIL OR ROOT DAMAGE HAS PASSED.

TREE PROTECTION ZONE:

APPLIES TO TREES LOCATED THE LIMIT OF GRADING OR NOTED OTHERWISE. THESE TREES ARE TO BE PRESERVED AND WILL HAVE SILT / TREE PROTECTION FENCING INSTALLED AT ALONG THE LIMIT OF GRADING / LIMIT OF WORK TO ESTABLISH THE TREE PROTECTION ZONE. ANY DAMAGE TO TREES SUCH AS BROKEN LIMBS, DAMAGE TO ROOTS, OR WOUNDS TO THE MAIN TRUNK OR STEM SYSTEMS ARE TO BE REPORTED TO THE CONSULTING ARBORIST SO THAT THE DAMAGE CAN BE ASSESSED IMMEDIATELY AND MITIGATION CAN BE PROMPTLY IMPLEMENTED. WITHIN A TREE PROTECTION ZONE THERE IS TO BE:

- NO CONSTRUCTION
- NO ALTERING OF GRADE BY ADDING FILL, EXCAVATING, TRENCHING, SCRAPING, DUMPING OR DISTURBANCE OF ANY KIND.
- NO STORAGE OF CONSTRUCTION MATERIALS, EQUIPMENT, SOIL, CONSTRUCTION WASTE OR DEBRIS WITHIN THE DRIP LINE
- NO MOVEMENT OF VEHICLES, EQUIPMENT
- NO PARKING OF VEHICLES OR MACHINERY
- NO DIGGING, BORING
- NO RIGGING CABLES SHALL BE WRAPPED AROUND OR INSTALLED IN TREES
- NO CONTAMINANTS WILL BE PLACED OVER ROOT SYSTEM
- NO CONTAMINANTS WILL BE DUMPED OR FLUSHED WHERE FEEDER ROOTS OF TREES EXIST

TREE PRESERVATION NOTES AND GUIDELINES

TREE PROTECTION FENCING

THE APPLICANT IS RESPONSIBLE FOR ENSURING THAT TREE PROTECTION HOARDING IS MAINTAINED THROUGHOUT ALL PHASES OF DEMOLITION AND CONSTRUCTION IN THE LOCATION AND CONDITION AS APPROVED BY THE PLANNING AND BUILDING DEPARTMENT. NO MATERIALS (BUILDING MATERIALS, SOIL, ETC.) MAY BE STOCKPILED WITHIN THE AREA OF HOARDING. FAILURE TO MAINTAIN THE HOARDING AS ORIGINALLY APPROVED OR THE STORAGE OF MATERIALS WITHIN THE HOARDING WILL BE CAUSE FOR THE LETTER OF CREDIT TO BE HELD FOR TWO (2) YEARS FOLLOWING COMPLETION OF ALL SITE WORKS.

TPZ REDUCTION - TREE INJURY

- WHERE TREE PROTECTION ZONES WILL REQUIRE A REDUCTION DUE TO PROPOSED WORKS E.G. CYCLE TRACK, IT IS EXPECTED THAT SOME 'INJURY' MAY OCCUR DUE TO POTENTIAL DAMAGE TO ROOTS AND BRANCHES FROM EXCAVATION, COMPACTION ETC .
- AIR-SPADE / HYDRO-VACUUM EXCAVATION IS RECOMMENDED AS A MEASURE TO REDUCE 'INJURY'.
- REFER TO NOTES ON THIS SHEET AS WELL AS SHEETS TP-1 TO TP-9 FOR TREES WHERE THIS MEASURE IS RECOMMENDED.

TPZ REDUCTIONS (NO INJURY)

WHERE TREE PROTECTION ZONES WILL REQUIRE A REDUCTION DUE TO PROXIMITY TO AN EXISTING HARD SURFACE SUCH AS DRIVEWAYS, EDGE OF PAVEMENT AND SIDEWALKS, THERE WILL BE NO 'INJURY' AS IT IS ASSUMED THAT NO TREE ROOTS HAVE ESTABLISHED UNDER CURBS, ROADS, DRIVEWAYS AND SIDEWALKS AND THAT NO CONSTRUCTION WILL OCCUR IN THESE AREAS. THIS APPLIES TO THE FOLLOWING TREES:

- REFER TO NOTES ON THIS SHEET AS WELL AS SHEETS TP-1 TO TP-9 FOR TREES WHERE THIS MEASURE IS RECOMMENDED.
- THIS MEASURE APPLIES TO TREE NUMBERS: L5, L7, L8, L13, L61, L62, L63, L67, L99, L100, L114 TO L116, L118, C1, C2, C10, C11, C16, C17, C42, C43, C49, C56, C76, C101

- WHERE AN ENCROACHMENT EXCEEDS 3x THE TRUNK DIAMETER, TREES HAVE BEEN RECOMMENDED TO BE REMOVED.
- E.G. 30cm DBH x 3 = 90cm. ANY PROPOSED WORKS WITHIN 90cm OF THE TRUNK WILL BE DEEMED TOO SIGNIFICANT AN INJURY WITHIN THE CRITICAL ROOT ZONE, FOR THE TREE TO OVERCOME, LEADING TO A SPIRAL OF DECLINE AND THEREFORE REMOVAL IS RECOMMENDED.

ROOT AND BRANCH PRUNING

- IT IS LIKELY THAT SOME BRANCH PRUNING WILL BE NECESSARY WHERE EXISTING PRESERVED TREES ARE CLOSE TO SERVICE CONNECTION INSTALLATIONS. BRANCH PRUNING LOCATIONS ARE TO BE REVIEWED IN THE FIELD BY THE CONTRACT ADMINISTRATOR. THIS WORK IS TO BE CONDUCTED BY AN ISA CERTIFIED ARBORIST OR UNDER THE SUPERVISION OF ONE AND IN ACCORDANCE WITH THE GUIDELINES ON SHEET TP-9.
- TREE ROOTS ARE LIKELY TO BE IMPACTED WHERE THERE WILL BE ENCROACHMENT INTO THE MINIMUM TREE PROTECTION ZONE. ROOTS ARE TO BE PRUNED BY A CERTIFIED ARBORIST OR UNDER THE SUPERVISION OF ONE AND IN ACCORDANCE WITH THE 'ROOT PRUNING' GUIDELINES ON SHEET TP-9.

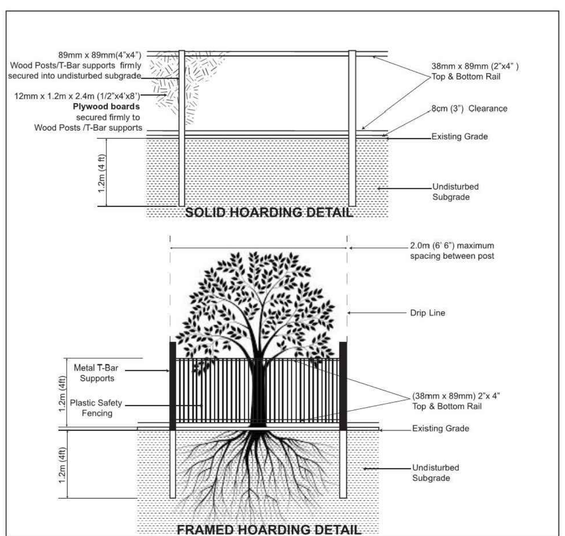
TREE PRESERVATION SPECIFIC NOTES

- HOARDING MUST BE INSPECTED BY THE CITY OF MISSISSAUGA PRIOR TO REMOVAL OF ANY TREE PROTECTION HOARDING FROM THE SITE. THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING THIS INSPECTION WITH THE CITY OF MISSISAUGA.
- CONTRACTOR TO IDENTITY THE LOCATION OF ALL EXISTING AND PROPOSED UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO REMOVAL OF TREES AND COMMENCEMENT OF CONSTRUCTION.

TREE INVENTORY CRITERIA

- IN ACCORDANCE WITH THE CRITERIA SET OUT IN THE RFP, TREES >10cm DBH WITHIN THE ROAD ALLOWANCE WERE REQUIRED TO BE INVENTORIED.
- TREES >10cm DBH WERE INVENTORIED FOR SPECIES, SIZE, CONDITION, DRIPLINE RADIUS AND ASSIGNED AN ALPHA-NUMERIC IDENTIFIER;
- TREES <10cm DBH WERE INVENTORIED FOR SPECIES AND SIZE ONLY AND NOT ASSIGNED AN ALPHA-NUMBERIC IDENTIFIER.

TREE PRESERVATION HOARDING DETAIL



NOTES:
1. Hoarding details to be determined following initial site inspection.
2. Private tree hoarding to be approved by Development & Design ; City tree hoarding to be approved by Community Services Dept.
3. Hoarding must be supplied, installed and maintained by the applicant throughout all phases of construction. **Inspection must be conducted by the Development and Design Division prior to removing any/all private hoarding.**
4. Do not allow water to collect and pond behind or within hoarding.
5. **T-bar supports are acceptable alternative to 4x4 posts. U-shaped metal supports will not be accepted.**
6. **Plywood** must be utilized for 'solid' hoarding. OSB/Chipboard will not be accepted for solid hoarding. Plywood sheets must be installed on "construction" side of frame.
7. Applicant is responsible to ensure utility locates are completed within city boulevard prior to installing framed hoarding.

TREE PRESERVATION HOARDING

SCALE : N.T.S DATE : June 2017

MISSISSAUGA

ARBORIST REPORT NOTES

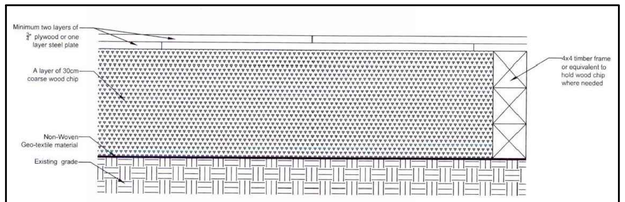
- FOR A DETAILED DESCRIPTION OF TREE SPECIES, SIZE, CONDITION AND RECOMMENDATIONS REFER TO THE TREE PRESERVATION CHARTS ON SHEETS C56101 AND C56102 AND APPENDIX A: TREE PRESERVATION CHARTS IN THE ARBORIST REPORT PREPARED BY WSP CANADA INC., DATED: NOVEMBER 16, 2023.
- REFER TO THE ARBORIST REPORT FOR SPECIFIC RECOMMENDATIONS, PROTECTIVE AND MITIGATION MEASURES.

WORK WITHIN A TREE PROTECTION ZONE

IF WORK MUST BE CONDUCTED WITHIN A TREE PROTECTION ZONE AND AIR-SPADE / HYDRO-VACUUM EXCAVATION CANNOT BE COMPLETED, THE CONTRACTOR SHALL MINIMIZE SOIL COMPACTION AND MECHANICAL ROOT DAMAGE BY UTILIZING ONE OF THE FOLLOWING METHODS:

1. APPLYING 150-300mm OF MULCH TO AREA. UPON COMPLETION REMOVE EXCESS MULCH LEAVING A 100mm DEPTH LAYER OF MULCH.
2. LAYING 20mm THICK PLYWOOD OR 100X100mm WOOD BEAMS OVER A 100+MM THICK LAYER OF WOOD CHIP MULCH. UPON COMPLETION REMOVE PLYWOOD AND LEAVE MULCH LAYER IN PLACE.

HORIZONTAL TREE PROTECTION DETAIL



Horizontal Tree Protection (Wood Chip)

HORIZONTAL ROOT PROTECTION

TO BE UTILIZED WHERE INDICATED ON PLANS, IN AREAS WHERE ENCROACHMENTS AND OR REDUCTIONS WILL OCCUR WITHIN A TREE PROTECTION ZONE (TPZ). THIS MEASURE WILL APPLY TO TREES T215, T216, T219 AND THE TREES IN TREE GROUPING TG31. THE FOLLOWING STEPS ARE RECOMMENDED RECOMMENDED WHEN IMPLEMENTING THIS MEASURE:

- THE TREE AND TPZ ARE LOCATED WITHIN THE PROPOSED STAGING AREA;
- PLACE LAYER OF NON-WOVEN GEO-TEXTILE MATERIAL ON TOP OF SOD;
- PLACE 30CM DEPTH WOOD CHIP MULCH ON TOP OF GEO-TEXTILE. WHERE REQUIRED PLACE 4X4 TIMBERS TO HOLD MULCH IN PLACE;
- FIELD FIT IF NECESSARY. BOARD WIDTH AND LENGTH MAY VARY DEPENDING ON AVAILABLE SPACE;
- INSTALL TREE PROTECTION HOARDING AROUND ROOT PROTECTION AREA;
- UPON COMPLETION, REMOVE EXCESS MULCH AND SPREAD MULCH IN A 1M DIAMETER AROUND THE TRUNK TO A DEPTH OF 5CM AND REINSTATE TREE PROTECTION FENCING TO ORIGINAL LOCATION;
- APPLICATION TO BE REVIEWED AND APPROVED BY THE CONTRACT ADMINISTRATOR PRIOR TO INSTALLATION;
- RESTORE DISTURBED AREAS.

TPZ ENCROACHMENT MITIGATION MEASURES - AIR-SPADE / HYDRO-VACUUM EXCAVATION

WHERE EXCAVATION OR CONSTRUCTION ACTIVITIES WILL ENCROACH INTO TREE PROTECTION ZONES, AIR-SPADE / HYDRO-VACUUM EXCAVATION IS RECOMMENCED. PRIOR TO EXCAVATION AND CONSTRUCTION THIS MEASURE IS RECOMMENDED TO BE APPLIED AT 1 TREE LOCATION (TREE T27):

- INSTALL TREE PROTECTION HOARDING AS SHOWN ON PLAN;
- AT THE LIMIT OF EXCAVATION FOR THE SIDEWALK, AIR-SPADE / HYDRO-VACUUM EXCAVATE TO A WIDTH OF 0.5m AND TO A DEPTH OF 300mm TO EXPOSE ROOTS SO THEY CAN BE PRUNED;
- AIR SPADE / HYDRO-VACUUM EXCAVATE ON THE OUTSIDE OF THE TREE PROTECTION HOARDING LIMIT;
- ENSURE THAT THE AIR / WATER PRESSURE USED FROM IS SUCH THAT IT WILL NOT DAMAGE ROOTS DURING EXCAVATION;
- PRUNE ROOTS IN ACCORDANCE WITH NOTES THIS SHEET OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST.
- TEMPORARILY BACKFILL WITH EXCAVATED MATERIAL UNTIL CONSTRUCTION COMMENCES, TO PROTECT ROOTS FROM DRYING OUT;
- WATER TREES PERIODICALLY DURING CONSTRUCTION;
- AT THE COMPLETION OF CONSTRUCTION, APPLY 50mm DEPTH SHREDDED BARK MULCH IN A MINIMUM 2m RADIUS AROUND THE TREE (MAY VARY DEPENDING ON TREE LOCATION);
- IT IS RECOMMENDED THAT THIS MEASURE BE APPLIED WHILE A CERTIFIED ARBORIST IS PRESENT.

ROOT PRUNING PRACTICES:

- DURING EXCAVATION OPERATIONS IN WHICH THE ROOT AREA IS AFFECTED, THE ISA CERTIFIED ARBORIST SHALL PRUNE ALL EXPOSED ROOTS CLEANLY. PRUNED ROOT ENDS ARE TO BE NEATLY AND SQUARELY TRIMMED AND THE AREA IS TO BE BACKFILLED WITH CLEAN NATIVE FILL AS SOON AS POSSIBLE TO PREVENT DESICCATION AND PROMOTE ROOT GROWTH. THE EXPOSED ROOTS SHALL NOT BE ALLOWED TO DRY OUT, AND THE CONTRACTOR SHALL DISCUSS WATERING OF THE ROOTS WITH THE CONSULTING ARBORIST SO THAT THE ROOTS SHALL MAINTAIN OPTIMUM SOIL MOISTURE DURING CONSTRUCTION AND BACKFILLING OPERATIONS, YET SO NOT TO INTERFERE WITH CONSTRUCTION OPERATIONS. BACKFILLING MUST BE WITH CLEAN UNCONTAMINATED TOPSOIL FROM AN APPROVED SOURCE. TEXTURE MUST BE COARSER THAN EXISTING SOILS, AND TO COME INTO CLEAN CONTACT WITH EXISTING SOILS (REMOVE AIR POCKETS, SOD, ETC.)

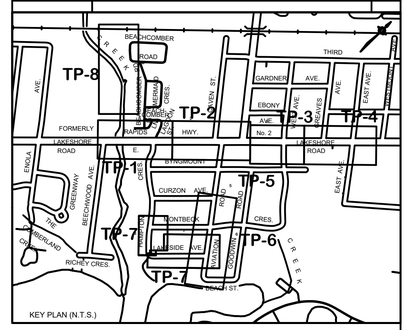
- ROOT PRUNING SHALL OCCUR PRIOR TO THE START OF CONSTRUCTION WHERE REQUIRED TO ACCOMMODATE CONSTRUCTION ACCESS. ROOTS SHALL BE PRUNED 15 TO 30 CM BACK FROM THE EDGE OF THE TPZ AND TO A DEPTH OF 1 METRE OR THE MAXIMUM DEPTH OF ROOT PENETRATION (WHICHEVER IS DEEPER). WHERE ROOT SYSTEMS OF PROTECTED TREES ARE EXPOSED DIRECTLY ADJACENT TO OR INJURED BY CONSTRUCTION WORK, THEY SHALL BE CLEANLY SEVERED BY AN ISA CERTI ED ARBORIST AND THE AREA BACK LLED WITH NATIVE MATERIAL TO PREVENT DESICCATION. CERTI CATION FROM THE ARBORIST OF THIS WORK SHALL BE AVAILABLE TO THE CITY.
- TREES TO BE PRESERVED THAT HAVE DIED OR HAVE BEEN INJURED BEYOND RECOVERY SHALL BE SUBJECT TO SUITABLE COMPENSATION AS DETERMINED BY THE CITY OF MARKHAM UPON REVIEW OF THE TREE INVENTORY AND ANALYSIS.

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.
DEC 6, 2023	60% DETAIL DESIGN	J.A.



Designed by

Chkd

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel working with you

LAKESHORE ROAD EAST

FROM BEECHWOOD AVE TO HAMPTON CRES

PROP. 1200mm AND 600mm SAN SEWER

CAD Area	X-XX	Area	X-XX
Checked by	P.M.	Drawn by	P.M.
Date	SEPTEMBER 2023	Sheet	12 of 12

Project No. 19M-00593

Plan No. **TP-12**

APPENDIX

A-3 Phase One and Two Environmental Site Assessments

DRAFT
PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
BEACH STREET PUMPING STATION DIVERSION
CITY OF MISSISSAUGA, ONTARIO

for

REGIONAL MUNICIPALITY OF PEEL

Peto MacCallum Ltd.
165 Cartwright Avenue
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M6A 1V5
Phone: (416) 785-5110
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Email: toronto@petomaccallum.com

Distribution:
Electronic Copy: The Regional Municipality of Peel
Electronic Copy: WSP
Electronic Copy: PML Toronto

PML Ref.: 21TF001
June 17, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

EXECUTIVE SUMMARY

Peto MacCallum Ltd. (PML) was retained by The Region of Peel to conduct a Phase One Environmental Site Assessment (ESA) along Lakeshore Road East from Beachwood Avenue to West Avenue (about 600 m), along Aviation Road between Lakeshore Road East and Lakeside Avenue to the south (about 380 m), along Lakeside Avenue between Aviation Road and Hampton Crescent (about 180 m), along Hampton Crescent between Lakeside Avenue and Montbeck Crescent (about 90 m) and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue intersection in the City of Mississauga.

The Phase One ESA was conducted for the Site and the Study Area (area within a 250 m radius of the Site) as part of the due diligence process to identify and verify the potential sources of contamination, if any. The assessment was performed in accordance with the Phase One ESA protocols outlined in Ontario Regulation 153/04 (amended).

Historically, residential with some mixed agricultural land use occupied the Site and the vicinity presumably since the late 1880s to early 1950s. Residential and commercial development occupied the Site and vicinity since the 1950s. At present, the Site is a double-lane local roadway having underground utilities, traffic lights and road lights. The Site's surface is mostly covered with asphalt pavement. The Site and vicinity are surrounded by mixed residential/parkland and commercial properties.

Based on the evaluation of the historical data and Site reconnaissance, twenty eight (28) Potentially Contaminating Activities (PCAs) were identified in thirteen (13) adjacent properties along the roadway alignment. The PCAs were related to auto repair shops, paint shops, diesel, gasoline, hydraulic oils and sewage spills, operation of dry-cleaning equipment, historical use of gasoline and associated products storage in fixed tanks, chemical manufacturing, processing and storage, metal fabrication, electricity generation/transformation, solvent manufacturing, processing and storage, foam manufacturing and processing and railway tracks.

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Tel: (416) 785-5110 Fax: (416) 785-5120
E-mail: toronto@petomaccallum.on.ca
BARRIE, HAMILTON, KITCHENER, TORONTO

The identified PCAs are listed below and shown on attached Drawing 1. The PCA numbers and descriptions are in accordance with Table 2, Schedule D, of Ontario Regulation 153/04 (amended).

LOCATION NO.	LOCATION	PCAs
1	740 Lakeshore Road East	PCA-39: Paints manufacturing, processing and bulk storage. Benjamin Moore - Current paint store.
2	644 Lakeshore Road East	PCA-10: Commercial autobody shop. Carwin Service Centre (Auto Repair Shop) PCA-28: Gasoline and Associated Products Storage in Fixed Tanks: Lakeview Shell Service Ctr-Former gasoline service station from 1989 to 1997. PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site. Unnumbered PCA A: As per Eris database, unknown amount of gasoline leaked into manhole and storm sewer in 1989.
3	570 Lakeshore Road East	PCA-10: Commercial autobody shop. ABM Garage (Auto Repair Shop) PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site. Unnumbered PCA B: As per Eris database, 10 L of unleaded gasoline seeped into the ground in 1988. Contamination in ground water was reported during interview.
4	544 Lakeshore Road East	Unnumbered PCA C: As per Eris database, 20 L of Hydraulic oil spilled on the ground in 2015.
5	Cooksville Creek at Lakeshore Rd and Beachwood	Unnumbered PCA D: As per Eris database, unknown amount of diesel fuel spilled in the Cooksville Creek. Unnumbered PCA E: As per Eris database, 3600 L of sewage spilled, impacting Cooksville Creek in 2009 and 2015.
6	Front of 859 Aviation Drive	Unnumbered PCA F: As per Eris database, unknown quantity of gasoline spilled into sewer in 2017.

LOCATION NO.	LOCATION	PCAs
7	849 Aviation Drive	Unnumbered PCA G: As per Eris database, unknown amount of sewage spill onto road during construction in 2012.
8	639 Beach Street	Unnumbered PCA H: As per Eris database, a power interruption caused 900 L of raw sewage spilled into Lake Ontario in 1994.
9	711 Lakeshore Road East	PCA-10: Commercial autobody shop. Cawthra Auto Service (Auto Repair Shop) PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site.
10	603 Lakeshore Road East	PCA- 37: Operation of Dry-Cleaning Equipment. Krisp and Clean Dry Cleaners - used for alteration of clothing, no chemical use. PCA-39: Paints manufacturing, processing and bulk storage - Sherman Williams Paints (Current paint store)
11	547 to 565 Lakeshore Road East	Unnumbered PCA I: As per Eris database, light fuels were used in 2016 and 2019.
12	501 Lakeshore Road East	Unnumbered PCA J: As per Eris database and RSC report, light and heavy fuels and petroleum distillates were used from 1992 to 2012. Based on RSC report, there was historical presence of: PCA-8: Chemical manufacturing, processing and bulk storage PCA-18: Electricity generation, transformation and power stations PCA-26: Foam and expanded foam manufacturing and processing PCA-28: Gasoline and associated products storage in fixed tanks PCA-34: Metal Fabrication PCA-51: Solvent manufacturing, processing and bulk storage PCA-55: Transformer manufacturing, processing and use

LOCATION NO.	LOCATION	PCAs
13	Tracks at the northwest end of the Site	PCA-46: Rail Yards, Tracks and Spurs- Existing Canadian Pacific Railway (CP) tracks.

The above-noted PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC) on the Site. The PCAs in locations 4, 5 and 13 were not considered environmental concerns since they were located distant or down-gradient/cross-gradient from the Site, and no indication of any contamination was noted during a walk-through visual inspection. The PCAs in remaining locations (1, 2, 3 and 6 to 12) were considered APEC for the Site since they were located up-gradient or in close proximity to the Site.

Based on the evaluation of information, it is understood that there are possibilities of contamination from historical and current land use activities along the alignment.

Recommendation

Based on the findings of Phase One ESA, a Phase Two ESA consisting of geoenvironmental sampling and chemical testing of soil and ground water are recommended for areas abutting the properties (except locations 4, 5 and 13) listed in the above table.

The proposed geotechnical/hydrogeological program will cover most of the identified PCAs/APEC except PCAs/APEC in three locations – the locations of a historical gas station/current auto repair shop (location 2 - 644 Lakeshore Road East), a current auto repair shop (location 3 - 570 Lakeshore Road East) and location 12 with numerous PCAs (501 Lakeshore Road East).

To address the PCAs at locations 2, 3 and 12, we are recommending three additional boreholes with monitoring wells to be drilled abutting the locations 2, 3 and 12 (APEC 2, 3 and 12). Proposed additional borehole/monitoring well locations are shown on attached Drawing 1.

TABLE OF CONTENTS

EXECUTIVE SUMMARY……..……i-iv

1. INTRODUCTION 1
   - 1.1 Site Description 1
   - 1.2 Key Regulatory Definitions 1
2. SCOPE OF INVESTIGATION 2
3. RECORDS REVIEW 3
   - 3.1 General 3
     - 3.1.1 Phase One ESA Study Area Determination and Rationale 3
     - 3.1.2 First Developed Use Determination and Rationale 3
     - 3.1.3 Fire Insurance Plan 3
     - 3.1.4 MECP Water Well Records Review 3
     - 3.1.5 Environmental Report 4
   - 3.2 Environmental Source Information 5
   - 3.3 Physical Setting Source 8
     - 3.3.1 Aerial Photograph 8
     - 3.3.2 Topography, Hydrology and Geology 8
     - 3.3.3 Fill Material 9
     - 3.3.4 Water Bodies and Areas of Natural Significance 9
4. INTERVIEW 10
5. SITE RECONNAISSANCE 10
   - 5.1 General 10
   - 5.2 The Site Observation 10
   - 5.3 The Study Area Observation 11
6. REVIEW AND EVALUATION OF INFORMATION 11
   - 6.1 Potentially Contaminating Activities (PCAs) 11
   - 6.2 Areas of Potential Environmental Concern (APEC) 14
   - 6.3 Conceptual Site Model (CSM) 18

7. CONCLUSION 20

8. RECOMMENDATION 21

9. STATEMENT OF LIMITATION 21

10. QUALIFICATION OF ENVIRONMENTAL CONSULTANT 22

11. REFERENCE 23

ATTACHMENTS

Figure 1 – Key Map

Figure 2 – 1954 Aerial Photograph

Figure 3 – 1966 Aerial Photograph

Figure 4 – 1977 Aerial Photograph

Figure 5 – 1988 Aerial Photograph

Figure 6 – 2000 Aerial Photograph

Figure 7 – 2020 Aerial Photograph

Figure 8 – Topographic Map

Drawing 1: Site and Surrounding Area Features

Plates 1 through 11 – Site Photographs

Appendix A - ERIS Environmental Risk Information Services Report

Appendix B –Technical Standards and Safety Authority (TSSA) Responses

Appendix C – Statement of Limitations

1. INTRODUCTION

Peto MacCallum Ltd. (PML) was retained by The Region of Peel to conduct a Phase One Environmental Site Assessment (ESA) along Lakeshore Road East from Beachwood Avenue to West Avenue (about 600 m), along Aviation Road between Lakeshore Road East and Lakeside Avenue to the south (about 380 m), along Lakeside Avenue between Aviation Road and Hampton Crescent (about 180 m), along Hampton Crescent between Lakeside Avenue and Montbeck Crescent (about 90 m) and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue intersection in the City of Mississauga.

The Phase One ESA was conducted for the Site and the Study Area (area within a 250 m radius of the Site) as part of the due diligence process to identify and verify the potential sources of contamination, if any. The assessment was performed in accordance with the Phase One ESA protocols outlined in Ontario Regulation 153/04 (amended).

1.1 Site Description

The Site consists of several roadways along Lakeshore Road East in the City of Mississauga (Figure 1).

Historically, residential with some mixed agricultural land use occupied the Site and the vicinity presumably since the late 1880s to early 1950s. Residential and commercial development occupied the Site and vicinity since the 1950s. At present, the Site is a double-lane local roadway having underground utilities, traffic lights and road lights. The Site's surface is mostly covered with asphalt pavement. The Site and the Study Area are surrounded by mixed residential/parkland and commercial properties.

1.2 Key Regulatory Definitions

Defined by Ontario Regulation 153/04 under the EPA, as amended.

Phase One ESA Property (the Site) - means the property that is the subject of a Phase One ESA.

Phase One ESA Study Area (the Study Area) - means the area that includes a Phase One ESA Property, any other properties located, wholly or partly, within 250 metres from the nearest point on a boundary of the Phase One ESA property and any property that the Qualified Person (QP) determines to be included as a part of the Study Area.

Potentially Contaminating Activity (PCA) - means a use or activity set out in Table 2 of Schedule D of O. Reg. 153/04 (amended) that is occurring or has occurred in a Phase One ESA Study Area.

Areas of Potential Environmental Concern (APEC) - means the areas on, in or under a Phase One ESA property where one or more contaminants are potentially present, as determined through the Phase One ESA.

2. SCOPE OF INVESTIGATION

The Phase One ESA involved the following tasks to assess the road alignment's physical and geoenvironmental setting and to document past and present land use activities. This assessment was performed in accordance with the the Phase One ESA protocols outlined in Schedule D of O. Reg. 153/04 (amended). The Phase One ESA work involved the following tasks

i) A review of available documents including aerial photographs, topographic, geologic and hydrogeologic maps for the subject site prepared by PML, land registry records, Ministry of the Environment, Conservation and Parks (MECP) water well records and fire insurance plans to evaluate the site physical setting and to document past and present land use activities.

ii) Conducting a walk-through visual inspection along the road alignment and a 250 m area on both sides of the alignment to assess current site and surrounding area conditions and the visual presence of site features or olfactory evidences indicating potential contamination, if any.

iii) Interviews with the knowledgeable individuals regarding the site conditions associated with historical land use activities at the subject site.

iv) Preparation of this report, discussing the information compiled and the pertinent conclusions and recommendations together with the tables, figures, site photographs and drawings as well as other information in Appendices.

3. RECORDS REVIEW

3.1 General

3.1.1 Phase One ESA Study Area Determination and Rationale

The Site consists of several roadways along Lakeshore Road East in the City of Mississauga (Figure 1). The roadways include portions of Lakeshore Road East, Aviation Road, Lakeside Avenue, Hampton Crescent and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue intersection in the City of Mississauga. The Site and Study Area are surrounded mostly by mixed residential/parkland and commercial land uses.

In accordance with the regulatory requirements, a Phase One ESA must include the Site and the Study Area (area within 250 m radius of the Site).

3.1.2 First Developed Use Determination and Rationale

Based on information from aerial photographs, site visit and available maps, the first developed use of the Site was presumably residential in late 1880s.

3.1.3 Fire Insurance Plan

An attempt was made to review the historical Fire Insurance Plans (FIPs) for the Site and surrounding areas. However, no FIPs were available to review.

3.1.4 MECP Water Well Records Review

The Ministry of Environment, Conservation and Parks (MECP) Water Well Records database was searched for well records within 250 m radius of the site. Sixty four (64) recorded wells were located

within the 250 m radius of the Site. The wells listed are primarily categorized as monitoring wells or test holes.

The majority of the well records close to the alignment indicate the near-surface stratigraphy as sand, silty sand or gravelly sand (encountered in wells close to Cooksville Creek, and close to Lake Ontario), with clayey soils less common (encountered in wells along Lakeshore Road East near West Avenue). Shale bedrock was typically encountered between 4.0 and 5.5 m below ground surface (bgs).

3.1.5 Environmental Report

Based on the RSC report found from the Eris database, EXP Services Inc conducted a Phase I and II Environmental Site Assessment for 501 Lakeshore Road East in 2012. Based on the Phase I Site Assessment, the property was being used for various commercial and light industrial activities from the 1950s to 2006. The list of activities included bottle cap and medical packaging manufacturing, flooring and bottle warehousing, storage of stage equipment, a retail bicycle sales and repair shop, manufacturing facility for the assembly of televisions, clocks, radios, air conditioners and refrigerators. Between 1966 and 1970, extrusion and forming of plastic and door liners for refrigerators were manufactured. In 1972, radiation measuring equipment was manufactured. Finished door and cabinet manufacturing operations for refrigerators were also introduced in 1972.

Currently the property houses a commercial building with banks and restaurants.

Based on the Phase II Site Assessment, soil samples were collected from the property between 2006 and 2013. EC and SAR were the two parameters that were detected at concentrations exceeding the applicable Site Condition Standards (Table 3). Ground water samples were collected in 2011, 2012, 2013, and 2014. There were exceedences for volatile organic compounds (VOCs) such as Chloroform, 1,1-DCE, cis-1,2-DCE, trans-1,2DCE, PCE, TCE and VC.

3.2 Environmental Source Information

Environmental source information was obtained from the following sources: Ministry of the Environment, Conservation and Parks (MECP), Technical Standards and Safety Authority (TSSA) and the National Pollutant Release Inventory website. The environmental source information from ERIS database and TSSA are attached in Appendices B and C respectively.

A summary of the environmental source information is presented in Table 1 below.

TABLE 1

ENVIRONMENTAL SOURCE INFORMATION

ITEM	SOURCE	TITLE	PERTINENT INFORMATION	ANY POTENTIAL SOURCE OF CONTAMINATION (PCAs)?
1	Technical Standards and Safety Authority (TSSA)	Release of Public Information - TSSA	Record of one (1) active and nine (9) expired fuel storage tanks noted at 644 Lakeshore Rd E. Record of five (5) expired fuel storage tanks noted at 570 Lakeshore Rd E. Record of one (1) active and one (1) under review storage tanks noted at 501 Lakeshore Road E. An AST was observed in the back of the building during the Site visit.	Yes, on-Site soils and ground water
2	Ontario Ministry of Environment and Energy (MOEE) Jul 1993	Ontario Inventory of PCB Storage Sites	No listing was noted within the Site and adjacent properties	None

TABLE 1

ENVIRONMENTAL SOURCE INFORMATION

ITEM	SOURCE	TITLE	PERTINENT INFORMATION	ANY POTENTIAL SOURCE OF CONTAMINATION (PCAs)?
3	Ontario Ministry of Environment and Energy (MOEE) Apr 1987 and Nov 1988	Inventory of Coal Tar Wastes and Coal Gasification Plants	No listing was noted within the Site and adjacent properties.	None
4	Ontario Ministry of Environment and Energy (MOEE) Jun 1991	Waste Disposal Site Inventory of Landfill Sites	No listing was noted within the Site and adjacent properties.	None
5	MECP Location of Small Landfill Sites, 2019	http://www.ontario.ca/data/small-landfill-sites	No listing was noted within the Site and adjacent properties.	None
6	MECP Location of Large Landfill Sites, 2019	http://www.ontario.ca/environment-and-energy/map-large-landfill-sites	No listing was noted within the Site and adjacent properties.	None
7	http://www.ec.gc.ca/inrp-npri/	National Pollutant Release Inventory	No listing found for the Site and adjacent properties.	None
8	Eris database	Certificates of Approval	Twenty-six listings were noted within adjacent properties to the Site.	None
9	Eris database	Ontario Spills	Eight of the fifty listings were noted within adjacent properties to the Site.	Yes, on-Site soils and ground water
10	Eris database	Private and Retail Fuel Storage Tanks	Seven listings were noted within adjacent properties to the Site.	Yes, on-Site soils and ground water

TABLE 1

ENVIRONMENTAL SOURCE INFORMATION

ITEM	SOURCE	TITLE	PERTINENT INFORMATION	ANY POTENTIAL SOURCE OF CONTAMINATION (PCAs)?
11	Eris database	Federal Convictions	No listing was noted within the Site and adjacent properties.	None
12	Eris database	Record of Site Condition	Eight listings found within the adjacent properties to the Site.	None
13	Eris database	Ontario Regulation 347 Waste Generators Summary	Three of sixty-eight listings found within the adjacent properties to the Site. These include alkaline wastes-other metals, aliphatic solvents, aromatic solvents, aliphatic solvents, petroleum distillates, polymertic resins, paint/pigment/coating residues, neutralized wastes-heavy metals, amines, organic laboratory chemicals, waste oils and lubricants, oil skimmers and sludges, inert organic wastes, waste oils, alkaline wastes- heavy metals, emulsified oils, halogenated solvents, organic acids, light fuels, pharmaceuticals, pathological wastes, waste compressed gases including cylinders, photoprocessing wastes, misc wastes and inorganic chemicals, organic non-halogenated pesticides and herbicide wastes, misc waste organic chemicals, heavy fuels, latex wastes, PCBs and detergent/soaps.	Yes, on-Site soils and ground water

3.3 Physical Setting Source

3.3.1 Aerial Photograph

Historical and recent aerial photographs for the Site and vicinity areas were reviewed in order to assess the development sequence of the Site and adjacent properties. Based on the availability, the aerial photographs for the years 1954, 1966, 1977, 1988, 2000 and 2020 were selected for the current investigation and are shown on Figures 2 to 7. The review findings are outlined below.

Based on the aerial photographs of 1954 and 1966, developing residential and commercial lands were noted along both the sides of Lakeshore Road and adjacent properties (Figures 2 and 3). Based on the aerial photographs of 1977, 1988, 2000 and 2020, residential/parkland and commercial type structures/developments were noted along both the sides of Lakeshore Road (Figures 4, 5, 6 and 7). Cooksville Creek can be seen running north to south (Figures 2 to 7).

3.3.2 Topography, Hydrology and Geology

A review of the Topographic Map (Figure 8) was conducted for the Site and surrounding areas. The Atlas of Canada (Natural Resources Canada), indicated that the Site and surrounding area groud service elevation ranged from 81 to 89 meters abouve sea level (masl).

According to Chapman and Putnam (Physiography of Southern Ontario, Ministry of Natural Resources, 1984), the project area is in the physiographic region known as Iroquious Plain. The physiographic landforms in the area are defined as Bevelled Till Plain.

The OGS Earth Map of Surficial Geology of Southern Ontario (Ontario Geological Survey, 2010), indicated that the surficial geology is highly variable across the Site. The proposed sewer alignment is expected to primarily encounter fine-textured glaciolacustrine deposits (silt and clay, with minor inclusions of sand and gravel) and coarse-textured glaciolacustrine deposits (sand and gravel, with minor silt and clay) along and south of Lakeshore Road East. Paleozoic bedrock is expected within the portion of the Site and modern alluvial deposits are expected near the current and former river

beds. Clay to silt-textured till derived from glaciolacustrine deposits or shale may be encountered along Lakeshore Road East at West Avenue.

The bedrock underlying the Site is the Georgian Bay formation, which typically consists of shale (Paleozoic Geology of Southern Ontario, OGS, OGSEarth, 2007). According to MECP water well records for wells located close to the proposed sewer alignment, the bedrock beneath the Site is typically at a depth of about 4.0 to 5.5 m bgs.

According to the Cooksville Creek Conservation, the Site is located within the Cooksville Creek Watershed. Cooksville Creek, located in the west end of the Site boundary, flows from the northwest to the southeast, passing beneath Lakeshore Road East and discharging to Lake Ontario to the south of the Site.

The hydrogeology of the Site and the vicinity is primarily controlled by Cooksville Creek, topographic elevation, glacial geology and bedrock topography of the region. Locally, shallow ground water flows towards topographic depressions. The deep/regional ground water is expected to flow southerly/southwesterly towards Cooksville Creek and finally to Lake Ontario.

3.3.3 Fill Material

No fill piles were noticed along the alignment. However, engineered fill materials are expected to be present along the road alignment and adjacent developed sites/properties.

3.3.4 Water Bodies and Areas of Natural Significance

Cooksville Creek, located in the west end of the Site boundary, flows from the northwest to the southeast, passing beneath Lakeshore Road East and discharging to Lake Ontario to the south of the Site. Based on the Ontario Ministry of Natural Resources and Forestry (MNRF), no area of natural significance (ANSI) existed on the Site and adjacent properties.

4. INTERVIEW

During the course of this assessment, PML interviewed the following person on March 15, 2021 as outlined in Table 2 below:

TABLE 2
INTERVIEW SUMMARIZED INFORMATION

PLACE/ METHOD	PERSON INTERVIEWED	RATIONALE	INFORMATION PROVIDED
570 Lakeshore Rd E. ABM Garage	Lee Thibeauet (Project Manager)	Familiar with the site since the 1950s	• The Site was built in the 1950s. • 10 boreholes were drilled in 2020. Found various contaminants in the ground water. • An UST was removed prior to drilling.

5. SITE RECONNAISSANCE

5.1 General

A site reconnaissance along Lakeshore Road East and surrounding areas was carried out by an Environmental Professional (Mr. Jason Noronha) of PML on March 15, 2021.

Selected site photographs were taken at the time of site reconnaissance which are shown on Plates 1 to 10. Drawing 1 shows the Site and surrounding features, and potentially contaminating activities (PCAs) along the road alignments as observed during the site reconnaissance.

5.2 The Site Observation

The Site consists of several roadways along Lakeshore Road East in the City of Mississauga. (Figure 1). The roadways include portions of Lakeshore Road East, Aviation Road, Lakeside Avenue, Hampton Crescent and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue in the City of Mississauga. The Site and Study Area are surrounded mostly by mixed residential/parkland and commercial land uses (Drawing 1).

At present, the Site is a three-lane local roadway having underground utilities, traffic lights and road lights and the Site's surface is mostly covered with asphalt pavement. During the Site visit, normal operation of road like movement of vehicles was noticed.

A fuel aboveground storage tank (AST) was noted at 644 Lakeshore Road East. It is located in the rear of the building at the property.

There were no unusual noise, odour and vibration noted. No unidentified substance was noted at the Site. There was no water well noted on the Site.

5.3 The Study Area Observation

A visual inspection of the Study Area (area within 250 m radius of the Site) was conducted from the limits of the Site and publicly accessible areas to check for PCAs, water bodies and areas of natural significance (ANSI).

The Site and the surrounding areas are located in an area of mixed residential/parkland and commercial properties.

No Area of Natural Significance (ANSI) existed on Lakeshore Road East. Cooksville Creek, located in the west end of the Site boundary, flows from the northwest to the southeast, passing beneath Lakeshore Road East and discharging to Lake Ontario to the south of the Site.

6. REVIEW AND EVALUATION OF INFORMATION

6.1 Potentially Contaminating Activities (PCAs)

Based on the evaluation of the historical data and Site reconnaissance, twenty eight (28) Potentially Contaminating Activities (PCAs) were identified in thirteen (13) adjacent properties along the roadway alignment.

The PCAs were related to auto repair shops, paint shops, diesel, gasoline, hydraulic oils and sewage spills, operation of dry-cleaning equipment, historical use of gasoline and associated products

storage in fixed tanks, chemical manufacturing, processing and storage, metal fabrication, electricity generation/transformation, solvent manufacturing, processing and storage, foam manufacturing and processing and railway tracks.

The identified PCAs are listed below and shown on attached Drawing 1.

TABLE 3
"TABLE OF CURRENT AND PAST USES OF PHASE ONE PROPERTY
(Refer to clause 16(2)(b), Schedule D, O.Reg. 153/04)

LOCATION NO.	LOCATION	PCAs
1	740 Lakeshore Road East	PCA-39: Paints manufacturing, processing and bulk storage. Benjamin Moore - Current paint store.
2	644 Lakeshore Road East	PCA-10: Commercial autobody shop. Carwin Service Centre (Auto Repair Shop) PCA-28: Gasoline and Associated Products Storage in Fixed Tanks: Lakeview Shell Service Ctr-Former gasoline service station from 1989 to 1997. PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site. Unnumbered PCA A: As per Eris database, unknown amount of gasoline leaked into manhole and storm sewer in 1989.
3	570 Lakeshore Road East	PCA-10: Commercial autobody shop. ABM Garage (Auto Repair Shop) PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site. Unnumbered PCA B: As per Eris database, 10 L of unleaded gasoline seeped into the ground in 1988. Contamination in ground water was reported during interview.
4	544 Lakeshore Road East	Unnumbered PCA C: As per Eris database, 20 L of Hydraulic oil spilled on the ground in 2015.

TABLE 3
"TABLE OF CURRENT AND PAST USES OF PHASE ONE PROPERTY
(Refer to clause 16(2)(b), Schedule D, O.Reg. 153/04)

LOCATION NO.	LOCATION	PCAs
5	Cooksville Creek at Lakeshore Rd and Beachwood	Unnumbered PCA D: As per Eris database, unknown amount of diesel fuel spilled in the Cooksville Creek. Unnumbered PCA E: As per Eris database, 3600 L of sewage spilled, impacting Cooksville Creek in 2009 and 2015.
6	Front of 859 Aviation Drive	Unnumbered PCA F: As per Eris database, unknown quantity of gasoline spilled into sewer in 2017.
7	849 Aviation Drive	Unnumbered PCA G: As per Eris database, unknown amount of sewage spill onto road during construction in 2012.
8	639 Beach Street	Unnumbered PCA H: As per Eris database, a power interruption caused 900 L of raw sewage spilled into Lake Ontario in 1994.
9	711 Lakeshore Road East	PCA-10: Commercial autobody shop. Cawthra Auto Service (Auto Repair Shop) PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site.
10	603 Lakeshore Road East	PCA- 37: Operation of Dry-Cleaning Equipment. Krisp and Clean Dry Cleaners - used for alteration of clothing, no chemical use. PCA-39: Paints manufacturing, processing and bulk storage - Sherman Williams Paints (Current paint store)
11	547 to 565 Lakeshore Road East	Unnumbered PCA I: As per Eris database, light fuels were used in 2016 and 2019.
12	501 Lakeshore Road East	Unnumbered PCA J: As per Eris database and RSC report, light and heavy fuels and petroleum distillates were used from 1992 to 2012. Based on RSC report, there was historical presence of: PCA-8: Chemical manufacturing, processing and bulk storage PCA-18: Electricity generation, transformation and power stations

TABLE 3
"TABLE OF CURRENT AND PAST USES OF PHASE ONE PROPERTY
(Refer to clause 16(2)(b), Schedule D, O.Reg. 153/04)

LOCATION NO.	LOCATION	PCAs
		PCA-26: Foam and expanded foam manufacturing and processing PCA-28: Gasoline and associated products storage in fixed tanks PCA-34: Metal Fabrication PCA-51: Solvent manufacturing, processing and bulk storage PCA-55: Transformer manufacturing, processing and use
13	Tracks at the northwest end of the Site	PCA-46: Rail Yards, Tracks and Spurs- Existing Canadian Pacific Railway (CP) tracks.

Note: The PCA numbers are in accordance with Table 2, Schedule D, Ontario Regulation 153/04 (amended)

6.2 Areas of Potential Environmental Concern (APEC)

The above-noted PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC) on the Site. The PCAs in locations 4, 5 and 13 were not considered environmental concerns since they were located distant or down-gradient/cross-gradient from the Site, and no indication of any contamination was noted during a walk-through visual inspection. PCA-37 at 603 Lakeshore Road East was not considered as an APEC for the Site since the property was used for alteration of clothing and there was no chemical use.

The PCAs in remaining locations (1, 2, 3 and 6 to 12) were considered APEC for the Site since they were located up-gradient or in close proximity to the Site.

The identified APEC are listed in the table below.

TABLE 4

TABLE OF AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

(Refer to clause 16(2)(a), Schedule D, O. Reg. 153/04)

Area of Potential Environmental Concern (APEC)[1]	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC- 1 Site Area	740 Lakeshore Road East	PCA-39: Paints manufacturing, processing and bulk storage.	Off-Site	Metals, PHCs, VOCs	Soil and/or Ground water
APEC-2 Site Area	644 Lakeshore Road East	PCA-10: Commercial autobody shop. PCA-28: Gasoline and Associated Products Storage in Fixed Tanks PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems Unnumbered PCA A: As per Eris database, unknown amount of gasoline leaked into manhole and storm sewer in 1989	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Ground water
APEC-3 Site Area	570 Lakeshore Road East	PCA-10: Commercial autobody shop PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems Unnumbered PCA B: As per Eris database, 10 L of unleaded gasoline seeped into the ground in 1988	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Ground water

TABLE 4

TABLE OF AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

(Refer to clause 16(2)(a), Schedule D, O. Reg. 153/04)

Area of Potential Environmental Concern (APEC)[1]	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC–6 Site Area	Front of 859 Aviation Drive	Unnumbered PCA F: As per Eris database, unknown quantity of gasoline spilled into sewer in 2017	Off- Site	Metals, PHCs, VOCs	Soil and/or Ground water
APEC-7 Site Area	849 Aviation Drive	Unnumbered PCA G: As per Eris database, unknown amount of sewage spill onto road during construction in 2012	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Ground water
APEC-8 Site Area	639 Beach Street	Unnumbered PCA H: As per Eris database, a power interruption caused 900 L of raw sewage spilled into Lake Ontario in 1994	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Groundwater
APEC-9 Site Area	711 Lakeshore Road East	PCA-10: Commercial autobody shop Commercial autobody shop PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and/or Groundwater
APEC-10 Site Area	603 Lakeshore Road East	PCA-39: Paints manufacturing, processing and bulk storage	Off-Site	Metals, PHCs, VOCs	Soil and Groundwater
APEC-11	547-565 Lakeshore Road East	Unnumbered PCA I: As per Eris database, light fuels were used in 2016 and 2019	Off Site	Metals, PHCs, VOCs	Soil and/or Groundwater

TABLE 4

TABLE OF AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

(Refer to clause 16(2)(a), Schedule D, O. Reg. 153/04)

Area of Potential Environmental Concern (APEC)[1]	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-12	501 Lakeshore Road East	Unnumbered PCA J: As per Eris database and RSC report, light and heavy fuels and petroleum distillates were used from 1992 to 2012. Based on RSC report, there was historical presence of: PCA-8: Chemical manufacturing, processing and bulk storage PCA-18: Electricity generation, transformation and power stations PCA-26: Foam and expanded foam manufacturing and processing PCA-28: Gasoline and Associated Products Storage in Fixed Tanks PCA-34: Metal Fabrication PCA-51: Solvent manufacturing, processing and bulk storage PCA-55: Transformer manufacturing, processing and use	Off-Site	Metals, PHCs, VOCs, PAHs, PCBs	Soil and Groundwater

Notes:

1 – Area of Potential Environmental Concern means the area on, in or under a phase one property where one or more contaminants are potentially present, as determined through the phase one envirormental Site assessment, including through,
(a) identification of past or present uses on , in or under the phase one property, and
(b) identification of potentially contaminating activity.

2 – Potentially Contaminating Activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

3 – When completing this column, identity all contaminants of potential concern using the Method Groups as identified in the ``Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, as specified below:

ABNs, PCBs, Metals, Electrical Conductivity, SAR
CPs, PAHs, As, Sb, Se, Cr (VI)
1,4-Dioxane, THMs, Na, Hg
Dioxins/Furans, PCDDs/PCDFs, VOCs, B-HWS, Methyl Mercury
OCs, BTEX, Cl^- high pH
PHCs, Ca, MG, CN^- low Ph

4 – When submitting a record of Site condition for filing, a copy of this table must be attached.

6.3 Conceptual Site Model (CSM)

A Conceptual Site Model (CSM) is presented to demonstrate the current site geoenvironmental conditions. The subject CSM has been prepared based on the site background information compiled to date and a site reconnaissance.

This CSM consists of Figures 1 to 8 and a plan showing Potentially Contaminating Activities (PCAs) along the both sides of Lakeshore Road East and the surrounding areas (Drawing 1), which depict the site conditions including surficial features, and present and past land uses in and around the alignment.

The Site consists of several roadways along Lakeshore Road East in the City of Mississauga. (Figure 1). The roadways include portions of Lakeshore Road East, Aviation Road, Lakeside Avenue, Hampton Crescent and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue in the City of Mississauga. The Site and Study Area are surrounded mostly by mixed residential/parkland and commercial land uses (Drawing 1).

Historically, residential with some mixed agricultural land use occupied the Site and the vicinity presumably since the late 1880s to early 1950s. Residential and commercial development occupied the Site and vicinity since the 1950s. At present, the Site is a double-lane local roadway having underground utilities, traffic lights and road lights. The Site's surface is mostly covered with asphalt pavement. The Site and vicinity are surrounded by mixed residential/parkland and commercial properties.

Based on the evaluation of the historical data and Site reconnaissance, twenty eight (28) Potentially Contaminating Activities (PCAs) were identified in thirteen (13) adjacent properties along the roadway alignment. The identified PCAs are listed in Section 6.1, Table 3, and shown on attached Drawing 1.

The PCAs were related to auto repair shops, paint shops, diesel, gasoline, hydraulic oils and sewage spills, operation of dry-cleaning equipment, historical use of gasoline and associated products storage in fixed tanks, chemical manufacturing, processing and storage, metal fabrication, electricity generation/transformation, solvent manufacturing, processing and storage, foam manufacturing and processing and railway tracks (For details, please see Sections 6.1 and 6.2).

Based on the evaluation of information, it is understood that there are possibilities of contamination from historical and current land use activities along the alignment.

Metals, PAHs, VOCs, PHCs and PCBs are considered as contaminants of potential concern (COPC) for the Site.

Based on the Ontario Ministry of Natural Resources and Forestry, no area of natural significance (ANSI) existed on the road alignment and adjacent properties.

According to the Cooksville Creek Conservation, the Site is located within the Cooksville Creek Watershed. Cooksville Creek, located in the west end of the Site boundary, flows from the northwest to the southeast, passing beneath Lakeshore Road East and discharging to Lake Ontario to the south of the Site.

The hydrogeology of the Site and the vicinity is primarily controlled by Cooksville Creek, topographic elevation, glacial geology and bedrock topography of the region. Locally, shallow ground water flows towards topographic depressions. The deep/regional ground water is expected to flow southerly/southwesterly towards Cooksville Creek and finally to Lake Ontario.

7. CONCLUSION

The Site consists of several roadways along Lakeshore Road East in the City of Mississauga. (Figure 1). The roadways include portions of Lakeshore Road East, Aviation Road, Lakeside Avenue, Hampton Crescent and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue in the City of Mississauga (Figure 1).

Based on the evaluation of the historical data and Site reconnaissance, twenty eight (28) Potentially Contaminating Activities (PCAs) were identified in thirteen (13) adjacent properties along the roadway alignment (The Site) as shown on Drawing 1.

The PCAs were related to auto repair shops, paint shops, diesel, gasoline, hydraulic oils and sewage spills, operation of dry-cleaning equipment, historical use of gasoline and associated products storage in fixed tanks, chemical manufacturing, processing and storage, metal fabrication, electricity generation/transformation, solvent manufacturing, processing and storage, foam manufacturing and processing and railway tracks.

The above-noted PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC) on the Site. The PCAs in locations 4, 5 and 13 were not considered environmental concerns since they were located distant or down-gradient/cross-gradient from the Site, and no indication of any contamination was noted during a walk-through visual inspection. PCA-37 at 603 Lakeshore Road East was not considered as an APEC for the Site since the property was used for alteration of clothing and there was no chemical use.

The PCAs in remaining locations (1, 2, 3 and 6 to 12) were considered APEC for the Site since they were located up-gradient or in close proximity to the Site.

Based on the evaluation of information, it is understood that there are possibilities of contamination from historical and current land use activities along the alignment (the Site).

Based on the Phase One ESA findings, it is understood that a soil and ground water sampling and chemical testing programs should be undertaken in some portions of Lakeshore Road East in order to further assess the soils and ground water environmental quality along the alignment and to delineate potentially impacted areas for the remedial/clean-up measures, if required for the future development.

8. RECOMMENDATION

Based on the findings of Phase One ESA, a Phase Two ESA consisting of geoenvironmental sampling and chemical testing of soil and ground water are recommended for areas abutting the properties (except locations 4, 5 and 13) listed in the above table.

The proposed geotechnical/hydrogeological program will cover most of the identified PCAs except PCAs in three locations – the locations of a historical gas station/current auto repair shop (location 2 - 644 Lakeshore Road East), a current auto repair shop (location 3 - 570 Lakeshore Road East) and a location with numerous PCAs (501 Lakeshore Road East) (Table 4 and Drawing 1).

To address the PCAs at locations 2, 3 and 12, we are recommending three additional boreholes with monitoring wells to be drilled abutting the locations 2, 3 and 12 (APEC 2, 3 and 12). Proposed additional borehole/monitoring well locations are shown on attached Drawing 1.

9. STATEMENT OF LIMITATION

The assignment is subject to the Statement of Limitations that is included in Appendix C and must be read in conjunction with this report.

10. QUALIFICATION OF ENVIRONMENTAL CONSULTANT

PML was established in 1973 as a result of the merger of Peto Associates Ltd., founded in 1956, and the Ontario division of Racey MacCallum and Associates Limited, chartered in 1952. PML is a consulting engineering firm that specializes in the fields of geoenvironmental, hydrogeological and geotechnical engineering, building sciences, construction supervision/inspection and materials engineering/testing. Personnel in our four-branch offices form a network of full time dedicated environmental professionals.

The Site reconnaissance and partial preparation of this report were conducted by Mr. Jason Noronha, BSc in Environmental Science. Mr. Noronha is a Project Supervisor with over seven years of experience in the field of Environmental Site Assessment, supervising field investigations, data gathering, conducting sampling programs, data analyses and report preparation. His main areas of expertise include Phase One and Phase Two ESAs and hydrogeologic investigations.

The investigation and report preparation was conducted by Mr. Shamsul Tarafder, MSc. PhD., P.Geo. Mr. Tarafder is a Senior Geoscientist with over fifteen years of experience in geology, geophysics, physical and contaminant hydrology and hydrogeology, hydrogeochemistry and soil contamination chemistry. His experience includes soil and ground water investigations including Phase One and Two ESAs, aquifer characterization, groundwater exploration, soil and groundwater quality assessment, hydrogeological assessment, in-situ remediation of organic contaminants involving LNAPLs and DNAPLs such as petroleum products, VOCs and semi-VOCs, PAHs, BTEX and ether compounds using advanced treatment technologies, and solute transport hybrid numerical and analytical modelling. He has completed hundreds of Phase One and Two ESAs and Hydrogeological Site Assessment (HSA) reports for commercial, industrial, and residential properties. Mr. Tarafder is also author and co-author of a number of peer reviewed scientific articles.

This report was reviewed by Mahaboob Alam, MSc., PhD., P.Geo., a Professional Geoscientist registered with the Association of Professional Geoscientists of Ontario. Mr. Alam is a Director of the firm and Discipline Lead, Geoenvironmental and Hydrogeological services and is a Qualified Person (QP) registered with the MECP. He has over 30 years of interdisciplinary professional experience specializing in geoenvironmental and hydrogeologic investigations and project management. His main areas of expertise include Phase One and Phase Two ESAs, site cleanup/remediation planning and supervision, waste management, UST and AST removals, site remediation, Risk Assessment, Records of site Condition and hydrogeologic investigations. He has completed hundreds of Phase One ESAs for commercial, industrial, and residential clients for a wide variety of project types (industrial complexes, commercial developments, entertainment and institutional buildings, and residential development).

11. REFERENCE

The following documents and data were referred to the Phase One ESA Report:

ITEM	DOCUMENT / DATA	DATE	AUTHOR / SOURCE
1	Aerial Photographs	1954, 1966, 1977, and 1988	City of Mississauga Online Archives
2	Aerial Photographs	2000 and 2020	Google Maps
3	Topographic Map	2018	Natural Resources Canada-The Atlas of Canada
4	The Physiography of Southern Ontario, 3rd Edition	1984	Chapman, L.J., and Putnam, D. F.
5	Bedrock Geology of Ontario, Map 2544	1991	Ministry of Northern Development and Mines
6	Quaternary Geology of Toronto and Surrounding Area, Map 2204	1980	Ministry of Natural Resources
7	Quaternary Geology of Ontario, Southern Sheet, Ontario Geological Survey, Map 2556, Scale 1:1,000,000	1991	Barnett, P.J., W.R. Cowan and A.P. Henry

ITEM	DOCUMENT / DATA	DATE	AUTHOR / SOURCE
8	MOEE Waste Disposal Inventory	June 1991	MOEE Reference book
9	Inventory of Coal Gasification Plant Waste Sites in Ontario	April 1987	MOEE Reference book
10	Inventory of Industrial Sites Producing Coal or Using Coal Tar and Related Tars Sites in Ontario	November 1988	MOEE Reference book
11	Exp Services Inc., Phase I and II Environmental Assessments – 501 Lakeshore Road East, Mississauga, Ontario.	January 2012	Exp Services Inc.
12	Ontario Inventory of PCB Storage Sites	July 1993	MOEE Reference book
13	MECP Location of Small Landfill Sites	2019	http://www.ontario.ca/data/small-landfill-sites
14	MECP Location of Large Landfill Sites	2019	http://www.ontario.ca/environment-and-energy/map-large-landfill-sites
15	National Pollutant Release Inventory	2019	http://www.ec.gc.ca/inrp-npri/
16	Make A Map: Natural Heritage Area	Current	Ontario Ministry of Natural Resources and Forestry

We trust this report is adequate for your present purposes. Should you have any questions or require further informations, please do not hesitate to contact our office.

Sincerely

Peto MacCallum Ltd.

DRAFT

Jason Noronha, BSc
Project Supervisor
Geoenvironmental and Hydrogeological Services

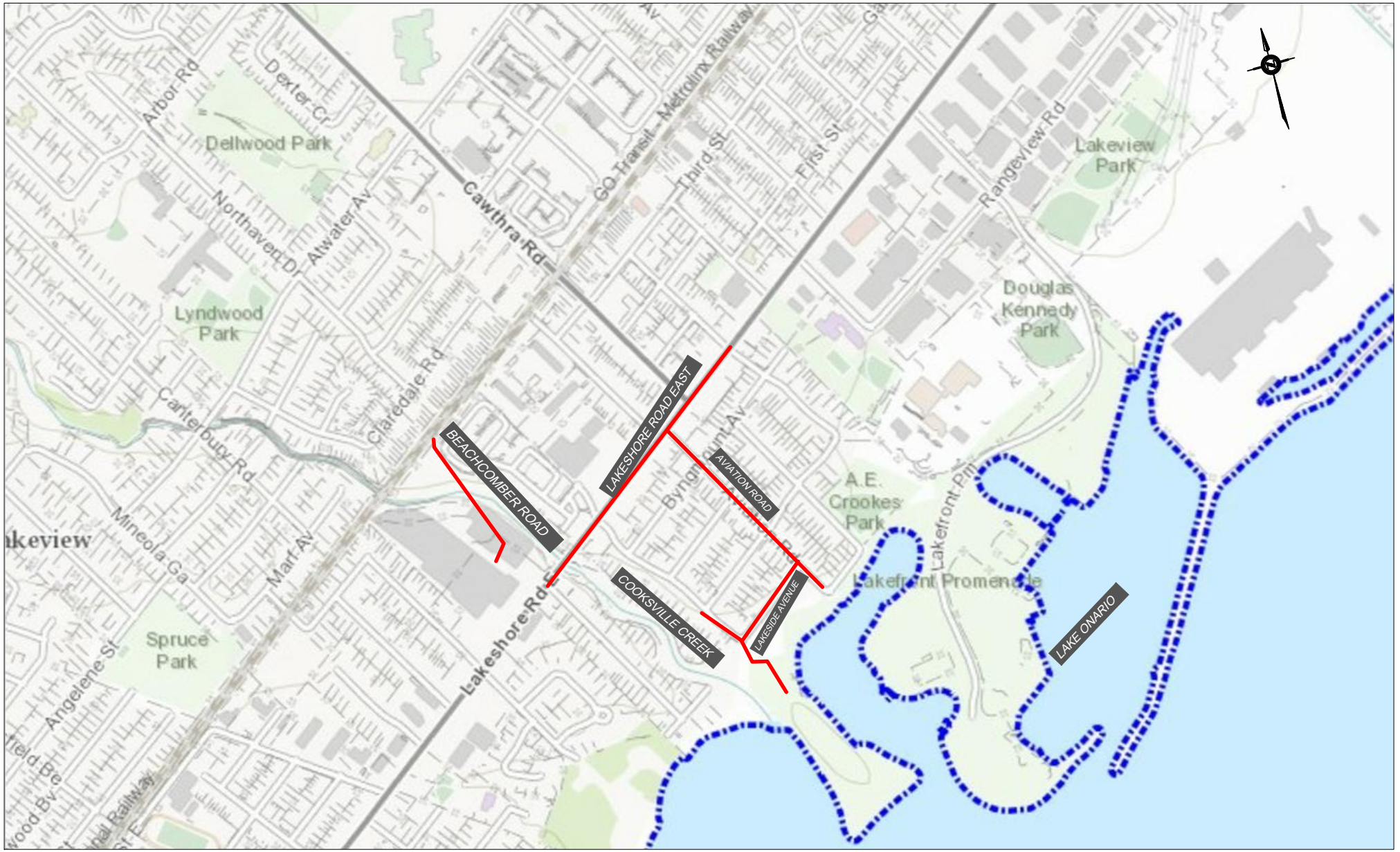
DRAFT

Shamsul A. Tarafder, MSc, PhD, P.Geo.
Senior Geoscientist
Geoenvironmental and Hydrogeological Services

DRAFT

Mahaboob Alam, MSc, PhD, P.Geo.
Director
Discipline Lead, Geoenvironmental and Hydrogeological Services

ST/MA:st



REFERENCE:
THIS FIGURE WAS PREPARED FROM ONTARIO SERVICES WEBSITE WWW6.MISSISSAUGA.CA//MISSMAPS.

LEGEND:

PROPOSED WATERMAIN LINE

REGIONAL MUNICPIALITY OF PEEL

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
BEACH STREET PUMPING STATION DIVERSION
MISSISSAUGA, ONTARIO

KEY MAP

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN	J.N.	DATE	SCALE	PML REF.	FIG. NO.
CHECKED	S.T.	JUNE 2021	1:10,000	21TF001B	1
APPROVED	M.A.				

REFERENCE:
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LEGEND:

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1954 AERIAL PHOTOGRAPH

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APPROVED	M.A.				

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PROPOSED WATERMAIN LINE

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1966 AERIAL PHOTOGRAPH

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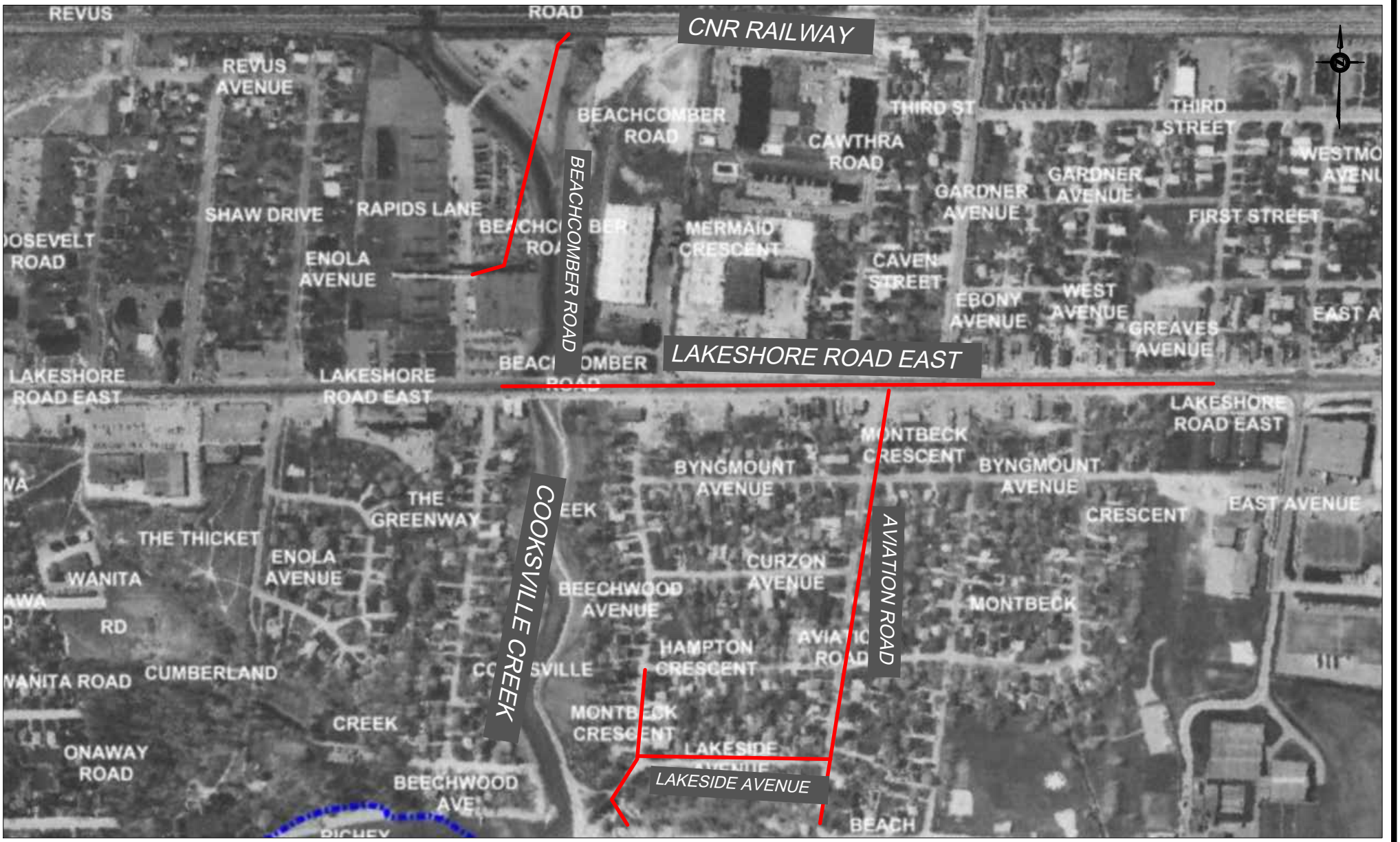
APPROVED	M.A.				



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LEGEND:

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1977 AERIAL PHOTOGRAPH

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APPROVED	M.A.				

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LEGEND:

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1988 AERIAL PHOTOGRAPH

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APPROVED	M.A.				

REFERENCE:
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LEGEND:

PROPOSED WATERMAIN LINE

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2000 AERIAL PHOTOGRAPH

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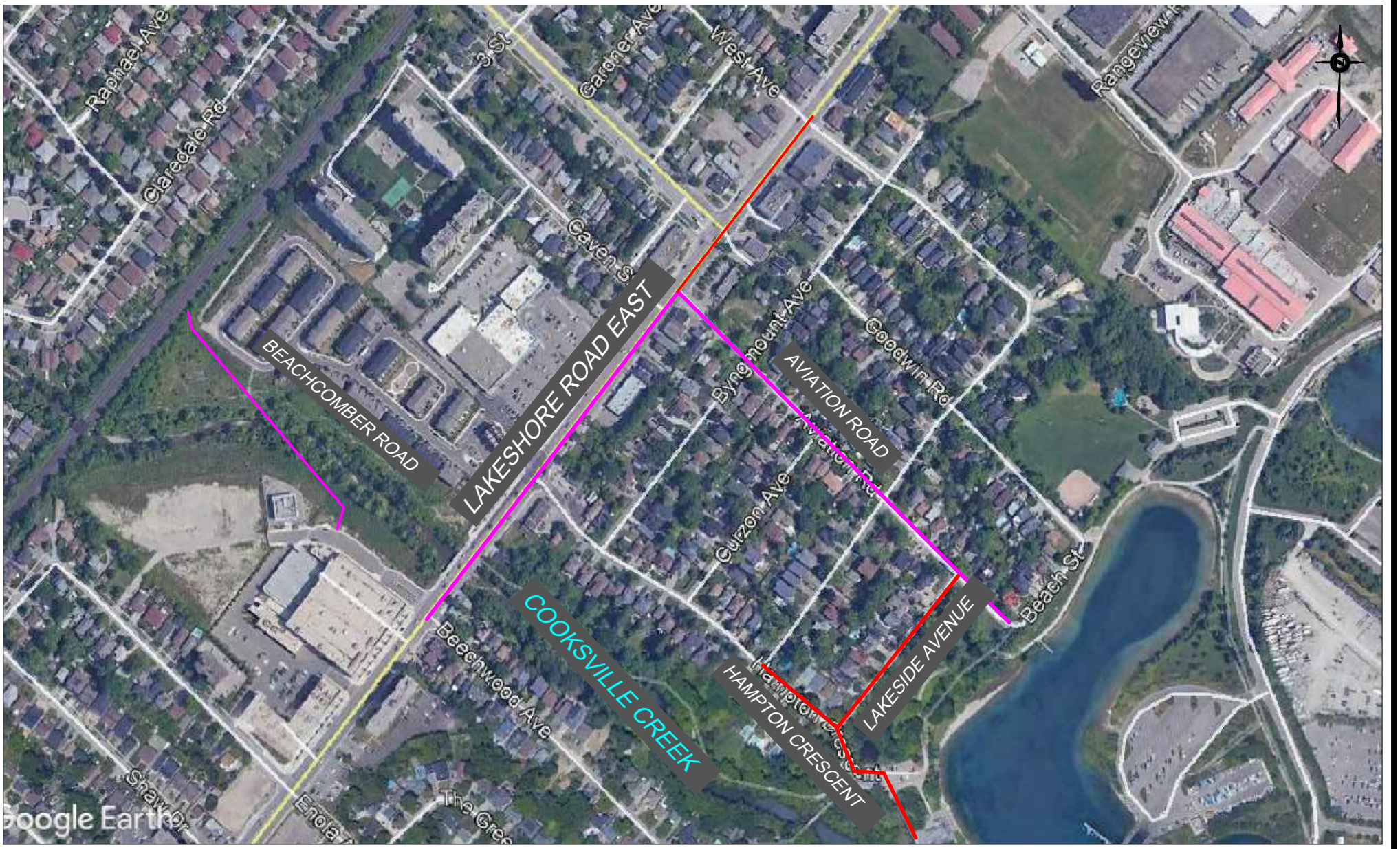
APPROVED	M.A.				



REFERENCE:
THIS FIGURE WAS PREPARED FROM GOOGLE EARTH, IMAGERY DATE 2020

LEGEND:

PROPOSED WATERMAIN LINE

THE REGIONAL MUNICIPALITY OF PEEL

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
BEACH STREET PUMPING STATION DIVERSION, MISSISSAUGA, ONTARIO

2020 AERIAL PHOTOGRAPH

Peto MacCallum Ltd.
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DRAWN	J.N.	DATE	SCALE	PML REF.	FIG. NO.
CHECKED	S.T.	JUNE 2021	1:5,000	21TF001B	7
APPROVED	M.A.				

REFERENCE:
THIS FIGURE WAS PREPARED FROM NATURAL RESOURCES CANADA-THE ATLAS OF CANADA, 2018

LEGEND:

PROPOSED WATERMAIN LINE

REGIONAL MUNICIPALITY OF PEEL

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
BEACH STREET PUMPING STATION DIVERSION,
MISSISSAUGA,ONTARIO

TOPOGRAPHIC MAP

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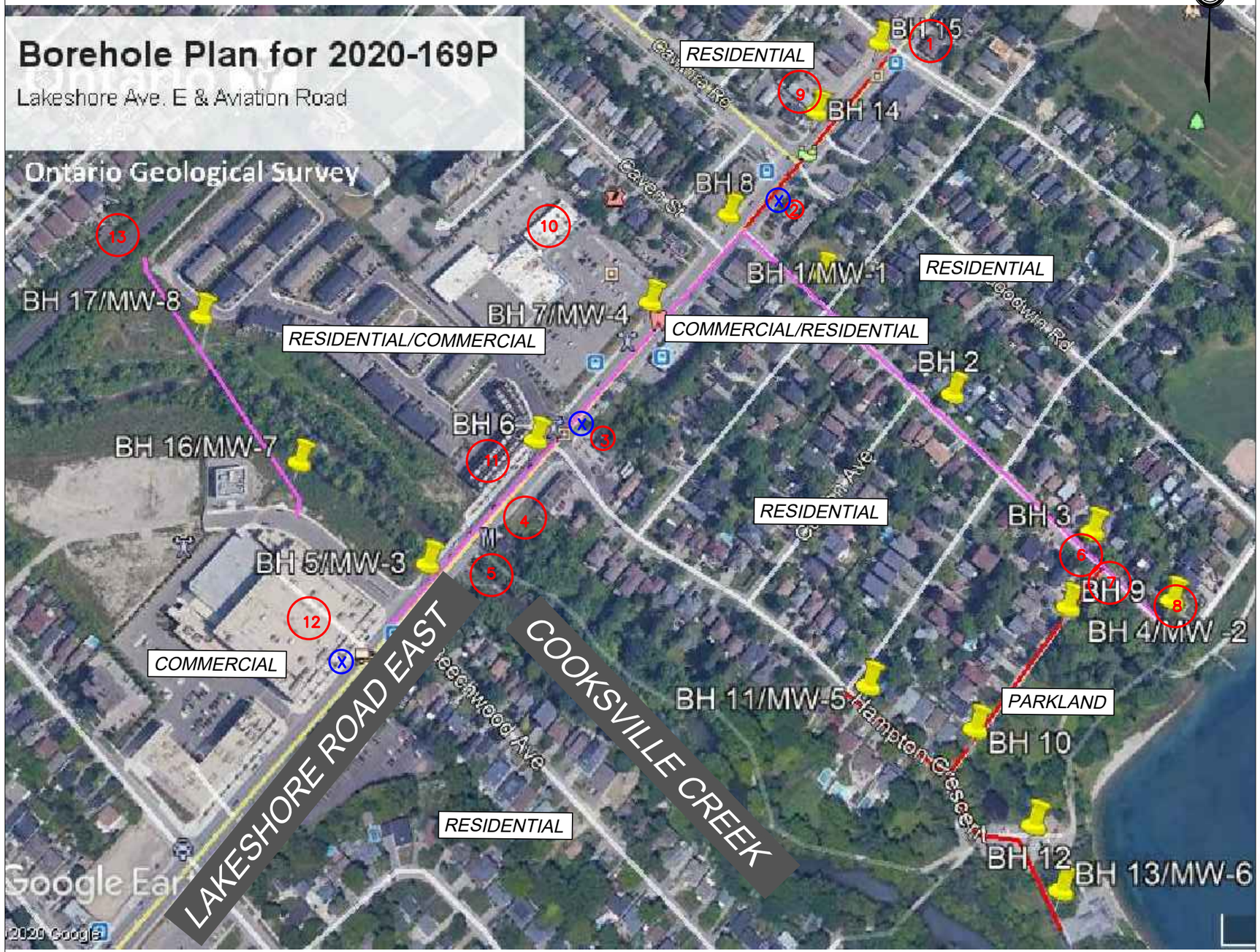
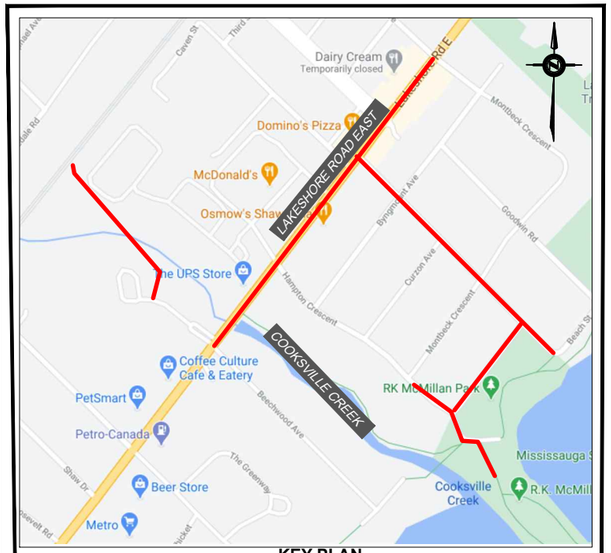
APPROVED	M.A.				

Borehole Plan for 2020-169P

Lakeshore Ave. E & Aviation Road



GEOTECHNICAL/HYDROGEOOGICAL BOREHOLES/MONITORING WELLS



KEY PLAN

LAKESHORE ROAD EAST

LEGEND:

OPEN CUT — MICROTUNNEL

1. PAINTS MANUFACTURING, PROCESSING AND BULK STORAGE (BENJAMIN MOORE)
2. GASOLINE AND DIESEL SPILL (LAKEVIEW SHELL SERVICE CTR-FORMER GASOLINE SERVICE STATION). COMMERCIAL AUTO BODY SHOP (CARWIN SERVICE CENTRE)
3. GASOLINE SPILL AND COMMERCIAL AUTO BODY SHOP (ABM GARAGE)
4. HYDRAULIC OIL SPILL
5. DIESEL FUEL AND SEWAGE SPILL
6. GASOLINE SPILL
7. RAW SEWAGE SPILL
8. RAW SEWAGE SPILL
9. COMMERCIAL AUTO BODY SHOP (CAWTRA AUTO SERVICE)
10. PAINTS MANUFACTURING, PROCESSING AND BULK STORAGE (SHERMAN WILLIAMS PAINTS)OPERATION OF DRY CLEANING EQUIPMENT (KRISP AND CLEAN DRY CLEANERS)
11. LIGHT FUELS USE
12. HISTORICAL LIGHT AND HEAVY FUELS AND PETROLEUM DISTILLATES USE, GASOLINE AND STORAGE IN FIXED TANKS, CHEMICAL MANUFACTURING AND STORAGE, METAL FABRICATION AND STORAGE, FOAM MANUFACTURING AND ELECTRICITY GENERATION TRANSFORMATION AND POWER STATION.
13. CNR RAILWAY

X PROPOSED ADDITIONAL BOREHOLE & MONITORING WELL LOCATIONS

REGIONAL MUNICIPALITY OF PEEL

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

BEACH STREET PUMPING STATION DIVERSION, MISSISSAUGA, ONTARIO

SITE AND SURROUNDING AREA FEATURES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

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CHECKED	S.T.	JUNE 2021	1:3333	21TF001	1
APPROVED	M.A.				

Plate 1: 501 Lakeshore Road East, commercial development, (facing southwest from the northeast end of the property).

Plate 2: Open field north of Lakeshore Road East and Beechwood Avenue.

Plate 3: Cooksville Creek, facing east from the open field located north of Lakeshore Road East and Beechwood Avenue.

Plate 4: 570 Lakeshore Road East (ABM Garage), commercial autobody shop, facing northeast from southwest end of the property.

Plate 5: 644 Lakeshore Road East (Carwin Service Centre), commercial autobody shop, facing northeast from southwest end of the property.

Plate 6: 644 Lakeshore Road East (Carwin Service Centre), commercial autobody shop. An aboveground storage tank (AST) located in the rear of the building.

Plate 7: A view of Lakeshore Road East facing southwest from Hampton Crescent and Lakeshore Road intersection.

Plate 8: Residential neighborhood on Hampton Crescent and Lakeside Avenue intersection.

Plate 9: 830 Aviation Road, (Helen Molasy Memorial Park).

Plate 10: View of Cooksville Creek flowing into Lake Ontario from the waterfront trail at Helen Molasy Memorial Park.

Plate 11: 639 Beach Street (Lake Ontario Beach Street Pumping Station).

APPENDIX A

ERIS Environmental Risk Information Services Report

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*Phase 1 Environmental Site Assessment* *Watermain Replacement for Beach Street* *Pumping Station Diversion* *Mississauga ON L5G*
Project No:	*21TF001*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*21030800117*
Requested by:	*Peto MacCallum Ltd.*
Date Completed:	*March 11, 2021*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Table of Contents

Table of Contents.....2
Executive Summary.....3
Executive Summary: Report Summary.....4
Executive Summary: Site Report Summary - Project Property.....6
Executive Summary: Site Report Summary - Surrounding Properties.....7
Executive Summary: Summary By Data Source.....21
Map.....38
Aerial.....39
Topographic Map.....40
Detail Report.....41
Unplottable Summary.....118
Unplottable Report.....120
Appendix: Database Descriptions.....130
Definitions.....139

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Executive Summary

Property Information:

Project Property:	*Phase 1 Environmental Site Assessment* *Watermain Replacement for Beach Street Pumping Station Diversion Mississauga ON L5G*
Project No:	*21TF001*

Order Information:

Order No:	*21030800117*
Date Requested:	*March 8, 2021*
Requested by:	*Peto MacCallum Ltd.*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
AAGR	Abandoned Aggregate Inventory	N	-	-	-
AGR	Aggregate Inventory	N	-	-	-
AMIS	Abandoned Mine Information System	N	-	-	-
ANDR	Anderson's Waste Disposal Sites	N	-	-	-
AST	Aboveground Storage Tanks	Y	0	0	0
AUWR	Automobile Wrecking & Supplies	N	-	-	-
BORE	Borehole	N	-	-	-
CA	Certificates of Approval	Y	0	26	26
CDRY	Dry Cleaning Facilities	N	-	-	-
CFOT	Commercial Fuel Oil Tanks	N	-	-	-
CHEM	Chemical Manufacturers and Distributors	N	-	-	-
CHM	Chemical Register	N	-	-	-
CNG	Compressed Natural Gas Stations	N	-	-	-
COAL	Inventory of Coal Gasification Plants and Coal Tar Sites	N	-	-	-
CONV	Compliance and Convictions	N	-	-	-
CPU	Certificates of Property Use	N	-	-	-
DRL	Drill Hole Database	N	-	-	-
DTNK	Delisted Fuel Tanks	N	-	-	-
EASR	Environmental Activity and Sector Registry	N	-	-	-
EBR	Environmental Registry	N	-	-	-
ECA	Environmental Compliance Approval	N	-	-	-
EEM	Environmental Effects Monitoring	N	-	-	-
EHS	ERIS Historical Searches	N	-	-	-
EIIS	Environmental Issues Inventory System	N	-	-	-
EMHE	Emergency Management Historical Event	N	-	-	-
EPAR	Environmental Penalty Annual Report	N	-	-	-
EXP	List of Expired Fuels Safety Facilities	N	-	-	-
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	N	-	-	-
FOFT	Fisheries & Oceans Fuel Tanks	N	-	-	-
FRST	Federal Identification Registry for Storage Tank Systems (FIRSTS)	N	-	-	-
FST	Fuel Storage Tank	N	-	-	-
FSTH	Fuel Storage Tank - Historic	N	-	-	-
GEN	Ontario Regulation 347 Waste Generators Summary	Y	0	68	68
GHG	Greenhouse Gas Emissions from Large Facilities	N	-	-	-
HINC	TSSA Historic Incidents	N	-	-	-

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
IAFT	Indian & Northern Affairs Fuel Tanks	N	-	-	-
INC	Fuel Oil Spills and Leaks	N	-	-	-
LIMO	Landfill Inventory Management Ontario	N	-	-	-
MINE	Canadian Mine Locations	N	-	-	-
MNR	Mineral Occurrences	N	-	-	-
NATE	National Analysis of Trends in Emergencies System (NATES)	N	-	-	-
NCPL	Non-Compliance Reports	N	-	-	-
NDFT	National Defense & Canadian Forces Fuel Tanks	N	-	-	-
NDSP	National Defense & Canadian Forces Spills	N	-	-	-
NDWD	National Defence & Canadian Forces Waste Disposal Sites	N	-	-	-
NEBI	National Energy Board Pipeline Incidents	N	-	-	-
NEBP	National Energy Board Wells	N	-	-	-
NEES	National Environmental Emergencies System (NEES)	N	-	-	-
NPCB	National PCB Inventory	N	-	-	-
NPRI	National Pollutant Release Inventory	N	-	-	-
OGWE	Oil and Gas Wells	N	-	-	-
OOGW	Ontario Oil and Gas Wells	N	-	-	-
OPCB	Inventory of PCB Storage Sites	N	-	-	-
ORD	Orders	N	-	-	-
PAP	Canadian Pulp and Paper	N	-	-	-
PCFT	Parks Canada Fuel Storage Tanks	N	-	-	-
PES	Pesticide Register	Y	0	14	14
PINC	Pipeline Incidents	N	-	-	-
PRT	Private and Retail Fuel Storage Tanks	Y	0	7	7
PTTW	Permit to Take Water	N	-	-	-
REC	Ontario Regulation 347 Waste Receivers Summary	N	-	-	-
RSC	Record of Site Condition	Y	0	8	8
RST	Retail Fuel Storage Tanks	N	-	-	-
SCT	Scott's Manufacturing Directory	N	-	-	-
SPL	Ontario Spills	Y	0	50	50
SRDS	Wastewater Discharger Registration Database	N	-	-	-
TANK	Anderson's Storage Tanks	N	-	-	-
TCFT	Transport Canada Fuel Storage Tanks	N	-	-	-
VAR	Variances for Abandonment of Underground Storage Tanks	N	-	-	-
WDS	Waste Disposal Sites - MOE CA Inventory	N	-	-	-
WDSH	Waste Disposal Sites - MOE 1991 Historical Approval Inventory	N	-	-	-
WWIS	Water Well Information System	N	-	-	-
	Total:		0	173	173

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
1	SPL	C C TRANSPORT	570 LAKESHORE RD. E. TRANSPORT TRUCK (CARGO) MISSISSAUGA CITY ON L5G 1J4	SSE/21.4	0.00	41
1	PRT	A MOLASY A B M GARAGE	570 LAKESHORE RD E MISSISSAUGA ON L5G 1J4	SSE/21.4	0.00	41
2	SPL	CONTRACTOR	565 LAKESHORE RD. E., NEAR HAMPTON CRESCENT (N.O.S.) MISSISSAUGA CITY ON L5G 1H9	W/36.9	-1.00	41
2	GEN	INGLIS LIMITED 21-516	565 LAKESHORE ROAD EAST C/O 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/36.9	-1.00	42
2	GEN	INGLIS LIMITED	565 LAKESHORE ROAD EAST C/O 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/36.9	-1.00	43
2	SPL	The Regional Municipality of Peel	565 Lakeshore Rd. East Mississauga ON	W/36.9	-1.00	44
2	RSC	Lakeshore Country Properties Ltd.	565 LAKESHORE ROAD EAST, MISSISSAUGA, ONTARIO L5G 1H9 Mississauga ON	W/36.9	-1.00	44
2	RSC	Lakeshore Country Properties Ltd.	565 LAKESHORE ROAD EAST, MISSISSAUGA, ONTARIO L5G 1H9 Mississauga ON	W/36.9	-1.00	45
2	GEN	TOLIN ENTERPRISES LTD.	565 LAKESHORE ROAD E. MISSISSAUGA ON L5G 1H9	W/36.9	-1.00	47
2	SPL	Country Homes Limited	Cooksville Creek right at Beechwood Avenue; Ref. Plan 43R-35317 565 Lakeshore Road East Mississauga; Mississauga ON L5G 1H9	W/36.9	-1.00	47
3	PES	MISSISSAUGA LAKESIDE GARDEN CENTER	544 LAKESHORE RD E MISSISSAUGA ON L5G1J3	SW/23.9	-1.00	48

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
4	SPL	The Regional Municipality of Peel	544 Lakeshore Rd E Mississauga ON	SW/21.6	-1.00	48
5	PES	CANADIAN TIRE ASSOCIATE STORE J.C. BORLAND LTD	579 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	48
5	PES	MAL WHITLOCK ENTERPRISES LTD O/A CANADIAN TIRE	579 LAKESHORE RD E MISSISSAUGA ON L5G1H9	NW/80.5	-1.00	49
5	PES	R.C. BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	49
5	PES	R.C. BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	50
5	PES	R.C BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	50
5	PES	POONAM RX LTD/ SHOPPERS DRUG MART #1275	579 LAKESHORE RD E MISSISSAUGA ON L5G1H9	NW/80.5	-1.00	50
5	GEN	Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	51
5	GEN	Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	51
5	GEN	Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	51
5	PES	CHUEN CHI CHUNG PHARMACY LIMITED O/A SHOPPERS DRUG MART #1275	579A LAKESHORE RD E MISSISSAUGA ON L5G1H9	NW/80.5	-1.00	52
5	PES	R.C BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G1H9	NW/80.5	-1.00	52
5	PES	R.C BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G1H9	NW/80.5	-1.00	53

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
5	GEN	Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	NW/80.5	-1.00	53
6	CA	MCDONALD'S RESTAURANTS OF CANADA LIMITED	601 LAKESHORE ROAD EAST MISSISSAUGA CITY ON L5G 1H9	NW/77.0	-1.00	53
7	SPL		610 Lakeshore Road East Mississauga ON	NE/39.4	0.00	54
8	GEN	Enbridge Gas Inc.	559-547 Lakeshore Road East Mississauga ON L5G 1J3	WSW/11.5	-1.43	54
9	CA	1012058 ONTARIO INC.	617-625 LAKESHORE RD.E. (SWM) MISSISSAUGA CITY ON L5G 1H9	N/57.3	0.00	54
10	SPL		West of Cawthra Road, east of Hurontario Street Mississauga ON	SW/10.1	-4.56	55
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	55
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	55
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	56
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON	NNW/109.3	-1.00	56
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	56
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	57
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	57

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	57
11	GEN	The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	NNW/109.3	-1.00	58
12	SPL	The Regional Municipality of Peel	Mississauga ON	W/68.6	-1.00	58
13	GEN	STANDARD BIOLOGICAL LAB (OUTOFBUS)	DIV. OF SGS SUPERVISION SERVICES INC. 514-516 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J3	SW/20.4	-4.99	59
13	GEN	STANDARD BIOLOGICAL LAB (OUTOFBUS)36-101	DIV. OF SGS SUPERVISION SERVICES INC. 514-516 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J3	SW/20.4	-4.99	59
13	GEN	STANDARD BIOLOGICAL (OUT OF BUSINESS)	SGS SUPERVISION SERVICES INC., A DIV. OF 514-516 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J3	SW/20.4	-4.99	59
14	GEN	Lakeshore Dental	611 Lakeshore Rd East Mississauga ON L5G1H9	NNW/105.6	-1.00	60
14	GEN	Lakeshore Dental	611 Lakeshore Rd East Mississauga ON L5G1H9	NNW/105.6	-1.00	60
14	GEN	Lakeshore Dental	611 Lakeshore Rd East Mississauga ON L5G1H9	NNW/105.6	-1.00	60
15	GEN	LAKESHORE PHOTO & FRAME 24-967	632 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J4	NE/15.1	0.00	60
15	GEN	LAKESHORE PHOTO & FRAME	632 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J4	NE/15.1	0.00	61
16	SPL	UNKNOWN	IN THE COOKSVILLE CREEK AT LAKESHORE RD. & BEACHWOOD MISSISSAUGA CITY ON	SW/6.1	-2.99	61

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
17	SPL	Unknown<UNOFFICIAL>	1036A Caven Street Mississauga ON	N/114.2	-1.00	62
18	GEN	PETM Canada Corporation	507 Lakeshore Rd E Mississauga ON L5G1H9	WSW/7.7	-1.00	62
19	RSC	501 LAKESHORE INC.	505 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	SW/10.2	-1.76	63
20	SPL	SHELL CANADA PRODUCTS LTD.	644 LAKESHORE BLVD. E. (NEAR CAWTHRA) SERVICE STATION MISSISSAUGA CITY ON	NE/20.1	-1.00	64
20	PRT	HENRY F GALLANT	644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	NE/20.1	-1.00	65
20	PRT	LAKEVIEW SHELL SERVICE CTR	644 LAKESHORE RD E MISSISSAUGA ON L5G 1J6	NE/20.1	-1.00	65
20	PRT	LAKEVIEW SHELL SERVICE CTR	644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	NE/20.1	-1.00	65
20	PRT	LAKEVIEW SHELL SERVICE CTR	644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	NE/20.1	-1.00	65
20	CA	1239726 ONTARIO LTD.	644 LAKESHORE ROAD EAST (SWM) MISSISSAUGA CITY ON	NE/20.1	-1.00	65
20	CA	1239726 ONTARIO LTD.	SWM-644 LAKESHORE RD., E. MISSISSAUGA CITY ON	NE/20.1	-1.00	66
21	SPL	Forest Town Development<UNOFFICIAL>	1060 Caven St. Mississauga ON L5G 4J5	NW/199.7	-1.00	66
21	SPL	The Corporation of the City of Mississauga	1060 Caven St Mississauga ON	NW/199.7	-1.00	66
22	SPL	Credit Valley Conservation Authority	Lakeshore Rd west of Cawthra Mississauga ON	NE/9.3	-1.00	67

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23	CA	R.M. OF PEEL	LAKESHORE RD/CAWTHRA RD. MISSISSAUGA CITY ON	NE/9.8	-1.00	67
23	CA	R.M. OF PEEL	LAKESHORE RD/CAWTHRA RD. MISSISSAUGA CITY ON	NE/9.8	-1.00	68
23	SPL		Lakeshore Rd and Cawthra Mississauga ON	NE/9.8	-1.00	68
23	SPL	The Corporation of the City of Mississauga	manhole on easement 200m north of Lakeshore Rd near Lakeshore and Cawthra Mississauga ON	NE/9.8	-1.00	69
24	SPL	The Regional Municipality of Peel	1600 Caven St Mississauga ON	NNW/184.3	-1.00	69
25	SPL		Hampton Cres at Montbeck Cres Mississauga ON	SE/1.5	-3.34	70
26	SPL		909 Beechwood Avenue Mississauga ON	SSE/167.3	-5.00	70
27	RSC	656731 Ontario Limited	707 LAKESHORE RD E, MISSISSAUGA, ON, L5G 1J7 ON L5G 1J7	NE/23.7	-1.00	70
28	PES	TOMCO HORTICULTURAL SERVICES	941 THE GREENWAY MISSISSAUGA ON L5G 1P7	SSW/133.5	-4.20	71
28	PES	619151 ONTARIO INC.	941 THE GREENWAY MISSISSAUGA ON L5G 1P7	SSW/133.5	-4.20	71
29	SPL	Enbridge Energy Distribution Inc.	1015 Cawthra Rd Mississauga ON	NNE/42.6	-1.00	72
30	SPL	CANADIAN WASTE SERVICES	BEHIND 1110 CAVEN MOTOR VEHICLE (OPERATING FLUID) MISSISSAUGA CITY ON L5G 4N4	NW/232.6	-0.14	72

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
30	SPL	CANADIAN WASTE SERVICES	1110 CAVEN ST. MOTOR VEHICLE (OPERATING FLUID) MISSISSAUGA CITY ON L5G 4N4	NW/232.6	-0.14	73
31	SPL	Enbridge Gas Distribution Inc.	918 Goodwin Road Mississauga ON	ENE/84.6	-1.00	73
32	SPL	Enbridge Gas Distribution Inc.	947 The Greenway Mississauga ON	SSW/126.4	-2.54	74
33	SPL	INGLIS LTD.	INGLIS IN YARD AT 501 LAHESHORE RD.E. TORONTO PLANT 14 STRACHAN AVENUE MISSISSAUGA CITY ON L5G 1H9	W/78.2	-1.95	74
33	PRT	INGLIS CANADA	501 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	75
33	CA	MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD MISSISSAUGA CITY ON	W/78.2	-1.95	75
33	CA	CONSUMERS GLASS COMPANY LIMITED	501 LAKESHORE ROAD EAST MISSISSAUGA CITY ON L5G 1H9	W/78.2	-1.95	75
33	CA	WINE BOTTLE & PACKAGING INC.	501 LAKESHORE RD.E.,8-3055-99 MISSISSAUGA CITY ON L5G 1H9	W/78.2	-1.95	75
33	CA	CONSUMERS GLASS COMPANY LIMITED	501 LAKESHORE RD.E., 8-3102-99 MISSISSAUGA CITY ON L5G 1H9	W/78.2	-1.95	76
33	CA		501 Lakeshore Road East, Port Credit Mississauga ON L5G 1H9	W/78.2	-1.95	76
33	GEN	INGLIS LTD.	501 LAKESHORE RD. E. MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	76
33	GEN	INGLIS LTD. 21-130	501 LAKESHORE RD. E. MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	77
33	GEN	INGLIS LIMITED	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	78

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
33	GEN	CONSUMERS PACKAGING INC.	WINE BOTTLE & PACKAGING INC. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	79
33	GEN	CONSUM(SEE & USE ON2528300)	WINE BOTTLE & PACKAGING INC. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	80
33	GEN	MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	80
33	GEN	SAXCO CANADA CO.	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	81
33	GEN	SAXCO CANADA CO.	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	81
33	GEN	SAXCO CANADA CO.	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	81
33	SPL	Caravan Logistics Inc.	501 Lakeshore Road East 501 LAKESHORE ROAD EAST Mississauga ON L5G 1H9	W/78.2	-1.95	81
33	CA	Massilly North America Inc.	501 Lakeshore Road East Mississauga ON	W/78.2	-1.95	82
33	CA	Massilly North America Inc.	501 Lakeshore Road East Mississauga ON	W/78.2	-1.95	82
33	CA	Massilly North America Inc.	501 Lakeshore Rd E Mississauga ON	W/78.2	-1.95	82
33	CA	Massilly North America Inc.	501 Lakeshore Road East Mississauga ON	W/78.2	-1.95	83
33	GEN	MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	83

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
33	GEN	MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	84
33	GEN	GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	84
33	GEN	GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	84
33	GEN	MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	85
33	GEN	MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	85
33	GEN	GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	86
33	GEN	GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON	W/78.2	-1.95	86
33	RSC	501 LAKESHORE INC.	501A LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	W/78.2	-1.95	86
33	RSC	501 LAKESHORE INC.	501B LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	W/78.2	-1.95	88
33	RSC	501 LAKESHORE INC.	501C LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	W/78.2	-1.95	89
33	SPL		501 Lakeshore Road East Mississauga ON	W/78.2	-1.95	90
33	GEN	Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	W/78.2	-1.95	91
33	GEN	Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	W/78.2	-1.95	91

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
33	GEN	Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	W/78.2	-1.95	92
33	GEN	Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	W/78.2	-1.95	92
33	GEN	Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	W/78.2	-1.95	93
33	GEN	GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	W/78.2	-1.95	93
34	SPL	Enbridge Gas Distribution Inc.	646 3rd Street Mississauga ON	NNW/247.7	-1.00	93
35	SPL	Enbridge Gas Distribution Inc.	928 The Greenway Mississauga ON	SSW/204.5	-5.36	94
36	PRT	SUNOCO INC - THROUGH AGENT PIONEER PETROLEUMS MANA	456 LAKESHORE RD E MISSISSAUGA ON L5G1J1	SW/172.8	-3.20	94
37	SPL	The Regional Municipality of Peel	519 Richey Cres Mississauga ON	SSE/154.4	-5.82	95
38	SPL	UNKNOWN	SANITARY SEWERS IN FRONT OF 859 AVIATION DRIVE MISSISSAUGA CITY ON L5G 4H5	E/32.3	-3.96	95
39	CA	R.M. OF PEEL	BYNGMOUNT AVE/MONTBECK CRES. MISSISSAUGA ON	ENE/87.4	-1.00	96
39	CA	The Corporation of the City of Mississauga	Montbeck Crescent and Byngmount Avenue Mississauga ON	ENE/87.4	-1.00	96
40	SPL	The Regional Municipality of Peel	On Enola Ave. south of Lakeshore Rd., at Lakeshore Rd. and Enola Ave. Mississauga ON	SW/204.4	-3.58	96

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41	SPL	Tamray Construction<UNOFFICIAL>; The Regional Municipality of Peel	849 Aviation Dr Mississauga ON	E/39.1	-4.02	97
42	CA	CITY	THE GREENWAY/ENOLA AVE. MISSISSAUGA ON	SSW/240.2	-3.86	97
43	SPL	The Regional Municipality of Peel	852 Goodwin Rd Mississauga ON	E/76.3	-4.00	97
44	SPL		Beechwood Ave. and Richey Cres. Mississauga ON	SSE/182.4	-6.00	98
45	RSC	INDWELL COMMUNITY HOMES	425 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H8 Mississauga ON	SW/240.4	-2.34	98
46	SPL	Enbridge Gas Distribution Inc.	420 Lakeshore Rd. E. Mississauga Mississauga ON	SW/243.9	-0.71	100
47	GEN	PINCHIN LTD.	756/760 LAKESHORE ROAD EAST MISSISSAUGA ON L5E 1C7	NE/41.6	-1.00	100
48	SPL		506 Richey Cres Mississauga ON L5G 1N4	SSE/173.3	-6.00	101
49	PES	MCGROW LANDSCAPING	1058 ENOLA DRIVE MISSISSAUGA ON L5G 4A9	WSW/242.2	-2.44	101
50	PES	MCGROW LANDSCAPING	1058 ENOLA DRIVE MISSISSAUGA ON L5G4A9	WSW/242.7	-2.44	102
51	CA	MINISTRY OF THE ENVIR.-PROJ# 1-0053-35	LOT 94/RP-A26), BEACH ST. SPS MISSISSAUGA CITY ON	ESE/100.1	-5.07	102
51	CA	MINISTRY OF THE ENVIR.-PROP# 1-0053-35	BEACH ST.S.T.P., LOT 94 MISSISSAUGA CITY ON	ESE/100.1	-5.07	102
51	SPL	ONTARIO CLEAN WATER AGENCY	LAKE ONTARIO BEACH ST, PUMPING STATION SANITARY SEWER/PUMPING STATION MISSISSAUGA CITY ON	ESE/100.1	-5.07	102

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51	SPL	MINISTRY OF THE ENVIRONMENT	LAKE ONTARIO BEACH ST. PUMPING STN. SANITARY SEWER SYSTEM MISSISSAUGA CITY ON	ESE/100.1	-5.07	103
52	SPL	Enbridge Gas Distribution Inc.	1065 West Ave. Mississauga ON	NNE/197.9	0.00	104
53	CA	REGION OF PEEL	CROOKES PARK CAWTHRA CREEK MISSISSAUGA ON	E/188.3	-5.03	104
54	SPL	Enersource Hydro Mississauga Inc.	1161 Claredale Rd Mississauga ON	WNW/129.6	0.98	104
55	CA	MINISTRY OF THE ENVIR.-MOE # 5-0020-53	LAKESHORE RD./GREAVES AVE. MISSISSAUGA CITY ON	NE/120.4	0.00	105
55	CA	MISSISSAUGA CITY	GREAVES AVE/LAKESHORE RD. MISSISSAUGA CITY ON	NE/120.4	0.00	105
55	CA	R.M. OF PEEL	GREAVES AVE/LAKESHORE RD. MISSISSAUGA CITY ON	NE/120.4	0.00	105
56	CA	PEEL NON-PROFIT HOUSING CORP.	1022 GRAVES AVE. MISSISSAUGA CITY ON	NNE/152.2	0.00	106
56	CA	PEEL NON-PROFIT HOUSING CORP.	1022 GRAVES AVENUE, RES. DEV. MISSISSAUGA CITY ON	NNE/152.2	0.00	106
57	SPL	Enersource Hydro Mississauga Inc.	558 Raphael Ave Mississauga ON	WNW/202.1	2.95	106
58	SPL	Enbridge Gas Distribution Inc.	570 Raphael Ave. Mississauga, ON Mississauga ON	WNW/227.9	2.85	107
59	SPL		512 Ettridge Court Mississauga ON	WNW/151.0	1.97	107
60	SPL	Enersource Hydro Mississauga Inc.	506 Ettridge Court Mississauga ON	WNW/150.5	1.81	108

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
61	GEN	PEEL BOARD OF EDUCATION	BYNGMOUNT BEACH PUBLIC SCHOOL 930 EAST AVENUE MISSISSAUGA ON L5E 1W6	ENE/210.3	-0.24	108
61	GEN	PEEL BOARD OF EDUCATION 30-247	BYNGMOUNT BEACH PUBLIC SCHOOL 930 EAST AVENUE MISSISSAUGA ON L5E 1W6	ENE/210.3	-0.24	109
61	GEN	PEEL DISTRICT SCHOOL BOARD	BYNGMOUNT BEACH PUBLIC SCHOOL 930 EAST AVENUE MISSISSAUGA ON L5E 1W6	ENE/210.3	-0.24	109
61	GEN	Region of Peel	930 East Ave Mississauga ON L5E 1W6	ENE/210.3	-0.24	110
61	GEN	Region of Peel	930 East Ave Mississauga ON L5E 1W6	ENE/210.3	-0.24	110
61	GEN	Region of Peel	930 East Ave Mississauga ON L5E 1W6	ENE/210.3	-0.24	110
61	GEN	Region of Peel	930 East Ave Mississauga ON L5E 1W6	ENE/210.3	-0.24	110
62	SPL	Gospel Assembly Church<UNOFFICIAL>	1023 Greaves Avenue Mississauga ON	NE/170.9	0.14	111
63	SPL	UNKNOWN	GARDINER AVE. AND GREAVES MISSISSAUGA CITY ON	NNE/222.3	1.00	111
64	SPL		803 Lakeshore Rd East Mississauga ON	NE/181.2	1.00	112
65	SPL	The Regional Municipality of Peel	1012 East Ave Mississauga ON	NE/201.7	1.00	112
66	SPL	The Regional Municipality of Peel	NW of Lakeshore Road E at East Ave Mississauga ON	NE/216.9	1.93	113

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
67	GEN	MEDIACOM INC	830 LAKESHORE RD. E. MISSISSAUGA ON L5E 1E1	NE/239.8	1.21	113
67	GEN	MEDIACOM INC. 26-031	830 LAKESHORE RD. E. MISSISSAUGA ON L5E 1E1	NE/239.8	1.21	113
67	GEN	MEDIACOM INC.	830 LAKESHORE ROAD EAST MISSISSAUGA ON L5E 1E1	NE/239.8	1.21	114
67	GEN	MEDIACOM (OUT OF BUSINESS)	830 LAKESHORE ROAD EAST MISSISSAUGA ON L5E 1E1	NE/239.8	1.21	114
67	GEN	Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON	NE/239.8	1.21	115
67	GEN	Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON	NE/239.8	1.21	115
67	GEN	Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	NE/239.8	1.21	115
67	GEN	Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	NE/239.8	1.21	115
67	GEN	Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	NE/239.8	1.21	116
67	GEN	Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	NE/239.8	1.21	116
67	GEN	Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	NE/239.8	1.21	117

Executive Summary: Summary By Data Source

CA - Certificates of Approval

A search of the CA database, dated 1985-Oct 30, 2011* has found that there are 26 CA site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
MCDONALD'S RESTAURANTS OF CANADA LIMITED	601 LAKESHORE ROAD EAST MISSISSAUGA CITY ON L5G 1H9	77.0	6
1012058 ONTARIO INC.	617-625 LAKESHORE RD.E. (SWM) MISSISSAUGA CITY ON L5G 1H9	57.3	9
1239726 ONTARIO LTD.	644 LAKESHORE ROAD EAST (SWM) MISSISSAUGA CITY ON	20.1	20
1239726 ONTARIO LTD.	SWM-644 LAKESHORE RD., E. MISSISSAUGA CITY ON	20.1	20
R.M. OF PEEL	LAKESHORE RD/CAWTHRA RD. MISSISSAUGA CITY ON	9.8	23
R.M. OF PEEL	LAKESHORE RD/CAWTHRA RD. MISSISSAUGA CITY ON	9.8	23
MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD MISSISSAUGA CITY ON	78.2	33
CONSUMERS GLASS COMPANY LIMITED	501 LAKESHORE ROAD EAST MISSISSAUGA CITY ON L5G 1H9	78.2	33
WINE BOTTLE & PACKAGING INC.	501 LAKESHORE RD.E.,8-3055-99 MISSISSAUGA CITY ON L5G 1H9	78.2	33

Site	Address	Distance (m)	Map Key
CONSUMERS GLASS COMPANY LIMITED	501 LAKESHORE RD.E., 8-3102-99 MISSISSAUGA CITY ON L5G 1H9	78.2	33
	501 Lakeshore Road East, Port Credit Mississauga ON L5G 1H9	78.2	33
Massilly North America Inc.	501 Lakeshore Road East Mississauga ON	78.2	33
Massilly North America Inc.	501 Lakeshore Road East Mississauga ON	78.2	33
Massilly North America Inc.	501 Lakeshore Rd E Mississauga ON	78.2	33
Massilly North America Inc.	501 Lakeshore Road East Mississauga ON	78.2	33
R.M. OF PEEL	BYNGMOUNT AVE/MONTBECK CRES. MISSISSAUGA ON	87.4	39
The Corporation of the City of Mississauga	Montbeck Crescent and Byngmount Avenue Mississauga ON	87.4	39
CITY	THE GREENWAY/ENOLA AVE. MISSISSAUGA ON	240.2	42
MINISTRY OF THE ENVIR.-PROJ# 1-0053-35	LOT 94/RP-A26), BEACH ST. SPS MISSISSAUGA CITY ON	100.1	51
MINISTRY OF THE ENVIR.-PROP# 1-0053-35	BEACH ST.S.T.P., LOT 94 MISSISSAUGA CITY ON	100.1	51
REGION OF PEEL	CROOKES PARK CAWTHRA CREEK MISSISSAUGA ON	188.3	53

Site	Address	Distance (m)	Map Key
MINISTRY OF THE ENVIR.-MOE # 5-0020-53	LAKESHORE RD./GREAVES AVE. MISSISSAUGA CITY ON	120.4	55
MISSISSAUGA CITY	GREAVES AVE/LAKESHORE RD. MISSISSAUGA CITY ON	120.4	55
R.M. OF PEEL	GREAVES AVE/LAKESHORE RD. MISSISSAUGA CITY ON	120.4	55
PEEL NON-PROFIT HOUSING CORP.	1022 GRAVES AVENUE, RES. DEV. MISSISSAUGA CITY ON	152.2	56
PEEL NON-PROFIT HOUSING CORP.	1022 GRAVES AVE. MISSISSAUGA CITY ON	152.2	56

GEN - Ontario Regulation 347 Waste Generators Summary

A search of the GEN database, dated 1986-Jul 31, 2020 has found that there are 68 GEN site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
INGLIS LIMITED 21-516	565 LAKESHORE ROAD EAST C/O 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	36.9	2
INGLIS LIMITED	565 LAKESHORE ROAD EAST C/O 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	36.9	2
TOLIN ENTERPRISES LTD.	565 LAKESHORE ROAD E. MISSISSAUGA ON L5G 1H9	36.9	2
Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	80.5	5

Site	Address	Distance (m)	Map Key
Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	80.5	5
Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	80.5	5
Chuen Chi Chung Pharmacy Limited	579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	80.5	5
Enbridge Gas Inc.	559-547 Lakeshore Road East Mississauga ON L5G 1J3	11.5	8
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON	109.3	11
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11

Site	Address	Distance (m)	Map Key
The Sherwin Williams Company	603 Lakeshore Road East Mississauga ON L5G 1H9	109.3	11
STANDARD BIOLOGICAL LAB (OUTOFBUS)	DIV. OF SGS SUPERVISION SERVICES INC. 514-516 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J3	20.4	13
STANDARD BIOLOGICAL LAB (OUTOFBUS)36-101	DIV. OF SGS SUPERVISION SERVICES INC. 514-516 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J3	20.4	13
STANDARD BIOLOGICAL (OUT OF BUSINESS)	SGS SUPERVISION SERVICES INC., A DIV. OF 514-516 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J3	20.4	13
Lakeshore Dental	611 Lakeshore Rd East Mississauga ON L5G1H9	105.6	14
Lakeshore Dental	611 Lakeshore Rd East Mississauga ON L5G1H9	105.6	14
Lakeshore Dental	611 Lakeshore Rd East Mississauga ON L5G1H9	105.6	14
LAKESHORE PHOTO & FRAME 24-967	632 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J4	15.1	15
LAKESHORE PHOTO & FRAME	632 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J4	15.1	15
PETM Canada Corporation	507 Lakeshore Rd E Mississauga ON L5G1H9	7.7	18
Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	78.2	33

Site	Address	Distance (m)	Map Key
Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	78.2	33
Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	78.2	33
Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	78.2	33
Trinity Development Group Inc.	501 Lakeshore Road East Mississauga ON L5G 1H9	78.2	33
GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	78.2	33
INGLIS LTD.	501 LAKESHORE RD. E. MISSISSAUGA ON L5G 1H9	78.2	33
INGLIS LTD. 21-130	501 LAKESHORE RD. E. MISSISSAUGA ON L5G 1H9	78.2	33
INGLIS LIMITED	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	78.2	33
CONSUMERS PACKAGING INC.	WINE BOTTLE & PACKAGING INC. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	78.2	33
CONSUM(SEE & USE ON2528300)	WINE BOTTLE & PACKAGING INC. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	78.2	33
MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	78.2	33
SAXCO CANADA CO.	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	78.2	33

Site	Address	Distance (m)	Map Key
SAXCO CANADA CO.	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	78.2	33
SAXCO CANADA CO.	501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	78.2	33
MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	78.2	33
MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	78.2	33
GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	78.2	33
GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	78.2	33
MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	78.2	33
MASSILLY NORTH AMERICA INC.	501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	78.2	33
GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	78.2	33
GS MEDICAL PACKAGING INC.	501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON	78.2	33
PINCHIN LTD.	756/760 LAKESHORE ROAD EAST MISSISSAUGA ON L5E 1C7	41.6	47

Site	Address	Distance (m)	Map Key
PEEL BOARD OF EDUCATION	BYNGMOUNT BEACH PUBLIC SCHOOL 930 EAST AVENUE MISSISSAUGA ON L5E 1W6	210.3	61
PEEL BOARD OF EDUCATION 30-247	BYNGMOUNT BEACH PUBLIC SCHOOL 930 EAST AVENUE MISSISSAUGA ON L5E 1W6	210.3	61
PEEL DISTRICT SCHOOL BOARD	BYNGMOUNT BEACH PUBLIC SCHOOL 930 EAST AVENUE MISSISSAUGA ON L5E 1W6	210.3	61
Region of Peel	930 East Ave Mississauga ON L5E 1W6	210.3	61
Region of Peel	930 East Ave Mississauga ON L5E 1W6	210.3	61
Region of Peel	930 East Ave Mississauga ON L5E 1W6	210.3	61
Region of Peel	930 East Ave Mississauga ON L5E 1W6	210.3	61
MEDIACOM INC	830 LAKESHORE RD. E. MISSISSAUGA ON L5E 1E1	239.8	67
MEDIACOM INC. 26-031	830 LAKESHORE RD. E. MISSISSAUGA ON L5E 1E1	239.8	67
MEDIACOM INC.	830 LAKESHORE ROAD EAST MISSISSAUGA ON L5E 1E1	239.8	67
MEDIACOM (OUT OF BUSINESS)	830 LAKESHORE ROAD EAST MISSISSAUGA ON L5E 1E1	239.8	67
Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON	239.8	67

Site	Address	Distance (m)	Map Key
Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON	239.8	67
Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	239.8	67
Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	239.8	67
Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	239.8	67
Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	239.8	67
Wellington Printworks Inc.	830 Lakeshore Road East Mississauga ON L5E 1E1	239.8	67

PES - Pesticide Register

A search of the PES database, dated Oct 2011-Dec 31, 2020 has found that there are 14 PES site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
MISSISSAUGA LAKESIDE GARDEN CENTER	544 LAKESHORE RD E MISSISSAUGA ON L5G1J3	23.9	3
R.C BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G1H9	80.5	5
CHUEN CHI CHUNG PHARMACY LIMITED O/A SHOPPERS DRUG MART #1275	579A LAKESHORE RD E MISSISSAUGA ON L5G1H9	80.5	5

Site	Address	Distance (m)	Map Key
R.C BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G1H9	80.5	5
POONAM RX LTD/ SHOPPERS DRUG MART #1275	579 LAKESHORE RD E MISSISSAUGA ON L5G1H9	80.5	5
CANADIAN TIRE ASSOCIATE STORE J.C. BORLAND LTD	579 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	80.5	5
MAL WHITLOCK ENTERPRISES LTD O/A CANADIAN TIRE	579 LAKESHORE RD E MISSISSAUGA ON L5G1H9	80.5	5
R.C. BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	80.5	5
R.C. BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	80.5	5
R.C BANOUB PHARMACY INC.	579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	80.5	5
TOMCO HORTICULTURAL SERVICES	941 THE GREENWAY MISSISSAUGA ON L5G 1P7	133.5	28
619151 ONTARIO INC.	941 THE GREENWAY MISSISSAUGA ON L5G 1P7	133.5	28
MCGROW LANDSCAPING	1058 ENOLA DRIVE MISSISSAUGA ON L5G 4A9	242.2	49
MCGROW LANDSCAPING	1058 ENOLA DRIVE MISSISSAUGA ON L5G4A9	242.7	50

PRT - Private and Retail Fuel Storage Tanks

A search of the PRT database, dated 1989-1996* has found that there are 7 PRT site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
A MOLASY A B M GARAGE	570 LAKESHORE RD E MISSISSAUGA ON L5G 1J4	21.4	1
LAKEVIEW SHELL SERVICE CTR	644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	20.1	20
LAKEVIEW SHELL SERVICE CTR	644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	20.1	20
LAKEVIEW SHELL SERVICE CTR	644 LAKESHORE RD E MISSISSAUGA ON L5G 1J6	20.1	20
HENRY F GALLANT	644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	20.1	20
INGLIS CANADA	501 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	78.2	33
SUNOCO INC - THROUGH AGENT PIONEER PETROLEUMS MANA	456 LAKESHORE RD E MISSISSAUGA ON L5G1J1	172.8	36

RSC - Record of Site Condition

A search of the RSC database, dated 1997-Sept 2001, Oct 2004-Jan 2021 has found that there are 8 RSC site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Lakeshore Country Properties Ltd.	565 LAKESHORE ROAD EAST, MISSISSAUGA, ONTARIO L5G 1H9 Mississauga ON	36.9	2
Lakeshore Country Properties Ltd.	565 LAKESHORE ROAD EAST, MISSISSAUGA, ONTARIO L5G 1H9 Mississauga ON	36.9	2

Site	Address	Distance (m)	Map Key
501 LAKESHORE INC.	505 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	10.2	19
656731 Ontario Limited	707 LAKESHORE RD E, MISSISSAUGA, ON, L5G 1J7 ON L5G 1J7	23.7	27
501 LAKESHORE INC.	501A LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	78.2	33
501 LAKESHORE INC.	501C LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	78.2	33
501 LAKESHORE INC.	501B LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9 Mississauga ON	78.2	33
INDWELL COMMUNITY HOMES	425 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H8 Mississauga ON	240.4	45

SPL - Ontario Spills

A search of the SPL database, dated 1988-Mar 2020; Jul 2020 - Aug 2020 has found that there are 50 SPL site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
C C TRANSPORT	570 LAKESHORE RD. E. TRANSPORT TRUCK (CARGO) MISSISSAUGA CITY ON L5G 1J4	21.4	1
CONTRACTOR	565 LAKESHORE RD. E., NEAR HAMPTON CRESCENT (N.O.S.) MISSISSAUGA CITY ON L5G 1H9	36.9	2
The Regional Municipality of Peel	565 Lakeshore Rd. East Mississauga ON	36.9	2

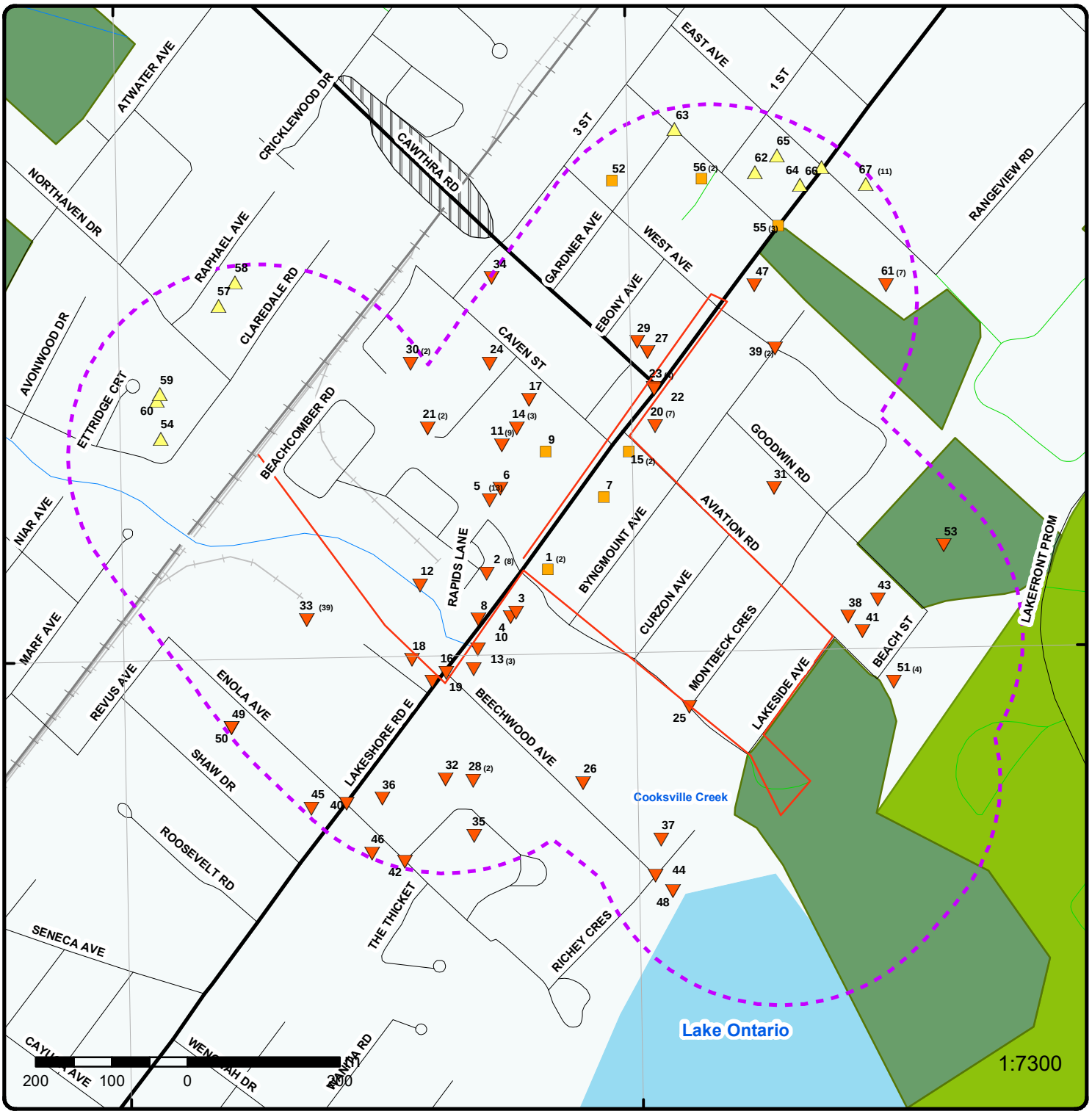
Site	Address	Distance (m)	Map Key
Country Homes Limited	Cooksville Creek right at Beechwood Avenue; Ref. Plan 43R-35317 565 Lakeshore Road East Mississauga; Mississauga ON L5G 1H9	36.9	2
The Regional Municipality of Peel	544 Lakeshore Rd E Mississauga ON	21.6	4
	610 Lakeshore Road East Mississauga ON	39.4	7
	West of Cawthra Road, east of Hurontario Street Mississauga ON	10.1	10
The Regional Municipality of Peel	Mississauga ON	68.6	12
UNKNOWN	IN THE COOKSVILLE CREEK AT LAKESHORE RD. & BEACHWOOD MISSISSAUGA CITY ON	6.1	16
Unknown<UNOFFICIAL>	1036A Caven Street Mississauga ON	114.2	17
SHELL CANADA PRODUCTS LTD.	644 LAKESHORE BLVD. E. (NEAR CAWTHRA) SERVICE STATION MISSISSAUGA CITY ON	20.1	20
Forest Town Development<UNOFFICIAL>	1060 Caven St. Mississauga ON L5G 4J5	199.7	21
The Corporation of the City of Mississauga	1060 Caven St Mississauga ON	199.7	21
Credit Valley Conservation Authority	Lakeshore Rd west of Cawthra Mississauga ON	9.3	22
	Lakeshore Rd and Cawthra Mississauga ON	9.8	23

Site	Address	Distance (m)	Map Key
The Corporation of the City of Mississauga	manhole on easement 200m north of Lakeshore Rd near Lakeshore and Cawthra Mississauga ON	9.8	23
The Regional Municipality of Peel	1600 Caven St Mississauga ON	184.3	24
	Hampton Cres at Montbeck Cres Mississauga ON	1.5	25
	909 Beechwood Avenue Mississauga ON	167.3	26
Enbridge Energy Distribution Inc.	1015 Cawthra Rd Mississauga ON	42.6	29
CANADIAN WASTE SERVICES	BEHIND 1110 CAVEN MOTOR VEHICLE (OPERATING FLUID) MISSISSAUGA CITY ON L5G 4N4	232.6	30
CANADIAN WASTE SERVICES	1110 CAVEN ST. MOTOR VEHICLE (OPERATING FLUID) MISSISSAUGA CITY ON L5G 4N4	232.6	30
Enbridge Gas Distribution Inc.	918 Goodwin Road Mississauga ON	84.6	31
Enbridge Gas Distribution Inc.	947 The Greenway Mississauga ON	126.4	32
INGLIS LTD.	INGLIS IN YARD AT 501 LAHESHORE RD.E. TORONTO PLANT 14 STRACHAN AVENUE MISSISSAUGA CITY ON L5G 1H9	78.2	33
Caravan Logistics Inc.	501 Lakeshore Road East 501 LAKESHORE ROAD EAST Mississauga ON L5G 1H9	78.2	33

Site	Address	Distance (m)	Map Key
	501 Lakeshore Road East Mississauga ON	78.2	33
Enbridge Gas Distribution Inc.	646 3rd Street Mississauga ON	247.7	34
Enbridge Gas Distribution Inc.	928 The Greenway Mississauga ON	204.5	35
The Regional Municipality of Peel	519 Richey Cres Mississauga ON	154.4	37
UNKNOWN	SANITARY SEWERS IN FRONT OF 859 AVIATION DRIVE MISSISSAUGA CITY ON L5G 4H5	32.3	38
The Regional Municipality of Peel	On Enola Ave. south of Lakeshore Rd., at Lakeshore Rd. and Enola Ave. Mississauga ON	204.4	40
Tamray Construction<UNOFFICIAL>; The Regional Municipality of Peel	849 Aviation Dr Mississauga ON	39.1	41
The Regional Municipality of Peel	852 Goodwin Rd Mississauga ON	76.3	43
	Beechwood Ave. and Richey Cres. Mississauga ON	182.4	44
Enbridge Gas Distribution Inc.	420 Lakeshore Rd. E. Mississauga Mississauga ON	243.9	46
	506 Richey Cres Mississauga ON L5G 1N4	173.3	48
ONTARIO CLEAN WATER AGENCY	LAKE ONTARIO BEACH ST, PUMPING STATION SANITARY SEWER/PUMPING STATION MISSISSAUGA CITY ON	100.1	51

Site	Address	Distance (m)	Map Key
MINISTRY OF THE ENVIRONMENT	LAKE ONTARIO BEACH ST. PUMPING STN. SANITARY SEWER SYSTEM MISSISSAUGA CITY ON	100.1	51
Enbridge Gas Distribution Inc.	1065 West Ave. Mississauga ON	197.9	52
Enersource Hydro Mississauga Inc.	1161 Claredale Rd Mississauga ON	129.6	54
Enersource Hydro Mississauga Inc.	558 Raphael Ave Mississauga ON	202.1	57
Enbridge Gas Distribution Inc.	570 Raphael Ave. Mississauga, ON Mississauga ON	227.9	58
	512 Ettridge Court Mississauga ON	151.0	59
Enersource Hydro Mississauga Inc.	506 Ettridge Court Mississauga ON	150.5	60
Gospel Assembly Church<UNOFFICIAL>	1023 Greaves Avenue Mississauga ON	170.9	62
UNKNOWN	GARDINER AVE. AND GREAVES MISSISSAUGA CITY ON	222.3	63
	803 Lakeshore Rd East Mississauga ON	181.2	64
The Regional Municipality of Peel	1012 East Ave Mississauga ON	201.7	65

Site	Address	Distance (m)	Map Key
The Regional Municipality of Peel	NW of Lakeshore Road E at East Ave Mississauga ON	216.9	66



Map: 0.25 Kilometer Radius

Order Number: 21030800117

Address: Watermain Replacement for Beach Street Pumping Station Diversion, Mississauga, ON

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

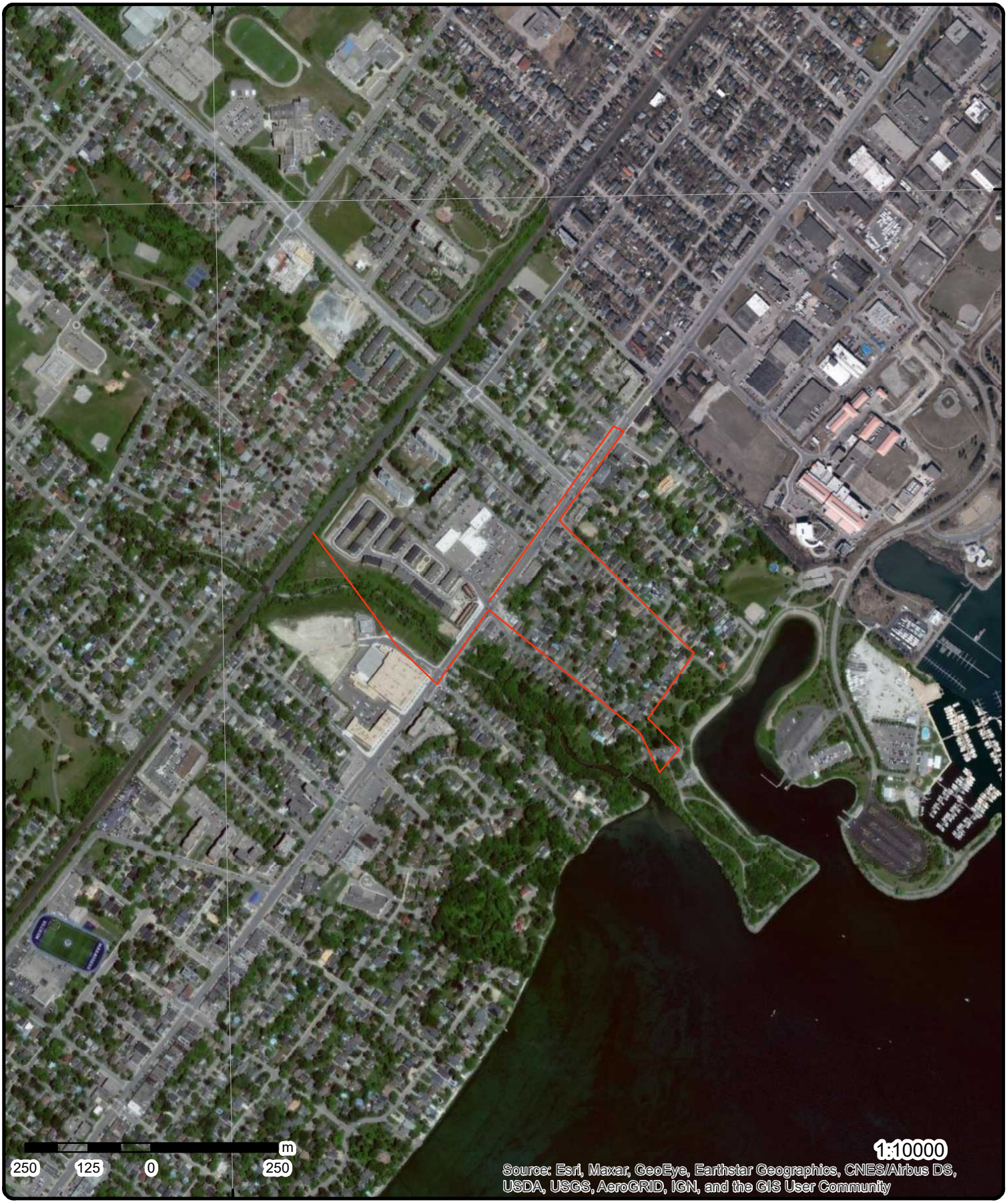
- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Expressway
- Principal Highway
- Secondary Highway
- Major Road
- Local road
- Trail
- Proposed Road
- Ferry Route/Ice Road
-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

Source: © 2015 DMTI Spatial Inc.

© ERIS Information Limited Partnership

79°34'30"W

43°34'30"N



43°34'30"N

Aerial

Year: 2018

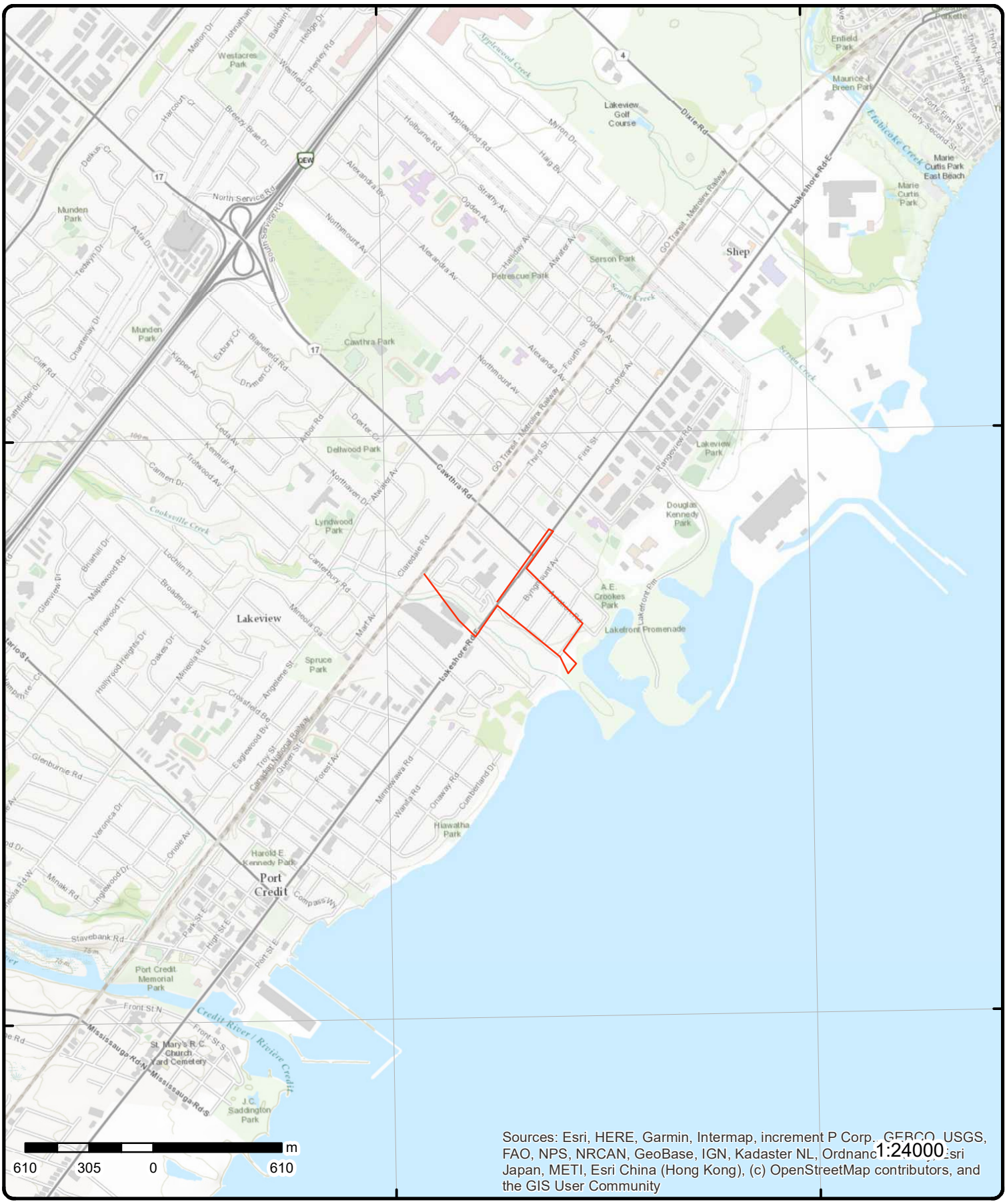
Order Number: 21030800117

Address: Watermain Replacement for Beach Street Pumping Station I

ERIS ENVIRONMENTAL RISK INFORMATION SERVICES

Source: ESRI World Imagery

© ERIS Information Limited Partnership



Topographic Map

Order Number: 21030800117

Address: Watermain Replacement for Beach Street Pumping Station D

Source: ESRI World Topographic Map

ENVIRONMENTAL RISK INFORMATION SERVICES

© ERIS Information Limited Partnership

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 2	SSE/21.4	80.8 / 0.00	C C TRANSPORT 570 LAKESHORE RD. E. TRANSPORT TRUCK (CARGO) MISSISSAUGA CITY ON L5G 1J4	SPL

Ref No:	10779	Discharger Report:	
Site No:		Material Group:	
Incident Dt:	10/21/1988	Health/Env Conseq:	
Year:		Client Type:	
Incident Cause:	CONTAINER OVERFLOW	Sector Type:	
Incident Event:		Agency Involved:	
Contaminant Code:		Nearest Watercourse:	
Contaminant Name:		Site Address:	
Contaminant Limit 1:		Site District Office:	
Contam Limit Freq 1:		Site Postal Code:	
Contaminant UN No 1:		Site Region:	
Environment Impact:		Site Municipality:	21102
Nature of Impact:		Site Lot:	
Receiving Medium:	LAND	Site Conc:	
Receiving Env:		Northing:	
MOE Response:		Easting:	
Dt MOE Arvl on Scn:		Site Geo Ref Accu:	
MOE Reported Dt:	10/22/1988	Site Map Datum:	
Dt Document Closed:		SAC Action Class:	
Incident Reason:	ERROR	Source Type:	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	M & P GAS BAR- 10 L UNLEADED GASOLINE TO GROUND.		
Contaminant Qty:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	2 of 2	SSE/21.4	80.8 / 0.00	A MOLASY A B M GARAGE 570 LAKESHORE RD E MISSISSAUGA ON L5G 1J4	PRT

Location ID:	9139
Type:	retail
Expiry Date:	1995-05-31
Capacity (L):	63500
Licence #:	0019668001

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
2	1 of 8	W/36.9	79.8 / -1.00	CONTRACTOR 565 LAKESHORE RD. E., NEAR HAMPTON CRESCENT (N.O.S.) MISSISSAUGA CITY ON L5G 1H9	SPL

Ref No:	131209	Discharger Report:	
Site No:		Material Group:	
Incident Dt:	8/31/1996	Health/Env Conseq:	
Year:		Client Type:	
Incident Cause:	OTHER CAUSE (N.O.S.)	Sector Type:	
Incident Event:		Agency Involved:	
Contaminant Code:		Nearest Watercourse:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	POSSIBLE	**Site Municipality:**	21102
Nature of Impact:	Human health	**Site Lot:**	
Receiving Medium:	LAND / AIR	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	F.D.,WORKS
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	8/31/1996	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	OTHER	**Source Type:**	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	SAN-MAR CONTRACTING: ASBESTOS PARTICULATE EMI-SSION FROM DEMOLITION.		
Contaminant Qty:			

2	2 of 8	W/36.9	79.8 / -1.00	**INGLIS LIMITED 21-516** **565 LAKESHORE ROAD EAST C/O 501** **LAKESHORE ROAD EAST** **MISSISSAUGA ON L5G 1H9**	GEN

Generator No:	ON0003404	**PO Box No:**	
Status:		**Country:**	
Approval Years:	92,93,94,95,96,97	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	3321		
SIC Description:	MAJOR APPLIANCE IND.		

Detail(s)

Waste Class:	122
Waste Class Desc:	ALKALINE WASTES - OTHER METALS
Waste Class:	131
Waste Class Desc:	NEUTRALIZED WASTES - HEAVY METALS
Waste Class:	145
Waste Class Desc:	PAINT/PIGMENT/COATING RESIDUES
Waste Class:	146
Waste Class Desc:	OTHER SPECIFIED INORGANICS
Waste Class:	211
Waste Class Desc:	AROMATIC SOLVENTS
Waste Class:	212
Waste Class Desc:	ALIPHATIC SOLVENTS
Waste Class:	213
Waste Class Desc:	PETROLEUM DISTILLATES
Waste Class:	232
Waste Class Desc:	POLYMERIC RESINS
Waste Class:	233
Waste Class Desc:	OTHER POLYMERIC WASTES
Waste Class:	241
Waste Class Desc:	HALOGENATED SOLVENTS

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 253
Waste Class Desc: EMULSIFIED OILS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 267
Waste Class Desc: ORGANIC ACIDS

Waste Class: 268
Waste Class Desc: AMINES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
2	3 of 8	W/36.9	79.8 / -1.00	INGLIS LIMITED 565 LAKESHORE ROAD EAST C/O 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON0003404
Status:
Approval Years: 98
Contam. Facility:
MHSW Facility:
SIC Code: 3321
SIC Description: MAJOR APPLIANCE IND.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 267
Waste Class Desc: ORGANIC ACIDS

Waste Class: 268
Waste Class Desc: AMINES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 146
Waste Class Desc: OTHER SPECIFIED INORGANICS

Waste Class: 211
Waste Class Desc: AROMATIC SOLVENTS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 122
Waste Class Desc: ALKALINE WASTES - OTHER METALS

Waste Class: 131
Waste Class Desc: NEUTRALIZED WASTES - HEAVY METALS

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 233
Waste Class Desc: OTHER POLYMERIC WASTES

Waste Class: 241
Waste Class Desc: HALOGENATED SOLVENTS

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 253
Waste Class Desc: EMULSIFIED OILS

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2 | **4 of 8** | **W/36.9** | **79.8 / -1.00** | **The Regional Municipality of Peel**
565 Lakeshore Rd. East
Mississauga ON | **SPL**

Ref No: 2845-8ETPKR
Site No:
Incident Dt: 3/10/2011
Year:
Incident Cause:
Incident Event:
Contaminant Code: 43
Contaminant Name: SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Environment Impact: Not Anticipated
Nature of Impact:
Receiving Medium:
Receiving Env:
MOE Response:
Dt MOE Arvl on Scn:
MOE Reported Dt: 3/10/2011
Dt Document Closed:
Incident Reason:
Site Name: Undeveloped Lot<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Region of Peel: sediment into Cooksville Creek
Contaminant Qty:

Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type:
Agency Involved:
Nearest Watercourse:
Site Address: 565 Lakeshore Rd. East
Site District Office:
Site Postal Code:
Site Region:
Site Municipality: Mississauga
Site Lot:
Site Conc:
Northing:
Easting:
Site Geo Ref Accu:
Site Map Datum:
SAC Action Class: Watercourse Spills
Source Type:

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2 | **5 of 8** | **W/36.9** | **79.8 / -1.00** | **Lakeshore Country Properties Ltd.**
565 LAKESHORE ROAD EAST, MISSISSAUGA,
ONTARIO L5G 1H9
Mississauga ON | **RSC**

RSC ID: 210088
RA No:
RSC Type: Phase 1 and 2 RSC
Curr Property Use: Industrial
Ministry District: Halton-Peel District Office
Filing Date: 2013/09/27
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:
Asmt Roll No: 2110 050 10002 17400 0000
Prop ID No (PIN): 13473-0288 (LT)

Cert Date:
Cert Prop Use No:
Intended Prop Use: Parkland
Qual Person Name: Prem Manicks
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:

Property Municipal Address:	565 LAKESHORE ROAD EAST, MISSISSAUGA, ONTARIO L5G 1H9
Mailing Address:	
Latitude & Latitude:	
UTM Coordinates:	
Consultant:	
Legal Desc:	
Measurement Method:	
Applicable Standards:	
RSC PDF:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26004&fileName=BROWNFIELDS-E.pdf

Document(s) Detail

Document Heading:	Supporting Documents
Document Name:	Land Transfer_565 Lakeshore Rd E.pdf
Document Type:	Copy of any deed(s), transfer(s) or other document(s)
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26002&fileName=Land+Transfer_565+Lakeshore+Rd+E.pdf
Document Heading:	Supporting Documents
Document Name:	Lawyers Letter_565 Lakeshore Rd E_GB.pdf
Document Type:	Lawyer's letter consisting of a legal description of the property
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26008&fileName=Lawyers+Letter_565+Lakeshore+Rd+E_GB.pdf
Document Heading:	Supporting Documents
Document Name:	Current and Past Uses Table.pdf
Document Type:	Table of Current and Past Property Use
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26005&fileName=Current+and+Past+Uses+Table.pdf
Document Heading:	Supporting Documents
Document Name:	APEC Table_GB_v2.pdf
Document Type:	Area(s) of Potential Environmental Concern
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26006&fileName=APEC+Table_GB_v2.pdf
Document Heading:	Supporting Documents
Document Name:	No Objection Letters_RegionCity_565 Lakeshore.pdf
Document Type:	A copy of No Objection Statement from municipality
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26007&fileName=No+Objection+Letters_RegionCity_565+Lakeshore.pdf
Document Heading:	Supporting Documents
Document Name:	Certificate of Status.pdf
Document Type:	Certificate of Status
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26010&fileName=Certificate+of+Status.pdf
Document Heading:	Supporting Documents
Document Name:	Phase II CSM_GB.pdf
Document Type:	Phase 2 Conceptual Site Model
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26011&fileName=Phase+II+CSM_GB.pdf
Document Heading:	Supporting Documents
Document Name:	Plan of Survey_GB.pdf
Document Type:	A Current plan of Survey
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=26009&fileName=Plan+of+Survey_GB.pdf

2	***6 of 8***	***W/36.9***	***79.8 / -1.00***	***Lakeshore Country Properties Ltd.*** ***565 LAKESHORE ROAD EAST, MISSISSAUGA, ONTARIO L5G 1H9***	***RSC***

Mississauga ON

RSC ID:	210087	***Cert Date:***	
RA No:		***Cert Prop Use No:***	
RSC Type:	Phase 1 and 2 RSC	***Intended Prop Use:***	Residential
Curr Property Use:	Industrial	***Qual Person Name:***	Prem Manicks
Ministry District:	Halton-Peel District Office	***Stratified (Y/N):***	
Filing Date:	2013/09/27	***Audit (Y/N):***	
Date Ack:		***Entire Leg Prop. (Y/N):***	
Date Returned:		***Accuracy Estimate:***	
Restoration Type:		***Telephone:***	
Soil Type:		***Fax:***	
Criteria:		***Email:***	
CPU Issued Sect 1686:			

Asmt Roll No: 2110 050 10002 17400 0000
Prop ID No (PIN): 13473-0288 (LT)
Property Municipal Address: 565 LAKESHORE ROAD EAST, MISSISSAUGA, ONTARIO L5G 1H9
Mailing Address:
Latitude & Latitude:
UTM Coordinates:
Consultant:
Legal Desc:
Measurement Method:
Applicable Standards:
RSC PDF: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25994&fileName=BROWNFIELDS-E.pdf

Document(s) Detail

Document Heading: Supporting Documents
Document Name: Certificate of Status.pdf
Document Type: Certificate of Status
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25991&fileName=Certificate+of+Status.pdf

Document Heading: Supporting Documents
Document Name: Land Transfer_565 Lakeshore Rd E.pdf
Document Type: Copy of any deed(s), transfer(s) or other document(s)
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25993&fileName=Land+Transfer_565+Lakeshore+Rd+E.pdf

Document Heading: Supporting Documents
Document Name: Plan of Survey_Dev.pdf
Document Type: A Current plan of Survey
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25990&fileName=Plan+of+Survey_Dev.pdf

Document Heading: Supporting Documents
Document Name: Current and Past Uses Table.pdf
Document Type: Table of Current and Past Property Use
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25996&fileName=Current+and+Past+Uses+Table.pdf

Document Heading: Supporting Documents
Document Name: APEC Table_Dev_v2.pdf
Document Type: Area(s) of Potential Environmental Concern
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25999&fileName=APEC+Table_Dev_v2.pdf

Document Heading: Supporting Documents
Document Name: Phase II CSM_Dev.pdf
Document Type: Phase 2 Conceptual Site Model
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25992&fileName=Phase+II+CSM_Dev.pdf

Document Heading: Supporting Documents
Document Name: No Objection Letters_RegionCity_565 Lakeshore.pdf
Document Type: A copy of No Objection Statement from municipality
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25995&fileName=No+Objection+Letters_RegionCity_565+Lakeshore.pdf

Document Heading: Supporting Documents
Document Name: Lawyers Letter_565 Lakeshore Rd E_Dev.pdf
Document Type: Lawyer's letter consisting of a legal description of the property
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=25997&fileName=Lawyers+Letter_565+Lakeshore+Rd+E_Dev.pdf

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2	7 of 8	W/36.9	79.8 / -1.00	**TOLIN ENTERPRISES LTD.** **565 LAKESHORE ROAD E.** **MISSISSAUGA ON L5G 1H9**	GEN

Generator No: ON9039149
Status:
Approval Years: 2016
Contam. Facility: No
MHSW Facility: No
SIC Code: 419120
SIC Description: PETROLEUM PRODUCT AGENTS AND BROKERS, WHOLESALE TRADE AGENTS AND BROKERS

PO Box No:
Country: Canada
Choice of Contact: CO_OFFICIAL
Co Admin: RAFFAELE TOMASONE
Phone No Admin: 905-417-0011 Ext.

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Waste Class: 221
Waste Class Desc: LIGHT FUELS

2	8 of 8	W/36.9	79.8 / -1.00	**Country Homes Limited** **Cooksville Creek right at Beechwood Avenue;** **Ref. Plan 43R-35317 565 Lakeshore Road East** **Mississauga; Mississauga ON L5G 1H9**	SPL

Ref No: 5683-ATKTYR
Site No: NA; 8662-9P9PU5
Incident Dt: 2017/11/29
Year:
Incident Cause:
Incident Event: Operator/Human error
Contaminant Code: 32
Contaminant Name: DUST (N.O.S.)
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1: n/a
Environment Impact:
Nature of Impact:
Receiving Medium:
Receiving Env: Surface Water
MOE Response: Yes
Dt MOE Arvl on Scn: 2017/11/30
MOE Reported Dt: 2017/11/29
Dt Document Closed:
Incident Reason: Operator/Human Error
Site Name: Cooksville Creek<UNOFFICIAL>; 565 Lakeshore Road East
Site County/District: Regional Municipality of Peel; Regional Municipality of Peel
Site Geo Ref Meth: 10 -100 metres eg. Topographic Map; NA
Incident Summary: Region of Peel: Milky white substance in Cooksville Creek

Discharger Report:
Material Group:
Health/Env Conseq: 2 - Minor Environment
Client Type: Corporation
Sector Type: Other
Agency Involved:
Nearest Watercourse: Cooksville Creek
Site Address: Cooksville Creek right at Beechwood Avenue; Ref. Plan 43R-35317 565 Lakeshore Road East
Site District Office: Halton-Peel; Halton-Peel
Site Postal Code: L5G 1H9
Site Region: Central
Site Municipality: Mississauga; Mississauga
Site Lot: Part of Lot 11 and 12
Site Conc: 2 South of Dundas Street
Northing: 4824530; 4824808
Easting: 615842; 615544
Site Geo Ref Accu: Survey
Site Map Datum: NAD27
SAC Action Class: Watercourse Spills
Source Type: Other

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contaminant Qty: 0 other - see incident description

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3 | **1 of 1** | **SW/23.9** | **79.8 / -1.00** | **MISSISSAUGA LAKESIDE GARDEN CENTER**
544 LAKESHORE RD E
MISSISSAUGA ON L5G1J3 | **PES**

Detail Licence No:	23-01-12223-0	**Operator Box:**	
Licence No:	12223	**Operator Class:**	
Status:		**Operator No:**	
Approval Date:		**Operator Type:**	
Report Source:	Legacy Licenses (Excluding TS)	**Oper Area Code:**	905
Licence Type:	Limited Vendor	**Oper Phone No:**	8915144
Licence Type Code:	23	**Operator Ext:**	
Licence Class:	01	**Operator Lot:**	
Licence Control:	0	**Oper Concession:**	
Latitude:		**Operator Region:**	
Longitude:		**Operator District:**	
Lot:		**Operator County:**	
Concession:		**Op Municipality:**	
Region:		**Post Office Box:**	
District:		**MOE District:**	
County:		**SWP Area Name:**	
Trade Name:			
PDF Link:			

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4 | **1 of 1** | **SW/21.6** | **79.8 / -1.00** | **The Regional Municipality of Peel**
544 Lakeshore Rd E
Mississauga ON | **SPL**

Ref No:	3503-9ZAPG8	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	8/11/2015	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:		**Agency Involved:**	
Contaminant Code:	15	**Nearest Watercourse:**	
Contaminant Name:	HYDRAULIC OIL	**Site Address:**	544 Lakeshore Rd E
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	8/11/2015	**Site Map Datum:**	
Dt Document Closed:	8/13/2015	**SAC Action Class:**	Watercourse Spills
Incident Reason:	Equipment Failure	**Source Type:**	
Site Name:	spill<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	ROP:hyd oil to grd, ctnd, clng CB 20 L		
Contaminant Qty:	20 L		

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5 | **1 of 13** | **NW/80.5** | **79.8 / -1.00** | **CANADIAN TIRE ASSOCIATE STORE J.C. BORLAND LTD**
579 LAKESHORE ROAD EAST
MISSISSAUGA ON L5G 1H9 | **PES**

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Detail Licence No:		**Operator Box:**	
Licence No:		**Operator Class:**	
Status:		**Operator No:**	
Approval Date:		**Operator Type:**	
Report Source:		**Oper Area Code:**	
Licence Type:	Vendor	**Oper Phone No:**	
Licence Type Code:		**Operator Ext:**	
Licence Class:		**Operator Lot:**	
Licence Control:		**Oper Concession:**	
Latitude:		**Operator Region:**	
Longitude:		**Operator District:**	
Lot:		**Operator County:**	
Concession:		**Op Municipality:**	
Region:		**Post Office Box:**	
District:		**MOE District:**	
County:		**SWP Area Name:**	
Trade Name:			
PDF Link:			

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5 | ***2 of 13*** | ***NW/80.5*** | ***79.8 / -1.00*** | ***MAL WHITLOCK ENTERPRISES LTD O/A CANADIAN TIRE***
579 LAKESHORE RD E
MISSISSAUGA ON L5G1H9 | ***PES***

Detail Licence No:	23-01-11965-0	**Operator Box:**	
Licence No:	11965	**Operator Class:**	
Status:		**Operator No:**	
Approval Date:		**Operator Type:**	
Report Source:	Legacy Licenses (Excluding TS)	**Oper Area Code:**	905
Licence Type:	Limited Vendor	**Oper Phone No:**	2788585
Licence Type Code:	23	**Operator Ext:**	
Licence Class:	01	**Operator Lot:**	
Licence Control:	0	**Oper Concession:**	
Latitude:		**Operator Region:**	3
Longitude:		**Operator District:**	
Lot:		**Operator County:**	49
Concession:		**Op Municipality:**	
Region:		**Post Office Box:**	
District:		**MOE District:**	
County:		**SWP Area Name:**	
Trade Name:			
PDF Link:			

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5 | ***3 of 13*** | ***NW/80.5*** | ***79.8 / -1.00*** | ***R.C. BANOUB PHARMACY INC.***
579A LAKESHORE ROAD EAST
MISSISSAUGA ON L5G 1H9 | ***PES***

Detail Licence No:		**Operator Box:**	
Licence No:		**Operator Class:**	
Status:		**Operator No:**	
Approval Date:		**Operator Type:**	
Report Source:		**Oper Area Code:**	
Licence Type:	Limited Vendor	**Oper Phone No:**	
Licence Type Code:	23	**Operator Ext:**	
Licence Class:		**Operator Lot:**	
Licence Control:		**Oper Concession:**	
Latitude:		**Operator Region:**	
Longitude:		**Operator District:**	
Lot:		**Operator County:**	
Concession:		**Op Municipality:**	
Region:		**Post Office Box:**	
District:		**MOE District:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
				County: **SWP Area Name:** **Trade Name:** **PDF Link:**	

5	4 of 13	NW/80.5	79.8 / -1.00	**R.C. BANOUB PHARMACY INC.** **579A LAKESHORE ROAD EAST** **MISSISSAUGA ON L5G 1H9**	PES

Detail Licence No:
Licence No:
Status:
Approval Date:
Report Source:
Licence Type: Vendor
Licence Type Code:
Licence Class:
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF Link:

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code:
Oper Phone No:
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

5	5 of 13	NW/80.5	79.8 / -1.00	**R.C BANOUB PHARMACY INC.** **579A LAKESHORE ROAD EAST** **MISSISSAUGA ON L5G 1H9**	PES

Detail Licence No: 23-01-16160-0
Licence No:
Status:
Approval Date:
Report Source:
Licence Type: LIMITED
Licence Type Code:
Licence Class:
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF Link:

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code:
Oper Phone No:
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

5	6 of 13	NW/80.5	79.8 / -1.00	**POONAM RX LTD/ SHOPPERS DRUG MART #1275** **579 LAKESHORE RD E** **MISSISSAUGA ON L5G1H9**	PES

Detail Licence No:
Licence No: 16565
Status:
Approval Date:
Report Source: Legacy Licenses (Excluding TS)

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code: 905

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Licence Type:	Limited Vendor	**Oper Phone No:**	2785506
Licence Type Code:	23	**Operator Ext:**	
Licence Class:	01	**Operator Lot:**	
Licence Control:		**Oper Concession:**	
Latitude:		**Operator Region:**	
Longitude:		**Operator District:**	
Lot:		**Operator County:**	
Concession:		**Op Municipality:**	
Region:		**Post Office Box:**	
District:		**MOE District:**	
County:		**SWP Area Name:**	
Trade Name:			
PDF Link:			

5	7 of 13	NW/80.5	79.8 / -1.00	**Chuen Chi Chung Pharmacy Limited** **579 LAKESHORE RD E** **MISSISSAUGA ON L5G 1H9**	GEN

Generator No:	ON3943083	**PO Box No:**	
Status:		**Country:**	Canada
Approval Years:	2016	**Choice of Contact:**	CO_ADMIN
Contam. Facility:	No	**Co Admin:**	NASTRAN NAJAFI-FARD
MHSW Facility:	No	**Phone No Admin:**	4164931120 Ext.3218
SIC Code:	446110		
SIC Description:	446110		

Detail(s)

Waste Class:	261
Waste Class Desc:	PHARMACEUTICALS
Waste Class:	312
Waste Class Desc:	PATHOLOGICAL WASTES

5	8 of 13	NW/80.5	79.8 / -1.00	**Chuen Chi Chung Pharmacy Limited** **579 LAKESHORE RD E** **MISSISSAUGA ON L5G 1H9**	GEN

Generator No:	ON3943083	**PO Box No:**	
Status:		**Country:**	Canada
Approval Years:	2015	**Choice of Contact:**	CO_ADMIN
Contam. Facility:	No	**Co Admin:**	NASTRAN NAJAFI-FARD
MHSW Facility:	No	**Phone No Admin:**	4164931120 Ext.3218
SIC Code:	446110		
SIC Description:	446110		

Detail(s)

Waste Class:	261
Waste Class Desc:	PHARMACEUTICALS
Waste Class:	312
Waste Class Desc:	PATHOLOGICAL WASTES

5	9 of 13	NW/80.5	79.8 / -1.00	**Chuen Chi Chung Pharmacy Limited** **579 LAKESHORE RD E** **MISSISSAUGA ON L5G 1H9**	GEN

Generator No:	ON3943083	**PO Box No:**	
Status:	Registered	**Country:**	Canada
Approval Years:	As of Dec 2018	**Choice of Contact:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 261 A
Waste Class Desc: Pharmaceuticals

Waste Class: 312 P
Waste Class Desc: Pathological wastes

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5 ***10 of 13*** ***NW/80.5*** ***79.8 / -1.00*** ***CHUEN CHI CHUNG PHARMACY LIMITED O/A SHOPPERS DRUG MART #1275 579A LAKESHORE RD E MISSISSAUGA ON L5G1H9*** ***PES***

Detail Licence No:
Licence No: 18316
Status:
Approval Date:
Report Source: Legacy Licenses (Excluding TS)
Licence Type: Limited Vendor
Licence Type Code: 23
Licence Class: 01
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF Link:

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code: 905
Oper Phone No: 2785506
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

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5 ***11 of 13*** ***NW/80.5*** ***79.8 / -1.00*** ***R.C BANOUB PHARMACY INC. 579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G1H9*** ***PES***

Detail Licence No:
Licence No: 14320
Status:
Approval Date:
Report Source: Legacy Licenses (Excluding TS)
Licence Type: Limited Vendor
Licence Type Code: 23
Licence Class: 01
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF Link:

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code: 905
Oper Phone No: 2785506
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
5	12 of 13	NW/80.5	79.8 / -1.00	R.C BANOUB PHARMACY INC. 579A LAKESHORE ROAD EAST MISSISSAUGA ON L5G1H9	PES

Detail Licence No:
Licence No: 16160
Status:
Approval Date:
Report Source: Legacy Licenses (Excluding TS)
Licence Type: Limited Vendor
Licence Type Code: 23
Licence Class: 01
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF Link:

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code: 905
Oper Phone No: 2785506
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
5	13 of 13	NW/80.5	79.8 / -1.00	Chuen Chi Chung Pharmacy Limited 579 LAKESHORE RD E MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON3943083
Status: Registered
Approval Years: As of Jul 2020
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 312 P
Waste Class Desc: Pathological wastes

Waste Class: 261 A
Waste Class Desc: Pharmaceuticals

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
6	1 of 1	NW/77.0	79.8 / -1.00	MCDONALD'S RESTAURANTS OF CANADA LIMITED 601 LAKESHORE ROAD EAST MISSISSAUGA CITY ON L5G 1H9	CA

Certificate #: 8-3153-88-
Application Year: 88
Issue Date: 2/10/1989
Approval Type: Industrial air
Status: Approved in 1989
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: KITCHEN EXHAUST
Contaminants: Odour/Fumes
Emission Control:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
7	1 of 1	NE/39.4	80.8 / 0.00	610 Lakeshore Road East Mississauga ON	SPL

Ref No:	3226-9V5MK9	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	3/31/2015	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Leak/Break	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	610 Lakeshore Road East
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:	Air	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	N	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	3/31/2015	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	Residence<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	TsSSA: 1/2 inch gas line stike, made safe		
Contaminant Qty:	0 other - see incident description		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
8	1 of 1	WSW/11.5	79.4 / -1.43	Enbridge Gas Inc. 559-547 Lakeshore Road East Mississauga ON L5G 1J3	GEN

Generator No:	ON6270429	**PO Box No:**	
Status:	Registered	**Country:**	Canada
Approval Years:	As of Oct 2019	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:			
SIC Description:			

Detail(s)

Waste Class:	221 L
Waste Class Desc:	Light fuels

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
9	1 of 1	N/57.3	80.8 / 0.00	1012058 ONTARIO INC. 617-625 LAKESHORE RD.E. (SWM) MISSISSAUGA CITY ON L5G 1H9	CA

Certificate #:	3-0595-94-
Application Year:	94
Issue Date:	6/7/1994
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Project Description:
Contaminants:
Emission Control:

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10 ***1 of 1*** ***SW/10.1*** ***76.3 / -4.56*** ***West of Cawthra Road, east of Hurontario Street Mississauga ON*** ***SPL***

Ref No:	5124-76KGFK	***Discharger Report:***	
Site No:		***Material Group:***	Oil
Incident Dt:		***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Unknown	***Sector Type:***	Unknown
Incident Event:		***Agency Involved:***	
Contaminant Code:	15	***Nearest Watercourse:***	
Contaminant Name:	LUBRICATING OIL/GREASE	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Confirmed	***Site Municipality:***	Mississauga
Nature of Impact:	Surface Water Pollution	***Site Lot:***	
Receiving Medium:	Water	***Site Conc:***	
Receiving Env:		***Northing:***	4824747
MOE Response:	Priority Field Response	***Easting:***	615539
Dt MOE Arvl on Scn:	8/30/2007	***Site Geo Ref Accu:***	
MOE Reported Dt:	8/30/2007	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	Unknown - Reason not determined	***Source Type:***	

Site Name: Cooksville Creek at Lakeshore Road East<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Cooksville Creek running red
Contaminant Qty: Unknown other - see incident description

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11 ***1 of 9*** ***NNW/109.3*** ***79.8 / -1.00*** ***The Sherwin Williams Company 603 Lakeshore Road East Mississauga ON L5G 1H9*** ***GEN***

Generator No:	ON4822666	***PO Box No:***	
Status:		***Country:***	
Approval Years:	2010	***Choice of Contact:***	
Contam. Facility:		***Co Admin:***	
MHSW Facility:		***Phone No Admin:***	
SIC Code:	444120		

SIC Description: Paint and Wallpaper Stores

Detail(s)

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

---

11 ***2 of 9*** ***NNW/109.3*** ***79.8 / -1.00*** ***The Sherwin Williams Company 603 Lakeshore Road East Mississauga ON L5G 1H9*** ***GEN***

Generator No:	ON4822666	***PO Box No:***	
Status:		***Country:***	
Approval Years:	2011	***Choice of Contact:***	
Contam. Facility:		***Co Admin:***	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

MHSW Facility: **Phone No Admin:**
SIC Code: 444120
SIC Description: Paint and Wallpaper Stores

Detail(s)

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

---

11 **3 of 9** **NNW/109.3** **79.8 / -1.00** **The Sherwin Williams Company**
603 Lakeshore Road East
Mississauga ON L5G 1H9
GEN

Generator No: ON4822666
Status:
Approval Years: 2012
Contam. Facility:
MHSW Facility:
SIC Code: 444120
SIC Description: Paint and Wallpaper Stores
PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

---

11 **4 of 9** **NNW/109.3** **79.8 / -1.00** **The Sherwin Williams Company**
603 Lakeshore Road East
Mississauga ON
GEN

Generator No: ON4822666
Status:
Approval Years: 2013
Contam. Facility:
MHSW Facility:
SIC Code: 444120
SIC Description: PAINT AND WALLPAPER STORES
PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

---

11 **5 of 9** **NNW/109.3** **79.8 / -1.00** **The Sherwin Williams Company**
603 Lakeshore Road East
Mississauga ON L5G 1H9
GEN

Generator No: ON4822666
Status:
Approval Years: 2015
Contam. Facility: No
MHSW Facility: No
PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Paula Braga
Phone No Admin: 905-507-0166 Ext.101

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

SIC Code: 444120
SIC Description: PAINT AND WALLPAPER STORES

Detail(s)

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

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11 | **6 of 9** | **NNW/109.3** | **79.8 / -1.00** | **The Sherwin Williams Company**
603 Lakeshore Road East
Mississauga ON L5G 1H9 | **GEN**

Generator No: ON4822666
Status:
Approval Years: 2016
Contam. Facility: No
MHSW Facility: No
SIC Code: 444120
SIC Description: PAINT AND WALLPAPER STORES

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Paula Braga
Phone No Admin: 905-507-0166 Ext.101

Detail(s)

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

---

11 | **7 of 9** | **NNW/109.3** | **79.8 / -1.00** | **The Sherwin Williams Company**
603 Lakeshore Road East
Mississauga ON L5G 1H9 | **GEN**

Generator No: ON4822666
Status:
Approval Years: 2014
Contam. Facility: No
MHSW Facility: No
SIC Code: 444120
SIC Description: PAINT AND WALLPAPER STORES

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Paula Braga
Phone No Admin: 905-507-0166 Ext.101

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

---

11 | **8 of 9** | **NNW/109.3** | **79.8 / -1.00** | **The Sherwin Williams Company**
603 Lakeshore Road East
Mississauga ON L5G 1H9 | **GEN**

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Generator No: ON4822666
Status: Registered
Approval Years: As of Dec 2018
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145 I
Waste Class Desc: Wastes from the use of pigments, coatings and paints

Waste Class: 145 L
Waste Class Desc: Wastes from the use of pigments, coatings and paints

Waste Class: 232 I
Waste Class Desc: Polymeric resins

Waste Class: 232 L
Waste Class Desc: Polymeric resins

Waste Class: 331 I
Waste Class Desc: Waste compressed gases including cylinders

---

11 | **9 of 9** | **NNW/109.3** | **79.8 / -1.00** | **The Sherwin Williams Company**
603 Lakeshore Road East
Mississauga ON L5G 1H9 | **GEN**

Generator No: ON4822666
Status: Registered
Approval Years: As of Jul 2020
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 232 I
Waste Class Desc: Polymeric resins

Waste Class: 331 I
Waste Class Desc: Waste compressed gases including cylinders

Waste Class: 145 I
Waste Class Desc: Wastes from the use of pigments, coatings and paints

Waste Class: 232 L
Waste Class Desc: Polymeric resins

Waste Class: 145 L
Waste Class Desc: Wastes from the use of pigments, coatings and paints

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12 | **1 of 1** | **W/68.6** | **79.8 / -1.00** | **The Regional Municipality of Peel**

Mississauga ON | **SPL**

Ref No: 7147-ASEHWP
Site No: NA
Incident Dt: 2017/10/23
Year:
Incident Cause:

Discharger Report:
Material Group:
Health/Env Conseq: 2 - Minor Environment
Client Type: Municipal Government
Sector Type: Municipal Sewage

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Incident Event:	Overflow/Surcharge	**Agency Involved:**	
Contaminant Code:	44	**Nearest Watercourse:**	
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	n/a	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land; Surface Water	**Northing:**	4824830.87
MOE Response:	No	**Easting:**	615462.98
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2017/10/23	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Sewage Bypasses / Overflows
Incident Reason:	Blockage	**Source Type:**	Sewer (Private or Municipal)

Site Name: Bank of Cooksville Creek, 100m North of Lakeshore Rd E<UNOFFICIAL>
Site County/District: Regional Municipality of Peel
Site Geo Ref Meth:
Incident Summary: RoP: sanitary sewer backup to Cooksville Crk; blockage to be removed
Contaminant Qty: 0 other - see incident description

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13 *1 of 3* *SW/20.4* *75.9 / -4.99*

STANDARD BIOLOGICAL LAB (OUTOFBUS)
DIV. OF SGS SUPERVISION SERVICES INC. 514-516 LAKESHORE ROAD EAST
MISSISSAUGA ON L5G 1J3

GEN

Generator No:	ON0211500	**PO Box No:**	
Status:		**Country:**	
Approval Years:	86,87,88,89,90	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	8681		
SIC Description:	MEDICAL LABORATORIES		

Detail(s)

Waste Class: 241
Waste Class Desc: HALOGENATED SOLVENTS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

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13 *2 of 3* *SW/20.4* *75.9 / -4.99*

STANDARD BIOLOGICAL LAB (OUTOFBUS)36-101
DIV. OF SGS SUPERVISION SERVICES INC. 514-516 LAKESHORE ROAD EAST
MISSISSAUGA ON L5G 1J3

GEN

Generator No:	ON0211500	**PO Box No:**	
Status:		**Country:**	
Approval Years:	92,93,94,95,96,97	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	8681		
SIC Description:	MEDICAL LABORATORIES		

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13 *3 of 3* *SW/20.4* *75.9 / -4.99*

STANDARD BIOLOGICAL (OUT OF BUSINESS)
SGS SUPERVISION SERVICES INC., A DIV. OF 514-516 LAKESHORE ROAD EAST
MISSISSAUGA ON L5G 1J3

GEN

Generator No:	ON0211500	**PO Box No:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Status: ***Country:***
Approval Years: 98 ***Choice of Contact:***
Contam. Facility: ***Co Admin:***
MHSW Facility: ***Phone No Admin:***
SIC Code: 8681
SIC Description: MEDICAL LABORATORIES

---

14 ***1 of 3*** ***NNW/105.6*** ***79.8 / -1.00*** ***Lakeshore Dental*** ***GEN***
611 Lakeshore Rd East
Mississauga ON L5G1H9

Generator No: ON9500852 ***PO Box No:***
Status: Registered ***Country:*** Canada
Approval Years: As of Dec 2018 ***Choice of Contact:***
Contam. Facility: ***Co Admin:***
MHSW Facility: ***Phone No Admin:***
SIC Code:
SIC Description:

Detail(s)

Waste Class: 312 P
Waste Class Desc: Pathological wastes

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14 ***2 of 3*** ***NNW/105.6*** ***79.8 / -1.00*** ***Lakeshore Dental*** ***GEN***
611 Lakeshore Rd East
Mississauga ON L5G1H9

Generator No: ON9500852 ***PO Box No:***
Status: ***Country:*** Canada
Approval Years: 2016 ***Choice of Contact:*** CO_OFFICIAL
Contam. Facility: No ***Co Admin:*** Lalaine D. Mancenarez
MHSW Facility: No ***Phone No Admin:*** 9052782913 Ext.
SIC Code: 621210, 621210, 621210
SIC Description: OFFICES OF DENTISTS, OFFICES OF DENTISTS, OFFICES OF DENTISTS

Detail(s)

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

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14 ***3 of 3*** ***NNW/105.6*** ***79.8 / -1.00*** ***Lakeshore Dental*** ***GEN***
611 Lakeshore Rd East
Mississauga ON L5G1H9

Generator No: ON9500852 ***PO Box No:***
Status: Registered ***Country:*** Canada
Approval Years: As of Jul 2020 ***Choice of Contact:***
Contam. Facility: ***Co Admin:***
MHSW Facility: ***Phone No Admin:***
SIC Code:
SIC Description:

Detail(s)

Waste Class: 312 P
Waste Class Desc: Pathological wastes

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15 ***1 of 2*** ***NE/15.1*** ***80.8 / 0.00*** ***LAKESHORE PHOTO & FRAME 24-967*** ***GEN***
632 LAKESHORE ROAD EAST

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
				MISSISSAUGA ON L5G 1J4	

Generator No: ON1628500
Status:
Approval Years: 92,93,94,95,96,97,98
Contam. Facility:
MHSW Facility:
SIC Code: 6591
SIC Description: 2ND HAND MERCHANDISE

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
15	2 of 2	NE/15.1	80.8 / 0.00	LAKESHORE PHOTO & FRAME 632 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1J4	GEN

Generator No: ON1628500
Status:
Approval Years: 99,00,01
Contam. Facility:
MHSW Facility:
SIC Code: 6591
SIC Description: 2ND HAND MERCHANDISE

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
16	1 of 1	SW/6.1	77.9 / -2.99	UNKNOWN IN THE COOKSVILLE CREEK AT LAKESHORE RD. & BEACHWOOD MISSISSAUGA CITY ON	SPL

Ref No: 97369
Site No:
Incident Dt: 3/15/1994
Year:
Incident Cause: WASTEWATER DISCHARGE TO WATERCOURSE
Incident Event:
Contaminant Code:
Contaminant Name:
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Environment Impact: CONFIRMED
Nature of Impact: Water course or lake
Receiving Medium: WATER
Receiving Env:
MOE Response:
Dt MOE Arvl on Scn:
MOE Reported Dt: 3/15/1994
Dt Document Closed:
Incident Reason: UNKNOWN
Site Name:
Site County/District:
Site Geo Ref Meth:
Incident Summary: DIESEL FUEL IN THE COOKSVILLE CRK., SOURCE UNKNOWN.

Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type:
Agency Involved:
Nearest Watercourse:
Site Address:
Site District Office:
Site Postal Code:
Site Region:
Site Municipality: 21102
Site Lot:
Site Conc:
Northing:
Easting: PEEL REGION
Site Geo Ref Accu:
Site Map Datum:
SAC Action Class:
Source Type:

Contaminant Qty:

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17 | **1 of 1** | **N/114.2** | **79.8 / -1.00** | **Unknown<UNOFFICIAL>**
1036A Caven Street
Mississauga ON | **SPL**

Ref No:	0718-9ATQEZ	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	2013/08/22	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Vandalism	**Sector Type:**	Unknown / N/A
Incident Event:		**Agency Involved:**	
Contaminant Code:	27	**Nearest Watercourse:**	
Contaminant Name:	CONCRETE	**Site Address:**	1036A Caven Street
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No Field Response	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2013/08/22	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Watercourse Spills
Incident Reason:	Deliberate Act	**Source Type:**	

Site Name: 1036A Caven Street<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Concrete solidified in catchbasin, cleanup to be completed
Contaminant Qty: 0 other - see incident description

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18 | **1 of 1** | **WSW/7.7** | **79.8 / -1.00** | **PETM Canada Corporation**
507 Lakeshore Rd E
Mississauga ON L5G1H9 | **GEN**

Generator No:	ON9153222	**PO Box No:**	
Status:	Registered	**Country:**	Canada
Approval Years:	As of Jul 2020	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:			
SIC Description:			

Detail(s)

Waste Class: 212 I
Waste Class Desc: Aliphatic solvents and residues

Waste Class: 148 A
Waste Class Desc: Misc. wastes and inorganic chemicals

Waste Class: 269 T
Waste Class Desc: Organic non-halogenated pesticide and herbicide wastes

Waste Class: 263 A
Waste Class Desc: Misc. waste organic chemicals

Waste Class: 331 L
Waste Class Desc: Waste compressed gases including cylinders

Waste Class: 331 I
Waste Class Desc: Waste compressed gases including cylinders

Waste Class: 263 L
Waste Class Desc: Misc. waste organic chemicals

Waste Class: 252 L
Waste Class Desc: Waste crankcase oils and lubricants

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19 | **1 of 1** | **SW/10.2** | **79.1 / -1.76** | **501 LAKESHORE INC.**
505 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9
Mississauga ON | **RSC**

RSC ID: 216809
RA No: RA1217-11
RSC Type: Phase 1 and 2 RSC with RA
Curr Property Use: Industrial
Ministry District: Halton-Peel District Office
Filing Date: 2015/02/10
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:
Asmt Roll No: 05-01-0-002-17800-0000-06, 05-01-0-003-16000-0000-03, 05-01-0-002-17610-0000-09
Prop ID No (PIN): 13473-0065 (LT), 13473-0064 (LT), 13473-0292 (LT), 13473-0066 (LT), 13473-0291 (LT)
Property Municipal Address: 505 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9, 501 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9
Mailing Address:
Latitude & Latitude:
UTM Coordinates:
Consultant:
Legal Desc:
Measurement Method:
Applicable Standards:
RSC PDF: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46099&fileName=BROWNFIELDS-E.pdf

Cert Date:
Cert Prop Use No:
Intended Prop Use: Commercial
Qual Person Name: THIAM TAN
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:

Document(s) Detail

Document Heading: Supporting Documents
Document Name: Area 2 Survey Plan.pdf
Document Type: A Current plan of Survey
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46101&fileName=Area+2+Survey+Plan.pdf

Document Heading: Supporting Documents
Document Name: APECs Area 2.pdf
Document Type: Area(s) of Potential Environmental Concern
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46097&fileName=APECs+Area+2.pdf

Document Heading: Supporting Documents
Document Name: Deed and Transfer Docs.pdf
Document Type: Copy of any deed(s), transfer(s) or other document(s)
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?

attachmentId=46095&fileName=Deed+and+Transfer+Docs.pdf

Document Heading: Supporting Documents
Document Name: LawyerLetter.pdf
Document Type: Lawyer's letter consisting of a legal description of the property
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46159&fileName=LawyerLetter.pdf

Document Heading: Supporting Documents
Document Name: Area 2 Phase Two CSM for RSC.pdf
Document Type: Phase 2 Conceptual Site Model
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46091&fileName=Area+2+Phase+Two+CSM+for+RSC.pdf

Document Heading: Orders and Notices
Document Name: 501 Lakeshore Road East Mississauga CPU 5871-9QLN43-02.pdf
Document Type: CPU
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=65759&fileName=501+Lakeshore+Road+East++Mississauga+CPU+5871-9QLN43-02.pdf

Document Heading: Supporting Documents
Document Name: Current and Past Uses Table Area 2.pdf
Document Type: Table of Current and Past Property Use
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46102&fileName=Current+and+Past+Uses+Table+Area+2.pdf

Document Heading: Supporting Documents
Document Name: PSS RA1217 11 Area2.xls
Document Type: Property Specific Standards
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46092&fileName=PSS+RA1217+11+Area2.xls

Document Heading: Supporting Documents
Document Name: 501 Lakeshore Inc.pdf
Document Type: Certificate of Status
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46093&fileName=501+Lakeshore+Inc.pdf

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20	1 of 7	NE/20.1	79.8 / -1.00	***SHELL CANADA PRODUCTS LTD.*** ***644 LAKESHORE BLVD. E. (NEAR CAWTHRA)*** ***SERVICE STATION*** ***MISSISSAUGA CITY ON***	SPL

Ref No:	21612	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	7/7/1989	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	UNKNOWN	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	21102
Nature of Impact:		***Site Lot:***	
Receiving Medium:	LAND / WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	7/7/1989	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	UNKNOWN	***Source Type:***	
Site Name:			
Site County/District:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Site Geo Ref Meth:					
Incident Summary:		SHELL CANADA -GASOLINE LEAK TO MANHOLE AND STORMSEWER.			
Contaminant Qty:					

20	2 of 7	NE/20.1	79.8 / -1.00	HENRY F GALLANT 644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	PRT

Location ID:	9140
Type:	retail
Expiry Date:	1990-11-30
Capacity (L):	0
Licence #:	0049917001

20	3 of 7	NE/20.1	79.8 / -1.00	LAKEVIEW SHELL SERVICE CTR 644 LAKESHORE RD E MISSISSAUGA ON L5G 1J6	PRT

Location ID:	9140
Type:	private
Expiry Date:	1994-09-30
Capacity (L):	0.00
Licence #:	0038228001

20	4 of 7	NE/20.1	79.8 / -1.00	LAKEVIEW SHELL SERVICE CTR 644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	PRT

Location ID:	9140
Type:	retail
Expiry Date:	1994-09-30
Capacity (L):	2000
Licence #:	0032893001

20	5 of 7	NE/20.1	79.8 / -1.00	LAKEVIEW SHELL SERVICE CTR 644 LAKESHORE RD E MISSISSAUGA ON L5G1J6	PRT

Location ID:	9140
Type:	retail
Expiry Date:	1995-11-30
Capacity (L):	113650
Licence #:	0076367127

20	6 of 7	NE/20.1	79.8 / -1.00	1239726 ONTARIO LTD. 644 LAKESHORE ROAD EAST (SWM) MISSISSAUGA CITY ON	CA

Certificate #:	3-0975-97-
Application Year:	97
Issue Date:	8/20/1997
Approval Type:	Municipal sewage
Status:	Cancelled
Application Type:	
Client Name:	
Client Address:	
Client City:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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20 | **7 of 7** | **NE/20.1** | **79.8 / -1.00** | **1239726 ONTARIO LTD.**
SWM-644 LAKESHORE RD., E.
MISSISSAUGA CITY ON | **CA**

Certificate #: 3-1764-97-
Application Year: 97
Issue Date: 12/18/1997
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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21 | **1 of 2** | **NW/199.7** | **79.8 / -1.00** | **Forest Town Development<UNOFFICIAL>**
1060 Caven St.
Mississauga ON L5G 4J5 | **SPL**

Ref No: 6831-5WMUKC
Site No:
Incident Dt: 2/29/2004
Year:
Incident Cause: Discharge Or Bypass To A Watercourse
Incident Event:
Contaminant Code:
Contaminant Name: SEWAGE
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Environment Impact: Possible
Nature of Impact: Surface Water Pollution
Receiving Medium: Water
Receiving Env:
MOE Response:
Dt MOE Arvl on Scn:
MOE Reported Dt: 2/29/2004
Dt Document Closed:
Incident Reason: Unknown - Reason not determined
Site Name: FOREST TOWN DEVELOPMENT<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Sewage overflow to storm sewer.
Contaminant Qty:

Discharger Report:
Material Group: Waste
Health/Env Conseq:
Client Type:
Sector Type: Sewer
Agency Involved:
Nearest Watercourse:
Site Address:
Site District Office: Halton-Peel
Site Postal Code:
Site Region: Central
Site Municipality: Mississauga
Site Lot:
Site Conc:
Northing:
Easting:
Site Geo Ref Accu:
Site Map Datum:
SAC Action Class: Spills
Source Type:

---

21 | **2 of 2** | **NW/199.7** | **79.8 / -1.00** | **The Corporation of the City of Mississauga**
1060 Caven St
Mississauga ON | **SPL**

Ref No: 5402-A4MTM5
Site No: NA
Incident Dt: 11/26/2015

Discharger Report:
Material Group:
Health/Env Conseq:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:		**Agency Involved:**	
Contaminant Code:	43	**Nearest Watercourse:**	Unknown Name
Contaminant Name:	SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)	**Site Address:**	1060 Caven St
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	4825058
MOE Response:	No	**Easting:**	615492
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	11/26/2015	**Site Map Datum:**	
Dt Document Closed:	12/31/2015	**SAC Action Class:**	Watercourse Spills
Incident Reason:	Material Failure - Poor Design/Substandard Material	**Source Type:**	
Site Name:	muni allowance<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Rof Peel: wmb; sediment/siltation to Cooksville Creek.		
Contaminant Qty:	0 other - see incident description		

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22 | ***1 of 1*** | ***NE/9.3*** | ***79.8 / -1.00*** | ***Credit Valley Conservation Authority***
Lakeshore Rd west of Cawthra
Mississauga ON | ***SPL***

Ref No:	1148-B2UL5A	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2018/07/20	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Corporation
Incident Cause:		**Sector Type:**	Miscellaneous Communal
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	Lakeshore Rd west of Cawthra
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Surface Water	**Northing:**	4825089
MOE Response:	No	**Easting:**	615771
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2018/07/20	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Spills Definition and Classification
Incident Reason:	Material Failure - Poor Design/Substandard Material	**Source Type:**	Water Supply
Site Name:	spill<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	Cooksville Creek sheen across width of river		
Contaminant Qty:			

---

23 | ***1 of 4*** | ***NE/9.8*** | ***79.8 / -1.00*** | ***R.M. OF PEEL***
LAKESHORE RD/CAWTHRA RD.
MISSISSAUGA CITY ON | ***CA***

Certificate #:	3-0878-99-
Application Year:	99

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Issue Date: 7/28/1999
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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23 | 2 of 4 | NE/9.8 | 79.8 / -1.00 | R.M. OF PEEL
LAKESHORE RD/CAWTHRA RD.
MISSISSAUGA CITY ON | CA

Certificate #: 7-0608-99-
Application Year: 99
Issue Date: 7/28/1999
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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23 | 3 of 4 | NE/9.8 | 79.8 / -1.00 | Lakeshore Rd and Cawthra
Mississauga ON | SPL

Ref No: 6575-7PYNGH
Site No:
Incident Dt:
Year:
Incident Cause: Other Discharges
Incident Event:
Contaminant Code:
Contaminant Name: SEWAGE,
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Environment Impact: Confirmed
Nature of Impact: Surface Water Pollution
Receiving Medium:
Receiving Env:
MOE Response:
Dt MOE Arvl on Scn:
MOE Reported Dt: 3/9/2009
Dt Document Closed:
Incident Reason: Spill
Site Name: sewer backup<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Sewer blockage, 3600 L impacting Cooksville Crk
Contaminant Qty: 3600 L

Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type: Sewage Municipal
Agency Involved:
Nearest Watercourse:
Site Address:
Site District Office:
Site Postal Code:
Site Region:
Site Municipality: Mississauga
Site Lot:
Site Conc:
Northing:
Easting:
Site Geo Ref Accu:
Site Map Datum:
SAC Action Class: Watercourse Spills
Source Type:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
23	4 of 4	NE/9.8	79.8 / -1.00	The Corporation of the City of Mississauga manhole on easement 200m north of Lakeshore Rd near Lakeshore and Cawthra Mississauga ON	SPL

Ref No:	0136-9VMMGF	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	4/16/2015	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Overflow/Surcharge	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:	44	**Nearest Watercourse:**	
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	**Site Address:**	manhole on easement 200m north of Lakeshore Rd near Lakeshore and Cawthra
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	N	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	4/16/2015	**Site Map Datum:**	
Dt Document Closed:	6/1/2015	**SAC Action Class:**	Sewage Bypasses / Overflows
Incident Reason:	Blockage	**Source Type:**	
Site Name:	Manhole<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	DWMD Sewage release from manhole to Cooksville Creek		
Contaminant Qty:	0 other - see incident description		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
24	1 of 1	NNW/184.3	79.8 / -1.00	The Regional Municipality of Peel 1600 Caven St Mississauga ON	SPL

Ref No:	7358-A3D2GR	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	10/16/2015	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:		**Agency Involved:**	
Contaminant Code:	43	**Nearest Watercourse:**	Unknown Name
Contaminant Name:	SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)	**Site Address:**	1600 Caven St
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	10/16/2015	**Site Map Datum:**	
Dt Document Closed:	12/16/2015	**SAC Action Class:**	Watercourse Spills
Incident Reason:	Unknown / N/A	**Source Type:**	
Site Name:	municpal allowance<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	RofPeel: WMB; sediment to Cooksville Creek; isolated		
Contaminant Qty:	0 other - see incident description		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
25	1 of 1	SE/1.5	77.5 / -3.34	Hampton Cres at Montbeck Cres Mississauga ON	SPL

Ref No:	0312-978UK5	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	29-APR-13	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Dumping	**Sector Type:**	Container/Drum/Tote
Incident Event:		**Agency Involved:**	
Contaminant Code:	13	**Nearest Watercourse:**	
Contaminant Name:	HYDROCARBON LIGHT	**Site Address:**	Hampton Cres at Montbeck Cres
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No Field Response	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	29-APR-13	**Site Map Datum:**	
Dt Document Closed:	26-JUN-13	**SAC Action Class:**	Primary Assessment of Spills
Incident Reason:	Deliberate Act	**Source Type:**	
Site Name:	CB behind houses<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	lt sheening from cb outfall to cooksville crk		
Contaminant Qty:	500 mL		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
26	1 of 1	SSE/167.3	75.8 / -5.00	909 Beechwood Avenue Mississauga ON	SPL

Ref No:	1540-ALANR6	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	4/10/2017	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	909 Beechwood Avenue
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	1075	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	4/10/2017	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	Operator/Human Error	**Source Type:**	Pipeline/Components
Site Name:	TSSA<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	TSSA FSB; 1/2" pl IP service damaged; Made safe		
Contaminant Qty:	0 other - see incident description		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
27	1 of 1	NE/23.7	79.8 / -1.00	656731 Ontario Limited 707 LAKESHORE RD E, MISSISSAUGA, ON, L5G 1J7	RSC

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
				ON L5G 1J7	

RSC ID: 2477
RA No:
RSC Type:
Curr Property Use: Commercial
Ministry District: MISSISSAUGA
Filing Date: 12-May-06
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686: No
Asmt Roll No:
Cert Date: 27-Jan-06
Cert Prop Use No: No CPU
Intended Prop Use: Commercial
Qual Person Name: Alfio Pasquarelli
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N): Yes
Accuracy Estimate: 21 to 100 meters
Telephone: 416-9671010
Fax: 416-9670891
Email: apasquarelli@pizzapizza.ca

Prop ID No (PIN): 13474-0139 LT
Property Municipal Address: 707 LAKESHORE RD E, MISSISSAUGA, ON, L5G 1J7
Mailing Address: 580 JARVIS ST, TORONTO, ON, M4Y 2H9
Latitude & Latitude: 43.56805560N 79.56694440W
UTM Coordinates: NAD83 17-615725-4824897 (converted from Latitude & Longitude)
Consultant:
Legal Desc: Lots 104, 105 and 106, PL C23, Except PT 24, 43R13431, Miisiisauga, Ontario
Measurement Method: Interpolation from a map
Applicable Standards: Full Depth Site Conditions Standard, with Nonpotable Ground Water, Medium/Fine Textured Soil, for Industrial/Commercial/Community property use
RSC PDF:

28	1 of 2	SSW/133.5	76.6 / -4.20	TOMCO HORTICULTURAL SERVICES 941 THE GREENWAY MISSISSAUGA ON L5G 1P7	PES

Detail Licence No:
Licence No:
Status:
Approval Date:
Report Source:
Licence Type: Operator
Licence Type Code:
Licence Class:
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF Link:
Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code:
Oper Phone No:
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

28	2 of 2	SSW/133.5	76.6 / -4.20	619151 ONTARIO INC. 941 THE GREENWAY MISSISSAUGA ON L5G 1P7	PES

Detail Licence No:
Licence No:
Status:
Approval Date:
Report Source:
Licence Type: Operator
Licence Type Code:
Licence Class:
Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code:
Oper Phone No:
Operator Ext:
Operator Lot:

Licence Control:		**Oper Concession:**	
Latitude:		**Operator Region:**	
Longitude:		**Operator District:**	
Lot:		**Operator County:**	
Concession:		**Op Municipality:**	
Region:		**Post Office Box:**	
District:		**MOE District:**	
County:		**SWP Area Name:**	
Trade Name:			
PDF Link:			

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29 | 1 of 1 | NNE/42.6 | 79.8 / -1.00 | **Enbridge Energy Distribution Inc.**
1015 Cawthra Rd
Mississauga ON | SPL

Ref No:	8670-ANQNYB	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	6/27/2017	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Corporation
Incident Cause:		**Sector Type:**	Unknown / N/A
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	1015 Cawthra Rd
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	1075	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	6/27/2017	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	Operator/Human Error	**Source Type:**	Pipeline/Components
Site Name:	Residential<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	TSSA FSB: 1/2" pl IP linestrike, made safe		
Contaminant Qty:	0 L		

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30 | 1 of 2 | NW/232.6 | 80.7 / -0.14 | **CANADIAN WASTE SERVICES**
BEHIND 1110 CAVEN MOTOR VEHICLE
(OPERATING FLUID)
MISSISSAUGA CITY ON L5G 4N4 | SPL

Ref No:	225625	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	5/16/2002	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	PIPE/HOSE LEAK	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	POSSIBLE	**Site Municipality:**	21102
Nature of Impact:	Soil contamination	**Site Lot:**	
Receiving Medium:	LAND	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	

Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	5/16/2002	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	EQUIPMENT FAILURE	**Source Type:**	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	CDN WASTE-50 L HYDRAULIC OIL TO LOT,PEEL REGION ONSITE.		
Contaminant Qty:			

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30 **2 of 2** **NW/232.6** **80.7 / -0.14** **CANADIAN WASTE SERVICES** **SPL**
1110 CAVEN ST. MOTOR VEHICLE (OPERATING FLUID)
MISSISSAUGA CITY ON L5G 4N4

Ref No:	225645	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	5/16/2002	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	PIPE/HOSE LEAK	**Sector Type:**	
Incident Event:		**Agency Involved:**	REGION OF PEEL
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	NOT ANTICIPATED	**Site Municipality:**	21102
Nature of Impact:		**Site Lot:**	
Receiving Medium:	LAND	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	5/16/2002	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	EQUIPMENT FAILURE	**Source Type:**	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	CANADAIN WASTE SERVICES - 50 L OF HYDRAULIC OIL TO GROUND FROM TRUCK.		
Contaminant Qty:			

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31 **1 of 1** **ENE/84.6** **79.8 / -1.00** **Enbridge Gas Distribution Inc.** **SPL**
918 Goodwin Road
Mississauga ON

Ref No:	3374-A4R5CW	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	11/29/2015	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:		**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	918 Goodwin Road
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

MOE Reported Dt:	11/29/2015	**Site Map Datum:**	
Dt Document Closed:	12/1/2015	**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	Private Residence<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	TSSA- 1/2" Plastic Service Line Strike, Made Safe- Mississauga		
Contaminant Qty:	0 other - see incident description		

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32 | ***1 of 1*** | ***SSW/126.4*** | ***78.3 / -2.54*** | ***Enbridge Gas Distribution Inc.***
947 The Greenway
Mississauga ON | ***SPL***

Ref No:	8408-9CPQ5J	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	2013/10/21	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Leak/Break	**Sector Type:**	Pipeline/Components
Incident Event:		**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	947 The Greenway
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Mississauga
Nature of Impact:	Air Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	Referral to others	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2013/10/21	**Site Map Datum:**	
Dt Document Closed:	2013/11/01	**SAC Action Class:**	Air Spills - Gases and Vapours
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	Single family home<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	TSSA: 1 1/4 inch plastic line strike, made safe		
Contaminant Qty:	0 other - see incident description		

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33 | ***1 of 39*** | ***W/78.2*** | ***78.9 / -1.95*** | ***INGLIS LTD.***
INGLIS IN YARD AT 501 LAHESHORE RD.E.
TORONTO PLANT 14 STRACHAN AVENUE
MISSISSAUGA CITY ON L5G 1H9 | ***SPL***

Ref No:	42644	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	10/26/1990	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	OTHER CONTAINER LEAK	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	NOT ANTICIPATED	**Site Municipality:**	21102
Nature of Impact:		**Site Lot:**	
Receiving Medium:	LAND	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

MOE Reported Dt: 10/26/1990
Dt Document Closed:
Incident Reason: CORROSION
Site Name:
Site County/District:
Site Geo Ref Meth:
Incident Summary: INGLIS-10L. PYRIDINE TO GROUND FROM LEAKING DRUM:
Contaminant Qty:
Site Map Datum:
SAC Action Class:
Source Type:

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33 **2 of 39** **W/78.2** **78.9 / -1.95** **INGLIS CANADA** **PRT**
501 LAKESHORE RD E
MISSISSAUGA ON L5G 1H9

Location ID: 19037
Type: retail
Expiry Date: 1993-01-31
Capacity (L): 1000
Licence #: 0076353069

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33 **3 of 39** **W/78.2** **78.9 / -1.95** **MASSILLY NORTH AMERICA INC.** **CA**
501 LAKESHORE ROAD
MISSISSAUGA CITY ON

Certificate #: 8-3280-97-
Application Year: 97
Issue Date: 8/13/1997
Approval Type: Industrial air
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: CAP LINER CURING OVEN WITH COOLER
Contaminants: Suspended Particulate Matter, Nitrogen Oxides
Emission Control: Electrostatic Precipit.,

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33 **4 of 39** **W/78.2** **78.9 / -1.95** **CONSUMERS GLASS COMPANY LIMITED** **CA**
501 LAKESHORE ROAD EAST
MISSISSAUGA CITY ON L5G 1H9

Certificate #: 8-3054-99-
Application Year: 99
Issue Date: 3/23/1999
Approval Type: Industrial air
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: EMISSIONS FROM COMFORT HEATING EXHAUSTS
Contaminants: Nitrogen Oxides
Emission Control:

---

33 **5 of 39** **W/78.2** **78.9 / -1.95** **WINE BOTTLE & PACKAGING INC.** **CA**
501 LAKESHORE RD.E.,8-3055-99
MISSISSAUGA CITY ON L5G 1H9

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Certificate #: 8-3102-99-
Application Year: 99
Issue Date: 4/21/1999
Approval Type: Industrial air
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: VENT LEHR OVEN,BGK CURE OVEN,COMB.EQUIP.
Contaminants:
Emission Control:

33	***6 of 39***	***W/78.2***	***78.9 / -1.95***	***CONSUMERS GLASS COMPANY LIMITED 501 LAKESHORE RD.E., 8-3102-99 MISSISSAUGA CITY ON L5G 1H9***	***CA***

Certificate #: 8-3055-99-
Application Year: 99
Issue Date: 4/12/1999
Approval Type: Industrial air
Status: Cancelled
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: VENT LEHR OVEN,BGK CURE OVEN,COMB.EQUIP.
Contaminants: Nitrogen Oxides
Emission Control:

33	***7 of 39***	***W/78.2***	***78.9 / -1.95***	***501 Lakeshore Road East, Port Credit Mississauga ON L5G 1H9***	***CA***

Certificate #: 8-3102-99-006
Application Year: 00
Issue Date: 6/5/00
Approval Type: Industrial air
Status: Approved
Application Type: Notice
Client Name: Saxco Canada Co.
Client Address: 501 Lakeshore Road East
Client City: Port Credit
Client Postal Code: L5G 1H9
Project Description: This application is for changing the ownership from Wine Bottle and Packaging Inc., to Saxco Canada Co.
Contaminants:
Emission Control:

33	***8 of 39***	***W/78.2***	***78.9 / -1.95***	***INGLIS LTD. 501 LAKESHORE RD. E. MISSISSAUGA ON L5G 1H9***	***GEN***

Generator No: ON0003403
Status:
Approval Years: 86,87,88,89,90
Contam. Facility:
MHSW Facility:
SIC Code: 3321
SIC Description: MAJOR APPLIANCE IND.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 131
Waste Class Desc: NEUTRALIZED WASTES - HEAVY METALS

Waste Class: 211
Waste Class Desc: AROMATIC SOLVENTS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 123
Waste Class Desc: ALKALINE PHOSPHATES

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33 | ***9 of 39*** | ***W/78.2*** | ***78.9 / -1.95*** | ***INGLIS LTD. 21-130***
501 LAKESHORE RD. E.
MISSISSAUGA ON L5G 1H9 | ***GEN***

Generator No: ON0003403
Status:
Approval Years: 92,93,94,95,96,97
Contam. Facility:
MHSW Facility:
SIC Code: 3321
SIC Description: MAJOR APPLIANCE IND.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 123
Waste Class Desc: ALKALINE PHOSPHATES

Waste Class: 131
Waste Class Desc: NEUTRALIZED WASTES - HEAVY METALS

Waste Class: 132
Waste Class Desc: NEUTRALIZED WASTES - OTHER METALS

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 211
Waste Class Desc: AROMATIC SOLVENTS

Waste Class: 231
Waste Class Desc: LATEX WASTES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 221
Waste Class Desc: LIGHT FUELS

Waste Class: 222

Waste Class Desc: HEAVY FUELS

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 241
Waste Class Desc: HALOGENATED SOLVENTS

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 253
Waste Class Desc: EMULSIFIED OILS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Waste Class: 268
Waste Class Desc: AMINES

Waste Class: 312
Waste Class Desc: PATHOLOGICAL WASTES

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 113
Waste Class Desc: ACID WASTE - OTHER METALS

Waste Class: 122
Waste Class Desc: ALKALINE WASTES - OTHER METALS

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33 | ***10 of 39*** | ***W/78.2*** | ***78.9 / -1.95*** | ***INGLIS LIMITED***
501 LAKESHORE ROAD EAST
MISSISSAUGA ON L5G 1H9 | ***GEN***

Generator No: ON0003403
Status:
Approval Years: 98,99,00,01
Contam. Facility:
MHSW Facility:
SIC Code: 3321
SIC Description: MAJOR APPLIANCE IND.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 123
Waste Class Desc: ALKALINE PHOSPHATES

Waste Class: 112
Waste Class Desc: ACID WASTE - HEAVY METALS

Waste Class: 113
Waste Class Desc: ACID WASTE - OTHER METALS

Waste Class: 122
Waste Class Desc: ALKALINE WASTES - OTHER METALS

Waste Class: 131
Waste Class Desc: NEUTRALIZED WASTES - HEAVY METALS

Waste Class:	132
Waste Class Desc:	NEUTRALIZED WASTES - OTHER METALS
Waste Class:	145
Waste Class Desc:	PAINT/PIGMENT/COATING RESIDUES
Waste Class:	148
Waste Class Desc:	INORGANIC LABORATORY CHEMICALS
Waste Class:	211
Waste Class Desc:	AROMATIC SOLVENTS
Waste Class:	212
Waste Class Desc:	ALIPHATIC SOLVENTS
Waste Class:	213
Waste Class Desc:	PETROLEUM DISTILLATES
Waste Class:	221
Waste Class Desc:	LIGHT FUELS
Waste Class:	222
Waste Class Desc:	HEAVY FUELS
Waste Class:	231
Waste Class Desc:	LATEX WASTES
Waste Class:	232
Waste Class Desc:	POLYMERIC RESINS
Waste Class:	241
Waste Class Desc:	HALOGENATED SOLVENTS
Waste Class:	252
Waste Class Desc:	WASTE OILS & LUBRICANTS
Waste Class:	253
Waste Class Desc:	EMULSIFIED OILS
Waste Class:	263
Waste Class Desc:	ORGANIC LABORATORY CHEMICALS
Waste Class:	268
Waste Class Desc:	AMINES
Waste Class:	312
Waste Class Desc:	PATHOLOGICAL WASTES
Waste Class:	331
Waste Class Desc:	WASTE COMPRESSED GASES

33	***11 of 39***	***W/78.2***	***78.9 / -1.95***	***CONSUMERS PACKAGING INC. WINE BOTTLE & PACKAGING INC. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9***	***GEN***

Generator No:	ON0060910	***PO Box No:***	
Status:		***Country:***	
Approval Years:	97,98	***Choice of Contact:***	
Contam. Facility:		***Co Admin:***	
MHSW Facility:		***Phone No Admin:***	
SIC Code:	3999		
SIC Description:	OTHER MANU. PROD.		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Detail(s)

Waste Class: 243
Waste Class Desc: PCB'S

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

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33 ***12 of 39*** ***W/78.2*** ***78.9 / -1.95*** ***CONSUM(SEE & USE ON2528300)***
WINE BOTTLE & PACKAGING INC. 501
LAKESHORE ROAD EAST
MISSISSAUGA ON L5G 1H9 ***GEN***

Generator No: ON0060910
Status:
Approval Years: 99,00
Contam. Facility:
MHSW Facility:
SIC Code: 3999
SIC Description: OTHER MANU. PROD.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 243
Waste Class Desc: PCB'S

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

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33 ***13 of 39*** ***W/78.2*** ***78.9 / -1.95*** ***MASSILLY NORTH AMERICA INC.***
501 LAKESHORE ROAD EAST MASSILLY
SECTION OF BUILDING
MISSISSAUGA ON L5G 1H9 ***GEN***

Generator No: ON2221800
Status:
Approval Years: 97,98,99,00,01,02,03,04,05,06,07,08
Contam. Facility:
MHSW Facility:
SIC Code: 3042
SIC Description: METAL CLOSURE & CONT.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 233
Waste Class Desc: OTHER POLYMERIC WASTES

Waste Class: 268
Waste Class Desc: AMINES

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 253

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Waste Class Desc:		EMULSIFIED OILS			

33	14 of 39	W/78.2	78.9 / -1.95	SAXCO CANADA CO. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2528300
Status:
Approval Years: 99,00,01,03
Contam. Facility:
MHSW Facility:
SIC Code: 3999
SIC Description: OTHER MANU. PROD.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 243
Waste Class Desc: PCB'S

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

33	15 of 39	W/78.2	78.9 / -1.95	SAXCO CANADA CO. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2528300
Status:
Approval Years: 02
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

33	16 of 39	W/78.2	78.9 / -1.95	SAXCO CANADA CO. 501 LAKESHORE ROAD EAST MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2528300
Status:
Approval Years: 04
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

33	17 of 39	W/78.2	78.9 / -1.95	Caravan Logistics Inc. 501 Lakeshore Road East 501 LAKESHORE ROAD EAST Mississauga ON L5G 1H9	SPL

Ref No: 6060-6SSQT2
Site No:
Incident Dt: 8/18/2006
Year:
Incident Cause: Other Discharges
Incident Event:
Contaminant Code: 96
Contaminant Name: JUICE and Water
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:

Discharger Report:
Material Group: Other
Health/Env Conseq:
Client Type:
Sector Type: Other
Agency Involved:
Nearest Watercourse:
Site Address: 501 LAKESHORE ROAD EAST
Site District Office: Halton-Peel
Site Postal Code:
Site Region:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Environment Impact:	Possible	**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:	Water	**Site Conc:**	
Receiving Env:		**Northing:**	NA
MOE Response:		**Easting:**	NA
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	8/18/2006	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:		**Source Type:**	
Site Name:	501 LAKESHORE ROAD EAST		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	4000L Watermelon Juice/Water to drainage ditch		
Contaminant Qty:	4000 L		

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33 ***18 of 39*** ***W/78.2*** ***78.9 / -1.95*** ***Massilly North America Inc.*** ***CA***
501 Lakeshore Road East
Mississauga ON

Certificate #:	2516-6GENTC
Application Year:	2006
Issue Date:	1/6/2006
Approval Type:	Air
Status:	Revoked and/or Replaced
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

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33 ***19 of 39*** ***W/78.2*** ***78.9 / -1.95*** ***Massilly North America Inc.*** ***CA***
501 Lakeshore Road East
Mississauga ON

Certificate #:	2813-5FCQZ8
Application Year:	2002
Issue Date:	11/14/2002
Approval Type:	Air
Status:	Revoked and/or Replaced
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

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33 ***20 of 39*** ***W/78.2*** ***78.9 / -1.95*** ***Massilly North America Inc.*** ***CA***
501 Lakeshore Rd E
Mississauga ON

Certificate #:	6670-7GUQ9K
Application Year:	2008
Issue Date:	9/3/2008
Approval Type:	Air
Status:	Approved

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	21 of 39	W/78.2	78.9 / -1.95	Massilly North America Inc. 501 Lakeshore Road East Mississauga ON	CA

Certificate #: 8218-6L8M86
Application Year: 2006
Issue Date: 1/20/2006
Approval Type: Air
Status: Revoked and/or Replaced
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	22 of 39	W/78.2	78.9 / -1.95	MASSILLY NORTH AMERICA INC. 501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2221800
Status:
Approval Years: 2009
Contam. Facility:
MHSW Facility:
SIC Code: 332999
SIC Description: All Other Miscellaneous Fabricated Metal Product Manufacturing

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 233
Waste Class Desc: OTHER POLYMERIC WASTES

Waste Class: 253
Waste Class Desc: EMULSIFIED OILS

Waste Class: 268
Waste Class Desc: AMINES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	23 of 39	W/78.2	78.9 / -1.95	MASSILLY NORTH AMERICA INC. 501 LAKESHORE ROAD EAST MASSILLY SECTION OF BUILDING MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2221800
Status:
Approval Years: 2010
Contam. Facility:
MHSW Facility:
SIC Code: 332118
SIC Description: Stamping

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 268
Waste Class Desc: AMINES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 233
Waste Class Desc: OTHER POLYMERIC WASTES

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 253
Waste Class Desc: EMULSIFIED OILS

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	24 of 39	W/78.2	78.9 / -1.95	GS MEDICAL PACKAGING INC. 501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2960778
Status:
Approval Years: 2010
Contam. Facility:
MHSW Facility:
SIC Code: 323119
SIC Description: Other Printing

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	25 of 39	W/78.2	78.9 / -1.95	GS MEDICAL PACKAGING INC. 501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2960778
Status:
Approval Years: 2011
Contam. Facility:
MHSW Facility:
SIC Code: 323119
SIC Description: Other Printing

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

33	26 of 39	W/78.2	78.9 / -1.95	***MASSILLY NORTH AMERICA INC.*** ***501 LAKESHORE ROAD EAST MASSILLY*** ***SECTION OF BUILDING*** ***MISSISSAUGA ON L5G 1H9***	***GEN***

Generator No: ON2221800
Status:
Approval Years: 2011
Contam. Facility:
MHSW Facility:
SIC Code: 332118
SIC Description: Stamping

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 253
Waste Class Desc: EMULSIFIED OILS

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 268
Waste Class Desc: AMINES

Waste Class: 233
Waste Class Desc: OTHER POLYMERIC WASTES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

33	27 of 39	W/78.2	78.9 / -1.95	***MASSILLY NORTH AMERICA INC.*** ***501 LAKESHORE ROAD EAST MASSILLY*** ***SECTION OF BUILDING*** ***MISSISSAUGA ON L5G 1H9***	***GEN***

Generator No: ON2221800
Status:
Approval Years: 2012
Contam. Facility:
MHSW Facility:
SIC Code: 332118
SIC Description: Stamping

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 253
Waste Class Desc: EMULSIFIED OILS

Waste Class: 233
Waste Class Desc: OTHER POLYMERIC WASTES

Waste Class: 268

Waste Class Desc: AMINES

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 232
Waste Class Desc: POLYMERIC RESINS

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33 | ***28 of 39*** | ***W/78.2*** | ***78.9 / -1.95*** | ***GS MEDICAL PACKAGING INC.***
501 LAKESHORE ROAD EAST, UNIT B1
MISSISSAUGA ON L5G 1H9 | ***GEN***

Generator No: ON2960778
Status:
Approval Years: 2012
Contam. Facility:
MHSW Facility:
SIC Code: 323119
SIC Description: Other Printing

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

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33 | ***29 of 39*** | ***W/78.2*** | ***78.9 / -1.95*** | ***GS MEDICAL PACKAGING INC.***
501 LAKESHORE ROAD EAST, UNIT B1
MISSISSAUGA ON | ***GEN***

Generator No: ON2960778
Status:
Approval Years: 2013
Contam. Facility:
MHSW Facility:
SIC Code: 323119
SIC Description: OTHER PRINTING

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

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33 | ***30 of 39*** | ***W/78.2*** | ***78.9 / -1.95*** | ***501 LAKESHORE INC.***
501A LAKESHORE ROAD EAST, MISSISSAUGA,
ON L5G 1H9
Mississauga ON | ***RSC***

RSC ID: 216808
RA No: RA1217-11
RSC Type: Phase 1 and 2 RSC with RA
Curr Property Use: Industrial
Ministry District: Halton-Peel District Office
Filing Date: 2015/02/10
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:
Asmt Roll No: 05-01-0-003-17100-0000-00,
05-01-0-002-17800-0000-06,

Cert Date:
Cert Prop Use No:
Intended Prop Use: Residential
Qual Person Name: THIAM TAN
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:

	05-01-0-003-16900-0000-04, 05-01-0-003-16000-0000-03, 05-01-0-002-17610-0000-09
Prop ID No (PIN):	13473-0055 (LT), 13473-0057 (LT), 13473-0292 (LT)
Property Municipal Address:	501A LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9
Mailing Address:	
Latitude & Latitude:	
UTM Coordinates:	
Consultant:	
Legal Desc:	
Measurement Method:	
Applicable Standards:	
RSC PDF:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46081&fileName=BROWNFIELDS-E.pdf

Document(s) Detail

Document Heading:	Supporting Documents
Document Name:	Current and Past Uses Table Area 1.pdf
Document Type:	Table of Current and Past Property Use
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46084&fileName=Current+and+Past+Uses+Table+Area+1.pdf
Document Heading:	Supporting Documents
Document Name:	APECs Area 1.pdf
Document Type:	Area(s) of Potential Environmental Concern
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46079&fileName=APECs+Area+1.pdf
Document Heading:	Supporting Documents
Document Name:	Area 1 Phase Two CSM for RSC.pdf
Document Type:	Phase 2 Conceptual Site Model
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46082&fileName=Area+1+Phase+Two+CSM+for+RSC.pdf
Document Heading:	Orders and Notices
Document Name:	501 Lakeshore Road East Mississauga CPU 5871-9QLN43-01.pdf
Document Type:	CPU
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=65758&fileName=501+Lakeshore+Road+East++Mississauga+CPU+5871-9QLN43-01.pdf
Document Heading:	Supporting Documents
Document Name:	Area 1 Survey Plan.pdf
Document Type:	A Current plan of Survey
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46088&fileName=Area+1+Survey+Plan.pdf
Document Heading:	Supporting Documents
Document Name:	501 Lakeshore Inc.pdf
Document Type:	Certificate of Status
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46089&fileName=501+Lakeshore+Inc.pdf
Document Heading:	Supporting Documents
Document Name:	Deed and Transfer Docs.pdf
Document Type:	Copy of any deed(s), transfer(s) or other document(s)
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46080&fileName=Deed+and+Transfer+Docs.pdf
Document Heading:	Supporting Documents
Document Name:	PSS RA1217 11 Area 1.xls
Document Type:	Property Specific Standards
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46078&fileName=PSS+RA1217+11+Area+1.xls

Document Heading: Supporting Documents
Document Name: Opinion Ltr Dec9 2014 Area 1.pdf
Document Type: Lawyer's letter consisting of a legal description of the property
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46086&fileName=Opinion+Ltr+Dec9+2014+Area+1.pdf

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33	31 of 39	W/78.2	78.9 / -1.95	***501 LAKESHORE INC.*** ***501B LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9*** ***Mississauga ON***	***RSC***

RSC ID: 216810
RA No: RA1217-11
RSC Type: Phase 1 and 2 RSC with RA
Curr Property Use: Industrial
Ministry District: Halton-Peel District Office
Filing Date: 2015/02/10
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:
Asmt Roll No:
Prop ID No (PIN): 13473-0292 (LT),
13473-0291 (LT)
Property Municipal Address: 501B LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9
Mailing Address:
Latitude & Latitude:
UTM Coordinates:
Consultant:
Legal Desc:
Measurement Method:
Applicable Standards:
RSC PDF: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46113&fileName=BROWNFIELDS-E.pdf

Cert Date:
Cert Prop Use No:
Intended Prop Use: Parkland
Qual Person Name: THIAM TAN
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:

Document(s) Detail

Document Heading: Supporting Documents
Document Name: Deed and Transfer Docs.pdf
Document Type: Copy of any deed(s), transfer(s) or other document(s)
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46109&fileName=Deed+and+Transfer+Docs.pdf

Document Heading: Supporting Documents
Document Name: PSS RA1217 11Area3.xls
Document Type: Property Specific Standards
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46104&fileName=PSS+RA1217+11Area3.xls

Document Heading: Supporting Documents
Document Name: LawyersLetter.pdf
Document Type: Lawyer's letter consisting of a legal description of the property
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46162&fileName=LawyersLetter.pdf

Document Heading: Orders and Notices
Document Name: 501 Lakeshore Road East Mississauga CPU 5871-9QLN43-03.pdf
Document Type: CPU
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=65757&fileName=501+Lakeshore+Road+East++Mississauga+CPU+5871-9QLN43-03.pdf

Document Heading: Supporting Documents
Document Name: Area 3 Survey Plan.pdf
Document Type: A Current plan of Survey
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46110&fileName=Area+3+Survey+Plan.pdf

Document Heading: Supporting Documents
Document Name: Area 3 Phase Two CSM for RSC.pdf
Document Type: Phase 2 Conceptual Site Model
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46112&fileName=Area+3+Phase+Two+CSM+for+RSC.pdf

Document Heading: Supporting Documents
Document Name: 501 Lakeshore Inc.pdf
Document Type: Certificate of Status
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46106&fileName=501+Lakeshore+Inc.pdf

Document Heading: Supporting Documents
Document Name: Current and Past Uses Table Area 3.pdf
Document Type: Table of Current and Past Property Use
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46107&fileName=Current+and+Past+Uses+Table+Area+3.pdf

Document Heading: Supporting Documents
Document Name: APECs Area 3.pdf
Document Type: Area(s) of Potential Environmental Concern
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46105&fileName=APECs+Area+3.pdf

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33	32 of 39	W/78.2	78.9 / -1.95	***501 LAKESHORE INC.*** ***501C LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9*** ***Mississauga ON***	***RSC***

RSC ID: 216811
RA No: RA1217-11
RSC Type: Phase 1 and 2 RSC with RA
Curr Property Use: Industrial
Ministry District: Halton-Peel District Office
Filing Date: 2015/02/10
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:
Asmt Roll No:
Prop ID No (PIN): 13473-0292 (LT)
Property Municipal Address: 501C LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H9
Mailing Address:
Latitude & Latitude:
UTM Coordinates:
Consultant:
Legal Desc:
Measurement Method:
Applicable Standards:
RSC PDF: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46119&fileName=BROWNFIELDS-E.pdf

Cert Date:
Cert Prop Use No:
Intended Prop Use: Industrial
Qual Person Name: THIAM CHUAN TAN
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:

Document(s) Detail

Document Heading: Supporting Documents

Document Name: Current and Past Uses Table Area 4.pdf
Document Type: Table of Current and Past Property Use
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46122&fileName=Current+and+Past+Uses+Table+Area+4.pdf

Document Heading: Orders and Notices
Document Name: 501 Lakeshore Road East Mississauga CPU 5871-9QLN43-04.pdf
Document Type: CPU
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=64407&fileName=501+Lakeshore+Road+East++Mississauga+CPU+5871-9QLN43-04.pdf

Document Heading: Supporting Documents
Document Name: Area 4 Phase Two CSM for RSC.pdf
Document Type: Phase 2 Conceptual Site Model
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46126&fileName=Area+4+Phase+Two+CSM+for+RSC.pdf

Document Heading: Supporting Documents
Document Name: PSS RA1217 11 Area4.xls
Document Type: Property Specific Standards
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46120&fileName=PSS+RA1217+11+Area4.xls

Document Heading: Supporting Documents
Document Name: APECs Area 4.pdf
Document Type: Area(s) of Potential Environmental Concern
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46128&fileName=APECs+Area+4.pdf

Document Heading: Supporting Documents
Document Name: 501 Lakeshore Inc.pdf
Document Type: Certificate of Status
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46123&fileName=501+Lakeshore+Inc.pdf

Document Heading: Supporting Documents
Document Name: Deed and Transfer Docs.pdf
Document Type: Copy of any deed(s), transfer(s) or other document(s)
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46125&fileName=Deed+and+Transfer+Docs.pdf

Document Heading: Supporting Documents
Document Name: Opinion Ltr Dec9 2014 Area 4.pdf
Document Type: Lawyer's letter consisting of a legal description of the property
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46124&fileName=Opinion+Ltr+Dec9+2014+Area+4.pdf

Document Heading: Supporting Documents
Document Name: Area 4 Survey Plan.pdf
Document Type: A Current plan of Survey
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=46127&fileName=Area+4+Survey+Plan.pdf

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33	33 of 39	W/78.2	78.9 / -1.95	501 Lakeshore Road East Mississauga ON	SPL

Ref No: 1155-A859AY
Site No: NA
Incident Dt: 2016/03/17
Year:
Incident Cause:
Incident Event: Leak/Break
Contaminant Code: 35
Contaminant Name: NATURAL GAS (METHANE)
Contaminant Limit 1:

Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type: Industrial Minerals
Agency Involved:
Nearest Watercourse:
Site Address: 501 Lakeshore Road East
Site District Office:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	
MOE Response:	No	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2016/03/17	**Site Map Datum:**	
Dt Document Closed:	2016/08/16	**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	Commercial building<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	TSSA FSB: 2" service damage, no evacuations, made safe		
Contaminant Qty:	0 other - see incident description		

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33 ***34 of 39*** ***W/78.2*** ***78.9 / -1.95*** ***Trinity Development Group Inc.*** ***GEN***
501 Lakeshore Road East
Mississauga ON L5G 1H9

Generator No:	ON9679248	**PO Box No:**	
Status:		**Country:**	Canada
Approval Years:	2016	**Choice of Contact:**	CO_ADMIN
Contam. Facility:	No	**Co Admin:**	Grant Pettypiece
MHSW Facility:	No	**Phone No Admin:**	905 695-3217 Ext.3633
SIC Code:	339990		
SIC Description:	ALL OTHER MISCELLANEOUS MANUFACTURING		

Detail(s)

Waste Class:	145
Waste Class Desc:	PAINT/PIGMENT/COATING RESIDUES
Waste Class:	262
Waste Class Desc:	DETERGENTS/SOAPS
Waste Class:	252
Waste Class Desc:	WASTE OILS & LUBRICANTS
Waste Class:	263
Waste Class Desc:	ORGANIC LABORATORY CHEMICALS
Waste Class:	243
Waste Class Desc:	PCBS
Waste Class:	148
Waste Class Desc:	INORGANIC LABORATORY CHEMICALS
Waste Class:	331
Waste Class Desc:	WASTE COMPRESSED GASES

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33 ***35 of 39*** ***W/78.2*** ***78.9 / -1.95*** ***Trinity Development Group Inc.*** ***GEN***
501 Lakeshore Road East
Mississauga ON L5G 1H9

Generator No:	ON9679248	**PO Box No:**	
Status:		**Country:**	Canada
Approval Years:	2015	**Choice of Contact:**	CO_ADMIN
Contam. Facility:	No	**Co Admin:**	Grant Pettypiece
MHSW Facility:	No	**Phone No Admin:**	905 695-3217 Ext.3633

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

SIC Code: 339990
SIC Description: ALL OTHER MISCELLANEOUS MANUFACTURING

Detail(s)

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 243
Waste Class Desc: PCBS

Waste Class: 262
Waste Class Desc: DETERGENTS/SOAPS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

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33 | **36 of 39** | **W/78.2** | **78.9 / -1.95** | **Trinity Development Group Inc.**
501 Lakeshore Road East
Mississauga ON L5G 1H9 | **GEN**

Generator No: ON4017992
Status:
Approval Years: 2015
Contam. Facility: No
MHSW Facility: No
SIC Code: 541620
SIC Description: ENVIRONMENTAL CONSULTING SERVICES

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Daniel Seguin
Phone No Admin: 4167980065 Ext.234

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

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33 | **37 of 39** | **W/78.2** | **78.9 / -1.95** | **Trinity Development Group Inc.**
501 Lakeshore Road East
Mississauga ON L5G 1H9 | **GEN**

Generator No: ON4017992
Status:
Approval Years: 2014
Contam. Facility: No
MHSW Facility: No
SIC Code: 541620
SIC Description: ENVIRONMENTAL CONSULTING SERVICES

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Daniel Seguin
Phone No Admin: 4167980065 Ext.234

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	38 of 39	W/78.2	78.9 / -1.95	Trinity Development Group Inc. 501 Lakeshore Road East Mississauga ON L5G 1H9	GEN

Generator No: ON9679248
Status:
Approval Years: 2014
Contam. Facility: No
MHSW Facility: No
SIC Code: 339990
SIC Description: ALL OTHER MISCELLANEOUS MANUFACTURING

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Grant Pettypiece
Phone No Admin: 905 695-3217 Ext.3633

Detail(s)

Waste Class: 252
Waste Class Desc: WASTE OILS & LUBRICANTS

Waste Class: 262
Waste Class Desc: DETERGENTS/SOAPS

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 331
Waste Class Desc: WASTE COMPRESSED GASES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 243
Waste Class Desc: PCBS

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
33	39 of 39	W/78.2	78.9 / -1.95	GS MEDICAL PACKAGING INC. 501 LAKESHORE ROAD EAST, UNIT B1 MISSISSAUGA ON L5G 1H9	GEN

Generator No: ON2960778
Status:
Approval Years: 2014
Contam. Facility: No
MHSW Facility: No
SIC Code: 323119
SIC Description: OTHER PRINTING

PO Box No:
Country: Canada
Choice of Contact: CO_OFFICIAL
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
34	1 of 1	NNW/247.7	79.8 / -1.00	Enbridge Gas Distribution Inc. 646 3rd Street Mississauga ON	SPL

Ref No: 1306-ACXRG5
Site No: NA
Incident Dt: 8/18/2016
Year:
Incident Cause:
Incident Event: Leak/Break
Contaminant Code: 35

Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type: Miscellaneous Communal
Agency Involved:
Nearest Watercourse:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	646 3rd Street
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	8/18/2016	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	Residence<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	TSSA: FSB 0.5" PL svc strike, Made Safe		
Contaminant Qty:	0 other - see incident description		

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35 | ***1 of 1*** | ***SSW/204.5*** | ***75.5 / -5.36*** | ***Enbridge Gas Distribution Inc.*** ***928 The Greenway*** ***Mississauga ON*** | ***SPL***

Ref No:	6450-ARNJXW	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	9/29/2017	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Corporation
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	928 The Greenway
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	1075	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	4824500.69
MOE Response:	No	**Easting:**	615560.43
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	9/29/2017	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	Valve/Fitting/Piping
Site Name:	Site of linestrike<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	TSSA FSB; ½" pl service line, IP dmgd; made safe		
Contaminant Qty:	0 other - see incident description		

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36 | ***1 of 1*** | ***SW/172.8*** | ***77.7 / -3.20*** | ***SUNOCO INC - THROUGH AGENT PIONEER PETROLEUMS MANA*** ***456 LAKESHORE RD E*** ***MISSISSAUGA ON L5G1J1*** | ***PRT***

Location ID:	9138
Type:	retail
Expiry Date:	1996-01-31
Capacity (L):	0
Licence #:	0019089080

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

37 | **1 of 1** | **SSE/154.4** | **75.0 / -5.82** | **The Regional Municipality of Peel**
519 Richey Cres
Mississauga ON | **SPL**

Ref No:	7276-AMGPLR	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	5/18/2017	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Municipal Government
Incident Cause:		**Sector Type:**	Miscellaneous Communal
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	99	**Nearest Watercourse:**	
Contaminant Name:	WATER	**Site Address:**	519 Richey Cres
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	n/a	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land; Surface Water	**Northing:**	4824512
MOE Response:		**Easting:**	615817
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	5/18/2017	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	Equipment Failure	**Source Type:**	Water Supply
Site Name:	watermain break<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	DWMD: R of Peel: watermain break, discharge to Cooksville Creek, clear		
Contaminant Qty:	0 other - see incident description		

38 | **1 of 1** | **E/32.3** | **76.9 / -3.96** | **UNKNOWN**
SANITARY SEWERS IN FRONT OF 859
AVIATION DRIVE
MISSISSAUGA CITY ON L5G 4H5 | **SPL**

Ref No:	130935	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	//	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	UNKNOWN	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	POSSIBLE	**Site Municipality:**	21102
Nature of Impact:	Water course or lake	**Site Lot:**	
Receiving Medium:	WATER	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	WORKS
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	8/25/1996	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	UNKNOWN	**Source Type:**	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	UNKNOWN SOURCE:UNKNOWN QUA OF GASOLINE IN SEWER. WORKS INVESTIGATING.		
Contaminant Qty:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
39	1 of 2	ENE/87.4	79.8 / -1.00	R.M. OF PEEL BYNGMOUNT AVE/MONTBECK CRES. MISSISSAUGA ON	CA

Certificate #:	7-0409-98-
Application Year:	98
Issue Date:	5/29/1998
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
39	2 of 2	ENE/87.4	79.8 / -1.00	The Corporation of the City of Mississauga Montbeck Crescent and Byngmount Avenue Mississauga ON	CA

Certificate #:	5057-6FKMXT
Application Year:	2005
Issue Date:	8/29/2005
Approval Type:	Municipal and Private Sewage Works
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
40	1 of 1	SW/204.4	77.3 / -3.58	The Regional Municipality of Peel On Enola Ave. south of Lakeshore Rd., at Lakeshore Rd. and Enola Ave. Mississauga ON	SPL

Ref No:	2633-94EQVA	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	29-JAN-13	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Unknown / N/A	**Sector Type:**	Sewer (Private or Municipal)
Incident Event:		**Agency Involved:**	
Contaminant Code:	n/a	**Nearest Watercourse:**	
Contaminant Name:	Odour	**Site Address:**	On Enola Ave. south of Lakeshore Rd., at Lakeshore Rd. and Enola Ave.
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No Field Response	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	29-JAN-13	**Site Map Datum:**	
Dt Document Closed:	11-JUN-13	**SAC Action Class:**	Pollution Incident Reports (PIRs) and "Other"

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

calls

Incident Reason: Unknown / N/A
Source Type:
Site Name: Residential area outfall<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Unknown: sheen and odours in outfall to Cumberland Creek
Contaminant Qty: 0 other - see incident description

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41 | **1 of 1** | **E/39.1** | **76.8 / -4.02** | **Tamray Construction<UNOFFICIAL>; The Regional Municipality of Peel**
849 Aviation Dr
Mississauga ON | **SPL**

Ref No: 5484-92QKWJ
Site No:
Incident Dt: 06-DEC-12
Year:
Incident Cause: Leak/Break
Incident Event:
Contaminant Code: 44
Contaminant Name: SEWAGE,FINAL EFFLUENT CHLORINATED
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Environment Impact: Confirmed
Nature of Impact: Surface Water Pollution
Receiving Medium:
Receiving Env:
MOE Response: No Field Response
Dt MOE Arvl on Scn:
MOE Reported Dt: 06-DEC-12
Dt Document Closed: 03-JAN-13
Incident Reason: Operator/Human Error
Site Name: sewer main<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Tamray Construction: broke sanitary sewer main
Contaminant Qty: 0 other - see incident description

Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type: Sewage Treatment
Agency Involved:
Nearest Watercourse:
Site Address: 849 Aviation Dr
Site District Office:
Site Postal Code:
Site Region:
Site Municipality: Mississauga
Site Lot:
Site Conc:
Northing:
Easting:
Site Geo Ref Accu:
Site Map Datum:
SAC Action Class: Sewage Bypasses / Overflows
Source Type:

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42 | **1 of 1** | **SSW/240.2** | **77.0 / -3.86** | **CITY**
THE GREENWAY/ENOLA AVE.
MISSISSAUGA ON | **CA**

Certificate #: 3-0216-85-006
Application Year: 85
Issue Date: 3/27/85
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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43 | **1 of 1** | **E/76.3** | **76.8 / -4.00** | **The Regional Municipality of Peel**
852 Goodwin Rd
Mississauga ON | **SPL**

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Ref No:	0518-9C2QMD	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	2013/09/30	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Leak/Break	**Sector Type:**	Water Supply
Incident Event:		**Agency Involved:**	
Contaminant Code:	41	**Nearest Watercourse:**	
Contaminant Name:	WATER/SEDIMENT	**Site Address:**	852 Goodwin Rd
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Possible	**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	No Field Response	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2013/09/30	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Watercourse Spills
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	Residential<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Watermain break, sediment to Lake Ont		
Contaminant Qty:	0 other - see incident description		

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44 | ***1 of 1*** | ***SSE/182.4*** | ***74.8 / -6.00*** | ***Beechwood Ave. and Richey Cres. Mississauga ON*** | ***SPL***

Ref No:	4543-6B9PSA	**Discharger Report:**	0
Site No:		**Material Group:**	Chemical
Incident Dt:	4/8/2005	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Discharge Or Bypass To A Watercourse	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:	Latex Paint	**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:	Water	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	4/8/2005	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Spill to Inland Watercourses
Incident Reason:	Unknown - Reason not determined	**Source Type:**	
Site Name:	Cumberland Creek<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Cumberland Crk: Flowing white		
Contaminant Qty:			

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45 | ***1 of 1*** | ***SW/240.4*** | ***78.5 / -2.34*** | ***INDWELL COMMUNITY HOMES 425 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H8 Mississauga ON*** | ***RSC***

RSC ID:	227243	**Cert Date:**	

RA No:	MGRA1768-19	***Cert Prop Use No:***	
RSC Type:	Phase 1 and 2 RSC with RA	***Intended Prop Use:***	Residential
Curr Property Use:	Commercial	***Qual Person Name:***	PAUL WILSON
Ministry District:	Halton-Peel District Office	***Stratified (Y/N):***	
Filing Date:	2020/09/18	***Audit (Y/N):***	
Date Ack:		***Entire Leg Prop. (Y/N):***	
Date Returned:		***Accuracy Estimate:***	
Restoration Type:		***Telephone:***	
Soil Type:		***Fax:***	
Criteria:		***Email:***	
CPU Issued Sect 1686:			
Asmt Roll No:	210501000217900		
Prop ID No (PIN):	13473-0034 (LT)		
Property Municipal Address:	425 LAKESHORE ROAD EAST, MISSISSAUGA, ON L5G 1H8		
Mailing Address:			
Latitude & Latitude:			
UTM Coordinates:			
Consultant:			
Legal Desc:			
Measurement Method:			
Applicable Standards:			
RSC PDF:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134662&fileName=BROWNFIELDS-E.pdf		

Document(s) Detail

Document Heading:	Supporting Documents
Document Name:	PlanofSurvey.pdf
Document Type:	A Current plan of Survey
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134659&fileName=PlanofSurvey.pdf
Document Heading:	Supporting Documents
Document Name:	PSS MGRA1768-19 - June11-2020.xls
Document Type:	Property Specific Standards
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134656&fileName=PSS+MGRA1768-19+-+June11-2020.xls
Document Heading:	Supporting Documents
Document Name:	TransferDocs.pdf
Document Type:	Copy of any deed(s), transfer(s) or other document(s)
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134660&fileName=TransferDocs.pdf
Document Heading:	Supporting Documents
Document Name:	CertofStatus.pdf
Document Type:	Certificate of Status
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134658&fileName=CertofStatus.pdf
Document Heading:	Supporting Documents
Document Name:	LawyersLetter.pdf
Document Type:	Lawyer's letter consisting of a legal description of the property
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134655&fileName=LawyersLetter.pdf
Document Heading:	Orders and Notices
Document Name:	MGRA CPU 4418-BQAGW8_June10-20.pdf
Document Type:	CPU
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=135773&fileName=MGRA+CPU+4418-BQAGW8_June10-20.pdf
Document Heading:	Supporting Documents
Document Name:	APECTable.pdf

Document Type:	Area(s) of Potential Environmental Concern
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134653&fileName=APECTable.pdf
Document Heading:	Supporting Documents
Document Name:	CPTable.pdf
Document Type:	Table of Current and Past Property Use
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134663&fileName=CPTable.pdf
Document Heading:	Supporting Documents
Document Name:	AgentAuthorization.pdf
Document Type:	Proof of the owner's authorization
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134664&fileName=AgentAuthorization.pdf
Document Heading:	Supporting Documents
Document Name:	PhaseTwoCSM.pdf
Document Type:	Phase 2 Conceptual Site Model
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=134665&fileName=PhaseTwoCSM.pdf

46 | **1 of 1** | **SW/243.9** | **80.1 / -0.71** | **Enbridge Gas Distribution Inc.**
420 Lakeshore Rd. E. Mississauga
Mississauga ON | **SPL**

Ref No:	7106-AWPJDX	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2018/02/28	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Corporation
Incident Cause:		**Sector Type:**	Miscellaneous Communal
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	420 Lakeshore Rd. E. Mississauga
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	1075	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	4824499.36
MOE Response:	No	**Easting:**	615340.89
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2018/03/09	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	Pipeline/Components
Site Name:	Gas Main on Lakeshore Rd<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	TSSA-FSB: 8 inch stl gas line dmgd; made safe		
Contaminant Qty:	0 L		

47 | **1 of 1** | **NE/41.6** | **79.8 / -1.00** | **PINCHIN LTD.**
756/760 LAKESHORE ROAD EAST
MISSISSAUGA ON L5E 1C7 | **GEN**

Generator No:	ON9332438	**PO Box No:**	
Status:	Registered	**Country:**	Canada
Approval Years:	As of Oct 2019	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:			

SIC Description:

Detail(s)

Waste Class: 150 L
Waste Class Desc: Inert organic wastes

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48 | ***1 of 1*** | ***SSE/173.3*** | ***74.8 / -6.00*** | ***506 Richey Cres Mississauga ON L5G 1N4*** | ***SPL***

Ref No: 8503-8KUU8S
Site No:
Incident Dt: 8/18/2011
Year:
Incident Cause: Unknown
Incident Event:
Contaminant Code: 15
Contaminant Name: OIL (PETROLEUM BASED, NOT SPECIFIED)
Contaminant Limit 1:
Contam Limit Freq 1:
Contaminant UN No 1:
Environment Impact: Confirmed
Nature of Impact: Surface Water Pollution
Receiving Medium:
Receiving Env:
MOE Response:
Dt MOE Arvl on Scn:
MOE Reported Dt: 8/18/2011
Dt Document Closed:
Incident Reason: Spill
Site Name: Lake Ontario<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Peel: Sheen in Lake Ontario coming from outfall
Contaminant Qty: 0 other - see incident description

Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type: Unknown
Agency Involved:
Nearest Watercourse:
Site Address: 506 Richey Cres
Site District Office:
Site Postal Code:
Site Region:
Site Municipality: Mississauga
Site Lot:
Site Conc:
Northing:
Easting:
Site Geo Ref Accu:
Site Map Datum:
SAC Action Class: Great Lakes and their Interconnecting Channels Spills
Source Type:

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49 | ***1 of 1*** | ***WSW/242.2*** | ***78.4 / -2.44*** | ***MCGROW LANDSCAPING 1058 ENOLA DRIVE MISSISSAUGA ON L5G 4A9*** | ***PES***

Detail Licence No:
Licence No:
Status:
Approval Date:
Report Source:
Licence Type: Operator
Licence Type Code:
Licence Class:
Licence Control:
Latitude:
Longitude:
Lot:
Concession:
Region:
District:
County:
Trade Name:
PDF Link:

Operator Box:
Operator Class:
Operator No:
Operator Type:
Oper Area Code:
Oper Phone No:
Operator Ext:
Operator Lot:
Oper Concession:
Operator Region:
Operator District:
Operator County:
Op Municipality:
Post Office Box:
MOE District:
SWP Area Name:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
50	1 of 1	WSW/242.7	78.4 / -2.44	MCGROW LANDSCAPING 1058 ENOLA DRIVE MISSISSAUGA ON L5G4A9	PES

Detail Licence No:		**Operator Box:**	
Licence No:	03627	**Operator Class:**	
Status:		**Operator No:**	
Approval Date:		**Operator Type:**	
Report Source:	Legacy Licenses (Excluding TS)	**Oper Area Code:**	905
Licence Type:	Operator	**Oper Phone No:**	8912143
Licence Type Code:	01	**Operator Ext:**	
Licence Class:	06	**Operator Lot:**	
Licence Control:		**Oper Concession:**	
Latitude:		**Operator Region:**	
Longitude:		**Operator District:**	
Lot:		**Operator County:**	
Concession:		**Op Municipality:**	
Region:		**Post Office Box:**	
District:		**MOE District:**	
County:		**SWP Area Name:**	
Trade Name:			
PDF Link:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
51	1 of 4	ESE/100.1	75.8 / -5.07	MINISTRY OF THE ENVIR.-PROJ# 1-0053-35 LOT 94/RP-A26), BEACH ST. SPS MISSISSAUGA CITY ON	CA

Certificate #:	8-3135-91-
Application Year:	91
Issue Date:	2/20/1992
Approval Type:	Industrial air
Status:	Approved in 1992
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	500 KW STANDBY DIESEL GENERATOR SET
Contaminants:	Nitrogen Oxides, Stoddard Solvent
Emission Control:	No Controls, Silencer, Muffler, Enclosure (Plenum), Noise Control - Acoustic Louvre

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
51	2 of 4	ESE/100.1	75.8 / -5.07	MINISTRY OF THE ENVIR.-PROP# 1-0053-35 BEACH ST.S.T.P., LOT 94 MISSISSAUGA CITY ON	CA

Certificate #:	3-0588-91-
Application Year:	91
Issue Date:	6/12/1991
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
51	3 of 4	ESE/100.1	75.8 / -5.07	ONTARIO CLEAN WATER AGENCY	SPL

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

LAKE ONTARIO BEACH ST, PUMPING STATION
SANITARY SEWER/PUMPING STATION
MISSISSAUGA CITY ON

Ref No:	95738	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	1/27/1994	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	CONTAINER OVERFLOW	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	21102
Nature of Impact:	Water course or lake	***Site Lot:***	
Receiving Medium:	WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	1/27/1994	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	POWER INTERRUPTION	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	OCWA BEACH ST. P.S.: POWER FAILURE; 900L RAW SEWAGE TO LAKE ONTARIO		
Contaminant Qty:			

51	***4 of 4***	***ESE/100.1***	***75.8 / -5.07***	***MINISTRY OF THE ENVIRONMENT***	***SPL***

LAKE ONTARIO BEACH ST. PUMPING STN.
SANITARY SEWER SYSTEM
MISSISSAUGA CITY ON

Ref No:	50148	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	5/7/1991	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	WASTEWATER DISCHARGE TO WATERCOURSE	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	NOT ANTICIPATED	***Site Municipality:***	21102
Nature of Impact:	Water course or lake	***Site Lot:***	
Receiving Medium:	WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	5/7/1991	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	EQUIPMENT FAILURE	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	MOE PUMPING STN. -900 L. RAW SEWAGE BYPASSED TO LAKE DUE TO EQ'T FAILURE.		
Contaminant Qty:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
52	1 of 1	NNE/197.9	80.8 / 0.00	Enbridge Gas Distribution Inc. 1065 West Ave. Mississauga ON	SPL

Ref No:	0516-9PET2C	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2014/09/29	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Leak/Break	**Sector Type:**	Pipeline/Components
Incident Event:		**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	1065 West Ave.
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Mississauga
Nature of Impact:	Air Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:	Not Moe mandate	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2014/09/29	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	Residential<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	TSSA FSB: 1 1/4" plastic main line strike to atm.		
Contaminant Qty:	0 other - see incident description		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
53	1 of 1	E/188.3	75.8 / -5.03	REGION OF PEEL CROOKES PARK CAWTHRA CREEK MISSISSAUGA ON	CA

Certificate #:	3-0026-86-
Application Year:	86
Issue Date:	2/7/1986
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
54	1 of 1	WNW/129.6	81.8 / 0.98	Enersource Hydro Mississauga Inc. 1161 Claredale Rd Mississauga ON	SPL

Ref No:	5310-9RTNVG	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2014/12/15	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Leak/Break	**Sector Type:**	Transformer
Incident Event:		**Agency Involved:**	
Contaminant Code:	26	**Nearest Watercourse:**	
Contaminant Name:	PCB-CONTAMINATED OIL (>50PPM PCB)	**Site Address:**	1161 Claredale Rd
Contaminant Limit 1:		**Site District Office:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:	Land	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	4824646
MOE Response:	N	**Easting:**	615834
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2014/12/15	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Equipment Failure	**Source Type:**	
Site Name:	Transformer<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Enersource: loss 6.39 L of PCB trans oil		
Contaminant Qty:	6.39 L		

55	1 of 3	NE/120.4	80.8 / 0.00	**MINISTRY OF THE ENVIR.-MOE # 5-0020-53** **LAKESHORE RD./GREAVES AVE.** **MISSISSAUGA CITY ON**	CA

Certificate #:	7-0131-91-
Application Year:	91
Issue Date:	8/25/1992
Approval Type:	Municipal water
Status:	Underwent 2nd revision in 1992
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

55	2 of 3	NE/120.4	80.8 / 0.00	**MISSISSAUGA CITY** **GREAVES AVE/LAKESHORE RD.** **MISSISSAUGA CITY ON**	CA

Certificate #:	3-0908-95-
Application Year:	95
Issue Date:	7/17/1995
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

55	3 of 3	NE/120.4	80.8 / 0.00	**R.M. OF PEEL** **GREAVES AVE/LAKESHORE RD.** **MISSISSAUGA CITY ON**	CA

Certificate #:	7-0392-95-
Application Year:	95
Issue Date:	5/24/1995

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

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56 | **1 of 2** | **NNE/152.2** | **80.8 / 0.00** | **PEEL NON-PROFIT HOUSING CORP.**
1022 GRAVES AVE.
MISSISSAUGA CITY ON | **CA**

Certificate #: 8-3674-95-966
Application Year: 95
Issue Date: 4/11/96
Approval Type: Industrial air
Status: Received in 1995, Issued in 1996
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: 125 KW DIESEL STANDBY GENERATOR
Contaminants: Nitrogen Oxides, Sulphur Dioxide
Emission Control: No Controls

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56 | **2 of 2** | **NNE/152.2** | **80.8 / 0.00** | **PEEL NON-PROFIT HOUSING CORP.**
1022 GRAVES AVENUE, RES. DEV.
MISSISSAUGA CITY ON | **CA**

Certificate #: 8-3711-95-000
Application Year: 95
Issue Date: 2/13/96
Approval Type: Industrial air
Status: Application Cancelled
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description: DIESEL GEN-SET FOR EMERGENCY POWER
Contaminants:
Emission Control:

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57 | **1 of 1** | **WNW/202.1** | **83.8 / 2.95** | **Enersource Hydro Mississauga Inc.**
558 Raphael Ave
Mississauga ON | **SPL**

Ref No: 2232-9WYPND
Site No: NA
Incident Dt: 5/29/2015
Year:
Incident Cause: Leak/Break
Incident Event:
Contaminant Code: 26
Contaminant Name: TRANSFORMER OIL (GT 50 PPM PCB)
Contaminant Limit 1:
Discharger Report:
Material Group:
Health/Env Conseq:
Client Type:
Sector Type:
Agency Involved:
Nearest Watercourse:
Site Address: 558 Raphael Ave
Site District Office:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:	Land	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	4825188
MOE Response:	N	**Easting:**	615155
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	5/29/2015	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Unknown / N/A	**Source Type:**	
Site Name:	Enersource Transformer - pad<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Enersource: PCB transformer oil leak		
Contaminant Qty:	59 L		

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58 **1 of 1** **WNW/227.9** **83.7 / 2.85** **Enbridge Gas Distribution Inc.**
570 Raphael Ave. Mississauga, ON
Mississauga ON **SPL**

Ref No:	8517-ADY53F	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	9/19/2016	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	570 Raphael Ave. Mississauga, ON
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	9/19/2016	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	
Site Name:	570 Raphael Ave. Mississauga, ON<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	TSSA FSB: 1/2" plastic linestrike		
Contaminant Qty:	0 other - see incident description		

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59 **1 of 1** **WNW/151.0** **82.8 / 1.97** **512 Ettridge Court**
Mississauga ON **SPL**

Ref No:	3006-B26R5E	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2018/06/28	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	35	**Nearest Watercourse:**	
Contaminant Name:	NATURAL GAS (METHANE)	**Site Address:**	512 Ettridge Court
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	1075	**Site Region:**	Central

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Air	**Northing:**	
MOE Response:	No	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2018/06/28	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Incident Reason:	Operator/Human Error	**Source Type:**	Valve/Fitting/Piping
Site Name:	Residence<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	TSSA FSB: 1/2" plastic IP service damaged; made safe		
Contaminant Qty:	0 other - see incident description		

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60 ***1 of 1*** ***WNW/150.5*** ***82.7 / 1.81*** ***Enersource Hydro Mississauga Inc.*** ***SPL***
506 Ettridge Court
Mississauga ON

Ref No:	5410-9RTP5K	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2014/12/15	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Leak/Break	**Sector Type:**	Transformer
Incident Event:		**Agency Involved:**	
Contaminant Code:	26	**Nearest Watercourse:**	
Contaminant Name:	PCB-CONTAMINATED OIL (>50PPM PCB)	**Site Address:**	506 Ettridge Court
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:	Land	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	4824249
MOE Response:	N	**Easting:**	613199
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2014/12/15	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Unknown / N/A	**Source Type:**	
Site Name:	Transformer<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Enersourc PCB trans oil to ground		
Contaminant Qty:	6.39 L		

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61 ***1 of 7*** ***ENE/210.3*** ***80.6 / -0.24*** ***PEEL BOARD OF EDUCATION*** ***GEN***
BYNGMOUNT BEACH PUBLIC SCHOOL 930
EAST AVENUE
MISSISSAUGA ON L5E 1W6

Generator No:	ON0359830	**PO Box No:**	
Status:		**Country:**	
Approval Years:	86,87,88,89,90	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	8511		
SIC Description:	ELEMT./SECON. EDUC.		

Detail(s)

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

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61 | ***2 of 7*** | ***ENE/210.3*** | ***80.6 / -0.24*** | ***PEEL BOARD OF EDUCATION 30-247***
BYNGMOUNT BEACH PUBLIC SCHOOL 930
EAST AVENUE
MISSISSAUGA ON L5E 1W6 | ***GEN***

Generator No: ON0359830
Status:
Approval Years: 92,93,94,95,96
Contam. Facility:
MHSW Facility:
SIC Code: 8511
SIC Description: ELEMT./SECON. EDUC.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

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61 | ***3 of 7*** | ***ENE/210.3*** | ***80.6 / -0.24*** | ***PEEL DISTRICT SCHOOL BOARD***
BYNGMOUNT BEACH PUBLIC SCHOOL 930
EAST AVENUE
MISSISSAUGA ON L5E 1W6 | ***GEN***

Generator No: ON0359830
Status:
Approval Years: 97,98,99,00,01
Contam. Facility:
MHSW Facility:
SIC Code: 8511
SIC Description: ELEMT./SECON. EDUC.

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 148
Waste Class Desc: INORGANIC LABORATORY CHEMICALS

Waste Class: 212
Waste Class Desc: ALIPHATIC SOLVENTS

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Waste Class: 263
Waste Class Desc: ORGANIC LABORATORY CHEMICALS

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61 *4 of 7* *ENE/210.3* *80.6 / -0.24*

Region of Peel
930 East Ave
Mississauga ON L5E 1W6

GEN

Generator No:	ON3379157	***PO Box No:***	
Status:		***Country:***	Canada
Approval Years:	2016	***Choice of Contact:***	CO_OFFICIAL
Contam. Facility:	No	***Co Admin:***	Nora Fleming
MHSW Facility:	No	***Phone No Admin:***	9058412224 Ext.
SIC Code:	236220		
SIC Description:	COMMERCIAL AND INSTITUTIONAL BUILDING CONSTRUCTION		

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

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61 *5 of 7* *ENE/210.3* *80.6 / -0.24*

Region of Peel
930 East Ave
Mississauga ON L5E 1W6

GEN

Generator No:	ON3379157	***PO Box No:***	
Status:		***Country:***	Canada
Approval Years:	2015	***Choice of Contact:***	CO_OFFICIAL
Contam. Facility:	No	***Co Admin:***	Nora Fleming
MHSW Facility:	No	***Phone No Admin:***	9058412224 Ext.
SIC Code:	236220		
SIC Description:	COMMERCIAL AND INSTITUTIONAL BUILDING CONSTRUCTION		

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

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61 *6 of 7* *ENE/210.3* *80.6 / -0.24*

Region of Peel
930 East Ave
Mississauga ON L5E 1W6

GEN

Generator No:	ON3379157	***PO Box No:***	
Status:		***Country:***	Canada
Approval Years:	2014	***Choice of Contact:***	CO_OFFICIAL
Contam. Facility:	No	***Co Admin:***	Nora Fleming
MHSW Facility:	No	***Phone No Admin:***	9058412224 Ext.
SIC Code:	236220		
SIC Description:	COMMERCIAL AND INSTITUTIONAL BUILDING CONSTRUCTION		

Detail(s)

Waste Class: 251
Waste Class Desc: OIL SKIMMINGS & SLUDGES

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61 *7 of 7* *ENE/210.3* *80.6 / -0.24*

Region of Peel
930 East Ave
Mississauga ON L5E 1W6

GEN

Generator No:	ON3379157	***PO Box No:***	
Status:	Registered	***Country:***	Canada

Approval Years:	As of Dec 2017	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:			
SIC Description:			

Detail(s)

Waste Class:	251 L
Waste Class Desc:	Waste oils/sludges (petroleum based)

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62 | ***1 of 1*** | ***NE/170.9*** | ***81.0 / 0.14*** | ***Gospel Assembly Church<UNOFFICIAL>*** | ***SPL***

1023 Greaves Avenue
Mississauga ON

Ref No:	6454-9JVNB6	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2014/05/07	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Overflow/Surcharge	**Sector Type:**	Sewer (Private or Municipal)
Incident Event:		**Agency Involved:**	
Contaminant Code:	44	**Nearest Watercourse:**	
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	**Site Address:**	1023 Greaves Avenue
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Confirmed	**Site Municipality:**	Mississauga
Nature of Impact:	Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2014/05/07	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Watercourse Spills
Incident Reason:	Equipment Failure	**Source Type:**	
Site Name:	Gospel Assembly Church<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Gospel Assembly Church: sewage pumped to ditches		
Contaminant Qty:	0 other - see incident description		

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63 | ***1 of 1*** | ***NNE/222.3*** | ***81.8 / 1.00*** | ***UNKNOWN*** | ***SPL***

GARDINER AVE. AND GREAVES
MISSISSAUGA CITY ON

Ref No:	4138	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	5/22/1988	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	UNKNOWN	**Sector Type:**	
Incident Event:		**Agency Involved:**	
Contaminant Code:		**Nearest Watercourse:**	
Contaminant Name:		**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:		**Site Municipality:**	21102
Nature of Impact:		**Site Lot:**	
Receiving Medium:	LAND	**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

MOE Reported Dt:	5/23/1988	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	
Incident Reason:	UNKNOWN	**Source Type:**	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	POOL OF OILY WATER IN FRONT OF CONSTRUCTION SITE		
Contaminant Qty:			

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64 | **1 of 1** | **NE/181.2** | **81.8 / 1.00** | **803 Lakeshore Rd East**
Mississauga ON | **SPL**

Ref No:	2878-9BKCBA	**Discharger Report:**	
Site No:		**Material Group:**	
Incident Dt:	2013/09/15	**Health/Env Conseq:**	
Year:		**Client Type:**	
Incident Cause:	Dumping	**Sector Type:**	Container/Drum/Tote
Incident Event:		**Agency Involved:**	
Contaminant Code:	14	**Nearest Watercourse:**	
Contaminant Name:	GREASE (N.O.S.)	**Site Address:**	803 Lakeshore Rd East
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:		**Site Region:**	
Environment Impact:	Possible	**Site Municipality:**	Mississauga
Nature of Impact:	Other Impact(s)	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	
MOE Response:		**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2013/09/15	**Site Map Datum:**	
Dt Document Closed:		**SAC Action Class:**	Land Spills
Incident Reason:	Other	**Source Type:**	
Site Name:	Antojitos<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Grease to catchbasins, unknown volume		
Contaminant Qty:	0 other - see incident description		

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65 | **1 of 1** | **NE/201.7** | **81.8 / 1.00** | **The Regional Municipality of Peel**
1012 East Ave
Mississauga ON | **SPL**

Ref No:	4850-ATBVKT	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2017/11/21	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Municipal Government
Incident Cause:		**Sector Type:**	Miscellaneous Industrial
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	43	**Nearest Watercourse:**	
Contaminant Name:	SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)	**Site Address:**	1012 East Ave
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	n/a	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Surface Water	**Northing:**	
MOE Response:	No	**Easting:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2017/11/21	**Site Map Datum:**	
Dt Document Closed:	2018/01/24	**SAC Action Class:**	Watercourse Spills

Incident Reason:	Equipment Failure	**Source Type:**	Pipeline/Components
Site Name:	1012 East Ave<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	Region of Peel: 6inch watermain break, sediment to Lk Ontario		
Contaminant Qty:	0 other - see incident description		

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66 **1 of 1** **NE/216.9** **82.8 / 1.93** **The Regional Municipality of Peel**
NW of Lakeshore Road E at East Ave
Mississauga ON
SPL

Ref No:	4610-ASAL94	**Discharger Report:**	
Site No:	NA	**Material Group:**	
Incident Dt:	2017/10/19	**Health/Env Conseq:**	2 - Minor Environment
Year:		**Client Type:**	Municipal Government
Incident Cause:		**Sector Type:**	Miscellaneous Communal
Incident Event:	Leak/Break	**Agency Involved:**	
Contaminant Code:	41	**Nearest Watercourse:**	Lake Ontario
Contaminant Name:	WATER/SEDIMENT	**Site Address:**	NW of Lakeshore Road E at East Ave
Contaminant Limit 1:		**Site District Office:**	Halton-Peel
Contam Limit Freq 1:		**Site Postal Code:**	
Contaminant UN No 1:	n/a	**Site Region:**	Central
Environment Impact:		**Site Municipality:**	Mississauga
Nature of Impact:		**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:	Land; Surface Water	**Northing:**	4825382
MOE Response:	No	**Easting:**	615991
Dt MOE Arvl on Scn:		**Site Geo Ref Accu:**	
MOE Reported Dt:	2017/10/19	**Site Map Datum:**	
Dt Document Closed:	2017/11/09	**SAC Action Class:**	Watercourse Spills
Incident Reason:	Equipment Failure	**Source Type:**	Water Supply
Site Name:	water main break<UNOFFICIAL>		
Site County/District:	Regional Municipality of Peel		
Site Geo Ref Meth:			
Incident Summary:	R of P, DWMD: water main break, water+sediment to L Ontario.		
Contaminant Qty:	0 other - see incident description		

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67 **1 of 11** **NE/239.8** **82.1 / 1.21** **MEDIACOM INC**
830 LAKESHORE RD. E.
MISSISSAUGA ON L5E 1E1
GEN

Generator No:	ON0120700	**PO Box No:**	
Status:		**Country:**	
Approval Years:	86,87,88,89,90	**Choice of Contact:**	
Contam. Facility:		**Co Admin:**	
MHSW Facility:		**Phone No Admin:**	
SIC Code:	2819		
SIC Description:	OTHER COMM. PRINTING		

Detail(s)

Waste Class:	213
Waste Class Desc:	PETROLEUM DISTILLATES

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67 **2 of 11** **NE/239.8** **82.1 / 1.21** **MEDIACOM INC. 26-031**
830 LAKESHORE RD. E.
MISSISSAUGA ON L5E 1E1
GEN

Generator No:	ON0120700	**PO Box No:**	
Status:		**Country:**	
Approval Years:	92,93,94,95,96,97	**Choice of Contact:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Contam. Facility: ***Co Admin:***
MHSW Facility: ***Phone No Admin:***
SIC Code: 2819
SIC Description: OTHER COMM. PRINTING

Detail(s)

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

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67 ***3 of 11*** ***NE/239.8*** ***82.1 / 1.21*** ***MEDIACOM INC.***
830 LAKESHORE ROAD EAST
MISSISSAUGA ON L5E 1E1 ***GEN***

Generator No: ON0120700 ***PO Box No:***
Status: ***Country:***
Approval Years: 98,99,00 ***Choice of Contact:***
Contam. Facility: ***Co Admin:***
MHSW Facility: ***Phone No Admin:***
SIC Code: 2819
SIC Description: OTHER COMM. PRINTING

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

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67 ***4 of 11*** ***NE/239.8*** ***82.1 / 1.21*** ***MEDIACOM (OUT OF BUSINESS)***
830 LAKESHORE ROAD EAST
MISSISSAUGA ON L5E 1E1 ***GEN***

Generator No: ON0120700 ***PO Box No:***
Status: ***Country:***
Approval Years: 01 ***Choice of Contact:***
Contam. Facility: ***Co Admin:***
MHSW Facility: ***Phone No Admin:***
SIC Code: 2819
SIC Description: OTHER COMM. PRINTING

Detail(s)

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
67	5 of 11	NE/239.8	82.1 / 1.21	Wellington Printworks Inc. 830 Lakeshore Road East Mississauga ON	GEN

Generator No: ON5311732
Status:
Approval Years: 2012
Contam. Facility:
MHSW Facility:
SIC Code: 323119
SIC Description: Other Printing

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
67	6 of 11	NE/239.8	82.1 / 1.21	Wellington Printworks Inc. 830 Lakeshore Road East Mississauga ON	GEN

Generator No: ON5311732
Status:
Approval Years: 2013
Contam. Facility:
MHSW Facility:
SIC Code: 323119
SIC Description: OTHER PRINTING

PO Box No:
Country:
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
67	7 of 11	NE/239.8	82.1 / 1.21	Wellington Printworks Inc. 830 Lakeshore Road East Mississauga ON L5E 1E1	GEN

Generator No: ON5311732
Status:
Approval Years: 2016
Contam. Facility: No
MHSW Facility: No
SIC Code: 323119
SIC Description: OTHER PRINTING

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Cynthia G Romans
Phone No Admin: 416-599-7406 Ext.

Detail(s)

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
67	8 of 11	NE/239.8	82.1 / 1.21	Wellington Printworks Inc. 830 Lakeshore Road East Mississauga ON L5E 1E1	GEN

Generator No: ON5311732
Status:
Approval Years: 2015
Contam. Facility: No
MHSW Facility: No
SIC Code: 323119
SIC Description: OTHER PRINTING

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Cynthia G Romans
Phone No Admin: 416-599-7406 Ext.

Detail(s)

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

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67 | ***9 of 11*** | ***NE/239.8*** | ***82.1 / 1.21*** | ***Wellington Printworks Inc.*** ***830 Lakeshore Road East*** ***Mississauga ON L5E 1E1*** | ***GEN***

Generator No: ON5311732
Status:
Approval Years: 2014
Contam. Facility: No
MHSW Facility: No
SIC Code: 323119
SIC Description: OTHER PRINTING

PO Box No:
Country: Canada
Choice of Contact: CO_ADMIN
Co Admin: Cynthia G Romans
Phone No Admin: 416-599-7406 Ext.

Detail(s)

Waste Class: 264
Waste Class Desc: PHOTOPROCESSING WASTES

Waste Class: 213
Waste Class Desc: PETROLEUM DISTILLATES

Waste Class: 145
Waste Class Desc: PAINT/PIGMENT/COATING RESIDUES

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67 | ***10 of 11*** | ***NE/239.8*** | ***82.1 / 1.21*** | ***Wellington Printworks Inc.*** ***830 Lakeshore Road East*** ***Mississauga ON L5E 1E1*** | ***GEN***

Generator No: ON5311732
Status: Registered
Approval Years: As of Dec 2018
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 145 L
Waste Class Desc: Wastes from the use of pigments, coatings and paints

Waste Class: 213 I
Waste Class Desc: Petroleum distillates

Waste Class: 252 L
Waste Class Desc: Waste crankcase oils and lubricants

Waste Class: 264 L
Waste Class Desc: Photoprocessing wastes

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67 ***11 of 11*** ***NE/239.8*** ***82.1 / 1.21*** ***Wellington Printworks Inc.*** ***GEN***
830 Lakeshore Road East
Mississauga ON L5E 1E1

Generator No: ON5311732
Status: Registered
Approval Years: As of Jul 2020
Contam. Facility:
MHSW Facility:
SIC Code:
SIC Description:

PO Box No:
Country: Canada
Choice of Contact:
Co Admin:
Phone No Admin:

Detail(s)

Waste Class: 252 L
Waste Class Desc: Waste crankcase oils and lubricants

Waste Class: 213 I
Waste Class Desc: Petroleum distillates

Waste Class: 145 L
Waste Class Desc: Wastes from the use of pigments, coatings and paints

Waste Class: 264 L
Waste Class Desc: Photoprocessing wastes

Unplottable Summary

Total: 28 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CA	R.M. OF PEEL	CAWTHRA RD.	MISSISSAUGA CITY ON	
CA	582392 ONTARIO LIMITED	GARDNER AVE.	MISSISSAUGA CITY ON	
CA	R.M. OF PEEL	MONTBECK AREA	MISSISSAUGA CITY ON	
CA	R.M. OF PEEL MONTBECK AVE.	HAMPTON CRESCENT	MISSISSAUGA CITY ON	
CA	P. NICK GIANNONE	REVUS AVENUE	MISSISSAUGA CITY ON	
CA	REGION OF PEEL	GOODWIN ROAD	MISSISSAUGA ON	
CA	P. NICK GIANNONE	REVUS AVE.	MISSISSAUGA CITY ON	
CA	CITY OF MISSISSAUGA	CLEARVIEW CREEK LAKESHORE RD.	MISSISSAUGA CITY ON	
CA	G.L. BALL CLEARVIEW CREEK CANNELIZATION	LAKESHORE RD.	MISSISSAUGA CITY ON	
CA	R.M. OF PEEL	CAWTHRA RD.	MISSISSAUGA CITY ON	
CA	REGION OF PEEL	GOODWIN RD.	MISSISSAUGA ON	
CA	R.M. OF PEEL	LAKESHORE RD.E./FIRST ST.	MISSISSAUGA CITY ON	
CA		Lakeshore Road East, Helen Street, Port Street, and St. Lawrence Drive	Mississauga ON	
CA	Lakeshore Road East, Helen Street, Port Street, and St. Lawrence Drive	Lakeshore Road East	Mississauga ON	
CA	REG.MUNIC.OF PEEL	RICHEY CRES.	MISSISSAUGA CITY ON	
CA		Lakeshore Road East	Mississauga ON	
CA	The Regional Municipality of Peel	From Enola Avenue to Alexandra Avenue and Beechwood Ave	Mississauga ON	

CA	The Regional Municipality of Peel	Cawthra Road	Mississauga ON
CA	582302 ONTARIO LIMITED	GARDNER AVE.	MISSISSAUGA CITY ON
CA	MISSISSAUGA CITY	LAKESHORE RD. TURTLE CREEK	MISSISSAUGA CITY ON
SPL	The Regional Municipality of Peel	Beach Street	Mississauga ON
SPL		Where creek crosses Lakeshore Rd, by Cawthra Rd.	Mississauga ON
SPL		under Lakeshore Road	Mississauga ON
SPL	GREEN SPACE SERVICES (SEARS LAW	JACK DARLING PARK,LAKESHORE ROAD. TANK TRUCK (CARGO)	MISSISSAUGA CITY ON
SPL		Cawthra Rd south of Burnhamthorpe	Mississauga ON
SPL	The Corporation of the City of Mississauga	RICHARDS MEMORIAL PARK, NEAR LAKESHORE RD.<UNOFFICIAL>	Mississauga ON
SPL	Seneca Autobody Complete Restoration and Collision Inc.	Enola Ave	Mississauga ON
SPL		Cawthra Road on ramp for westbound QEW	Mississauga ON

Unplottable Report

Site: ***R.M. OF PEEL***
CAWTHRA RD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-0704-86-
Application Year:	86
Issue Date:	7/10/1986
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***582392 ONTARIO LIMITED***
GARDNER AVE. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-1276-87-
Application Year:	87
Issue Date:	9/10/1987
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***R.M. OF PEEL***
MONTBECK AREA MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-1005-87-
Application Year:	87
Issue Date:	7/21/1987
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***R.M. OF PEEL MONTBECK AVE.***
HAMPTON CRESCENT MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-0892-87-

Application Year: 87
Issue Date: 7/7/1987
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***P. NICK GIANNONE***
REVUS AVENUE MISSISSAUGA CITY ON

Database: ***CA***

Certificate #: 7-0047-89-
Application Year: 89
Issue Date: 1/24/1989
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***REGION OF PEEL***
GOODWIN ROAD MISSISSAUGA ON

Database: ***CA***

Certificate #: 7-0020-86-
Application Year: 86
Issue Date: 2/4/1986
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***P. NICK GIANNONE***
REVUS AVE. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #: 3-0050-89-
Application Year: 89
Issue Date: 1/24/1989
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***CITY OF MISSISSAUGA***
CLEARVIEW CREEK LAKESHORE RD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #: 3-1542-88-
Application Year: 88
Issue Date: 10/21/1988
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***G.L. BALL CLEARVIEW CREEK CANNELIZATION***
LAKESHORE RD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #: 3-1828-88-
Application Year: 88
Issue Date: 9/28/1988
Approval Type: Municipal sewage
Status: Cancelled
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R.M. OF PEEL***
CAWTHRA RD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #: 3-0880-86-
Application Year: 86
Issue Date: 7/10/1986
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***REGION OF PEEL***
GOODWIN RD. MISSISSAUGA ON

Database: ***CA***

Certificate #: 3-0027-86-
Application Year: 86
Issue Date: 2/4/1986
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:

Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***R.M. OF PEEL***
LAKESHORE RD.E./FIRST ST. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #: 7-0879-96-
Application Year: 96
Issue Date: 9/16/1996
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site:
Lakeshore Road East, Helen Street, Port Street, and St. Lawrence Drive Mississauga ON

Database: ***CA***

Certificate #: 6288-4QGS2N
Application Year: 00
Issue Date: 10/30/00
Approval Type: Municipal & Private water
Status: Approved
Application Type: New Certificate of Approval
Client Name: Fram Builders (Durham) Corp.
Client Address: 135 Queen's Plate Drive
Client City: Toronto
Client Postal Code: M9W 6V1
Project Description: Construction of watermains on Port street and St. Lawrence Drive.
Contaminants:
Emission Control:

Site: ***Lakeshore Road East, Helen Street, Port Street, and St. Lawrence Drive***
Lakeshore Road East Mississauga ON

Database: ***CA***

Certificate #: 8104-4QGR6K
Application Year: 00
Issue Date: 11/6/00
Approval Type: Municipal & Private sewage
Status: Approved
Application Type: New Certificate of Approval
Client Name: Fram Builders (Durham) Corp.
Client Address: 135 Queen's Plate Drive
Client City: Toronto
Client Postal Code: M9W 6V1
Project Description: Construction of storm and sanitary sewers on Lakeshore Road East, Helen Street, Port Street, St. Lawrence Drive and on three Easements,
Contaminants:
Emission Control:

Site: ***REG.MUNIC.OF PEEL***
RICHEY CRES. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #: 3-1348-85-006

Application Year: 85
Issue Date: 11/8/85
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***Database:*** ***CA***
Lakeshore Road East Mississauga ON

Certificate #: 2788-4SGLXJ
Application Year: 00
Issue Date: 12/29/00
Approval Type: Municipal & Private sewage
Status: Approved
Application Type: New Certificate of Approval
Client Name: Corporation of the Regional Municipality of Peel
Client Address: 10 Peel Centre Drive
Client City: Brampton
Client Postal Code: L6T 4B9
Project Description: Sanitary sewers and appurtenances to be constructed in conjunction with Project No. 00-2210 in the City of Mississauga on Lakeshore Road East.
Contaminants:
Emission Control:

Site: ***The Regional Municipality of Peel*** ***Database:*** ***CA***
From Enola Avenue to Alexandra Avenue and Beechwood Ave Mississauga ON

Certificate #: 4613-7Y7PSM
Application Year: 2009
Issue Date: 12/2/2009
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***The Regional Municipality of Peel*** ***Database:*** ***CA***
Cawthra Road Mississauga ON

Certificate #: 8941-5FVQSM
Application Year: 2002
Issue Date: 11/15/2002
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***582302 ONTARIO LIMITED***
GARDNER AVE. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	3-1529-87-
Application Year:	87
Issue Date:	9/10/1987
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***MISSISSAUGA CITY***
LAKESHORE RD. TURTLE CREEK MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	3-1566-87-
Application Year:	87
Issue Date:	9/4/1987
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***The Regional Municipality of Peel***
Beach Street Mississauga ON

Database: ***SPL***

Ref No:	4654-9R72WH	***Discharger Report:***	
Site No:	NA	***Material Group:***	
Incident Dt:	2014/11/24	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Bypass	***Sector Type:***	Sewer (Private or Municipal)
Incident Event:		***Agency Involved:***	
Contaminant Code:	44	***Nearest Watercourse:***	Lake Ontario
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	***Site Address:***	Beach Street
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	Mississauga
Nature of Impact:	Surface Water	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	N	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	2014/11/24	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	Watercourse Spills
Incident Reason:	Power Interruption/Loss	***Source Type:***	
Site Name:	Beach Street WWPS<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	DWMD WW - L.Ont: Raw Sewage to lake due to power failure		
Contaminant Qty:	0 other - see incident description		

Site: ***Database:*** ***SPL***

Where creek crosses Lakeshore Rd, by Cawthra Rd. Mississauga ON

Ref No:	2238-84YTEK	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:		***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Discharge Or Bypass To A Watercourse	***Sector Type:***	Other
Incident Event:		***Agency Involved:***	
Contaminant Code:	99	***Nearest Watercourse:***	
Contaminant Name:	SILT	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Confirmed	***Site Municipality:***	
Nature of Impact:	Other Impact(s); Surface Water Pollution	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	4/29/2010	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	Watercourse Spills
Incident Reason:	Spill	***Source Type:***	
Site Name:	Cooksville Creek<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	RoP: minor siltation of Cooksville Crk. Filtration present.		
Contaminant Qty:			

Site: ***Database:*** ***SPL***

under Lakeshore Road Mississauga ON

Ref No:	8707-9YNM5N	***Discharger Report:***	
Site No:	NA	***Material Group:***	
Incident Dt:	7/22/2015	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	Municipal Sewage
Incident Event:		***Agency Involved:***	
Contaminant Code:	44	***Nearest Watercourse:***	
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	***Site Address:***	under Lakeshore Road
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	Mississauga
Nature of Impact:		***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	No	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	7/22/2015	***Site Map Datum:***	
Dt Document Closed:	9/17/2015	***SAC Action Class:***	Watercourse Spills
Incident Reason:	Deliberate Act	***Source Type:***	
Site Name:	Cooksville Creek<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	RofPeel: sani siphon backup to Cooksville		
Contaminant Qty:	0 other - see incident description		

Site: ***GREEN SPACE SERVICES(SEARS LAW*** ***Database:*** ***SPL***

JACK DARLING PARK,LAKESHORE ROAD. TANK TRUCK (CARGO) MISSISSAUGA CITY ON

Ref No:	230431	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	7/2/2002	***Health/Env Conseq:***	

Year:		***Client Type:***	
Incident Cause:	UNKNOWN	***Sector Type:***	
Incident Event:		***Agency Involved:***	WORKS
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	21102
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	7/2/2002	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	UNKNOWN	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	GREEN SPACE-30 L KILLEX TOL LOT,REGION RESPONDED.		
Contaminant Qty:			

Site: ***Database:*** ***SPL***

Cawthra Rd south of Burnhamthorpe Mississauga ON

Ref No:	2885-8GHP8Z	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	5/3/2011	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Pipe Or Hose Leak	***Sector Type:***	Motor Vehicle
Incident Event:		***Agency Involved:***	
Contaminant Code:	15	***Nearest Watercourse:***	
Contaminant Name:	HYDRAULIC OIL	***Site Address:***	Cawthra Rd south of Burnhamthorpe
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Confirmed	***Site Municipality:***	Mississauga
Nature of Impact:	Soil Contamination	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	5/3/2011	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	Land Spills
Incident Reason:		***Source Type:***	
Site Name:	Cawthra Rd<UNOFFICIAL>		
Site County/District:			
Site Geo Ref Meth:			
Incident Summary:	Cawthra Rd: 40 L hydraulic fluid to curbside, cleaned		
Contaminant Qty:	40 L		

Site: ***The Corporation of the City of Mississauga*** ***Database:*** ***SPL***

RICHARDS MEMORIAL PARK, NEAR LAKESHORE RD.<UNOFFICIAL> Mississauga ON

Ref No:	2472-5NVTCU	***Discharger Report:***	
Site No:		***Material Group:***	Waste
Incident Dt:	6/26/2003	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	Other Plant - Sewage Municipal
Incident Event:		***Agency Involved:***	
Contaminant Code:	44	***Nearest Watercourse:***	
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	Halton-Peel
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	Central

Environment Impact:	Possible	***Site Municipality:***	Mississauga
Nature of Impact:	Human Health/Safety	***Site Lot:***	
Receiving Medium:	Land	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	6/26/2003	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	Spill to Land
Incident Reason:		***Source Type:***	

Site Name: RICHARDS MEMORIAL PARK, NEAR LAKESHORE RD.<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: Richards Memorial Park-small sewage spill.
Contaminant Qty:

Site: ***Seneca Autobody Complete Restoration and Collision Inc.***
Enola Ave Mississauga ON

Database: ***SPL***

Ref No:	1231-7JDVUS	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:		***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	Unknown	***Sector Type:***	Unknown
Incident Event:		***Agency Involved:***	
Contaminant Code:	24	***Nearest Watercourse:***	
Contaminant Name:	SOLVENT (N.O.S.)	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	Halton-Peel
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:	Confirmed	***Site Municipality:***	Mississauga
Nature of Impact:	Fish Kill; Human Health/Safety; Soil Contamination; Surface Water Pollution	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	NA
MOE Response:	Priority Field Response (ERP Callout)	***Easting:***	NA
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	9/11/2008	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	Watercourse Spills
Incident Reason:	Unknown - Reason not determined	***Source Type:***	

Site Name: Cumberland Creek
Site County/District:
Site Geo Ref Meth:
Incident Summary: Cumberland Creek. solvent in creek. Mississauga
Contaminant Qty: 0 L

Site:
Cawthra Road on ramp for westbound QEW Mississauga ON

Database: ***SPL***

Ref No:	4252-7YMV29	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:		***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:		***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	
Nature of Impact:		***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:	No Field Response	***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	12/11/2009	***Site Map Datum:***	

Dt Document Closed: ***SAC Action Class:*** Pollution Incident Reports (PIRs) and ¿Other¿ calls

Incident Reason: ***Source Type:***
Site Name: Cawthra Road on ramp for westbound QEW<UNOFFICIAL>
Site County/District:
Site Geo Ref Meth:
Incident Summary: QEW: TT 120L of diesel to ground, cleaned.
Contaminant Qty:

Appendix: Database Descriptions

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

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Sep 2020

Abandoned Mine Information System: Provincial AMIS

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

Government Publication Date: 1800-Oct 2018

Anderson's Waste Disposal Sites: Private ANDR

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

Government Publication Date: 1860s-Present

Aboveground Storage Tanks: Provincial AST

Historical listing of aboveground storage tanks made available by the Department of Natural Resources and Forestry. Includes tanks used to hold water or petroleum. This dataset has been retired as of September 25, 2014 and will no longer be updated.

Government Publication Date: May 31, 2014

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Dec 31, 2020

Borehole: Provincial BORE

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

Government Publication Date: 1875-Jul 2018

Certificates of Approval: Provincial CA

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

Government Publication Date: 1985-Oct 30, 2011*

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2018

Commercial Fuel Oil Tanks: Provincial CFOT

Locations of commercial underground fuel oil tanks. This is not a comprehensive or complete inventory of commercial fuel tanks in the province; this listing is a copy of records of registered commercial underground fuel oil tanks obtained under Access to Public Information.
Note that the following types of tanks do not require registration: waste oil tanks in apartments, office buildings, residences, etc.; aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Jul 31, 2020

Chemical Manufacturers and Distributors: Private CHEM

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

Government Publication Date: 1999-Jan 31, 2020

Chemical Register: Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-Dec 31, 2020

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -Dec 2020

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

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

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

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

Government Publication Date: 1989-Nov 2020

Certificates of Property Use: Provincial CPU

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

Government Publication Date: 1994-Jan 31, 2020

Drill Hole Database: Provincial DRL

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

Government Publication Date: 1886 - Sep 2020

Delisted Fuel Tanks: Provincial DTNK

List of fuel storage tank sites that were once found in - and have since been removed from - the list of fuel storage tanks made available by the regulatory agency under Access to Public Information.

Government Publication Date: Jul 31, 2020

Environmental Activity and Sector Registry: Provincial EASR

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

Government Publication Date: Oct 2011-Dec 31, 2020

Environmental Registry: Provincial EBR

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

Government Publication Date: 1994-Jan 31, 2020

Environmental Compliance Approval: Provincial ECA

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

Government Publication Date: Oct 2011- Dec 31, 2020

Environmental Effects Monitoring: Federal EEM

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

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

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

Government Publication Date: 1999-Oct 31, 2020

Environmental Issues Inventory System: Federal EIIS

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

Government Publication Date: 1992-2001*

Emergency Management Historical Event: Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Dec 31, 2016

Environmental Penalty Annual Report: Provincial EPAR

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment and Climate Change. These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

Government Publication Date: Jan 1, 2011 - Dec 31, 2019

List of Expired Fuels Safety Facilities: Provincial EXP

List of facilities and tanks for which there was once a fuel registration. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province; this listing is a copy of previously registered tanks and facilities obtained under Access to Public Information. Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc; includes tanks which have been removed from the ground.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Jul 31, 2020

Federal Convictions: Federal FCON

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

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

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

Government Publication Date: Jun 2000-Sep 2020

Fisheries & Oceans Fuel Tanks: Federal FOFT

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

Government Publication Date: 1964-Sep 2019

Federal Identification Registry for Storage Tank Systems (FIRSTS): Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: May 31, 2018

Fuel Storage Tank: Provincial FST

List of registered private and retail fuel storage tanks. This is not a comprehensive or complete inventory of private and retail fuel storage tanks in the province; this listing is a copy of registered private and retail fuel storage tanks, obtained under Access to Public Information.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Jul 31, 2020

Fuel Storage Tank - Historic: Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary: Provincial GEN

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

Government Publication Date: 1986-Jul 31, 2020

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2018

TSSA Historic Incidents: Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

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

Government Publication Date: 1950-Aug 2003*

Fuel Oil Spills and Leaks: Provincial INC

Listing of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC). This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province; this listing in a copy of incidents reported to the SAC, obtained under Access to Public Information. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness.

Government Publication Date: Jul 31, 2020

Landfill Inventory Management Ontario: Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the Ministry of the Environment, Conservation and Parks compiles new and updated information. Includes small and large landfills currently operating as well as those which are closed and historic. Operators of larger landfills provide landfill information for the previous operating year to the ministry for LIMO including: estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Feb 28, 2019

Canadian Mine Locations: Private MINE

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

Government Publication Date: 1998-2009*

Mineral Occurrences: Provincial MNR

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

Government Publication Date: 1846-Jan 2020

National Analysis of Trends in Emergencies System (NATES): Federal NATE

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

Government Publication Date: 1974-1994*

Non-Compliance Reports: Provincial NCPL

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

Government Publication Date: Dec 31, 2018

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Dec 31, 2020

National Energy Board Wells: Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Aug 31, 2020

Ontario Oil and Gas Wells: Provincial OOGW

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

Government Publication Date: 1800-Jun 2020

Inventory of PCB Storage Sites: Provincial OPCB

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

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

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

Government Publication Date: 1994-Jan 31, 2020

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: Oct 2011-Dec 31, 2020

Pipeline Incidents: Provincial PINC

List of pipeline incidents (strikes, leaks, spills). This is not a comprehensive or complete inventory of pipeline incidents in the province; this listing in an historical copy of records previously obtained under Access to Public Information. Records are not verified for accuracy or completeness.

Government Publication Date: Oct 31, 2020

Private and Retail Fuel Storage Tanks: Provincial PRT

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

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994-Jan 31, 2020

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

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

Government Publication Date: 1986-2016

Record of Site Condition: Provincial RSC

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

Government Publication Date: 1997-Sept 2001, Oct 2004-Jan 2021

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Dec 31, 2020

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills: Provincial SPL

List of spills and incidents made available the Ministry of the Environment, Conservation and Parks. This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

Government Publication Date: 1988-Mar 2020; Jul 2020 - Aug 2020

Wastewater Discharger Registration Database: Provincial SRDS

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

Government Publication Date: 1990-Dec 31, 2017

Anderson's Storage Tanks: Private TANK

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

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970 - Dec 2020

Variances for Abandonment of Underground Storage Tanks: Provincial VAR

Listing of variances granted for storage tank abandonment. This is not a comprehensive or complete inventory of tank abandonment variances in the province; this listing is a copy of tank abandonment variance records previously obtained under Access to Public Information. In Ontario, registered underground storage tanks must be removed within two years of disuse; if removal of a tank is not feasible, an application may be sought for a variance from this code requirement.
Records are not verified for accuracy or completeness.

Government Publication Date: Jul 31, 2020

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

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

Government Publication Date: Oct 2011-Dec 31, 2020

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

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

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

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

Government Publication Date: Apr 30, 2020

Definitions

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

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

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

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

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

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

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

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

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

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

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

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

APPENDIX B

Technical Standards and Safety Authority (TSSA) Response

From: Public Information Services
To: Jason Noronha
Subject: RE: fuel tanks
Date: Tuesday, March 16, 2021 11:58:15 AM
Attachments: image002.png
image003.png
image004.png
image005.png
image011.png
image012.png
image013.png
image015.png

CAUTION: This email is originated from outside of the organization.Please do not open attachments or follow instructions from unsolicited e-mails, even if they come from people in your contact list, and never click on a URL contained in an unsolicited e-mail, even if the link seems benign. Please contact IT if you have any doubts on any email's authenticity.

Please refrain from sending documents to head office and only submit your requests electronically via email along with credit card payment. We are all working remotely and mailing in applications with cheques will lengthen the overall processing time.
NO RECORD FOUND
Hello. Thank you for your request for confirmation of public information.

- We confirm that there are no records in our database of fuel storage tanks at the subject address(es).

For a further search in our archives please complete our release of public information form found at https://www.tssa.org/en/about-tssa/release-of-public-information.aspx?_mid_=392 and email the completed form to publicinformationservices@tssa.org along with a fee of $56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard). Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.
Kind regards,

Connie Hill | Public Information Agent
Facilities
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1-416-734-3383 | Fax: +1-416-231-6183 | E-Mail: chill@tssa.org
www.tssa.org

From: Jason Noronha <jnoronha@petomaccallum.com>
Sent: March 16, 2021 11:48 AM
To: Public Information Services <publicinformationservices@tssa.org>
Subject: RE: fuel tanks

[CAUTION]: This email originated outside the organisation.
Please do not click links or open attachments unless you recognise the source of this email and know the content is safe.

Good morning,

I would like to request a list of fuel tanks for the following locations in Mississauga,

1) 711 Lakeshore Rd E
2) 565 Lakeshore Rd E

J

Sent from Mail for Windows 10

From: Public Information Services
Sent: Tuesday, March 16, 2021 7:48 AM
To: Jason Noronha
Subject: RE: fuel tanks

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Please refrain from sending documents to head office and only submit your requests electronically via email along with credit card payment. We are all working remotely and mailing in applications with cheques will lengthen the overall processing time.
RECORD FOUND
Hello. Thank you for your request for confirmation of public information.

- We confirm that there are records in our database of fuel storage tanks at the subject address(es).

Inst Number	Segment1	Address	City	Postal Code	Status
9906616	FS PROPANE CYLR HANDLING FACILITY	501 LAKESHORE RD E	MISSISSAUGA	L5G 1H9	Under Review
11097194	FS PROPANE TANK	501 LAKESHORE RD E	MISSISSAUGA	L5G 1H9	Active

https://www.tssa.org/en/about-tssa/release-of-public-information.aspx?_mid_=392
and email the completed form to publicinformationservices@tssa.org along with a fee of $56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard). Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.
Kind regards,

Connie Hill | Public Information Agent
Facilities
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1-416-734-3383 | Fax: +1-416-231-6183 | E-Mail: chill@tssa.org

www.tssa.org

From: Jason Noronha <jnoronha@petomaccallum.com>
Sent: March 15, 2021 10:38 AM
To: Public Information Services <publicinformationservices@tssa.org>
Subject: RE: fuel tanks

[CAUTION]: This email originated outside the organisation.
Please do not click links or open attachments unless you recognise the source of this email and know the content is safe.

Good morning,

Thanks

Jason

Sent from Mail for Windows 10

From: Public Information Services
Sent: Tuesday, March 9, 2021 12:46 PM
To: Jason Noronha
Subject: RE: fuel tanks

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Please refrain from sending documents to head office and only submit your requests electronically via email along with credit card payment. We are all working remotely and mailing in applications with cheques will lengthen the overall processing time.

RECORD FOUND

Hello Jason,
Thank you for your request for confirmation of public information.

- We confirm that there are records in our database of fuel storage tanks at the subject addresses:

Inst Numb	Context	Address	City	Provin	Postal Co	Inststatusnan	Segment1
9669137	FS Facility	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	Active	FS PROPANE VEHICLE CONV CENTRE
9926441	FS Facility	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS PROPANE REFILL CNTR - MOTOR FILL
9926473	FS Facility	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS GASOLINE STATION - FULL SERVE
9966782	FS Facility	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS GASOLINE STATION - FULL SERVE
10857751	FS Propane Tank	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS PROPANE TANK
10857767	FS Liquid Fuel Tank	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS LIQUID FUEL TANK
10857785	FS Liquid Fuel Tank	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS LIQUID FUEL TANK
10857800	FS Liquid Fuel Tank	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS LIQUID FUEL TANK
10857821	FS Liquid Fuel Tank	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS LIQUID FUEL TANK
10857836	FS Liquid Fuel Tank	644 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J6	EXPIRED	FS LIQUID FUEL TANK
Inst Number	Context	Address	City	Province	Postal Code	Inststatusname	Segment1
9528237	FS Facility	570 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J4	EXPIRED	FS GASOLINE STATION - FULL SERVE
10857676	FS Liquid Fuel Tank	570 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J4	EXPIRED	FS LIQUID FUEL TANK
10857692	FS Liquid Fuel Tank	570 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J4	EXPIRED	FS LIQUID FUEL TANK
10857708	FS Liquid Fuel Tank	570 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J4	EXPIRED	FS LIQUID FUEL TANK
10857725	FS Liquid Fuel Tank	570 LAKESHORE RD E	MISSISSAUGA	ON	L5G 1J4	EXPIRED	FS LIQUID FUEL TANK

For a further search in our archives please complete our release of public information form found at https://www.tssa.org/en/about-tssa/release-of-public-information.aspx?_mid_=392 and email the completed form to publicinformationservices@tssa.org along with a fee of $56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard).
Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.
Kind regards,
Sherees

Public Information Agent
Facilities and Business Services
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1-416-734-6222 | Fax: +1-416-734-3568 | E-Mail: publicinformationservices@tssa.org
www.tssa.org

From: Jason Noronha <jnoronha@petomaccallum.com>
Sent: March 8, 2021 11:25 AM
To: Public Information Services <publicinformationservices@tssa.org>
Subject: fuel tanks

[CAUTION]: This email originated outside the organisation.
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I would like to request a list of fuel tanks for the following locations in Mississauga,

1. 644 Lakeshore Rd E
2. 498 Lakeshore Rd E
3. 570 Lakeshore Rd E
4. 740 Lakeshore Rd E
5. 811 Lakeshore Rd E
6. 519 Lakeshore Rd E

Thank you,

Jason

Sent from Mail for Windows 10

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APPENDIX C

Statement of Limitations

STATEMENT OF LIMITATIONS

This report is prepared for and made available for the sole use of the client named. Peto MacCallum Ltd. (PML) hereby disclaims any liability or responsibility to any person or entity, other than those for whom this report is specifically issued, for any loss, damage, expenses, or penalties that may arise or result from the use of any information or recommendations contained in this report. The contents of this report may not be used or relied upon by any other person without the express written consent and authorization of PML.

This report shall not be relied upon for any purpose other than as agreed with the client named without the written consent of PML. It shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. A portion of this report may not be used as a separate entity: that is to say the report is to be read in its entirety at all times.

The report is based solely on the scope of services which are specifically referred to in this report. No physical or intrusive testing has been performed, except as specifically referenced in this report. This report is not a certification of compliance with past or present regulations, codes, guidelines and policies.

The scope of services carried out by PML is based on details of the proposed development and land use to address certain issues, purposes and objectives with respect to the specific site as identified by the client. Services not expressly set forth in writing are expressly excluded from the services provided by PML. In other words, PML has not performed any observations, investigations, study analysis, engineering evaluation or testing that is not specifically listed in the scope of services in this report. PML assumes no responsibility or duty to the client for any such services and shall not be liable for failing to discover any condition, whose discovery would require the performance of services not specifically referred to in this report.

The findings and comments made by PML in this report are based on the conditions observed at the time of PML's site reconnaissance. No assurances can be made and no assurances are given with respect to any potential changes in site conditions following the time of completion of PML's field work. Furthermore, regulations, codes and guidelines may change at any time subsequent to the date of this report and these changes may affect the validity of the findings and recommendations given in this report.

The results and conclusions with respect to site conditions are therefore in no way intended to be taken as a guarantee or representation, expressed or implied, that the site is free from any contaminants from past or current land use activities or that the conditions in all areas of the site and beneath or within structures are the same as those areas specifically sampled.

Any investigation, examination, measurements or sampling explorations at a particular location may not be representative of conditions between sampled locations. Soil, groundwater, surface water, or building material conditions between and beyond the sampled locations may differ from those encountered at the sampling locations and conditions may become apparent during construction which could not be detected or anticipated at the time of the intrusive sampling investigation.

Budget estimates contained in this report are to be viewed as an engineering estimate of probable costs and provided solely for the purposes of assisting the client in its budgeting process. It is understood and agreed that PML will not in any way be held liable as a result of any budget figures provided by it.

The Client expressly waives its right to withhold PML's fees, either in whole or in part, or to make any claim or commence an action or bring any other proceedings, whether in contract, tort, or otherwise against PML in any way connected with advice or information given by PML relating to the cost estimate or Environmental Remediation/Cleanup and Restoration or Soil and Groundwater Management Plan Cost Estimate.

DRAFT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
BEACH STREET PUMPING STATION
CITY OF MISSISSAUGA, ONTARIO

for

THE REGIONAL MUNICIPALITY OF PEEL

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PML Ref.: 21TF001
March 11, 2022

EXECUTIVE SUMMARY

Peto MacCallum Ltd. (PML) was retained by The Regional Municipality of Peel to conduct a Phase Two Environmental Site Assessment (ESA) along Lakeshore Road East from Beachwood Avenue to West Avenue (about 600 m), along aviation Road between Lakeshore Road East and Lakeside Avenue to the south (about 380 m), along Lakeside Avenue between Aviation Road and Hampton Crescent (about 180 m), along Hampton Crescent between Lakeside Avenue and Montbeck Crescent (about 90 m) and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue intersection in the City of Mississauga.

The Phase Two ESA was conducted for the Site as part of the due diligence process to verify the potential source of contaminations identified during a concurrent Phase One ESA. The assessment was performed in accordance with the Phase Two ESA protocols outlined in Ontario Regulation 153/04 (amended).

Historically, residential with some mixed agricultural land use occupied the Site and the vicinity presumably since the late 1880s to early 1950s. Residential and commercial development occupied the Site and vicinity since the 1950s. At present, the Site is a double-lane local roadway having underground utilities, traffic lights and road lights. The Site's surface is mostly covered with asphalt pavement. The Site and vicinity are surrounded by mixed residential/parkland and commercial properties.

Based on the Phase One ESA conducted by PML, twenty eight (28) Potentially Contaminating Activities (PCAs) were identified in thirteen (13) adjacent properties along the roadway alignment. The PCAs were related to auto repair shops, paint shops, diesel, gasoline, hydraulic oils and sewage spills, operation of dry-cleaning equipment, historical use of gasoline and associated products storage in fixed tanks, chemical manufacturing, processing and storage, metal fabrication, electricity generation/transformation, solvent manufacturing, processing and storage, foam manufacturing and processing and railway tracks.

The above-noted PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC) on the Site. The PCAs in locations 4, 5 and 13 were not considered environmental concerns since they were located distant or down-gradient/cross-gradient from the Site, and no indication of any contamination was noted during a walk-through visual inspection. PCA-37 at 603 Lakeshore Road East was not considered as an APEC for the Site since the property was used for alteration of clothing and there was no chemical use.

Based on the evaluation of information, it is understood that there are possibilities of contamination from historical and current land use activities along the alignment.

Based on the findings of the Phase One ESA, a program of subsurface investigation (Phase Two ESA) was carried out at the Site. The Phase Two ESA program included advancement of twenty (20) boreholes with ground water monitoring wells in eleven (11) of the drilled boreholes on

the Site for soil and ground water samplings and chemical analyses and evaluation of the chemical test results in terms of the applicable Site Condition Standards (Ontario Regulation 153/04, amended, Table 3 Site Condition Standards).

Eight (8) composite soil samples were prepared from the collected borehole soil samples, and submitted for leachate analysis in accordance with the toxicity characteristic leaching procedure (TCLP) in Ontario Regulation 347, as amended by 558/00, for waste characterization purposes.

Five (5) bedrock samples were prepared from select boreholes and were analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX) in accordance with O. Reg 153/04 (amended) Table 3 Standards for Industrial/Commercial/Community Property Uses.

Results of the chemical analyses conducted on borehole soil samples indicated that the measured concentrations of metals, inorganic parameters, volatile organic compounds (VOCs), F1-F4 petroleum hydrocarbon compounds (PHCs), BTEX, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) were below the Ontario Regulation 153/04 (amended) Table 3 Standards for Industrial/Commercial/Community Property Uses in the non-potable ground water condition for coarse textured soils with the following exceptions.

- Measured concentration of Electrical Conductivity (EC) in the soil samples retrieved from boreholes BH4 (SS1), BH5 (SS3 and SS4), BH6 (SS2), BH12 (SS2), BH14 (SS2), BH15 (SS2), BH18 (SS2 and SS3), and BH19 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of Sodium Adsorption Ratio (SAR) in the soil samples retrieved from boreholes BH6 (SS2), BH12 (SS2), BH14 (SS2 and SS4) and BH15 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentrations of PAHs (benzo(a)pyrene, benzo(b+j) fluoranthene and dibenz(a,h)anthracene) in the soil sample (SS1) retrieved from borehole BH6 exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of Gravimetric Heavy Hydrocarbons (PHC F4G) in the soil samples retrieved from boreholes BH8 (SS1) and BH9 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of arsenic in the soil samples retrieved from boreholes BH11 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

The elevated level of salt related parameters (EC and/or SAR) in the soil samples from boreholes BH4, BH5, BH6, BH7, BH12, BH14, BH15, BH18, and BH19 are most likely associated with road salt application for safety under conditions of snow or ice.

It is understood that winter de-icing salts were applied in the sidewalks and roadway alignment. As per recent amendments of O. Reg. 153/04, effective date July 1, 2020, the salt related parameter exceedances are exempted if applied for safety purposes.

The elevated level of Gravimetric Heavy Hydrocarbons (PHC F4G) in the soil samples BH9 (SS2) located on the Site near the intersection of Lakeside Avenue and Aviation Road, is most likely related to uncharacterized fill placement in the past, which is expected to be localized. However, the elevated level of Gravimetric Heavy Hydrocarbons in the soil samples from BH8 (SS1), located adjacent to 844 Lakeshore Road East, is most likely related to the auto body shop at the aforementioned address.

The elevated level of arsenic in the soil samples BH11 (SS2) located on the Site near the intersection of Hampton Crescent and Montbeck Crescent, and PAHs from BH6 (SS1) located near Hampton Crescent and Lakeshore Road East intersection, are most likely related to uncharacterized fill placement in the past, which is expected to be localized.

Based on the Toxicity Characteristic Leaching Procedure (TCLP) chemical test results of the composite soil samples, the Site soils are not leachate toxic and are non-hazardous.

Based on the bedrock chemical test results of the shale bedrock samples, the levels of BTEX in bedrock are below applicable Ontario Regulation 153/04 (amended) Table 3 Site Condition Standards.

Results of the chemical analyses conducted on the ground water samples from monitoring wells indicated that the measured concentrations of metals, inorganic parameters, VOCs, BTEX, F1 to F4 PHCs and PAHs were less than the applicable Ontario Regulation 153/04 (amended) Table 3 Site Condition Standards (SCS) for All Types of Property Uses in the non-potable ground water condition with the following exceptions:

- Measured concentration of Chloride in the ground water retrieved from monitoring well BH17/MW8 exceeded Table 3 Site Condition Standard in a Non-Potable Ground water Condition for All Types of Property Uses with Coarse Textured Soils.

- Measured concentration of F3 (C16 to C34) in the ground water retrieved from monitoring well BH19 exceeded Table 3 Site Condition Standard in a Non-Potable Ground water Condition for All Types of Property Uses with Coarse Textured Soils.

The elevated level of PHC F3 in the ground water samples at BH19 located on the Site near the intersection of Lakeshore Road East and Lagoon Street, is most likely related to the nearby former auto body shop at 570 Lakeshore Road East , which is expected to be localized.

The elevated level of chloride in the ground water samples from boreholes BH17/MW8 are most likely associated with road salt application for safety under conditions of snow or ice.

It is important to note that ground water level recorded in borehole BH17/MW8 was at a depth of about 4 m below ground surface (bgs), which is well above the proposed excavation depth of about 8.5 m bgs at this borehole location.

Based on the above site background information, Phase Two ESA field and laboratory data and the limitations inherent in the scope of sampling and testing program undertaken to date, the following recommendations are made for the Site:

- Based on the current sampling and testing program, it is understood that the fill materials encountered at the sampling locations of borehole BH6, BH8, BH9 and BH11 are impacted with PAHs, PHC F4G, PHC F4G and arsenic, respectively, as discussed previously. During the earthwork operation of Site development stage, the impacted soils should be delineated, excavated, segregated and disposed of off-site to a licensed landfill facility.

- Considering the presence of PHC F3 in the ground water samples from monitoring well at BH19, further monitoring of ground water is recommended in order to verify the overall ground water quality in relation to PHCs.

- Considering the proposed excavation depth of about 8.5 m bgs at borehole BH17/MW8 location, chloride impacted ground water encountered in borehole BH17/MW8 can be pumped out and disposed of off-site during the Site development program.

- Upon completion of the ground water monitoring program, the monitoring wells installed during the investigations should be decommissioned in accordance with the Ontario Regulation 903, amended to O. Reg. 128/03 under the Water Resources Act.

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... i – iv

1. INTRODUCTION 1
   - 1.1 Site Description and Land Uses 1
   - 1.2 Current Property Uses 1
   - 1.3 Applicable Site Condition Standards 2
2. BACKGROUND INFORMATION 3
   - 2.1 Physical Setting 3
   - 2.2 Past Geoenvironmental Investigations 3
3. SCOPE OF INVESTIGATIONS 4
   - 3.1 Overview of Site Investigation 4
   - 3.2 Media Investigated 5
   - 3.3 Deviations from Sampling and Analytical Plan 5
4. SITE AND SUBSURFACE INVESTIGATIONS 5
   - 4.1 Subsurface Exploration and Sampling 5
   - 4.2 Elevation Survey 6
   - 4.3 Drilling and Summarized Subsurface Conditions 6
     - 4.3.1 Stratigraphy 7
   - 4.4 Soil Sampling 12
   - 4.5 Field Screening Measurements 13
   - 4.6 Monitoring Well Installation 13
   - 4.7 Field Measurement of Water Quality Parameters 13
   - 4.8 Ground Water Sampling 14
   - 4.9 Analytical Protocols 15
   - 4.10 Residue Management Procedures 15
   - 4.11 Quality Assurance and Quality Control (QA/QC) 15
5. RESULTS AND EVALUATION 16

5.1 Geology and Drainage 16
5.2 Ground Water Conditions 17
5.3 Soil Texture 18
5.4 Field Screening Results 18
5.5 Soil Quality 18
5.6 Ground Water Quality 20
5.7 Phase Two ESA Conceptual Site Model 21
5.7.1 Potentially Contaminating Activities (PCAs) 21
5.7.2 Physical Setting of the Phase Two Property 28
5.7.2.1 Geology, Hydrogeology and Soil Stratigraphy 28
5.7.2.2 Bedrock 29
5.7.2.3 Ground Water Conditions 29
5.7.3 Soils Brought From Off-Site to On-Site 30
5.7.4 Soil and Ground Water Quality 30
5.7.4.1 Soil Quality 30
5.7.4.2 Ground Water Quality 32
5.7.4.3 Field Screening Results 33
5.8 QA/QC Results 33
6. CONCLUDING REMARKS 34
7. RECOMMENDATIONS 37
8. STATEMENT OF LIMITATIONS 38

ATTACHMENTS:

Table 1 – Borehole Soil Sample Analytical Protocols

Table 2 – Ground Water Sample Analytical Protocols

Table 3 – Ground Water Level Readings in Monitoring Wells

Table 4 – Elevated Level of Chemical Substance Detected in Borehole Soil Sample Analyzed

Table 5 – Elevated Level of Chemical Substance Detected in Ground Water Sample Analyzed

Table 6 – Tabulated Percentage Differences between the Original and Duplicate Soil Sample Trace Metal parameters

Figure 1 – Key Map

Figure 2 – Topographic Map

Drawing 1 – Site and Surrounding Area Features

Drawing 2 – Borehole Location Plan

Drawings PP-1 to PP-8 – Borehole Location Plans and Geotechnical Stratigraphic Data

List of Abbreviations

Record of Borehole Sheets BH1 to BH20

Figures GS-1-GS-3, GS-4A to 4C, GS-5A, and GS-5B– Particle Size Distribution Charts

Figures PC-1, PC-2, PC-3A to 3C and PC-4 – Plasticity Charts

Appendix A – Certificates of Chemical Analyses, QA/QC Measures, and Chain of Custody Records

Appendix B – Statement of Limitations

1. INTRODUCTION

Peto MacCallum Ltd. (PML) was retained by The Regional of Peel to conduct a Phase Two Environmental Site Assessment (ESA) along Lakeshore Road East from Beachwood Avenue to West Avenue (about 600 m), along Aviation Road between Lakeshore Road East and Lakeside Avenue to the south (about 380 m), along Lakeside Avenue between Aviation Road and Hampton Crescent (about 180 m), along Hampton Crescent between Lakeside Avenue and Montbeck Crescent (about 90 m) and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue intersection in the City of Mississauga.

The Phase Two ESA was conducted for the Site as part of the due diligence process to verify the potential source of contaminations identified during a concurrent Phase One ESA. The assessment was performed in accordance with the Phase Two ESA protocols outlined in Ontario Regulation 153/04 (amended).

1.1 Site Description and Land Uses

The Site is a roadway along Lakeshore Road East, Lakeside Avenue, Hampton Crescent, and also a vacant piece of land as described previously. See Figure 1 for further details.

Historically, residential with some mixed agricultural land use occupied the Site and the vicinity presumably since the late 1880s to early 1950s. Residential and commercial development occupied the Site and vicinity since the 1950s. At present, the Site is a double-lane local roadway having underground utilities, traffic lights and road lights. The Site's surface is mostly covered with asphalt pavement. The Site and vicinity are surrounded by mixed residential/parkland and commercial properties.

1.2 Current Property Uses

At present, the Site is an operational roadway and/or vacant land.

1.3 Applicable Site Condition Standards

In general, the applicable environmental quality standards depend on the site location, land use, and source of potable water at the investigation site. For the Site, the Full Depth Background Criteria of the Ontario Regulation 153/04 (amended), Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act dated April 15, 2011 (Soil/Ground Water Site Condition Standards) were selected.

At present, the Site is an operational roadway and/or vacant land. The Site and the adjacent properties are located in an industrial/commercial/community setting. The area is connected to the municipal water supply systems.

The analyzed pH values of soil samples from the Site ranged from 7.07 to 10.35. To apply Generic Site Condition Standards as per Ontario Regulation 153/04 (amended), pH value should be in the range of 5 to 9 for surface soils and 5 to 11 for subsurface soils.

Based on the subsurface investigation and review of available maps, it is understood that the Site is not a shallow soil property.

Based on the visual inspection of the retrieved borehole soil samples and grain size gradation test results, the soils underlying the Site are considered to be generally fine to coarse textured with respect to the regulatory criteria.

Based on the Ontario Ministry of Natural Resources and Forestry (MNRF), no area of natural significance (ANSI) existed on the Site and adjacent properties.

Considering the Site settings, land use and soil grain size, the Ontario Regulation 153/04 (amended), Table 3, Site Condition Standards (SCS) for Industrial/Commercial/Community Property Uses in a Non-Potable Ground Water Condition for coarse textured soils were conservatively considered applicable for comparison to the Site.

2. BACKGROUND INFORMATION

2.1 Physical Setting

The Site is located within the physiographic region known as Iroquois Plain. The physiographic landforms in the area are defined as Bevelled Till Plain. ("The Physiography of Southern Ontario", Ministry of Natural Resources, 1984, Chapman, L.J. and Putnam, D.E.).

According to the Cooksville Creek Conservation, the Site is located within the Cooksville Creek Watershed. Cooksville Creek, located in the west end of the Site boundary, flows from the northwest to the southeast, passing beneath Lakeshore Road East and discharging to Lake Ontario to the south of the Site.

A review of the Topographic Map (Figure 2) was conducted for the Site and surrounding areas. The Atlas of Canada (Natural Resources Canada) indicated that the Site and surrounding area ground surface elevation ranged from 169 to 187 meters above sea level (masl).

2.2 Past Geoenvironmental Investigations

A past Phase One Environmental Site Assessment entitled "Draft Phase One Environmental Site Assessment, Beach Street Pumping Station Diversion, Mississauga, Ontario, PML Ref.: 21TF001, June 17, 2021 was reviewed and the review findings are given below:

Based on the evaluation of the historical data and site reconnaissance, twenty eight (28) Potentially Contaminating Activities (PCAs) were identified in thirteen (13) adjacent properties along the roadway alignment. The PCAs were related to auto repair shops, paint shops, diesel, gasoline, hydraulic oils and sewage spills, operation of dry-cleaning equipment, historical use of gasoline and associated products storage in fixed tanks, chemical manufacturing, processing and storage, metal fabrication, electricity generation/transformation, solvent manufacturing, processing and storage, foam manufacturing and processing and railway tracks.

The identified PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC) on the Site. The PCAs in locations 4, 5 and 13 were not considered environmental concerns since they were located distant or down-gradient/cross-gradient from the Site, and no indication of any contamination was noted during a walk-through visual inspection. PCA-37 at 603 Lakeshore Road East was not considered as an APEC for the Site since the property was used for alteration of clothing and there was no chemical use.

The PCAs in remaining locations (1, 2, 3 and 6 to 12) were considered APEC for the Site since they were located up-gradient or in close proximity to the Site.

For details of the PCA and APEC, see report Section 5.7 (Conceptual Site Model).

Based on the evaluation of information, it is understood that there are possibilities of contamination from historical and current land use activities along the alignment.

Based on the findings of Phase One ESA, a Phase Two ESA consisting of geoenvironmental sampling and chemical testing of soil and ground water was recommended for areas abutting the properties (except locations 4, 5 and 13) listed in the table in Section 5.7.

3. SCOPE OF INVESTIGATIONS

3.1 Overview of Site Investigation

This Phase Two ESA was conducted to determine the present environmental condition of the soils and ground water underlying the Site, and to determine the remedial or other action required to mitigate the environmental issues, if any.

To accomplish this task, a program of Phase Two ESA was undertaken, which involved subsurface investigations of the Site. The undertaken Phase Two ESA involved the following tasks:

- Locating, clearing, sampling and logging twenty (20) boreholes to depths ranging from 5.2 to 16.2 m below ground surface (bgs) with decontamination procedures and

installation of a 50 mm diameter PVC well casing and screen in eleven (11) of the drilled boreholes for ground water sampling and ground water level monitoring.

- Chemical analyses on representative soil samples for chemical substances and parameters related to the actual and/or potential source of contaminations.
- Ground water samplings from monitoring wells installed in drilled boreholes for chemical analyses.
- Scientific evaluation of the compiled background information, field and laboratory data and preparation of a Phase Two ESA report including the factual data and interpretation together with the pertinent illustrations and recommendations.

3.2 Media Investigated

Sampling and chemical testing of soil and ground water underlying the Site were carried out to verify the environmental quality in comparison with the Ontario Regulation 153/04 (amended) Site Condition Standards.

3.3 Deviations from Sampling and Analytical Plan

There were no physical impediments encountered during the course of the Site visit, borehole drilling, monitoring wells installation and soil sampling.

4. SITE AND SUBSURFACE INVESTIGATIONS

4.1 Subsurface Exploration and Sampling

The field work for this investigation was carried out as follows:

- June 2, 3, 8, 10-11, 14-16, 28-30, July 2, 22-23: Drilling, logging and soil sampling of boreholes BH1 to BH17, and installation of monitoring wells in drilled boreholes BH1, BH4, BH5, BH7, BH11, BH13, BH16, BH18, BH19, BH20

- August 28 & October 1, 2021: Ground water sampling for chemical analyses from monitoring wells installed in drilled boreholes BH1, BH4, BH5, BH7, BH11, BH13, BH16, BH17, BH18, BH19, BH20.

The boreholes were advanced to depths ranging from 5.2 to 16.2 m bgs at the approximate locations shown on Drawings 2.

4.2 Elevation Survey

The borehole locations were marked at the Site by PML. The geodetic elevations were surveyed with a differential Global Positioning System (GPS) by PML. The survey data is presented on the Log of Borehole sheets.

4.3 Drilling and Summarized Subsurface Conditions

The boreholes were advanced using a combination of track/truck mounted drill rigs (Geoprobe 7822DT, CME-55 and CME-75) equipped with 125 mm diameter continuous solid stem augers and 200 mm diameter continuous hollow stem augers. The drill rigs were supplied and operated by Drilltech Drilling Inc. based in Brantford, Ontario, PML Field Services from Hamilton, Ontario and Geotechnical Support from Vaughan, Ontario. The specialist drilling contractor was subcontracted by PML to carry out the field investigation work. The fieldwork was supervised on a full-time basis by PML engineering staff.

Appropriate precautions were taken and equipment and sampling tools decontamination was carried out during field work to minimize potential cross-contamination between samples and boreholes.

The drilling contractor pre-cleaned a set of solid stem augers and tools prior to arriving the Site. The split spoon sampler was decontaminated prior to and between taking samples by scrubbing with a wire brush and washing in a solution of Alconox soap. The sampler was then sprayed with isopropanol and rinsed with distilled water.

Reference is made to the appended Logs of Borehole Sheets for details of the field work, including inferred stratigraphy, soil classifications, Standard Penetration Test (SPT) N values, ground water observations carried out in the open boreholes during and upon completion of augering, details of monitoring well installations, ground water level readings in the monitoring wells, moisture content determinations and grain size distribution analyses.

Due to the soil sampling procedures and limited sample size, the depth/elevation demarcations on the borehole logs must be viewed as “transitional” zones between layers and cannot be construed as exact geologic boundaries between layers.

4.3.1 Stratigraphy

In general, the subsoil conditions consisted of pavement structure underlain by fill, silty clay, sandy silt/silty sand, silty clay, sandy clayey silt/clayey sand till and shale bedrock (see Logs of Borehole Sheets, and Drawings PP-1 to PP-8). A summary of subsurface conditions is provided in the following paragraphs.

a. Pavement Structure
b. Fill
c. Silty Clay, Trace Sand/Sandy, Trace Gravel
d. Sandy Silt/Silty Sand, Trace Gravel
e. Silty Clay, Trace Sand/Sandy, Trace Gravel
f. Sandy Clayey Silt/Clayey Sand Till
g. Shale Bedrock

Pavement Structure

The pavement structure was encountered immediately below the existing ground surface in all boreholes advanced within the existing roadways (Boreholes BH1 to BH15, and BH18 to BH20). The pavement structure consisting of 75 mm to 150 mm thick asphalt over 100 mm to 775 mm of

granular base/subbase. The depth of the total pavement structure, including the asphalt, was 100 mm to 900 mm below the road surface.

Fill

In general, the fill layers were encountered immediately below the existing ground surface in Borehole BH16 and BH17, and below the pavement structure in all other investigated boreholes, with the exception of Borehole BH10. The fill layers consisted of clayey silt/silty clay and/or sandy silt/silty, and was approximately 0.7 m to 5.3 m in total thickness, extending to depths ranging from 0.8 m to 5.5 m (EL. 80.8 to EL. 71.7) below the existing ground surface.

Clayey Silt/Silty Clay, Trace Sand/Sandy, Trace Gravel Fill

The clayey silt/silty clay fill layer was encountered immediately below the existing ground surface in Borehole BH17, and below the pavement structure in Boreholes BH1 to BH 8, BH12 to BH15, and BH18 to BH20. In Boreholes BH11 and BH16, this fill was encountered below the sandy silt/silty sand fill layer. This fill layer was approximately 0.6 m to 2.8 m in thickness, and extended to depths ranging from 1.2 m to 3.0 m (EL. 79.9 to EL. 74.7) below the existing ground surface.

With the exception of Boreholes BH2 and BH 16, the SPT N values in this fill typically ranged from 5 blows to 28 blows per 0.3 m of penetration, indicating firm to very stiff consistency. In Borehole BH2, the two (2) SPT N values observed in this layer were 39 and 50, indicating hard consistency. In Borehole BH16, located off road, the one (1) SPT N value observed in this layer was 1 blow, indicating very soft consistency.

The moisture content of the samples tested from this fill ranged from 4.2% to 31.6%, with an average value of 15.3%.

Dry unit weight tests were performed on two (2) samples selected from this layer. The test results indicate dry unit weight values of 20.06 kN/m3 and 20.09 kN/m3.

The results of the grain size analysis tests performed on five (5) representative samples from this layer are provided on Figure GS-1. The test results indicate that this deposit consists of none to 5% gravel, 9% to 42% sand, 57% to 89% silt and clay sized particles. Atterberg limits tests were performed on selected samples and the result are provided on Figure PC-1. The test results indicate liquid limit values of 35 to 44, plastic limit values of 19 to 22, and corresponding plasticity index values of 16 to 22. Based on the test results, this layer may generally be classified as Lean Clay/Sandy Lean Clay (CL) in accordance with the Unified Soil Classification System (USCS), and as Clayey Silt (CL) in the MTO classification system.

Sandy Silt/Silty Sand, Trace Gravel Fill

The sandy silt/silty sand fill layer was encountered immediately below the existing ground surface in Borehole BH16 (located off road), and below the pavement structure in Borehole BH11 (located within the existing Hampton Crescent alignment). In Boreholes BH12, and BH13 (located within the existing Hampton Crescent alignment), this fill was encountered below the clayey silt/silty clay fill layer. This fill layer was approximately 0.7 m to 4.1 m in thickness, and extended to depths ranging from 0.8 m to 5.5 m (EL. 80.8 to EL. 71.7) below the existing ground surface.

The SPT N values in this fill ranged from as low as 3 blows to 32 blows per 0.3 m of penetration, indicating a very loose to dense state of compaction.

The moisture content of the samples tested from this fill ranged from 5.9% to 34.7%, with an average value of 16.0%.

The results of the grain size analysis tests performed on two (2) representative samples from this layer are provided on Figure GS-2. The test results indicate that this deposit consists of none and 6% gravel, 46% and 59% sand, 35% and 54% silt and clay sized particles. Based on the test results, this layer may generally be classified as Sandy Silt/Silty Sand (SM/ML) in accordance with the USCS and the MTO classification system.

Silty Clay, Trace Sand/Sandy, Trace Gravel

The silty clay deposit was encountered below the pavement structure in Borehole BH10, and below the fill layers in Borehole BH3 and BH16. This deposit was approximately 1.3 m to 2.1 m in thickness, and extended to depths ranging from of 2.3 m to 4.6 m (EL. 77.3 to EL. 75.2) below the existing ground surface.

The SPT N values in this fill ranged from 14 blows to 26 blows per 0.3 m of penetration, indicating stiff to very stiff consistency.

The moisture content of the samples tested from this fill ranged from 13.2% to 17.1%, with an average value of 15.2%.

Dry unit weight tests were performed on three (3) samples selected from this layer. The test results indicate dry unit weight values of 16.39 kN/m3, 17.75 kN/m3, and 17.84 kN/m3.

The results of the grain size analysis tests performed on four (4) representative samples from this layer are provided on Figure GS-3. The test results indicate that this deposit consists of none to 8% gravel, 2% to 29% sand, 40% to 53% silt, and 18% to 49% clay sized particles. Atterberg limits tests were performed on selected samples and the result are provided on Figure PC-2. The test results indicate liquid limit values of 34 to 42, plastic limit values of 20 to 22, and corresponding plasticity index values of 12 to 20. Based on the test results, this layer may generally be classified as Lean Clay/Sandy Lean Clay (CL) in accordance with the USCS, and as Silty Clay (CI) in the MTO classification system.

Sandy Clayey Silt/Clayey Sand Till

The sandy clayey silt/clayey sand till deposit was encountered below the silty clay deposit in Boreholes BH4, BH10, and BH16, and below the fill layers in the remaining investigated boreholes. This till deposit was approximately 4.5m to 8.0 m in thickness, and extended to depths ranging from of 6.3 m to 11.0 m (EL. 73.8 to EL. 68.9) below the existing ground surface in Boreholes BH1 to BH8, where this deposit was fully penetrated. This till deposit was not full penetrated in Boreholes BH9 to BH20 to establish thickness.

The SPT N values in this till ranged from 17 blows to over 100 blows per 0.3 m of penetration, indicating very stiff to hard consistency.

The moisture content of the samples tested from this fill ranged from 3.7% to 22.6%, with an average value of 9.8%.

Dry unit weight tests were performed on 11 samples selected from this layer. The test results indicate dry unit weight values ranging from 18.56 kN/m3 to 21.35 kN/m3, with an average dry unit weight of 19.68 kN/m3.

The results of the grain size analysis tests performed on 30 representative samples from the clayey silt samples of this deposit are provided on Figure GS-4. The test results indicate that this deposit consists of none to 17% gravel, 3% to 38% sand, and 55% to 97% silt and clay sized particles. Atterberg limits tests were performed on 27 selected samples and the result are provided on Figure PC-3. The test results indicate liquid limit values of 23 to 35, plastic limit values of 15 to 23, and corresponding plasticity index values of 6 to 15. Based on the test results, this deposit may generally be classified as Lean Clay/Sandy Lean Clay (CL) in accordance with the USCS, and as Clayey Silt/Sandy Clayey Silt (CL) in the MTO classification system.

The results of the grain size analysis tests performed on 14 representative samples from the clayey silt samples of this deposit are provided on Figure GS-5. The test results indicate that this deposit consists of 3% to 35% gravel, 23% to 50% sand, and 29% to 49% silt and clay sized particles. Atterberg limits tests were performed on 10 selected samples and the result are provided on Figure PC-3. The test results indicate liquid limit values of 25 to 31, plastic limit values of 15 to 21, and corresponding plasticity index values of 8 to 15. Based on the test results, this deposit may generally be classified as Clayey Sand/Clayey Sand with Gravel (SC) in accordance with the USCS, and as Clayey Sand/Gravelly Clayey Sand (SC) in the MTO classification system.

Shale Bedrock

Bedrock was encountered in Boreholes BH1 to BH8, immediately below the till deposit at elevation varying from EL. 68.9 to EL. 73.8. The presence of bedrock was confirmed by obtaining 1.5 m and 5.2 m of rock cores from Boreholes BH1 to BH8. These boreholes were advanced using HQ2 sized wireline core barrels. The rock core recovery ranged from 67% to 100% and the Rock Quality Designation (RQD) of the bedrock ranged from 34% to 100% with the exception of Run 2 in BH1 and Run1 in BH6 and BH8. Based on the RQD values, the quality of the bedrock at this site may be described as poor to excellent. The bedrock was identified as slightly weathered to unweathered shale.

Unconfined compressive strength (UCS) of five (5) rock core samples selected from Boreholes BH1, BH6, and BH8 were 120.2 MPa, 110.5 MPa, 48.5 MPa, 120.2 MPa, and 170.0 MPa, respectively. Based on the unconfined compression test values of five samples, the bedrock may be classified as very strong to medium (R5 to R3) with respect to strength.

4.4 Soil Sampling

Representative samples of the overburden were recovered at regular depth intervals in the drilled boreholes using conventional split spoon sampler.

The soil samples obtained from the boreholes were immediately placed in glass jars and plastic bags. Observations of visible foreign materials and odours were recorded during the sampling operations.

The soil samples taken from boreholes are numbered as SS. The soil samples assigned for petroleum hydrocarbons and volatile organic compounds analyses were collected at the Site using laboratory supplied methanol vials.

Soil samples collected during this investigation were stored at low temperatures and brought to PML's laboratory for detailed visual examination before selecting the analytical protocols.

4.5 Field Screening Measurements

Following completion of the field work, the soil vapour concentrations (SVCs) were measured in the headspace of soil samples, which had sufficient recovery. The SVCs were measured using a combustible gas detector, RKI Eagle 2, calibrated to hexane.

There are no regulatory criteria for soil and wellhead vapours; however, vapours are often used as a field screening tool to identify petroleum hydrocarbon impacted soils. Elevated SVCs, typically in the percent of lower explosive level (LEL) range, are generally indicative of the presence of volatile petroleum products, such as gasoline or chlorinated degreasing solvents, and to a lesser extent diesel and fuel oil.

4.6 Monitoring Well Installation

Upon completion of drilling the boreholes, monitoring wells were installed in the drilled boreholes BH1, BH4, BH5, BH7, BH11, BH13, BH16, and BH17, BH18, BH19, BH20. The casing was screened with 50 mm diameter Schedule 40 PVC pipe extended out as a riser. The annular space of the borehole around the screen was backfilled with clean filter sand (up to 0.5 m above the top of the well screen). The monitoring wells were installed to allow ground water level measurement and sampling. The ground water conditions in the boreholes were also noted upon completion of drilling. The details of the monitoring well are shown on the appended Log of Borehole sheets.

4.7 Field Measurement of Water Quality Parameters

During the well development events, field measurements of pH, electrical conductivity (EC), total dissolved solids (TDS) and temperature were conducted using a HANNA instruments (HI98130). The field measurements of water quality parameters are given below.

TABLE 1

FIELD MEASUREMENT OF WATER QUALITY PARAMETERS

Monitoring Well No.	pH	Electrical Conductivity (mS/cm)	TDS (ppt)	Temp (°C)
BH1	7.95	2.11	2.08	17.5
BH4	7.97	1.75	2.11	17.7
BH5	8.24	1.44	0.78	18.1
BH7	8.69	0.33	0.17	18.1
BH11	8.06	0.86	0.46	18.8
BH13	7.64	2.67	1.44	15.8
BH16	7.95	3.75	2.03	15.2
BH17	7.97	9.09	4.89	15.1
BH18	7.69	3.32	1.84	16.4
BH19	8.56	0.53	0.98	18.0
BH20	7.50	5.50	3.06	19.0

4.8 Ground Water Sampling

A total of ten (10) ground water samples were collected from the Site during the investigation. Six (6) ground water samples were collected in September, 2021, with an additional three (3) samples collected in October 2021, from monitoring well installed in boreholes BH1/MW1, BH4/MW2, BH11/MW5, BH13/MW6, BH16/MW7, BH17/MW8, BH18, BH19, and BH20 using Waterra Ecobailer.

The samples obtained were immediately placed in bottles supplied by SGS and stored at low temperatures (<10°C). Observations of visible foreign materials and odours, if any, were recorded during the sampling operations.

Ground water samples collected for the analysis of metals were filtered using Waterra Filter (0.45 micron pore size) during samplings and stored at low temperatures.

The collected ground water samples were taken to SGS for chemical analyses immediately after collection.

4.9 Analytical Protocols

Representative soil samples collected from the boreholes were selected and delivered to SGS Canada Inc. (SGS) for the chemical analyses. SGS is accredited by the Canadian Association of Environmental Analytical Laboratories (CALA). The soil and ground water sample analytical protocols are listed in the attached Table 1 and Table 2, respectively.

The PCAs were related to auto repair shops, paint shops, diesel, gasoline, hydraulic oils and sewage spills, operation of dry-cleaning equipment, historical use of gasoline and associated products storage in fixed tanks, chemical manufacturing, processing and storage, metal fabrication, electricity generation/transformation, solvent manufacturing, processing and storage, foam manufacturing and processing and railway tracks.

4.10 Residue Management Procedures

Excess soil cuttings were placed in 45-gallon drums with lids and transported at PML's facility. Excess soil cuttings were later disposed of as waste by Giant Disposal Ltd. located in Toronto, Ontario.

4.11 Quality Assurance and Quality Control (QA/QC)

Since the quality of data depends upon planning, sampling, analysis and reporting, duplicate soil and ground water samples were analyzed for QA/QC purposes. In addition to the equipment used and the sampling tools decontamination procedures described in Section 4.3 above, the field QC measures consisted of taking two sets of samples of analyte free media (field blank and trip blank) prepared and supplied by SGS. These samples were delivered to SGS Laboratories for analysis of trace metals.

The field QA/QC procedures were for determining the reproducibility or variability related to analytical procedures and sample homogeneity. The percentage differences between analyzed values for the original and duplicate samples were also calculated.

The laboratory analytical methods consisted of using standard testing methods required by the Ministry of Environment, Conservation and Parks (MECP) and referenced in SGS certificate of analyses (attached in Appendix A). The analytical procedures included the method blank, the spiked method blank, the laboratory spiked and duplicate soil and ground water samples, along with analyses of each batch of soil and ground water samples.

Appendix A includes the certificates of analyses and the QA/QC measures along with a table of analytical data indicating the parameters analyzed, the estimated quantitation limit, the corrected quantitation limit for dilute samples, the percentage recovery, and the range of lower and upper limits.

5. RESULTS AND EVALUATION

5.1 Geology and Drainage

The OGS Earth Map of Surficial Geology of Southern Ontario (Ontario Geological Survey, 2010), indicated that the surficial geology is highly variable across the Site. The proposed sewer alignment is expected to primarily encounter fine-textured glaciolacustrine deposits (silt and clay, with minor inclusions of sand and gravel) and coarse-textured glaciolacustrine deposits (sand and gravel, with minor silt and clay) along and south of Lakeshore Road East. Paleozoic bedrock is expected within the portion of the Site and modern alluvial deposits are expected near the current and former river beds. Clay to silt-textured till derived from glaciolacustrine deposits or shale may be encountered along Lakeshore Road East at West Avenue.

The OGS Earth Map of Paleozoic Geology of Southern Ontario (Armstrong and Dodge, 2007), indicates that the bedrock geology at the project area comprises shale of Georgian Bay Formation.

The hydrogeology of the Site and the vicinity is primarily controlled by Cooksville Creek, topographic elevation, glacial geology and bedrock topography of the region. Locally, shallow ground water flows towards topographic depressions. The deep/regional ground water is expected to flow southerly/southwesterly towards Cooksville Creek and finally to Lake Ontario.

5.2 Ground Water Conditions

Ground water conditions were noted during and upon completion of drilling. The Log of Borehole sheets include details of ground water observations made during and upon completion of drilling.

Monitoring wells were installed in Boreholes BH1, BH4, BH5, BH7, BH11, BH13, BH16, and BH17, BH18, BH19, BH20. Initial measurement of the water levels was taken immediately upon completion of the well installation work.

During the investigations, no indications of questionable materials or evidence of presence of contaminants and/or deleterious materials were observed.

Interphase probes were used during the investigations to assess the presence or absence of free product. No evidence of presence of free-phase products was observed during the assessments.

The hydrostatic ground water levels in the monitoring wells were measured on six (6) site visits during the month of July, September, October, November, December in 2021 and January to February in 2022 . The hydrostatic ground water levels in the monitoring wells throughout the Site were measured at depths ranging from 1.17 to 5.6 m bgs (elevations 73.22 to 79.93 m). The hydrostatic ground water levels of the monitoring wells are presented in attached Table 4.

Ground water levels are subject to seasonal fluctuations and variations in precipitation and climate change.

5.3 Soil Texture

The grain size distribution test results as well as the soil description on the Log of Borehole sheets indicated the presence of fine to coarse textured soils underlying the Site. However, the coarse textured soil was conservatively considered for the subject assessment.

5.4 Field Screening Results

The measured headspace soil vapour concentrations (SVCs) varied from <5 parts per million (ppm) to 15 ppm, which are considered negligible. The measured wellhead vapour concentrations were 5 to 20 ppm, which are considered negligible.

5.5 Soil Quality

The laboratory certificates of chemical analyses carried out by SGS in accordance with the analytical protocols (attached Table 1) described in Section 4.9 above and chain-of-custody records are included in Appendix A.

Results of the chemical analyses conducted on borehole soil samples indicated that the measured concentrations of metals, inorganic parameters, volatile organic compounds (VOCs), F1-F4 petroleum hydrocarbon compounds (PHCs), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) were below the Ontario Regulation 153/04 (amended) Table 3 Standards for Industrial/Commercial/Community Property Uses in the non-potable ground water condition for coarse textured soils with the following exceptions.

- Measured concentration of Electrical Conductivity (EC) in the soil samples retrieved from boreholes BH4 (SS1), BH5 (SS3 and SS4), BH6 (SS2), BH12 (SS2), BH14 (SS2), BH15 (SS2), BH18 (SS2 and SS3), and BH19 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of Sodium Adsorption Ratio (SAR) in the soil samples retrieved from boreholes BH6 (SS2), BH14 (SS2 and SS4) and BH15 (SS2)

exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentrations of PAHs (benzo(a)pyrene, benzo(b+j)fluoranthene, and dibenze(a, H)anthracene) in the soil sample from BH6 (SS1) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of Gravimetric Heavy Hydrocarbons (PHC F4G) in the soil samples retrieved from boreholes BH8 (SS1) and BH9 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of arsenic in the soil sample retrieved from borehole BH11 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/ Community Property Uses.

The elevated level of salt related parameters (EC and/or SAR) in the soil samples from boreholes BH4, BH5, BH6, BH7, BH12, BH14, BH15, BH18, and BH19 are most likely associated with road salt application for safety under conditions of snow or ice.

It is understood that winter de-icing salts were applied in the sidewalks and roadway alignment. As per recent amendments of O. Reg. 153/04, effective date July 1, 2020, the salt related parameter exceedances are exempted if applied for safety purposes.

The elevated level of Gravimetric Heavy Hydrocarbons (PHC F4G) in the soil samples BH9 (SS2) located on the Site near the intersection of Lakeside Avenue and Aviation Road, is most likely related to uncharacterized fill placement in the past, which is expected to be localized. However, the elevated level of Gravimetric Heavy Hydrocarbons in the soil samples from BH8 (SS1), located adjacent to 844 Lakeshore Road East, is most likely related to the auto body shop at the aforementioned address.

The elevated level of arsenic in the soil samples BH11 (SS2) located on the Site near the intersection of Hampton Crescent and Montbeck Crescent, is most likely related to uncharacterized fill placement in the past, which is expected to be localized.

Based on the Toxicity Characteristic Leaching Procedure (TCLP) chemical test results of the composite soil samples, the Site soils are not leachate toxic and are non-hazardous.

Based on the bedrock chemical test results of the shale bedrock samples, the levels of BTEX in bedrock are below applicable Ontario Regulation 153/04 (amended) Table 3 Site Condition Standards.

The elevated levels of chemical substances detected in the borehole soil samples are listed in attached Table 4.

5.6 Ground Water Quality

The laboratory certificates of chemical analyses carried out by SGS in accordance with the analytical protocols (attached Table 2) described in Section 4.9 above and chain-of-custody records are included in Appendix A.

Results of the chemical analyses conducted on the ground water samples from monitoring wells indicated that the measured concentrations of metals, inorganic parameters, VOCs, BTEX, F1 to F4 PHCs and PAHs were less than the applicable Ontario Regulation 153/04 (amended) Table 3 Site Condition Standards (SCS) for All Types of Property Uses in the non-potable ground water condition with the following exceptions:

- Measured concentration of Chloride in the ground water retrieved from monitoring well BH17/MW8 exceeded Table 3 Site Condition Standard in a Non-Potable Ground water Condition for All Types of Property Uses with Coarse Textured Soils.
- Measured concentration of F3 (C16 to C34) in the ground water retrieved from monitoring well BH19 exceeded Table 3 Site Condition Standard in a Non-Potable Ground water Condition for All Types of Property Uses with Coarse Textured Soils.

The elevated level of PHC F3 in the ground water samples at BH19 located on the Site near the intersection of Lakeshore Road East and Lagoon Street, is most likely related to the nearby former auto body shop at 570 Lakeshore Road East , which is expected to be localized.

The elevated level of chloride in the ground water samples from boreholes BH17/MW8 are most likely associated with road salt application for safety under conditions of snow or ice.

The elevated levels of chemical substances detected in the ground water samples are listed in attached Table 5.

5.7 Phase Two ESA Conceptual Site Model

A Phase Two ESA Conceptual Site Model (CSM) is prepared for the Site (Figure 1) to demonstrate the current underlying soil and ground water environmental condition.

5.7.1 Potentially Contaminating Activities (PCAs)

Based on the evaluation of the historical data and Site reconnaissance, twenty eight (28) Potentially Contaminating Activities (PCAs) were identified in thirteen (13) adjacent properties along the roadway alignment. The identified PCAs are listed below and shown on attached Drawing 1.

TABLE 2
POTENTIALLY CONTAMINATING ACTIVITIES (PCAs)

PCA No.	LOCATION	DESCRIPTION
1	740 Lakeshore Road East	PCA-39: Paints manufacturing, processing and bulk storage. Benjamin Moore - Current paint store.
2	644 Lakeshore Road East	PCA-10: Commercial autobody shop. Carwin Service Centre (Auto Repair Shop) PCA-28: Gasoline and Associated Products Storage in Fixed Tanks: Lakeview Shell Service Ctr-Former gasoline service station from 1989 to 1997. PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site. Unnumbered PCA A: As per Eris database, unknown amount of gasoline leaked into manhole and storm sewer in 1989.
3	570 Lakeshore Road East	PCA-10: Commercial autobody shop. ABM Garage (Auto Repair Shop) PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to

TABLE 2
POTENTIALLY CONTAMINATING ACTIVITIES (PCAs)

PCA No.	LOCATION	DESCRIPTION
		maintain transportation systems- Storage of vehicles throughout the Site. Unnumbered PCA B: As per Eris database, 10 L of unleaded gasoline seeped into the ground in 1988. Contamination in ground water was reported during interview.
4	544 Lakeshore Road East	Unnumbered PCA C: As per Eris database, 20 L of Hydraulic oil spilled on the ground in 2015.
5	Cooksville Creek at Lakeshore Rd and Beachwood	Unnumbered PCA D: As per Eris database, unknown amount of diesel fuel spilled in the Cooksville Creek. Unnumbered PCA E: As per Eris database, 3600 L of sewage spilled, impacting Cooksville Creek in 2009 and 2015.
6	Front of 859 Aviation Drive	Unnumbered PCA F: As per Eris database, unknown quantity of gasoline spilled into sewer in 2017.
7	849 Aviation Drive	Unnumbered PCA G: As per Eris database, unknown amount of sewage spill onto road during construction in 2012.
8	639 Beach Street	Unnumbered PCA H: As per Eris database, a power interruption caused 900 L of raw sewage spilled into Lake Ontario in 1994.
9	711 Lakeshore Road East	PCA-10: Commercial autobody shop. Cawthra Auto Service (Auto Repair Shop) PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems- Storage of vehicles throughout the Site.
10	603 Lakeshore Road East	PCA- 37: Operation of Dry-Cleaning Equipment. Krisp and Clean Dry Cleaners - used for alteration of clothing, no chemical use. PCA-39: Paints manufacturing, processing and bulk storage - Sherman Williams Paints

TABLE 2
POTENTIALLY CONTAMINATING ACTIVITIES (PCAs)

PCA No.	LOCATION	DESCRIPTION
		(Current paint store)
11	547 to 565 Lakeshore Road East	Unnumbered PCA I: As per Eris database, light fuels were used in 2016 and 2019.
12	501 Lakeshore Road East	Unnumbered PCA J: As per Eris database and RSC report, light and heavy fuels and petroleum distillates were used from 1992 to 2012. Based on RSC report, there was historical presence of: PCA-8: Chemical manufacturing, processing and bulk storage PCA-18: Electricity generation, transformation and power stations PCA-26: Foam and expanded foam manufacturing and processing PCA-28: Gasoline and associated products storage in fixed tanks PCA-34: Metal Fabrication PCA-51: Solvent manufacturing, processing and bulk storage PCA-55: Transformer manufacturing, processing and use
13	Tracks at the northwest end of the Site	PCA-46: Rail Yards, Tracks and Spurs-Existing Canadian Pacific Railway (CP) tracks.

The above-noted PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC) on the Site. The PCAs in locations 4, 5 and 13 were not considered environmental concerns since they were located distant or down-gradient/cross-gradient from the Site, and no indication of any contamination was noted during a walk-through visual inspection.

PCA-37 at 603 Lakeshore Road East was not considered as an APEC for the Site since the property was used for alteration of clothing and there was no chemical use.

The PCAs in remaining locations (1, 2, 3 and 6 to 12) were considered APEC for the Site since they were located up-gradient or in close proximity to the Site.

The identified APEC are listed in the table below.

TABLE 3
TABLE OF AREAS OF POTENTIAL ENVIRONMENTAL CONCERN
(Refer to clause 16(2)(a), Schedule D, O. Reg. 153/04)

Area of Potential Environmental Concern (APEC)[1]	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC- 1 Site Area	740 Lakeshore Road East	PCA-39: Paints manufacturing, processing and bulk storage.	Off-Site	Metals, PHCs, VOCs	Soil and/or Ground water
APEC-2 Site Area	644 Lakeshore Road East	PCA-10: Commercial autobody shop. PCA-28: Gasoline and Associated Products Storage in Fixed Tanks PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation systems Unnumbered PCA A: As per Eris database, unknown amount of gasoline leaked into manhole and storm sewer in 1989	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Ground water
APEC-3 Site Area	570 Lakeshore Road East	PCA-10: Commercial autobody shop PCA-52: Storage, maintenance, fuelling and	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Ground water

TABLE 3

TABLE OF AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

(Refer to clause 16(2)(a), Schedule D, O. Reg. 153/04)

Area of Potential Environmental Concern (APEC)[1]	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, soil and/or sediment)
		repair of vehicles and materials used to maintain transportation systems Unnumbered PCA B: As per Eris database, 10 L of unleaded gasoline seeped into the ground in 1988			
APEC–6 Site Area	Front of 859 Aviation Drive	Unnumbered PCA F: As per Eris database, unknown quantity of gasoline spilled into sewer in 2017	Off- Site	Metals, PHCs, VOCs	Soil and/or Ground water
APEC-7 Site Area	849 Aviation Drive	Unnumbered PCA G: As per Eris database, unknown amount of sewage spill onto road during construction in 2012	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Ground water
APEC-8 Site Area	639 Beach Street	Unnumbered PCA H: As per Eris database, a power interruption caused 900 L of raw sewage spilled into Lake Ontario in 1994	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and Ground water
APEC-9 Site Area	711 Lakeshore Road East	PCA-10: Commercial autobody shop Commercial autobody shop PCA-52: Storage, maintenance, fuelling and repair of vehicles and materials used to maintain transportation	Off-Site	Metals, PHCs, VOCs, PAHs	Soil and/or Ground water

TABLE 3

TABLE OF AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

(Refer to clause 16(2)(a), Schedule D, O. Reg. 153/04)

Area of Potential Environmental Concern (APEC)[1]	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, soil and/or sediment)
		systems			
APEC-10 Site Area	603 Lakeshore Road East	PCA-39: Paints manufacturing, processing and bulk storage	Off-Site	Metals, PHCs, VOCs	Soil and Ground water
APEC-11	547-565 Lakeshore Road East	Unnumbered PCA I: As per Eris database, light fuels were used in 2016 and 2019	Off Site	Metals, PHCs, VOCs	Soil and/or Ground water
APEC-12	501 Lakeshore Road East	Unnumbered PCA J: As per Eris database and RSC report, light and heavy fuels and petroleum distillates were used from 1992 to 2012. Based on RSC report, there was historical presence of: PCA-8: Chemical manufacturing, processing and bulk storage PCA-18: Electricity generation, transformation and power stations PCA-26: Foam and expanded foam manufacturing and processing PCA-28: Gasoline and Associated Products	Off-Site	Metals, PHCs, VOCs, PAHs, PCBs	Soil and Ground water

TABLE 3

TABLE OF AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

(Refer to clause 16(2)(a), Schedule D, O. Reg. 153/04)

Area of Potential Environmental Concern (APEC)[1]	Location of APEC on Phase One Property	Potentially Contaminating Activity (PCA)[2]	Location of PCA (On-Site or Off-Site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Ground water, soil and/or sediment)
		Storage in Fixed Tanks PCA-34: Metal Fabrication PCA-51: Solvent manufacturing, processing and bulk storage PCA-55: Transformer manufacturing, processing and use			

Notes:

1 – Area of Potential Environmental Concern means the area on, in or under a phase one property where one or more contaminants are potentially present, as determined through the phase one envirormental Site assessment, including through,
(a) identification of past or present uses on , in or under the phase one property, and
(b) identification of potentially contaminating activity.

2 – Potentially Contaminating Activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a phase one study area

3 – When completing this column, identity all contaminants of potential concern using the Method Groups as identified in the ``Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, as specified below:

ABNs, PCBs, Metals, Electrical Conductivity, SAR
CPs, PAHs, As, Sb, Se, Cr (VI)
1,4-Dioxane, THMs, Na, Hg
Dioxins/Furans, PCDDs/PCDFs, VOCs, B-HWS, Methyl Mercury
OCs, BTEX, Cl^- high pH
PHCs, Ca, MG, CN^- low Ph

4 – When submitting a record of Site condition for filing, a copy of this table must be attached.

5.7.2 Physical Setting of the Phase Two Property

The Site consists of several roadways along Lakeshore Road East in the City of Mississauga (Figure 1). The roadways include portions of Lakeshore Road East, Aviation Road, Lakeside Avenue, Hampton Crescent and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue intersection in the City of Mississauga. The Site and Study Area are surrounded mostly by mixed residential/parkland and commercial land uses.

5.7.2.1 Geology, Hydrogeology and Soil Stratigraphy

The OGS Earth Map of Surficial Geology of Southern Ontario (Ontario Geological Survey, 2010), indicated that the surficial geology is highly variable across the Site. The proposed sewer alignment is expected to primarily encounter fine-textured glaciolacustrine deposits (silt and clay, with minor inclusions of sand and gravel) and coarse-textured glaciolacustrine deposits (sand and gravel, with minor silt and clay) along and south of Lakeshore Road East. Paleozoic bedrock is expected within the portion of the Site and modern alluvial deposits are expected near the current and former river beds. Clay to silt-textured till derived from glaciolacustrine deposits or shale may be encountered along Lakeshore Road East at West Avenue.

According to the Cooksville Creek Conservation, the Site is located within the Cooksville Creek Watershed. Cooksville Creek, located in the west end of the Site boundary, flows from the northwest to the southeast, passing beneath Lakeshore Road East and discharging to Lake Ontario to the south of the Site.

The hydrogeology of the Site and the vicinity is primarily controlled by Cooksville Creek, topographic elevation, glacial geology and bedrock topography of the region. Locally, shallow ground water flows towards topographic depressions. The deep/regional ground water is expected to flow southerly/southwesterly towards Cooksville Creek and finally to Lake Ontario.

In general, the subsoil conditions consisted of pavement structure underlain by fill, silty clay, sandy silt/silty sand, silty clay, sandy clayey silt/clayey sand till and shale bedrock (Log of borehole sheets).

5.7.2.2 Bedrock

The bedrock underlying the Site is the Georgian Bay formation, which typically consists of shale (Paleozoic Geology of Southern Ontario, OGS, OGSEarth, 2007). According to MECP water well records for wells located close to the proposed sewer alignment, the bedrock beneath the Site is typically at a depth of about 4.0 to 5.5 m bgs.

5.7.2.3 Ground Water Conditions

Ground water conditions were noted during and upon completion of drilling. The Log of Borehole sheets include details of ground water observations made during and upon completion of drilling.

Upon completion of borehole drilling, ground water was measured in boreholes BH1, BH4, BH5, BH7, BH11, BH13, BH16, and BH17, BH18, BH19, BH20 at depths ranging from 1.17 m to 5.6 m to bgs (EL. 79.93 to EL. 75.19).

Monitoring wells were installed in Boreholes BH1, BH4, BH5, BH7, BH11, BH13, BH16, and BH17, BH18, BH19, BH20. Initial measurement of the water levels was taken immediately upon completion of the well installation work.

During the investigations, no indications of questionable materials or evidence of presence of contaminants and/or deleterious materials were observed.

Interphase probes were used during the investigations to assess the presence or absence of free product. No evidence of presence of free-phase products was observed during the assessments.

The hydrostatic ground water levels in the monitoring wells were measured on six (6) site visits during the month of July, September, October, November, December in 2021 and January to February in 2022 . The hydrostatic ground water levels in the monitoring wells throughout the Site were measured at depths ranging from 1.17 to 5.6 m bgs (elevations 73.22 to 79.93 m). The hydrostatic ground water levels of the monitoring wells are presented in attached Table 4.

During the investigations, a “petroleum” smell and sheen in water from BH19 was observed.

Ground water levels are subject to seasonal fluctuations and variations in precipitation and climate change.

5.7.3 Soils Brought From Off-Site to On-Site

During the Site reconnaissance, no surficial placement or dumping of fill material was observed on-Site. However, there may be a possibility of the presence of fill material underneath the Site due to the developed Site condition.

5.7.4 Soil and Ground Water Quality

Based on the findings of the Phase One ESA conducted by PML, a program of subsurface investigation (Phase Two ESA) was carried out at the Site. The Phase Two ESA program included advancement of twenty (20) boreholes with ground water monitoring wells in eleven (11) of the drilled boreholes on the Site for soil and ground water samplings and chemical analyses and evaluation of the chemical test results in terms of the applicable Site Condition Standards (Ontario Regulation 153/04, amended, Table 3 Site Condition Standards).

5.7.4.1 Soil Quality

Results of the chemical analyses conducted on borehole soil samples indicated that the measured concentrations of metals, inorganic parameters, volatile organic compounds (VOCs), F1-F4 petroleum hydrocarbon compounds (PHCs), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) were below the Ontario Regulation 153/04 (amended) Table 3 Standards for Industrial/Commercial/Community Property Uses in the non-potable ground water condition for coarse textured soils with the following exceptions.

- Measured concentration of Electrical Conductivity (EC) in the soil samples retrieved from boreholes BH4 (SS1), BH5 (SS3 and SS4), BH6 (SS2), BH12 (SS2), BH14 (SS2), BH15 (SS2), BH18 (SS2 and SS3), and BH19 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of Sodium Adsorption Ratio (SAR) in the soil samples retrieved from boreholes BH6 (SS2), BH12 (SS2), BH14 (SS2 and SS4) and BH15 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentrations of PAHs (benzo(a)pyrene, benzo(b+j)fluoranthene, and dibenze(a, H)anthracene) in the soil sample from BH6 (SS1) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of Gravimetric Heavy Hydrocarbons (PHC F4G) in the soil samples retrieved from boreholes BH8 (SS1) and BH9 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/Community Property Uses.

- Measured concentration of arsenic in the soil sample retrieved from borehole BH11 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/ Community Property Uses.

The elevated level of salt related parameters (EC and/or SAR) in the soil samples from boreholes BH4, BH5, BH6, BH7, BH12, BH14, BH15, BH18, and BH19 are most likely associated with road salt application for safety under conditions of snow or ice.

It is understood that winter de-icing salts were applied in the sidewalks and roadway alignment. As per recent amendments of O. Reg. 153/04, effective date July 1, 2020, the salt related parameter exceedances are exempted if applied for safety purposes.

The elevated level of Gravimetric Heavy Hydrocarbons (PHC F4G) in the soil samples BH9 (SS2) located on the Site near the intersection of Lakeside Avenue and Aviation Road, is most likely related to uncharacterized fill placement in the past, which is expected to be localized. However, the elevated level of Gravimetric Heavy Hydrocarbons in the soil samples from BH8 (SS1), located adjacent to 844 Lakeshore Road East, is most likely related to the auto body shop at the aforementioned address.

The elevated level of arsenic in the soil samples BH11 (SS2) located on the Site near the intersection of Hampton Crescent and Montbeck Crescent, is most likely related to uncharacterized fill placement in the past, which is expected to be localized.

Based on the Toxicity Characteristic Leaching Procedure (TCLP) chemical test results of the composite soil samples, the Site soils are not leachate toxic and are non-hazardous.

Based on the bedrock chemical test results of the shale bedrock samples, the levels of BTEX in bedrock are below applicable Ontario Regulation 153/04 (amended) Table 3 Site Condition Standards.

The elevated levels of chemical substances detected in the borehole soil samples are listed in attached Table 5.

5.7.4.2 Ground Water Quality

Results of the chemical analyses conducted on the ground water samples from monitoring wells indicated that the measured concentrations of metals, inorganic parameters, VOCs, BTEX, F1 to F4 PHCs and PAHs were less than the applicable Ontario Regulation 153/04 (amended) Table 3 Site Condition Standards (SCS) for All Types of Property Uses in the non-potable ground water condition with the following exceptions:

- Measured concentration of Chloride in the ground water retrieved from monitoring well BH17/MW8 exceeded Table 3 Site Condition Standard in a Non-Potable Ground water Condition for All Types of Property Uses with Coarse Textured Soils.
- Measured concentration of F3 (C16 to C34) in the ground water retrieved from monitoring well BH19 exceeded Table 3 Site Condition Standard in a Non-Potable Ground water Condition for All Types of Property Uses with Coarse Textured Soils.

The elevated level of PHC F3 in the ground water samples at BH19 located on the Site near the intersection of Lakeshore Road East and Lagoon Street, is most likely related to the nearby former auto body shop at 570 Lakeshore Road East , which is expected to be localized.

The elevated level of chloride in the ground water samples from boreholes BH17/MW8 are most likely associated with road salt application for safety under conditions of snow or ice.

The elevated levels of chemical substances detected in the ground water samples are listed in attached Table 5.

5.7.4.3 Field Screening Results

The measured headspace soil vapour concentrations (SVCs) varied from <5 parts per million (ppm) to 15 ppm, which are considered negligible. The measured wellhead vapour concentrations were 5 to 20 ppm, which are considered negligible.

5.8 QA/QC Results

Three standard surrogates were used with each batch of soil and ground water samples in accordance with the MECP's criteria and the surrogate recoveries were reported on the certificates of analyses in terms of percentage recovery. The surrogate recoveries were compared with standard percentage recovery for each surrogate. The reported surrogate recoveries were within the statistical control limits.

The results of chemical analyses on method blank sample indicated that the detected levels were within the acceptable range. The chemical test results for spiked method blank and laboratory spike samples indicated that the recovery ranges were within the statistically determined control limits.

Two duplicate soil samples were submitted to SGS for the analyses of trace metals for quality control purposes.

For sample reproducibility calculations, percentage differences were calculated for the chemical substances with analytical values greater than 5 X LOQ (Limit of Quantification, namely, the lowest concentration that a parameter can be identified with confidence by an analytical laboratory).

Percentage differences were determined using the following formula:

$$\text{Percentage difference of Analyte A} = \frac{(\text{Analyte A in test 1} - \text{Analyte A in test 2}) \times 100}{(\text{Analyte A in test 1} + \text{Analyte A in test 2}) / 2}$$

Attached Table 6 shows the calculated percentage differences between the duplicate and original soil samples analyzed for the Site. The calculated percentage differences between the original

and duplicate soil samples were mostly within the acceptable statistical variation of 30% with the exception of cobalt, nickel and lead; where the statistical variation exceeded the acceptable limit, which may be due to the inhomogeneity of the subsurface soils.

6. CONCLUDING REMARKS

Based on the Site background information, field investigation data and laboratory test results compiled to date and presented above, the following conclusions are made on the Site setting, soil stratigraphy and ground water conditions and existing geoenvironmental conditions in comparison with the Ontario Regulation 153/04 (amended), Table 3 Site Condition Standards.

- The Site is a roadway along Lakeshore Road East from Beachwood Avenue to West Avenue (about 600 m), along aviation Road between Lakeshore Road East and Lakeside Avenue to the south (about 380 m), along Lakeside Avenue between Aviation Road and Hampton Crescent (about 180 m), along Hampton Crescent between Lakeside Avenue and Montbeck Crescent (about 90 m) and a vacant piece of land about 350 m north of Lakeshore Road East and Beechwood Avenue intersection in the City of Mississauga.

- Historically, residential with some mixed agricultural land use occupied the Site and the vicinity presumably since the late 1880s to early 1950s. Residential and commercial development occupied the Site and vicinity since the 1950s. At present, the Site is a double-lane local roadway having underground utilities, traffic lights and road lights. The Site's surface is mostly covered with asphalt pavement. The Site and vicinity are surrounded by mixed residential/parkland and commercial properties.

- The Site is located within the physiographic region known as Iroquois Plain. The physiographic landforms in the area are defined as Bevelled Till Plain. ("The Physiography of Southern Ontario", Ministry of Natural Resources, 1984, Chapman, L.J. and Putnam, D.E.).

- According to the Cooksville Creek Conservation, the Site is located within the Cooksville Creek Watershed. Cooksville Creek, located in the west end of the Site boundary, flows from the northwest to the southeast, passing beneath Lakeshore Road East and discharging to Lake Ontario to the south of the Site.

- Based on the Ontario Ministry of Natural Resources and Forestry (MNRF), no area of natural significance (ANSI) existed on the road alignment and adjacent properties.

- Based on the findings of the Phase One ESA, a program of subsurface investigation (Phase Two ESA) was carried out at the Site. The Phase Two ESA program included advancement of twenty (20) boreholes with ground water monitoring wells in eleven (11) of the drilled boreholes on the Site for soil and ground water samplings and chemical analyses and evaluation of the chemical test results in terms of the applicable Site Condition Standards (Ontario Regulation 153/04, amended, Table 3 Site Condition Standards).

- In general, the subsoil conditions consisted of pavement structure underlain by fill, silty clay, sandy silt/silty sand, silty clay, sandy clayey silt/clayey sand till and shale bedrock (Log of borehole sheets).

- The hydrostatic ground water levels in the monitoring wells were measured on six (6) site visits during the month of July, September, October, November, December in 2021 and January to February in 2022. The hydrostatic ground water levels in the monitoring wells throughout the Site were measured at depths ranging from 1.17 to 5.6 m bgs (elevations 73.22 to 79.93 m).

- The measured headspace soil vapour concentrations (SVCs) varied from <5 parts per million (ppm) to 15 ppm, which are considered negligible. The measured wellhead vapour concentrations were 5 to 20 ppm, which are considered negligible.

- Results of the chemical analyses conducted on borehole soil samples indicated that the measured concentrations of metals, inorganic parameters, volatile organic compounds (VOCs), F1-F4 petroleum hydrocarbon compounds (PHCs), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) were below the Ontario Regulation 153/04 (amended) Table 3 Standards for Industrial/Commercial/Community Property Uses in the non-potable ground water condition for coarse textured soils with the exceptions for EC in soils samples from boreholes BH4 (SS1), BH5 (SS3 and SS4), BH6 (SS2), BH14 (SS2), and BH15 (SS2), SAR from boreholes (SAR) in the soil samples retrieved from boreholes BH6 (SS2), BH14 (SS2 and SS4) and BH15 (SS2); PAHs (benzo(a)pyrene, benzo(b+j)fluoranthene, and dibenze(a, H)anthracene) in the soil sample from BH6

(SS1); PHC F4G in the soil samples retrieved from boreholes BH8 (SS1) and BH9 (SS2), and arsenic in the soil sample retrieved from borehole BH11 (SS2) exceeded Table 3 Site Condition Standard for Industrial/Commercial/ Community Property Uses.

- The elevated level of salt related parameters (EC and/or SAR) in the soil samples from boreholes BH4, BH5, BH6, BH7, BH12, BH14, BH15, BH18, and BH19 are most likely associated with road salt application for safety under conditions of snow or ice. It is understood that winter de-icing salts were applied in the sidewalks and roadway alignment. As per recent amendments of O. Reg. 153/04, effective date July 1, 2020, the salt related parameter exceedances are exempted if applied for safety purposes.

- The elevated level of arsenic in the soil samples BH11 (SS2) located on the Site near the intersection of Hampton Crescent and Montbeck Crescent, and PAHs from BH6 (SS1) located near Hampton Crescent and Lakeshore Road East intersection, are most likely related to uncharacterized fill placement in the past, which is expected to be localized.

- The elevated level of Gravimetric Heavy Hydrocarbons (PHC F4G) in the soil samples BH9 (SS2) located on the Site near the intersection of Lakeside Avenue and Aviation Road, is most likely related to uncharacterized fill placement in the past, which is expected to be localized. However, the elevated level of Gravimetric Heavy Hydrocarbons in the soil samples from BH8 (SS1), located adjacent to 844 Lakeshore Road East, is most likely related to the auto body shop at the aforementioned address.

- .Based on the Toxicity Characteristic Leaching Procedure (TCLP) chemical test results of the composite soil samples, the Site soils are not leachate toxic and are non-hazardous.

- Results of the chemical analyses conducted on the ground water samples from monitoring wells indicated that the measured concentrations of metals, inorganic parameters, VOCs, BTEX, F1 to F4 PHCs and PAHs were less than the applicable Ontario Regulation 153/04 (amended) Table 3 Site Condition Standards (SCS) for All Types of Property Uses in the non-potable ground water condition with the exceptions for Chloride in the ground water retrieved from monitoring well BH17/MW8, and F3 (C16 to C34) in the ground water retrieved from monitoring well BH19 exceeded the applicable Table 3 Site Condition Standards.

- The elevated level of PHC F3 in the ground water samples at BH19 located on the Site near the intersection of Lakeshore Road East and Lagoon Street, is most likely related to the nearby former auto body shop at 570 Lakeshore Road East, which is expected to be localized.

- The elevated level of chloride in the ground water samples from boreholes BH17/MW8 are most likely associated with road salt application for safety under conditions of snow or ice.

- It is important to note that ground water level recorded in borehole BH17/MW8 was at a depth of about 4 m below ground surface (bgs), which is well above the proposed excavation depth of about 8.5 m bgs at this borehole location.

7. RECOMMENDATIONS

Based on the above site background information, Phase Two ESA field and laboratory data and the limitations inherent in the scope of sampling and testing program undertaken to date, the following recommendations are made for the Site:

- Based on the current sampling and testing program, it is understood that the fill materials encountered at the sampling locations of borehole BH6, BH8, BH9 and BH11 are impacted with PAHs, PHC F4G, PHC F4G and arsenic, respectively, as discussed previously. During the earthwork operation of Site development stage, the impacted soils should be delineated, excavated, segregated and disposed of off-site to a licensed landfill facility.

- Considering the presence of PHC F3 in the ground water samples from monitoring well at BH19, further monitoring of ground water is recommended in order to verify the overall ground water quality in relation to PHCs.

- Considering the proposed excavation depth of about 8.5 m bgs at borehole BH17/MW8 location, chloride impacted ground water encountered in borehole BH17/MW8 can be pumped out and disposed of off-site during the Site development program.

- Upon completion of the ground water monitoring program, the monitoring wells installed during the investigations should be decommissioned in accordance with the Ontario Regulation 903, amended to O. Reg. 128/03 under the Water Resources Act.

8. STATEMENT OF LIMITATIONS

A Statement of Limitation is included in the attached Appendix B that should be read in conjunction with this report.

We trust this report is adequate for your present purposes. Should you have any questions or require further information, please do not hesitate to contact our office.

Sincerely

Peto MacCallum Ltd.

Draft

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ST/MA:st

TABLE 1

BOREHOLE SOIL SAMPLE ANALYTICAL PROTOCOLS

BOREHOLE No.(1)	SAMPLE NO. DEPTH, m	ANALYTICAL PARAMETERS(2)							
		METALS AND INORGANICS	BTEX, F1-F4 PHCs	VOCs	PAHs	PCBs	ICP METALS	pH, EC, SAR	TCLP METALS/INORGANICS/ PCBs/VOCs/BAPs
BH1	SS1		X						
	SS2	X			X				
	SS3			X					
BH2	SS1				X	X			
	SS2		X						
	SS3	X							
BH2	Shale bedrock		X*						
BH3	Shale bedrock		X*						
BH3	SS1		X		X				
	SS2	X							
	SS3			X					
BH4	SS1	X							
	SS2		X		X				

	SS3			X					
	SS4						X	X	
	SS4 (Duplicate)						X	X	
BH5	SS1				X				
	SS2		X			X			
	SS3	X							
	SS4						X		
BH5	Shale bedrock		X						
BH6	SS1		X		X				
	SS2	X							
	SS3			X					
BH6	Shale bedrock		X						
BH7	SS1				X				
	SS2	X	X	X					
	SS4						X	X	
	SS4 DUP						X		
BH8	SS1		X		X				
	SS2					X			

	SS3	X							
BH8	Shale bedrock		X						
BH9	SS1				X				
	SS2		X						
	SS3	X							
BH10	SS1				X				
	SS2		X						
	SS3	X		X					
	SS4						X	X	
BH11	SS1		X		X				
	SS2	X				X			
BH12	SS1				X				
	SS2	X							
	SS3		X	X					
BH13	SS2	X							
BH14	SS1				X	X			
	SS2	X	X						
	SS3			X					
	SS3 Duplicate			X					
	SS4						X	X	

BH15	SS1				X				
	SS2	X							
	SS3		X	X					
	SS5						X	X	
	SS5 (Duplicate)						X		
BH16	SS2		X						
	SS3	X							
BH17	SS1				X				
	SS2	X						X	
BH18	SS1				X	X			
	SS2	X	X						
	SS3	X		X					
BH19	SS2	X	X	X	X	X			
	SS3		X	X					
	SS5	X					X		
	SS5 (Duplicate)							X	
BH20	SS1		X		X	X			
	SS2		X						

	SS3	X		X					
	SS3 (Duplicate)			X					
COMP# 1 to 8	All BHs								X

Notes

(1) See Drawings 1 to 6 for approximate borehole and monitoring well location.

(2) Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ontario dated April 15, 2011, Table 3 - Site Condition Standards at Industrial/Commercial/Community Property Uses with Coarse Textured Soils.

TABLE 2

GROUND WATER SAMPLE ANALYTICAL PROTOCOLS[1]

GROUNDWATER SAMPLE IDENTIFICATION[2]	PARAMETERS ANALYZED				
	METALS & INORGANICS	ICP METALS	F1-F4 PHCs+BTEX	PAHs	VOCs
BH1/MW1	X		X		X
BH4/MW2	X		X	X	X
BH4/MW2 (Duplicate)	X		X		X
BH11/MW5	X		X	X	X
BH13/MW6	X		X		X
BH16/MW7	X		X	X	X
BH17/MW8	X		X	X	X
BH18	X			X	X
BH19	X			X	X
BH20	X			X	X
FIELD BLANK		X			X
TRIP BLANK		X			X

Notes

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Ontario Reg. 153/04 (amended), Table 3, Site Condition Standards for All Types of Property Uses under Non-Potable Ground Water Conditions with Coarse Textured Soils.

(2) See Drawings 1 to 6 for approximate borehole and monitoring well location.

TABLE 3

GROUND WATER LEVEL READINGS IN MONITORING WELLS

MONITORING WELL (MW) No.[1]	GROUND SURFACE ELEVATION (m)[2]	MID-SCREEN DEPTH (m) [1] (ELEVATION, m)	HYDROSTATIC GROUND WATER LEVEL DEPTH (m)[3] (ELEVATION, m)						
			July 26, 2021	Sept 27, 2021	Oct 01, 2021	Nov 5, 2021	Dec 10, 2021	Jan 10, 2022	Feb 9, 2022
BH1/MW1	81.1	8.3 (72.8)	1.17 (79.93)	4.8 (76.3)	4.8 (76.3)	4.8 (76.3)	1.23 (79.87)	1.2 (79.90)	5.0 (76.10)
BH4/MW2	78.15	7.8 (70.35)	2.27 (75.88)	4.9 (73.25)	4.8 (73.35)	4.75 (73.4)	2.3 (75.85)	2.2 (75.95)	4.93 (73.22)
BH5/MW3	79.86	9.5 (70.36)	3.5 (76.36)	-	3.6 (76.26)	-	3.6 (76.26)	3.8 (76.06)	3.83 (76.03)
BH7/MW4	81.43	10.1 (71.33)	1.5 (79.93)	-	5.0 (76.43)	-	3.85 (77.58)	4.9 (76.53)	5.0 (76.43)
BH11/MW5	77.92	4.6 (73.32)	2.64 (75.28)	1.8 (76.12)	2.0 (75.92)	2.0 (75.92)	2.75 (75.17)	2.8 (75.12)	2.55 (75.37)
BH13/MW6	77.69	4.5 (73.19)	3.0 (74.69)	2.7 (74.99)	2.8 (74.89)	2.89 (74.8)	3.05 (74.64)	3.0 (74.69)	2.9 (74.79)
BH16/MW-7	81.11	10.7 (70.41)	4.42 (76.69)	4.56 (76.55)	4.6 (76.51)	4.63 (76.48)	4.6 (76.51)	4.6 (76.51)	–
BH17/MW-8	82.1	10.7 (71.4)	3.92 (78.18)	4.8 (77.3)	4.7 (77.4)	4.7 (77.4)	3.85 (78.25)	3.8 (78.30)	–
BH18	81.31	5.6 (75.71)	3.75 (77.56)	-	3.8 (77.51)	-	4.0 (77.13)	3.7 (77.61)	3.90 (77.41)

TABLE 3

GROUND WATER LEVEL READINGS IN MONITORING WELLS

MONITORING WELL (MW) No.(1)	GROUND SURFACE ELEVATION (m)(2)	MID-SCREEN DEPTH (m) (1) (ELEVATION, m)	HYDROSTATIC GROUND WATER LEVEL DEPTH (m)(3) (ELEVATION, m)						
			July 26, 2021	Sept 27, 2021	Oct 01, 2021	Nov 5, 2021	Dec 10, 2021	Jan 10, 2022	Feb 9, 2022
BH19	80.79	4.6 (76.19)	5.6 (75.19)	-	3.5 (77.29)	-	3.7 (77.09)	3.6 (77.19)	3.60 (77.19)
BH20	77.83	6.2 (71.63)	4.2 (73.63)	-	4.2 (73.63)	-	3.2 (74.63)	4.6 (73.23)	4.20 (73.63)

Notes:

(1) See Drawings 1 to 6 for approximate monitoring well location plan and Log of Borehole sheets for details of monitoring well installation.
(2) Ground surface elevations at the monitoring well locations were surveyed by PML and are geodetic.
(3) Ground water levels measured using a Solinst flat tape water level reader.

TABLE 4

ELEVATED LEVEL OF CHEMICAL SUBSTANCE DETECTED IN BOREHOLE SOIL SAMPLE ANALYZED

BOREHOLE NO.(1)	SAMPLE NO. (Depth, m)	PARAMETER	MEASURED CONCENTRATIONS (µS/cm)	SITE CONDITION STANDARD(2) (µS/cm)	REMARKS
BH4	SS1	Electrical Conductivity	3.1	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community
BH5	SS3	Electrical Conductivity	2.4	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community
	SS4	Electrical Conductivity	2.5	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community
BH6	SS1	Benzo(a)pyrene	1.49	0.3	Exceeds Table 3 Standard for Industrial/Commercial/Community
		Benzo(b+j)fluoranthene	1.94	0.96	Exceeds Table 3 Standard for Industrial/Commercial/Community
		Dibenz(a,h)anthracene	0.16	0.1	Exceeds Table 3 Standard for Industrial/Commercial/Community
	SS2	Electrical Conductivity	2.8	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community
		Sodium Adsorption Ratio	32.4	12	
BH7	SS2	Electrical Conductivity	3.7	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community

TABLE 4

ELEVATED LEVEL OF CHEMICAL SUBSTANCE DETECTED IN BOREHOLE SOIL SAMPLE ANALYZED

BOREHOLE NO.(1)	SAMPLE NO. (Depth, m)	PARAMETER	MEASURED CONCENTRATIONS (µS/cm)	SITE CONDITION STANDARD(2) (µS/cm)	REMARKS
BH8	SS1	Gravimetric Heavy Hydrocarbons	3420	3300	Exceeds Table 3 Standard for Industrial/Commercial/Community
BH9	SS2	Gravimetric Heavy Hydrocarbons	3900	3300	Exceeds Table 3 Standard for Industrial/Commercial/Community
BH11	SS2	Arsenic	33	18	Exceeds Table 3 Standard for Industrial/Commercial/Community
BH12	SS2	Electrical Conductivity	1.5	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community
		Sodium Adsorption Ratio	15.3	12	Exceeds Table 3 Standard for Industrial/Commercial/Community
BH14	SS2	Electrical Conductivity	2.0	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community
		Sodium Adsorption Ratio	55.0	12	
	SS4	Sodium Adsorption Ratio	19.5	12	
BH15	SS2	Electrical Conductivity	5.1	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community

TABLE 4

ELEVATED LEVEL OF CHEMICAL SUBSTANCE DETECTED IN BOREHOLE SOIL SAMPLE ANALYZED

BOREHOLE NO.(1)	SAMPLE NO. (Depth, m)	PARAMETER	MEASURED CONCENTRATIONS (µS/cm)	SITE CONDITION STANDARD(2) (µS/cm)	REMARKS
		Sodium Adsorption Ratio	31.2	12	Exceeds Table 3 Standard for Industrial/Commercial/Community
BH18	SS2	Conductivity	3.9	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community
	SS3		1.7		
BH19	SS2	Conductivity	4.8	1.4	Exceeds Table 3 Standard for Industrial/Commercial/Community

Notes

(1) See Drawing 2 for approximate borehole location.

(2) Soil, Ground Water and Sediment Standards for Use under Part XV of the Environmental Protection Act, Ontario dated April 15, 2011, Table 3 - Full Depth Generic Site Condition Standards for Industrial/Commercial/Community Property Uses with Coarse Textured Soils.

TABLE 5

ELEVATED LEVEL OF CHEMICAL SUBSTANCE DETECTED IN GROUND WATER SAMPLE ANALYZED

MONITORING WELL NO. (1)	MID-SCREEN DEPTH (m) (ELEVATION, m)	PARAMETER	MEASURED CONCENTRATION (ug/L)	SITE CONDITION STANDARD(2) (ug/L)	REMARKS
BH17/MW8	10.7 (71.4)	Chloride	2800000	2600000	Exceeded Table 3 Standard
BH19	4.6 (76.19)	F3 (C16 to C34)	711	500	Exceeded Table 3 Standard

Notes

(1) See Drawing 2 for appropriate borehole/monitoring well locations
(2) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Ontario dated April 15, 2011, Table 3 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition for All Types Property Uses with Coarse Textured Soils

TABLE 6

TABULATED PERCENTAGE DIFFERENCES BETWEEN THE ORIGINAL AND DUPLICATE SOIL SAMPLE TRACE METAL PARAMETERS

(Concentrations in ug/g or except otherwise noted)

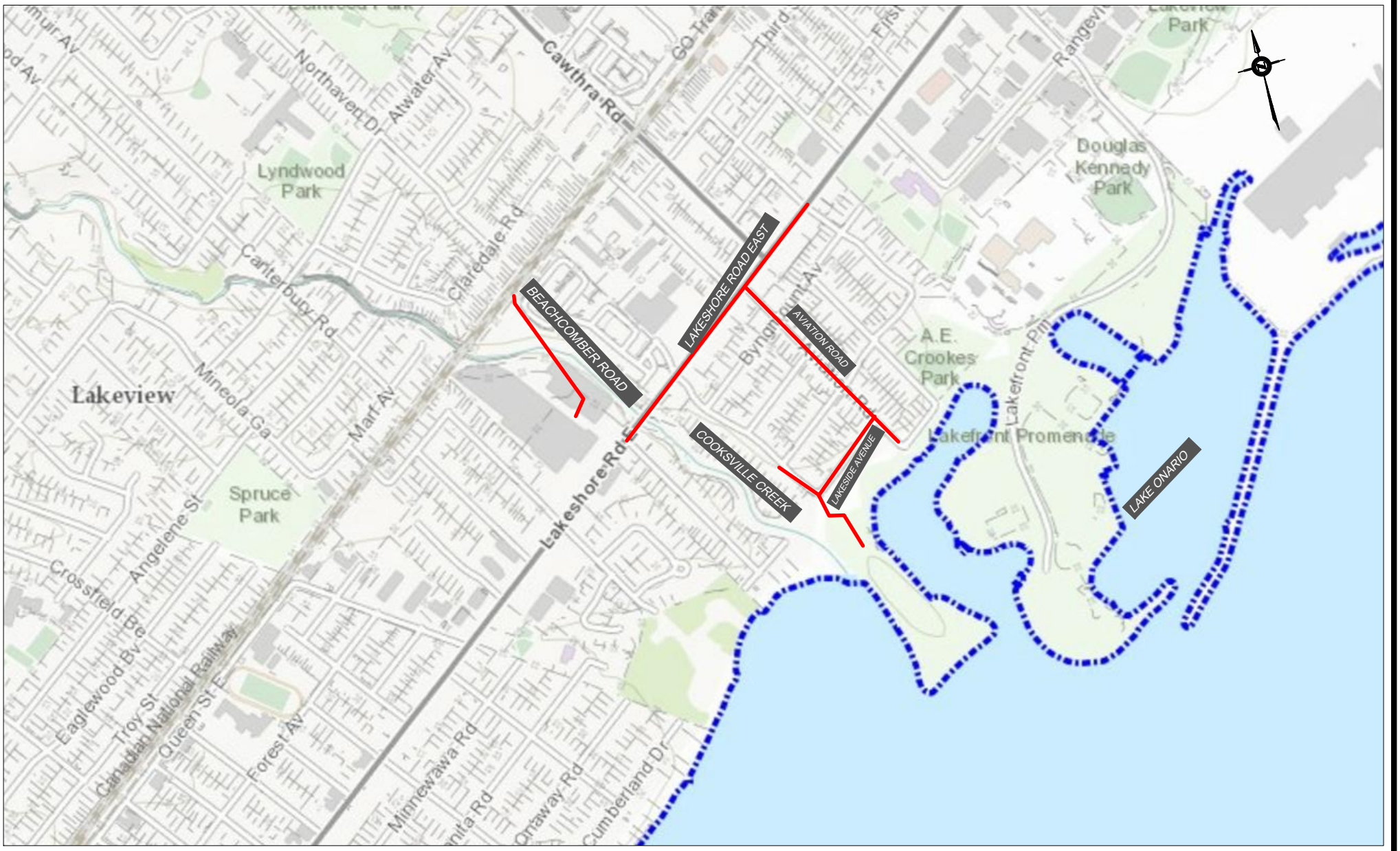
PARAMETER	LIMIT OF QUANTITATION	BH4 SS4	BH4 SS4 DUPLICATE	PERCENTAGE DIFFERENCES
		Analyte A in Test 1	Analyte A in Test 2	
Barium	0.1	110	120	-9
Beryllium	0.02	1	0.7	35
Boron	1	18	14	25
Chromium	0.5	30	24	22
Cobalt	0.01	19	11	53
Copper	0.1	18	21	-15
Lead	0.1	10	9.8	2
Nickel	0.5	35	24	37
Thallium	0.02	0.22	0.2	10
Uranium	0.002	0.75	0.65	14
Vanadium	3.0	41	32	25
Zinc	0.7	71	56	24

TABLE 6

TABULATED PERCENTAGE DIFFERENCES BETWEEN THE ORIGINAL AND DUPLICATE SOIL SAMPLE TRACE METAL PARAMETERS

(Concentrations in ug/g or except otherwise noted)

PARAMETER	LIMIT OF QUANTITATION	BH7 SS4	BH7 SS4 DUPLICATE	PERCENTAGE DIFFERENCES
		Analyte A in Test 1	Analyte A in Test 2	
Barium	0.1	27	33	-20
Beryllium	0.02	0.73	0.72	1
Boron	1	11	12	-9
Chromium	0.5	22	23	-4
Cobalt	0.01	12	15	-22
Copper	0.1	34	32	6
Lead	0.1	8.5	5.9	36
Nickel	0.5	29	31	-7
Thallium	0.02	0.14	0.15	-7
Uranium	0.002	0.58	0.51	13
Vanadium	3.0	28	29	-4
Zinc	0.7	63	63	0



REFERENCE:
THIS FIGURE WAS PREPARED FROM ONTARIO SERVICES WEBSITE WWW6.MISSISSAUGA.CA//MISSMAPS.

LEGEND:

PROPOSED WATERMAIN LINE

REGIONAL MUNICPIALITY OF PEEL

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
BEACH STREET PUMPING STATION DIVERSION
MISSISSAUGA, ONTARIO

KEY MAP

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN	J.N.	DATE	SCALE	PML REF.	FIG. NO.
CHECKED	S.T.	MARCH 2022	1:10,000	21TF001B	1
APPROVED	M.A.				

REFERENCE:
THIS FIGURE WAS PREPARED FROM NATURAL RESOURCES CANADA-THE ATLAS OF CANADA, 2018

LEGEND:

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PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
BEACH STREET PUMPING STATION DIVERSION,
MISSISSAUGA,ONTARIO

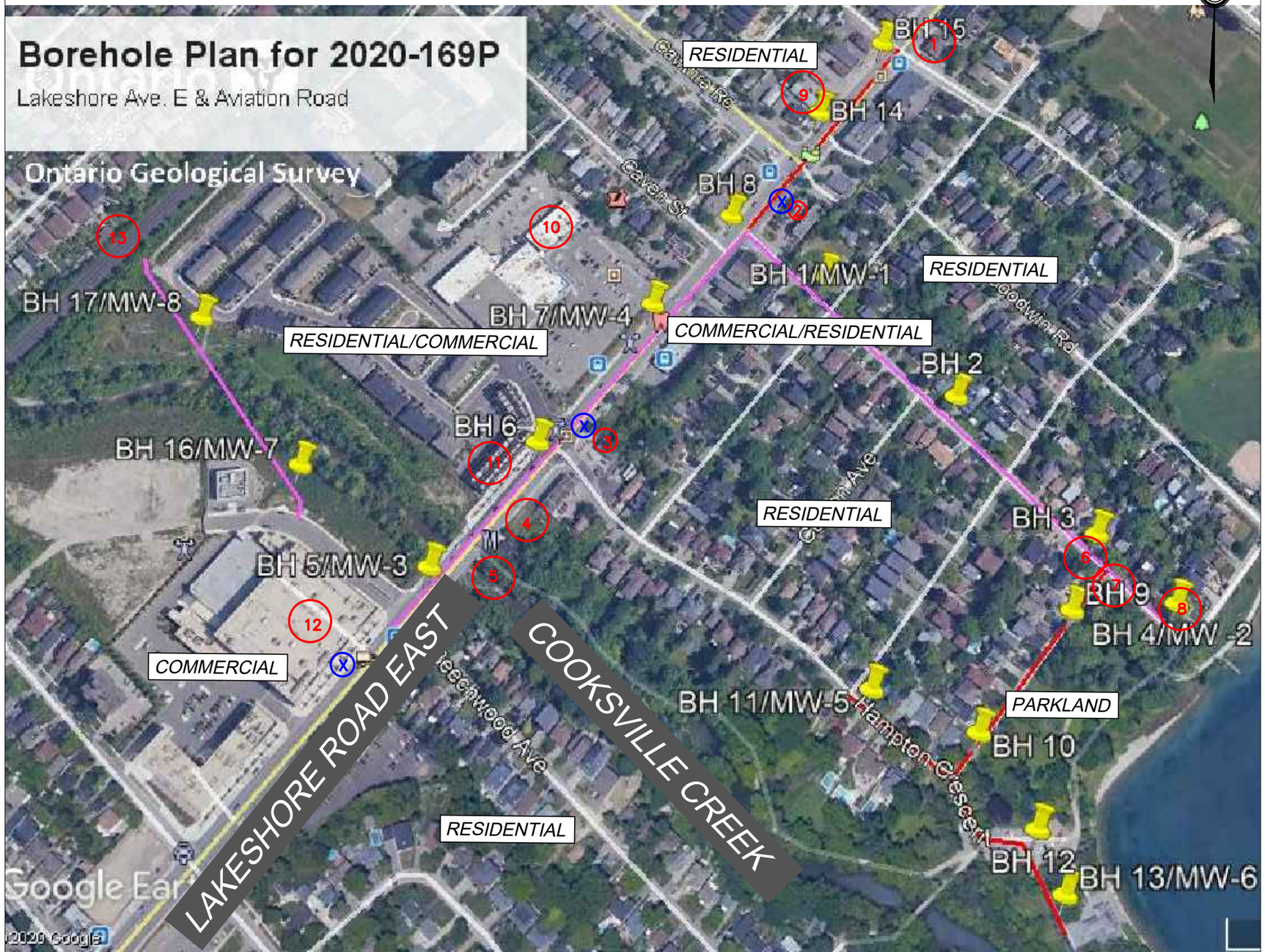
TOPOGRAPHIC MAP

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

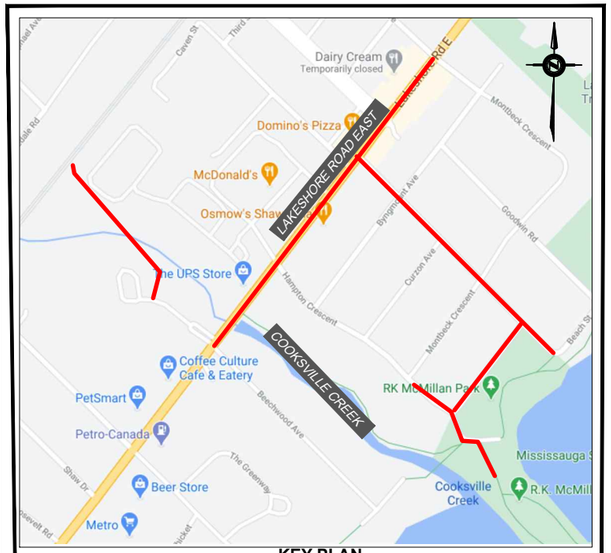
DRAWN	J.N.	DATE	SCALE	PML REF.	FIG. NO.
CHECKED	S.T.	MARCH 2022	1:10,000	21TF001B	2
APPROVED	M.A.				

Borehole Plan for 2020-169P

Lakeshore Ave. E & Aviation Road



GEOTECHNICAL/HYDROGEOOGICAL BOREHOLES/MONITORING WELLS



KEY PLAN

LAKESHORE ROAD EAST

LEGEND:

OPEN CUT — MICROTUNNEL

1. PAINTS MANUFACTURING, PROCESSING AND BULK STORAGE (BENJAMIN MOORE)
2. GASOLINE AND DIESEL SPILL (LAKEVIEW SHELL SERVICE CTR-FORMER GASOLINE SERVICE STATION). COMMERCIAL AUTO BODY SHOP (CARWIN SERVICE CENTRE)
3. GASOLINE SPILL AND COMMERCIAL AUTO BODY SHOP (ABM GARAGE)
4. HYDRAULIC OIL SPILL
5. DIESEL FUEL AND SEWAGE SPILL
6. GASOLINE SPILL
7. RAW SEWAGE SPILL
8. RAW SEWAGE SPILL
9. COMMERCIAL AUTO BODY SHOP (CAWTRA AUTO SERVICE)
10. PAINTS MANUFACTURING, PROCESSING AND BULK STORAGE (SHERMAN WILLIAMS PAINTS)OPERATION OF DRY CLEANING EQUIPMENT (KRISP AND CLEAN DRY CLEANERS)
11. LIGHT FUELS USE
12. HISTORICAL LIGHT AND HEAVY FUELS AND PETROLEUM DISTILLATES USE, GASOLINE AND STORAGE IN FIXED TANKS, CHEMICAL MANUFACTURING AND STORAGE, METAL FABRICATION AND STORAGE, FOAM MANUFACTURING AND ELECTRICITY GENERATION TRANSFORMATION AND POWER STATION.
13. CNR RAILWAY

X PROPOSED ADDITIONAL BOREHOLE & MONITORING WELL LOCATIONS

REGIONAL MUNICIPALITY OF PEEL

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

BEACH STREET PUMPING STATION DIVERSION, MISSISSAUGA, ONTARIO

SITE AND SURROUNDING AREA FEATURES

Peto MacCallum Ltd.

CONSULTING ENGINEERS

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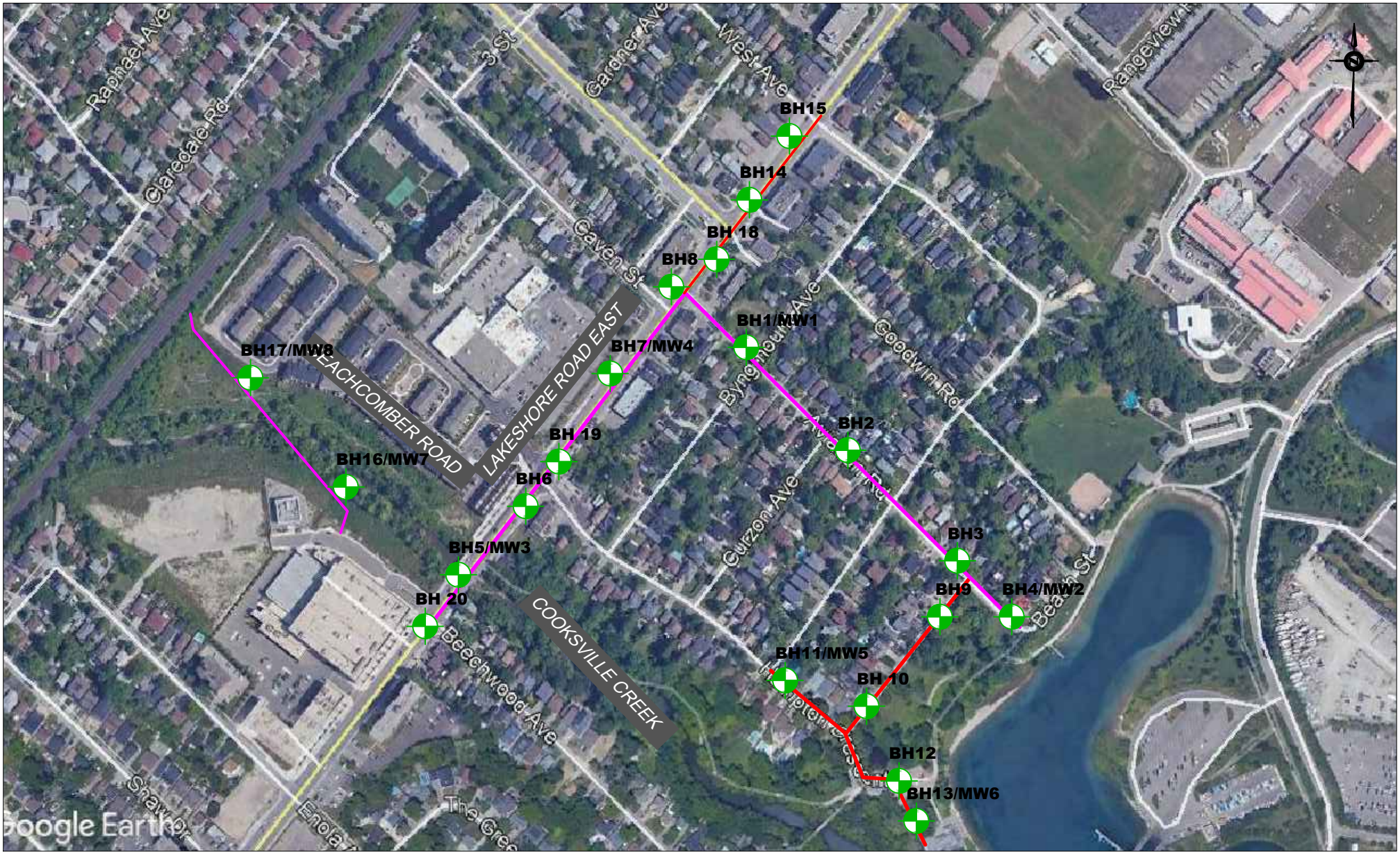
APPROVED	M.A.				



REFERENCE:
THIS FIGURE WAS PREPARED FROM GOOGLE EARTH, IMAGERY DATE 2019

LEGEND:
- PRPOSED OPEN CUT
- PROPOSED MICROTUNNEL
- BH — BOREHOLE/ MONITORING WELL

THE REGIONAL MUNICIPALITY OF PEEL

LAKESHORE ROAD BRIDGE
GEO-STRUCTURAL REPORT AND CONDITION ASSESSMENT
MISSISSAUGA, ONTARIO

BOREHOLE LOCATION PLAN

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN	A.T.	DATE	SCALE	PML REF.	DWG. NO.
CHECKED	L.Y.	MAR 2022	1:5,000	21TF001B	2
APPROVED	M.A.				

SEE DWG No. PP 3
MATCH LINE STA. 2+160

SEE DWG No. PP 2

LAKESIDE AVENUE

250mm OVERFLOW CONNECTED TO EX. SMH-1783108

2+140

0+140 0+120 0+100

Lake Ontario

HAMPTON CRESCENT

REMOVE AND REPLACE EX. SMH-178309

MH 4

MH 5

BH12 MW-5

MH 6

MH 7

PROP. 250 mm DIA. PVC SAN. SEWER

PROP. 250 mm DIA. PVC SAN. SEWER

PROP. 250 mm DIA. PVC SAN. SEWER

Water Front Trail

McMillan Park

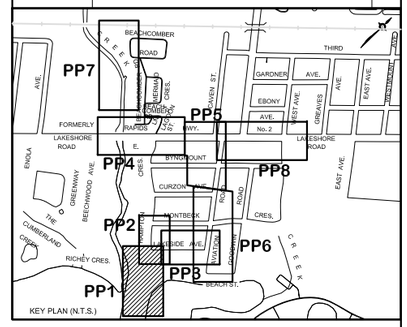
CONNECT EXISTING PARK WASHROOM SAN SERVICE LATERAL TO MH

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JJA.



LEGEND:

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- Water Level Measured in Monitoring Well
- PML Borehole
- Previous Borehole
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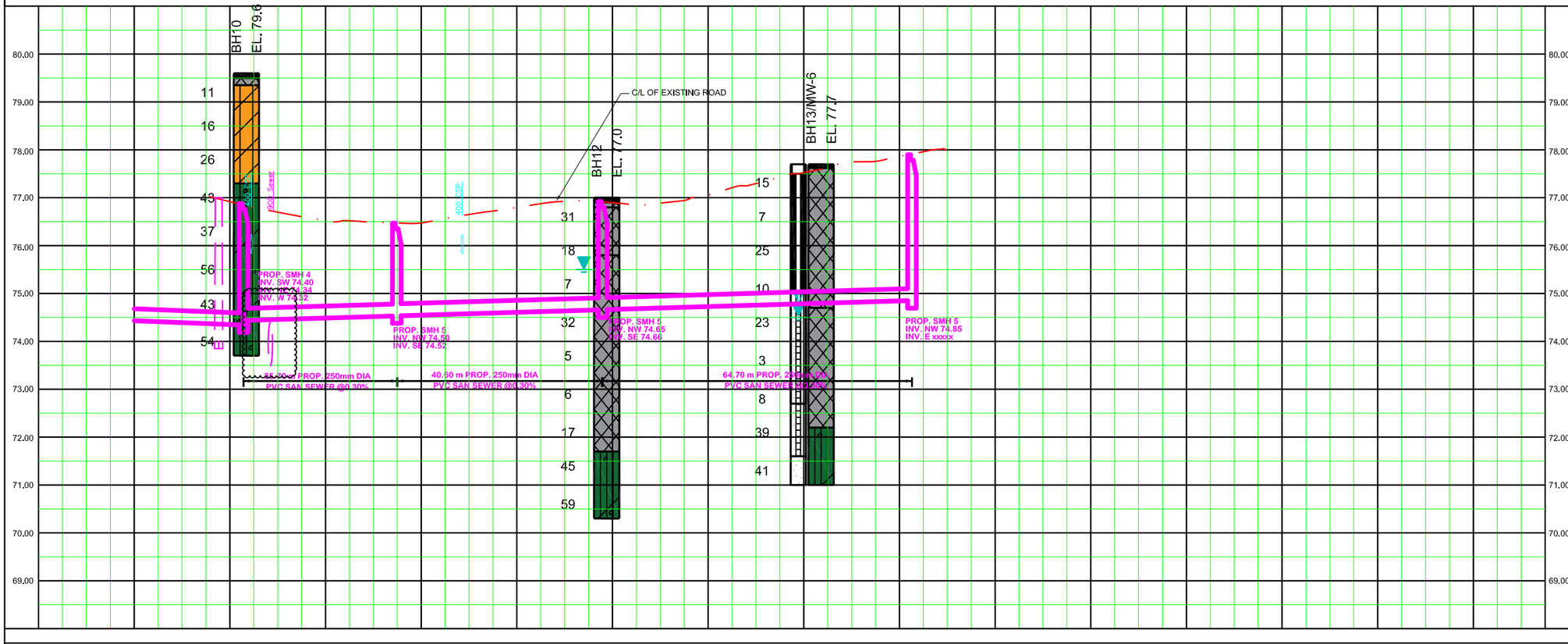
- Fill
- Topsoil
- Silty Clay
- Sandy Clayey Silt/ Clayey Sand Till
- Shale Bedrock



General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

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All Horizontal And Vertical Bends Are In Degrees

All Pipes Size In mm

20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. Elev.
Description
Location

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by

Chkd.

Approved by

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CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
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ONTARIO MINISTRY OF TRANSPORTATION
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HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
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ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

MC MILLAN PARK

FROM WATER FRONT TRAIL TO LAKESIDE AVE.

PROP. 250mm PVC SAN. SEWER

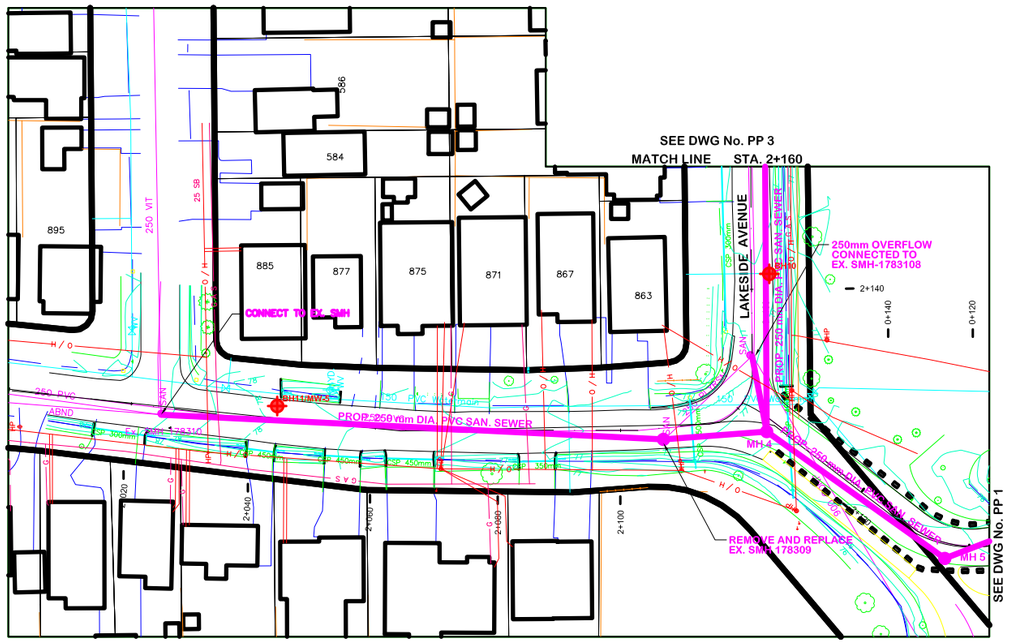
STA. 0+000 TO STA. 0+160

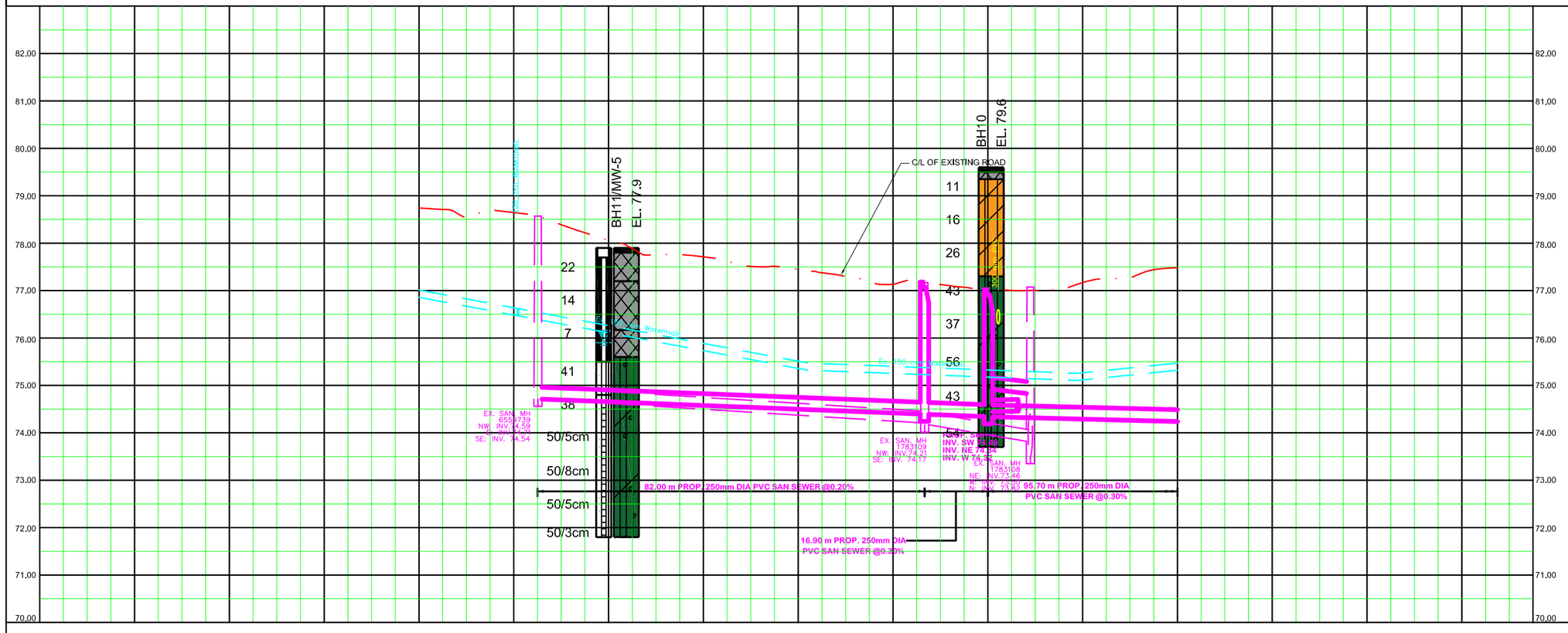
000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00
000.00	76.90	76.52	76.49	76.80	76.91	77.06	77.53	77.86	000.00	000.00
0+000	0+160	0+140	0+120	0+100	0+080	0+060	0+040	0+020	0+000	0-020

EX. ROAD ELEV.
ROAD CHAINAGE

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	1 of 8	Plan No.	PP-1

HAMPTON CRESCENT





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78.65	78.07	77.71	77.45	77.13	77.03	77.16	77.49	EX. ROAD ELEV.
2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	ROAD CHAINAGE

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SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
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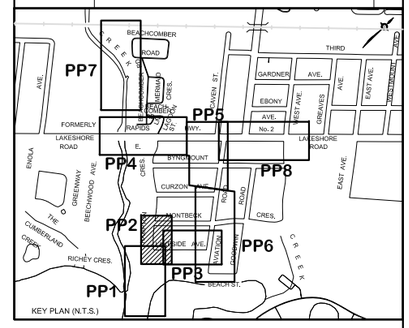
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JJA.



LEGEND:

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- Water Level Measured in Monitoring Well
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- Previous Borehole
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B.M. No. Elev.
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Designed by

Chkd.

Approved by

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FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

HAMPTON CRESCENT

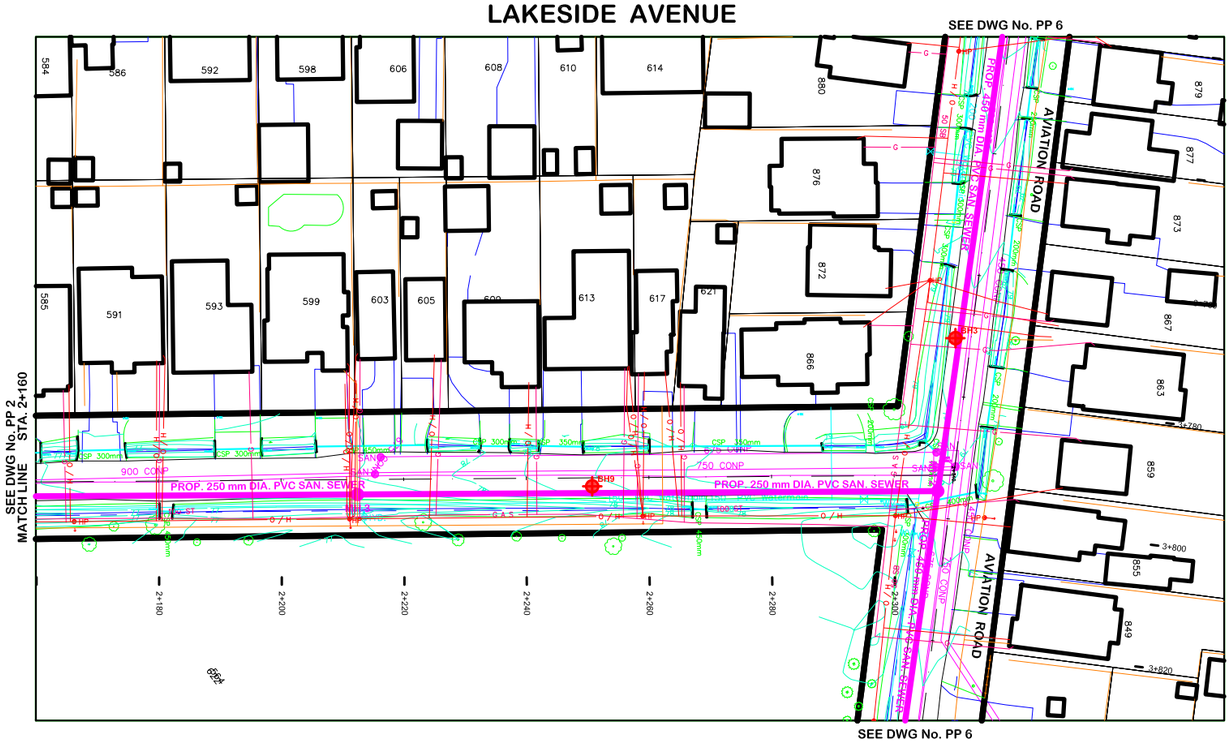
FROM MONTBECK CRESCENT TO LAKESIDE AVE.

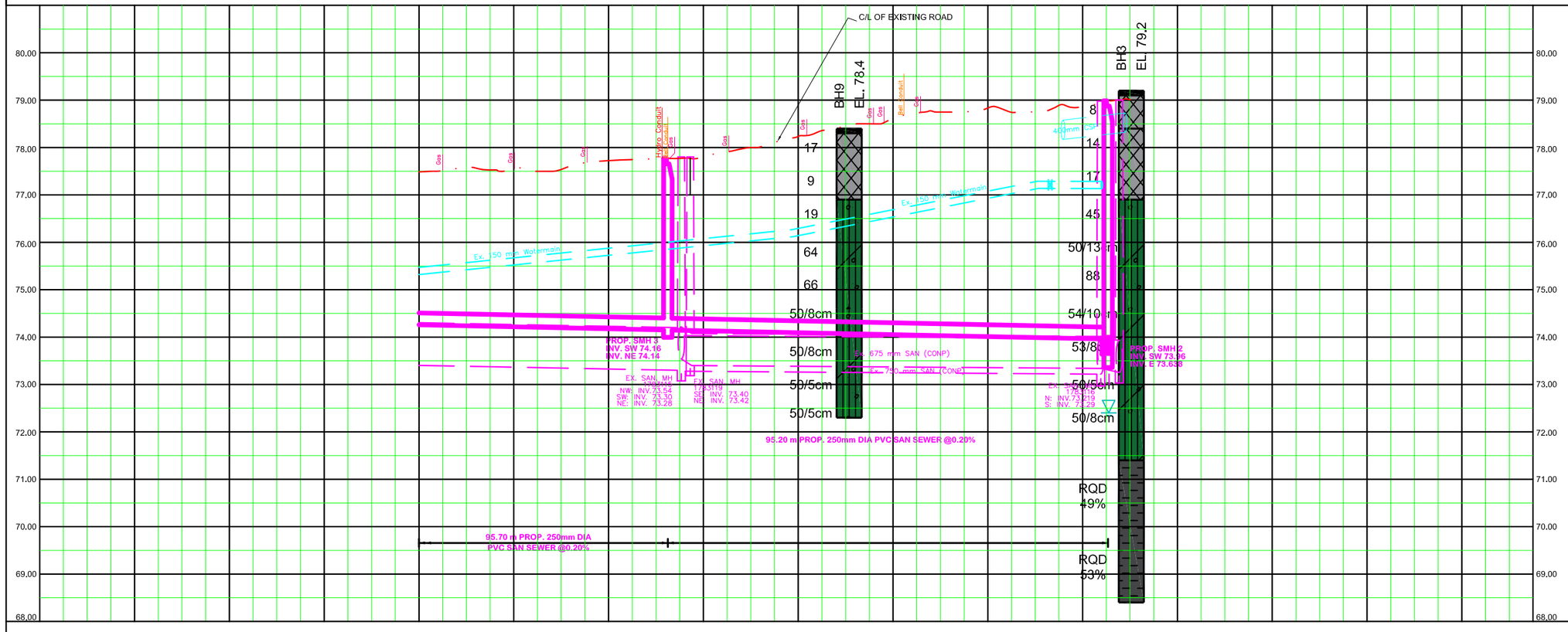
PROP. 250mm PVC SAN. SEWER

STA.2+000 TO STA. 2+160

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	2 of 8	Plan No.	**PP-2**

LAKESIDE AVENUE





	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	
EX. ROAD ELEV.	77.49	77.55	77.50	77.81	78.24	78.61	78.84	78.78	00.00	
ROAD CHAINAGE	2+160	2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320	

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SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
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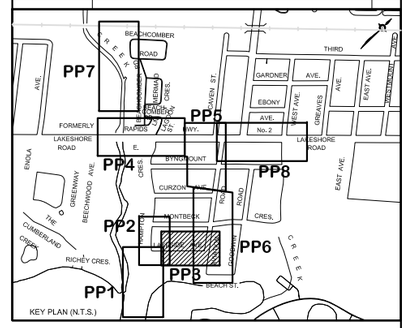
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JJA.



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B.M. No. Description Location — Elev.

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Designed by

Approved by

Chkd.

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ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

LAKESIDE AVENUE

FROM HAMPTON CRESCENT TO AVIATION ROAD

PROP. 250mm PVC SAN. SEWER

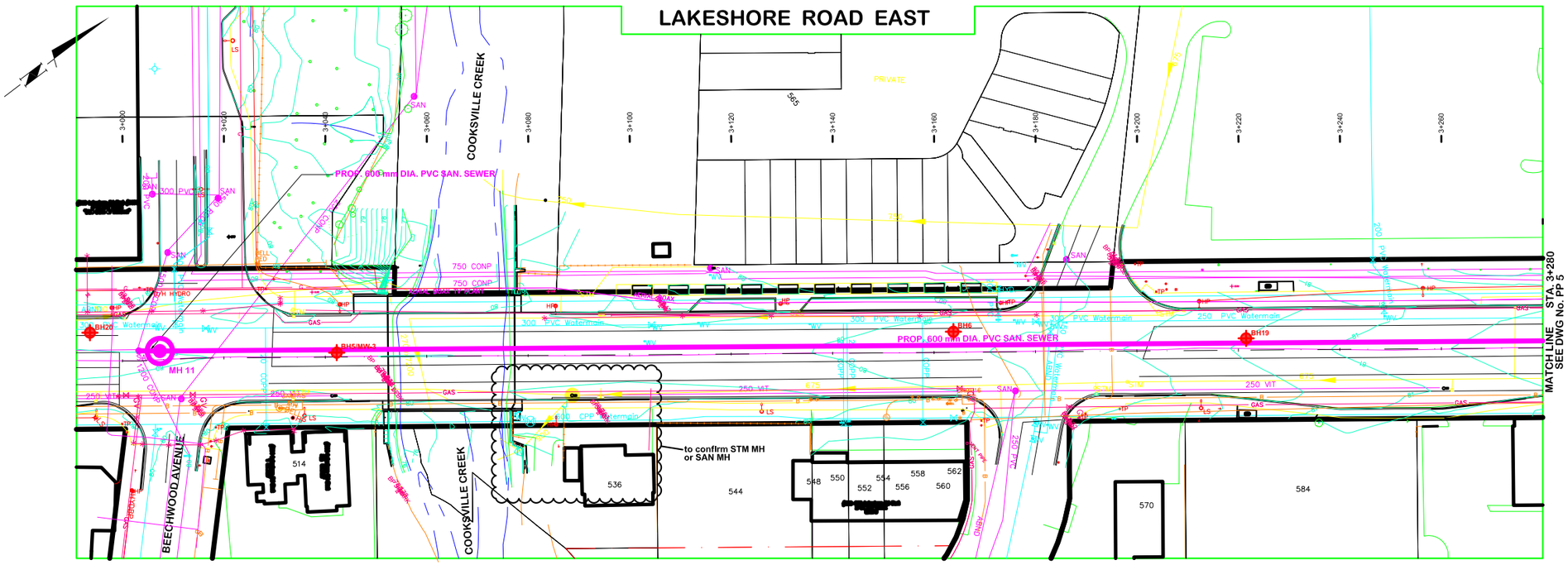
STA. 2+160 TO STA. 2+320

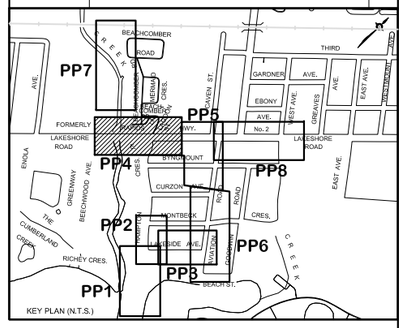
CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	3 of 8

Project No. 19M-00593

Plan No. **PP-3**

LAKESHORE ROAD EAST





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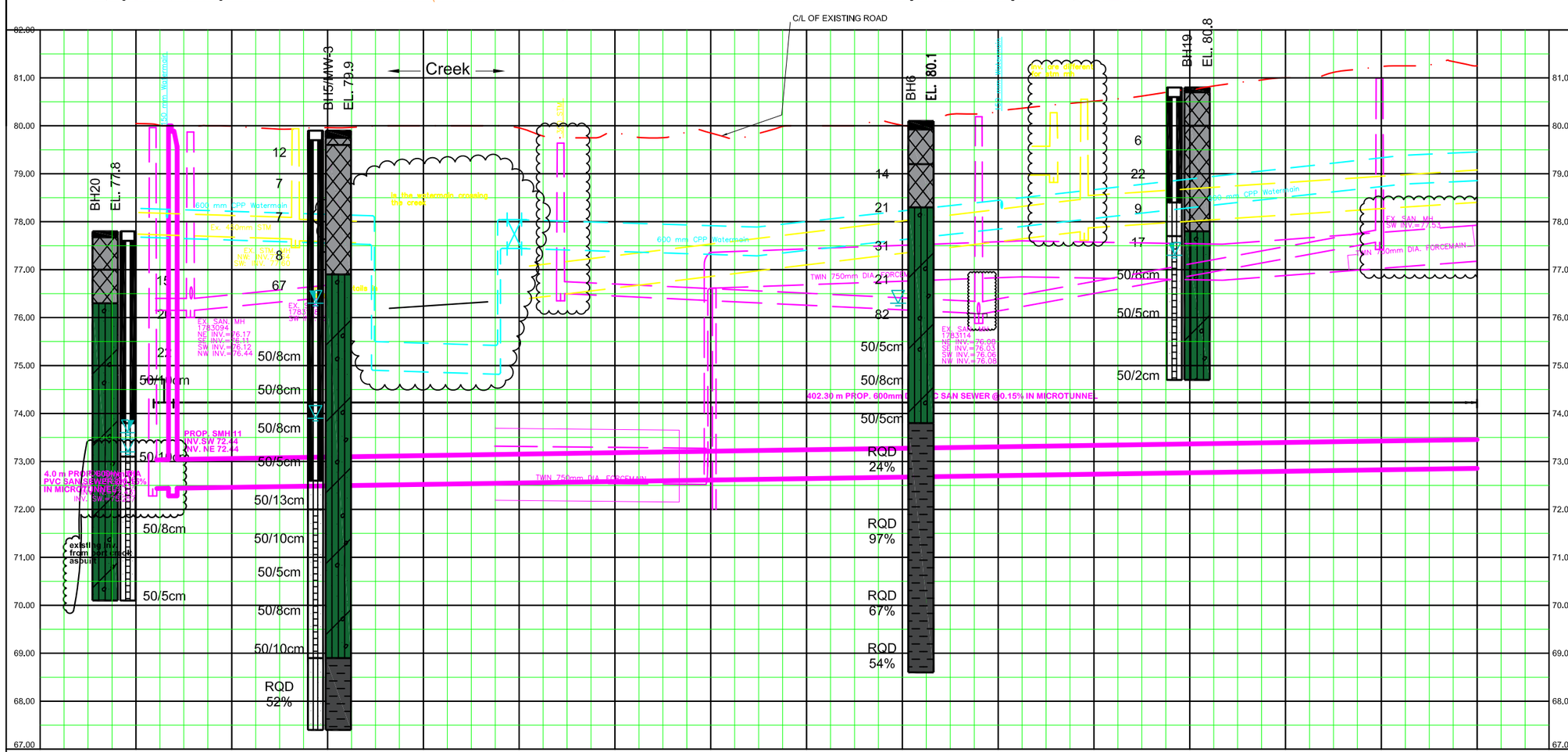
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



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80.05	79.98	79.96	80.00	79.96	79.87	79.85	80.00	80.02	80.30	80.51	80.75	81.00	81.23	81.25	EX. ROAD ELEV.	
3+000	3+020	3+040	3+060	3+080	3+100	3+120	3+140	3+160	3+180	3+200	3+220	3+240	3+260	3+280	ROAD CHAINAGE	

LEGEND:

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2.0C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. Elev.
Description
Location

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Designed by _____ Chkd. _____

Approved by _____

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FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

FROM BEECHWOOD AVE. TO HAMPTON CRESCENT

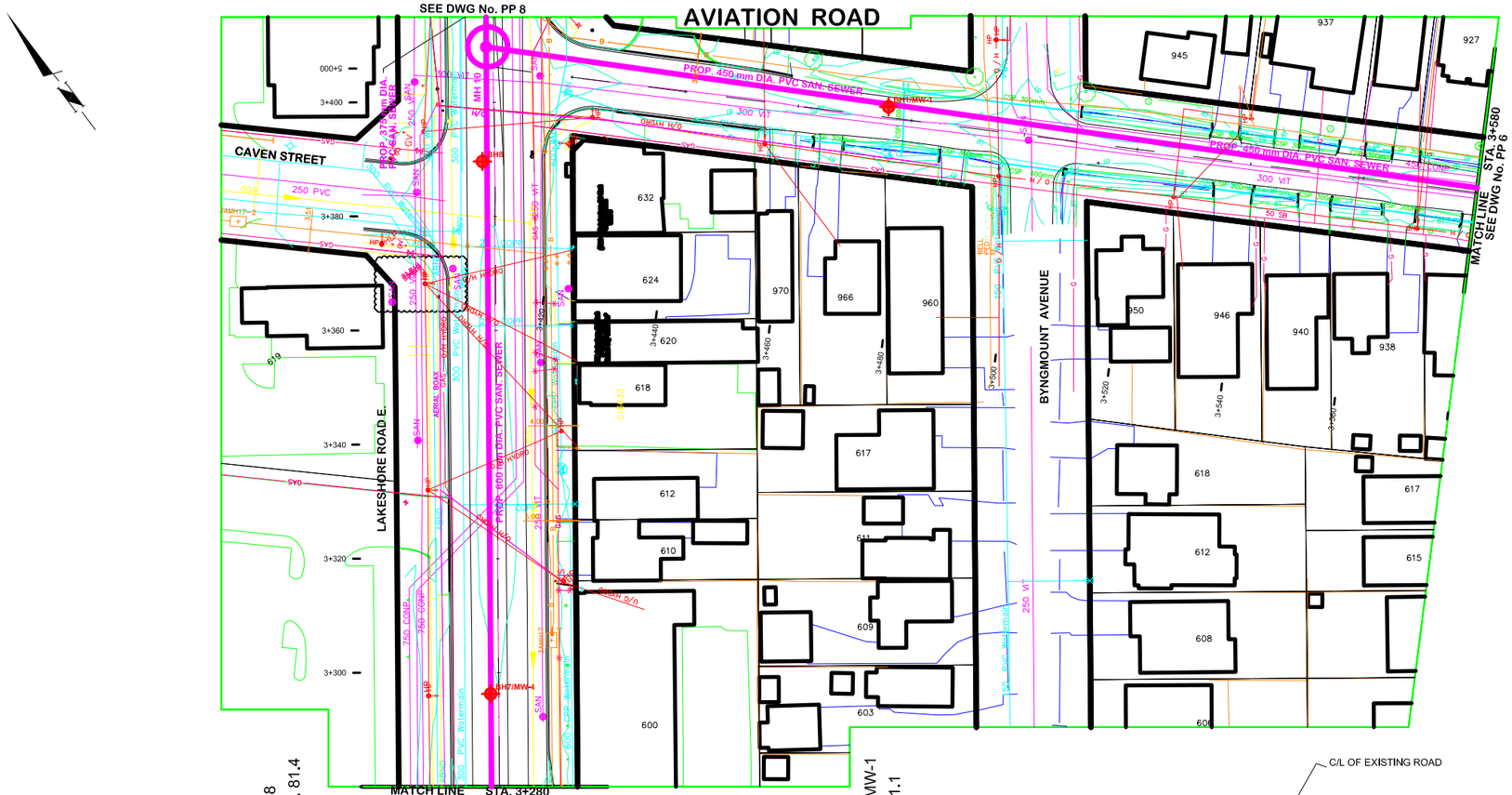
PROP. 600mm SAN. SEWER

STA. 3+000 TO STA. 3+280

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	4 of 8	Plan No.	**PP-4**

SEE DWG No. PP 8

AVIATION ROAD



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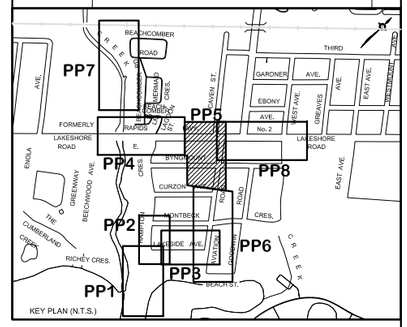
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JA.



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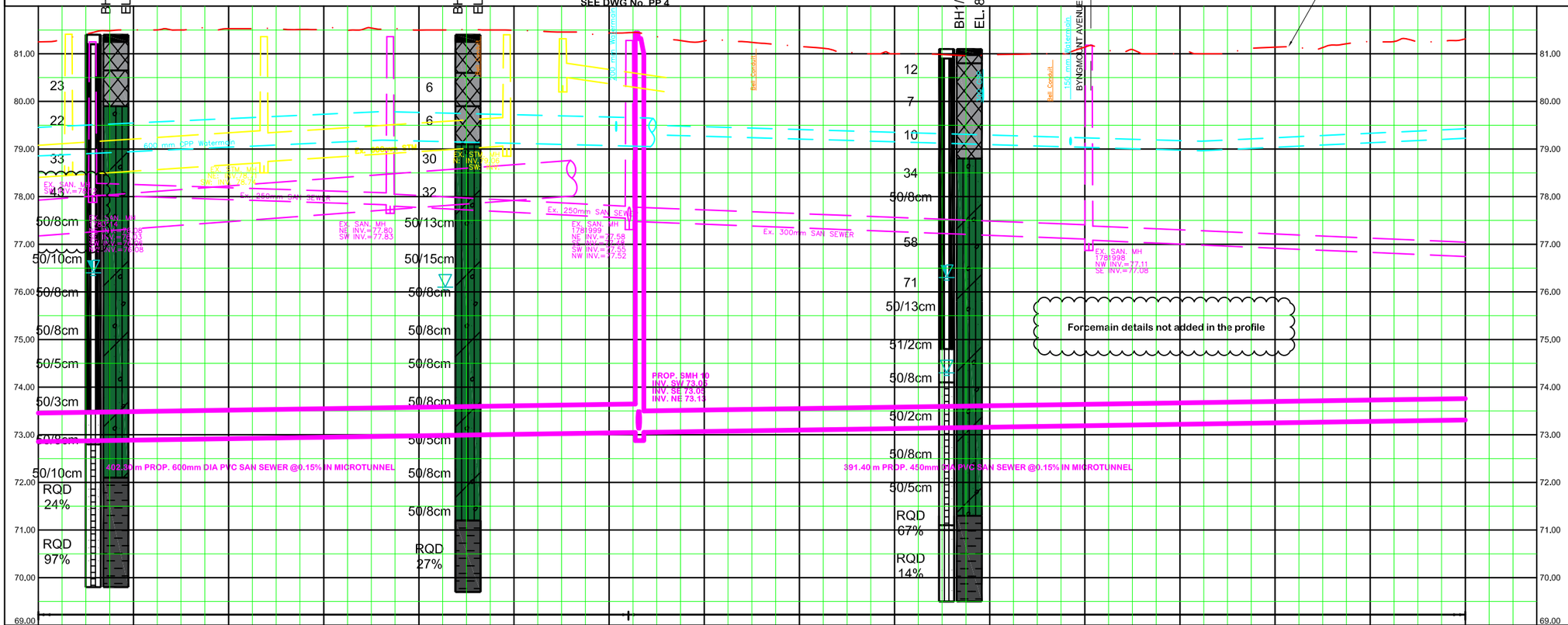
BH7/MW-4 EL. 81.4

BH8 EL. 81.4

BH1/MW-1 EL. 81.1



000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	
81.25	81.50	81.53	81.53	81.50	81.49	81.44	81.27	81.16	81.00	80.98	81.14	81.03	81.14	81.26	81.32	EX. ROAD ELEV.
3+280	3+300	3+320	3+340	3+360	3+380	3+400	3+420	3+440	3+460	3+480	3+500	3+520	3+540	3+560	3+580	ROAD CHAINAGE

General Notes

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WS25 Proposed Water Service, Size In mm
B.M. No. Elev.
Description
Location
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Designed by

Chkd.

Approved by

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FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel working with you

AVIATION ROAD

FROM LAKESHORE ROAD E. TO BYNGMOUNT AVE.

PROP. 450 - 600mm SAN SEWER

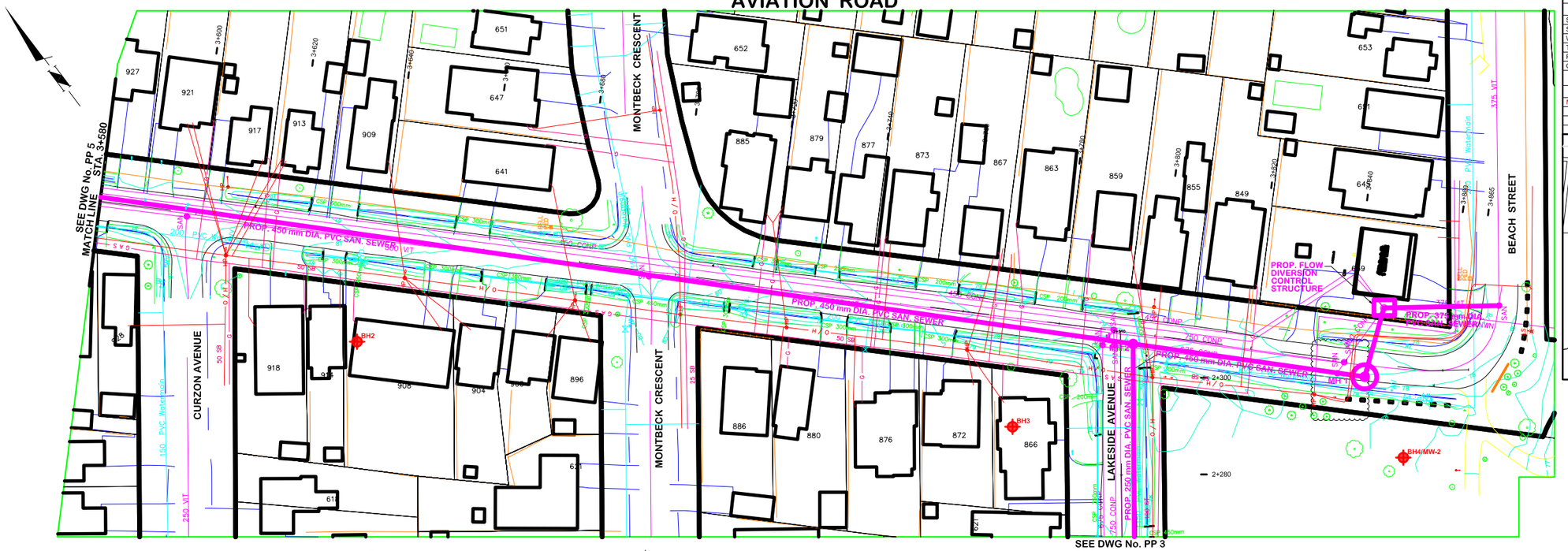
STA. 3+280 TO STA. 3+580

CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	5 of 8

Project No. 19M-00593

Plan No. **PP-5**

AVIATION ROAD



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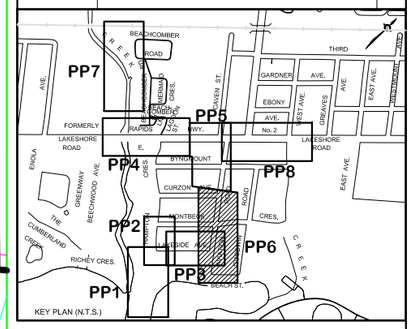
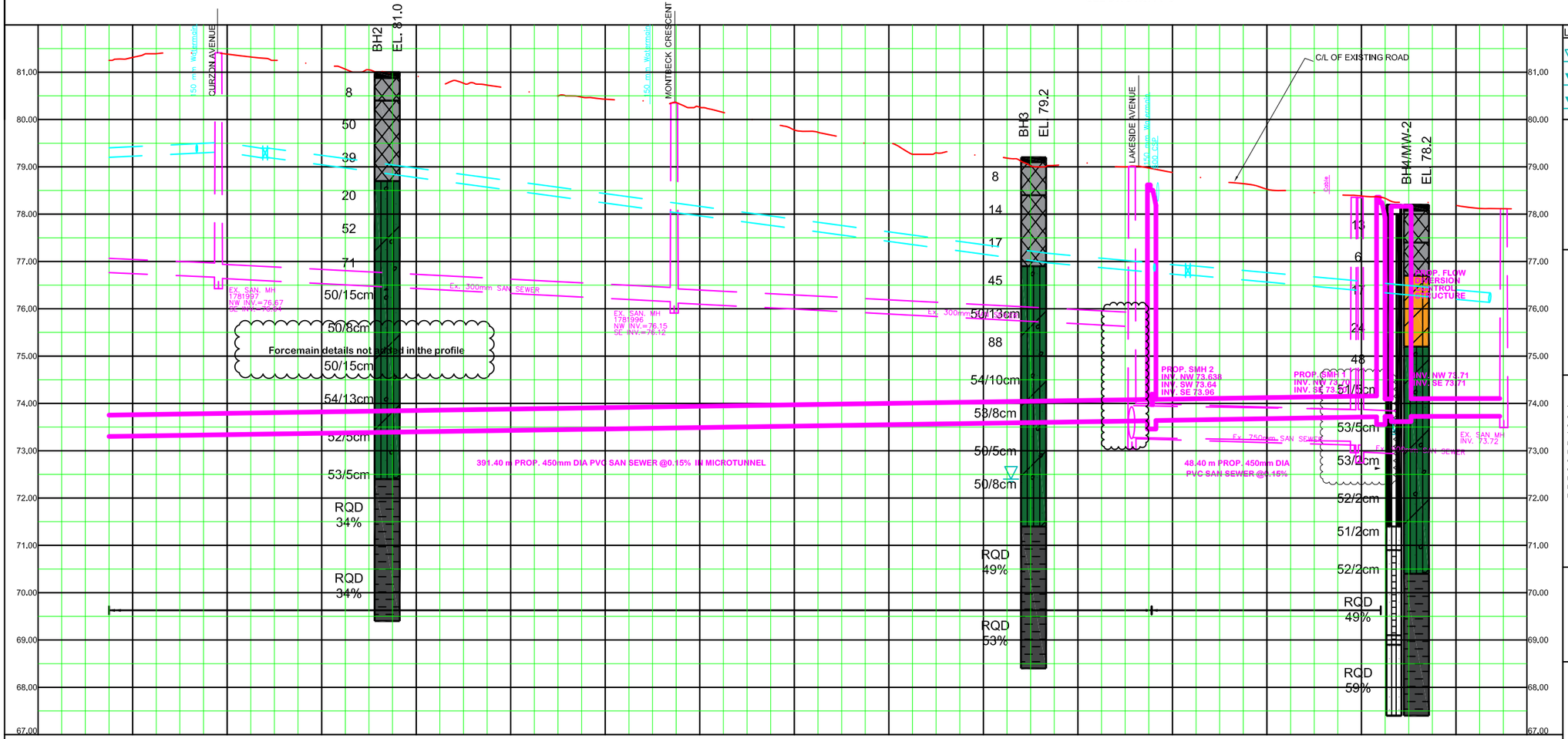
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JA.





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Designed by — Chkd.
Approved by

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10m 0 10 20 30m — HORIZONTAL SCALE
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Region of Peel
working with you

AVIATION ROAD

FROM BYNGMOUNT AVE. TO BEACH STREET

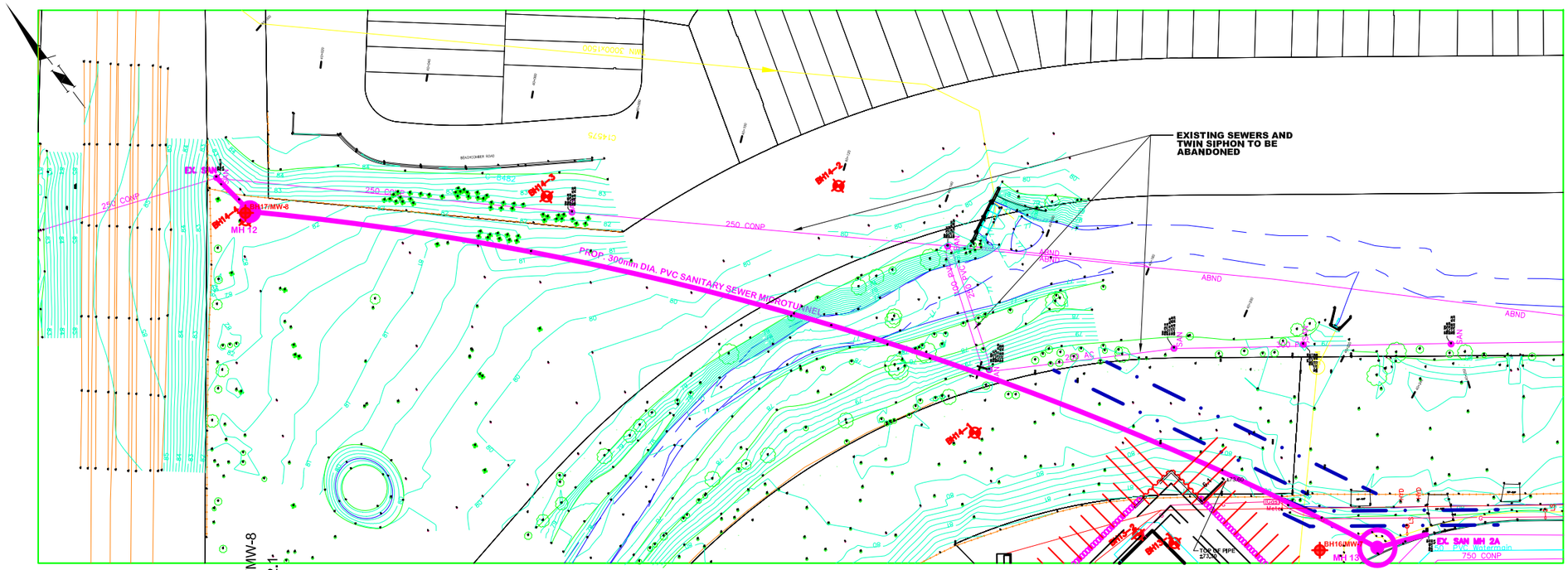
PROP. 375 - 450mm SAN SEWER

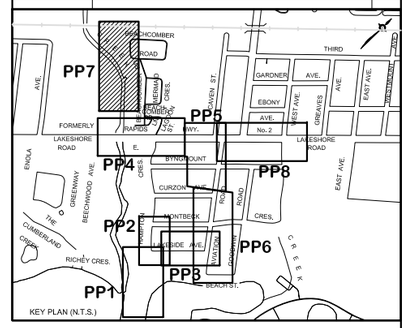
STA. 3+580 TO STA. 3+860

000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00		
81.32	81.38	81.16	80.92	80.65	80.43	80.26	79.78	79.50	79.25	79.09	78.88	78.53	78.37	78.19	EX. ROAD ELEV.	
3+580	3+600	3+620	3+640	3+660	3+680	3+700	3+720	3+740	3+760	3+780	3+800	3+820	3+840	3+860	ROAD CHAINAGE	

CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	6 of 8

Project No. 19M-00593
Plan No. **PP-6**





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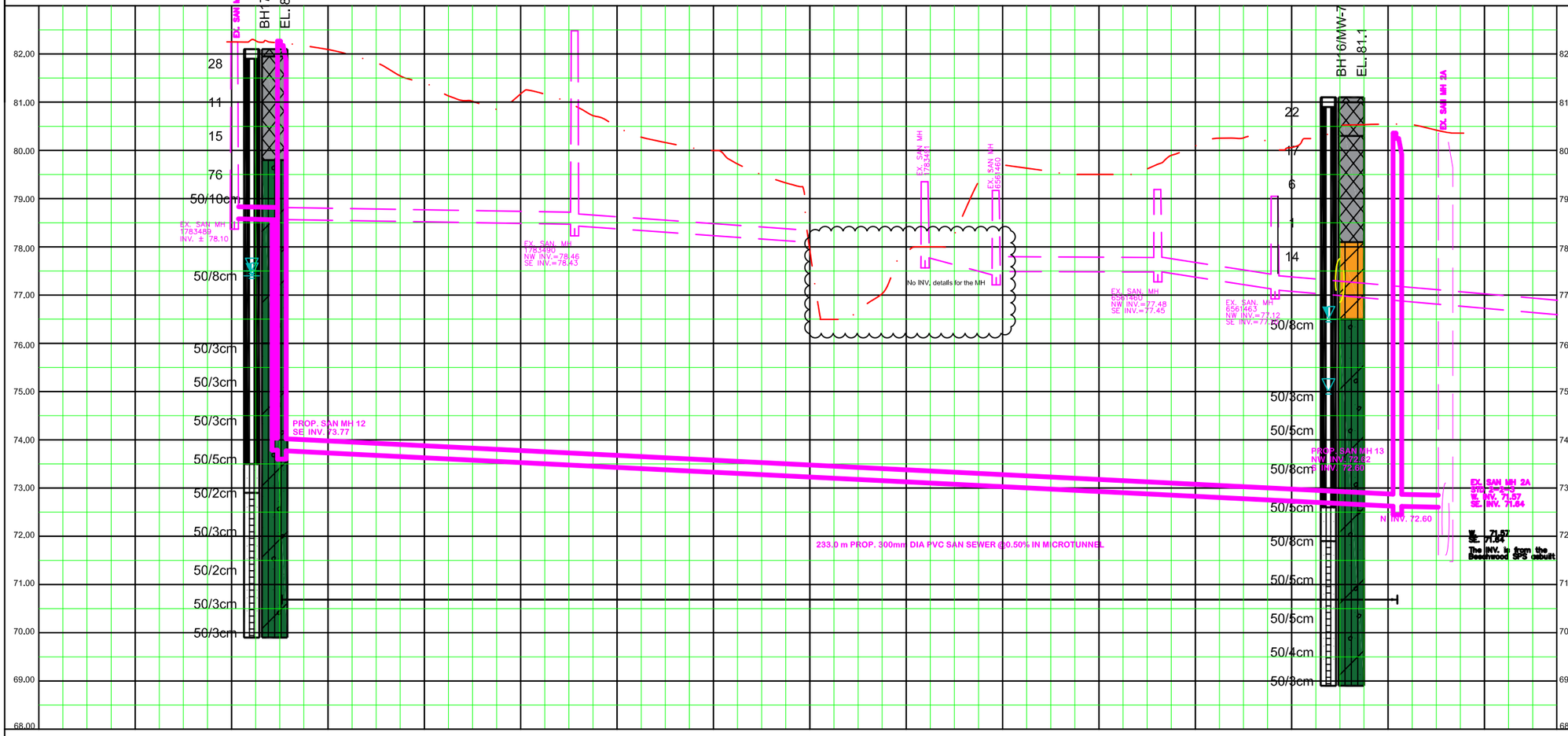
REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JA.



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Designed by

Chkd.

Approved by

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10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

BEECHWOOD SPS

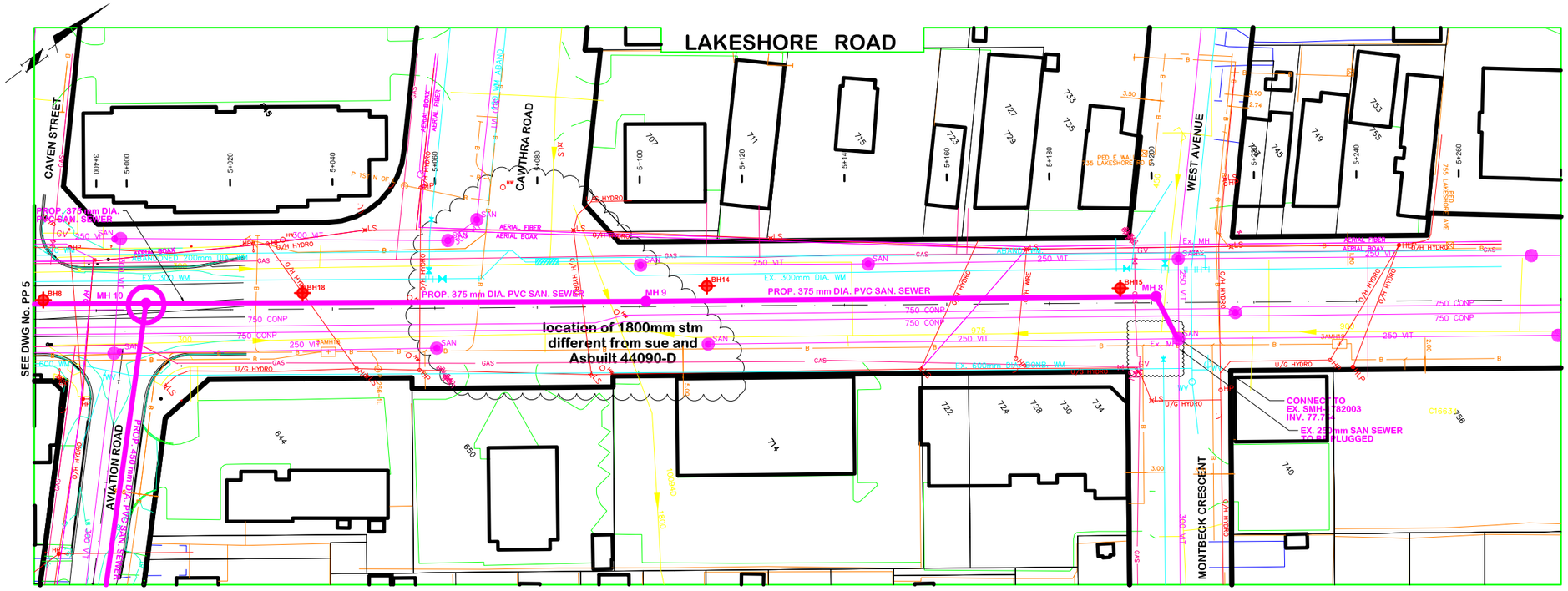
PROP. 300mm SAN SEWER

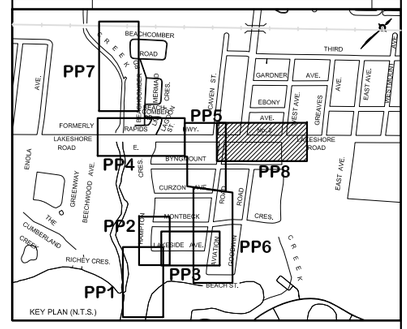
STA. 4+000 TO STA. 4+260

CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	7 of 8

Project No. 19M-00593

Plan No. **PP-7**





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10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

FROM AVIATION ROAD TO WEST AVE..

PROP. 375mm SAN SEWER

STA. 5+000 TO STA. 5+240

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	8 of 8	Plan No.	PP-8

81.49	81.47	81.40	81.34	81.26	81.21	81.19	81.15	81.15	81.20	81.30	81.46	81.64	81.83	82.03	EX. ROAD ELEV.
5+000	5+020	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180	5+200	5+220	5+240	5+260	5+280	ROAD CHAINAGE

LIST OF ABBREVIATIONS

PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m.

Dynamic Penetration Resistance: - The number of blows required to advance a 51 mm, 60 degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

CONSISTENCY	N (blows/0.3 m)	c (kPa)	DENSENESS	N (blows/0.3 m)
Very Soft	0 - 2	0 - 12	Very Loose	0 - 4
Soft	2 - 4	12 - 25	Loose	4 - 10
Firm	4 - 8	25 - 50	Compact	10 - 30
Stiff	8 - 15	50 - 100	Dense	30 - 50
Very Stiff	15 - 30	100 - 200	Very Dense	> 50
Hard	> 30	> 200		

WTPL	Wetter Than Plastic Limit
APL	About Plastic Limit
DTPL	Drier Than Plastic Limit

TYPE OF SAMPLE

SS	Split Spoon	TW	Thinwall Open
WS	Washed Sample	TP	Thinwall Piston
SB	Scraper Bucket Sample	OS	Oesterberg Sample
AS	Auger Sample	FS	Foil Sample
CS	Chunk Sample	RC	Rock Core
ST	Slotted Tube Sample		

PH	Sample Advanced Hydraulically
PM	Sample Advanced Manually

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH1/MW-1

17T; 4824985.5N; 615782.1E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 2, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH ELEV (metres)	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
	SURFACE ELEVATION 81.10					81
0.30	PAVEMENT STRUCTURE: 125mm asphaltic concrete		1	SS	12	
0.50	over 175mm granular base/subbase					
80.60	organics					
	FILL: firm to stiff, grey silty clay, sandy, wet		2	SS	7	80
			3	SS	10	
2.3						79
78.8	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, trace/some gravel, moist		4	SS	34	
			5	SS	50/8cm	78
			6	SS	58	77
			7	SS	71	
5.3						76
75.8	thinly laminated shale layers		8	SS	50/13cm	
			9	SS	51/2cm	75
			10	SS	50/8cm	
			11	SS	50/2cm	74
			12	SS	50/8cm	73
			13	SS	50/5cm	72
9.8	AUGER REFUSAL AT 9.8m					
71.3	SHALE BEDROCK: Unweathered to slightly weathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 67%	71
			RUN 2	RC	RQD 14%	70
11.6						
69.5	Borehole terminated at 11.6 m					

GAS READING NOTES:

1. CO=4 PPM, H_2S=0 PPM, and O_2=20.9% at 0.1 m
2. CO=9 PPM, H_2S=0 PPM, and O_2=20.9% at 3.0 m
3. CO=5 PPM, H_2S=0 PPM, and O_2=20.9% at 3.8 m
4. CO=0 PPM, H_2S=0 PPM, and O_2=20.3% at 4.6 m
5. CO=9 PPM, H_2S=0 PPM, and O_2=20.9% at 5.3 m

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS (ppm)

	GROUND WATER OBSERVATIONS AND REMARKS	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Flushmount Casing	
CO= 4 ppm	50 mm Dia. PVC pipe	
		0 31 42 27
		15 28 39 18
CO= 9 ppm	Bentonite Seal	3 48 (49)
CO= 5 ppm		17 50 26 7
CO= 0 ppm	El. 76.3	23 48 (29)
CO= 0 ppm		
	Filter Sand El. 74.3	11 43 31 15
	Screen	
	REC 94% UCS=120.2 MPa	
	REC 100% UCS=110.5 MPa	

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	1.2	79.9
2021-09-27	4.8	76.3
2021-10-01	4.8	76.3
2021-11-05	4.8	76.3

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH2

17T; 4824871.9N; 615892.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 3, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GAS READINGS (ppm)	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		SURFACE ELEVATION 81.00						
0.60	80.40	PAVEMENT STRUCTURE: 125mm asphaltic concrete over 475mm sand and gravel		1	SS	8		
		FILL: hard to very stiff, brown clayey silt, trace to some sand, some gravel, moist		2	SS	50		
				3	SS	39		
2.3	78.7	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, some gravel, moist		4	SS	20		13 32 (55)
				5	SS	52		
				6	SS	71		16 25 44 15
4.6	76.4	thinly laminated shale layers		7	SS	50/15cm		24 30 31 15
				8	SS	50/8cm		
				9	SS	50/15cm		
				10	SS	54/13cm		
				11	SS	52/5cm		
8.6		AUGER REFUSAL AT 8.6m		12	SS	53/5cm		
	72.4	SHALE BEDROCK: Slightly weathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 34%		REC 100%
				RUN 2	RC	RQD 34%		REC 92%
11.6	69.4	Borehole terminated at 11.6 m						Upon completion, no cave-in, groundwater level could not be established

GAS READING NOTES:

1. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 2.3 m

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q (50 100 150 200); DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20 40 60 80)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%) (10 20 30 40)

ELEVATION SCALE: 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH3

17T; 4824776.0N; 615989.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 10, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 79.20					
0.0	79.20	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 700mm granular base/subbase		1	SS	8	79
0.80	78.40	FILL: stiff, brown silty clay, trace sand, trace gravel, moist		2	SS	14	78
1.0				3	SS	17	
2.0							77
2.3	76.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, trace to some gravel, thinly laminated shale layers, moist		4	SS	45	
3.0				5	SS	50/13cm	76
4.0				6	SS	88	
				7	SS	54/10cm	75
5.0				8	SS	53/8cm	74
6.0				9	SS	50/5cm	73
7.0				10	SS	50/8cm	
7.8	71.4	AUGER REFUSAL AT 7.8m SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 49%	72
8.0							71
9.0				RUN 2	RC	RQD 53%	70
10.0							69
10.8	68.4	Borehole terminated at 10.8 m.					
11.0							
12.0							
13.0							
14.0							
15.0							

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

2 9 45 44
9 31 (60)
27 32 26 15
26 37 23 14

▽ El. 72.4

REC 97%
REC 98%

Upon completion, no cave-in, groundwater level could not be established

NOTES

▽ GROUND WATER STRIKE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH4/MW-2

17T; 4824722.1N; 616050.3E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 8, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	78.20	SURFACE ELEVATION 78.20			
0.0	78.20	PAVEMENT STRUCTURE: 125mm asphaltic concrete over 675mm granular base/subbase	1	SS	13
0.80	77.40	FILL: firm, brown clayey silt, trace sand, trace gravel, moist	2	SS	6
1.5	76.7	SILTY CLAY: very stiff, brown silty clay, some sand, trace gravel, moist	3	SS	17
			4	SS	24
3.0	75.2	SANDY CLAYEY SILT/CLAYEY SAND TILL: very stiff to hard, grey sandy clayey silt/clayey sand till, some gravel, moist	5	SS	48
3.8	74.4	thinly laminated shale layers	6	SS	51/5cm
			7	SS	53/5cm
			8	SS	53/2cm
			9	SS	52/2cm
			10	SS	51/2cm
7.8		AUGER REFUSAL AT 7.8m	11	SS	52/2cm
8.0	70.4	SHALE BEDROCK: Unweathered to slightly weathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds	RUN 1	RC	RQD 49%
10.0			RUN 2	RC	RQD 59%
10.8	67.4	Borehole terminated at 10.8m			

GAS READING NOTES:

1. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 0.1 m
2. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 0.8 m
3. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 1.5 m
4. CO=0 PPM, H_2S=0 PPM, and O_2=20.3% at 2.3 m
5. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 3.0 m

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
6 23 41 30
8 21 40 31
24 36 27 13
Bentonite Seal
El. 73.4 12 43 28 17
Filter Sand
Screen
REC 100%
REC 98%

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	2.3	75.9
2021-09-27	4.9	73.3
2021-10-01	4.8	73.4
2021-11-05	4.8	73.4

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH5/MW-3

17T; 4824741.6N; 615512.9E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 10, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
	79.90	SURFACE ELEVATION 79.90				
0.30	79.60	PAVEMENT STRUCTURE: 125mm asphaltic concrete over 175mm granular base/subbase		1	SS	12
		FILL: stiff to firm, brown clayey silt, some sand, trace gravel, moist		2	SS	7
				3	SS	7
				4	SS	8
3.0	76.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, grey sandy clayey silt/clayey sand till, trace to some gravel, moist		5	SS	67
4.6	75.3	thinly laminated shale layers		6	SS	50/8cm
				7	SS	50/8cm
				8	SS	50/8cm
				9	SS	50/5cm
				10	SS	50/13cm
				11	SS/AS	50/10cm
				12	SS	50/5cm
				13	SS	50/8cm
11.0	68.9	AUGER REFUSAL AT 11.0m SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		14 RUN 1	SS RC	50/10cm RQD 52%
12.5	67.4	Borehole terminated at 12.5m				

ELEVATION SCALE: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0 m; 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69, 68

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

El. 76.3
Bentonite Seal

El. 73.9

Filter Sand

10 31 33 26

Screen

REC 100%

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.5	76.4
2021-09-27	-	79.9
2021-10-01	3.6	76.3
2021-11-05	-	79.9

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH6

17T; 4824841.0N; 615583.0E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 11, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
	80.10	SURFACE ELEVATION					80
0.0		PAVEMENT STRUCTURE: 125mm asphaltic concrete over 775mm granular base/subbase		1	AS		
0.90	79.20	FILL: stiff to very stiff, brown clayey silt, trace sand, trace gravel, moist		2	SS	14	79
1.8	78.3	SANDY CLAYEY SILT TILL: very stiff to hard, brown sandy clayey silt till, trace/some gravel, moist		3	SS	21	78
				4	SS	31	
				5	SS	21	77
				6	SS	82	76
4.6	75.5	thinly laminated shale layers		7	SS/AS	50/5cm	
				8	SS	50/8cm	75
6.3		AUGER REFUSAL AT 6.3m		9	SS	50/5cm	74
	73.8	SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 24%	73
				RUN 2	RC	RQD 97%	72
				RUN 3	RC	RQD 67%	71
				RUN 4	RC	RQD 54%	70
11.5	68.6	Borehole terminated at 11.5m					69

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

9 30 (61)

11 29 36 24

▽ El. 76.3

13 20 47 20

4 30 39 27

REC 67%

REC 970%

REC 97%
UCS=48.4 MPa at 10.4m
UCS=120.2 MPa at 9.9m

REC 87%

Upon completion, no cave-in, groundwater level could not be established

NOTES

▽ GROUND WATER STRIKE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH7/MW-4

17T; 4824945.6N; 615664.3E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 14-15, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
0.0	81.40	SURFACE ELEVATION 81.40				
		PAVEMENT STRUCTURE: 150mm asphaltic concrete over 600mm granular base/subbase		1	AS	
0.75	80.65	FILL: very stiff, brown clayey silt, trace sand, trace gravel, moist		2	SS	23
1.5	79.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: very stiff, to hard brown sandy clayey silt/clayey sand till, trace/some gravel, moist		3	SS	22
				4	SS	33
				5	SS	43
3.8	77.6	thinly laminated shale layers		6	SS	50/8cm
				7	SS/AS	50/10cm
				8	SS	50/8cm
				9	SS	50/8cm
				10	SS/AS	50/5cm
				11	SS	50/3cm
				12	SS	50/8cm
9.3		AUGER REFUSAL AT 9.3m		13	SS	50/10cm
11.6	72.1	SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 24%
				RUN 2	RC	RQD 97%
	69.8	Borehole terminated at 11.6m				

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q (50 100 150 200)

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20 40 60 80)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30 40)

GAS READINGS (ppm)

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

5 30 38 27

8 28 45 19

Bentonite Seal

11 29 38 22

▼ El. 76.4

4 50 28 18

Filter Sand

REC 67%

Screen

REC 97%

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	1.5	79.9
2021-09-27	-	81.4
2021-10-01	5.0	76.4
2021-11-05	-	81.4

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH8

17T; 4825020.9N; 615719.5E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 14-15, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	GAS READINGS (ppm)	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	81.40	SURFACE ELEVATION 81.40				81		
		PAVEMENT STRUCTURE: 150mm asphaltic concrete over 650mm granular base/subbase	1	AS				
0.80	80.60	FILL: firm, brown to grey clayey silt, trace to some sand, trace gravel, moist	2	SS	6	80		
1.0			3	SS	6			
2.0						79		
2.3	79.1	SANDY CLAYEY SILT/CLAYEY SAND TILL: very stiff to hard, brown sandy clayey silt/clayey sand till, trace/some gravel, moist	4	SS	30			
3.0			5	SS	32	78		11 29 40 20
3.8								
4.0	77.6	thinly laminated shale layers	6	SS	50/13cm			35 23 26 16
			7	SS	50/15cm	77		
5.0								∇ El. 76.1
			8	SS	50/8cm	76		
6.0			9	SS	50/8cm			
						75		
7.0			10	SS	50/8cm			7 32 37 24
			11	SS	50/8cm	74		
8.0								
			12	SS	50/5cm	73		
9.0			13	SS	50/8cm			
						72		
10.0			14	SS	50/8cm			
10.2	71.2	AUGER REFUSAL AT 10.2m SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE	RUN 1	RC	RQD 27%	71		REC 100% UCS=170.0 MPa
11.0						70		
11.7	69.7	Borehole terminated at 11.7m						Upon completion, no cave-in, groundwater level could not be established
12.0								
13.0								
14.0								
15.0								

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 50 100 150 200 / 20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40

NOTES

∇ GROUND WATER STRIKE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH9

17T; 4824714.2N; 615973.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 10, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.A.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	SAMPLE TYPE	"N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 78.40					
0.0	78.30	PAVEMENT STRUCTURE: 100mm asphaltic concrete					
		FILL: stiff, brown silty clay, some sand, some gravel, moist		1	SS	17	78
1.0				2	SS	9	
1.5	76.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: stiff to hard, brown sandy clayey silt/clayey sand till, some gravel, moist		3	SS	19	77
2.0				4	SS	64	76
3.0				5	SS	66	75
3.8	74.6	thinley lamintaed shale layers		6	SS	50/8cm	
4.0							74
				7	SS	50/8cm	
5.0				8	SS	50/5cm	73
6.0	72.3	Borehole terminated at 6.1m		9	SS	50/5cm	

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
17	39	31	13
10	32	40	18

Upon completion, cave-in at 3.7m, groundwater level could not be established

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH10

17T; 4824626.5N; 615909.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 11, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" VALUES	GAS READINGS ppm	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		SURFACE ELEVATION 79.60						
0.25	79.35	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 150mm granular base/subbase		1	SS	11		
		SILTY CLAY: stiff to very stiff, brown silty clay, trace sand, moist		2	SS	16		0 2 49 49
				3	SS	26		
2.3	77.3	CLAYEY SILT TILL: hard, grey clayey silt till, some to trace sand, trace gravel, shale fragments, moist		4	SS	43		17 28 38 17
				5	SS	37		
				6	SS	56		7 15 53 25
				7	SS	43		0 6 66 28
				8	SS	54		0 7 62 31
5.9	73.7	Borehole terminated at 5.9m						Upon completion, no cave-in, no water

ELEVATION SCALE: 79, 78, 77, 76, 75, 74

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30 40

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH11/MW-5

17T; 4824657.8N; 615832.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 16, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres) / ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	SURFACE ELEVATION 77.90			
0.0 / 77.90	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 600mm granular base/subbase	1	SS	22
0.70 / 77.20	FILL: compact to loose, brown silty sand and crusher run limestone, wet.	2	SS	14
1.7 / 76.2	firm, brown silty clay, trace sand, trace gravel, moist	3	SS	7
2.3 / 75.6	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, trace/some gravel, moist	4	SS	41
		5	SS	38
3.8 / 74.1	thinly laminated shale layers	6	SS	50/5cm
		7	SS	50/8cm
		8	SS	50/5cm
6.1 / 71.8	Borehole terminated at 6.1m	9	SS	50/3cm

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu; ▲ POCKET PENETROMETER ○ Q; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%)

GAS READINGS (ppm)

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
Bentonite Seal
El. 75.9
12 31 38 19
Filter Sand
5 31 43 21
17 45 27 11
Screen

Upon completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	2.6	75.3
2021-09-27	1.8	76.1
2021-10-01	2.0	75.9
2021-11-05	2.0	75.9

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH12

17T; 4824561.8N; 615947.0E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 2, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" VALUES
		SURFACE ELEVATION 77.00				
0.0	76.80	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 100mm granular base/subbase		1	SS	31
		FILL: hard to very stiff, grey silty clay, trace sand, trace gravel, moist		2	SS	18
1.2	75.8	loose to dense, brown silty sand, trace gravel, moist		3	SS	7
				4	SS	32
				5	SS	5
				6	SS	6
				7	SS	17
5.3	71.7	CLAYEY SILT TILL: hard, grey clayey silt till, some sand, moist		8	SS	45
6.7	70.3	Borehole terminated at 6.7m		9	SS	59

ELEVATION SCALE: 76, 75, 74, 73, 72, 71

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

El. 75.5

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

0 46 (54)

9 14 59 18

Upon completion, no cave-in, water at 1.5m

NOTES

▽ GROUND WATER STRIKE
▼ GROUND WATER LEVEL MEASURED UPON COMPLETION OF DRILLING

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH13/MW-6

17T; 4824518.4N; 615960.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 2 & 22 , 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" VALUES
		SURFACE ELEVATION 77.70				
0.0	77.52	PAVEMENT STRUCTURE: 75mm asphaltic concrete over 100mm granular base/subbase		1	SS	15
1.0		FILL: stiff, brown silty clay, some gravel, mixed with topsoil, organics, brick and asphalt debris, moist		2	SS	7
2.0				3	SS	25
				4	SS	10
3.0	74.7	compact to very loose, brown silty sand, trace gravel, asphalt debris		5	SS	23
4.0				6	SS	3
5.0				7	SS	8
5.5	72.2	CLAYEY SILT TILL: hard, brown clayey silt till, trace sand, moist		8	SS	39
6.0				9	SS	41
6.7	71.0	Borehole terminated at 6.7m				
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						

ELEVATION SCALE: 77, 76, 75, 74, 73, 72, 71

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
Bentonite Seal
El. 74.8
El. 74.5
Filter Sand
Screen
6 59 (35)
0 3 79 18

Upon completion, no cave-in, water at 3.2m

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.0	74.7
2021-09-27	2.7	75.0
2021-10-01	2.8	74.9
2021-11-05	2.9	74.8

NOTES

▼ GROUND WATER LEVEL MEASURED UPON COMPLETION OF DRILLING
▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH14

17T; 4825125.9N; 615795.6E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 14, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 81.10					
0.0		PAVEMENT STRUCTURE: 150mm asphaltic concrete over 650mm granular base/subbase		1	AS		81
0.80	80.30	very stiff to firm, grey silty clay, trace sand, trace gravel, moist		2	SS	26	80
1.0							
2.0				3	SS	5	79
2.4	78.7	SANDY CLAYEY SILT TILL: very stiff to hard, brown sandy clayey silt till, trace gravel, thinly laminted shale layers, moist		4	SS	20	
3.0				5	SS	50/13cm	78
4.0				6	SS	50/10cm	77
5.0				7	SS	50/10cm	
				8	SS	50/8cm	76
6.0				9	SS	50/8cm	75
7.0	74.1	Borehole terminated at 7m		10	SS	50/10cm	
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							
14.0							
15.0							

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ● Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

▽ El. 77.3
▼ El. 77.1
2 25 47 26

Upon completion, no cave-in, water at 4.0m

NOTES

▽ GROUND WATER STRIKE
▼ GROUND WATER LEVEL MEASURED UPON COMPLETION OF DRILLING

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH15

17T; 4825190.0N; 615844.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 1 & 14, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 81.30				
0.0	81.30	PAVEMENT STRUCTURE: 150mm asphaltic concrete over 450mm granular base/subbase		1	AS	
0.60	80.70	FILL: stiff to very stiff, brown clayey silt/silty clay, trace sand, some gravel, moist		2	SS	12
1.0				3	SS	24
2.0						
2.3	79.0	SANDY CLAYEY SILT TILL: hard, brown sandy clayey silt till, some gravel, moist		4	SS	31
3.0						
3.0	78.3	thinly laminated shale layers		5	SS	50/15cm
4.0				6	SS	50/3cm
5.0				7	SS	50/5cm
				8	SS	50/8cm
5.9				9	SS	50/2cm
6.0	75.4	Borehole terminated at 5.9m				

ELEVATION SCALE: 81, 80, 79, 78, 77, 76

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%); 10 20 30 40

GAS READINGS (ppm)

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

5 22 (73)

14 17 45 24

Upon completion, no cave-in, no water

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH16/MW-7

17T; 4824803.7N; 615388.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 29-30, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 81.10				
0.0	81.00	organics				
		FILL: compact, brown sandy silt, trace clay, trace gravel, moist		1	SS	22
0.80	80.30	very stiff to soft, brown clayey silt, trace sand, trace gravel, moist		2	SS	17
1.0						
2.0				3	SS	6
				4	SS	1
3.0	78.1	SILTY CLAY: stiff, brown silty clay, sandy, moist		5	SS	14
4.0						
4.6	76.5	SANDY CLAYEY SILT TILL: hard, grey sandy clayey silt till, trace gravel, thinly lamiated shale layers, moist to wet		6	SS	50/8cm
5.0						
6.0				7	SS	50/3cm
				8	SS	50/5cm
7.0						
				9	SS	50/8cm
8.0						
				10	SS	50/5cm
9.0				11	SS	50/8cm
10.0				12	SS	50/5cm
11.0				13	SS	50/5cm
				14	SS	50/4cm
12.0						
12.2				15	SS	50/3cm
	68.9	Borehole terminated 12.2m				
13.0		GAS READING NOTES:				
		1. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 0.8 m				
		2. CO=3 PPM, H_2S=0 PPM, and O_2=20.9% at 2.3 m				
14.0		3. CO=8 PPM, H_2S=0 PPM, and O_2=20.9% at 6.1 m				
15.0						

ELEVATION SCALE: 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

1 42 (57)

0 29 53 18

Bentonite Seal

El. 76.5

El. 75.0

5 38 37 20

Filter Sand

Screen

Upon completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	4.4	76.7
2021-09-27	4.6	76.5
2021-10-01	4.6	76.5
2021-11-05	4.6	76.5

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH17/MW-8

17T; 4824984.2N; 615259.8E

PROJECT Beach St. Pumping Station Diversion — **PML REF.** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — **BORING DATE** June 28, 2021 — **ENGINEER** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — **TECHNICIAN** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 82.10				
0.15	81.95	organics				
		FILL: very stiff to stiff, brown clayey silt, some sand, topsoil, some gravel, moist		1	SS	28
				2	SS	11
				3	SS	15
2.3	79.8	CLAYEY SILT TILL: hard, brown clayey silt till, trace sand, trace gravel, moist		4	SS	76
				5	SS	50/10cm
				6	SS	50/8cm
6.1	76.0	thinly laminted shale layers		7	SS	50/3cm
				8	SS	50/3cm
				9	SS	50/3cm
				10	SS	50/5cm
				11	SS	50/2cm
				12	SS	50/3cm
				13	SS	50/2cm
				14	SS	50/3cm
12.2	69.9	Borehole terminated at 12.2M		15	SS	50/3cm

ELEVATION SCALE: 82, 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

2 41 (57)

0 10 63 27

Bentonite Seal

El. 77.5

El. 77.4

Filter Sand

Screen

Upon Completion, cave-in at 9.1m, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.9	78.2
2021-09-27	4.8	77.3
2021-10-01	4.7	77.4
2021-11-05	4.7	77.4

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH18

17T; 4825062.1N; 615749.0E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 22, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.A.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
		SURFACE ELEVATION 81.30				
0.0	81.30	PAVEMENT STRUCTURE: 150mm asphaltic concrete over 300mm concrete slab over 350mm granular base/subbase		1	AS	
0.80	80.50	FILL: stiff, grey clayey silt, trace sand, trace gravel, moist		2	SS	13
1.5	79.8	SANDY CLAYEY SILT TILL: stiff to hard, grey sandy clayey silt till, trace gravel, moist		3	SS	22
				4	SS	34
				5	SS	49
4.6	76.7	thinly laminted shale layers		6	SS	50/5cm
				7	SS	50/8cm
				8	SS	50/10cm
7.1	74.2	Borehole terminated at 7.1M.		9	SS	50/8cm

ELEVATION SCALE: 81, 80, 79, 78, 77, 76, 75

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

Bentonite Seal

6 35 44 15

Filter Sand
El. 77.5

Screen

El. 75.7

Upon Completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.4	77.9
2021-09-27	-	81.3
2021-10-01	3.8	77.5
2021-11-05	-	81.3

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH19

17T; 4824886.2N; 615618.9E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 23, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	80.80	SURFACE ELEVATION 80.80			
0.0		PAVEMENT STRUCTURE: 100mm asphaltic concrete over 300mm concrete slab over 400mm granular base/subbase	1	AS	
0.80	80.00	FILL: firm to very stiff, brown clayey silt, trace sand, trace gravel, moist	2	SS	6
1.0					
2.0			3	SS	22
			4	SS	9
3.0	77.8	SANDY CLAYEY SILT TILL: hard, grey sandy clayey silt till, moist	5	SS	17
3.8	77.0	thinly laminated shale layers	6	SS	50/8cm
4.0			7	SS	50/5cm
5.0					
6.0	6.1		8	SS	50/2cm
	74.7	Borehole terminated at 6.1m			

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●

ELEVATION SCALE: 80, 79, 78, 77, 76, 75

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
Bentonite Seal
Filter Sand
El. 77.3
11 29 42 18
Screen

Upon completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	5.6	75.2
2021-09-27	-	80.8
2021-10-01	3.5	77.3
2021-11-05	-	80.8

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH20

17T; 4824705.2N; 615480.4E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 23, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 77.80				
0.0		PAVEMENT STRUCTURE: 125mm asphaltic concrete over 300mm concrete slab over 375mm granular base/subbase				
0.80	77.00	FILL: stiff, brown clayey silt, trace sand, trace gravel, moist		1	SS	15
1.5	76.3	SANDY CLAYEY SILT TILL: very stiff to hard, brown to grey sandy clayey silt till, trace gravel, moist		2	SS	20
2.0				3	SS	22
3.0	74.8	thinly laminted shale layers		4	SS	50/10cm
4.0				5	SS	50/10cm
5.0						
6.0				6	SS	50/8cm
7.0						
7.7	70.1	Borehole terminated at 7.7m		7	SS	50/5cm
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						

ELEVATION SCALE: 77, 76, 75, 74, 73, 72, 71

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

Bentonite Seal

El. 73.6
Filter Sand

El. 73.2

Screen

7 28 40 25

Upon completion, no cave-in, no water

Water Level Readings:

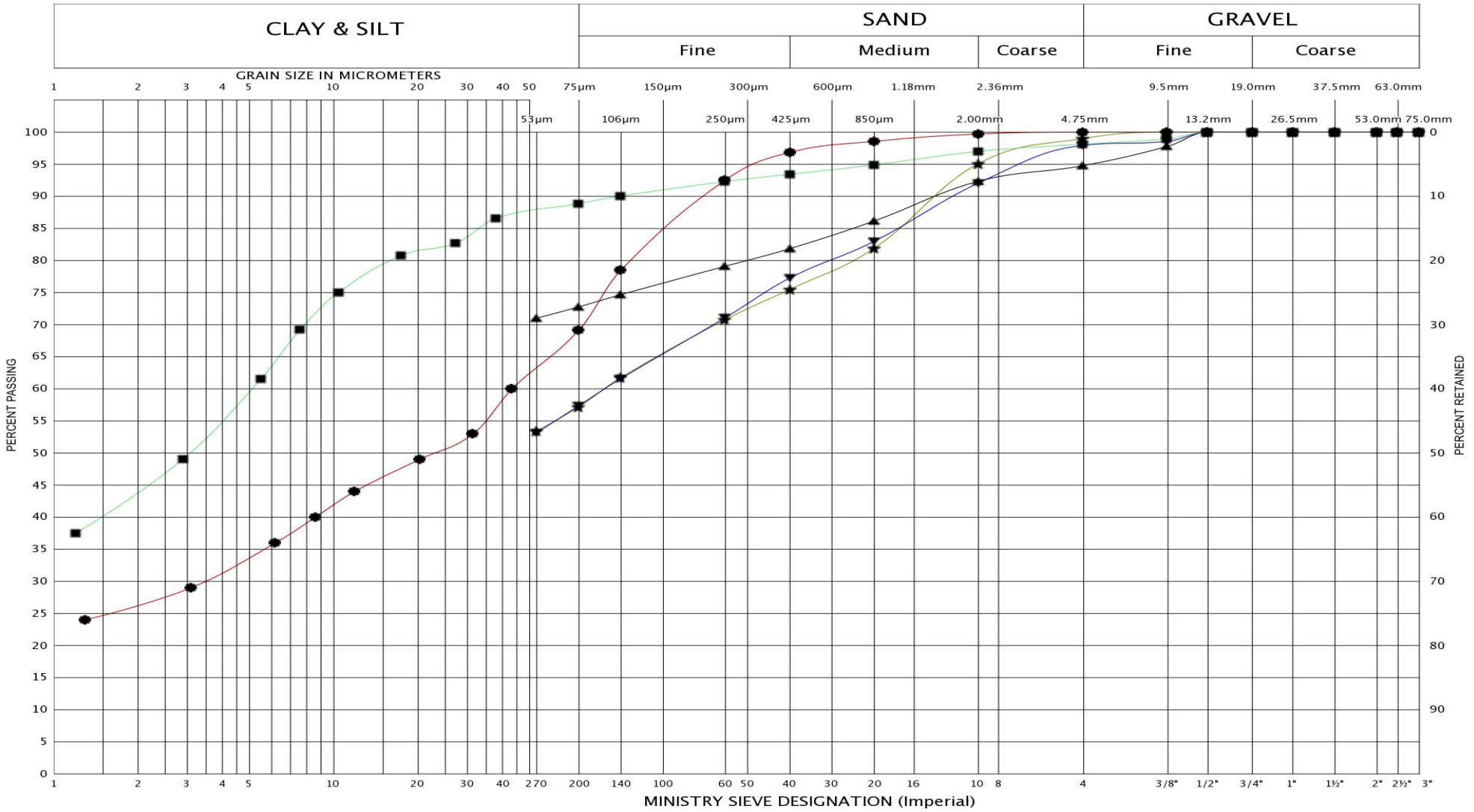
Date	Depth	Elev.
2021-07-26	4.2	73.6
2021-09-27	-	77.8
2021-10-01	4.2	73.6
2021-11-05	-	77.8

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	1	3	15	16	17
	SAMPLE	3	3	3	3	3
	SYMBOL	●	■	▲	★	▼

Peto MacCallum Ltd.
CONSULTING ENGINEERS

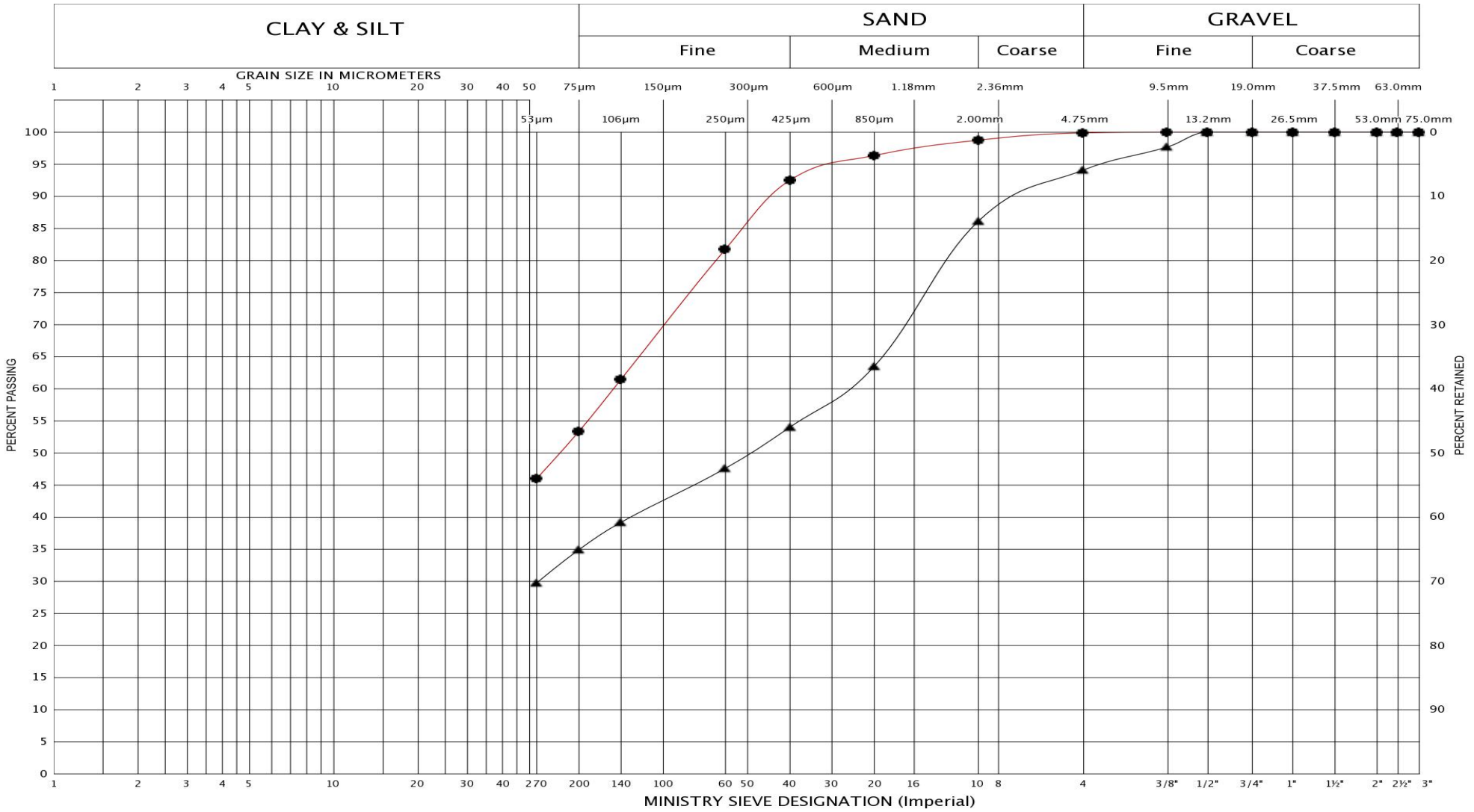
GRAIN SIZE DISTRIBUTION

CLAYEY SILT/SILTY CLAY, trace sand/sandy, trace gravel (Fill)

FIG No.: GS-1

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	12	13
	SAMPLE	6	7
	SYMBOL	●	▲

Peto MacCallum Ltd.
CONSULTING ENGINEERS

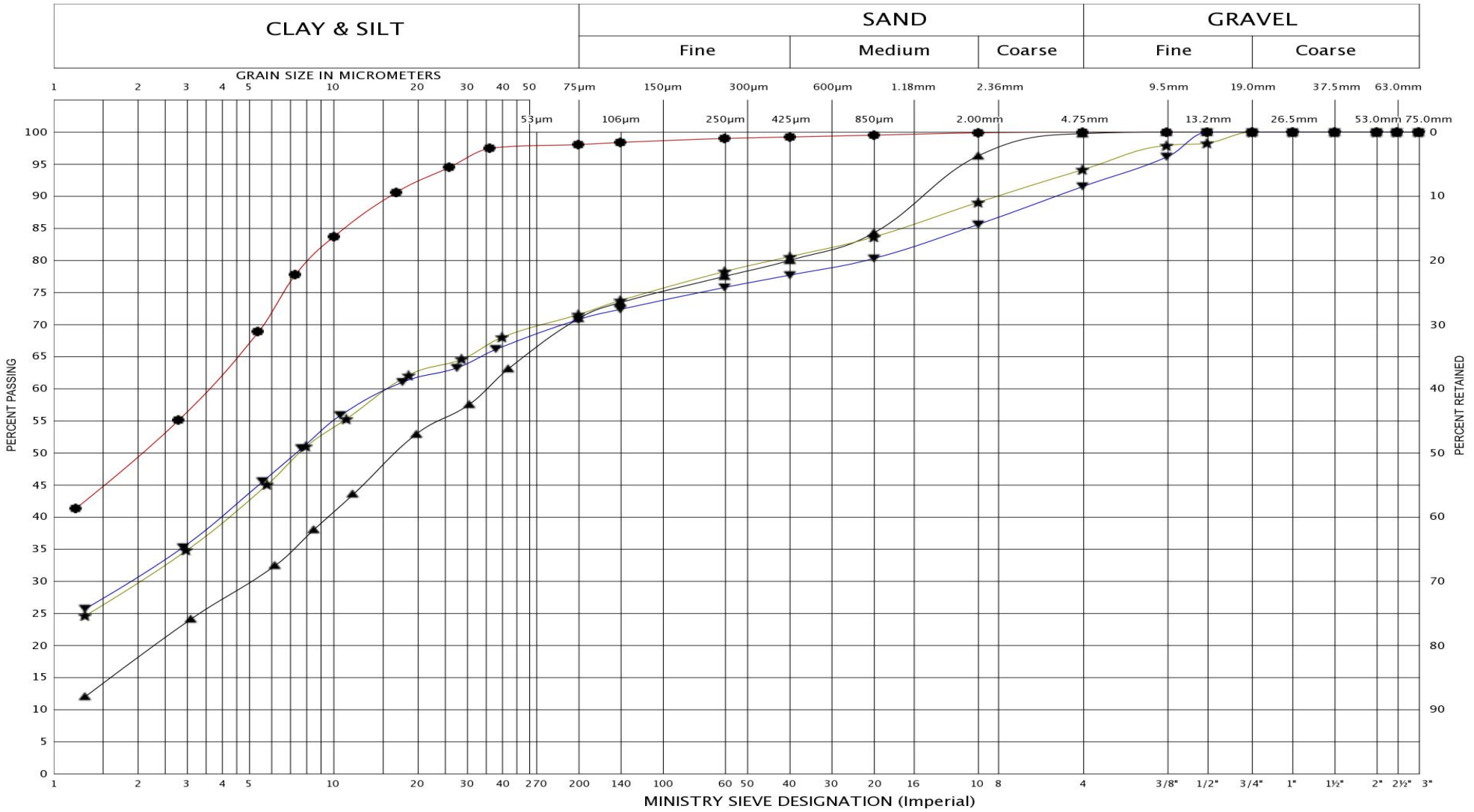
GRAIN SIZE DISTRIBUTION

SANDY SILT/SILTY SAND, trace gravel (Fill)

FIG No.: GS-2

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	4	4	10	16
	SAMPLE	3	4	2	5
	SYMBOL	✱	▼	●	▲

PML Peto MacCallum Ltd. CONSULTING ENGINEERS

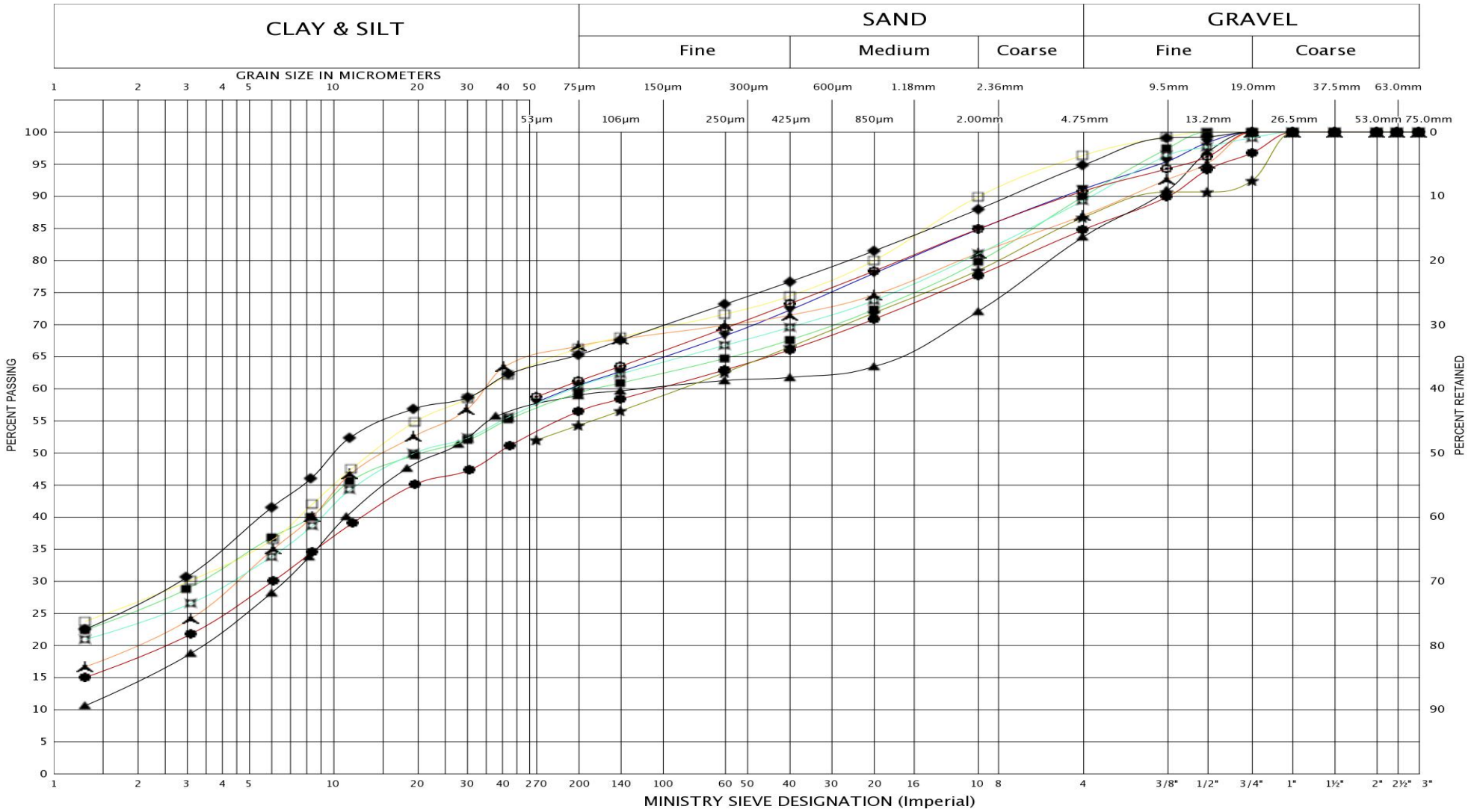
GRAIN SIZE DISTRIBUTION

SILTY CLAY, trace sand/sandy, trace gravel

FIG No.: GS-3

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	1	2	2	3	5	6	6	6	6	7
	SAMPLE	4	4	6	4	11	4	5	6	7	3
	SYMBOL	●	✱	▲	▼	■	⊕	✖	⅄	□	◆

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CONSULTING ENGINEERS

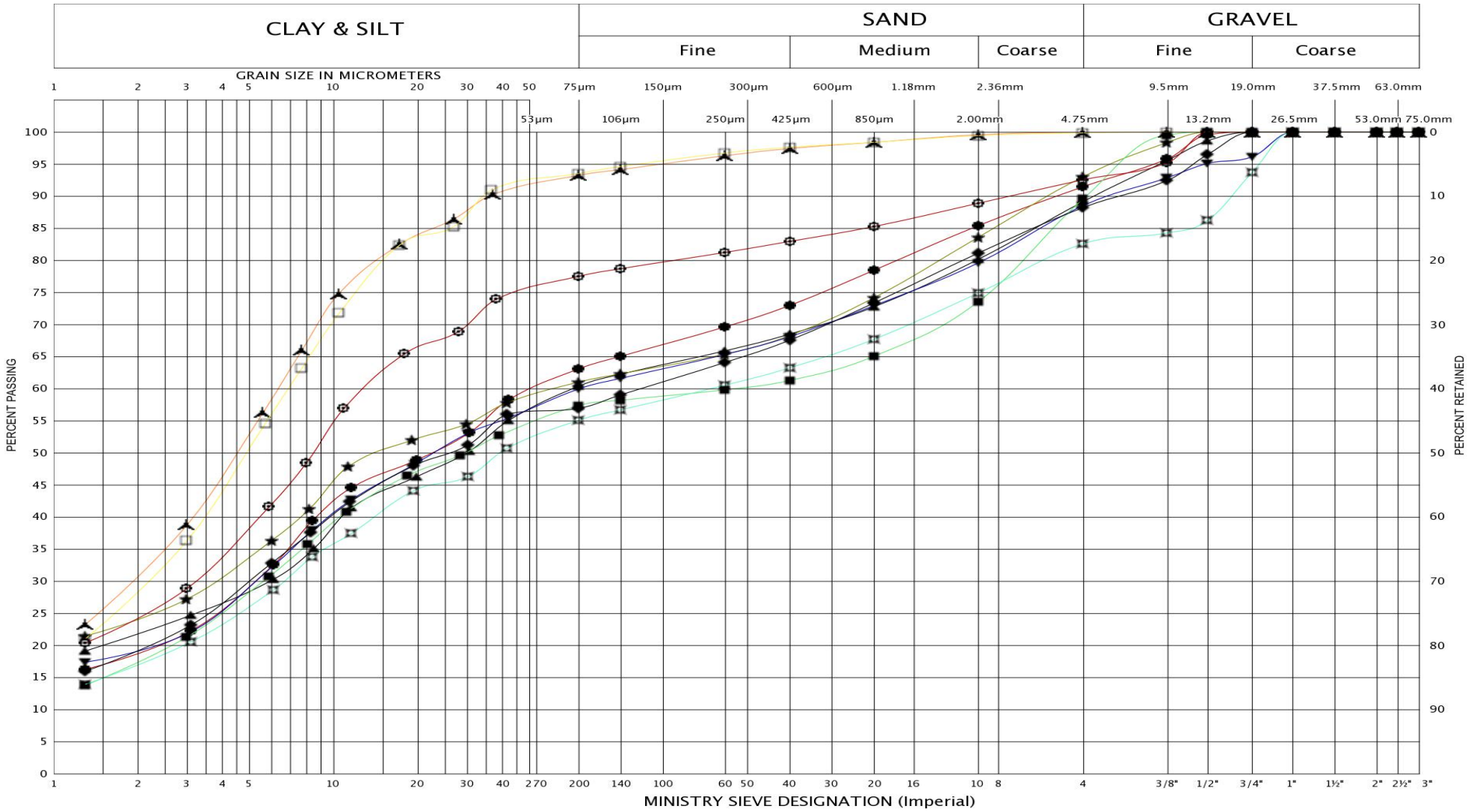
GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: GS-4A

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	7	7	8	8	9	10	10	10	10	11
	SAMPLE	5	7	5	10	5	4	6	7	8	4
	SYMBOL	●	▲	▼	★	■	⊠	⊙	□	⅄	◆

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

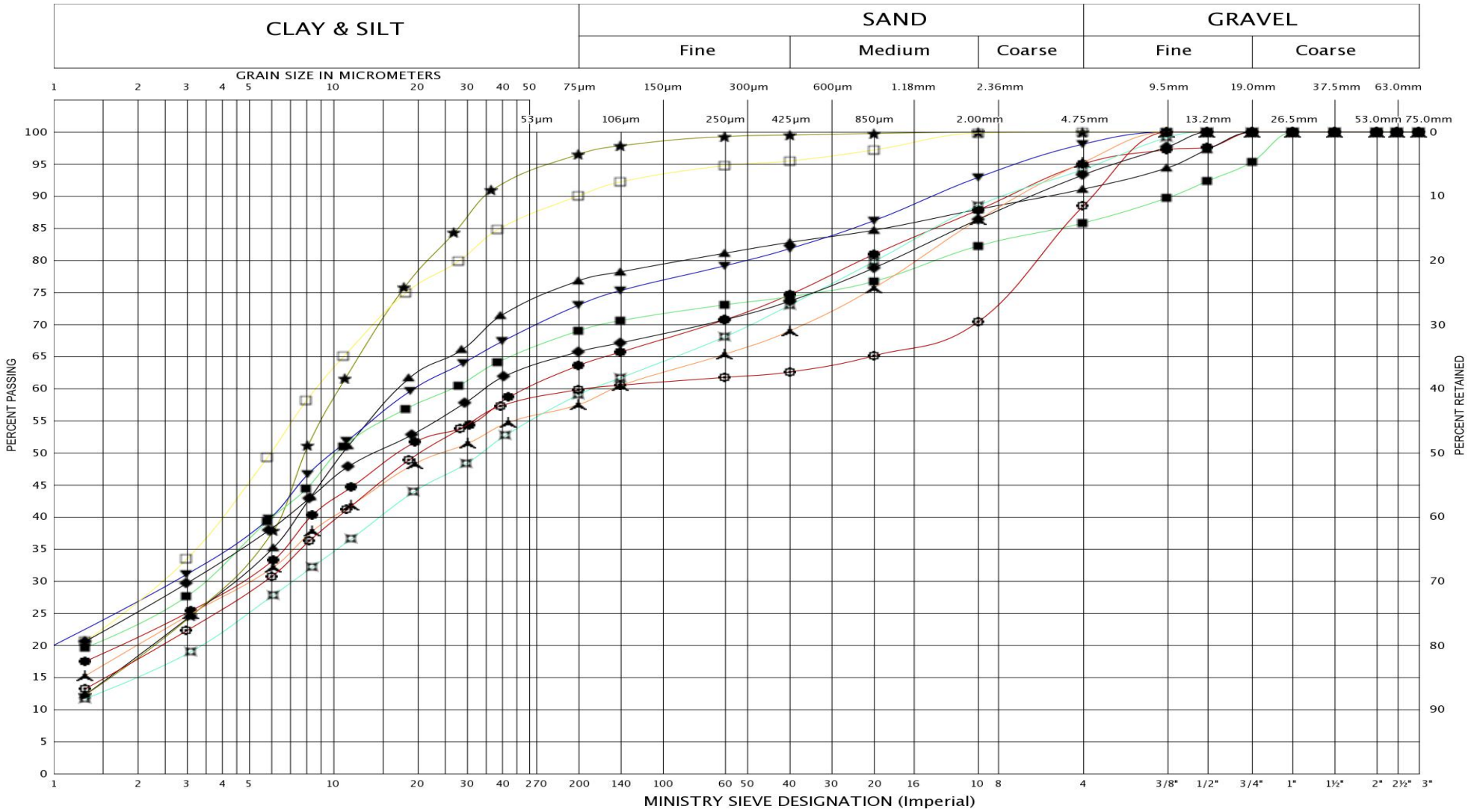
GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: GS-4B

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	11	12	13	14	15	16	17	18	19	20
	SAMPLE	5	9	9	6	4	9	4	5	6	6
	SYMBOL	●	▲	★	▼	■	⅄	□	⊠	⊕	◆

PML Peto MacCallum Ltd. CONSULTING ENGINEERS

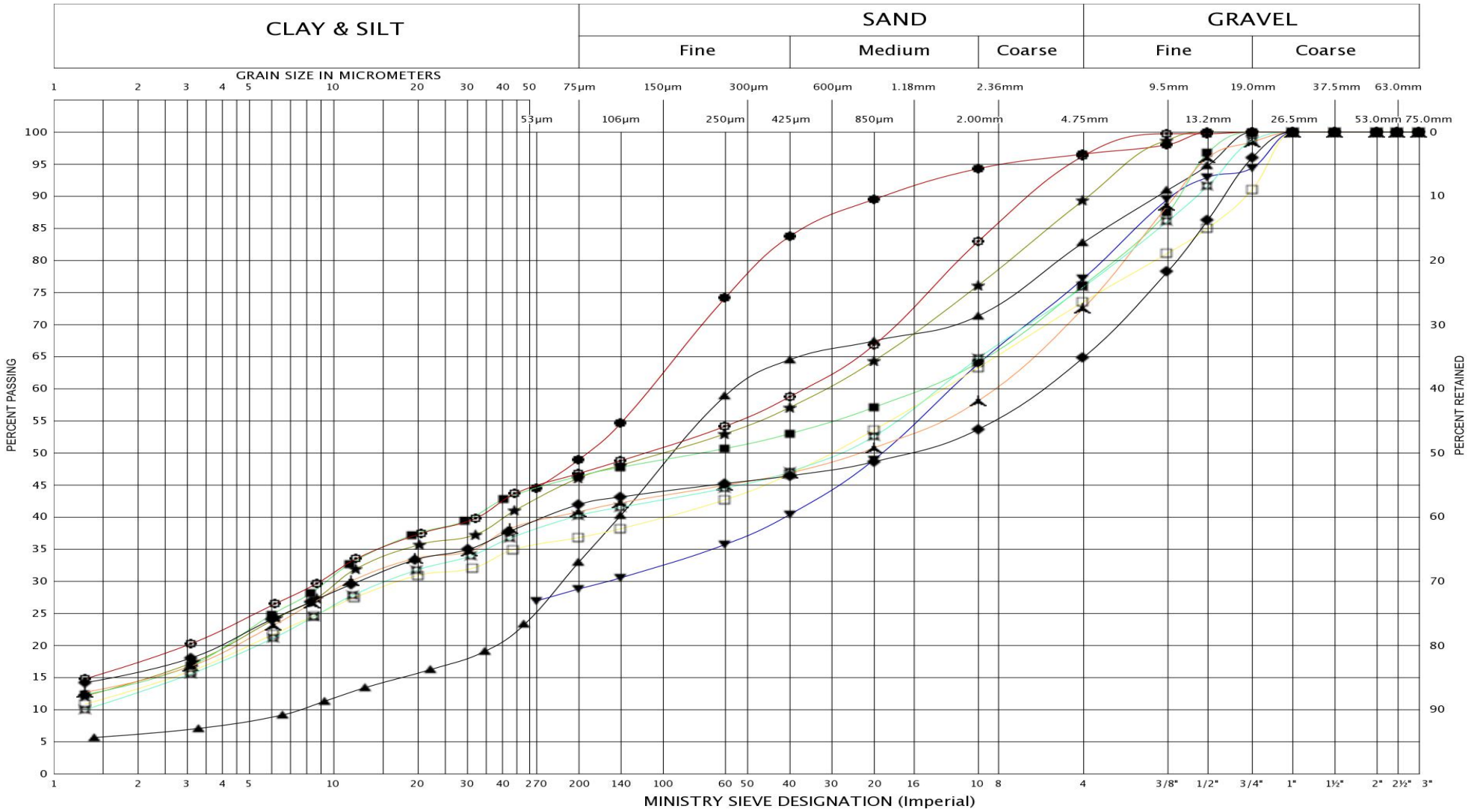
GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: GS-4C

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	1	1	1	1	2	3	3	4	7	8
	SAMPLE	5	6	7	10	7	5	6	5	10	6
	SYMBOL	●	▲	▼	★	■	⅄	□	⊠	⊙	◆

Peto MacCallum Ltd.
CONSULTING ENGINEERS

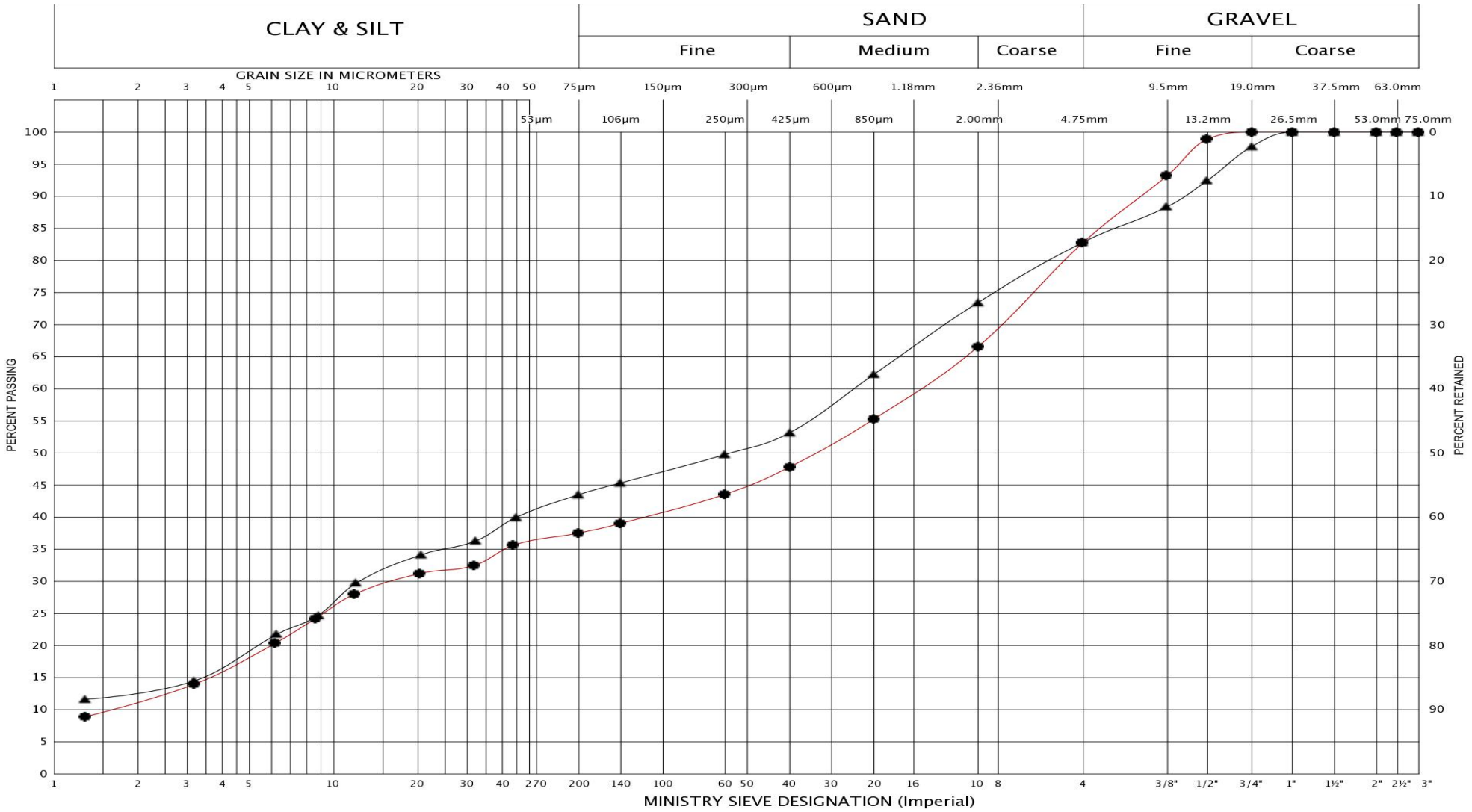
GRAIN SIZE DISTRIBUTION

CLAYEY SAND, trace gravel to gravelly (Till)

FIG No.: GS-5A

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	9	11
	SAMPLE	4	6
	SYMBOL	▲	●

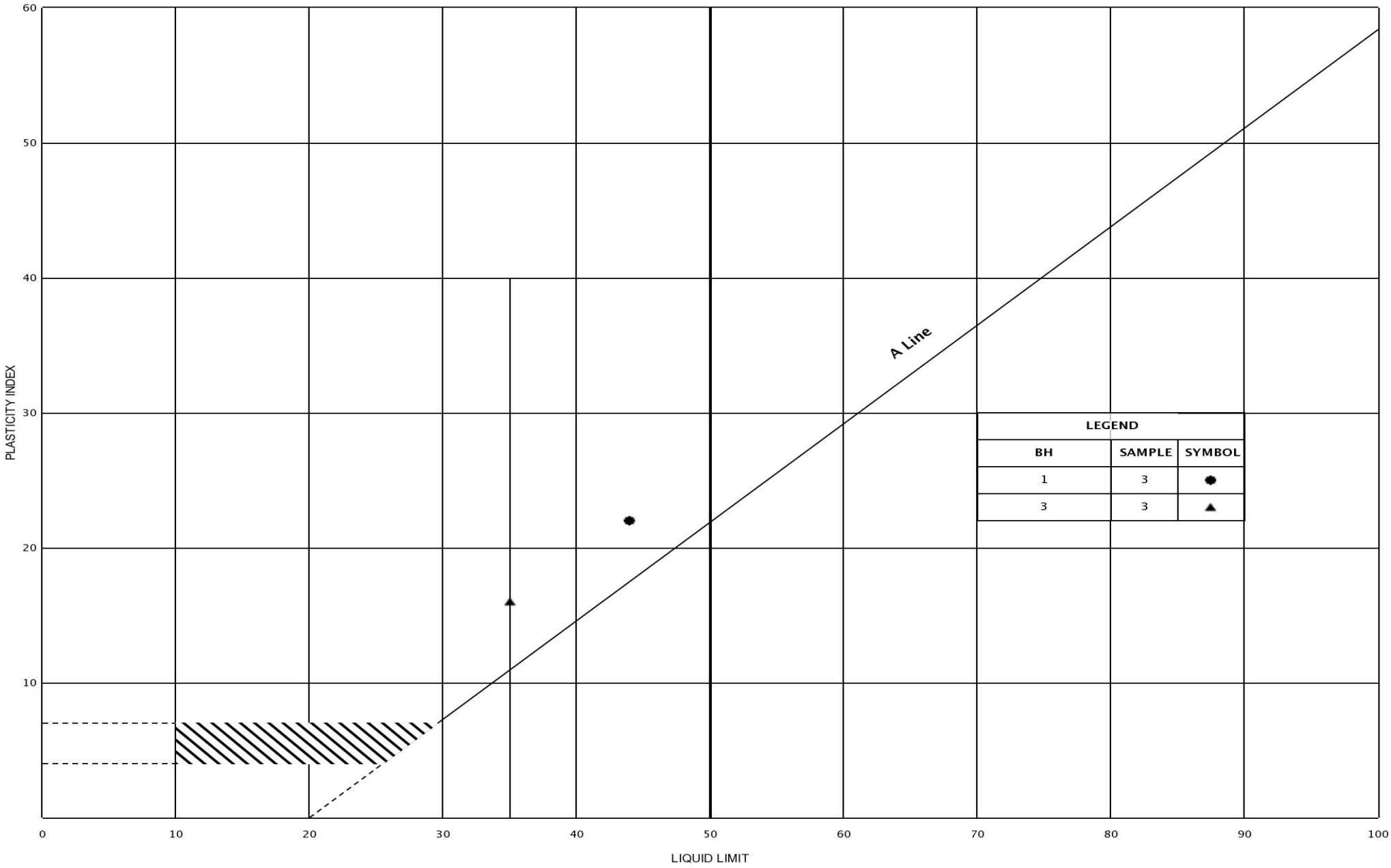
Peto MacCallum Ltd.
CONSULTING ENGINEERS

GRAIN SIZE DISTRIBUTION

CLAYEY SAND, trace gravel to gravelly (Till)

FIG No.: GS-5B

Project No.: 21TF001A



Peto MacCallum Ltd.
CONSULTING ENGINEERS

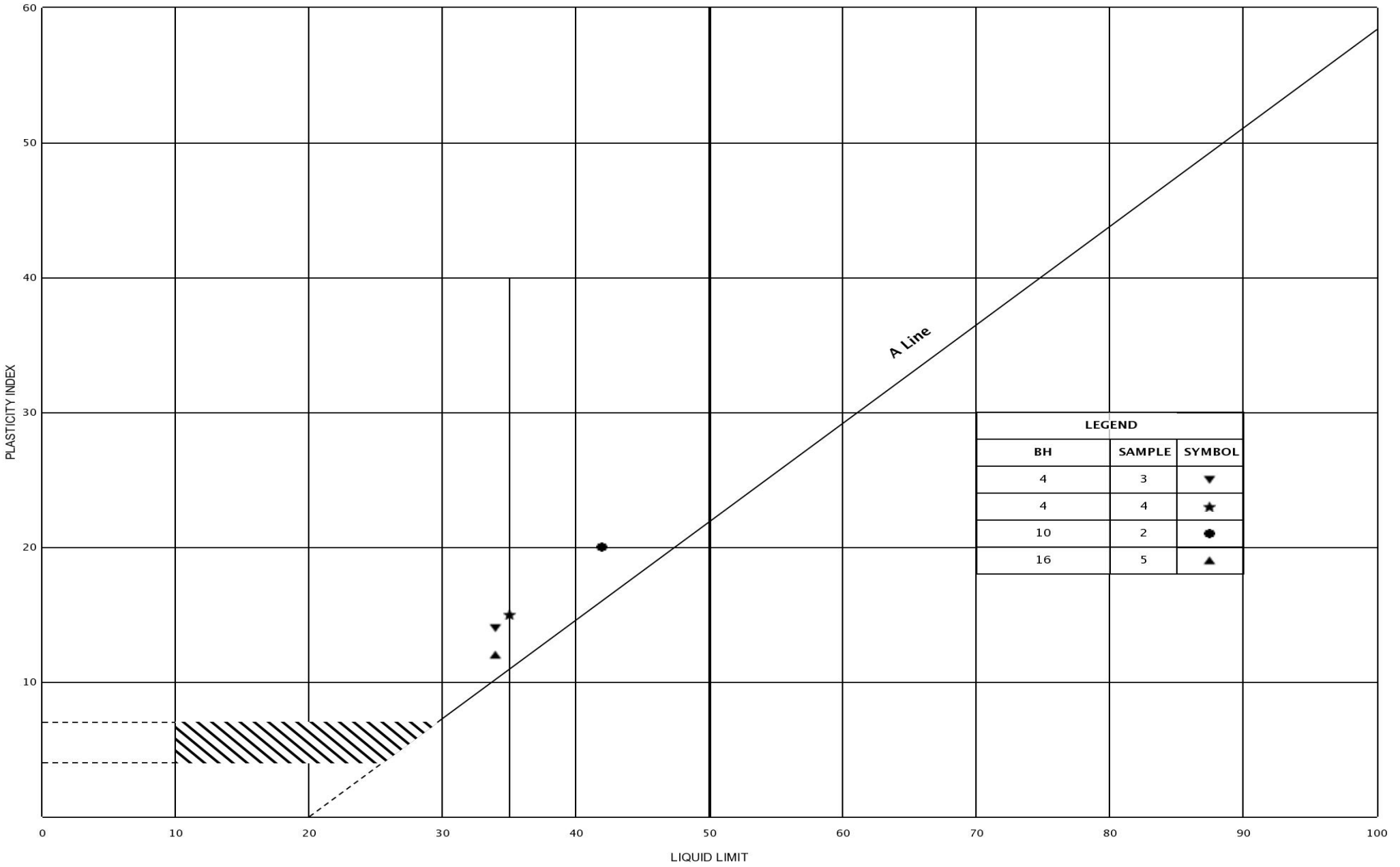
PLASTICITY CHART

CLAYEY SILTSILTY CLAY, trace sandsandy, trace gravel
(Fill)

FIG No.: PC-1

HWY.:

Assg No.



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CONSULTING ENGINEERS

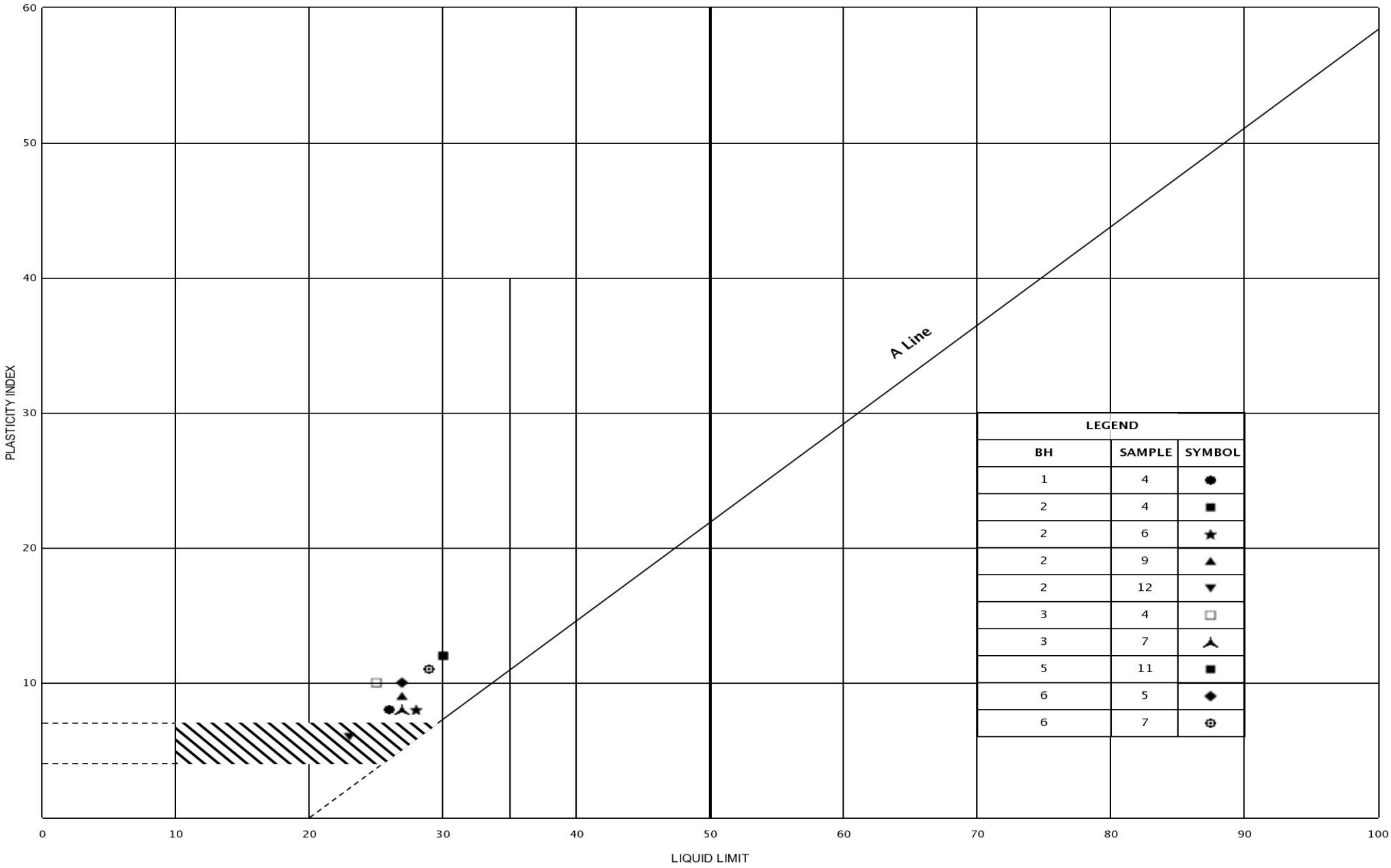
PLASTICITY CHART

SILTY CLAY, trace sand/sandy, trace gravel

FIG No.: PC-2

HWY.:

Assg No.



LEGEND		
BH	SAMPLE	SYMBOL
1	4	●
2	4	■
2	6	★
2	9	▲
2	12	▼
3	4	□
3	7	⅄
5	11	■
6	5	◆
6	7	⊙

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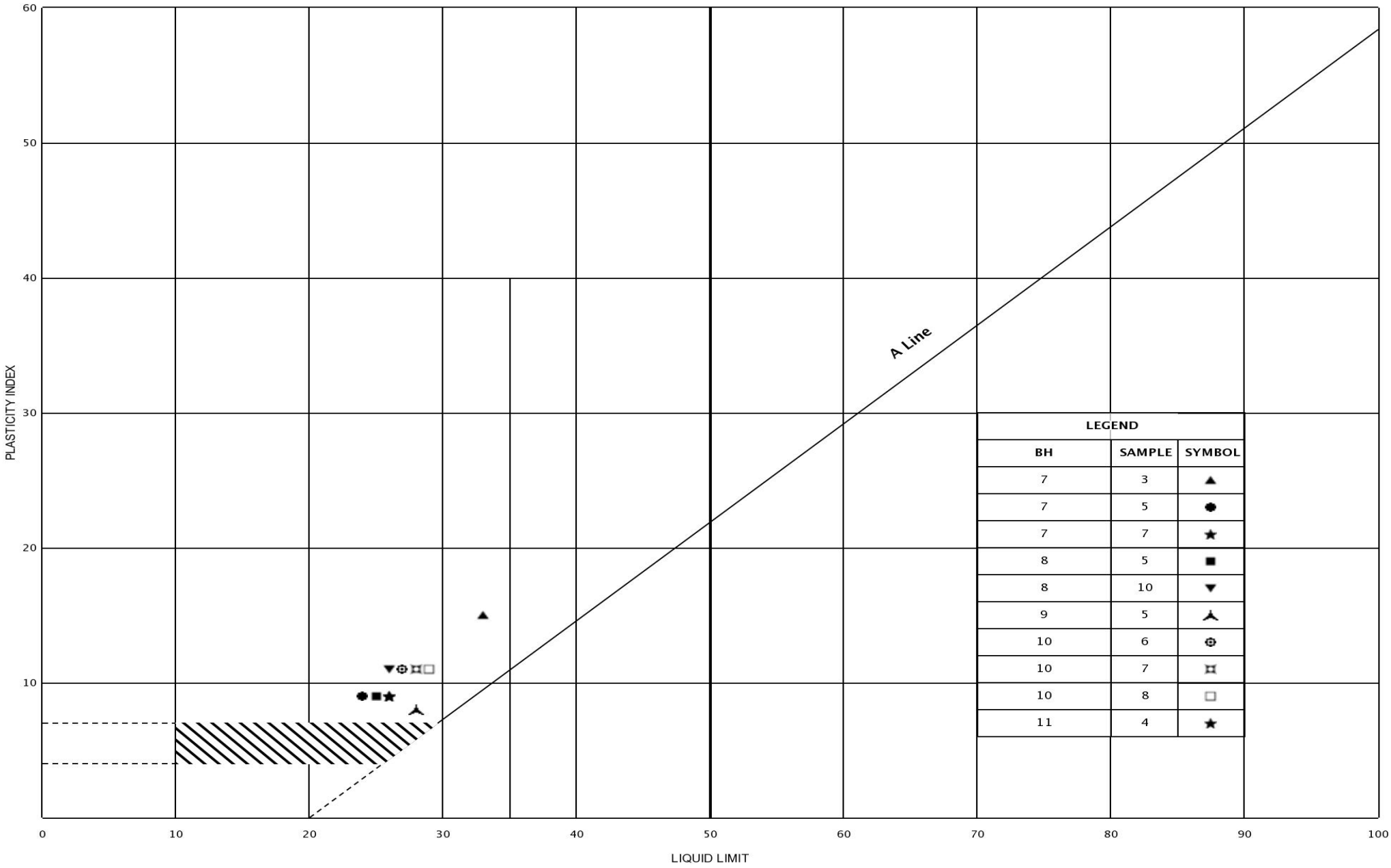
PLASTICITY CHART

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: PC-3A

HWY.:

Assg No.



LEGEND		
BH	SAMPLE	SYMBOL
7	3	▲
7	5	●
7	7	★
8	5	■
8	10	▼
9	5	⅄
10	6	⊕
10	7	⌑
10	8	□
11	4	★

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

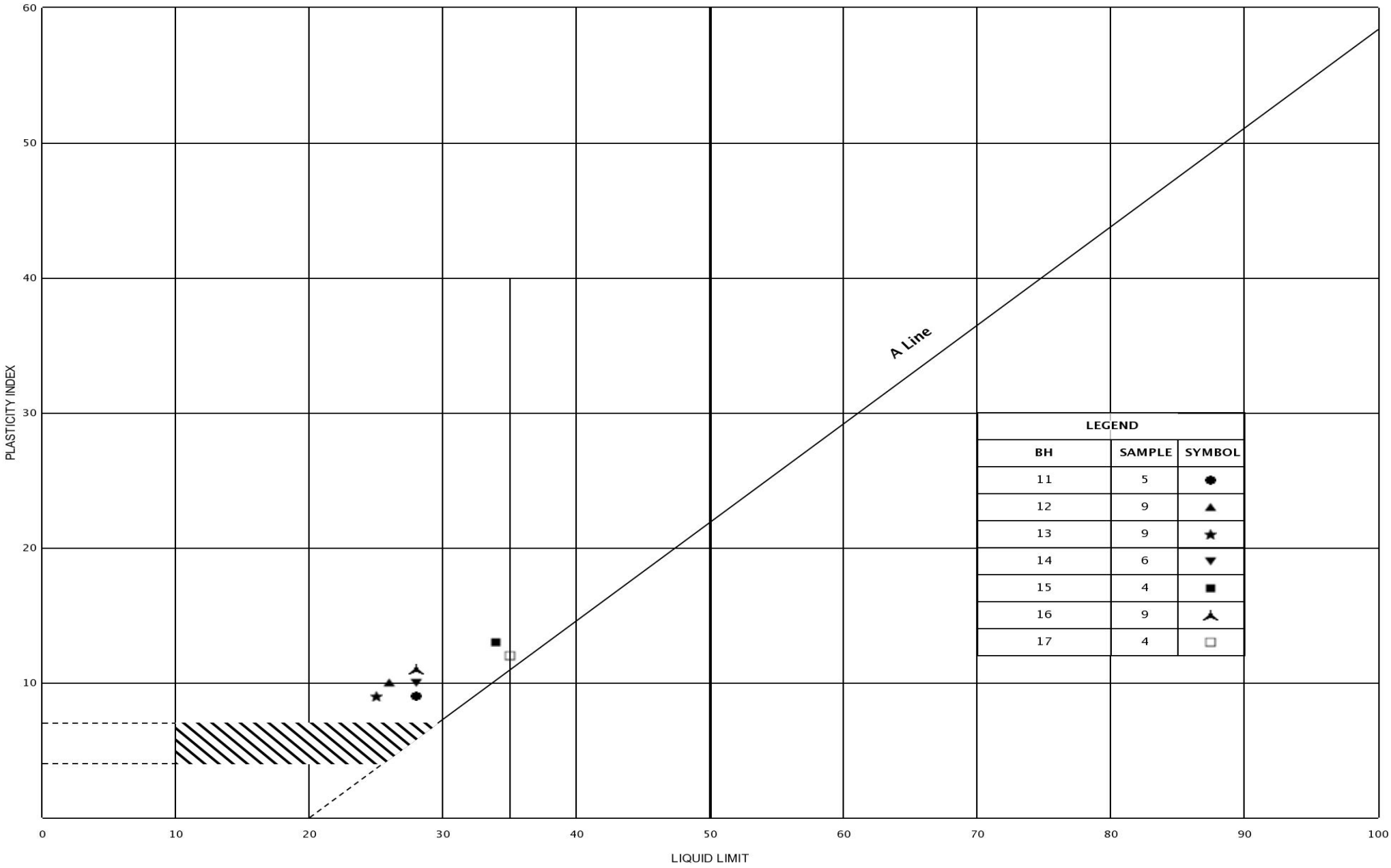
PLASTICITY CHART

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: PC-3B

HWY.:

Assg No.



Peto MacCallum Ltd.
CONSULTING ENGINEERS

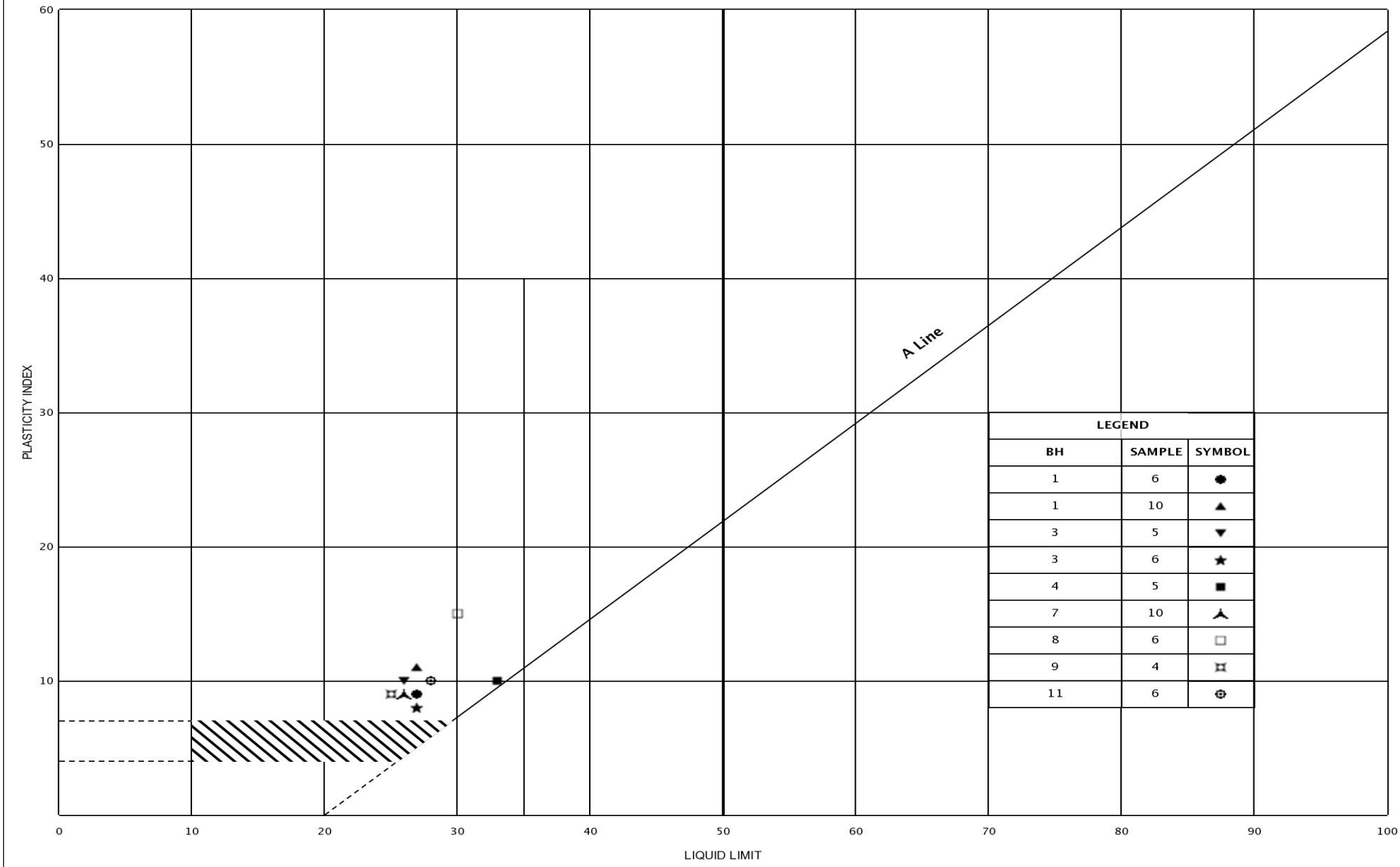
PLASTICITY CHART

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: PC-3C

HWY.:

Assg No.



Peto MacCallum Ltd.
CONSULTING ENGINEERS

PLASTICITY CHART

CLAYEY SAND, trace gravel to gravelly (Till)

FIG No.: PC-4

HWY.:

Assg No.

APPENDIX A

Certificates of Chemical Analyses, QA/QC Measures, and Chain of Custody Records

FINAL REPORT

CA14164-JUN21 R

21TF001

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14164-JUN21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	705-652-2143
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	brad.moore@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA14164-JUN21
Project	21TF001	Received	06/04/2021
Order Number		Approved	06/09/2021
Samples	Soil (11)	Report Number	CA14164-JUN21 R
		Date Reported	06/09/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

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

Chain of Custody Number:

BH15, SS1 - Surrogate recovery is outside of acceptance for 2-Fluorophenol, Phenol-d6 and 2,4,6-Tribromophenol due to sample matrix.

SIGNATORIES

Brad Moore Hon. B.Sc

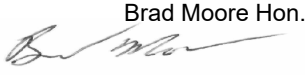


TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-11

Exceedance Summary..... 12

QC Summary..... 13-21

Legend..... 22

Annexes..... 23

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number				8	10	12	16
Sample Name				BH1, SS1	BH1, SS3	BH2, SS2	BH15, SS3
Sample Matrix				Soil	Soil	Soil	Soil
Sample Date				02/06/2021	02/06/2021	03/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
BTEX							
Benzene	µg/g	0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	µg/g	0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05
Xylene (total)	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05
o-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number				9	13	15	17	18
Sample Name				BH1, SS2	BH2, SS3	BH15, SS2	BH15, SS5	BH15, SS5 Dup
Sample Matrix				Soil	Soil	Soil	Soil	Soil
Sample Date				02/06/2021	03/06/2021	01/06/2021	01/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
Hydrides								
Antimony	µg/g	0.8	1.3	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Arsenic	µg/g	0.5	18	2.5	4.0	2.2	6.9	5.7
Selenium	µg/g	0.7	1.5	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	8	9	10	11	12	13	14	15
			Sample Name	BH1, SS1	BH1, SS2	BH1, SS3	BH2, SS1	BH2, SS2	BH2, SS3	BH15, SS1	BH15, SS2
			Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Sample Date	02/06/2021	02/06/2021	02/06/2021	03/06/2021	03/06/2021	03/06/2021	01/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics											
Moisture Content	%	-		14.3	15.7	21.5	21.2	12.8	12.8	5.3	12.6
Barium	µg/g	0.1	220		66				70		64
Beryllium	µg/g	0.02	2.5		0.47				0.71		0.38
Boron	µg/g	1	36		5				10		4
Cadmium	µg/g	0.02	1.2		0.10				0.09		0.15
Chromium	µg/g	0.5	70		16				21		11
Cobalt	µg/g	0.01	21		6.8				15		5.8
Copper	µg/g	0.1	92		8.2				26		15
Lead	µg/g	0.1	120		9.0				13		11
Molybdenum	µg/g	0.1	2		0.2				0.2		0.3
Nickel	µg/g	0.5	82		12				29		10
Silver	µg/g	0.05	0.5		< 0.05				< 0.05		< 0.05
Thallium	µg/g	0.02	1		0.08				0.15		0.06
Uranium	µg/g	0.002	2.5		0.79				0.60		0.59
Vanadium	µg/g	3	86		24				27		19
Zinc	µg/g	0.7	290		35				61		35
Water Soluble Boron	µg/g	0.5			< 0.5				< 0.5		< 0.5

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	16	17	18
			Sample Name	BH15, SS3	BH15, SS5	BH15, SS5 Dup
			Sample Matrix	Soil	Soil	Soil
			Sample Date	01/06/2021	01/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Metals and Inorganics						
Moisture Content	%	-		13.2	9.6	13.4
Barium	µg/g	0.1	220		150	92
Beryllium	µg/g	0.02	2.5		0.74	0.87
Boron	µg/g	1	36		12	9
Cadmium	µg/g	0.02	1.2		0.03	0.06
Chromium	µg/g	0.5	70		22	25
Cobalt	µg/g	0.01	21		15	16
Copper	µg/g	0.1	92		33	26
Lead	µg/g	0.1	120		9.3	13
Molybdenum	µg/g	0.1	2		0.3	0.4
Nickel	µg/g	0.5	82		28	33
Silver	µg/g	0.05	0.5		< 0.05	< 0.05
Thallium	µg/g	0.02	1		0.15	0.14
Uranium	µg/g	0.002	2.5		0.53	0.59
Vanadium	µg/g	3	86		28	32
Zinc	µg/g	0.7	290		60	66

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number				9	13	15	17
Sample Name				BH1, SS2	BH2, SS3	BH15, SS2	BH15, SS5
Sample Matrix				Soil	Soil	Soil	Soil
Sample Date				02/06/2021	03/06/2021	01/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
Other (ORP)							
Mercury	ug/g	0.05	0.27	< 0.05	< 0.05	0.14	
Sodium Adsorption Ratio	No unit	0.2	2.4	2.5	1.7	31.2	2.7
SAR Calcium	mg/L	0.2		80.1	66.0	23.6	78.1
SAR Magnesium	mg/L	0.3		9.9	8.6	1.2	9.6
SAR Sodium	mg/L	0.1		87.9	55.1	572	95.2
Conductivity	mS/cm	0.002	0.57	1.4	1.1	5.1	1.6
pH	pH Units	0.05		7.07	7.89	7.63	7.92
Chromium VI	µg/g	0.2	0.66	< 0.2	< 0.2	< 0.2	
Free Cyanide	µg/g	0.05	0.051	< 0.05	< 0.05	< 0.05	

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

				Sample Number	9	11	14
				Sample Name	BH1, SS2	BH2, SS1	BH15, SS1
				Sample Matrix	Soil	Soil	Soil
				Sample Date	02/06/2021	03/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
PAHs						
Acenaphthene	µg/g	0.05	0.072	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/g	0.05	0.093	< 0.05	< 0.05	< 0.05
Anthracene	µg/g	0.05	0.16	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.36	0.19	< 0.05	0.06
Benzo(a)pyrene	µg/g	0.05	0.3	0.16	< 0.05	0.08
Benzo(b+j)fluoranthene	µg/g	0.05	0.47	0.21	< 0.05	0.13
Benzo(ghi)perylene	µg/g	0.1	0.68	< 0.1	< 0.1	0.12
Benzo(k)fluoranthene	µg/g	0.05	0.48	0.08	< 0.05	< 0.05
Chrysene	µg/g	0.05	2.8	0.16	< 0.05	0.08
Dibenzo(a,h)anthracene	µg/g	0.06	0.1	< 0.06	< 0.06	< 0.06
Fluoranthene	µg/g	0.05	0.56	0.46	< 0.05	0.11
Fluorene	µg/g	0.05	0.12	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.1	0.23	< 0.1	< 0.1	< 0.1
1-Methylnaphthalene	µg/g	0.05		< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/g	0.05		< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2-(1-)	µg/g	0.05	0.59	< 0.05	< 0.05	0.08
Naphthalene	µg/g	0.05	0.09	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/g	0.05	0.69	0.08	< 0.05	0.11
Pyrene	µg/g	0.05	1	0.36	< 0.05	0.15

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PCBs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number				11
Sample Name				BH2, SS1
Sample Matrix				Soil
Sample Date				03/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	µg/g	0.3	0.3	< 0.3

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number				8	12	16
Sample Name				BH1, SS1	BH2, SS2	BH15, SS3
Sample Matrix				Soil	Soil	Soil
Sample Date				02/06/2021	03/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
PHCs						
F1 (C6-C10)	µg/g	10	25	< 10	< 10	< 10
F1-BTEX (C6-C10)	µg/g	10		< 10	< 10	< 10
F2 (C10-C16)	µg/g	10	10	< 10	< 10	< 10
F3 (C16-C34)	µg/g	50	240	227	< 50	< 50
F4 (C34-C50)	µg/g	50	120	168	< 50	< 50
Chromatogram returned to baseline at nC50	Yes / No	-		YES	YES	YES

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - SVOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number			9	11	14
	Sample Name			BH1, SS2	BH2, SS1	BH15, SS1
	Sample Matrix			Soil	Soil	Soil
	Sample Date			02/06/2021	03/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
SVOC Surrogates						
Surr Nitrobenzene-d5	Surr Rec %	-		87	74	62
Surr 2-Fluorobiphenyl	Surr Rec %	-		85	70	63
Surr 4-Terphenyl-d14	Surr Rec %	-		95	68	66
Surr 2-Fluorophenol	Surr Rec %	-		85	87	0.0
Surr Phenol-d6	Surr Rec %	-		86	83	23
Surr 2,4,6-Tribromophenol	Surr Rec %	-		85	50	0.0

PACKAGE: **REG153 - THMs (VOC)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number			10	16
	Sample Name			BH1, SS3	BH15, SS3
	Sample Matrix			Soil	Soil
	Sample Date			02/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
THMs (VOC)					
Bromodichloromethane	µg/g	0.05	0.05	< 0.05	< 0.05
Bromoform	µg/g	0.05	0.05	< 0.05	< 0.05
Dibromochloromethane	µg/g	0.05	0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	10	16
			Sample Name	BH1, SS3	BH15, SS3
			Sample Matrix	Soil	Soil
			Sample Date	02/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
VOC Surrogates					
Surr 1,2-Dichloroethane-d4	Surr Rec %	-		102	101
Surr 4-Bromofluorobenzene	Surr Rec %	-		94	94
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-		97	97

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	10	16
			Sample Name	BH1, SS3	BH15, SS3
			Sample Matrix	Soil	Soil
			Sample Date	02/06/2021	01/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
VOCs					
Acetone	µg/g	0.5	0.5	< 0.5	< 0.5
Bromomethane	µg/g	0.05	0.05	< 0.05	< 0.05
Carbon tetrachloride	µg/g	0.05	0.05	< 0.05	< 0.05
Chlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
Chloroform	µg/g	0.05	0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
Dichlorodifluoromethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1-Dichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,2-Dichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1-Dichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05
trans-1,2-Dichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10	16
Sample Name	BH1, SS3	BH15, SS3
Sample Matrix	Soil	Soil
Sample Date	02/06/2021	01/06/2021

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
cis-1,2-Dichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05
1,2-Dichloropropane	µg/g	0.05	0.05	< 0.05	< 0.05
cis-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03
trans-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03
1,3-dichloropropene (total)	µg/g	0.05	0.05	< 0.05	< 0.05
Ethylenedibromide	µg/g	0.05	0.05	< 0.05	< 0.05
n-Hexane	µg/g	0.05	0.05	< 0.05	< 0.05
Methyl ethyl ketone	µg/g	0.5	0.5	< 0.5	< 0.5
Methyl isobutyl ketone	µg/g	0.5	0.5	< 0.5	< 0.5
Methyl-t-butyl Ether	µg/g	0.05	0.05	< 0.05	< 0.05
Methylene Chloride	µg/g	0.05	0.05	< 0.05	< 0.05
Styrene	µg/g	0.05	0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,1-Trichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
Trichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05
Trichlorofluoromethane	µg/g	0.05	0.25	< 0.05	< 0.05
Vinyl Chloride	µg/g	0.02	0.02	< 0.02	< 0.02

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED L1
BH1, SS1				
F4 (C34 to C50)	CCME Tier 1	µg/g	168	120
BH1, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	1.4	0.57
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	2.5	2.4
BH2, SS3				
Conductivity	EPA 6010/SM 2510	mS/cm	1.1	0.57
BH15, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	5.1	0.57
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	31.2	2.4
BH15, SS5				
Conductivity	EPA 6010/SM 2510	mS/cm	1.6	0.57
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	2.7	2.4

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 | Internal ref.: ME-CA-IENVIEWL-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
Conductivity	EWL0135-JUN21	mS/cm	0.002	<0.002	2	10	99	90	110	NA		

Cyanide by SFA

Method: SM 4500 | 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
Free Cyanide	SKA5024-JUN21	µg/g	0.05	<0.05	ND	20	103	80	120	100	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | 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	SKA5022-JUN21	ug/g	0.2	<0.2	ND	20	94	80	120	75	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-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	EMS0046-JUN21	ug/g	0.05	<0.05	ND	20	100	80	120	97	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

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
SAR Calcium	ESG0024-JUN21	mg/L	0.2	<0.09	1	20	105	80	120	102	70	130
SAR Magnesium	ESG0024-JUN21	mg/L	0.3	<0.02	1	20	113	80	120	101	70	130
SAR Sodium	ESG0024-JUN21	mg/L	0.1	<0.15	1	20	113	80	120	101	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENVISPE-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
Silver	EMS0046-JUN21	ug/g	0.05	<0.05	ND	20	100	70	130	97	70	130
Arsenic	EMS0046-JUN21	µg/g	0.5	<0.5	1	20	98	70	130	91	70	130
Barium	EMS0046-JUN21	ug/g	0.1	<0.1	4	20	102	70	130	92	70	130
Beryllium	EMS0046-JUN21	µg/g	0.02	<0.02	1	20	100	70	130	90	70	130
Boron	EMS0046-JUN21	µg/g	1	<1	3	20	107	70	130	91	70	130
Cadmium	EMS0046-JUN21	µg/g	0.02	<0.02	8	20	98	70	130	90	70	130
Cobalt	EMS0046-JUN21	µg/g	0.01	<0.01	3	20	100	70	130	96	70	130
Chromium	EMS0046-JUN21	µg/g	0.5	<0.5	2	20	102	70	130	93	70	130
Copper	EMS0046-JUN21	µg/g	0.1	<0.1	2	20	98	70	130	92	70	130
Molybdenum	EMS0046-JUN21	µg/g	0.1	<0.1	7	20	94	70	130	91	70	130
Nickel	EMS0046-JUN21	ug/g	0.5	<0.5	5	20	98	70	130	93	70	130
Lead	EMS0046-JUN21	µg/g	0.1	<0.1	3	20	107	70	130	105	70	130
Antimony	EMS0046-JUN21	µg/g	0.8	<0.8	ND	20	95	70	130	77	70	130
Selenium	EMS0046-JUN21	µg/g	0.7	<0.7	ND	20	97	70	130	91	70	130
Thallium	EMS0046-JUN21	µg/g	0.02	<0.02	7	20	99	70	130	90	70	130
Uranium	EMS0046-JUN21	µg/g	0.002	<0.002	ND	20	95	70	130	89	70	130
Vanadium	EMS0046-JUN21	µg/g	3	<3	4	20	100	70	130	92	70	130
Zinc	EMS0046-JUN21	µg/g	0.7	<0.7	2	20	96	70	130	89	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F1 (C6-C10)	GCM0132-JUN21	µg/g	10	<10	ND	30	107	80	120	93	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F2 (C10-C16)	GCM0110-JUN21	µg/g	10	<10	ND	30	118	80	120	104	60	140
F3 (C16-C34)	GCM0110-JUN21	µg/g	50	<50	ND	30	118	80	120	104	60	140
F4 (C34-C50)	GCM0110-JUN21	µg/g	50	<50	ND	30	118	80	120	104	60	140

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENVIEWL-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
pH	ARD0050-JUN21	pH Units	0.05		0	20	100	80	120			

Polychlorinated Biphenyls

Method: EPA 3570/8082A/8270C I Internal ref.: ME-CA-[ENVIGC-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	GCM0117-JUN21	µg/g	0.3	< 0.3	ND	40	78	60	140	74	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENVIGC-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
1-Methylnaphthalene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	83	50	140	87	50	140
2-Methylnaphthalene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	79	50	140	84	50	140
Acenaphthene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	86	50	140	91	50	140
Acenaphthylene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	83	50	140	89	50	140
Anthracene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	82	50	140	86	50	140
Benzo(a)anthracene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	84	50	140	88	50	140
Benzo(a)pyrene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	82	50	140	85	50	140
Benzo(b+j)fluoranthene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	85	50	140	90	50	140
Benzo(ghi)perylene	GCM0127-JUN21	µg/g	0.1	< 0.1	ND	40	77	50	140	81	50	140
Benzo(k)fluoranthene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	88	50	140	91	50	140
Chrysene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	85	50	140	88	50	140
Dibenzo(a,h)anthracene	GCM0127-JUN21	µg/g	0.06	< 0.06	ND	40	77	50	140	81	50	140
Fluoranthene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	86	50	140	91	50	140
Fluorene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	84	50	140	87	50	140
Indeno(1,2,3-cd)pyrene	GCM0127-JUN21	µg/g	0.1	< 0.1	ND	40	77	50	140	82	50	140
Naphthalene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	84	50	140	88	50	140
Phenanthrene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	84	50	140	89	50	140
Pyrene	GCM0127-JUN21	µg/g	0.05	< 0.05	ND	40	90	50	140	94	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	94	60	130	97	50	140
1,1,1-Trichloroethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	97	50	140
1,1,2,2-Tetrachloroethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	93	60	130	99	50	140
1,1,2-Trichloroethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	94	60	130	98	50	140
1,1-Dichloroethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	94	60	130	97	50	140
1,1-Dichloroethylene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	93	60	130	94	50	140
1,2-Dichlorobenzene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	99	50	140
1,2-Dichloroethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	99	50	140
1,2-Dichloropropane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	94	60	130	97	50	140
1,3-Dichlorobenzene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	97	50	140
1,4-Dichlorobenzene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	98	50	140
Acetone	GCM0131-JUN21	µg/g	0.5	< 0.5	ND	50	85	50	140	95	50	140
Benzene	GCM0131-JUN21	µg/g	0.02	< 0.02	ND	50	96	60	130	98	50	140
Bromodichloromethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	93	60	130	95	50	140
Bromoform	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	93	60	130	94	50	140
Bromomethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	86	50	140	80	50	140
Carbon tetrachloride	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	96	50	140
Chlorobenzene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	98	50	140
Chloroform	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	97	50	140
cis-1,2-Dichloroethylene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	96	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
cis-1,3-dichloropropene	GCM0131-JUN21	µg/g	0.03	< 0.03	ND	50	96	60	130	94	50	140
Dibromochloromethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	93	60	130	94	50	140
Dichlorodifluoromethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	69	50	140	58	50	140
Ethylbenzene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	100	50	140
Ethylenedibromide	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	98	50	140
n-Hexane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	84	50	140
m/p-xylene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	99	50	140
Methyl ethyl ketone	GCM0131-JUN21	µg/g	0.5	< 0.5	ND	50	89	50	140	93	50	140
Methyl isobutyl ketone	GCM0131-JUN21	µg/g	0.5	< 0.5	ND	50	95	50	140	100	50	140
Methyl-t-butyl Ether	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	94	60	130	97	50	140
Methylene Chloride	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	94	60	130	96	50	140
o-xylene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	100	50	140
Styrene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	100	50	140
Tetrachloroethylene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	98	60	130	97	50	140
Toluene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	98	50	140
trans-1,2-Dichloroethylene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	97	50	140
trans-1,3-dichloropropene	GCM0131-JUN21	µg/g	0.03	< 0.03	ND	50	96	60	130	93	50	140
Trichloroethylene	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	97	50	140
Trichlorofluoromethane	GCM0131-JUN21	µg/g	0.05	< 0.05	ND	50	90	50	140	90	50	140
Vinyl Chloride	GCM0131-JUN21	µg/g	0.02	< 0.02	ND	50	83	50	140	81	50	140

QC SUMMARY

Water Soluble Boron

Method: O.Reg. 15 3/04 | Internal ref.: ME-CA-[ENV] SPE-LAK-AN-003

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
Water Soluble Boron	ESG0019-JUN21	µg/g	0.5	<0.5	ND	20	102	80	120	112	70	130

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

Samples analysed as received. 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" 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. 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.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 021765 Page 1 of 2

Laboratory Information Section - Lab use only

Received By: Scott H
Received Date: 06/04/2021 (mm/dd/yy)
Received Time: 16:[illegible] (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): 5.2, 4.6, 5.6
LAB LIMS #: CA14164-65-Jun21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE. TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petromecall.com	Phone:
Email: Starafdar@petromecall.com	Email:

Quotation #: PML RATE
Project #: 21TF001
P.O. #:
Site Location/ID:

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 ____

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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH1, SS1	June 2/21	PM	2+1	SOIL
2	BH1, SS2	"	"	2	"
3	BH1, SS3	"	"	2+1	"
4	BH2, SS1	June 3/21	AM	2	"
5	BH2, SS2	"	"	2+1	"
6	BH2, SS3	"	"	1	"
7	BH15, SS1	June 1/21	"	1	"
8	BH15, SS2	"	"	1	"
9	BH15, SS3	"	"	2+1	"
10	BH15, SS5	"	"	1	"
11	BH15, SS5 DUP	"	"	1	"
12	COMP #1	"	"	2	"

	M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)							TCLP	COMMENTS:
	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN,Hg pH,(BHWS),EC,SAR–soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs ☑ Total ☐ Aroclor	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	VOCs + PHCs F1-F4	PH, EC, SAR			Appendix 2: 406/19 Leachate Screening Levels Table :	Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	
1								✓													
2		✓			✓																
3										✓											
4					✓		✓														
5								✓													
6		✓																			
7					✓																
8		✓																			
9													✓								
10				✓										✓							
11				✓																	
12																				✓	

Observations/Comments/Special Instructions

Sampled By (NAME): JASON Signature: [signature] Date: 06/04/21 (mm/dd/yy)
Relinquished by (NAME): JASON Signature: [signature] Date: 06/04/21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA14165-JUN21 R

21TF001

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14165-JUN21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	705-652-2143
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	brad.moore@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA14165-JUN21
Project	21TF001	Received	06/04/2021
Order Number		Approved	06/10/2021
Samples	Leachate (1)	Report Number	CA14165-JUN21 R
		Date Reported	06/10/2021

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:021765

TCLP metals reported at 10x DL

SIGNATORIES

Brad Moore Hon. B.Sc

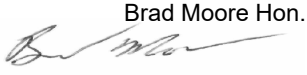


TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

Exceedance Summary..... 6

QC Summary..... 7-10

Legend..... 11

Annexes..... 12

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG558 - Acid rock Drainage**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP #1
Sample Matrix	Leachate
Sample Date	04/06/2021

Parameter	Units	RL	L1	Result
Acid rock Drainage				
Final pH	no unit	0.01		4.61

PACKAGE: **REG558 - Metals and Inorganics**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP #1
Sample Matrix	Leachate
Sample Date	04/06/2021

Parameter	Units	RL	L1	Result
Metals and Inorganics				
Sample weight	g	0.001		100
Ext Fluid	#1 or #2	0.01		2
^ Ext Volume	mL	0.01		2000
Nitrite (as N)	as N mg/L	0.3		< 0.3
Nitrate (as N)	as N mg/L	0.6		< 0.6
Nitrate + Nitrite (as N)	as N mg/L	0.6	1000	< 0.6
Fluoride	mg/L	0.06	150	0.26
Cyanide (total)	mg/L	0.01	20	< 0.01
Arsenic	mg/L	0.002	2.5	0.004
Silver	mg/L	0.0005	5	< 0.0005
Barium	mg/L	0.0002	100	1.03
Boron	mg/L	0.02	500	0.10
Cadmium	mg/L	0.00003	0.5	0.00292

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG558 - Metals and Inorganics** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP #1
Sample Matrix	Leachate
Sample Date	04/06/2021

Parameter	Units	RL	L1	Result
Metals and Inorganics (continued)				
Chromium	mg/L	0.0008	5	0.0057
Lead	mg/L	0.00009	5	0.0385
Selenium	mg/L	0.0004	1	< 0.0004
Uranium	mg/L	0.00002	10	0.00338

PACKAGE: **REG558 - Other (ORP)** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP #1
Sample Matrix	Leachate
Sample Date	04/06/2021

Parameter	Units	RL	L1	Result
Other (ORP)				
Mercury	mg/L	0.00001	0.1	< 0.00001

PACKAGE: **REG558 - PCBs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP #1
Sample Matrix	Leachate
Sample Date	04/06/2021

Parameter	Units	RL	L1	Result
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.001	0.3	< 0.001

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG558 - SVOCs - PAHs**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP #1
Sample Matrix	Leachate
Sample Date	04/06/2021

Parameter	Units	RL	L1	Result
SVOCs - PAHs				
Benzo(a)pyrene	mg/L	0.001	0.001	< 0.001

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

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)	SKA0096-JUN21	mg/L	0.01	<0.01	ND	10	92	90	110	77	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	EWL0146-JUN21	mg/L	0.06	<0.06	ND	10	103	90	110	104	75	125

Inorganics-General

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-IENVISPE-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	EHG0008-JUN21	mg/L	0.00001	< 0.00001	ND	20	107	80	120	112	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	EMS0053-JUN21	mg/L	0.0005	<0.00005	ND	20	108	90	110	120	70	130
Arsenic	EMS0053-JUN21	mg/L	0.002	<0.0002	ND	20	104	90	110	129	70	130
Barium	EMS0053-JUN21	mg/L	0.0002	<0.00002	6	20	102	90	110	115	70	130
Boron	EMS0053-JUN21	mg/L	0.02	<0.002	7	20	105	90	110	106	70	130
Cadmium	EMS0053-JUN21	mg/L	0.00003	<0.000003	ND	20	106	90	110	114	70	130
Chromium	EMS0053-JUN21	mg/L	0.0008	<0.00008	15	20	106	90	110	111	70	130
Lead	EMS0053-JUN21	mg/L	0.00009	<0.00001	5	20	108	90	110	121	70	130
Selenium	EMS0053-JUN21	mg/L	0.0004	<0.00004	8	20	103	90	110	107	70	130
Uranium	EMS0053-JUN21	mg/L	0.00002	<0.000002	5	20	100	90	110	117	70	130

Nitrate by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-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
Nitrate (as N)	DIO0127-JUN21	mg/L	0.6	<0.6	ND	20	100	90	110	101	75	125

QC SUMMARY

Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENVIIC-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
Nitrite (as N)	DIO0127-JUN21	mg/L	0.3	<0.3	ND	20	99	90	110	95	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENVIGC-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	GCM0138-JUN21	mg/L	0.001	< 0.001	NSS	30	99	60	140	NSS	60	140

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENVIGC-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
Benzo(a)pyrene	GCM0142-JUN21	mg/L	0.001	< 0.001	NSS	30	88	50	140	NSS	50	140

QC SUMMARY

Total Nitrate/Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Nitrate + Nitrite (as N)	DIO0127-JUN21	mg/L	0.6	<0.6	NA	20	NA	80	120	NA	75	125

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

Samples analysed as received. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 021765 Page 1 of 2

Laboratory Information Section - Lab use only

Received By: Sarah
Received Date: 06/04/2021 (mm/dd/yy)
Received Time: 16:22 (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): 5.2, 4.6, 5.0
LAB LIMS #: CA14164-65-Jun21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE. TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petromecall	Phone:
Email: Starafdar@petromecall	Email:

Quotation #: PML RATE
Project #: 21TF001
P.O. #:
Site Location/ID:

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 ____
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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH1, SS1	June 2/21	PM	2+1	SOIL
2	BH1, SS2	"	"	2	"
3	BH1, SS3	"	"	2+1	"
4	BH2, SS1	June 3/21	AM	2	"
5	BH2, SS2	"	"	2+1	"
6	BH2, SS3	"	"	1	"
7	BH15, SS1	June 1/21	"	1	"
8	BH15, SS2	"	"	1	"
9	BH15, SS3	"	"	2+1	"
10	BH15, SS5	"	"	1	"
11	BH15, SS5 DUP	"	"	1	"
12	COMP #1	"	"	2	"

	M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)							TCLP	COMMENTS:
	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN,Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs ☑ Total ☐ Aroclor	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	VOCs + PHCs F1-F4	PH, EC, SAR			Appendix 2: 406/19 Leachate Screening Levels Table :	Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	
1								✓													
2		✓			✓																
3										✓											
4					✓		✓														
5								✓													
6		✓																			
7					✓																
8		✓																			
9													✓								
10				✓										✓							
11				✓																	
12																				✓	

Observations/Comments/Special Instructions

Sampled By (NAME): JASON Signature:
Relinquished by (NAME): JASON Signature:
Date: 06/04/21 (mm/dd/yy)
Date: 06/04/21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA14224-JUN21 R

21TF001

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14224-JUN21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	2165
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	jill.campbell@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA14224-JUN21
Project	21TF001	Received	06/11/2021
Order Number		Approved	06/18/2021
Samples	Soil (15)	Report Number	CA14224-JUN21 R
		Date Reported	06/18/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:021769/012770

F1 LCS; recovery for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

Dichlorodifluoromethane LCS and matrix spike; recovery for this parameter is outside control limits. Results are from a multielement scan where 10% of the analytes may exceed the acceptance criteria by up to 10%.

Fluoranthene, Pyrene and Benzo(b+j)fluoranthene Duplicate RPD is outside of control limits due to sample matrix.

TABLE OF CONTENTS

First Page..... 1-3

Index..... 4

Results..... 5-13

Exceedance Summary..... 14

QC Summary..... 15-24

Legend..... 25

Annexes..... 26-27

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	8	10	12	13	17	21			
	Sample Name	BH3, SS1	BH3, SS3	BH4, SS2	BH4, SS3	BH5, SS2	BH9, SS2			
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil			
	Sample Date	08/06/2021	08/06/2021	08/06/2021	08/06/2021	10/06/2021	10/06/2021			
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	
BTEX										
Benzene	µg/g	0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Ethylbenzene	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Toluene	µg/g	0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Xylene (total)	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
m/p-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
o-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	9	11	14	15	18	19	22			
	Sample Name	BH3, SS2	BH4, SS1	BH4, SS4	BH4, SS4 DUP	BH5, SS3	BH5, SS4	BH9, SS3			
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
	Sample Date	08/06/2021	08/06/2021	08/06/2021	08/06/2021	10/06/2021	10/06/2021	10/06/2021			
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	
Hydrides											
Antimony	µg/g	0.8	1.3	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	
Arsenic	µg/g	0.5	18	3.7	1.3	8.2	4.0	4.1	3.8	3.9	
Selenium	µg/g	0.7	1.5	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	8	9	10	11	12	13	14	15		
	Sample Name	BH3, SS1	BH3, SS2	BH3, SS3	BH4, SS1	BH4, SS2	BH4, SS3	BH4, SS4	BH4, SS4 DUP		
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
	Sample Date	08/06/2021	08/06/2021	08/06/2021	08/06/2021	08/06/2021	08/06/2021	08/06/2021	08/06/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics											
Moisture Content	%	-		12.0	16.6	17.1	13.7	16.1	14.2		
Barium	µg/g	0.1	220		100		20			110	120
Beryllium	µg/g	0.02	2.5		0.57		0.29			1.0	0.71
Boron	µg/g	1	36		8		2			18	14
Cadmium	µg/g	0.02	1.2		0.08		0.04			0.04	0.11
Chromium	µg/g	0.5	70		22		9.5			30	24
Cobalt	µg/g	0.01	21		9.5		3.0			19	11
Copper	µg/g	0.1	92		19		5.1			18	21
Lead	µg/g	0.1	120		7.8		4.4			10	9.8
Molybdenum	µg/g	0.1	2		0.2		0.2			0.3	0.3
Nickel	µg/g	0.5	82		19		6.0			35	24
Silver	µg/g	0.05	0.5		< 0.05		< 0.05			< 0.05	< 0.05
Thallium	µg/g	0.02	1		0.16		0.04			0.22	0.20
Uranium	µg/g	0.002	2.5		0.52		0.32			0.75	0.65
Vanadium	µg/g	3	86		30		17			41	32
Zinc	µg/g	0.7	290		45		18			71	56
Water Soluble Boron	µg/g	0.5			< 0.5		< 0.5				

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	16	17	18	19	20	21	22		
	Sample Name	BH5, SS1	BH5, SS2	BH5, SS3	BH5, SS4	BH9, SS1	BH9, SS2	BH9, SS3		
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
	Sample Date	10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics										
Moisture Content	%	-		13.4	11.4	14.0		4.2	11.4	12.5
Barium	µg/g	0.1	220			80	98			97
Beryllium	µg/g	0.02	2.5			0.57	0.69			0.68
Boron	µg/g	1	36			6	5			12
Cadmium	µg/g	0.02	1.2			0.13	0.10			0.09
Chromium	µg/g	0.5	70			20	19			23
Cobalt	µg/g	0.01	21			9.5	11			12
Copper	µg/g	0.1	92			24	34			24
Lead	µg/g	0.1	120			15	7.5			12
Molybdenum	µg/g	0.1	2			0.3	0.2			0.2
Nickel	µg/g	0.5	82			20	21			25
Silver	µg/g	0.05	0.5			< 0.05	< 0.05			< 0.05
Thallium	µg/g	0.02	1			0.15	0.11			0.16
Uranium	µg/g	0.002	2.5			0.52	0.55			0.71
Vanadium	µg/g	3	86			28	27			30
Zinc	µg/g	0.7	290			66	52			59
Water Soluble Boron	µg/g	0.5				< 0.5				< 0.5

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	9	11	14	15	18	19	22		
	Sample Name	BH3, SS2	BH4, SS1	BH4, SS4	BH4, SS4 DUP	BH5, SS3	BH5, SS4	BH9, SS3		
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
	Sample Date	08/06/2021	08/06/2021	08/06/2021	08/06/2021	10/06/2021	10/06/2021	10/06/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Other (ORP)										
Mercury	ug/g	0.05	0.27	< 0.05	< 0.05			0.05		< 0.05
Sodium Adsorption Ratio	No unit	0.2	2.4	5.1	1.2	1.5	1.4	7.3	1.2	1.3
SAR Calcium	mg/L	0.2		10.3	54.8	23.1	34.7	126	356	38.5
SAR Magnesium	mg/L	0.3		0.7	25.4	2.2	3.2	11.5	27.4	10.7
SAR Sodium	mg/L	0.1		62.4	43.2	27.3	33.0	318	86.0	34.9
Conductivity	mS/cm	0.002	0.57	0.42	3.1	0.31	0.27	2.4	2.5	0.53
pH	pH Units	0.05		8.13	7.66	7.69	7.73	7.76	7.43	7.76
Chromium VI	µg/g	0.2	0.66	< 0.2	0.4			< 0.2		< 0.2
Free Cyanide	µg/g	0.05	0.051	< 0.05	< 0.05			< 0.05		< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	8	12	16	20		
	Sample Name	BH3, SS1	BH4, SS2	BH5, SS1	BH9, SS1		
	Sample Matrix	Soil	Soil	Soil	Soil		
	Sample Date	08/06/2021	08/06/2021	10/06/2021	10/06/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
PAHs							
Acenaphthene	µg/g	0.05	0.072	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/g	0.05	0.093	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	µg/g	0.05	0.16	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.36	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	µg/g	0.05	0.3	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b+j)fluoranthene	µg/g	0.05	0.47	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	µg/g	0.1	0.68	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	µg/g	0.05	0.48	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	µg/g	0.05	2.8	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	µg/g	0.06	0.1	< 0.06	< 0.06	< 0.06	< 0.06
Fluoranthene	µg/g	0.05	0.56	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/g	0.05	0.12	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.1	0.23	< 0.1	< 0.1	< 0.1	< 0.1
1-Methylnaphthalene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2-(1-)	µg/g	0.05	0.59	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/g	0.05	0.09	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/g	0.05	0.69	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	µg/g	0.05	1	< 0.05	< 0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PCBs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	17
			Sample Name	BH5, SS2
			Sample Matrix	Soil
			Sample Date	10/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	µg/g	0.3	0.3	< 0.3

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

				Sample Number	8	12	17	21
				Sample Name	BH3, SS1	BH4, SS2	BH5, SS2	BH9, SS2
				Sample Matrix	Soil	Soil	Soil	Soil
				Sample Date	08/06/2021	08/06/2021	10/06/2021	10/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
PHCs							
F1 (C6-C10)	µg/g	10	25	< 10	< 10	< 10	< 10
F1-BTEX (C6-C10)	µg/g	10		< 10	< 10	< 10	< 10
F2 (C10-C16)	µg/g	10	10	< 10	< 10	< 10	34
F3 (C16-C34)	µg/g	50	240	222	< 50	101	498
F4 (C34-C50)	µg/g	50	120	790	< 50	210	781
CCME F4G-sg (GHH)	µg/g	200	120	2910		728	3900
Chromatogram returned to baseline at nC50	Yes / No	-		NO	YES	NO	NO

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - SVOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	8	12	16	20		
	Sample Name	BH3, SS1	BH4, SS2	BH5, SS1	BH9, SS1		
	Sample Matrix	Soil	Soil	Soil	Soil		
	Sample Date	08/06/2021	08/06/2021	10/06/2021	10/06/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
SVOC Surrogates							
Surr Nitrobenzene-d5	Surr Rec %	-		95	90	85	86
Surr 2-Fluorobiphenyl	Surr Rec %	-		92	86	88	93
Surr 4-Terphenyl-d14	Surr Rec %	-		118	109	98	122
Surr 2-Fluorophenol	Surr Rec %	-		82	83	80	82
Surr Phenol-d6	Surr Rec %	-		90	87	85	86
Surr 2,4,6-Tribromophenol	Surr Rec %	-		108	100	88	103

PACKAGE: **REG153 - THMs (VOC)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	10	13		
	Sample Name	BH3, SS3	BH4, SS3		
	Sample Matrix	Soil	Soil		
	Sample Date	08/06/2021	08/06/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
THMs (VOC)					
Bromodichloromethane	µg/g	0.05	0.05	< 0.05	< 0.05
Bromoform	µg/g	0.05	0.05	< 0.05	< 0.05
Dibromochloromethane	µg/g	0.05	0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	10	13
			Sample Name	BH3, SS3	BH4, SS3
			Sample Matrix	Soil	Soil
			Sample Date	08/06/2021	08/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
VOC Surrogates					
Surr 1,2-Dichloroethane-d4	Surr Rec %	-		100	103
Surr 4-Bromofluorobenzene	Surr Rec %	-		93	94
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-		96	97

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	10	13
			Sample Name	BH3, SS3	BH4, SS3
			Sample Matrix	Soil	Soil
			Sample Date	08/06/2021	08/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
VOCs					
Acetone	µg/g	0.5	0.5	< 0.5	< 0.5
Bromomethane	µg/g	0.05	0.05	< 0.05	< 0.05
Carbon tetrachloride	µg/g	0.05	0.05	< 0.05	< 0.05
Chlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
Chloroform	µg/g	0.05	0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/g	0.05	0.05	< 0.05	< 0.05
Dichlorodifluoromethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1-Dichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,2-Dichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1-Dichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05
trans-1,2-Dichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10	13
Sample Name	BH3, SS3	BH4, SS3
Sample Matrix	Soil	Soil
Sample Date	08/06/2021	08/06/2021

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
cis-1,2-Dichloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05
1,2-Dichloropropane	µg/g	0.05	0.05	< 0.05	< 0.05
cis-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03
trans-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03
1,3-dichloropropene (total)	µg/g	0.05	0.05	< 0.05	< 0.05
Ethylenedibromide	µg/g	0.05	0.05	< 0.05	< 0.05
n-Hexane	µg/g	0.05	0.05	< 0.05	< 0.05
Methyl ethyl ketone	µg/g	0.5	0.5	< 0.5	< 0.5
Methyl isobutyl ketone	µg/g	0.5	0.5	< 0.5	< 0.5
Methyl-t-butyl Ether	µg/g	0.05	0.05	< 0.05	< 0.05
Methylene Chloride	µg/g	0.05	0.05	< 0.05	< 0.05
Styrene	µg/g	0.05	0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,1-Trichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05
Trichloroethylene	µg/g	0.05	0.05	0.08	0.05
Trichlorofluoromethane	µg/g	0.05	0.25	< 0.05	< 0.05
Vinyl Chloride	µg/g	0.02	0.02	< 0.02	< 0.02

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED L1
BH3, SS1				
F4 (C34 to C50)	CCME Tier 1	µg/g	790	120
Gravimetric Heavy Hydrocarbons	CCME Tier 1	µg/g	2910	120
BH3, SS2				
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	5.1	2.4
BH3, SS3				
Trichloroethylene	EPA 5035A/5030B/8260C	µg/g	0.08	0.05
BH4, SS1				
Conductivity	EPA 6010/SM 2510	mS/cm	3.1	0.57
BH5, SS2				
F4 (C34 to C50)	CCME Tier 1	µg/g	210	120
Gravimetric Heavy Hydrocarbons	CCME Tier 1	µg/g	728	120
BH5, SS3				
Conductivity	EPA 6010/SM 2510	mS/cm	2.4	0.57
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	7.3	2.4
BH5, SS4				
Conductivity	EPA 6010/SM 2510	mS/cm	2.5	0.57
BH9, SS2				
F2 (C10 to C16)	CCME Tier 1	µg/g	34	10
F3 (C16 to C34)	CCME Tier 1	µg/g	498	240
F4 (C34 to C50)	CCME Tier 1	µg/g	781	120
Gravimetric Heavy Hydrocarbons	CCME Tier 1	µg/g	3900	120

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 I Internal ref.: ME-CA-IENVIEWL-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
Conductivity	EWL0318-JUN21	mS/cm	0.002	<0.002	0	10	99	90	110	NA		

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
Free Cyanide	SKA5051-JUN21	µg/g	0.05	<0.05	ND	20	101	80	120	87	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	SKA5052-JUN21	ug/g	0.2	<0.2	ND	20	82	80	120	124	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-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	EMS0102-JUN21	ug/g	0.05	<0.05	ND	20	95	80	120	93	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

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
SAR Calcium	ESG0053-JUN21	mg/L	0.2	<0.09	0	20	90	80	120	70	70	130
SAR Magnesium	ESG0053-JUN21	mg/L	0.3	<0.02	1	20	93	80	120	93	70	130
SAR Sodium	ESG0053-JUN21	mg/L	0.1	<0.15	0	20	95	80	120	80	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENVISPE-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
Silver	EMS0102-JUN21	ug/g	0.05	<0.05	ND	20	99	70	130	96	70	130
Arsenic	EMS0102-JUN21	µg/g	0.5	<0.5	5	20	104	70	130	96	70	130
Barium	EMS0102-JUN21	ug/g	0.1	<0.1	1	20	109	70	130	96	70	130
Beryllium	EMS0102-JUN21	µg/g	0.02	<0.02	4	20	96	70	130	89	70	130
Boron	EMS0102-JUN21	µg/g	1	<1	4	20	101	70	130	97	70	130
Cadmium	EMS0102-JUN21	µg/g	0.02	<0.02	ND	20	101	70	130	94	70	130
Cobalt	EMS0102-JUN21	µg/g	0.01	<0.01	5	20	103	70	130	100	70	130
Chromium	EMS0102-JUN21	µg/g	0.5	<0.5	4	20	104	70	130	98	70	130
Copper	EMS0102-JUN21	µg/g	0.1	<0.1	5	20	102	70	130	98	70	130
Molybdenum	EMS0102-JUN21	µg/g	0.1	<0.1	ND	20	106	70	130	96	70	130
Nickel	EMS0102-JUN21	ug/g	0.5	<0.5	9	20	101	70	130	98	70	130
Lead	EMS0102-JUN21	µg/g	0.1	<0.1	11	20	104	70	130	98	70	130
Antimony	EMS0102-JUN21	µg/g	0.8	<0.8	ND	20	94	70	130	93	70	130
Selenium	EMS0102-JUN21	µg/g	0.7	<0.7	ND	20	100	70	130	95	70	130
Thallium	EMS0102-JUN21	µg/g	0.02	<0.02	ND	20	106	70	130	92	70	130
Uranium	EMS0102-JUN21	µg/g	0.002	<0.002	8	20	103	70	130	122	70	130
Vanadium	EMS0102-JUN21	µg/g	3	<3	16	20	105	70	130	100	70	130
Zinc	EMS0102-JUN21	µg/g	0.7	<0.7	7	20	99	70	130	93	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F1 (C6-C10)	GCM0249-JUN21	µg/g	10	<10	ND	30	126	80	120	85	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F2 (C10-C16)	GCM0263-JUN21	µg/g	10	<10	ND	30	113	80	120	125	60	140
F3 (C16-C34)	GCM0263-JUN21	µg/g	50	<50	ND	30	113	80	120	125	60	140
F4 (C34-C50)	GCM0263-JUN21	µg/g	50	<50	ND	30	113	80	120	125	60	140

QC SUMMARY

Petroleum Hydrocarbons (F4G)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

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
CCME F4G-sg (GHH)	GCM0316-JUN21	ug/g	200	<200	NA	30	98	80	120	NA	60	140

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-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
pH	ARD0087-JUN21	pH Units	0.05		0	20	100	80	120			
pH	ARD0089-JUN21	pH Units	0.05		0	20	100	80	120			

QC SUMMARY

Polychlorinated Biphenyls

Method: EPA 3570/8082A/8270C | 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	GCM0268-JUN21	µg/g	0.3	< 0.3	ND	40	86	60	140	83	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENVIGC-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
1-Methylnaphthalene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	84	50	140	88	50	140
2-Methylnaphthalene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	78	50	140	85	50	140
Acenaphthene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	95	50	140	103	50	140
Acenaphthylene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	87	50	140	96	50	140
Anthracene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	92	50	140	96	50	140
Benzo(a)anthracene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	93	50	140	109	50	140
Benzo(a)pyrene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	86	50	140	110	50	140
Benzo(b+j)fluoranthene	GCM0260-JUN21	µg/g	0.05	< 0.05	136	40	93	50	140	118	50	140
Benzo(ghi)perylene	GCM0260-JUN21	µg/g	0.1	< 0.1	ND	40	91	50	140	133	50	140
Benzo(k)fluoranthene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	90	50	140	124	50	140
Chrysene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	93	50	140	108	50	140
Dibenzo(a,h)anthracene	GCM0260-JUN21	µg/g	0.06	< 0.06	ND	40	90	50	140	119	50	140
Fluoranthene	GCM0260-JUN21	µg/g	0.05	< 0.05	157	40	97	50	140	109	50	140
Fluorene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	96	50	140	102	50	140
Indeno(1,2,3-cd)pyrene	GCM0260-JUN21	µg/g	0.1	< 0.1	ND	40	91	50	140	124	50	140
Naphthalene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	89	50	140	93	50	140
Phenanthrene	GCM0260-JUN21	µg/g	0.05	< 0.05	ND	40	95	50	140	96	50	140
Pyrene	GCM0260-JUN21	µg/g	0.05	< 0.05	154	40	102	50	140	115	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	97	50	140
1,1,1-Trichloroethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	97	50	140
1,1,2,2-Tetrachloroethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	98	50	140
1,1,2-Trichloroethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	90	50	140
1,1-Dichloroethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	95	50	140
1,1-Dichloroethylene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	88	60	130	92	50	140
1,2-Dichlorobenzene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	98	50	140
1,2-Dichloroethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	97	50	140
1,2-Dichloropropane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	97	50	140
1,3-Dichlorobenzene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	98	60	130	96	50	140
1,4-Dichlorobenzene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	97	50	140
Acetone	GCM0248-JUN21	µg/g	0.5	< 0.5	ND	50	90	50	140	95	50	140
Benzene	GCM0248-JUN21	µg/g	0.02	< 0.02	ND	50	98	60	130	98	50	140
Bromodichloromethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	96	50	140
Bromoform	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	96	50	140
Bromomethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	79	50	140	74	50	140
Carbon tetrachloride	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	98	60	130	97	50	140
Chlorobenzene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	98	60	130	97	50	140
Chloroform	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	97	50	140
cis-1,2-Dichloroethylene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	98	60	130	96	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
cis-1,3-dichloropropene	GCM0248-JUN21	µg/g	0.03	< 0.03	ND	50	99	60	130	93	50	140
Dibromochloromethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	96	50	140
Dichlorodifluoromethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	47	50	140	45	50	140
Ethylbenzene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	100	60	130	99	50	140
Ethylenedibromide	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	98	50	140
n-Hexane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	91	60	130	82	50	140
m/p-xylene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	100	60	130	99	50	140
Methyl ethyl ketone	GCM0248-JUN21	µg/g	0.5	< 0.5	ND	50	92	50	140	91	50	140
Methyl isobutyl ketone	GCM0248-JUN21	µg/g	0.5	< 0.5	ND	50	92	50	140	92	50	140
Methyl-t-butyl Ether	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	103	60	130	102	50	140
Methylene Chloride	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	94	50	140
o-xylene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	100	60	130	99	50	140
Styrene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	100	60	130	99	50	140
Tetrachloroethylene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	100	60	130	98	50	140
Toluene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	99	50	140
trans-1,2-Dichloroethylene	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	98	60	130	95	50	140
trans-1,3-dichloropropene	GCM0248-JUN21	µg/g	0.03	< 0.03	ND	50	98	60	130	94	50	140
Trichloroethylene	GCM0248-JUN21	µg/g	0.05	< 0.05	2	50	98	60	130	97	50	140
Trichlorofluoromethane	GCM0248-JUN21	µg/g	0.05	< 0.05	ND	50	86	50	140	86	50	140
Vinyl Chloride	GCM0248-JUN21	µg/g	0.02	< 0.02	ND	50	75	50	140	74	50	140

QC SUMMARY

Water Soluble Boron

Method: O.Reg. 15 3/04 | Internal ref.: ME-CA-[ENV] SPE-LAK-AN-003

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
Water Soluble Boron	ESG0045-JUN21	µg/g	0.5	<0.5	ND	20	101	80	120	110	70	130

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

Samples analysed as received. 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" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --

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No: 0217 Page 1 of 2

Laboratory Information Section - Lab use only

Received By: B CARMAN Received By (signature): [signature]
Received Date: 06 / 11 / 21 (mm/dd/yy) Custody Seal Present: Yes ☐ No ☐ Cooling Agent Present: Yes ☑ No ☐ Type: ICE
Received Time: 11:30 (hr : min) Custody Seal Intact: Yes ☐ No ☐ Temperature Upon Receipt (°C) 9.7.9
CA 14768-JUN21
LAB LIMS #: CA14824-JUN21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE, TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petromecall.com	Phone:
Email: Starafdr@petromecall.com	Email:

Quotation #: PML RATE P.O. #:
Project #: 21TF001 Site Location/ID:

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 ____
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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH3, SS1	JUNE8/21	AM	2+2	SOIL
2	BH3, SS2	"	"	1	"
3	BH3, SS3	"	"	2+1	"
4	BH4, SS1	"	PM	1	"
5	BH4, SS2	"	"	2+2	"
6	BH4, SS3	"	"	2+1	"
7	BH4, SS4	"	"	1	"
8	BH4, SS4 DUP	"	"	1	"
9	BH5, SS1	June10/21	AM	1	"
10	BH5, SS2	"	"	2+2	"
11	BH5, SS3	"	"	1	"
12	BH5, SS4	"	"	1	"

	M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)							TCLP	COMMENTS:
	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN, Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs ☑ Total ☐ Aroclor	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	PH, EC, SAR				Appendix 2: 406/19 Leachate Screening Levels Table :	Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	
1					✓			✓													
2		✓																			
3										✓											
4		✓																			
5					✓			✓													
6										✓											
7				✓									✓								
8				✓									✓								
9					✓																
10							✓	✓													
11		✓								.											
12				✓						.			✓								

Observations/Comments/Special Instructions

Sampled By (NAME):	Jason	Signature:	[signature]	Date: 06 / 11 / 21 (mm/dd/yy)
Relinquished by (NAME):	Jason	Signature:	[signature]	Date: 06 / 11 / 21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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 Environment, Health & Safety - 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: 021770 Page 2 of 2

Laboratory Information Section - Lab use only

Received By: B. Cannon
Received Date: 06 / M / 21 (mm/dd/yy)
Received Time: 17 : 10 (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): 9.7.9
LAB LIMS #:

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE. TORONTO	Contact:
Phone: 416-785-5110	Address:
Fax:	Phone:
Email: malam@petomacall.com	Email:
Email: Starafdu@petomacall.com	

Quotation #: PML RATE P.O. #:
Project #: 21 T[illegible]001 Site Location/ID:

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 ____
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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH9, SS1	JUNE10/21	PM	1	SOIL
2	BH9, SS2	"	"	2+1	"
3	BH9, SS3	"	"	1	"
4	COMP #2	"	"	2	"
5					
6					
7					
8					
9					
10					
11					
12					

	Field Filtered (Y/N)	Metals & Inorganics (incl CrVI, CN,Hg pH,(BHWS),EC,SAR-soil) (CrI, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs; ABNs, CPs	PCBs ☐ Total ☐ Aroclor	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	Other (please specify)	Appendix 2: 406/19 Leachate Screening Levels Table :	Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	TCLP Specify TCLP tests	COMMENTS:
1					✓												
2								✓									
3		✓															
4																✓	

TCLP tests: ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.

Observations/Comments/Special Instructions

Sampled By (NAME): Jason	Signature: Jason Mourly	Date: 06 / 11 / 21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Jason	Signature: Jason Mourly	Date: 06 / 11 / 21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA14357-JUN21 R1

21TF001

Prepared for

Peto MacCallum Ltd

FINAL REPORT

First Page

CLIENT DETAILS

Client	Peto MacCallum Ltd
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada
Contact	M. Alam
Telephone	416-785-5110
Facsimile	416-785-5120
Email	starafder@petomaccallum.com; malam@petomaccallum.com
Project	21TF001
Order Number	
Samples	Soil (21)

LABORATORY DETAILS

Project Specialist	Jill Campbell, B.Sc.,GISAS
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	2165
Facsimile	705-652-6365
Email	jill.campbell@sgs.com
SGS Reference	CA14357-JUN21
Received	06/17/2021
Approved	06/24/2021
Report Number	CA14357-JUN21 R1
Date Reported	09/15/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

Hydrocarbon results are expressed on a dry weight basis.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020138/020146

BH6, SS1 - Surrogate recovery is outside of acceptance for 2,4,6-Tribromophenol due to sample matrix.

BH7, SS1 - Surrogate recovery is outside of acceptance for 4-Terphenyl-d14 and

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

2,4,6-Tribromophenol due to sample matrix

Polychlorinated Biphenyls (PCBs) - Total matrix spike; the recovery is outside of control limits due to sample matrix.

QC Batch - GCM0365-JUN21 - Phenanthrene, Anthracene, Fluoranthene, and Pyrene Dup RPD is outside of control limits due to sample heterogeneity.

R6 prep tech did not spike digestion spike or sample spike. Accepting run on insol spike only

TABLE OF CONTENTS

First Page..... 1-3

Index..... 4

Results..... 5-16

Exceedance Summary..... 17

QC Summary..... 18-30

Legend..... 31

Annexes..... 32-33

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				8	10	12	15	19	20	22	25
Sample Name				BH6, SS1	BH6, SS3	BH7, SS2	BH8, SS1	BH10, SS2	BH10, SS3	BH11, SS1	BH14, SS2
Sample Matrix				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Date				11/06/2021	11/06/2021	14/06/2021	14/06/2021	11/06/2021	11/06/2021	16/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX											
Benzene	µg/g	0.02	0.32	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	9.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	µg/g	0.05	68	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Xylene (total)	µg/g	0.05	26	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
o-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				26	27
Sample Name				BH14, SS3	BH14, SS3 DUP
Sample Matrix				Soil	Soil
Sample Date				14/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**
BTEX					
Benzene	µg/g	0.02	0.32	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	9.5	< 0.05	< 0.05
Toluene	µg/g	0.05	68	< 0.05	< 0.05
Xylene (total)	µg/g	0.05	26	< 0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05	< 0.05
o-xylene	µg/g	0.05		< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Parameter	Units	RL	L1	Sample Number	9	12	13	14	17	20	21	23
				Sample Name	BH6, SS2	BH7, SS2	BH7, SS4	BH7, SS4 DUP	BH8, SS3	BH10, SS3	BH10, SS4	BH11, SS2
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	11/06/2021	14/06/2021	14/06/2021	14/06/2021	14/06/2021	11/06/2021	11/06/2021	16/06/2021
					Result	Result	Result	Result	Result	Result	Result	Result
Hydrides												
Antimony	µg/g	0.8	40		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Arsenic	µg/g	0.5	18		1.9	4.7	6.6	6.6	5.5	3.2	6.3	33
Selenium	µg/g	0.7	5.5		< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Parameter	Units	RL	L1	Sample Number	25	28
				Sample Name	BH14, SS2	BH14, SS4
				Sample Matrix	Soil	Soil
				Sample Date	14/06/2021	14/06/2021
					Result	Result
Hydrides						
Antimony	µg/g	0.8	40		< 0.8	< 0.8
Arsenic	µg/g	0.5	18		4.2	5.9
Selenium	µg/g	0.7	5.5		< 0.7	< 0.7

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Parameter	Units	RL	L1	Sample Number	8	9	10	11	12	13	14	15
				Sample Name	BH6, SS1	BH6, SS2	BH6, SS3	BH7, SS1	BH7, SS2	BH7, SS4	BH7, SS4 DUP	BH8, SS1
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	11/06/2021	11/06/2021	11/06/2021	14/06/2021	14/06/2021	14/06/2021	14/06/2021	14/06/2021
					Result	Result	Result	Result	Result	Result	Result	Result
Metals and Inorganics												
Moisture Content	%	-			9.1	10.8	12.4	3.2	10.4			7.5
Barium	µg/g	0.1	670			48			85	27	33	
Beryllium	µg/g	0.02	8			0.28			0.69	0.73	0.72	

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number	8	9	10	11	12	13	14	15
	Sample Name	BH6, SS1	BH6, SS2	BH6, SS3	BH7, SS1	BH7, SS2	BH7, SS4	BH7, SS4 DUP	BH8, SS1
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date	11/06/2021	11/06/2021	11/06/2021	14/06/2021	14/06/2021	14/06/2021	14/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics (continued)										
Boron	µg/g	1	120	5			10	11	12	
Cadmium	µg/g	0.02	1.9	0.19			0.10	0.05	0.04	
Chromium	µg/g	0.5	160	11			20	22	23	
Cobalt	µg/g	0.01	80	3.8			14	12	15	
Copper	µg/g	0.1	230	14			27	34	32	
Lead	µg/g	0.1	120	28			11	8.5	5.9	
Molybdenum	µg/g	0.1	40	0.8			0.4	0.1	0.1	
Nickel	µg/g	0.5	270	9.4			30	29	31	
Silver	µg/g	0.05	40	< 0.05			< 0.05	< 0.05	< 0.05	
Thallium	µg/g	0.02	3.3	0.07			0.19	0.14	0.15	
Uranium	µg/g	0.002	33	0.44			0.74	0.58	0.51	
Vanadium	µg/g	3	86	14			26	28	29	
Zinc	µg/g	0.7	340	77			58	63	63	
Water Soluble Boron	µg/g	0.5	2	< 0.5			< 0.5			

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				16	17	18	19	20	21	22	23	
Sample Name				BH8, SS2	BH8, SS3	BH10, SS1	BH10, SS2	BH10, SS3	BH10, SS4	BH11, SS1	BH11, SS2	
Sample Matrix				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sample Date				14/06/2021	14/06/2021	11/06/2021	11/06/2021	11/06/2021	11/06/2021	16/06/2021	16/06/2021	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	
Metals and Inorganics												
Moisture Content	%	-		20.8	10.5	14.7	13.8	15.3	8.3	4.8	4.7	
Barium	µg/g	0.1	670		63			130	28		34	
Beryllium	µg/g	0.02	8		0.70			0.58	0.73		0.23	
Boron	µg/g	1	120		9			9	12		24	
Cadmium	µg/g	0.02	1.9		0.06			0.10	0.04		0.96	
Chromium	µg/g	0.5	160		22			25	22		6.4	
Cobalt	µg/g	0.01	80		15			10	14		8.0	
Copper	µg/g	0.1	230		33			19	29		20	
Lead	µg/g	0.1	120		9.7			7.9	7.7		34	
Molybdenum	µg/g	0.1	40		0.1			0.2	0.1		0.7	
Nickel	µg/g	0.5	270		29			21	30		9.4	
Silver	µg/g	0.05	40		< 0.05			< 0.05	< 0.05		0.41	
Thallium	µg/g	0.02	3.3		0.13			0.20	0.19		0.34	
Uranium	µg/g	0.002	33		0.62			0.57	0.47		0.31	
Vanadium	µg/g	3	86		28			32	27		9	
Zinc	µg/g	0.7	340		65			54	61		290	
Water Soluble Boron	µg/g	0.5	2		< 0.5			< 0.5			< 0.5	

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number			24	25	26	27	28	
	Sample Name			BH14, SS1	BH14, SS2	BH14, SS3	BH14, SS3 DUP	BH14, SS4	
	Sample Matrix			Soil	Soil	Soil	Soil	Soil	
	Sample Date			14/06/2021	14/06/2021	14/06/2021	14/06/2021	14/06/2021	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	
Metals and Inorganics									
Moisture Content	%	-		10.6	11.8	16.0	19.5	13.7	
Barium	µg/g	0.1	670		77			140	
Beryllium	µg/g	0.02	8		0.66			0.74	
Boron	µg/g	1	120		7			10	
Cadmium	µg/g	0.02	1.9		0.10			0.06	
Chromium	µg/g	0.5	160		21			23	
Cobalt	µg/g	0.01	80		11			16	
Copper	µg/g	0.1	230		23			34	
Lead	µg/g	0.1	120		14			9.4	
Molybdenum	µg/g	0.1	40		0.2			0.2	
Nickel	µg/g	0.5	270		24			32	
Silver	µg/g	0.05	40		< 0.05			< 0.05	
Thallium	µg/g	0.02	3.3		0.16			0.16	
Uranium	µg/g	0.002	33		0.60			0.49	
Vanadium	µg/g	3	86		28			29	
Zinc	µg/g	0.7	340		59			64	
Water Soluble Boron	µg/g	0.5	2		< 0.5				

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number	9	12	13	17	20	21	23	25
	Sample Name	BH6, SS2	BH7, SS2	BH7, SS4	BH8, SS3	BH10, SS3	BH10, SS4	BH11, SS2	BH14, SS2
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date	11/06/2021	14/06/2021	14/06/2021	14/06/2021	11/06/2021	11/06/2021	16/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Other (ORP)											
Mercury	ug/g	0.05	3.9	0.23	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05
Sodium Adsorption Ratio	No unit	0.2	12	32.4	11.8	0.9	7.2	10.4	0.8	7.2	55.0
SAR Calcium	mg/L	0.2		37.0	205	16.7	58.3	48.9	31.8	65.4	8.3
SAR Magnesium	mg/L	0.3		< 0.3	44.6	11.9	14.6	10.2	17.6	18.7	0.8
SAR Sodium	mg/L	0.1		719	718	18.6	237	305	23.7	255	619
Conductivity	mS/cm	0.002	1.4	2.8	3.7	0.28	1.3	1.4	0.43	1.3	2.0
pH	pH Units	0.05		10.35	8.26	7.79	8.08	8.23	7.99	8.35	9.24
Chromium VI	µg/g	0.2	8	< 0.2	< 0.2		< 0.2	< 0.2		< 0.2	< 0.2
Free Cyanide	µg/g	0.05	0.051	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	28
			Sample Name	BH14, SS4
			Sample Matrix	Soil
			Sample Date	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**
Other (ORP)				
Sodium Adsorption Ratio	No unit	0.2	12	19.5
SAR Calcium	mg/L	0.2		7.8
SAR Magnesium	mg/L	0.3		0.7
SAR Sodium	mg/L	0.1		212
Conductivity	mS/cm	0.002	1.4	0.70
pH	pH Units	0.05		7.69

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

				Sample Number	8	11	15	18	22	24
				Sample Name	BH6, SS1	BH7, SS1	BH8, SS1	BH10, SS1	BH11, SS1	BH14, SS1
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	11/06/2021	14/06/2021	14/06/2021	11/06/2021	16/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PAHs										
Acenaphthene	µg/g	0.05	96	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/g	0.05	0.15	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	µg/g	0.05	0.67	0.12	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.96	0.71	0.18	0.08	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	µg/g	0.05	0.3	1.49	0.16	0.08	< 0.05	< 0.05	< 0.05
Benzo(b+j)fluoranthene	µg/g	0.05	0.96	1.94	0.31	0.11	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	µg/g	0.1	9.6	0.70	< 0.1	< 0.1	0.24	< 0.1	< 0.1
Benzo(k)fluoranthene	µg/g	0.05	0.96	0.51	0.10	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	µg/g	0.05	9.6	0.77	0.24	0.06	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	µg/g	0.06	0.1	0.16	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				8	11	15	18	22	24
Sample Name				BH6, SS1	BH7, SS1	BH8, SS1	BH10, SS1	BH11, SS1	BH14, SS1
Sample Matrix				Soil	Soil	Soil	Soil	Soil	Soil
Sample Date				11/06/2021	14/06/2021	14/06/2021	11/06/2021	16/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PAHs (continued)									
Fluoranthene	µg/g	0.05	9.6	1.07	0.42	0.16	< 0.05	< 0.05	< 0.05
Fluorene	µg/g	0.05	62	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.1	0.76	0.62	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1-Methylnaphthalene	µg/g	0.05		< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/g	0.05		< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2-(1-)	µg/g	0.05	76	0.08	0.13	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/g	0.05	9.6	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/g	0.05	12	0.33	0.24	0.10	< 0.05	< 0.05	< 0.05
Pyrene	µg/g	0.05	96	1.15	0.43	0.13	< 0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PCBs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	16	23	24	
			Sample Name	BH8, SS2	BH11, SS2	BH14, SS1	
			Sample Matrix	Soil	Soil	Soil	
			Sample Date	14/06/2021	16/06/2021	14/06/2021	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	
PCBs							
Polychlorinated Biphenyls (PCBs) - Total	µg/g	0.3	1.1	< 0.3	< 0.3	< 0.3	

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	8	12	15	19	22	25
			Sample Name	BH6, SS1	BH7, SS2	BH8, SS1	BH10, SS2	BH11, SS1	BH14, SS2
			Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil
			Sample Date	11/06/2021	14/06/2021	14/06/2021	11/06/2021	16/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PHCs									
F1 (C6-C10)	µg/g	10	55	< 10	< 10	< 10	< 10	< 10	< 10
F1-BTEX (C6-C10)	µg/g	10	55	< 10	< 10	< 10	< 10	< 10	< 10
F2 (C10-C16)	µg/g	10	230	< 10	< 10	< 10	< 10	< 10	< 10
F3 (C16-C34)	µg/g	50	1700	100	< 50	323	< 50	71	< 50
F4 (C34-C50)	µg/g	50	3300	129	< 50	828	< 50	104	62
CCME F4G-sg (GHH)	µg/g	200	3300			3420			
Chromatogram returned to baseline at nC50	Yes / No	-		YES	YES	NO	YES	YES	YES

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - SVOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number			8	11	15	18	22	24	
	Sample Name			BH6, SS1	BH7, SS1	BH8, SS1	BH10, SS1	BH11, SS1	BH14, SS1	
	Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	
	Sample Date			11/06/2021	14/06/2021	14/06/2021	11/06/2021	16/06/2021	14/06/2021	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	
SVOC Surrogates										
Surr Nitrobenzene-d5	Surr Rec %	-		82	94	82	72	74	68	
Surr 2-Fluorobiphenyl	Surr Rec %	-		80	92	83	70	73	101	
Surr 4-Terphenyl-d14	Surr Rec %	-		130	159	114	122	116	95	
Surr 2-Fluorophenol	Surr Rec %	-		72	24	83	72	74	84	
Surr Phenol-d6	Surr Rec %	-		91	82	89	80	82	92	
Surr 2,4,6-Tribromophenol	Surr Rec %	-		8.0	1.0	82	87	95	65	

PACKAGE: **REG153 - THMs (VOC)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number			10	12	20	26	27	
	Sample Name			BH6, SS3	BH7, SS2	BH10, SS3	BH14, SS3	BH14, SS3 DUP	
	Sample Matrix			Soil	Soil	Soil	Soil	Soil	
	Sample Date			11/06/2021	14/06/2021	11/06/2021	14/06/2021	14/06/2021	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	
THMs (VOC)									
Bromodichloromethane	µg/g	0.05	18	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Bromoform	µg/g	0.05	0.61	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dibromochloromethane	µg/g	0.05	13	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	10	12	20	26	27
			Sample Name	BH6, SS3	BH7, SS2	BH10, SS3	BH14, SS3	BH14, SS3 DUP
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	11/06/2021	14/06/2021	11/06/2021	14/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
VOC Surrogates								
Surr 1,2-Dichloroethane-d4	Surr Rec %	-		103	102	103	103	99
Surr 4-Bromofluorobenzene	Surr Rec %	-		92	92	92	91	96
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-		98	98	98	98	97

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	10	12	20	26	27
			Sample Name	BH6, SS3	BH7, SS2	BH10, SS3	BH14, SS3	BH14, SS3 DUP
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	11/06/2021	14/06/2021	11/06/2021	14/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs								
Acetone	µg/g	0.5	16	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbon tetrachloride	µg/g	0.05	0.21	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlorobenzene	µg/g	0.05	2.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloroform	µg/g	0.05	0.47	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/g	0.05	6.8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/g	0.05	9.6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/g	0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	µg/g	0.05	16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethane	µg/g	0.05	17	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethylene	µg/g	0.05	0.064	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
trans-1,2-Dichloroethylene	µg/g	0.05	1.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				10	12	20	26	27
Sample Name				BH6, SS3	BH7, SS2	BH10, SS3	BH14, SS3	BH14, SS3 DUP
Sample Matrix				Soil	Soil	Soil	Soil	Soil
Sample Date				11/06/2021	14/06/2021	11/06/2021	14/06/2021	14/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs (continued)								
cis-1,2-Dichloroethylene	µg/g	0.05	55	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichloropropane	µg/g	0.05	0.16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
cis-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
trans-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
1,3-dichloropropene (total)	µg/g	0.05	0.18	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylenedibromide	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
n-Hexane	µg/g	0.05	46	< 0.05	< 0.05	< 0.05	< 0.05	0.15
Methyl ethyl ketone	µg/g	0.5	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl isobutyl ketone	µg/g	0.5	31	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl-t-butyl Ether	µg/g	0.05	11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylene Chloride	µg/g	0.05	1.6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	µg/g	0.05	34	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	4.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	µg/g	0.05	0.087	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,1-Trichloroethane	µg/g	0.05	6.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Trichloroethylene	µg/g	0.05	0.91	0.06	0.07	0.13	0.06	0.05
Trichlorofluoromethane	µg/g	0.05	4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vinyl Chloride	µg/g	0.02	0.032	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED L1
BH6, SS1				
Benzo(a)pyrene	EPA 3541/8270D	µg/g	1.49	0.3
Benzo(b+j)fluoranthene	EPA 3541/8270D	µg/g	1.94	0.96
Dibenz(a,h)anthracene	EPA 3541/8270D	µg/g	0.16	0.1
BH6, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	2.8	1.4
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	32.4	12
BH7, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	3.7	1.4
BH8, SS1				
Gravimetric Heavy Hydrocarbons	CCME Tier 1	µg/g	3420	3300
BH11, SS2				
Arsenic	EPA 3050/EPA 200.8	µg/g	33	18
BH14, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	2.0	1.4
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	55.0	12
BH14, SS4				
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	19.5	12

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 | Internal ref.: ME-CA-IENVIEWL-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
Conductivity	EWL0414-JUN21	mS/cm	0.002	<0.002	1	10	99	90	110	NA		

Cyanide by SFA

Method: SM 4500 | 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
Free Cyanide	SKA5069-JUN21	µg/g	0.05	<0.05	ND	20	100	80	120	90	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | 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	SKA5073-JUN21	ug/g	0.2	<0.2	ND	20	NV	80	120	79	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-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	EMS0128-JUN21	ug/g	0.05	<0.05	ND	20	102	80	120	90	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

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
SAR Calcium	ESG0062-JUN21	mg/L	0.2	<0.09	2	20	97	80	120	98	70	130
SAR Magnesium	ESG0062-JUN21	mg/L	0.3	<0.02	2	20	98	80	120	100	70	130
SAR Sodium	ESG0062-JUN21	mg/L	0.1	<0.15	8	20	106	80	120	103	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENVISPE-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
Silver	EMS0128-JUN21	ug/g	0.05	<0.05	ND	20	101	70	130	91	70	130
Arsenic	EMS0128-JUN21	µg/g	0.5	<0.5	10	20	98	70	130	88	70	130
Barium	EMS0128-JUN21	ug/g	0.1	<0.1	5	20	102	70	130	85	70	130
Beryllium	EMS0128-JUN21	µg/g	0.02	<0.02	12	20	101	70	130	93	70	130
Cadmium	EMS0128-JUN21	µg/g	0.02	<0.02	ND	20	99	70	130	87	70	130
Cobalt	EMS0128-JUN21	µg/g	0.01	<0.01	1	20	99	70	130	91	70	130
Chromium	EMS0128-JUN21	µg/g	0.5	<0.5	15	20	104	70	130	87	70	130
Copper	EMS0128-JUN21	µg/g	0.1	<0.1	0	20	100	70	130	88	70	130
Molybdenum	EMS0128-JUN21	µg/g	0.1	<0.1	ND	20	96	70	130	92	70	130
Nickel	EMS0128-JUN21	ug/g	0.5	<0.5	4	20	98	70	130	89	70	130
Lead	EMS0128-JUN21	µg/g	0.1	<0.1	9	20	102	70	130	93	70	130
Antimony	EMS0128-JUN21	µg/g	0.8	<0.8	ND	20	99	70	130	94	70	130
Selenium	EMS0128-JUN21	µg/g	0.7	<0.7	ND	20	97	70	130	88	70	130
Thallium	EMS0128-JUN21	µg/g	0.02	<0.02	ND	20	105	70	130	90	70	130
Uranium	EMS0128-JUN21	µg/g	0.002	<0.002	5	20	103	70	130	91	70	130
Vanadium	EMS0128-JUN21	µg/g	3	<3	7	20	99	70	130	89	70	130
Zinc	EMS0128-JUN21	µg/g	0.7	<0.7	3	20	101	70	130	85	70	130
Boron	EMS0145-JUN21	µg/g	1	<1	5	20	110	70	130	93	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F1 (C6-C10)	GCM0372-JUN21	µg/g	10	<10	ND	30	107	80	120	79	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F2 (C10-C16)	GCM0357-JUN21	µg/g	10	<10	ND	30	95	80	120	91	60	140
F3 (C16-C34)	GCM0357-JUN21	µg/g	50	<50	ND	30	95	80	120	91	60	140
F4 (C34-C50)	GCM0357-JUN21	µg/g	50	<50	ND	30	95	80	120	91	60	140

QC SUMMARY

Petroleum Hydrocarbons (F4G)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

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
CCME F4G-sg (GHH)	GCM0396-JUN21	ug/g	200	<200	NA	30	108	80	120	NA	60	140

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-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
pH	ARD0110-JUN21	pH Units	0.05		0	20	100	80	120			
pH	ARD0119-JUN21	pH Units	0.05		0	20	100	80	120			

QC SUMMARY

Polychlorinated Biphenyls

Method: EPA 3570/8082A/8270C | 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	GCM0335-JUN21	µg/g	0.3	< 0.3	ND	40	73	60	140	89	60	140
Polychlorinated Biphenyls (PCBs) - Total	GCM0361-JUN21	µg/g	0.3	< 0.3	ND	40	68	60	140	53	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENVIGC-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
1-Methylnaphthalene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	96	50	140	76	50	140
2-Methylnaphthalene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	91	50	140	70	50	140
Acenaphthene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	102	50	140	78	50	140
Acenaphthylene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	92	50	140	72	50	140
Anthracene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	102	50	140	77	50	140
Benzo(a)anthracene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	103	50	140	80	50	140
Benzo(a)pyrene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	95	50	140	71	50	140
Benzo(b+j)fluoranthene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	99	50	140	72	50	140
Benzo(ghi)perylene	GCM0337-JUN21	µg/g	0.1	< 0.1	ND	40	101	50	140	66	50	140
Benzo(k)fluoranthene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	99	50	140	76	50	140
Chrysene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	102	50	140	71	50	140
Dibenzo(a,h)anthracene	GCM0337-JUN21	µg/g	0.06	< 0.06	ND	40	98	50	140	66	50	140
Fluoranthene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	106	50	140	80	50	140
Fluorene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	103	50	140	78	50	140
Indeno(1,2,3-cd)pyrene	GCM0337-JUN21	µg/g	0.1	< 0.1	ND	40	98	50	140	70	50	140
Naphthalene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	100	50	140	76	50	140
Phenanthrene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	105	50	140	81	50	140
Pyrene	GCM0337-JUN21	µg/g	0.05	< 0.05	ND	40	112	50	140	84	50	140
1-Methylnaphthalene	GCM0365-JUN21	µg/g	0.05	< 0.05	22	40	74	50	140	79	50	140
2-Methylnaphthalene	GCM0365-JUN21	µg/g	0.05	< 0.05	27	40	72	50	140	81	50	140

QC SUMMARY

Semi-Volatile Organics (continued)

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENVIGC-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
Acenaphthene	GCM0365-JUN21	µg/g	0.05	< 0.05	ND	40	96	50	140	96	50	140
Acenaphthylene	GCM0365-JUN21	µg/g	0.05	< 0.05	18	40	88	50	140	98	50	140
Anthracene	GCM0365-JUN21	µg/g	0.05	< 0.05	55	40	92	50	140	92	50	140
Benzo(a)anthracene	GCM0365-JUN21	µg/g	0.05	< 0.05	33	40	94	50	140	102	50	140
Benzo(a)pyrene	GCM0365-JUN21	µg/g	0.05	< 0.05	16	40	80	50	140	100	50	140
Benzo(b+j)fluoranthene	GCM0365-JUN21	µg/g	0.05	< 0.05	4	40	82	50	140	86	50	140
Benzo(ghi)perylene	GCM0365-JUN21	µg/g	0.1	< 0.1	2	40	84	50	140	74	50	140
Benzo(k)fluoranthene	GCM0365-JUN21	µg/g	0.05	< 0.05	4	40	84	50	140	113	50	140
Chrysene	GCM0365-JUN21	µg/g	0.05	< 0.05	26	40	91	50	140	95	50	140
Dibenzo(a,h)anthracene	GCM0365-JUN21	µg/g	0.06	< 0.06	2	40	86	50	140	82	50	140
Fluoranthene	GCM0365-JUN21	µg/g	0.05	< 0.05	46	40	95	50	140	100	50	140
Fluorene	GCM0365-JUN21	µg/g	0.05	< 0.05	ND	40	84	50	140	85	50	140
Indeno(1,2,3-cd)pyrene	GCM0365-JUN21	µg/g	0.1	< 0.1	2	40	85	50	140	84	50	140
Naphthalene	GCM0365-JUN21	µg/g	0.05	< 0.05	18	40	94	50	140	96	50	140
Phenanthrene	GCM0365-JUN21	µg/g	0.05	< 0.05	75	40	97	50	140	100	50	140
Pyrene	GCM0365-JUN21	µg/g	0.05	< 0.05	64	40	102	50	140	108	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	113	60	130	123	50	140
1,1,1-Trichloroethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	119	60	130	124	50	140
1,1,2,2-Tetrachloroethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	109	60	130	118	50	140
1,1,2-Trichloroethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	111	60	130	116	50	140
1,1-Dichloroethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	120	60	130	125	50	140
1,1-Dichloroethylene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	123	60	130	130	50	140
1,2-Dichlorobenzene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	114	60	130	119	50	140
1,2-Dichloroethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	115	60	130	120	50	140
1,2-Dichloropropane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	115	60	130	122	50	140
1,3-Dichlorobenzene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	114	60	130	119	50	140
1,4-Dichlorobenzene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	115	60	130	119	50	140
Acetone	GCM0371-JUN21	µg/g	0.5	< 0.5	ND	50	108	50	140	123	50	140
Benzene	GCM0371-JUN21	µg/g	0.02	< 0.02	ND	50	120	60	130	125	50	140
Bromodichloromethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	113	60	130	117	50	140
Bromoform	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	110	60	130	115	50	140
Bromomethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	111	50	140	115	50	140
Carbon tetrachloride	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	121	60	130	124	50	140
Chlorobenzene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	115	60	130	126	50	140
Chloroform	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	116	60	130	121	50	140
cis-1,2-Dichloroethylene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	118	60	130	123	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
cis-1,3-dichloropropene	GCM0371-JUN21	µg/g	0.03	< 0.03	ND	50	115	60	130	117	50	140
Dibromochloromethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	110	60	130	114	50	140
Dichlorodifluoromethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	106	50	140	101	50	140
Ethylbenzene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	118	60	130	128	50	140
Ethylenedibromide	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	113	60	130	119	50	140
n-Hexane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	116	60	130	105	50	140
m/p-xylene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	119	60	130	128	50	140
Methyl ethyl ketone	GCM0371-JUN21	µg/g	0.5	< 0.5	ND	50	109	50	140	109	50	140
Methyl isobutyl ketone	GCM0371-JUN21	µg/g	0.5	< 0.5	ND	50	110	50	140	115	50	140
Methyl-t-butyl Ether	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	111	60	130	121	50	140
Methylene Chloride	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	118	60	130	125	50	140
o-xylene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	119	60	130	131	50	140
Styrene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	118	60	130	128	50	140
Tetrachloroethylene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	120	60	130	122	50	140
Toluene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	118	60	130	125	50	140
trans-1,2-Dichloroethylene	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	123	60	130	133	50	140
trans-1,3-dichloropropene	GCM0371-JUN21	µg/g	0.03	< 0.03	ND	50	113	60	130	113	50	140
Trichloroethylene	GCM0371-JUN21	µg/g	0.05	< 0.05	9	50	119	60	130	125	50	140
Trichlorofluoromethane	GCM0371-JUN21	µg/g	0.05	< 0.05	ND	50	115	50	140	113	50	140
Vinyl Chloride	GCM0371-JUN21	µg/g	0.02	< 0.02	ND	50	114	50	140	117	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	89	50	140
1,1,1-Trichloroethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	90	50	140
1,1,2,2-Tetrachloroethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	87	50	140
1,1,2-Trichloroethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	87	50	140
1,1-Dichloroethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	89	50	140
1,1-Dichloroethylene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	93	60	130	88	50	140
1,2-Dichlorobenzene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	89	50	140
1,2-Dichloroethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	89	50	140
1,2-Dichloropropane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	90	50	140
1,3-Dichlorobenzene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	98	60	130	89	50	140
1,4-Dichlorobenzene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	90	50	140
Acetone	GCM0381-JUN21	µg/g	0.5	< 0.5	ND	50	96	50	140	88	50	140
Benzene	GCM0381-JUN21	µg/g	0.02	< 0.02	ND	50	97	60	130	91	50	140
Bromodichloromethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	88	50	140
Bromoform	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	85	50	140
Bromomethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	82	50	140	73	50	140
Carbon tetrachloride	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	90	50	140
Chlorobenzene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	91	50	140
Chloroform	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	89	50	140
cis-1,2-Dichloroethylene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	89	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
cis-1,3-dichloropropene	GCM0381-JUN21	µg/g	0.03	< 0.03	ND	50	98	60	130	89	50	140
Dibromochloromethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	95	60	130	85	50	140
Dichlorodifluoromethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	66	50	140	60	50	140
Ethylbenzene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	93	50	140
Ethylenedibromide	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	88	50	140
n-Hexane	GCM0381-JUN21	µg/g	0.05	< 0.05	2	50	91	60	130	82	50	140
m/p-xylene	GCM0381-JUN21	µg/g	0.05	< 0.05	3	50	99	60	130	93	50	140
Methyl ethyl ketone	GCM0381-JUN21	µg/g	0.5	< 0.5	ND	50	93	50	140	80	50	140
Methyl isobutyl ketone	GCM0381-JUN21	µg/g	0.5	< 0.5	ND	50	95	50	140	83	50	140
Methyl-t-butyl Ether	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	88	50	140
Methylene Chloride	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	94	60	130	87	50	140
o-xylene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	93	50	140
Styrene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	92	50	140
Tetrachloroethylene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	99	60	130	90	50	140
Toluene	GCM0381-JUN21	µg/g	0.05	< 0.05	4	50	97	60	130	91	50	140
trans-1,2-Dichloroethylene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	96	60	130	91	50	140
trans-1,3-dichloropropene	GCM0381-JUN21	µg/g	0.03	< 0.03	ND	50	98	60	130	87	50	140
Trichloroethylene	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	97	60	130	90	50	140
Trichlorofluoromethane	GCM0381-JUN21	µg/g	0.05	< 0.05	ND	50	87	50	140	81	50	140
Vinyl Chloride	GCM0381-JUN21	µg/g	0.02	< 0.02	ND	50	81	50	140	76	50	140

QC SUMMARY

Water Soluble Boron

Method: O.Reg. 15 3/04 | Internal ref.: ME-CA-[ENV] SPE-LAK-AN-003

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
Water Soluble Boron	ESG0058-JUN21	µg/g	0.5	<0.5	ND	20	103	80	120	115	70	130

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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 020138 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Scott M
Received Date: 06/17/2021 (mm/dd/yy)
Received Time: 17:30 (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): 7C 9C 5C
LAB LIMS #: CA14357/58-JUN21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE., TORONTO	Contact:
Phone: 416-785-5110	Address:
Fax: ~~malam@petromaccallum.com~~	Phone:
Email: Stanfdel@petromaccallum.com	Email:

Quotation #: PML RATE
Project #: 21TF0018
P.O. #:
Site Location/ID:

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 ____
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:

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,	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: VOCs + PHCs	Other: pH, Ec, SAR	Other	Other	Other: Appendix 2: 406/19 Leachate Screening Levels Table :	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	TCLP: Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	BH6, SS1	06/11/21	PM	2+2	SOIL					✓			✓					✓								
2	BH6, SS2	"	"	1	"		✓																			
3	BH6, SS3	"	"	2+1	"										✓											
4	BH7, SS1	06/14/21	AM	1	"					✓																
5	BH7, SS2	"	"	2+2	"		✓											✓								
6	BH7, SS4	"	"	1	"				✓										✓							
7	BH7, SS4 DUP	"	"	1	"				✓																	
8	BH8, SS1	"	PM	2+2	"					✓			✓													
9	BH8, SS2	"	"	1	"							✓														
10	BH8, SS3	"	"	1	"		✓																			
11	COMP #3	"	"	2	"																				✓	
12																										

Observations/Comments/Special Instructions

Sampled By (NAME): Jason Taylor	Signature: Jason Morgan	Date: 06/17/21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Jason Taylor	Signature: Jason Morgan	Date: 06/17/21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 27 May. 2020

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 Environment, Health & Safety - 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: 020146 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Sal Received By (signature): S
Received Date: 06/17/2021 (mm/dd/yy) Custody Seal Present: Yes ✓ No ☐ Cooling Agent Present: Yes ✓ No ☐ Type: Ice
Received Time: 17:30 (hr : min) Custody Seal Intact: Yes ✓ No ☐ Temperature Upon Receipt (°C) 9C 9C 9C LAB LIMS #: ____

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE, TORONTO	Contact:
Phone: 416-785-5110	Address:
Fax:	Phone:
Email: malam@petroscallum.com Starafder@petroscallum.com	Email:

Quotation #: PML RATE P.O. #: ____
Project #: 21TF001 Site Location/ID: ____

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 ____
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: ____

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH10, SS1	06/11/21	PM	1	SOIL
2	BH10, SS2	"	"	2+1	"
3	BH10, SS3	"	"	2+2	"
4	BH10, SS4	"	"	1	"
5	BH11, SS1	06/16/21	AM	2+1	"
6	BH11, SS2	"	"	2	"
7	BH14, SS1	06/14/21	AM	2+1	"
8	BH14, SS2	"	"	2+1	"
9	BH14, SS3	"	"	2+1	"
10	BH14, SS3 DUP	"	PM	2+1	"
11	BH14, SS4	"	"	1	"
12	COMP # 4	"	"	2	

	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN, Hg pH, (B(HWS), EC, SAR–soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs ☐ Total ☐ Aroclor	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	Other (please specify)				Appendix 2: 406/19 Leachate Screening Levels Table : ____	Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	TCLP Specify TCLP tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
													pH, Ee, SAR							
1					✓															
2								✓												
3		✓								✓										
4				✓									✓							
5					✓			✓												
6		✓					✓													
7					✓		✓													
8		✓						✓												
9										✓										
10										✓										Emailed
11				✓									✓							
12																			✓	

Observations/Comments/Special Instructions

Sampled By (NAME): Jason Signature: Jason Date: 07/17 (mm/dd/yy)
Relinquished by (NAME): Jason Signature: Jason Date: / / (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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FINAL REPORT

CA14358-JUN21 R1

21TF001

Prepared for

Peto MacCallum Ltd

FINAL REPORT

First Page

CLIENT DETAILS

Client	Peto MacCallum Ltd
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada
Contact	M. Alam
Telephone	416-785-5110
Facsimile	416-785-5120
Email	starafder@petomaccallum.com; malam@petomaccallum.com
Project	21TF001
Order Number	
Samples	Leachate (2)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA14358-JUN21
Received	06/17/2021
Approved	06/23/2021
Report Number	CA14358-JUN21 R1
Date Reported	06/23/2021

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020138/020146

TCLP metals reported at 10x DL

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

Exceedance Summary..... 6

QC Summary..... 7-10

Legend..... 11

Annexes..... 12-13

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: ,

PACKAGE: **REG558 - Acid rock Drainage**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Sample Number 6	Sample Number 7
				Sample Name: Comp #3	Sample Name: Comp #4
				Sample Matrix: Leachate	Sample Matrix: Leachate
Acid rock Drainage					
Final pH	no unit	0.01		6.15	6.52

PACKAGE: **REG558 - Metals and Inorganics**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Sample Number 6	Sample Number 7
				Sample Name: Comp #3	Sample Name: Comp #4
				Sample Matrix: Leachate	Sample Matrix: Leachate
Metals and Inorganics					
Sample weight	g	0.001		100	100
Ext Fluid	#1 or #2	0.01		2	1
^ Ext Volume	mL	0.01		2000	2000
Nitrite (as N)	as N mg/L	0.3		< 0.3	< 0.3
Nitrate (as N)	as N mg/L	0.6		< 0.6	< 0.6
Nitrate + Nitrite (as N)	as N mg/L	0.6	1000	< 0.6	< 0.6
Fluoride	mg/L	0.06	150	0.34	0.32
Cyanide (total)	mg/L	0.01	20	< 0.01	< 0.01
Arsenic	mg/L	0.002	2.5	< 0.002	0.002
Silver	mg/L	0.0005	5	< 0.0005	< 0.0005
Barium	mg/L	0.0002	100	0.611	1.38
Boron	mg/L	0.02	500	0.16	0.20
Cadmium	mg/L	0.00003	0.5	0.00169	0.00084
Chromium	mg/L	0.0008	5	0.0024	0.0020
Lead	mg/L	0.00009	5	0.00184	0.00144

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: ,

PACKAGE: **REG558 - Metals and Inorganics** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Sample Number 6 Result	Sample Number 7 Result
				Sample Name: Comp #3	Sample Name: Comp #4
				Sample Matrix: Leachate	Sample Matrix: Leachate
Metals and Inorganics (continued)					
Selenium	mg/L	0.0004	1	< 0.0004	< 0.0004
Uranium	mg/L	0.00002	10	0.00381	0.00336

PACKAGE: **REG558 - Other (ORP)** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Sample Number 6 Result	Sample Number 7 Result
				Sample Name: Comp #3	Sample Name: Comp #4
				Sample Matrix: Leachate	Sample Matrix: Leachate
Other (ORP)					
Mercury	mg/L	0.00001	0.1	< 0.00001	< 0.00001

PACKAGE: **REG558 - PCBs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Sample Number 6 Result	Sample Number 7 Result
				Sample Name: Comp #3	Sample Name: Comp #4
				Sample Matrix: Leachate	Sample Matrix: Leachate
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.001	0.3	< 0.001	< 0.001

PACKAGE: **REG558 - SVOCs - PAHs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Sample Number 6 Result	Sample Number 7 Result
				Sample Name: Comp #3	Sample Name: Comp #4
				Sample Matrix: Leachate	Sample Matrix: Leachate
SVOCs - PAHs					

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: ,

PACKAGE: **REG558 - SVOCs - PAHs**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6	7
				Sample Name	Comp #3	Comp #4
				Sample Matrix	Leachate	Leachate
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	
SVOCs - PAHs (continued)						
Benzo(a)pyrene	mg/L	0.001	0.001	< 0.001	< 0.001	

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

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)	SKA0219-JUN21	mg/L	0.01	<0.01	ND	10	90	90	110	87	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	EWL0434-JUN21	mg/L	0.06	<0.06	ND	10	103	90	110	95	75	125

Inorganics-General

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-IENVISPE-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	EHG0025-JUN21	mg/L	0.00001	< 0.00001	ND	20	107	80	120	115	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	EMS0135-JUN21	mg/L	0.0005	<0.00005	ND	20	103	90	110	106	70	130
Arsenic	EMS0135-JUN21	mg/L	0.002	<0.0002	ND	20	109	90	110	111	70	130
Barium	EMS0135-JUN21	mg/L	0.0002	<0.00002	ND	20	104	90	110	107	70	130
Boron	EMS0135-JUN21	mg/L	0.02	<0.002	ND	20	92	90	110	97	70	130
Cadmium	EMS0135-JUN21	mg/L	0.00003	<0.000003	ND	20	104	90	110	110	70	130
Chromium	EMS0135-JUN21	mg/L	0.0008	<0.00008	ND	20	108	90	110	110	70	130
Lead	EMS0135-JUN21	mg/L	0.00009	<0.00001	ND	20	109	90	110	115	70	130
Selenium	EMS0135-JUN21	mg/L	0.0004	<0.00004	ND	20	104	90	110	113	70	130
Uranium	EMS0135-JUN21	mg/L	0.00002	<0.000002	ND	20	99	90	110	102	70	130

Nitrate by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-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
Nitrate (as N)	DIO0372-JUN21	mg/L	0.6	<0.6	3	20	101	90	110	102	75	125

QC SUMMARY

Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENVIIC-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
Nitrite (as N)	DIO0372-JUN21	mg/L	0.3	<0.3	ND	20	97	90	110	103	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENVIGC-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	GCM0378-JUN21	mg/L	0.001	< 0.001	NSS	30	86	60	140	NSS	60	140

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENVIGC-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
Benzo(a)pyrene	GCM0380-JUN21	mg/L	0.001	< 0.001	NSS	30	92	50	140	NSS	50	140

QC SUMMARY

Total Nitrate/Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Nitrate + Nitrite (as N)	DIO0372-JUN21	mg/L	0.6	<0.6	NA	20	NA	80	120	NA	75	125

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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 020138 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Scott R | Received By (signature): | Cooling Agent Present: Yes ☑ No ☐ Type: Ice | LAB LIMS #: CA14357/58-JUN21
Received Date: 06/17/2021 (mm/dd/yy) | Custody Seal Present: Yes ☐ No ☐
Received Time: 17:30 (hr : min) | Custody Seal Intact: Yes ☑ No ☐ | Temperature Upon Receipt (°C): 7C 9C 5C

REPORT INFORMATION
Company: PML
Contact: M. ALAM/S. TARAFDER
Address: 165 CARTWRIGHT AVE., TORONTO
Phone: 416-785-5110
Fax: ~~416~~ malam@petromarcall.com
Email: Stanfdel@petromarcall.com

INVOICE INFORMATION
☐ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #: PML RATE | P.O. #:
Project #: 21TF0018 | Site Location/ID:

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 ____
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:

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,	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs ☐ Aroclor ☑ Total	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:	Other:	Other:	Other:	Other: Appendix 2: 406/19 Leachate Screening Levels Table: ____	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	TCLP: Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
																		VOCs + PHCs	PH, EC, SAR							
1	BH6, SS1	06/11/21	PM	2+2	SOIL					✓			✓													
2	BH6, SS2	"	"	1	"		✓																			
3	BH6, SS3	"	"	2+1	"										✓											
4	BH7, SS1	06/14/21	AM	1	"					✓																
5	BH7, SS2	"	"	2+2	"		✓											✓								
6	BH7, SS4	"	"	1	"				✓										✓							
7	BH7, SS4 DUP	"	"	1	"				✓																	
8	BH8, SS1	"	PM	2+2	"					✓			✓													
9	BH8, SS2	"	"	1	"							✓														
10	BH8, SS3	"	"	1	"		✓																			
11	COMP #3	"	"	2	"																				✓	
12																										

Observations/Comments/Special Instructions

Sampled By (NAME): JASON | Signature: Jason Morgan | Date: 06/17/21 (mm/dd/yy)
Relinquished by (NAME): JASON | Signature: Jason Morgan | Date: 06/17/21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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 Environment, Health & Safety - 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: 020146 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Sal
Received Date: 06/17/2021 (mm/dd/yy)
Received Time: 17 30 (hr : min)
Received By (signature): S
Custody Seal Present: Yes ✓ No
Custody Seal Intact: Yes ✓ No
Cooling Agent Present: Yes ✓ No Type: Ice
Temperature Upon Receipt (°C): 9C 9C 9C
LAB LIMS #:

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE, TORONTO	Contact:
Phone: 416-785-5110	Address:
Fax: Email: malam@petromecallum.com	Phone:
Email: Starafder@petromecallum.com	Email:

Quotation #: PML RATE
Project #: 21TF001
P.O. #:
Site Location/ID:

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 ____
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:

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,	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): PH, Ea, SAR	Other: Appendix 2: 406/19 Leachate Screening Levels Table :	Other: Sewer Use: (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	TCLP (Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	BH10, SS1	06/11/21	PM	1	SOIL					✓													
2	BH10, SS2	"	"	2+1	"								✓										
3	BH10, SS3	"	"	2+2	"		✓								✓								
4	BH10, SS4	"	"	1	"				✓									✓					
5	BH11, SS1	06/16/21	AM	2+1	"					✓			✓										
6	BH11, SS2	"	"	2	"		✓					✓											
7	BH14, SS1	06/14/21	AM	1	"					✓		✓											
8	BH14, SS2	"	"	2+1	"		✓						✓										
9	BH14, SS3	"	"	2+1	"										✓								
10	BH14, SS3 DUP	"	PM	2+1	"										✓								Emailed
11	BH14, SS4	"	"	1	"				✓									✓					
12	COMP #4	"	"	2																		✓	

Observations/Comments/Special Instructions

Sampled By (NAME): Jason Sousa	Signature: Jason Sousa	Date: 06/17/21 (mm/dd/yy)	Pink Copy - Client
Relinquished By (NAME):	Signature:	Date: / / (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA14538-JUL21 R1

21TF001B

Prepared for

Peto MacCallum Ltd

FINAL REPORT

First Page

CLIENT DETAILS

Client	Peto MacCallum Ltd
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada
Contact	M. Alam
Telephone	416-785-5110
Facsimile	416-785-5120
Email	starafder@petomaccallum.com; malam@petomaccallum.com
Project	21TF001B
Order Number	
Samples	Soil (11)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA14538-JUL21
Received	07/27/2021
Approved	08/03/2021
Report Number	CA14538-JUL21 R1
Date Reported	09/15/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

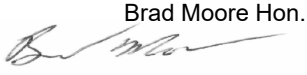
Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020174/020175

PCB Matrix Spike; Recovery is outside control limits due to sample matrix.

SIGNATORIES

Brad Moore Hon. B.Sc



QCBatchID: GCM0502-JUL21; 1,1,2,2-Tetrachloroethane, Trichloroethylene Matrix Spike; Recoveries outside control limits due to sample matrix.

BH18, SS1 - Surrogate recovery is outside of acceptance for 2-Fluorophenol, Phenol-d6 and 2,4,6-Tribromophenol due to sample matrix.

SVOC Duplicate RPD is outside of acceptance for Phenanthrene due to sample matrix.

TABLE OF CONTENTS

First Page..... 1-2

Index..... 3

Results..... 4-12

Exceedance Summary..... 13

QC Summary..... 14-24

Legend..... 25

Annexes..... 26-27

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number	9	10	11	12	15	16	17	18
	Sample Name	BH18, SS2	BH18, SS3	BH19, SS2	BH19, SS3	BH20, SS1	BH20, SS2	BH20, SS3	BH20, SS3 Dup
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX											
Benzene	µg/g	0.02	0.32	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	9.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	µg/g	0.05	68	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06
Xylene (total)	µg/g	0.05	26	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
o-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number	9	10	11	13	14	17			
	Sample Name	BH18, SS2	BH18, SS3	BH19, SS2	BH19, SS5	BH19, SS5 Dup	BH20, SS3			
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil			
	Sample Date	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021			
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	
Hydrides										
Antimony	µg/g	0.8	40	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	
Arsenic	µg/g	0.5	18	2.2	4.7	4.3	4.7	7.7	4.9	
Selenium	µg/g	0.7	5.5	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number	8	9	10	11	12	13	14	15
	Sample Name	BH18, SS1	BH18, SS2	BH18, SS3	BH19, SS2	BH19, SS3	BH19, SS5	BH19, SS5 Dup	BH20, SS1
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics											
Moisture Content	%	-		2.9	15.3	11.4	13.5	19.9	8.1		12.9
Barium	µg/g	0.1	670		120	91	88		66	75	
Beryllium	µg/g	0.02	8		0.53	0.76	0.76		0.87	1.1	
Boron	µg/g	1	120		9	13	9		11	14	
Cadmium	µg/g	0.02	1.9		0.10	0.09	0.12		0.05	< 0.02	
Chromium	µg/g	0.5	160		20	23	22		25	27	
Cobalt	µg/g	0.01	80		8.1	13	13		15	17	
Copper	µg/g	0.1	230		16	28	26		28	21	
Lead	µg/g	0.1	120		7.5	11	14		8.7	3.4	
Molybdenum	µg/g	0.1	40		0.2	0.3	0.2		0.1	0.2	
Nickel	µg/g	0.5	270		18	27	28		31	33	
Silver	µg/g	0.05	40		< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	
Thallium	µg/g	0.02	3.3		0.15	0.15	0.17		0.16	0.15	
Uranium	µg/g	0.002	33		0.64	0.65	0.48		0.62	0.66	
Vanadium	µg/g	3	86		26	30	28		29	30	
Zinc	µg/g	0.7	340		45	61	58		61	67	
Water Soluble Boron	µg/g	0.5	2		< 0.5	< 0.5	< 0.5		< 0.5		

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number			16	17	18
	Sample Name			BH20, SS2	BH20, SS3	BH20, SS3 Dup
	Sample Matrix			Soil	Soil	Soil
	Sample Date			23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Metals and Inorganics						
Moisture Content	%	-		9.7	10.0	8.7
Barium	µg/g	0.1	670		52	
Beryllium	µg/g	0.02	8		0.81	
Boron	µg/g	1	120		16	
Cadmium	µg/g	0.02	1.9		0.07	
Chromium	µg/g	0.5	160		23	
Cobalt	µg/g	0.01	80		12	
Copper	µg/g	0.1	230		24	
Lead	µg/g	0.1	120		12	
Molybdenum	µg/g	0.1	40		0.3	
Nickel	µg/g	0.5	270		26	
Silver	µg/g	0.05	40		< 0.05	
Thallium	µg/g	0.02	3.3		0.15	
Uranium	µg/g	0.002	33		0.63	
Vanadium	µg/g	3	86		30	
Zinc	µg/g	0.7	340		56	
Water Soluble Boron	µg/g	0.5	2		< 0.5	

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				9	10	11	13	14	17
Sample Name				BH18, SS2	BH18, SS3	BH19, SS2	BH19, SS5	BH19, SS5 Dup	BH20, SS3
Sample Matrix				Soil	Soil	Soil	Soil	Soil	Soil
Sample Date				23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Other (ORP)									
Mercury	ug/g	0.05	3.9	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05
Sodium Adsorption Ratio	No unit	0.2	12	11.5	4.6	11.6	0.8	1.2	1.2
SAR Calcium	mg/L	0.2		91.5	72.8	133	63.0	51.0	69.8
SAR Magnesium	mg/L	0.3		34.9	30.2	13.8	18.4	12.1	28.8
SAR Sodium	mg/L	0.1		509	183	526	29.3	35.4	47.7
Conductivity	mS/cm	0.002	1.4	3.9	1.7	4.8	0.71	0.67	0.99
pH	pH Units	0.05		8.02	8.17	8.11	8.00	8.08	8.09
Chromium VI	µg/g	0.2	8	< 0.2	< 0.2	< 0.2	< 0.2		< 0.2
Free Cyanide	µg/g	0.05	0.051	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number			8	11	15
	Sample Name			BH18, SS1	BH19, SS2	BH20, SS1
	Sample Matrix			Soil	Soil	Soil
	Sample Date			23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
PAHs						
Acenaphthene	µg/g	0.05	96	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/g	0.05	0.15	< 0.05	< 0.05	< 0.05
Anthracene	µg/g	0.05	0.67	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.96	0.07	< 0.05	< 0.05
Benzo(a)pyrene	µg/g	0.05	0.3	0.06	< 0.05	< 0.05
Benzo(b+j)fluoranthene	µg/g	0.05	0.96	0.12	< 0.05	< 0.05
Benzo(ghi)perylene	µg/g	0.1	9.6	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	µg/g	0.05	0.96	< 0.05	< 0.05	< 0.05
Chrysene	µg/g	0.05	9.6	0.08	< 0.05	< 0.05
Dibenzo(a,h)anthracene	µg/g	0.06	0.1	< 0.06	< 0.06	< 0.06
Fluoranthene	µg/g	0.05	9.6	0.23	0.06	< 0.05
Fluorene	µg/g	0.05	62	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.1	0.76	< 0.1	< 0.1	< 0.1
1-Methylnaphthalene	µg/g	0.05		< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/g	0.05		0.05	< 0.05	< 0.05
Methylnaphthalene, 2-(1-)	µg/g	0.05	76	0.10	< 0.05	< 0.05
Naphthalene	µg/g	0.05	9.6	0.06	< 0.05	< 0.05
Phenanthrene	µg/g	0.05	12	0.26	< 0.05	< 0.05
Pyrene	µg/g	0.05	96	0.28	0.06	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - PCBs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	8	11	15	
			Sample Name	BH18, SS1	BH19, SS2	BH20, SS1	
			Sample Matrix	Soil	Soil	Soil	
			Sample Date	23/07/2021	23/07/2021	23/07/2021	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	
PCBs							
Polychlorinated Biphenyls (PCBs) - Total	µg/g	0.3	1.1	< 0.3	< 0.3	< 0.3	

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	9	11	12	15	16
			Sample Name	BH18, SS2	BH19, SS2	BH19, SS3	BH20, SS1	BH20, SS2
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
PHCs								
F1 (C6-C10)	µg/g	10	55	< 10	< 10	< 10	< 10	< 10
F1-BTEX (C6-C10)	µg/g	10	55	< 10	< 10	< 10	< 10	< 10
F2 (C10-C16)	µg/g	10	230	< 10	< 10	< 10	< 10	13
F3 (C16-C34)	µg/g	50	1700	< 50	< 50	< 50	< 50	< 50
F4 (C34-C50)	µg/g	50	3300	< 50	< 50	< 50	< 50	< 50
Chromatogram returned to baseline at nC50	Yes / No	-		YES	YES	YES	YES	YES

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - SVOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number	8	11	15		
	Sample Name	BH18, SS1	BH19, SS2	BH20, SS1		
	Sample Matrix	Soil	Soil	Soil		
	Sample Date	23/07/2021	23/07/2021	23/07/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
SVOC Surrogates						
Surr Nitrobenzene-d5	Surr Rec %	-		75	92	84
Surr 2-Fluorobiphenyl	Surr Rec %	-		67	86	68
Surr 4-Terphenyl-d14	Surr Rec %	-		92	98	76
Surr 2-Fluorophenol	Surr Rec %	-		1.0	89	83
Surr Phenol-d6	Surr Rec %	-		5.0	92	86
Surr 2,4,6-Tribromophenol	Surr Rec %	-		1.0	89	71

PACKAGE: **REG153 - THMs (VOC)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

	Sample Number	10	11	12	17	18		
	Sample Name	BH18, SS3	BH19, SS2	BH19, SS3	BH20, SS3	BH20, SS3 Dup		
	Sample Matrix	Soil	Soil	Soil	Soil	Soil		
	Sample Date	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
THMs (VOC)								
Bromodichloromethane	µg/g	0.05	18	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromoform	µg/g	0.05	0.61	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibromochloromethane	µg/g	0.05	13	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - VOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	10	11	12	17	18
			Sample Name	BH18, SS3	BH19, SS2	BH19, SS3	BH20, SS3	BH20, SS3 Dup
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
VOC Surrogates								
Surr 1,2-Dichloroethane-d4	Surr Rec %	-		100	100	100	99	99
Surr 4-Bromofluorobenzene	Surr Rec %	-		93	93	93	92	93
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-		91	91	91	91	91

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	10	11	12	17	18
			Sample Name	BH18, SS3	BH19, SS2	BH19, SS3	BH20, SS3	BH20, SS3 Dup
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs								
Acetone	µg/g	0.5	16	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Carbon tetrachloride	µg/g	0.05	0.21	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlorobenzene	µg/g	0.05	2.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloroform	µg/g	0.05	0.47	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/g	0.05	6.8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/g	0.05	9.6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/g	0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dichlorodifluoromethane	µg/g	0.05	16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethane	µg/g	0.05	17	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1-Dichloroethylene	µg/g	0.05	0.064	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
trans-1,2-Dichloroethylene	µg/g	0.05	1.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				10	11	12	17	18
Sample Name				BH18, SS3	BH19, SS2	BH19, SS3	BH20, SS3	BH20, SS3 Dup
Sample Matrix				Soil	Soil	Soil	Soil	Soil
Sample Date				23/07/2021	23/07/2021	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs (continued)								
cis-1,2-Dichloroethylene	µg/g	0.05	55	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichloropropane	µg/g	0.05	0.16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
cis-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
trans-1,3-dichloropropene	µg/g	0.03		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
1,3-dichloropropene (total)	µg/g	0.05	0.18	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ethylenedibromide	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
n-Hexane	µg/g	0.05	46	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl ethyl ketone	µg/g	0.5	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl isobutyl ketone	µg/g	0.5	31	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl-t-butyl Ether	µg/g	0.05	11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylene Chloride	µg/g	0.05	1.6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Styrene	µg/g	0.05	34	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	4.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,1,2-Tetrachloroethane	µg/g	0.05	0.087	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,1-Trichloroethane	µg/g	0.05	6.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,1,2-Trichloroethane	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Trichloroethylene	µg/g	0.05	0.91	< 0.05	0.06	< 0.05	0.39	0.21
Trichlorofluoromethane	µg/g	0.05	4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vinyl Chloride	µg/g	0.02	0.032	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED L1
BH18, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	3.9	1.4
BH18, SS3				
Conductivity	EPA 6010/SM 2510	mS/cm	1.7	1.4
BH19, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	4.8	1.4

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 I Internal ref.: ME-CA-IENVIEWL-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
Conductivity	EWL0513-JUL21	mS/cm	0.002	<0.002	0	10	100	90	110	NA		

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
Free Cyanide	SKA5119-JUL21	µg/g	0.05	<0.05	ND	20	99	80	120	78	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	SKA5108-JUL21	ug/g	0.2	<0.2	ND	20	94	80	120	91	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-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	EMS0169-JUL21	ug/g	0.05	<0.05	12	20	103	80	120	89	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

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
SAR Calcium	ESG0084-JUL21	mg/L	0.2	<0.09	1	20	97	80	120	99	70	130
SAR Magnesium	ESG0084-JUL21	mg/L	0.3	<0.02	2	20	97	80	120	100	70	130
SAR Sodium	ESG0084-JUL21	mg/L	0.1	<0.15	1	20	99	80	120	96	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENVISPE-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
Silver	EMS0169-JUL21	ug/g	0.05	<0.05	13	20	98	70	130	88	70	130
Arsenic	EMS0169-JUL21	µg/g	0.5	<0.5	6	20	102	70	130	86	70	130
Barium	EMS0169-JUL21	ug/g	0.1	<0.1	8	20	101	70	130	87	70	130
Beryllium	EMS0169-JUL21	µg/g	0.02	<0.02	3	20	100	70	130	90	70	130
Boron	EMS0169-JUL21	µg/g	1	<1	10	20	103	70	130	88	70	130
Cadmium	EMS0169-JUL21	µg/g	0.02	<0.02	ND	20	102	70	130	87	70	130
Cobalt	EMS0169-JUL21	µg/g	0.01	<0.01	8	20	101	70	130	91	70	130
Chromium	EMS0169-JUL21	µg/g	0.5	<0.5	9	20	102	70	130	91	70	130
Copper	EMS0169-JUL21	µg/g	0.1	<0.1	5	20	100	70	130	88	70	130
Molybdenum	EMS0169-JUL21	µg/g	0.1	<0.1	8	20	90	70	130	90	70	130
Nickel	EMS0169-JUL21	ug/g	0.5	<0.5	7	20	98	70	130	89	70	130
Lead	EMS0169-JUL21	µg/g	0.1	<0.1	1	20	101	70	130	90	70	130
Antimony	EMS0169-JUL21	µg/g	0.8	<0.8	ND	20	98	70	130	84	70	130
Selenium	EMS0169-JUL21	µg/g	0.7	<0.7	ND	20	101	70	130	84	70	130
Thallium	EMS0169-JUL21	µg/g	0.02	<0.02	6	20	103	70	130	85	70	130
Uranium	EMS0169-JUL21	µg/g	0.002	<0.002	3	20	98	70	130	109	70	130
Vanadium	EMS0169-JUL21	µg/g	3	<3	5	20	99	70	130	92	70	130
Zinc	EMS0169-JUL21	µg/g	0.7	<0.7	ND	20	95	70	130	84	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

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
F1 (C6-C10)	GCM0503-JUL21	µg/g	10	<10	ND	30	83	80	120	109	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

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
F2 (C10-C16)	GCM0554-JUL21	µg/g	10	<10	ND	30	105	80	120	94	60	140
F3 (C16-C34)	GCM0554-JUL21	µg/g	50	<50	ND	30	105	80	120	94	60	140
F4 (C34-C50)	GCM0554-JUL21	µg/g	50	<50	ND	30	105	80	120	94	60	140

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENVIEWL-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
pH	ARD0111-JUL21	pH Units	0.05		0	20	100	80	120			

Polychlorinated Biphenyls

Method: EPA 3570/8082A/8270C I Internal ref.: ME-CA-[ENVIGC-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	GCM0504-JUL21	µg/g	0.3	< 0.3	ND	40	78	60	140	53	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENVIGC-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
1-Methylnaphthalene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	94	50	140	84	50	140
2-Methylnaphthalene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	81	50	140
Acenaphthene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	101	50	140	96	50	140
Acenaphthylene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	95	50	140	90	50	140
Anthracene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	97	50	140	97	50	140
Benzo(a)anthracene	GCM0501-JUL21	µg/g	0.05	< 0.05	18	40	100	50	140	102	50	140
Benzo(a)pyrene	GCM0501-JUL21	µg/g	0.05	< 0.05	9	40	89	50	140	93	50	140
Benzo(b+j)fluoranthene	GCM0501-JUL21	µg/g	0.05	< 0.05	2	40	96	50	140	94	50	140
Benzo(ghi)perylene	GCM0501-JUL21	µg/g	0.1	< 0.1	ND	40	99	50	140	79	50	140
Benzo(k)fluoranthene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	98	50	140	105	50	140
Chrysene	GCM0501-JUL21	µg/g	0.05	< 0.05	0	40	101	50	140	94	50	140
Dibenzo(a,h)anthracene	GCM0501-JUL21	µg/g	0.06	< 0.06	ND	40	101	50	140	88	50	140
Fluoranthene	GCM0501-JUL21	µg/g	0.05	< 0.05	22	40	100	50	140	93	50	140
Fluorene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	99	50	140	105	50	140
Indeno(1,2,3-cd)pyrene	GCM0501-JUL21	µg/g	0.1	< 0.1	ND	40	101	50	140	88	50	140
Naphthalene	GCM0501-JUL21	µg/g	0.05	< 0.05	ND	40	99	50	140	92	50	140
Phenanthrene	GCM0501-JUL21	µg/g	0.05	< 0.05	65	40	98	50	140	85	50	140
Pyrene	GCM0501-JUL21	µg/g	0.05	< 0.05	38	40	103	50	140	90	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	106	50	140
1,1,1-Trichloroethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	105	50	140
1,1,2,2-Tetrachloroethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	5	50	140
1,1,2-Trichloroethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	106	50	140
1,1-Dichloroethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	91	60	130	102	50	140
1,1-Dichloroethylene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	88	60	130	99	50	140
1,2-Dichlorobenzene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	96	60	130	107	50	140
1,2-Dichloroethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	103	50	140
1,2-Dichloropropane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	105	50	140
1,3-Dichlorobenzene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	97	60	130	107	50	140
1,4-Dichlorobenzene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	98	60	130	108	50	140
Acetone	GCM0502-JUL21	µg/g	0.5	< 0.5	ND	50	93	50	140	107	50	140
Benzene	GCM0502-JUL21	µg/g	0.02	< 0.02	ND	50	93	60	130	104	50	140
Bromodichloromethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	104	50	140
Bromoform	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	103	50	140
Bromomethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	82	50	140	83	50	140
Carbon tetrachloride	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	103	50	140
Chlorobenzene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	106	50	140
Chloroform	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	105	50	140
cis-1,2-Dichloroethylene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	103	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
cis-1,3-dichloropropene	GCM0502-JUL21	µg/g	0.03	< 0.03	ND	50	95	60	130	103	50	140
Dibromochloromethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	103	50	140
Dichlorodifluoromethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	55	50	140	58	50	140
Ethylbenzene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	96	60	130	108	50	140
Ethylenedibromide	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	106	50	140
n-Hexane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	99	60	130	107	50	140
m/p-xylene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	107	50	140
Methyl ethyl ketone	GCM0502-JUL21	µg/g	0.5	< 0.5	ND	50	93	50	140	108	50	140
Methyl isobutyl ketone	GCM0502-JUL21	µg/g	0.5	< 0.5	ND	50	94	50	140	108	50	140
Methyl-t-butyl Ether	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	96	60	130	109	50	140
Methylene Chloride	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	91	60	130	101	50	140
o-xylene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	96	60	130	107	50	140
Styrene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	96	60	130	108	50	140
Tetrachloroethylene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	97	60	130	107	50	140
Toluene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	106	50	140
trans-1,2-Dichloroethylene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	92	60	130	102	50	140
trans-1,3-dichloropropene	GCM0502-JUL21	µg/g	0.03	< 0.03	ND	50	94	60	130	102	50	140
Trichloroethylene	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	186	50	140
Trichlorofluoromethane	GCM0502-JUL21	µg/g	0.05	< 0.05	ND	50	90	50	140	97	50	140
Vinyl Chloride	GCM0502-JUL21	µg/g	0.02	< 0.02	ND	50	76	50	140	81	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	102	50	140
1,1,1-Trichloroethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	101	50	140
1,1,2,2-Tetrachloroethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	108	60	130	99	50	140
1,1,2-Trichloroethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	100	50	140
1,1-Dichloroethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	103	60	130	95	50	140
1,1-Dichloroethylene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	105	60	130	96	50	140
1,2-Dichlorobenzene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	102	50	140
1,2-Dichloroethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	107	60	130	98	50	140
1,2-Dichloropropane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	108	60	130	101	50	140
1,3-Dichlorobenzene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	102	50	140
1,4-Dichlorobenzene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	102	50	140
Acetone	GCM0549-JUL21	µg/g	0.5	< 0.5	ND	50	104	50	140	94	50	140
Benzene	GCM0549-JUL21	µg/g	0.02	< 0.02	ND	50	109	60	130	101	50	140
Bromodichloromethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	99	50	140
Bromoform	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	107	60	130	95	50	140
Bromomethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	98	50	140	93	50	140
Carbon tetrachloride	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	99	50	140
Chlorobenzene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	102	50	140
Chloroform	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	102	50	140
cis-1,2-Dichloroethylene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	108	60	130	100	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
cis-1,3-dichloropropene	GCM0549-JUL21	µg/g	0.03	< 0.03	ND	50	110	60	130	95	50	140
Dibromochloromethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	108	60	130	97	50	140
Dichlorodifluoromethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	76	50	140	64	50	140
Ethylbenzene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	103	50	140
Ethylenedibromide	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	100	50	140
n-Hexane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	101	60	130	78	50	140
m/p-xylene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	101	50	140
Methyl ethyl ketone	GCM0549-JUL21	µg/g	0.5	< 0.5	ND	50	102	50	140	90	50	140
Methyl isobutyl ketone	GCM0549-JUL21	µg/g	0.5	< 0.5	ND	50	103	50	140	92	50	140
Methyl-t-butyl Ether	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	106	60	130	95	50	140
Methylene Chloride	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	108	60	130	99	50	140
o-xylene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	102	50	140
Styrene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	102	50	140
Tetrachloroethylene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	100	50	140
Toluene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	103	50	140
trans-1,2-Dichloroethylene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	99	50	140
trans-1,3-dichloropropene	GCM0549-JUL21	µg/g	0.03	< 0.03	ND	50	109	60	130	94	50	140
Trichloroethylene	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	109	60	130	102	50	140
Trichlorofluoromethane	GCM0549-JUL21	µg/g	0.05	< 0.05	ND	50	105	50	140	102	50	140
Vinyl Chloride	GCM0549-JUL21	µg/g	0.02	< 0.02	ND	50	97	50	140	87	50	140

QC SUMMARY

Water Soluble Boron

Method: O.Reg. 15 3/04 | Internal ref.: ME-CA-[ENV] SPE-LAK-AN-003

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
Water Soluble Boron	ESG0080-JUL21	µg/g	0.5	<0.5	ND	20	105	80	120	93	70	130

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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 020174

Page 1 of 2

Laboratory Information Section - Lab use only

Received By: B Cranmer
Received Date: 07/27/21 (mm/dd/yy)
Received Time: 18:22 (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) 9.9.9
LAB LIMS #: CA14539-JU21 / CA14538-JU21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☑ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE. TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petromacall.ca	Phone:
Email: starafdr@petromacall.ca	Email:

Quotation #: PML RATE
Project #: 21TF001B
P.O.#:
Site Location/ID:

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 _____

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:

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,	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: PH, Be, SAR	Other: Appendix 2: 406/19 Leachate Screening Levels Table: _____	Other: Sewer Use: (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	TCLP (Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	BH18, SS1	07/23/21	AM	2	SOIL					✓		✓	*										
2	BH18, SS2	"	"	2+2	"		✓						✓										
3	BH18, SS3	"	"	2+2	"		✓								✓								
4	COMP # 6	"	"	1	"																	✓	
5	~~BH19, SS1~~	"	"	2+2	"		✓						✓										
6	BH19, SS2	"	"	2+2	"		✓			✓		✓	✓		✓								
7	BH19, SS3	"	"	2+2	"		~~✓~~						✓		✓								
8	BH19, SS5	"	"	1	"		✓																
9	BH19, SS5 DUP	"	PM	1	"				✓									✓					
10	COMP # 7	"	"	1	"																	✓	
11	BH20, SS1	"	"	2+2	"					✓		✓	✓										
12	BH20, SS2	"	"	2+1	"								✓										

Observations/Comments/Special Instructions

Sampled By (NAME): Rishi Manicks	Signature:		Date: 07/27/21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Rishi Manicks	Signature:		Date: 07/27/21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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 Environment, Health & Safety - 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: 020175 Page 2 of 2

Laboratory Information Section - Lab use only

Received By: B Pauwels Received By (signature): Custody Seal Present: Yes ☑ No ☐ Cooling Agent Present: Yes ☑ No ☐ Type: ICE.
Received Date: 07/27/21 (mm/dd/yy) Custody Seal Intact: Yes ☑ No ☐ Temperature Upon Receipt (°C) 9.9.9
Received Time: 18:00 (hr : min) LAB LIMS #: ~~CA14536-JU21~~ ~~CA14537-JU21~~

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☑ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE., TORONTO	Contact:
Phone: 416-785-5110	Address:
~~Email~~: malam@petromecalb.	Phone:
Email: Starafdd@petromecalb.	~~Email~~:

Quotation #: PML RATE P.O. #:
Project #: 21TF001B Site Location/ID:

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 ____
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:

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,	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 (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	TCLP: Specify TCLP tests	COMMENTS:
1	BH20, SS3	07/23/21	PM	2+2	SOIL		✓								✓										
2	COMP #8	"	"	1	"																			✓	
3	BH20, SS3 DUP	"	"	2+1	"										✓										
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): RAJ Manicks	Signature: RManicks	Date: 07/27/21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Raj Manicks	Signature: RManicks	Date: 07/27/21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA14539-JUL21 R1

21TF001B

Prepared for

Peto MacCallum Ltd

FINAL REPORT

First Page

CLIENT DETAILS

Client	Peto MacCallum Ltd
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada
Contact	M. Alam
Telephone	416-785-5110
Facsimile	416-785-5120
Email	starafder@petomaccallum.com; malam@petomaccallum.com
Project	21TF001B
Order Number	
Samples	Leachate (3)

LABORATORY DETAILS

Project Specialist	Jill Campbell, B.Sc.,GISAS
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	2165
Facsimile	705-652-6365
Email	jill.campbell@sgs.com
SGS Reference	CA14539-JUL21
Received	07/27/2021
Approved	08/04/2021
Report Number	CA14539-JUL21 R1
Date Reported	08/04/2021

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020174/75

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

First Page..... 1-2

Index..... 3

Results..... 4-6

Exceedance Summary..... 7

QC Summary..... 8-11

Legend..... 12

Annexes..... 13-14

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG558 - Acid rock Drainage**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6	7	8
				Sample Name	Comp #6	Comp #7	Comp #8
				Sample Matrix	Leachate	Leachate	Leachate
				Sample Date	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Acid rock Drainage						
Final pH	no unit	0.01		6.08	5.72	5.82

PACKAGE: **REG558 - Metals and Inorganics**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6	7	8
				Sample Name	Comp #6	Comp #7	Comp #8
				Sample Matrix	Leachate	Leachate	Leachate
				Sample Date	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Metals and Inorganics						
Sample weight	g	0.001		100	100	100
Ext Fluid	#1 or #2	0.01		2	2	2
^ Ext Volume	mL	0.01		2000	2000	2000
Nitrite (as N)	as N mg/L	0.3		< 0.3	< 0.3	< 0.3
Nitrate (as N)	as N mg/L	0.6		< 0.6	< 0.6	< 0.6
Nitrate + Nitrite (as N)	as N mg/L	0.6	1000	< 0.6	< 0.6	< 0.6
Fluoride	mg/L	0.06	150	0.32	0.41	0.35
Cyanide (total)	mg/L	0.01	20	< 0.01	< 0.01	< 0.01
Arsenic	mg/L	0.002	2.5	< 0.002	0.002	0.002
Silver	mg/L	0.0005	5	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.0002	100	0.690	0.521	0.650
Boron	mg/L	0.02	500	0.08	0.07	0.10
Cadmium	mg/L	0.00003	0.5	0.00106	0.00073	0.00079

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG558 - Metals and Inorganics** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6	7	8
				Sample Name	Comp #6	Comp #7	Comp #8
				Sample Matrix	Leachate	Leachate	Leachate
				Sample Date	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**		**Result**	**Result**	**Result**
Metals and Inorganics (continued)							
Chromium	mg/L	0.0008	5		< 0.0008	< 0.0008	< 0.0008
Lead	mg/L	0.00009	5		0.00303	0.00432	0.00567
Selenium	mg/L	0.0004	1		< 0.0004	0.0007	0.0007
Uranium	mg/L	0.00002	10		0.00411	0.00445	0.00336

PACKAGE: **REG558 - Other (ORP)** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6	7	8
				Sample Name	Comp #6	Comp #7	Comp #8
				Sample Matrix	Leachate	Leachate	Leachate
				Sample Date	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**		**Result**	**Result**	**Result**
Other (ORP)							
Mercury	mg/L	0.00001	0.1		< 0.00001	< 0.00001	< 0.00001

PACKAGE: **REG558 - PCBs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6	7	8
				Sample Name	Comp #6	Comp #7	Comp #8
				Sample Matrix	Leachate	Leachate	Leachate
				Sample Date	23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**		**Result**	**Result**	**Result**
PCBs							
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.001	0.3		< 0.001	< 0.001	< 0.001

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG558 - SVOCs - PAHs**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number				6	7	8
Sample Name				Comp #6	Comp #7	Comp #8
Sample Matrix				Leachate	Leachate	Leachate
Sample Date				23/07/2021	23/07/2021	23/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
SVOCs - PAHs						
Benzo(a)pyrene	mg/L	0.001	0.001	< 0.001	< 0.001	< 0.001

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

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)	SKA0005-AUG21	mg/L	0.01	<0.01	ND	10	93	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	EWL0512-JUL21	mg/L	0.06	<0.06	2	10	102	90	110	109	75	125

Inorganics-General

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-IENVISPE-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	EHG0033-JUL21	mg/L	0.00001	< 0.00001	13	20	109	80	120	NV	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	EMS0002-AUG21	mg/L	0.0005	<0.00005	ND	20	101	90	110	101	70	130
Arsenic	EMS0002-AUG21	mg/L	0.002	<0.0002	5	20	109	90	110	107	70	130
Barium	EMS0002-AUG21	mg/L	0.0002	<0.00002	5	20	101	90	110	103	70	130
Boron	EMS0002-AUG21	mg/L	0.02	<0.002	3	20	106	90	110	97	70	130
Cadmium	EMS0002-AUG21	mg/L	0.00003	<0.000003	4	20	103	90	110	108	70	130
Chromium	EMS0002-AUG21	mg/L	0.0008	<0.00008	20	20	105	90	110	110	70	130
Lead	EMS0002-AUG21	mg/L	0.00009	<0.00001	16	20	102	90	110	100	70	130
Selenium	EMS0002-AUG21	mg/L	0.0004	<0.00004	13	20	105	90	110	100	70	130
Uranium	EMS0002-AUG21	mg/L	0.00002	<0.000002	7	20	92	90	110	90	70	130

Nitrate by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-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
Nitrate (as N)	DIO0447-JUL21	mg/L	0.6	<0.6	0	20	103	90	110	103	75	125

QC SUMMARY

Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENVIIC-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
Nitrite (as N)	DIO0447-JUL21	mg/L	0.3	<0.3	ND	20	101	90	110	101	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENVIGC-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	GCM0557-JUL21	mg/L	0.001	< 0.001	ND	30	138	60	140	NSS	60	140

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENVIGC-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
Benzo(a)pyrene	GCM0527-JUL21	mg/L	0.001	< 0.001	NSS	30	86	50	140	NSS	50	140

QC SUMMARY

Total Nitrate/Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Nitrate + Nitrite (as N)	DIO0447-JUL21	mg/L	0.6	<0.6	NA	20	NA	80	120	NA	75	125

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

Samples analysed as received. 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” 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 020174 Page 1 of 2

Laboratory Information Section - Lab use only

Received By: B Cannon
Received Date: 07 / 27 / 21 (mm/dd/yy)
Received Time: 18 : 22 (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) 9.9.9
LAB LIMS #: CA14539-JL21 / CA14538-JL21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☑ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE. TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petroscall.ca	Phone:
Email: staraf dr@petroscall.ca	Email:

Quotation #: PML RATE
Project #: 21TF001B
P.O. #:
Site Location/ID:

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 ____
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:

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,	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 + ~~PHCs~~	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other	Other (please specify)				Appendix 2: 406/19 Leachate Screening Levels Table :	Sewer Use: Specify pkg:	Water Characterization Pkg ☐ Extended ☐ General	TCLP: Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
																		PH, Ba, SAR								
1	BH18, SS1	07/23/21	AM	2	SOIL					✓		✓													
2	BH18, SS2	"	"	2+2	"		✓						✓												
3	BH18, SS3	"	"	2+2	"		✓								✓										
4	COMP # 6	"	"	1	"																			✓	
5	~~BH19, SS1~~	"	"	2+2	"		✓						✓												
6	BH19, SS2	"	"	2+2	"		✓			✓		✓	✓		✓										
7	BH19, SS3	"	"	2+2	"		~~✓~~						✓		✓										
8	BH19, SS5	"	"	1	"		✓																		
9	BH19, SS5 DUP	"	PM	1	"				✓									✓							
10	COMP # 7	"	"	1	"																			✓	
11	BH20, SS1	"	"	2+2	"					✓		✓	✓												
12	BH20, SS2	"	"	2+1	"								✓												

Observations/Comments/Special Instructions

Sampled By (NAME): Rishi Manicks	Signature: R Manicks	Date: 07/27/21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Rishi Manicks	Signature: R Manicks	Date: 07/27/21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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No: 020175 Page 2 of 2

Laboratory Information Section - Lab use only

Received By: B Paquin Received By (signature): [signature]
Received Date: 07/27/21 (mm/dd/yy) Custody Seal Present: Yes ☐ No ☐ Cooling Agent Present: Yes ☑ No ☐ Type: ICE
Received Time: 18:00 (hr : min) Custody Seal Intact: Yes ☐ No ☐ Temperature Upon Receipt (°C) 9.9.9
LAB LIMS #: ~~CA14536-Jul21~~ ~~CA14537-Jul21~~

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☑ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE., TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petromecall.com	Phone:
Email: starafdr@petromecall.com	Email:

Quotation #: PML RATE P.O. #:
Project #: 21TF001B Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

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☑ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table ____
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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

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1	BH20, SS3	07/23/21	PM	2+2	SOIL		✓								✓										
2	COMP #8	"	"	1	"																			✓	
3	BH20, SS3 DUP	"	"	2+1	"										✓										
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): R.Bhi Manicks **Signature:** [signature] Date: 07/27/21 (mm/dd/yy)
Relinquished by (NAME): R.Bhi Manicks **Signature:** [signature] Date: 07/27/21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

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.

FINAL REPORT

CA14768-JUN21 R

21TF001

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14768-JUN21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	705-652-2143
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	brad.moore@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA14768-JUN21
Project	21TF001	Received	06/11/2021
Order Number		Approved	06/17/2021
Samples	Leachate (1)	Report Number	CA14768-JUN21 R
		Date Reported	06/17/2021

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:021768

TCLP metals reported at 10x DL

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

Exceedance Summary..... 6

QC Summary..... 7-10

Legend..... 11

Annexes..... 12-13

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG558 - Acid rock Drainage**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#2
Sample Matrix	Leachate
Sample Date	10/06/2021

Parameter	Units	RL	L1	Result
Acid rock Drainage				
Final pH	no unit	0.01		6.00

PACKAGE: **REG558 - Metals and Inorganics**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#2
Sample Matrix	Leachate
Sample Date	10/06/2021

Parameter	Units	RL	L1	Result
Metals and Inorganics				
Sample weight	g	0.001		100
Ext Fluid	#1 or #2	0.01		2
^ Ext Volume	mL	0.01		2000
Nitrite (as N)	as N mg/L	0.3		< 0.3
Nitrate (as N)	as N mg/L	0.6		< 0.6
Nitrate + Nitrite (as N)	as N mg/L	0.6	1000	< 0.6
Fluoride	mg/L	0.06	150	0.29
Cyanide (total)	mg/L	0.01	20	< 0.01
Arsenic	mg/L	0.002	2.5	< 0.002
Silver	mg/L	0.0005	5	< 0.0005
Barium	mg/L	0.0002	100	0.499
Boron	mg/L	0.02	500	0.05
Cadmium	mg/L	0.00003	0.5	0.00181

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG558 - Metals and Inorganics** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#2
Sample Matrix	Leachate
Sample Date	10/06/2021

Parameter	Units	RL	L1	Result
Metals and Inorganics (continued)				
Chromium	mg/L	0.0008	5	0.0009
Lead	mg/L	0.00009	5	0.00230
Selenium	mg/L	0.0004	1	< 0.0004
Uranium	mg/L	0.00002	10	0.00216

PACKAGE: **REG558 - Other (ORP)** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#2
Sample Matrix	Leachate
Sample Date	10/06/2021

Parameter	Units	RL	L1	Result
Other (ORP)				
Mercury	mg/L	0.00001	0.1	< 0.00001

PACKAGE: **REG558 - PCBs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#2
Sample Matrix	Leachate
Sample Date	10/06/2021

Parameter	Units	RL	L1	Result
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.001	0.3	< 0.001

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG558 - SVOCs - PAHs**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#2
Sample Matrix	Leachate
Sample Date	10/06/2021

Parameter	Units	RL	L1	Result
SVOCs - PAHs				
Benzo(a)pyrene	mg/L	0.001	0.001	< 0.001

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

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)	SKA0163-JUN21	mg/L	0.01	<0.01	ND	10	96	90	110	93	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	EWL0309-JUN21	mg/L	0.06	<0.06	ND	10	105	90	110	107	75	125

Inorganics-General

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-IENVISPE-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	EHG0020-JUN21	mg/L	0.00001	< 0.00001	ND	20	102	80	120	113	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	EMS0093-JUN21	mg/L	0.0005	<0.00005	ND	20	101	90	110	108	70	130
Arsenic	EMS0093-JUN21	mg/L	0.002	<0.0002	5	20	103	90	110	99	70	130
Barium	EMS0093-JUN21	mg/L	0.0002	<0.00002	3	20	99	90	110	83	70	130
Boron	EMS0093-JUN21	mg/L	0.02	<0.002	8	20	101	90	110	108	70	130
Cadmium	EMS0093-JUN21	mg/L	0.00003	<0.000003	ND	20	100	90	110	92	70	130
Chromium	EMS0093-JUN21	mg/L	0.0008	<0.00008	11	20	101	90	110	94	70	130
Lead	EMS0093-JUN21	mg/L	0.00009	<0.00001	5	20	106	90	110	109	70	130
Selenium	EMS0093-JUN21	mg/L	0.0004	<0.00004	1	20	102	90	110	99	70	130
Uranium	EMS0093-JUN21	mg/L	0.00002	<0.000002	0	20	101	90	110	93	70	130

Nitrate by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-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
Nitrate (as N)	DIO0266-JUN21	mg/L	0.6	<0.6	1	20	99	90	110	101	75	125

QC SUMMARY

Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 I Internal ref.: ME-CA-IENVIIC-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
Nitrite (as N)	DIO0266-JUN21	mg/L	0.3	<0.3	0	20	97	90	110	103	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A I Internal ref.: ME-CA-IENVIGC-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	GCM0291-JUN21	mg/L	0.001	< 0.001	ND	30	79	60	140	96	60	140

Semi-Volatile Organics

Method: EPA 3510C/8270D I Internal ref.: ME-CA-IENVIGC-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
Benzo(a)pyrene	GCM0271-JUN21	mg/L	0.001	< 0.001	NSS	30	96	50	140	NSS	50	140

QC SUMMARY

Total Nitrate/Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Nitrate + Nitrite (as N)	DIO0266-JUN21	mg/L	0.6	<0.6	NA	20	NA	80	120	NA	75	125

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

Samples analysed as received. 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" 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. 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.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 0217
Page 1 of 2

Laboratory Information Section - Lab use only

Received By: BCARMAN
Received By (signature):
Received Date: 06 / 11 / 21 (mm/dd/yy)
Received Time: 17 : 10 (hr : min)
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☐ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice.
Temperature Upon Receipt (°C) 9.7.9
CA 14768-JUN21
LAB LIMS #: CA14824-JUN21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE, TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petromecall.com	Phone:
Email: Starafdr@petromecall.com	Email:

Quotation #: PML RATE
Project #: 21TF001
P.O. #:
Site Location/ID:

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 ____
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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH3, SS1	JUNE8/21	AM	2+2	SOIL
2	BH3, SS2	"	"	1	"
3	BH3, SS3	"	"	2+1	"
4	BH4, SS1	"	PM	1	"
5	BH4, SS2	"	"	2+2	"
6	BH4, SS3	"	"	2+1	"
7	BH4, SS4	"	"	1	"
8	BH4, SS4 DUP	"	"	1	"
9	BH5, SS1	June10/21	AM	1	"
10	BH5, SS2	"	"	2+2	"
11	BH5, SS3	"	"	1	"
12	BH5, SS4	"	"	1	"

	Field Filtered (Y/N)	M & I: Metals & Inorganics (Incl CrVI, CN, Hg pH (B(HWS),EC,SAR-soil)	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,	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: Appendix 2: 406/19 Leachate Screening Levels Table : ____	Other: Sewer Use: (Specify pkg:	Other: Water Characterization Pkg (General ☐ Extended ☐	TCLP (Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.
1					✓			✓					PH, EC, SAR						
2		✓																	
3										✓									
4		✓																	
5					✓			✓											
6										✓									
7				✓									✓						
8				✓									✓						
9					✓														
10							✓	✓											
11		✓								,									
12				✓						,			✓						

COMMENTS:

Observations/Comments/Special Instructions

Sampled By (NAME): Jason Signature: Jason Nourza Date: 06 / 11 / 21 (mm/dd/yy) Pink Copy - Client
Relinquished by (NAME): Jason Signature: Jason Nourza Date: 06 / 11 / 21 (mm/dd/yy) Yellow & White Copy - SGS

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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: 021770
Page 2 of 2

Laboratory Information Section - Lab use only

Received By: B. Cannon
Received Date: 06 / 11 / 21 (mm/dd/yy)
Received Time: 17 : 10 (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) 9.7.9
LAB LIMS #:

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE. TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petromecall.com	Phone:
Email: staraftdr@petromecall.com	Email:

Quotation #: PML RATE
Project #: 21T-0001
P.O. #:
Site Location/ID:

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

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	Bit9, SS1	JUNE10/21	PM	1	SOIL
2	Bit9, SS2	"	"	2+1	"
3	Bit9, SS3	"	"	1	"
4	COMP #2	"	"	2	"
5					
6					
7					
8					
9					
10					
11					
12					

	Field Filtered (Y/N)	Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (CI, No-Water)	Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only (Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs (all incl PAHs, ABNs, CPs	PCBs ☐ Total ☐ Aroclor	F1-F4 + BTEX	F1-F4 only (no BTEX	VOCs (all incl BTEX	BTEX only	Pesticides (Organochlorine or specify other	Other (please specify)				Appendix 2: 406/19 Leachate Screening Levels Table :	Sewer Use: (Specify pkg:	Water Characterization Pkg (General ☐ Extended ☐	TCLP (Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1					✓			✓												
2																				
3		✓																		
4																			✓	

Observations/Comments/Special Instructions

Sampled By (NAME): Jason	Signature: Jason Mourik	Date: 06 / 11 / 21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Jason	Signature: Jason Mourik	Date: 06 / 11 / 21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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FINAL REPORT

CA14992-JUL21 R

21TF001B

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14992-JUL21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	705-652-2143
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	brad.moore@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA14992-JUL21
Project	21TF001B	Received	07/07/2021
Order Number		Approved	07/14/2021
Samples	Leachate (1)	Report Number	CA14992-JUL21 R
		Date Reported	07/14/2021

COMMENTS

Temperature of Sample upon Receipt: 6 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020168

TCLP metals reported at 10x DL

SIGNATORIES

Brad Moore Hon. B.Sc

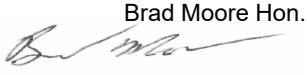

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-5

Exceedance Summary..... 6

QC Summary..... 7-10

Legend..... 11

Annexes..... 12

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG558 - Acid rock Drainage**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#5
Sample Matrix	Leachate
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
Acid rock Drainage				
Final pH	no unit	0.01		5.84

PACKAGE: **REG558 - Metals and Inorganics**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#5
Sample Matrix	Leachate
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
Metals and Inorganics				
Sample weight	g	0.001		100
Ext Fluid	#1 or #2	0.01		2
^ Ext Volume	mL	0.01		2000
Nitrite (as N)	as N mg/L	0.3		< 0.3
Nitrate (as N)	as N mg/L	0.6		< 0.6
Nitrate + Nitrite (as N)	as N mg/L	0.6	1000	< 0.6
Fluoride	mg/L	0.06	150	0.30
Cyanide (total)	mg/L	0.01	20	< 0.01
Arsenic	mg/L	0.002	2.5	0.043
Silver	mg/L	0.0005	5	< 0.0005
Barium	mg/L	0.0002	100	0.593
Boron	mg/L	0.02	500	0.05
Cadmium	mg/L	0.00003	0.5	0.00142

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG558 - Metals and Inorganics** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#5
Sample Matrix	Leachate
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
Metals and Inorganics (continued)				
Chromium	mg/L	0.0008	5	< 0.0008
Lead	mg/L	0.00009	5	0.00621
Selenium	mg/L	0.0004	1	0.0010
Uranium	mg/L	0.00002	10	0.00353

PACKAGE: **REG558 - Other (ORP)** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#5
Sample Matrix	Leachate
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
Other (ORP)				
Mercury	mg/L	0.00001	0.1	< 0.00001

PACKAGE: **REG558 - PCBs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#5
Sample Matrix	Leachate
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.001	0.3	< 0.001

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG558 - SVOCs - PAHs**
(LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	COMP#5
Sample Matrix	Leachate
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
SVOCs - PAHs				
Benzo(a)pyrene	mg/L	0.001	0.001	< 0.001

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

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)	SKA0103-JUL21	mg/L	0.01	<0.01	ND	10	91	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	EWL0158-JUL21	mg/L	0.06	<0.06	ND	10	95	90	110	91	75	125

Inorganics-General

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-IENVISPE-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	EHG0009-JUL21	mg/L	0.00001	< 0.00001	0	20	105	80	120	105	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	EMS0050-JUL21	mg/L	0.0005	<0.00005	ND	20	97	90	110	98	70	130
Arsenic	EMS0050-JUL21	mg/L	0.002	<0.0002	8	20	97	90	110	101	70	130
Barium	EMS0050-JUL21	mg/L	0.0002	<0.00002	0	20	96	90	110	97	70	130
Boron	EMS0050-JUL21	mg/L	0.02	<0.002	3	20	100	90	110	99	70	130
Cadmium	EMS0050-JUL21	mg/L	0.00003	<0.000003	9	20	98	90	110	96	70	130
Chromium	EMS0050-JUL21	mg/L	0.0008	<0.00008	ND	20	92	90	110	96	70	130
Lead	EMS0050-JUL21	mg/L	0.00009	<0.00001	4	20	100	90	110	105	70	130
Selenium	EMS0050-JUL21	mg/L	0.0004	<0.00004	7	20	91	90	110	100	70	130
Uranium	EMS0050-JUL21	mg/L	0.00002	<0.000002	8	20	94	90	110	95	70	130

Nitrate by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-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
Nitrate (as N)	DIO0144-JUL21	mg/L	0.6	<0.6	11	20	104	90	110	102	75	125

QC SUMMARY

Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 I Internal ref.: ME-CA-IENVIIC-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
Nitrite (as N)	DIO0144-JUL21	mg/L	0.3	<0.3	ND	20	101	90	110	101	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A I Internal ref.: ME-CA-IENVIGC-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	GCM0165-JUL21	mg/L	0.001	< 0.001	NSS	30	92	60	140	NSS	60	140

Semi-Volatile Organics

Method: EPA 3510C/8270D I Internal ref.: ME-CA-IENVIGC-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
Benzo(a)pyrene	GCM0166-JUL21	mg/L	0.001	< 0.001	ND	30	80	50	140	82	50	140

QC SUMMARY

Total Nitrate/Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Nitrate + Nitrite (as N)	DIO0144-JUL21	mg/L	0.6	<0.6	NA	20	NA	80	120	NA	75	125

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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 020168 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: B Thomson
Received By (signature):
Received Date: 07/07/21 (mm/dd/yy)
Received Time: 17:09 (hr : min)
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ICE / PACK
Temperature Upon Receipt (°C) 6.6
LAB LIMS #: CA14992-Jul21

REPORT INFORMATION

Company: PML
Contact: M. ALAM/S. TARAFDER
Address: 165 CARTWRIGHT AVE, TORONTO
Phone: 416-785-5110
Email: malam@petromacallum
Email: starafder@petromacallum

INVOICE INFORMATION

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

Quotation #: PML RATE
Project #: 21TF001B
P.O. #:
Site Location/ID:

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 ____
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:

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,	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: ☐	Other: ☐	Other: ☐	Other: ☐	Other: Appendix 2: 406/19 Leachate Screening Levels Table : ____	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	TCLP: Specify TCLP tests ☑ M&I ☐ VOC ☑ PCB ☑ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	COMP #5	JULY 2/21	AM	2	SOIL																			✓	
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Rishi Manicks
Signature:
Date: 07/07/21 (mm/dd/yy)

Relinquished by (NAME): Rishi Manicks
Signature:
Date: 07/07/21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA15738-JUN21 R

21TF001

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA15738-JUN21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	705-652-2143
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	brad.moore@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA15738-JUN21
Project	21TF001	Received	06/28/2021
Order Number		Approved	07/05/2021
Samples	Soil (5)	Report Number	CA15738-JUN21 R
		Date Reported	07/05/2021

COMMENTS

Temperature of Sample upon Receipt: 7 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020143

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3

Exceedance Summary..... 4

QC Summary..... 5-6

Legend..... 7

Annexes..... 8

Client: Peto MacCallum Ltd
Project: 21TF001
Project Manager: M. Alam
Samplers: Rishi Manizks

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	8	9	10	11	12
			Sample Name	BH2	BH3	BH5	BH6	BH8
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	28/06/2021	28/06/2021	28/06/2021	28/06/2021	28/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX								
Benzene	µg/g	0.02	0.32	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	9.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	µg/g	0.05	68	< 0.05	< 0.05	0.06	< 0.05	0.05
Xylene (total)	µg/g	0.05	26	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
o-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 3 - Industrial/Commercial - UNDEFINED

			Sample Number	8	9	10	11	12
			Sample Name	BH2	BH3	BH5	BH6	BH8
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	28/06/2021	28/06/2021	28/06/2021	28/06/2021	28/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics								
Moisture Content	%	-		3.2	2.6	3.7	2.9	2.6

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-[ENV]GC-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
Benzene	GCM0526-JUN21	µg/g	0.02	<0.02	ND	50	78	60	130	59	50	140
Ethylbenzene	GCM0526-JUN21	µg/g	0.05	<0.05	ND	50	74	60	130	66	50	140
m/p-xylene	GCM0526-JUN21	µg/g	0.05	<0.05	ND	50	75	60	130	68	50	140
o-xylene	GCM0526-JUN21	µg/g	0.05	<0.05	ND	50	75	60	130	69	50	140
Toluene	GCM0526-JUN21	µg/g	0.05	<0.05	ND	50	76	60	130	64	50	140

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.

QC SUMMARY

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

Samples analysed as received. 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.

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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: 020143 Page _____ of _____

Laboratory Information Section - Lab use only

Received By: Kim Sheard
Received By (signature):
Received Date: 06 / 28 / 21 (mm/dd/yy)
Received Time: 16 : 40 (hr : min)
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C) 7.7.7
LAB LIMS #: CA 15738-JUN21

REPORT INFORMATION

Company: PML
Contact: M. ALAM / S. TARAFDER
Address: 165 CARTWRIGHT AVE., TORONTO
Phone: 416-785-5110
Email: malam@petromercallu
Email: Starafder@petromercallu

INVOICE INFORMATION

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

Quotation #: PML RATE
Project #: 21TF001
P.O. #:
Site Location/ID:

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 _____
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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH2	JUNE 25/21	AM	2	SHALE BEDROCK
2	BH3	"		2	"
3	BH5	"		2	"
4	BH6	"		2	"
5	BH8	"		2	"
6					
7					
8					
9					
10					
11					
12					

	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN, Hg pH, (B(HWS), EC, SAR–soil) (Cl, Na–water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs ☐ Aroclor ☐ Total	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	Other (please specify)								TCLP	COMMENTS:
		M & I			SVOC		PCB	PHC		VOC		Pest									TCLP	
1											✓										PLEASE
2											✓										CRUSH
3											✓										THE SHALE
4											✓										BEDROCK
5											✓										AND
6																					ANALYZE
7																					
8																					
9																					
10																					
11																					
12																					

Specify TCLP tests: ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.

Appendix 2: 406/19 Leachate Screening Levels Table: _____
Sewer Use: Specify pkg:
Water Characterization Pkg: General ☐ Extended ☐

Observations/Comments/Special Instructions

Sampled By (NAME): RISHI MANICKS Signature: Date: 06 / 26 / 21 (mm/dd/yy)
Relinquished by (NAME): RISHI MANICKS Signature: Date: 06 / 28 / 21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA15777-JUL21 R

21TF001B

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA15777-JUL21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	705-652-2143
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	brad.moore@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA15777-JUL21
Project	21TF001B	Received	07/02/2021
Order Number		Approved	07/08/2021
Samples	Soil (4)	Report Number	CA15777-JUL21 R
		Date Reported	07/08/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020161

SIGNATORIES

Brad Moore Hon. B.Sc

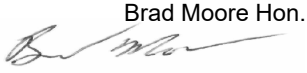

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-7

Exceedance Summary..... 8

QC Summary..... 9-16

Legend..... 17

Annexes..... 18

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	8
Sample Name	BH16, SS2
Sample Matrix	Soil
Sample Date	29/06/2021

Parameter	Units	RL	L1	Result
BTEX				
Benzene	µg/g	0.02	0.02	< 0.02
Ethylbenzene	µg/g	0.05	0.05	< 0.05
Toluene	µg/g	0.05	0.2	< 0.05
Xylene (total)	µg/g	0.05	0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05
o-xylene	µg/g	0.05		< 0.05

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	9	11
Sample Name	BH16, SS3	BH17 SS2
Sample Matrix	Soil	Soil
Sample Date	29/06/2021	28/06/2021

Parameter	Units	RL	L1	Result	Result
Hydrides					
Antimony	µg/g	0.8	1.3	< 0.8	< 0.8
Arsenic	µg/g	0.5	18	5.5	4.6
Selenium	µg/g	0.7	1.5	< 0.7	< 0.7

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	8	9	10	11
			Sample Name	BH16, SS2	BH16, SS3	BH17 SS1	BH17 SS2
			Sample Matrix	Soil	Soil	Soil	Soil
			Sample Date	29/06/2021	29/06/2021	28/06/2021	28/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics							
Moisture Content	%	-		8.9	15.1	21.0	24.2
Barium	µg/g	0.1	220		61		63
Beryllium	µg/g	0.02	2.5		0.65		0.66
Boron	µg/g	1	36		7		7
Cadmium	µg/g	0.02	1.2		0.14		0.33
Chromium	µg/g	0.5	70		21		18
Cobalt	µg/g	0.01	21		13		10
Copper	µg/g	0.1	92		30		28
Lead	µg/g	0.1	120		12		15
Molybdenum	µg/g	0.1	2		0.3		0.5
Nickel	µg/g	0.5	82		25		22
Silver	µg/g	0.05	0.5		< 0.05		0.06
Thallium	µg/g	0.02	1		0.12		0.14
Uranium	µg/g	0.002	2.5		0.47		0.54
Vanadium	µg/g	3	86		26		24
Zinc	µg/g	0.7	290		63		88
Water Soluble Boron	µg/g	0.5			< 0.5		0.6

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	9	11
Sample Name	BH16, SS3	BH17 SS2
Sample Matrix	Soil	Soil
Sample Date	29/06/2021	28/06/2021

Parameter	Units	RL	L1	Result	Result
Other (ORP)					
Mercury	ug/g	0.05	0.27	< 0.05	< 0.05
Sodium Adsorption Ratio	No unit	0.2	2.4	1.2	0.4
SAR Calcium	mg/L	0.2		135	151
SAR Magnesium	mg/L	0.3		14.0	17.4
SAR Sodium	mg/L	0.1		55.4	17.1
Conductivity	mS/cm	0.002	0.57	0.59	0.51
pH	pH Units	0.05		7.52	7.04
Chromium VI	µg/g	0.2	0.66	< 0.2	< 0.2
Free Cyanide	µg/g	0.05	0.051	< 0.05	

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH17 SS1
Sample Matrix	Soil
Sample Date	28/06/2021

PAHs

Parameter	Units	RL	L1	Result
Acenaphthene	µg/g	0.05	0.072	< 0.05
Acenaphthylene	µg/g	0.05	0.093	< 0.05
Anthracene	µg/g	0.05	0.16	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.36	0.08
Benzo(a)pyrene	µg/g	0.05	0.3	0.07
Benzo(b+j)fluoranthene	µg/g	0.05	0.47	0.12
Benzo(ghi)perylene	µg/g	0.1	0.68	< 0.1
Benzo(k)fluoranthene	µg/g	0.05	0.48	< 0.05
Chrysene	µg/g	0.05	2.8	0.10
Dibenzo(a,h)anthracene	µg/g	0.06	0.1	< 0.06
Fluoranthene	µg/g	0.05	0.56	0.10
Fluorene	µg/g	0.05	0.12	< 0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.1	0.23	< 0.1
1-Methylnaphthalene	µg/g	0.05		< 0.05
2-Methylnaphthalene	µg/g	0.05		< 0.05
Methylnaphthalene, 2-(1-)	µg/g	0.05	0.59	< 0.05
Naphthalene	µg/g	0.05	0.09	< 0.05
Phenanthrene	µg/g	0.05	0.69	0.05
Pyrene	µg/g	0.05	1	0.10

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	8
Sample Name	BH16, SS2
Sample Matrix	Soil
Sample Date	29/06/2021

Parameter	Units	RL	L1	Result
PHCs				
F1 (C6-C10)	µg/g	10	25	< 10
F1-BTEX (C6-C10)	µg/g	10		< 10
F2 (C10-C16)	µg/g	10	10	< 10
F3 (C16-C34)	µg/g	50	240	< 50
F4 (C34-C50)	µg/g	50	120	< 50
Chromatogram returned to baseline at nC50	Yes / No	-		YES

PACKAGE: **REG153 - SVOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH17 SS1
Sample Matrix	Soil
Sample Date	28/06/2021

Parameter	Units	RL	L1	Result
SVOC Surrogates				
Surr Nitrobenzene-d5	Surr Rec %	-		77
Surr 2-Fluorobiphenyl	Surr Rec %	-		84
Surr 4-Terphenyl-d14	Surr Rec %	-		102
Surr 2-Fluorophenol	Surr Rec %	-		86
Surr Phenol-d6	Surr Rec %	-		89
Surr 2,4,6-Tribromophenol	Surr Rec %	-		82

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED L1
BH16, SS3				
Conductivity	EPA 6010/SM 2510	mS/cm	0.59	0.57

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 | Internal ref.: ME-CA-IENVIEWL-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
Conductivity	EWL0082-JUL21	mS/cm	0.002	<0.002	4	10	99	90	110	NA		

Cyanide by SFA

Method: SM 4500 | 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
Free Cyanide	SKA5007-JUL21	µg/g	0.05	<0.05	ND	20	114	80	120	91	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | 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	SKA5012-JUL21	ug/g	0.2	<0.2	ND	20	94	80	120	NV	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-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	EMS0025-JUL21	ug/g	0.05	<0.05	ND	20	90	80	120	90	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

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
SAR Calcium	ESG0011-JUL21	mg/L	0.2	<0.09	2	20	96	80	120	101	70	130
SAR Magnesium	ESG0011-JUL21	mg/L	0.3	<0.02	3	20	97	80	120	102	70	130
SAR Sodium	ESG0011-JUL21	mg/L	0.1	<0.15	4	20	101	80	120	93	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENVISPE-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
Silver	EMS0025-JUL21	ug/g	0.05	<0.05	ND	20	101	70	130	89	70	130
Arsenic	EMS0025-JUL21	µg/g	0.5	<0.5	12	20	102	70	130	94	70	130
Barium	EMS0025-JUL21	ug/g	0.1	<0.1	8	20	104	70	130	88	70	130
Beryllium	EMS0025-JUL21	µg/g	0.02	<0.02	11	20	100	70	130	89	70	130
Boron	EMS0025-JUL21	µg/g	1	<1	15	20	105	70	130	91	70	130
Cadmium	EMS0025-JUL21	µg/g	0.02	<0.02	8	20	101	70	130	93	70	130
Cobalt	EMS0025-JUL21	µg/g	0.01	<0.01	9	20	103	70	130	97	70	130
Chromium	EMS0025-JUL21	µg/g	0.5	<0.5	8	20	103	70	130	94	70	130
Copper	EMS0025-JUL21	µg/g	0.1	<0.1	8	20	104	70	130	93	70	130
Molybdenum	EMS0025-JUL21	µg/g	0.1	<0.1	17	20	95	70	130	95	70	130
Nickel	EMS0025-JUL21	ug/g	0.5	<0.5	8	20	101	70	130	94	70	130
Lead	EMS0025-JUL21	µg/g	0.1	<0.1	6	20	109	70	130	101	70	130
Antimony	EMS0025-JUL21	µg/g	0.8	<0.8	ND	20	97	70	130	73	70	130
Selenium	EMS0025-JUL21	µg/g	0.7	<0.7	ND	20	103	70	130	93	70	130
Thallium	EMS0025-JUL21	µg/g	0.02	<0.02	ND	20	100	70	130	89	70	130
Uranium	EMS0025-JUL21	µg/g	0.002	<0.002	4	20	96	70	130	85	70	130
Vanadium	EMS0025-JUL21	µg/g	3	<3	11	20	102	70	130	94	70	130
Zinc	EMS0025-JUL21	µg/g	0.7	<0.7	0	20	101	70	130	92	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

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
F1 (C6-C10)	GCM0061-JUL21	µg/g	10	<10	ND	30	93	80	120	78	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

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
F2 (C10-C16)	GCM0052-JUL21	µg/g	10	<10	ND	30	114	80	120	108	60	140
F3 (C16-C34)	GCM0052-JUL21	µg/g	50	<50	ND	30	114	80	120	108	60	140
F4 (C34-C50)	GCM0052-JUL21	µg/g	50	<50	ND	30	114	80	120	108	60	140

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-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
pH	ARD0012-JUL21	pH Units	0.05		0	20	100	80	120			

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3541/8270D | 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
1-Methylnaphthalene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	87	50	140	85	50	140
2-Methylnaphthalene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	81	50	140	82	50	140
Acenaphthene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	95	50	140	91	50	140
Acenaphthylene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	88	50	140	87	50	140
Anthracene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	90	50	140	88	50	140
Benzo(a)anthracene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	92	50	140
Benzo(a)pyrene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	87	50	140	88	50	140
Benzo(b+j)fluoranthene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	85	50	140	88	50	140
Benzo(ghi)perylene	GCM0049-JUL21	µg/g	0.1	< 0.1	ND	40	93	50	140	90	50	140
Benzo(k)fluoranthene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	92	50	140	92	50	140
Chrysene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	84	50	140	85	50	140
Dibenzo(a,h)anthracene	GCM0049-JUL21	µg/g	0.06	< 0.06	ND	40	88	50	140	87	50	140
Fluoranthene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	90	50	140	90	50	140
Fluorene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	88	50	140
Indeno(1,2,3-cd)pyrene	GCM0049-JUL21	µg/g	0.1	< 0.1	ND	40	91	50	140	90	50	140
Naphthalene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	86	50	140
Phenanthrene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	92	50	140	88	50	140
Pyrene	GCM0049-JUL21	µg/g	0.05	< 0.05	ND	40	97	50	140	96	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
Benzene	GCM0061-JUL21	µg/g	0.02	<0.02	ND	50	81	60	130	58	50	140
Ethylbenzene	GCM0061-JUL21	µg/g	0.05	<0.05	ND	50	78	60	130	68	50	140
m/p-xylene	GCM0061-JUL21	µg/g	0.05	<0.05	ND	50	82	60	130	73	50	140
o-xylene	GCM0061-JUL21	µg/g	0.05	<0.05	ND	50	82	60	130	76	50	140
Toluene	GCM0061-JUL21	µg/g	0.05	<0.05	ND	50	76	60	130	61	50	140

Water Soluble Boron

Method: O.Reg. 15 3/04 | Internal ref.: ME-CA-IENVI SPE-LAK-AN-003

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
Water Soluble Boron	ESG0009-JUL21	µg/g	0.5	<0.5	ND	20	97	80	120	122	70	130

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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

SGS Request for Laboratory Services and CHAIN OF CUSTODY

No: 020161

Environment, Health & Safety - 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

Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Sidi Roy
Received Date: 07 / 02 / 2021 (mm/dd/yy)
Received Time: 12 : 10 (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) 5C . 5C . 5C
CA15777-JUL21
LAB LIMS #: JUL15777

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☑ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE., TORONTO	Contact:
Phone: 416-785-5110	Address:
Email: malam@petomaccallum.com	Phone:
Email: staraf der@petomaccallum.com	Email:

Quotation #: PML RATE
Project #: 21TF001B
P.O. #:
Site Location/ID:

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 ____
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:

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,	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: Appendix 2: 406/19 Leachate Screening Levels Table : ____	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	TCLP: Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.	COMMENTS:
1	BH16, SS2	JUNE29/21	AM	2+1	SOIL								✓					PH, EC, SAR							
2	BH16, SS3	"	"	1	"		✓																		
3	BH17, SS1	JUNE28/21	"	1	"					✓															
4	BH17, SS2	"	"	1	"			✓										✓							
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Rishi Manicks
Signature: Rmanicks
Date: 07 / 02 / 21 (mm/dd/yy)

Relinquished by (NAME): Rishi Manicks
Signature: Rmanicks
Date: 07 / 02 / 21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA15978-JUL21 R

21TF001B

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA15978-JUL21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	2165
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	jill.campbell@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA15978-JUL21
Project	21TF001B	Received	07/05/2021
Order Number		Approved	07/08/2021
Samples	Soil (4)	Report Number	CA15978-JUL21 R
		Date Reported	07/08/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

Hydrocarbon results are expressed on a dry weight basis.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

Temperature of Sample upon Receipt: 5 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:020165

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

First Page..... 1-2
Index..... 3
Results..... 4-11
Exceedance Summary..... 12
QC Summary..... 13-21
Legend..... 22
Annexes..... 23

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH12, SS3
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
BTEX				
Benzene	µg/g	0.02	0.02	< 0.02
Ethylbenzene	µg/g	0.05	0.05	< 0.05
Toluene	µg/g	0.05	0.2	< 0.05
Xylene (total)	µg/g	0.05	0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05
o-xylene	µg/g	0.05		< 0.05

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	9	11
Sample Name	BH12, SS2	BH13, SS2
Sample Matrix	Soil	Soil
Sample Date	02/07/2021	02/07/2021

Parameter	Units	RL	L1	Result	Result
Hydrides					
Antimony	µg/g	0.8	1.3	< 0.8	< 0.8
Arsenic	µg/g	0.5	18	6.5	5.3
Selenium	µg/g	0.7	1.5	< 0.7	< 0.7

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - Metals and Inorganics**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	8	9	10	11
			Sample Name	BH12, SS1	BH12, SS2	BH12, SS3	BH13, SS2
			Sample Matrix	Soil	Soil	Soil	Soil
			Sample Date	02/07/2021	02/07/2021	02/07/2021	02/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics							
Moisture Content	%	-		10.1	11.7	15.5	9.5
Barium	µg/g	0.1	220		73		47
Beryllium	µg/g	0.02	2.5		0.76		0.36
Boron	µg/g	1	36		13		7
Cadmium	µg/g	0.02	1.2		0.07		0.62
Chromium	µg/g	0.5	70		23		13
Cobalt	µg/g	0.01	21		14		6.4
Copper	µg/g	0.1	92		29		31
Lead	µg/g	0.1	120		10		98
Molybdenum	µg/g	0.1	2		0.3		0.6
Nickel	µg/g	0.5	82		29		15
Silver	µg/g	0.05	0.5		< 0.05		< 0.05
Thallium	µg/g	0.02	1		0.14		0.09
Uranium	µg/g	0.002	2.5		0.55		0.43
Vanadium	µg/g	3	86		29		19
Zinc	µg/g	0.7	290		67		76
Water Soluble Boron	µg/g	0.5			< 0.5		< 0.5

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	9	11
Sample Name	BH12, SS2	BH13, SS2
Sample Matrix	Soil	Soil
Sample Date	02/07/2021	02/07/2021

Parameter	Units	RL	L1	Result	Result
Other (ORP)					
Mercury	ug/g	0.05	0.27	< 0.05	< 0.05
Sodium Adsorption Ratio	No unit	0.2	2.4	15.3	2.7
SAR Calcium	mg/L	0.2		7.6	28.1
SAR Magnesium	mg/L	0.3		2.3	2.7
SAR Sodium	mg/L	0.1		187	56.7
Conductivity	mS/cm	0.002	0.57	1.5	0.81
pH	pH Units	0.05		7.88	7.83
Chromium VI	µg/g	0.2	0.66	< 0.2	< 0.2
Free Cyanide	µg/g	0.05	0.051	< 0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - PAHs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	8
Sample Name	BH12, SS1
Sample Matrix	Soil
Sample Date	02/07/2021

PAHs

Parameter	Units	RL	L1	Result
Acenaphthene	µg/g	0.05	0.072	< 0.05
Acenaphthylene	µg/g	0.05	0.093	< 0.05
Anthracene	µg/g	0.05	0.16	< 0.05
Benzo(a)anthracene	µg/g	0.05	0.36	0.08
Benzo(a)pyrene	µg/g	0.05	0.3	0.07
Benzo(b+j)fluoranthene	µg/g	0.05	0.47	0.13
Benzo(ghi)perylene	µg/g	0.1	0.68	< 0.1
Benzo(k)fluoranthene	µg/g	0.05	0.48	< 0.05
Chrysene	µg/g	0.05	2.8	0.08
Dibenzo(a,h)anthracene	µg/g	0.06	0.1	< 0.06
Fluoranthene	µg/g	0.05	0.56	0.15
Fluorene	µg/g	0.05	0.12	< 0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.1	0.23	< 0.1
1-Methylnaphthalene	µg/g	0.05		< 0.05
2-Methylnaphthalene	µg/g	0.05		0.06
Methylnaphthalene, 2-(1-)	µg/g	0.05	0.59	0.10
Naphthalene	µg/g	0.05	0.09	< 0.05
Phenanthrene	µg/g	0.05	0.69	0.11
Pyrene	µg/g	0.05	1	0.15

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH12, SS3
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
PHCs				
F1 (C6-C10)	µg/g	10	25	< 10
F1-BTEX (C6-C10)	µg/g	10		< 10
F2 (C10-C16)	µg/g	10	10	< 10
F3 (C16-C34)	µg/g	50	240	< 50
F4 (C34-C50)	µg/g	50	120	< 50
Chromatogram returned to baseline at nC50	Yes / No	-		YES

PACKAGE: **REG153 - SVOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	8
Sample Name	BH12, SS1
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
SVOC Surrogates				
Surr Nitrobenzene-d5	Surr Rec %	-		86
Surr 2-Fluorobiphenyl	Surr Rec %	-		87
Surr 4-Terphenyl-d14	Surr Rec %	-		122
Surr 2-Fluorophenol	Surr Rec %	-		84
Surr Phenol-d6	Surr Rec %	-		89
Surr 2,4,6-Tribromophenol	Surr Rec %	-		103

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - THMs (VOC)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH12, SS3
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
THMs (VOC)				
Bromodichloromethane	µg/g	0.05	0.05	< 0.05
Bromoform	µg/g	0.05	0.05	< 0.05
Dibromochloromethane	µg/g	0.05	0.05	< 0.05

PACKAGE: **REG153 - VOC Surrogates** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH12, SS3
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
VOC Surrogates				
Surr 1,2-Dichloroethane-d4	Surr Rec %	-		98
Surr 4-Bromofluorobenzene	Surr Rec %	-		95
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-		91

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH12, SS3
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
VOCs				
Acetone	µg/g	0.5	0.5	< 0.5
Bromomethane	µg/g	0.05	0.05	< 0.05
Carbon tetrachloride	µg/g	0.05	0.05	< 0.05
Chlorobenzene	µg/g	0.05	0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH12, SS3
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
VOCs (continued)				
Chloroform	µg/g	0.05	0.05	< 0.05
1,2-Dichlorobenzene	µg/g	0.05	0.05	< 0.05
1,3-Dichlorobenzene	µg/g	0.05	0.05	< 0.05
1,4-Dichlorobenzene	µg/g	0.05	0.05	< 0.05
Dichlorodifluoromethane	µg/g	0.05	0.05	< 0.05
1,1-Dichloroethane	µg/g	0.05	0.05	< 0.05
1,2-Dichloroethane	µg/g	0.05	0.05	< 0.05
1,1-Dichloroethylene	µg/g	0.05	0.05	< 0.05
trans-1,2-Dichloroethylene	µg/g	0.05	0.05	< 0.05
cis-1,2-Dichloroethylene	µg/g	0.05	0.05	< 0.05
1,2-Dichloropropane	µg/g	0.05	0.05	< 0.05
cis-1,3-dichloropropene	µg/g	0.03		< 0.03
trans-1,3-dichloropropene	µg/g	0.03		< 0.03
1,3-dichloropropene (total)	µg/g	0.05	0.05	< 0.05
Ethylenedibromide	µg/g	0.05	0.05	< 0.05
n-Hexane	µg/g	0.05	0.05	< 0.05
Methyl ethyl ketone	µg/g	0.5	0.5	< 0.5
Methyl isobutyl ketone	µg/g	0.5	0.5	< 0.5
Methyl-t-butyl Ether	µg/g	0.05	0.05	< 0.05
Methylene Chloride	µg/g	0.05	0.05	< 0.05
Styrene	µg/g	0.05	0.05	< 0.05
Tetrachloroethylene	µg/g	0.05	0.05	< 0.05
1,1,1,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Rishi Manicks

PACKAGE: **REG153 - VOCs** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	10
Sample Name	BH12, SS3
Sample Matrix	Soil
Sample Date	02/07/2021

Parameter	Units	RL	L1	Result
VOCs (continued)				
1,1,2,2-Tetrachloroethane	µg/g	0.05	0.05	< 0.05
1,1,1-Trichloroethane	µg/g	0.05	0.05	< 0.05
1,1,2-Trichloroethane	µg/g	0.05	0.05	< 0.05
Trichloroethylene	µg/g	0.05	0.05	< 0.05
Trichlorofluoromethane	µg/g	0.05	0.25	< 0.05
Vinyl Chloride	µg/g	0.02	0.02	< 0.02

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED L1
BH12, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	1.5	0.57
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	15.3	2.4
BH13, SS2				
Conductivity	EPA 6010/SM 2510	mS/cm	0.81	0.57
Sodium Adsorption Ratio	MOE 4696e01/EPA 6010	No unit	2.7	2.4

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 | Internal ref.: ME-CA-IENVIEWL-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
Conductivity	EWL0114-JUL21	mS/cm	0.002	<0.002	0	10	100	90	110	NA		

Cyanide by SFA

Method: SM 4500 | 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
Free Cyanide	SKA5011-JUL21	µg/g	0.05	<0.05	ND	20	97	80	120	94	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | 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	SKA5012-JUL21	ug/g	0.2	<0.2	ND	20	94	80	120	NV	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-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	EMS0030-JUL21	ug/g	0.05	<0.05	ND	20	100	80	120	102	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

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
SAR Calcium	ESG0018-JUL21	mg/L	0.2	<0.09	1	20	96	80	120	88	70	130
SAR Magnesium	ESG0018-JUL21	mg/L	0.3	<0.02	ND	20	97	80	120	90	70	130
SAR Sodium	ESG0018-JUL21	mg/L	0.1	<0.15	1	20	99	80	120	84	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENVISPE-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
Silver	EMS0030-JUL21	ug/g	0.05	<0.05	ND	20	100	70	130	94	70	130
Arsenic	EMS0030-JUL21	µg/g	0.5	<0.5	3	20	100	70	130	92	70	130
Barium	EMS0030-JUL21	ug/g	0.1	<0.1	2	20	104	70	130	85	70	130
Beryllium	EMS0030-JUL21	µg/g	0.02	<0.02	0	20	97	70	130	88	70	130
Boron	EMS0030-JUL21	µg/g	1	<1	ND	20	100	70	130	94	70	130
Cadmium	EMS0030-JUL21	µg/g	0.02	<0.02	19	20	100	70	130	92	70	130
Cobalt	EMS0030-JUL21	µg/g	0.01	<0.01	4	20	102	70	130	97	70	130
Chromium	EMS0030-JUL21	µg/g	0.5	<0.5	4	20	101	70	130	94	70	130
Copper	EMS0030-JUL21	µg/g	0.1	<0.1	1	20	100	70	130	94	70	130
Molybdenum	EMS0030-JUL21	µg/g	0.1	<0.1	20	20	95	70	130	93	70	130
Nickel	EMS0030-JUL21	ug/g	0.5	<0.5	4	20	101	70	130	94	70	130
Lead	EMS0030-JUL21	µg/g	0.1	<0.1	5	20	102	70	130	95	70	130
Antimony	EMS0030-JUL21	µg/g	0.8	<0.8	ND	20	97	70	130	85	70	130
Selenium	EMS0030-JUL21	µg/g	0.7	<0.7	ND	20	101	70	130	92	70	130
Thallium	EMS0030-JUL21	µg/g	0.02	<0.02	1	20	105	70	130	94	70	130
Uranium	EMS0030-JUL21	µg/g	0.002	<0.002	5	20	102	70	130	103	70	130
Vanadium	EMS0030-JUL21	µg/g	3	<3	0	20	101	70	130	95	70	130
Zinc	EMS0030-JUL21	µg/g	0.7	<0.7	3	20	97	70	130	90	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F1 (C6-C10)	GCM0051-JUL21	µg/g	10	<10	ND	30	110	80	120	86	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F2 (C10-C16)	GCM0048-JUL21	µg/g	10	<10	ND	30	106	80	120	113	60	140
F3 (C16-C34)	GCM0048-JUL21	µg/g	50	<50	18	30	106	80	120	113	60	140
F4 (C34-C50)	GCM0048-JUL21	µg/g	50	<50	ND	30	106	80	120	113	60	140

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-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
pH	ARD0013-JUL21	pH Units	0.05		0	20	100	80	120			

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3541/8270D | 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
1-Methylnaphthalene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	95	50	140	87	50	140
2-Methylnaphthalene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	90	50	140	84	50	140
Acenaphthene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	96	50	140	89	50	140
Acenaphthylene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	89	50	140
Anthracene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	94	50	140	90	50	140
Benzo(a)anthracene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	98	50	140	98	50	140
Benzo(a)pyrene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	91	50	140
Benzo(b+j)fluoranthene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	96	50	140
Benzo(ghi)perylene	GCM0063-JUL21	µg/g	0.1	< 0.1	ND	40	99	50	140	85	50	140
Benzo(k)fluoranthene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	95	50	140	92	50	140
Chrysene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	87	50	140
Dibenzo(a,h)anthracene	GCM0063-JUL21	µg/g	0.06	< 0.06	ND	40	95	50	140	84	50	140
Fluoranthene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	95	50	140	92	50	140
Fluorene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	89	50	140	84	50	140
Indeno(1,2,3-cd)pyrene	GCM0063-JUL21	µg/g	0.1	< 0.1	ND	40	97	50	140	85	50	140
Naphthalene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	91	50	140	84	50	140
Phenanthrene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	99	50	140	90	50	140
Pyrene	GCM0063-JUL21	µg/g	0.05	< 0.05	ND	40	108	50	140	97	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	100	50	140
1,1,1-Trichloroethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	99	50	140
1,1,2,2-Tetrachloroethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	61	50	140
1,1,2-Trichloroethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	88	60	130	98	50	140
1,1-Dichloroethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	82	60	130	88	50	140
1,1-Dichloroethylene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	92	60	130	101	50	140
1,2-Dichlorobenzene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	98	50	140
1,2-Dichloroethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	98	50	140
1,2-Dichloropropane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	89	60	130	95	50	140
1,3-Dichlorobenzene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	99	50	140
1,4-Dichlorobenzene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	95	60	130	99	50	140
Acetone	GCM0050-JUL21	µg/g	0.5	< 0.5	ND	50	107	50	140	115	50	140
Benzene	GCM0050-JUL21	µg/g	0.02	< 0.02	ND	50	93	60	130	100	50	140
Bromodichloromethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	90	60	130	92	50	140
Bromoform	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	90	60	130	95	50	140
Bromomethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	99	50	140	106	50	140
Carbon tetrachloride	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	99	50	140
Chlorobenzene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	99	50	140
Chloroform	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	92	60	130	98	50	140
cis-1,2-Dichloroethylene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	91	60	130	98	50	140

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-IENVIGC-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
cis-1,3-dichloropropene	GCM0050-JUL21	µg/g	0.03	< 0.03	ND	50	92	60	130	92	50	140
Dibromochloromethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	85	60	130	96	50	140
Dichlorodifluoromethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	106	50	140	107	50	140
Ethylbenzene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	99	50	140
Ethylenedibromide	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	88	60	130	98	50	140
n-Hexane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	94	60	130	85	50	140
m/p-xylene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	92	60	130	100	50	140
Methyl ethyl ketone	GCM0050-JUL21	µg/g	0.5	< 0.5	ND	50	95	50	140	95	50	140
Methyl isobutyl ketone	GCM0050-JUL21	µg/g	0.5	< 0.5	ND	50	91	50	140	93	50	140
Methyl-t-butyl Ether	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	110	60	130	91	50	140
Methylene Chloride	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	99	60	130	108	50	140
o-xylene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	91	60	130	102	50	140
Styrene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	92	60	130	100	50	140
Tetrachloroethylene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	88	60	130	99	50	140
Toluene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	92	60	130	98	50	140
trans-1,2-Dichloroethylene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	104	60	130	98	50	140
trans-1,3-dichloropropene	GCM0050-JUL21	µg/g	0.03	< 0.03	ND	50	88	60	130	91	50	140
Trichloroethylene	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	93	60	130	124	50	140
Trichlorofluoromethane	GCM0050-JUL21	µg/g	0.05	< 0.05	ND	50	96	50	140	114	50	140
Vinyl Chloride	GCM0050-JUL21	µg/g	0.02	< 0.02	ND	50	103	50	140	106	50	140

QC SUMMARY

Water Soluble Boron

Method: O.Reg. 15 3/04 | Internal ref.: ME-CA-[ENV] SPE-LAK-AN-003

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
Water Soluble Boron	ESG0016-JUL21	µg/g	0.5	<0.5	ND	20	107	80	120	115	70	130

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

Samples analysed as received. 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” 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 020165 Page _____ of _____

Laboratory Information Section - Lab use only

Received By: Kim Sheard
Received Date: 07/05/21 (mm/dd/yy)
Received Time: 17 : 25 (hr : min)
Received By (signature): [signature]
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C) 5.5.5
LAB LIMS # OA15978-Jul 21

REPORT INFORMATION

Company: PML
Contact: M. ALAM / S. TARAFDER
Address: 165 CARTWRIGHT AVE, TORONTO
Phone: 416-785-5110
Email: malam@petromaccallum.com
Email: starafder@petromaccallum.com

INVOICE INFORMATION

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

Quotation #: PML RATE
Project #: 21TF001B
P.O. #:
Site Location/ID:

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 _____
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:

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,	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: VOCs + PHCs F1-F4	Other: Appendix 2: 406/19 Leachate Screening Levels Table : _____	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	TCLP: Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.	COMMENTS:
1	BH12, SS1	JULY 2/21	AM	1	SOIL					✓													
2	BH12, SS2	"	"	1	"		✓																
3	BH12, SS3	"	"	2+2	"													✓					
4	BH13, SS2	"	PM	1	"		✓																
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Observations/Comments/Special Instructions

Sampled By (NAME): Rishi Manicks Signature: [signature] Date: 07/06/21 (mm/dd/yy)
Relinquished by (NAME): Rishi Manicks Signature: [signature] Date: 07/05/21 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

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.

FINAL REPORT

CA14595-SEP21 R

21TF001B

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14595-SEP21 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	M. Alam	Telephone	705-652-2143
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	brad.moore@sgs.com
Email	starafder@petomaccallum.com; malam@petomaccallum.com	SGS Reference	CA14595-SEP21
Project	21TF001B	Received	09/28/2021
Order Number		Approved	10/06/2021
Samples	Ground Water (9)	Report Number	CA14595-SEP21 R
		Date Reported	10/06/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:016872

Chloroform Blank; Results are above the reporting limit, the overall quality control for this analysis has been assessed and meets method acceptability criteria.

F1 Matrix Spike; Recovery is outside control limits; the overall quality control for this analysis has been assessed and and was determined to be acceptable.

SIGNATORIES

Brad Moore Hon. B.Sc

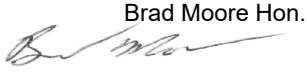

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-14

Exceedance Summary..... 15

QC Summary..... 16-24

Legend..... 25

Annexes..... 26

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - BTEX** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9	10	11	12	13	14
	Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
	Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
	Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX											
Benzene	µg/L	0.5	44	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	2300	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	18000	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Xylene (total)	µg/L	0.5	4200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
m/p-xylene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
o-xylene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

PACKAGE: **REG153 - BTEX** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	15			
	Sample Name	Trip Blank			
	Sample Matrix	Ground Water			
	Sample Date	28/09/2021			
Parameter	**Units**	**RL**	**L1**	**Result**	
BTEX					
Benzene	µg/L	0.5	44	< 0.5	
Ethylbenzene	µg/L	0.5	2300	< 0.5	
Toluene	µg/L	0.5	18000	< 0.5	
Xylene (total)	µg/L	0.5	4200	< 0.5	
m/p-xylene	µg/L	0.5		< 0.5	
o-xylene	µg/L	0.5		< 0.5	

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Hydrides** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Parameter	Units	RL	L1	Sample Number	7	8	9	10	11	12	13	14
				Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
				Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
				Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
					Result	Result	Result	Result	Result	Result	Result	Result
Hydrides												
Antimony	µg/L	0.9	20000		1.3	1.5	2.1	1.3	< 0.9	< 0.9	1.6	< 0.9
Arsenic	µg/L	0.2	1900		0.3	3.5	3.6	1.7	15.5	1.3	20.9	< 0.2
Selenium	µg/L	0.04	63		0.12	0.51	0.49	0.26	0.39	0.08	0.50	< 0.04

PACKAGE: **REG153 - Hydrides** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Parameter	Units	RL	L1	Sample Number	15
				Sample Name	Trip Blank
				Sample Matrix	Ground Water
				Sample Date	28/09/2021
					Result
Hydrides					
Antimony	µg/L	0.9	20000		< 0.9
Arsenic	µg/L	0.2	1900		< 0.2
Selenium	µg/L	0.04	63		< 0.04

PACKAGE: **REG153 - Metals and Inorganics** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Parameter	Units	RL	L1	Sample Number	7	8	9	10	11	12	13	14
				Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
				Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
				Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
					Result	Result	Result	Result	Result	Result	Result	Result
Metals and Inorganics												
Barium	µg/L	0.02	29000		23.5	461	409	58.9	178	86.8	543	0.43
Beryllium	µg/L	0.007	67		0.012	0.008	< 0.007	0.096	0.034	< 0.007	0.008	< 0.007
Boron	µg/L	2	45000		25	1010	875	117	199	1280	788	< 2

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9	10	11	12	13	14
	Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
	Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
	Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics (continued)										
Cadmium	µg/L	0.003	2.7	0.018	0.032	0.032	0.017	0.020	0.010	0.027	< 0.003
Chromium	µg/L	0.08	810	0.63	0.36	0.24	0.83	0.86	0.38	0.66	0.54
Cobalt	µg/L	0.004	66	0.137	3.21	3.21	0.586	1.01	0.426	4.32	< 0.004
Copper	µg/L	0.2	87	2.4	1.4	0.9	6.1	1.5	2.2	1.6	0.5
Lead	µg/L	0.09	25	0.59	0.26	0.19	2.70	4.45	0.21	0.63	< 0.09
Molybdenum	µg/L	0.04	9200	2.58	7.31	7.22	4.28	18.5	6.78	58.9	< 0.04
Nickel	µg/L	0.1	490	0.6	5.2	4.9	2.7	4.5	1.9	9.5	< 0.1
Silver	µg/L	0.05	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Thallium	µg/L	0.005	510	0.016	0.108	0.109	0.007	< 0.005	< 0.005	0.160	< 0.005
Uranium	µg/L	0.002	420	0.315	1.06	0.837	1.62	2.82	0.252	2.50	< 0.002
Vanadium	µg/L	0.01	250	0.77	0.36	0.42	1.86	1.96	0.32	0.43	0.02
Zinc	µg/L	2	1100	259	1040	1030	146	12	18	17	6

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Sample Number	15
Sample Name	Trip Blank
Sample Matrix	Ground Water
Sample Date	28/09/2021

Metals and Inorganics

Parameter	Units	RL	L1	Result
Barium	µg/L	0.02	29000	0.26
Beryllium	µg/L	0.007	67	< 0.007
Boron	µg/L	2	45000	< 2
Cadmium	µg/L	0.003	2.7	< 0.003
Chromium	µg/L	0.08	810	0.44
Cobalt	µg/L	0.004	66	< 0.004
Copper	µg/L	0.2	87	< 0.2
Lead	µg/L	0.09	25	< 0.09
Molybdenum	µg/L	0.04	9200	< 0.04
Nickel	µg/L	0.1	490	< 0.1
Silver	µg/L	0.05	1.5	< 0.05
Thallium	µg/L	0.005	510	< 0.005
Uranium	µg/L	0.002	420	< 0.002
Vanadium	µg/L	0.01	250	0.01
Zinc	µg/L	2	1100	5

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Na** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number			7	8	9	10	11	12	13	14
	Sample Name			BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
	Sample Matrix			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
	Sample Date			28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Na											
Sodium	µg/L	10	2.3e+006	29800	609000	548000	126000	314000	550000	1290000	335

PACKAGE: **REG153 - Na** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number			15
	Sample Name			Trip Blank
	Sample Matrix			Ground Water
	Sample Date			28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**
Na				
Sodium	µg/L	10	2.3e+006	322

PACKAGE: **REG153 - Other (ORP)** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number			7	8	9	10	11	12	13		
	Sample Name			BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8		
	Sample Matrix			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water		
	Sample Date			28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**		
Other (ORP)												
Mercury (total)	µg/L	0.01	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
pH	No unit	0.05		7.67	7.34	7.48	7.87	7.10	7.46	7.34		
Chloride	µg/L	1000	2.3e+006	17000	2100000	2000000	54000	560000	1400000	2800000		
Chromium VI	µg/L	0.2	140	0.5	0.3	0.4	0.5	< 0.2	0.4	< 0.2		
Cyanide (free)	µg/L	2	66	< 2	< 2	< 2	< 2	< 2	< 2	< 2		

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PAHs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Sample Number				8	10	12	13
Sample Name				BH4/MW2	BH11/MW5	BH16/MW7	BH17/MW8
Sample Matrix				Ground Water	Ground Water	Ground Water	Ground Water
Sample Date				28/09/2021	28/09/2021	28/09/2021	28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
PAHs							
Acenaphthene	µg/L	0.1	600	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	µg/L	0.1	1.8	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	µg/L	0.1	2.4	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	µg/L	0.1	4.7	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	µg/L	0.01	0.81	0.02	0.02	< 0.01	< 0.01
Benzo(b+j)fluoranthene	µg/L	0.1	0.75	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	µg/L	0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzo(k)fluoranthene	µg/L	0.1	0.4	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	µg/L	0.1	1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	µg/L	0.1	0.52	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	µg/L	0.1	130	0.17	< 0.1	< 0.1	< 0.1
Fluorene	µg/L	0.1	400	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2
1-Methylnaphthalene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5
2-Methylnaphthalene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5
Methylnaphthalene, 2-(1-)	µg/L	0.5	1800	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	µg/L	0.5	1400	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	µg/L	0.1	580	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	µg/L	0.1	68	0.63	< 0.1	< 0.1	< 0.1

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PHCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9	10	11	12	13		
	Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8		
	Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water		
	Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PHCs										
F1 (C6-C10)	µg/L	25	750	< 25	< 25	< 25	< 25	< 25	< 25	< 25
F1-BTEX (C6-C10)	µg/L	25		< 25	< 25	< 25	< 25	< 25	< 25	< 25
F2 (C10-C16)	µg/L	100	150	< 100	< 100	< 100	< 100	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200	500	341	< 200	< 200	< 200	< 200	< 200	< 200
F4 (C34-C50)	µg/L	200	500	382	206	< 200	< 200	< 200	< 200	< 200
Chromatogram returned to baseline at nC50	Yes / No	-		YES	YES	YES	YES	YES	YES	YES

PACKAGE: **REG153 - SVOC Surrogates** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	8	10	12	13					
	Sample Name	BH4/MW2	BH11/MW5	BH16/MW7	BH17/MW8					
	Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water					
	Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021					
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**			
SVOC Surrogates										
Surr 2-Methylnaphthalene-D10	Surr Rec %	-		74	82	80	77			
Surr Fluoranthene-D10	Surr Rec %	-		94	105	96	95			
Surr 2-Fluorobiphenyl	Surr Rec %	-		74	81	80	76			
Surr 4-Terphenyl-d14	Surr Rec %	-		67	96	88	95			

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - THMs (VOC)** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Parameter	Units	RL	L1	Sample Number	7	8	9	10	11	12	13	14
				Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
				Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
				Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
					Result	Result	Result	Result	Result	Result	Result	Result
THMs (VOC)												
Bromodichloromethane	µg/L	0.5	85000		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	380		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5	82000		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

PACKAGE: **REG153 - THMs (VOC)** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Parameter	Units	RL	L1	Sample Number	15
				Sample Name	Trip Blank
				Sample Matrix	Ground Water
				Sample Date	28/09/2021
					Result
THMs (VOC)					
Bromodichloromethane	µg/L	0.5	85000		< 0.5
Bromoform	µg/L	0.5	380		< 0.5
Dibromochloromethane	µg/L	0.5	82000		< 0.5

PACKAGE: **REG153 - VOC Surrogates** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Parameter	Units	RL	L1	Sample Number	7	8	9	10	11	12	13	14
				Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
				Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
				Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
					Result	Result	Result	Result	Result	Result	Result	Result
VOC Surrogates												
Surr 1,2-Dichloroethane-d4	Surr Rec %	-			101	100	100	102	102	101	102	100
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-			90	94	93	92	94	93	94	95
Surr 4-Bromofluorobenzene	Surr Rec %	-			91	93	93	92	96	92	93	94

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOC Surrogates** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

			Sample Number	15
			Sample Name	Trip Blank
			Sample Matrix	Ground Water
			Sample Date	28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**
VOC Surrogates				
Surr 1,2-Dichloroethane-d4	Surr Rec %	-		100
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-		91
Surr 4-Bromofluorobenzene	Surr Rec %	-		93

PACKAGE: **REG153 - VOCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

			Sample Number	7	8	9	10	11	12	13	14
			Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
			Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
			Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs											
Acetone	µg/L	30	130000	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
Bromomethane	µg/L	0.5	5.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2	0.79	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	630	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	µg/L	0.5	2.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	4600	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	9600	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2.0	4400	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	320	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9	10	11	12	13	14
	Sample Name	BH1/MW1	BH4/MW2	BH4/MW2 Dup	BH11/MW5	BH13/MW6	BH16/MW7	BH17/MW8	Field Blank
	Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
	Sample Date	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021	28/09/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
VOCs (continued)											
cis-1,2-Dichloroethene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	16	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-dichloropropene (total)	µg/L	0.5	5.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	0.25	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1.0	51	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	µg/L	20	470000	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Isobutyl Ketone	µg/L	20	140000	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-t-butyl Ether	µg/L	2.0	190	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methylene Chloride	µg/L	0.5	610	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	µg/L	0.5	1300	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene (perchloroethylene)	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	3.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	3.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	640	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	4.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5.0	2500	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	µg/L	0.2	0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Sample Number	15
Sample Name	Trip Blank
Sample Matrix	Ground Water
Sample Date	28/09/2021

VOCs

Parameter	Units	RL	L1	Result
Acetone	µg/L	30	130000	< 30
Bromomethane	µg/L	0.5	5.6	< 0.5
Carbon tetrachloride	µg/L	0.2	0.79	< 0.2
Chlorobenzene	µg/L	0.5	630	< 0.5
Chloroform	µg/L	0.5	2.4	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	4600	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	9600	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	8	< 0.5
Dichlorodifluoromethane	µg/L	2.0	4400	< 2
1,1-Dichloroethane	µg/L	0.5	320	< 0.5
1,2-Dichloroethane	µg/L	0.5	1.6	< 0.5
1,1-Dichloroethylene	µg/L	0.5	1.6	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	1.6	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	1.6	< 0.5
1,2-Dichloropropane	µg/L	0.5	16	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5
trans-1,3-Dichloropropene	µg/L	0.5		< 0.5
1,3-dichloropropene (total)	µg/L	0.5	5.2	< 0.5
Ethylenedibromide	µg/L	0.2	0.25	< 0.2
n-Hexane	µg/L	1.0	51	< 1
Methyl ethyl ketone	µg/L	20	470000	< 20
Methyl Isobutyl Ketone	µg/L	20	140000	< 20
Methyl-t-butyl Ether	µg/L	2.0	190	< 2

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Sample Number	15
Sample Name	Trip Blank
Sample Matrix	Ground Water
Sample Date	28/09/2021

VOCs (continued)

Parameter	Units	RL	L1	Result
Methylene Chloride	µg/L	0.5	610	< 0.5
Styrene	µg/L	0.5	1300	< 0.5
Tetrachloroethylene (perchloroethylene)	µg/L	0.5	1.6	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	3.3	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	3.2	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	640	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	4.7	< 0.5
Trichloroethylene	µg/L	0.5	1.6	< 0.5
Trichlorofluoromethane	µg/L	5.0	2500	< 5
Vinyl Chloride	µg/L	0.2	0.5	< 0.2

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED L1
BH17/MW8				
Chloride	US EPA 325.2	µg/L	2800000	2.3e+006

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 I 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
Chloride	DIO5068-SEP21	ug/L	1000	<1000	1	20	111	80	120	NV	75	125

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 (free)	SKA0012-OCT21	µg/L	2	<2	ND	10	100	90	110	95	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	SKA0007-OCT21	ug/L	0.2	<0.2	5	20	99	80	120	80	75	125

QC SUMMARY

Mercury by CVAAS

Method: SM 3112/SM 3112B | Internal ref.: ME-CA-[ENV]SPE-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)	EHG0054-SEP21	ug/L	0.01	< 0.01	ND	20	92	80	120	98	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	EMS0204-SEP21	ug/L	0.05	<0.05	ND	20	104	90	110	94	70	130
Arsenic	EMS0204-SEP21	µg/L	0.2	<0.2	0	20	104	90	110	100	70	130
Barium	EMS0204-SEP21	µg/L	0.02	<0.02	1	20	100	90	110	95	70	130
Beryllium	EMS0204-SEP21	µg/L	0.007	<0.07	ND	20	102	90	110	99	70	130
Boron	EMS0204-SEP21	µg/L	2	<2	1	20	109	90	110	111	70	130
Cadmium	EMS0204-SEP21	µg/L	0.003	<0.003	18	20	101	90	110	100	70	130
Cobalt	EMS0204-SEP21	µg/L	0.004	<0.004	15	20	102	90	110	92	70	130
Chromium	EMS0204-SEP21	ug/L	0.08	<0.08	4	20	108	90	110	99	70	130
Copper	EMS0204-SEP21	ug/L	0.2	<0.2	3	20	100	90	110	97	70	130
Molybdenum	EMS0204-SEP21	ug/L	0.04	<0.04	0	20	105	90	110	96	70	130
Sodium	EMS0204-SEP21	ug/L	10	<0.01	2	20	97	90	110	98	70	130
Nickel	EMS0204-SEP21	µg/L	0.1	<0.1	2	20	102	90	110	102	70	130
Lead	EMS0204-SEP21	ug/L	0.09	<0.01	5	20	109	90	110	111	70	130
Antimony	EMS0204-SEP21	ug/L	0.9	<0.9	ND	20	105	90	110	118	70	130
Selenium	EMS0204-SEP21	µg/L	0.04	<0.04	10	20	102	90	110	96	70	130
Thallium	EMS0204-SEP21	µg/L	0.005	<0.005	0	20	101	90	110	99	70	130
Uranium	EMS0204-SEP21	µg/L	0.002	<0.002	7	20	103	90	110	101	70	130
Vanadium	EMS0204-SEP21	µg/L	0.01	-0.004	4	20	102	90	110	93	70	130
Zinc	EMS0204-SEP21	µg/L	2	<0.002	5	20	97	90	110	125	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F1 (C6-C10)	GCM0427-SEP21	µg/L	25	<25	ND	30	87	60	140	54	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F2 (C10-C16)	GCM0424-SEP21	µg/L	100	<100	ND	30	94	60	140	97	60	140
F3 (C16-C34)	GCM0424-SEP21	µg/L	200	<200	14	30	94	60	140	97	60	140
F4 (C34-C50)	GCM0424-SEP21	µg/L	200	<200	ND	30	94	60	140	97	60	140

QC SUMMARY

pH

Method: SM 4500 I 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	EWL0534-SEP21	No unit	0.05	NA	0		100			NA		

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
1-Methylnaphthalene	GCM0428-SEP21	µg/L	0.5	< 0.5	ND	30	81	50	140	85	50	140
2-Methylnaphthalene	GCM0428-SEP21	µg/L	0.5	< 0.5	ND	30	81	50	140	86	50	140
Acenaphthene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	85	50	140	85	50	140
Acenaphthylene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	84	50	140	86	50	140
Anthracene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	76	50	140	79	50	140
Benzo(a)anthracene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	78	50	140	81	50	140
Benzo(a)pyrene	GCM0428-SEP21	ug/L	0.01	< 0.01	ND	30	68	50	140	72	50	140
Benzo(b+j)fluoranthene	GCM0428-SEP21	ug/L	0.1	< 0.1	ND	30	76	50	140	76	50	140
Benzo(ghi)perylene	GCM0428-SEP21	µg/L	0.2	< 0.2	ND	30	74	50	140	77	50	140
Benzo(k)fluoranthene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	71	50	140	72	50	140
Chrysene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	75	50	140	76	50	140
Dibenzo(a,h)anthracene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	74	50	140	77	50	140
Fluoranthene	GCM0428-SEP21	ug/L	0.1	< 0.1	ND	30	75	50	140	79	50	140
Fluorene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	82	50	140	86	50	140
Indeno(1,2,3-cd)pyrene	GCM0428-SEP21	µg/L	0.2	< 0.2	ND	30	77	50	140	82	50	140
Naphthalene	GCM0428-SEP21	µg/L	0.5	< 0.5	ND	30	85	50	140	85	50	140
Phenanthrene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	77	50	140	79	50	140
Pyrene	GCM0428-SEP21	µg/L	0.1	< 0.1	ND	30	74	50	140	75	50	140

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENV]GC-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	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	90	60	130	98	50	140
1,1,1-Trichloroethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	93	60	130	97	50	140
1,1,2,2-Tetrachloroethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	95	60	130	104	50	140
1,1,2-Trichloroethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	89	60	130	96	50	140
1,1-Dichloroethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	96	50	140
1,1-Dichloroethylene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	93	60	130	98	50	140
1,2-Dichlorobenzene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	89	60	130	94	50	140
1,2-Dichloroethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	90	60	130	96	50	140
1,2-Dichloropropane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	98	50	140
1,3-Dichlorobenzene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	89	60	130	94	50	140
1,4-Dichlorobenzene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	89	60	130	94	50	140
Acetone	GCM0417-SEP21	µg/L	30	<30	ND	30	101	60	130	100	50	140
Benzene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	98	50	140
Bromodichloromethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	87	60	130	95	50	140
Bromoform	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	86	60	130	93	50	140
Bromomethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	93	50	140	98	50	140
Carbon tetrachloride	GCM0417-SEP21	µg/L	0.2	<0.2	ND	30	91	60	130	95	50	140
Chlorobenzene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	90	60	130	96	50	140
Chloroform	GCM0417-SEP21	µg/L	0.5	0.96	ND	30	90	60	130	89	50	140
cis-1,2-Dichloroethene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	92	60	130	96	50	140

QC SUMMARY

Volatile Organics (continued)

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
cis-1,3-Dichloropropene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	92	60	130	97	50	140
Dibromochloromethane	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	87	60	130	95	50	140
Dichlorodifluoromethane	GCM0417-SEP21	µg/L	2.0	<2	ND	30	88	50	140	87	50	140
Ethylbenzene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	96	50	140
Ethylenedibromide	GCM0417-SEP21	µg/L	0.2	<0.2	ND	30	92	60	130	101	50	140
n-Hexane	GCM0417-SEP21	µg/L	1.0	<1	ND	30	86	60	130	81	50	140
m/p-xylene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	97	50	140
Methyl ethyl ketone	GCM0417-SEP21	ug/L	20	<20	ND	30	102	60	130	102	50	140
Methyl Isobutyl Ketone	GCM0417-SEP21	µg/L	20	<20	ND	30	103	50	140	103	50	140
Methyl-t-butyl Ether	GCM0417-SEP21	µg/L	2.0	<2	ND	30	87	60	130	103	50	140
Methylene Chloride	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	97	50	140
o-xylene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	93	60	130	100	50	140
Styrene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	90	60	130	96	50	140
Tetrachloroethylene (perchloroethylene)	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	97	50	140
Toluene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	92	60	130	97	50	140
trans-1,2-Dichloroethene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	91	60	130	95	50	140
trans-1,3-Dichloropropene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	93	60	130	97	50	140
Trichloroethylene	GCM0417-SEP21	µg/L	0.5	<0.5	ND	30	87	60	130	92	50	140
Trichlorofluoromethane	GCM0417-SEP21	µg/L	5.0	<5	ND	30	92	50	140	96	50	140
Vinyl Chloride	GCM0417-SEP21	µg/L	0.2	<0.2	ND	30	92	60	130	96	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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 016872 Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Staff
Received Date: 09/28/2021 (mm/dd/yy)
Received Time: 14:30 (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): 9°C 9°C 9°C
LAB LIMS #: CAL595-Sept21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☑ (same as Report Information)
Contact: M. ALAM/S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE., TORONTO	Contact:
Phone: 416-785-5110	Address:
Fax:	
Email: malam@petromarcallum / staraf de@petromarcallum	Phone:
	Email:

Quotation #: PML RATE
Project #: 21TF001B
P.O. #:
Site Location/ID:

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 ____
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:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN, Hg pH (B(HWS), EC, SAR–soil) (Cl, Na–water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs ☐ Total ☐ Aroclor	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX + PHCs F1-F4	BTEX only	Pesti cides Organochlorine or specify other	Other (please specify): ICP METALS	VOCs			Appendix 2: 406/19 Leachate Screening Levels Table : ____	Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	TCLP Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.	COMMENTS:
1	BH1/MW1	09/28/21	AM	12	WATER	✓	✓								✓										
2	BH4/MW2	"	PM	14	"	✓	✓			✓					✓										
3	BH4/MW2 DUP	"	PM	12	"	✓	✓								✓										
4	BH11/MW5	09/28/21	AM	14	"	✓	✓			✓					✓										
5	BH13/MW6	09/28/21	AM	12	"	✓	✓								✓										
6	BH16/MW7	09/28/21	AM	14	"	✓	✓			✓					✓										
7	BH17/MW8	09/28/21	AM	14	"	✓	✓			✓					✓										
8	FIELD BLANK	"	PM	~~3~~ 3	"													✓	✓						
9	TRIP BLANK	"	AM	~~3~~ 3	"													✓	✓						
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): SAGAR	Signature: Sagar Narula	Date: 09/28/21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): SAGAR	Signature: Sagar Narula	Date: 09/28/21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA40009-OCT21 R

21TF001B

Prepared for

Peto MacCallum Ltd

FINAL REPORT

First Page

CLIENT DETAILS

Client	Peto MacCallum Ltd
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada
Contact	M. Alam
Telephone	416-785-5110
Facsimile	416-785-5120
Email	starafder@petomaccallum.com; malam@petomaccallum.com
Project	21TF001B
Order Number	
Samples	Ground Water (3)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA40009-OCT21
Received	10/01/2021
Approved	10/07/2021
Report Number	CA40009-OCT21 R
Date Reported	10/07/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Benzo(b)fluoranthene results for comparison to the standard are reported as benzo(b+j)fluoranthene. Benzo(b)fluoranthene and benzo(j)fluoranthene co-elute and cannot be reported individually by the analytical method used.

Temperature of Sample upon Receipt: 13 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:021704

SIGNATORIES

Brad Moore Hon. B.Sc

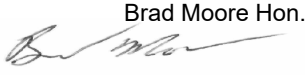

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-10

Exceedance Summary..... 11

QC Summary..... 12-21

Legend..... 22

Annexes..... 23

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - BTEX** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number			7	8	9
	Sample Name			BH18	BH19	BH20
	Sample Matrix			Ground Water	Ground Water	Ground Water
	Sample Date			01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
BTEX						
Benzene	µg/L	0.5	44	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	2300	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	18000	< 0.5	< 0.5	< 0.5
Xylene (total)	µg/L	0.5	4200	< 0.5	< 0.5	< 0.5
m/p-xylene	µg/L	0.5		< 0.5	< 0.5	< 0.5
o-xylene	µg/L	0.5		< 0.5	< 0.5	< 0.5

PACKAGE: **REG153 - Hydrides** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number			7	8	9
	Sample Name			BH18	BH19	BH20
	Sample Matrix			Ground Water	Ground Water	Ground Water
	Sample Date			01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Hydrides						
Antimony	µg/L	0.9	20000	< 0.9	< 0.9	< 0.9
Arsenic	µg/L	0.2	1900	3.5	2.3	0.9
Selenium	µg/L	0.04	63	< 0.04	0.53	0.06

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Metals and Inorganics**
(WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

			Sample Number	7	8	9
			Sample Name	BH18	BH19	BH20
			Sample Matrix	Ground Water	Ground Water	Ground Water
			Sample Date	01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Metals and Inorganics						
Barium	µg/L	0.02	29000	602	302	138
Beryllium	µg/L	0.007	67	< 0.007	< 0.007	0.012
Boron	µg/L	2	45000	2540	216	443
Cadmium	µg/L	0.003	2.7	0.005	0.012	< 0.003
Chromium	µg/L	0.08	810	0.08	0.34	0.25
Cobalt	µg/L	0.004	66	0.209	0.147	0.506
Copper	µg/L	0.2	87	0.9	0.4	0.3
Lead	µg/L	0.09	25	< 0.09	< 0.09	< 0.09
Molybdenum	µg/L	0.04	9200	3.76	17.9	4.25
Nickel	µg/L	0.1	490	1.5	1.0	3.5
Silver	µg/L	0.05	1.5	< 0.05	< 0.05	< 0.05
Thallium	µg/L	0.005	510	< 0.005	< 0.005	< 0.005
Uranium	µg/L	0.002	420	0.317	0.173	0.641
Vanadium	µg/L	0.01	250	0.22	0.30	0.18
Zinc	µg/L	2	1100	17	10	74

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - Na** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9		
	Sample Name	BH18	BH19	BH20		
	Sample Matrix	Ground Water	Ground Water	Ground Water		
	Sample Date	01/10/2021	01/10/2021	01/10/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Na						
Sodium	µg/L	10	2.3e+006	472000	54100	621000

PACKAGE: **REG153 - Other (ORP)** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9		
	Sample Name	BH18	BH19	BH20		
	Sample Matrix	Ground Water	Ground Water	Ground Water		
	Sample Date	01/10/2021	01/10/2021	01/10/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
Other (ORP)						
Mercury (total)	µg/L	0.01	0.29	< 0.01	< 0.01	< 0.01
pH	No unit	0.05		7.32	7.57	7.06
Chloride	µg/L	1000	2.3e+006	890000	130000	1900000
Chromium VI	µg/L	0.2	140	< 0.2	< 0.2	< 0.2
Cyanide (free)	µg/L	2	66	< 2	< 2	< 2

PACKAGE: **REG153 - PAHs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9		
	Sample Name	BH18	BH19	BH20		
	Sample Matrix	Ground Water	Ground Water	Ground Water		
	Sample Date	01/10/2021	01/10/2021	01/10/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
PAHs						
Acenaphthene	µg/L	0.1	600	< 0.1	< 0.1	< 0.1
Acenaphthylene	µg/L	0.1	1.8	< 0.1	< 0.1	< 0.1

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PAHs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Sample Number	7	8	9
Sample Name	BH18	BH19	BH20
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	01/10/2021	01/10/2021	01/10/2021

Parameter	Units	RL	L1	Result	Result	Result
PAHs (continued)						
Anthracene	µg/L	0.1	2.4	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	µg/L	0.1	4.7	< 0.1	0.13	< 0.1
Benzo(a)pyrene	µg/L	0.01	0.81	< 0.01	0.09	< 0.01
Benzo(b+j)fluoranthene	µg/L	0.1	0.75	< 0.1	0.14	< 0.1
Benzo(ghi)perylene	µg/L	0.2	0.2	< 0.2	< 0.2	< 0.2
Benzo(k)fluoranthene	µg/L	0.1	0.4	< 0.1	< 0.1	< 0.1
Chrysene	µg/L	0.1	1	< 0.1	0.14	< 0.1
Dibenzo(a,h)anthracene	µg/L	0.1	0.52	< 0.1	< 0.1	< 0.1
Fluoranthene	µg/L	0.1	130	< 0.1	0.29	< 0.1
Fluorene	µg/L	0.1	400	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.2	< 0.2	< 0.2	< 0.2
1-Methylnaphthalene	µg/L	0.5		< 0.5	< 0.5	< 0.5
2-Methylnaphthalene	µg/L	0.5		< 0.5	< 0.5	< 0.5
Methylnaphthalene, 2-(1-)	µg/L	0.5	1800	< 0.5	< 0.5	< 0.5
Naphthalene	µg/L	0.5	1400	< 0.5	< 0.5	< 0.5
Phenanthrene	µg/L	0.1	580	< 0.1	0.21	< 0.1
Pyrene	µg/L	0.1	68	< 0.1	0.49	< 0.1

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - PCBs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Sample Number				9
Sample Name				BH20
Sample Matrix				Ground Water
Sample Date				01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	µg/L	0.04	7.8	< 0.04

PACKAGE: **REG153 - PHCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

Sample Number				7	8	9
Sample Name				BH18	BH19	BH20
Sample Matrix				Ground Water	Ground Water	Ground Water
Sample Date				01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
PHCs						
F1 (C6-C10)	µg/L	25	750	< 25	< 25	< 25
F1-BTEX (C6-C10)	µg/L	25		< 25	< 25	< 25
F2 (C10-C16)	µg/L	100	150	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200	500	< 200	711	< 200
F4 (C34-C50)	µg/L	200	500	< 200	216	< 200
Chromatogram returned to baseline at nC50	Yes / No	-		YES	YES	YES

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - SVOC Surrogates** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

			Sample Number	7	8	9
			Sample Name	BH18	BH19	BH20
			Sample Matrix	Ground Water	Ground Water	Ground Water
			Sample Date	01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
SVOC Surrogates						
Surr 2-Methylnaphthalene-D10	Surr Rec %	-		70	75	73
Surr Fluoranthene-D10	Surr Rec %	-		88	98	92
Surr 2-Fluorobiphenyl	Surr Rec %	-		70	75	73
Surr 4-Terphenyl-d14	Surr Rec %	-		82	83	80

PACKAGE: **REG153 - THMs (VOC)** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

			Sample Number	7	8	9
			Sample Name	BH18	BH19	BH20
			Sample Matrix	Ground Water	Ground Water	Ground Water
			Sample Date	01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
THMs (VOC)						
Bromodichloromethane	µg/L	0.5	85000	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	380	< 0.5	< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5	82000	< 0.5	< 0.5	< 0.5

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOC Surrogates** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number			7	8	9
	Sample Name			BH18	BH19	BH20
	Sample Matrix			Ground Water	Ground Water	Ground Water
	Sample Date			01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
VOC Surrogates						
Surr 1,2-Dichloroethane-d4	Surr Rec %	-		106	107	107
Surr 2-Bromo-1-Chloropropane	Surr Rec %	-		95	95	95
Surr 4-Bromofluorobenzene	Surr Rec %	-		85	88	87

PACKAGE: **REG153 - VOCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number			7	8	9
	Sample Name			BH18	BH19	BH20
	Sample Matrix			Ground Water	Ground Water	Ground Water
	Sample Date			01/10/2021	01/10/2021	01/10/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
VOCs						
Acetone	µg/L	30	130000	< 30	< 30	< 30
Bromomethane	µg/L	0.5	5.6	< 0.5	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2	0.79	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	630	< 0.5	< 0.5	< 0.5
Chloroform	µg/L	0.5	2.4	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	4600	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	9600	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	8	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2.0	4400	< 2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	320	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5

Client: Peto MacCallum Ltd
Project: 21TF001B
Project Manager: M. Alam
Samplers: Jason

PACKAGE: **REG153 - VOCs** (WATER)

L1 = REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED

	Sample Number	7	8	9		
	Sample Name	BH18	BH19	BH20		
	Sample Matrix	Ground Water	Ground Water	Ground Water		
	Sample Date	01/10/2021	01/10/2021	01/10/2021		
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**
VOCs (continued)						
cis-1,2-Dichloroethene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	16	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5	< 0.5
1,3-dichloropropene (total)	µg/L	0.5	5.2	< 0.5	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	0.25	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1.0	51	< 1	< 1	< 1
Methyl ethyl ketone	µg/L	20	470000	< 20	< 20	< 20
Methyl Isobutyl Ketone	µg/L	20	140000	< 20	< 20	< 20
Methyl-t-butyl Ether	µg/L	2.0	190	< 2	< 2	< 2
Methylene Chloride	µg/L	0.5	610	< 0.5	< 0.5	< 0.5
Styrene	µg/L	0.5	1300	< 0.5	< 0.5	< 0.5
Tetrachloroethylene (perchloroethylene)	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	3.3	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	3.2	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	640	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	4.7	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	1.6	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5.0	2500	< 5	< 5	< 5
Vinyl Chloride	µg/L	0.2	0.5	< 0.2	< 0.2	< 0.2

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / GROUND WATER / COARSE - TABLE 3 - All Types of Property Uses - UNDEFINED L1
BH19				
F3 (C16 to C34)	CCME Tier 1	µg/L	711	500

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 I 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
Chloride	DIO5020-OCT21	ug/L	1000	<1000	0	20	103	80	120	101	75	125

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 (free)	SKA0055-OCT21	µg/L	2	<2	ND	10	98	90	110	86	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	SKA0053-OCT21	ug/L	0.2	<0.2	4	20	99	80	120	NV	75	125

QC SUMMARY

Mercury by CVAAS

Method: SM 3112/SM 3112B | Internal ref.: ME-CA-[ENV]SPE-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)	EHG0006-OCT21	ug/L	0.01	< 0.01	ND	20	99	80	120	81	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	EMS0019-OCT21	ug/L	0.05	<0.05	ND	20	101	90	110	95	70	130
Arsenic	EMS0019-OCT21	µg/L	0.2	<0.2	ND	20	105	90	110	101	70	130
Barium	EMS0019-OCT21	µg/L	0.02	<0.02	ND	20	102	90	110	95	70	130
Beryllium	EMS0019-OCT21	µg/L	0.007	<0.07	ND	20	99	90	110	106	70	130
Boron	EMS0019-OCT21	µg/L	2	<2	ND	20	105	90	110	103	70	130
Cadmium	EMS0019-OCT21	µg/L	0.003	<0.003	ND	20	101	90	110	104	70	130
Cobalt	EMS0019-OCT21	µg/L	0.004	<0.004	ND	20	104	90	110	99	70	130
Chromium	EMS0019-OCT21	ug/L	0.08	<0.08	ND	20	100	90	110	94	70	130
Copper	EMS0019-OCT21	ug/L	0.2	<0.2	ND	20	104	90	110	92	70	130
Molybdenum	EMS0019-OCT21	ug/L	0.04	<0.04	ND	20	101	90	110	99	70	130
Sodium	EMS0019-OCT21	ug/L	10	4	ND	20	103	90	110	101	70	130
Nickel	EMS0019-OCT21	µg/L	0.1	<0.1	ND	20	102	90	110	85	70	130
Lead	EMS0019-OCT21	ug/L	0.09	<0.01	ND	20	108	90	110	104	70	130
Antimony	EMS0019-OCT21	ug/L	0.9	<0.9	ND	20	100	90	110	95	70	130
Selenium	EMS0019-OCT21	µg/L	0.04	<0.04	ND	20	101	90	110	98	70	130
Thallium	EMS0019-OCT21	µg/L	0.005	<0.005	ND	20	103	90	110	100	70	130
Uranium	EMS0019-OCT21	µg/L	0.002	<0.002	ND	20	100	90	110	102	70	130
Vanadium	EMS0019-OCT21	µg/L	0.01	0.003	ND	20	101	90	110	96	70	130
Zinc	EMS0019-OCT21	µg/L	2	0.062	ND	20	106	90	110	95	70	130
Silver	EMS0022-OCT21	ug/L	0.05	<0.05	ND	20	95	90	110	91	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

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
Arsenic	EMS0022-OCT21	µg/L	0.2	<0.2	9	20	94	90	110	104	70	130
Barium	EMS0022-OCT21	µg/L	0.02	<0.00002	6	20	104	90	110	110	70	130
Beryllium	EMS0022-OCT21	µg/L	0.007	<0.07	ND	20	100	90	110	111	70	130
Boron	EMS0022-OCT21	µg/L	2	<2	5	20	92	90	110	95	70	130
Cadmium	EMS0022-OCT21	µg/L	0.003	<0.003	ND	20	95	90	110	91	70	130
Cobalt	EMS0022-OCT21	µg/L	0.004	<0.004	3	20	96	90	110	103	70	130
Chromium	EMS0022-OCT21	ug/L	0.08	<0.08	14	20	91	90	110	94	70	130
Copper	EMS0022-OCT21	ug/L	0.2	<0.2	4	20	94	90	110	99	70	130
Molybdenum	EMS0022-OCT21	ug/L	0.04	<0.04	4	20	100	90	110	100	70	130
Sodium	EMS0022-OCT21	ug/L	10	6	ND	20	106	90	110	107	70	130
Nickel	EMS0022-OCT21	µg/L	0.1	<0.1	1	20	94	90	110	101	70	130
Lead	EMS0022-OCT21	ug/L	0.09	<0.01	5	20	98	90	110	105	70	130
Antimony	EMS0022-OCT21	ug/L	0.9	<0.9	3	20	104	90	110	102	70	130
Selenium	EMS0022-OCT21	µg/L	0.04	<0.04	9	20	103	90	110	92	70	130
Thallium	EMS0022-OCT21	µg/L	0.005	<0.005	11	20	98	90	110	106	70	130
Uranium	EMS0022-OCT21	µg/L	0.002	<0.002	2	20	101	90	110	107	70	130
Vanadium	EMS0022-OCT21	µg/L	0.01	-0.002	3	20	92	90	110	97	70	130
Zinc	EMS0022-OCT21	µg/L	2	0.022	6	20	95	90	110	NV	70	130

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F1 (C6-C10)	GCM0082-OCT21	µg/L	25	<25	ND	30	87	60	140	68	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 I Internal ref.: ME-CA-[ENVIGC-LAK-AN-010

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
F2 (C10-C16)	GCM0039-OCT21	µg/L	100	<100	ND	30	103	60	140	104	60	140
F3 (C16-C34)	GCM0039-OCT21	µg/L	200	<200	ND	30	103	60	140	104	60	140
F4 (C34-C50)	GCM0039-OCT21	µg/L	200	<200	ND	30	103	60	140	104	60	140

QC SUMMARY

pH

Method: SM 4500 I 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 (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
pH	EWL0121-OCT21	No unit	0.05	NA	0		100			NA		

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A I 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 (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Polychlorinated Biphenyls (PCBs) - Total	GCM0066-OCT21	µg/L	0.04	< 0.04	ND	30	99	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
1-Methylnaphthalene	GCM0052-OCT21	µg/L	0.5	< 0.5	ND	30	92	50	140	97	50	140
2-Methylnaphthalene	GCM0052-OCT21	µg/L	0.5	< 0.5	ND	30	91	50	140	97	50	140
Acenaphthene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	97	50	140	91	50	140
Acenaphthylene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	94	50	140	96	50	140
Anthracene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	88	50	140	94	50	140
Benzo(a)anthracene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	89	50	140	88	50	140
Benzo(a)pyrene	GCM0052-OCT21	ug/L	0.01	< 0.01	ND	30	78	50	140	72	50	140
Benzo(b+j)fluoranthene	GCM0052-OCT21	ug/L	0.1	< 0.1	ND	30	84	50	140	73	50	140
Benzo(ghi)perylene	GCM0052-OCT21	µg/L	0.2	< 0.2	ND	30	85	50	140	79	50	140
Benzo(k)fluoranthene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	82	50	140	73	50	140
Chrysene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	84	50	140	79	50	140
Dibenzo(a,h)anthracene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	84	50	140	77	50	140
Fluoranthene	GCM0052-OCT21	ug/L	0.1	< 0.1	ND	30	91	50	140	97	50	140
Fluorene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	93	50	140	100	50	140
Indeno(1,2,3-cd)pyrene	GCM0052-OCT21	µg/L	0.2	< 0.2	ND	30	88	50	140	79	50	140
Naphthalene	GCM0052-OCT21	µg/L	0.5	< 0.5	ND	30	95	50	140	90	50	140
Phenanthrene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	90	50	140	88	50	140
Pyrene	GCM0052-OCT21	µg/L	0.1	< 0.1	ND	30	87	50	140	82	50	140

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	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	103	60	130	102	50	140
1,1,1-Trichloroethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	103	60	130	101	50	140
1,1,2,2-Tetrachloroethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	98	60	130	100	50	140
1,1,2-Trichloroethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	102	60	130	100	50	140
1,1-Dichloroethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	100	50	140
1,1-Dichloroethylene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	100	50	140
1,2-Dichlorobenzene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	103	60	130	101	50	140
1,2-Dichloroethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	103	60	130	101	50	140
1,2-Dichloropropane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	103	60	130	101	50	140
1,3-Dichlorobenzene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	102	60	130	99	50	140
1,4-Dichlorobenzene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	102	60	130	98	50	140
Acetone	GCM0042-OCT21	µg/L	30	<30	ND	30	97	60	130	93	50	140
Benzene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	101	50	140
Bromodichloromethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	101	60	130	98	50	140
Bromoform	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	99	60	130	97	50	140
Bromomethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	50	140	99	50	140
Carbon tetrachloride	GCM0042-OCT21	µg/L	0.2	<0.2	ND	30	103	60	130	100	50	140
Chlorobenzene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	103	60	130	100	50	140
Chloroform	GCM0042-OCT21	µg/L	0.5	<0.5	3	30	103	60	130	100	50	140
cis-1,2-Dichloroethene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	103	50	140

QC SUMMARY

Volatile Organics (continued)

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
cis-1,3-Dichloropropene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	100	50	140
Dibromochloromethane	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	99	60	130	98	50	140
Dichlorodifluoromethane	GCM0042-OCT21	µg/L	2.0	<2	ND	30	94	50	140	86	50	140
Ethylbenzene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	103	60	130	102	50	140
Ethylenedibromide	GCM0042-OCT21	µg/L	0.2	<0.2	ND	30	106	60	130	103	50	140
n-Hexane	GCM0042-OCT21	µg/L	1.0	<1	ND	30	88	60	130	94	50	140
m/p-xylene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	105	60	130	103	50	140
Methyl ethyl ketone	GCM0042-OCT21	ug/L	20	<20	ND	30	104	60	130	99	50	140
Methyl Isobutyl Ketone	GCM0042-OCT21	µg/L	20	<20	ND	30	103	50	140	99	50	140
Methyl-t-butyl Ether	GCM0042-OCT21	µg/L	2.0	<2	ND	30	105	60	130	91	50	140
Methylene Chloride	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	105	60	130	100	50	140
o-xylene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	104	50	140
Styrene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	106	60	130	104	50	140
Tetrachloroethylene (perchloroethylene)	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	102	60	130	101	50	140
Toluene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	101	50	140
trans-1,2-Dichloroethene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	100	50	140
trans-1,3-Dichloropropene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	106	60	130	103	50	140
Trichloroethylene	GCM0042-OCT21	µg/L	0.5	<0.5	ND	30	104	60	130	102	50	140
Trichlorofluoromethane	GCM0042-OCT21	µg/L	5.0	<5	ND	30	101	50	140	99	50	140
Vinyl Chloride	GCM0042-OCT21	µg/L	0.2	<0.2	ND	30	103	60	130	100	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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 021704 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Nicole Brigant
Received Date: 10/01/21 (mm/dd/yy)
Received Time: 12:45 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type:
Temperature Upon Receipt (°C) 13, 17, 3
LAB LIMS #: CA40009-OCT21

REPORT INFORMATION	INVOICE INFORMATION
Company: PML	☐ (same as Report Information)
Contact: M. ALAM / S. TARAFDER	Company:
Address: 165 CARTWRIGHT AVE., TORONTO	Contact:
Phone: 416-785-5110	Address:
Fax:	Phone:
Email: malam@petroleumlabs.com; starafder@petroleumlabs.com	Email:

Quotation #: PML RATE
Project #: 21TF00LB
P.O. #:
Site Location/ID:

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 ____
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:

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,	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 + PHCs F1-F4	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other (please specify)	TCLP: Specify TCLP tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	BH18	10/01/21	AM	14	WATER	✓	✓			✓					✓					
2	BH19	10/01/21	AM	14	"	✓	✓			✓					✓					
3	BH20	"	AM	15	"	✓	✓			✓		✓			✓					
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Observations/Comments/Special Instructions

Sampled By (NAME): Jason	Signature: Jason Norovsky	Date: 10/01/21 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Jason	Signature: Jason Norovsky	Date: 10/01/21 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May 2020

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.

APPENDIX B

Statement of Limitations

STATEMENT OF LIMITATIONS

This report is prepared for and made available for the sole use of the client named. Peto MacCallum Ltd. (PML) hereby disclaims any liability or responsibility to any person or entity, other than those for whom this report is specifically issued, for any loss, damage, expenses, or penalties that may arise or result from the use of any information or recommendations contained in this report. The contents of this report may not be used or relied upon by any other person without the express written consent and authorization of PML.

This report shall not be relied upon for any purpose other than as agreed with the client named without the written consent of PML. It shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. A portion of this report may not be used as a separate entity: that is to say the report is to be read in its entirety at all times.

The report is based solely on the scope of services which are specifically referred to in this report. No physical or intrusive testing has been performed, except as specifically referenced in this report. This report is not a certification of compliance with past or present regulations, codes, guidelines and policies.

The scope of services carried out by PML is based on details of the proposed development and land use to address certain issues, purposes and objectives with respect to the specific site as identified by the client. Services not expressly set forth in writing are expressly excluded from the services provided by PML. In other words, PML has not performed any observations, investigations, study analysis, engineering evaluation or testing that is not specifically listed in the scope of services in this report. PML assumes no responsibility or duty to the client for any such services and shall not be liable for failing to discover any condition, whose discovery would require the performance of services not specifically referred to in this report.

The findings and comments made by PML in this report are based on the conditions observed at the time of PML's site reconnaissance. No assurances can be made and no assurances are given with respect to any potential changes in site conditions following the time of completion of PML's field work. Furthermore, regulations, codes and guidelines may change at any time subsequent to the date of this report and these changes may affect the validity of the findings and recommendations given in this report.

The results and conclusions with respect to site conditions are therefore in no way intended to be taken as a guarantee or representation, expressed or implied, that the site is free from any contaminants from past or current land use activities or that the conditions in all areas of the site and beneath or within structures are the same as those areas specifically sampled.

Any investigation, examination, measurements or sampling explorations at a particular location may not be representative of conditions between sampled locations. Soil, groundwater, surface water, or building material conditions between and beyond the sampled locations may differ from those encountered at the sampling locations and conditions may become apparent during construction which could not be detected or anticipated at the time of the intrusive sampling investigation.

Budget estimates contained in this report are to be viewed as an engineering estimate of probable costs and provided solely for the purposes of assisting the client in its budgeting process. It is understood and agreed that PML will not in any way be held liable as a result of any budget figures provided by it.

The Client expressly waives its right to withhold PML's fees, either in whole or in part, or to make any claim or commence an action or bring any other proceedings, whether in contract, tort, or otherwise against PML in any way connected with advice or information given by PML relating to the cost estimate or Environmental Remediation/Cleanup and Restoration or Soil and Groundwater Management Plan Cost Estimate.

APPENDIX

A-4 Geotechnical Studies

DRAFT
GEOTECHNICAL DATA REPORT (GDR)
THE BEACH STREET PUMPING STATION DIVERSION
CITY OF MISSISSAUGA, ONTARIO, PROJECT 16-2905
for
REGIONAL MUNICIPALITY OF PEEL

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PML Ref.: 21TF001A
December 17, 2021

TABLE OF CONTENTS

1. INTRODUCTION 1
2. OBJECTIVE 1
3. SCOPE OF WORK 2
4. PROJECT SITE DESCRIPTION 3
5. BOREHOLE AND MONITORING WELL LOCATION PLANS 3
6. BOREHOLE STAKE-OUT AND UTILITY CLEARANCE 3
7. FIELD INVESTIGATION PROCEDURES 4
8. LABORATORY TEST PROCEDURES 7
9. SITE GEOLOGY AND SUBSURFACE CONDITIONS 8
    9.1 Site Geology 8
    9.2 Site Reconnaissance 8
    9.3 Subsurface Conditions 8
        9.3.1 Pavement Structure 9
        9.3.2 Fill 9
            9.3.2.1 Clayey Silt/Silty Clay, Trace Sand/Sandy, Trace Gravel Fill 9
            9.3.2.2 Sandy Silt/Silty Sand, Trace Gravel Fill 11
        9.3.3 Silty Clay, Trace Sand/Sandy, Trace Gravel 12
        9.3.4 Sandy Clayey Silt/Clayey Sand Till 13
        9.3.5 Shale Bedrock 18
        9.3.6 Laboratory Testing of Representative Rock Core Samples 18
            9.3.6.1 Rock Moduli and Uniaxial Compressive Strength (UCS) Testing 18
            9.3.6.2 Point Load Index (PLI) 19
            9.3.6.3 Slake Durability Testing 21
            9.3.6.4 CERCHAR Abrasivity Index (CAI)* 21
            9.3.6.5 Rock Density Test 22
            9.3.6.6 Semi-Confined Swell Testing 23
10. GROUNDWATER 24
11. PACKER TEST 26
12. GAS MONITORING 28
13. GEOPHYSICAL SURVEY 28
14. CHEMICAL (CORROSIVITY) ANALYSIS TESTING 28
15. CLOSURE 30

ATTACHMENTS

Appendix A – Plan Nos. PP-1 to PP- 8 - Borehole Location Plans and Geotechnical Stratigraphic Data
List of Abbreviations
Record of Borehole Sheets BH1 to BH20
Figures GS-1, GS-2. GS-3, GS-4A to GS-4C, GS-5A and GS-5B – Grain Size Distribution Charts
Figures PC-1, PC-2, PC-3A to 3C and PC-4 – Plasticity Charts
Standard Proctor Test Results
Consolidated Undrained Triaxial Shear Test Results
Rock Core Description Logs and Photographs
Rock Moduli and Unconfined Compressive Strength Test Results
Point Load Index Test Results
Slake Durability Test Results
CERCHAR Abrasivity Test Results
Rock Density Test Results
Semi-confined Swell Test Results

Appendix B – Site Photographs

Appendix C – Geophysical Survey Report

Appendix D – Packer Test Results

Appendix E – Soil Chemical Analyses Results by SGS Environment

1. INTRODUCTION

Peto MacCallum Ltd. (PML) was retained by The Regional Municipality of Peel (the Region) to conduct geotechnical and hydrogeological investigation to complete the detailed design of the Beach Street Sewage Pumping Station (SPS) reconfiguration and Beechwood SPS modification and associated gravity sewer works. The Region retained WSP Canada Inc. (WSP) to complete the detail design.

As outlined in the Request for Proposal (RFP) Document 2020-169P Section 1.1 Project Description, the project included:

i. Installation of a diversion sewer from the Beech Street SPS to the Beechwood SPS to the Beechwood SPS along Aviation Road and Lakeshore Road. The diversion sewer is proposed to be constructed by micro-tunnel due to the required depth

ii. New local sewer on Lakeshore Road from West Avenue to Aviation Road constructed by open cut.

iii. New local sewers on Hampton Crescent, and Lakeside Avenue, constructed by open cut.

iv. Reconfiguration of the Secret Park sanitary lateral and connection to the Lakeside Avenue sewer constructed by open cut; and

v. Installation of a new sewer from the open space south of Claredale Road and west of Beachcomber Road, heading south crossing Cooksville Creek and connecting to the existing sewer discharging into Beechwood SPS that will allow the Agency to abandon the existing sewer siphon under the Cooksville Creek. Construction of the siphon bypass is proposed to be completed using micro-tunnelling techniques.

2. OBJECTIVE

The objective of the subsurface investigation work was to obtain data to determine and evaluate the engineering characteristics of soil and bedrock along the proposed sanitary sewer alignments. The majority of the field investigation activities involved drilling through overburden to specified depths at specific locations, in-situ testing and field classification of soil. A limited geo-environmental (corrosivity) chemical testing program of soil was undertaken in conjunction with the geotechnical

investigation. The results of the geo-environmental (corrosivity) chemical testing of soil samples are included in this report. The Hydrogeological Data Report and the associated Impact Assessment Report, Phase One Environmental Site assessment (ESA), Geostructural Investigation and Condition Assessment will be issued separately.

The proposed sewer alignment is shown in Appendix A, Project Area map.

3. SCOPE OF WORK

The scope of work as outlined in the RFP document (Section 2.5) includes but not limited to the following:

- Geological features and geologic formation;
- Measure the pavement layer thickness and identify material types;
- Identify and classify the overburden materials including fill, top of till and bedrock transition zone;
- Conduct a geophysical investigation along the micro-tunnelling sections in accordance with methodology describes in the RFP;
- Characterize overburden layers for texture, plasticity, relative density/consistency, moisture content, Standard Penetration Test (SPT) ‘N’ value;
- Characterize bedrock according to layer lithology, intact strength, degree of weathering Rock Quality Designation (RQD), total rock recovery, solid rock recovery;
- Determine the corrosivity, water soluble sulphate content of the soil, bedrock and groundwater;
- Preparation of Geotechnical Data Report (GDR);
- Geotechnical Memorandum for Design (GMD) and construction methodologies recommendations for the sewer alignment;
- Monitoring and laboratory test programs, sample transportation to the laboratory and long-term sample storage;
- Borehole decommissioning as per Ontario Regulation 903 requirements;
- Preparation of geotechnical drawings for different soil and rock layers with the standard graphic symbols and colours;

- Carry out geo-environmental soil, bedrock and groundwater analytical testing in accordance with O. Reg. 153 (as amended); O. Reg. 406/19 (as amended), Reg. 558, the Region of Peel/City of Mississauga Storm and Sanitary Sewer use By-Laws and the Provincial Water Quality Objectives.
- Recommendation for geotechnical investigation based on gap identified from the field data obtained from geotechnical investigation.

4. PROJECT SITE DESCRIPTION

The Beach Street SPS site area is located near the northwest coastline of Lake Ontario, approximately 1.6 km south of Highway 401 in the City of Mississauga, Ontario. The surrounding area is typically flat and gently slopes south toward Lake Ontario. The surrounding area south of Lakeshore Road is mainly residential zone and north of Lakeshore Road East is a mixed commercial and residential zone.

5. BOREHOLE AND MONITORING WELL LOCATION PLANS

The proposed borehole locations and depths were provided in Table 1 – Proposed Geotechnical Boreholes, consisted of 17 boreholes. The proposed monitoring well installation locations were provided in Table 2 – Proposed Monitoring Wells, and consisted of eight (8) monitoring well installations. Three (3) additional boreholes with monitoring well (50 mm diameter) on Lakeshore Road East for geoenvironmental purposes (Phase II) was installed following a confirmation from WSP via email dated June 17, 2021

The borehole location plan of the as-drilled borehole locations and monitoring well installations are presented in the attached Plan Nos. PP-1, PP-2, PP-3, PP-4, PP-5, PP-6, PP-7 and PP-8. The AutoCAD version of the design drawings were provided by WSP on November 12, 2021.

6. BOREHOLE STAKE-OUT AND UTILITY CLEARANCE

The borehole locations were laid out in the field by PML staff based on borehole plan approved by WSP on behalf of the Region dated March 3, 2021.

Upon completion of the borehole layout work, underground utility locate clearances were processed via Ontario One Call. Localized borehole location adjustments were made as necessary in some areas to avoid conflict with existing underground utility installations.

In accordance with the RFP requirements, a road occupancy permits were obtained from the City of Mississauga and the Region prior to commencement of the field investigation work.

7. FIELD INVESTIGATION PROCEDURES

The fieldwork for the geotechnical investigation for Boreholes BH1 to BH17 was carried out between June 1, 2021 and July 23, 2021. Furthermore, PML requested for additional three (3) boreholes to be investigated for geoenvironmental purposes on June 17, 2021. Following an approval from the Region/WSP, the field work for the additional boreholes were carried out between July 22 and 23, 2021. The depths of borehole exploration ranged from 5.9 m to 12.5 m below the existing ground surface elevation.

The boreholes were advanced using a combination of truck mounted CME-75/Mobile crane B53 and track mounted MARL M5T/Geoprobe 7822DT equipped with 200 mm diameter continuous hollow stem augers and rotary drilling. The drill rigs were supplied and operated by Drilltech Drilling Limited, based in Newmarket, Ontario and PML Field Services based in Hamilton, Ontario. The specialist drilling contractors were subcontracted by PML to carry out the field investigation work. Packer testing equipment was provided by Drilltech Drilling Limited. The fieldwork was supervised on a full-time basis by PML engineering staff.

Traffic control services were provided by Jackson Trademark Services based in Pefferlaw, Ontario, in accordance with Ontario Traffic Manual Book 7-Temporary Conditions (January 2014).

Paid duty police officer was requested and engaged during drilling operation on Lakeshore Road East to control traffic and pedestrian with at the intersection/signal zone with active traffic control signal.

The thicknesses of the pavement components, where encountered, in the boreholes were measured and samples of granular base/subbase materials were obtained. Representative samples of the overburden were recovered at frequent depth intervals using a conventional split spoon sampler. Standard penetration tests (SPT) were carried out simultaneously with the sampling operations to assess the compactness/consistency of the subsoil.

Soils were identified in the field and in the laboratory in accordance with ASTM D2487, Unified Soil Classification System (USCS) by visual examination on recovered samples. The backfilling operation of the investigated boreholes was carried out in accordance with O. Reg. 903, as amended.

The groundwater conditions in the open boreholes were assessed during drilling by visual examination of soil, split spoon sampler, and drill rods as the samples were being retrieved and, where encountered, by measuring the groundwater level in the open boreholes using a Solinst water level meter.

As part of the field investigation work, eleven (11) monitoring wells were installed in the overburden to facilitate subsequent monitoring of groundwater levels. The details of the monitoring well groundwater level is summarized in Table 15.

QRAE 3, a diffusion gas monitor from RAE Systems, was used to monitor/measure subsurface gases in the boreholes along the alignments for tunneling/micro-tunnelling construction work. The QRAE 3 was used to detect the presence of methane, hydrogen sulphide, carbon monoxide and oxygen in the boreholes during drilling and immediately after completion of drilling.

The recovered soil samples were delivered to PML's laboratory for detailed visual examination and testing. Moisture content testing was conducted on the retrieved soil samples. Grain size analyses and hydrometer testing were conducted on selected soil samples. The moisture content test results are included in the attached Record of Borehole Sheets. Unit weight, Standard proctor test, Corrosivity package and pH, Triaxle shear stress (CU) for cohesive soil on selected soil samples were carried out.

PML staff used a portable GPS device to establish the location of boreholes in the field. Subsequently, PML carried out the survey of the as-drilled borehole locations and elevations using a Sokkia SHC5000 Differential GPS system, equipped with a GCX3 (Network RTK rover) GNSS Receiver. The vertical and horizontal accuracy of this equipment for RTK (L1+L2) method are 15 mm+1.0 ppm and 10 mm +0.8 ppm, respectively.

The borehole coordinates, ground surface elevations, exploration depths are summarised in Table 1.

TABLE 1

Summary of Borehole Location, Ground Elevation and Borehole Depth

BOREHOLE NO.	UTM NAD 83 ZONE 17		GROUND ELEVATION (m)	BOREHOLE DEPTH (m)
	NORTHING	EASTING		
1	4824985.5	615782.1	81.1	11.6
2	4824871.8	615892.2	81.0	11.6
3	4824776.0	615989.7	79.1	10.8
4	4824722.1	616050.3	78.1	10.8
5	4824741.6	615512.9	79.8	12.5
6	4824840.9	615582.9	80.1	11.5
7	4824945.5	615664.4	81.4	11.6
8	4825020.8	615719.6	81.4	11.7
9	4824714.2	615973.3	78.4	6.1
10	4824626.5	615909.7	79.6	5.9
11	4824657.7	615832.7	77.9	6.1
12	4824561.7	615947.0	77.0	6.7
13	4824518.3	615960.1	77.7	6.7
14	4825125.9	615795.6	81.1	7.0
15	4825189.9	615844.8	81.3	5.9
16	4824803.6	615388.2	81.1	12.2
17	4824984.2	615259.8	82.1	12.2
18	615748.9	4825062.0	81.3	7.1
19	615618.9	4824886.0	80.8	6.1
20	615480.4	4824705.0	77.8	7.7

It should be noted that the borehole elevations and coordinates at the borehole locations are approximate. The designer and contractor should verify the elevations and coordinates for detail design and project construction purposes.

8. LABORATORY TEST PROCEDURES

Laboratory testing was conducted on representative soil samples at PML's laboratory facility in Toronto, Ontario. The following laboratory tests were performed on soil samples:

- Soil classification was conducted on 187 samples in accordance with ASTM D2487;
- Unit weight testing was measured for 19 soil samples in accordance with ASTM D7263-21
- Moisture content testing was conducted on 159 soil samples in accordance with ASTM D2216
- Atterberg limits tests were performed on 43 soil and weathered shale samples samples in accordance with ASTM D4318
- Sieve and hydrometer analyses were conducted on 51 soil samples in accordance with ASTM D422
- Standard Proctor tests were conducted for 7 soil samples in accordance with ASTM D698
- Soil Chemical (Corrosivity Package and pH) tests we performed on 7 soil samples
- Consolidated Undrained (CU) Triaxial Comression test was conducted on 6 cohesive soil samples in accordence with ASTM D4767
- Density testing was performed on 10 bedrock core samples
- Corrosivity Package and pH tests we performed on 5 rock samples
- Uniaxial Compressive Strength test was performed on 5 intact rock samples and rock moduli from uniaxial test was performed in accordance with ASTM D7012
- Point Load Strength test was performed on 20 rock samples in accordance with ASTM D5731
- Slake Durability Test was performed on 3 rock samples in accordance with ASTM D4644
- CERCHAR Abrasivity test was performed on 3 rock samples in accordance with ASTM D7625
- Bedrock Chemical (Corrosivity Package and pH) tests we performed on 5 bedrock samples

The particle size (sieve and hydrometer) test results are presented in the appended Figures GS-1, GS-2, GS-3, GS-4A to GS-4C, GS-5A and GS-5B. The Atterberg limit test results are presented in Figures PC-1, PC-2, PC-3A to PC-3C and PC-4.

9. SITE GEOLOGY AND SUBSURFACE CONDITIONS

9.1 Site Geology

In general, the project area is located within the Bevelled Till Plains landform of the Iroquois Plains physiographic region, which consists of previously deposited clay and till, and partly floored with sand deposits, as outlined in The Physiography of Southern Ontario (Chapman and Putnam, 1984).

The Quaternary Geology map published by the Ontario Ministry of Northern Development and Mines (MNDM), indicates that the surface conditions in the area of the overhead site consist of glaciolacustrine deposits; Predominantly sand, gravelly sand and gravel, nearshore and beach deposits. Based on the Bedrock Geology map (MRD126-REV1, 2011) published by the MNDM, the overhead site lies within Upper Ordovician shale, limestone, dolostone, and siltstones of the Georgian Bay formations.

9.2 Site Reconnaissance

PML staff visited the site on January 27, 2021 to conduct a site reconnaissance and confirm the accessibility of the borehole locations within the proposed SPS alignment and Right-of-Way (ROW). A photographic record of the site visit is attached in Appendix A.

9.3 Subsurface Conditions

The subsurface conditions encountered during the course of the investigation, together with the field and laboratory test results are shown on the attached Record of Borehole Sheets. The borehole locations are presented in Figure 1, appended in Appendix A. This GDR report presents factual information/data only; it does not include interpretation, extrapolation or interpolation of the borehole data.

In general, the subsoil conditions consisted of 100 mm to 150 mm of topsoil or 300 mm to 900 mm pavement structure immediately below the ground surface, followed by 0.7 m to 5.3 m of fill. The fill was underlain by 1.3 m to 2.1 m of silty clay in Boreholes BH4, BH 10, and BH16 only. This silty clay deposit and the fill layers encountered in the remaining boreholes were underlain by

approximately 4.5 m to 8.0 m of sandy clayey silt/clayey sand till, where fully penetrated. Shale bedrock was intercepted in Boreholes BH1 to BH8 that were advanced below the till deposit and the boreholes were terminated within the unweathered bedrock at a maximum depth of 12.5 m (EL. 67.4) below the existing ground surface. For classification purposes, the soiled encountered at this site can be divided into five (5) distinct zones:

a. Pavement Structure
b. Fill
c. Silty Clay, Trace Sand/Sandy, Trace Gravel
d. Sandy Clayey Silt/Clayey Sand Till
e. Shale Bedrock

9.3.1 Pavement Structure

The pavement structure was encountered immediately below the existing ground surface in all boreholes advanced within the existing roadways (Boreholes BH1 to BH15, and BH18 to BH20). The pavement structure consisting of 75 mm to 150 mm thick asphalt over 100 mm to 775 mm of granular base/subbase. The depth of the total pavement structure, including the asphalt, was 100 mm to 900 mm below the road surface.

9.3.2 Fill

In general, the fill layers were encountered immediately below the existing ground surface in Borehole BH16 and BH17, and below the pavement structure in all other investigated boreholes, with the exception of Borehole BH10. The fill layers consisted of clayey silt/silty clay and/or sandy silt/silty, and was approximately 0.7 m to 5.3 m in total thickness, extending to depths ranging from 0.8 m to 5.5 m (EL. 80.8 to EL. 71.7) below the existing ground surface.

9.3.2.1 Clayey Silt/Silty Clay, Trace Sand/Sandy, Trace Gravel Fill

The clayey silt/silty clay fill layer was encountered immediately below the existing ground surface in Borehole BH17, and below the pavement structure in Boreholes BH1 to BH 8, BH12 to BH15, and BH18 to BH20. In Boreholes BH11 and BH16, this fill was encountered below the sandy silt/silty

sand fill layer. This fill layer was approximately 0.6 m to 2.8 m in thickness, and extended to depths ranging from 1.2 m to 3.0 m (EL. 79.9 to EL. 74.7) below the existing ground surface.

With the exception of Boreholes BH2 and BH 16, the SPT N values in this fill typically ranged from 5 blows to 28 blows per 0.3 m of penetration, indicating firm to very stiff consistency. In Borehole BH2, the two (2) SPT N values observed in this layer were 39 and 50, indicating hard consistency. In Borehole BH16, located off road, the one (1) SPT N value observed in this layer was 1 blow, indicating very soft consistency.

The moisture content of the samples tested from this fill ranged from 4.2% to 31.6%, with an average value of 15.3%.

Dry unit weight tests were performed on two (2) samples selected from this layer. The test results indicate dry unit weight values of 20.06 kN/m3 and 20.09 kN/m3.

The results of the grain size analysis tests performed on five (5) representative samples from this layer are provided on Figure GS-1. The test results indicate that this deposit consists of none to 5% gravel, 9% to 42% sand, 57% to 89% silt and clay sized particles. Atterberg limits tests were performed on selected samples and the result are provided on Figure PC-1. The test results indicate liquid limit values of 35 to 44, plastic limit values of 19 to 22, and corresponding plasticity index values of 16 to 22. Based on the test results, this layer may generally be classified as Lean Clay/Sandy Lean Clay (CL) in accordance with the Unified Soil Classification System (USCS), and as Clayey Silt (CL) in the MTO classification system. The grain size analysis and Atterberg limit test results are summarized in Table 2.

TABLE 2

Summary of Atterberg Limits and Grain Size Distribution

BOREHOLE NO.	SAMPLE NO.	GRAIN SIZE DISTRIBUTION (%)				ATTERBERG LIMITS		
		GRAVEL	SAND	SILT	CLAY	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
1	3	0	31	42	27	44	22	22
3	3	2	9	45	44	35	19	16
15	3	5	22	73				

TABLE 2

Summary of Atterberg Limits and Grain Size Distribution

BOREHOLE NO.	SAMPLE NO.	GRAIN SIZE DISTRIBUTION (%)				ATTERBERG LIMITS		
		GRAVEL	SAND	SILT	CLAY	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
16	3	1	42	57				
17	3	2	41	57				

9.3.2.2 Sandy Silt/Silty Sand, Trace Gravel Fill

The sandy silt/silty sand fill layer was encountered immediately below the existing ground surface in Borehole BH16 (located off road), and below the pavement structure in Borehole BH11 (located within the existing Hampton Crescent alignment). In Boreholes BH12, and BH13 (located within the existing Hampton Crescent alignment), this fill was encountered below the clayey silt/silty clay fill layer. This fill layer was approximately 0.7 m to 4.1 m in thickness, and extended to depths ranging from 0.8 m to 5.5 m (EL. 80.8 to EL. 71.7) below the existing ground surface.

The SPT N values in this fill ranged from as low as 3 blows to 32 blows per 0.3 m of penetration, indicating a very loose to dense state of compaction.

The moisture content of the samples tested from this fill ranged from 5.9% to 34.7%, with an average value of 16.0%.

The results of the grain size analysis tests performed on two (2) representative samples from this layer are provided on Figure GS-2. The test results indicate that this deposit consists of none and 6% gravel, 46% and 59% sand, 35% and 54% silt and clay sized particles. Based on the test results, this layer may generally be classified as Sandy Silt/Silty Sand (SM/ML) in accordance with the USCS and the MTO classification system. The grain size analysis test results are summarized in Table 3.

TABLE 3

Summary of Grain Size Distribution

BOREHOLE NO.	SAMPLE NO.	GRAIN SIZE DISTRIBUTION (%)			
		GRAVEL	SAND	SILT	CLAY
12	6	0	46	54	
13	7	6	59	35	

9.3.3 Silty Clay, Trace Sand/Sandy, Trace Gravel

The silty clay deposit was encountered below the pavement structure in Borehole BH10, and below the fill layers in Borehole BH3 and BH16. This deposit was approximately 1.3 m to 2.1 m in thickness, and extended to depths ranging from of 2.3 m to 4.6 m (EL. 77.3 to EL. 75.2) below the existing ground surface.

The SPT N values in this fill ranged from 14 blows to 26 blows per 0.3 m of penetration, indicating stiff to very stiff consistency.

The moisture content of the samples tested from this fill ranged from 13.2% to 17.1%, with an average value of 15.2%.

Dry unit weight tests were performed on three (3) samples selected from this layer. The test results indicate dry unit weight values of 16.39 kN/m3, 17.75 kN/m3, and 17.84 kN/m3.

The results of the grain size analysis tests performed on four (4) representative samples from this layer are provided on Figure GS-3. The test results indicate that this deposit consists of none to 8% gravel, 2% to 29% sand, 40% to 53% silt, and 18% to 49% clay sized particles. Atterberg limits tests were performed on selected samples and the result are provided on Figure PC-2. The test results indicate liquid limit values of 34 to 42, plastic limit values of 20 to 22, and corresponding plasticity index values of 12 to 20. Based on the test results, this layer may generally be classified as Lean Clay/Sandy Lean Clay (CL) in accordance with the USCS, and as Silty Clay (CI) in the MTO classification system. The grain size analysis and Atterberg limits test results are summarized in Table 4.

TABLE 4

Summary of Atterberg Limits and Grain Size Distribution

BOREHOLE NO.	SAMPLE NO.	GRAIN SIZE DISTRIBUTION (%)				ATTERBERG LIMITS		
		GRAVEL	SAND	SILT	CLAY	LIQUID LIMIT	PLASTIC LIMIT	PIASTICITY INDEX
4	3	6	23	41	30	34	20	14
4	4	8	21	40	31	35	20	15
10	2	0	2	49	49	42	22	20
16	5	0	29	53	18	34	22	12

9.3.4 Sandy Clayey Silt/Clayey Sand Till

The sandy clayey silt/clayey sand till deposit was encountered below the silty clay deposit in Boreholes BH4, BH10, and BH16, and below the fill layers in the remaining investigated boreholes. This till deposit was approximately 4.5m to 8.0 m in thickness, and extended to depths ranging from of 6.3 m to 11.0 m (EL. 73.8 to EL. 68.9) below the existing ground surface in Boreholes BH1 to BH8, where this deposit was fully penetrated. This till deposit was not full penetrated in Boreholes BH9 to BH20 to establish thickness.

The SPT N values in this till ranged from 17 blows to over 100 blows per 0.3 m of penetration, indicating very stiff to hard consistency.

The moisture content of the samples tested from this fill ranged from 3.7% to 22.6%, with an average value of 9.8%.

Dry unit weight tests were performed on 11 samples selected from this layer. The test results indicate dry unit weight values ranging from 18.56 kN/m3 to 21.35 kN/m3, with an average dry unit weight of 19.68 kN/m3.

The results of the grain size analysis tests performed on 30 representative samples from the clayey silt samples of this deposit are provided on Figure GS-4. The test results indicate that this deposit consists of none to 17% gravel, 3% to 38% sand, and 55% to 97% silt and clay sized particles. Atterberg limits tests were performed on 27 selected samples and the result are provided on Figure

PC-3. The test results indicate liquid limit values of 23 to 35, plastic limit values of 15 to 23, and corresponding plasticity index values of 6 to 15. Based on the test results, this deposit may generally be classified as Lean Clay/Sandy Lean Clay (CL) in accordance with the USCS, and as Clayey Silt/Sandy Clayey Silt (CL) in the MTO classification system. The grain size analysis and Atterberg limit test results are summarized in Table 5.

TABLE 5

Summary of Atterberg Limits and Grain Size Distribution

BOREHOLE NO.	SAMPLE NO.	GRAIN SIZE DISTRIBUTION (%)				ATTERBERG LIMITS		
		GRAVEL	SAND	SILT	CLAY	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
1	4	15	28	39	18	26	18	8
2	4	13	32	55		30	18	12
2	6	16	25	44	15	28	20	8
2	9					27	18	9
2	12					23	17	6
3	4	9	31	60		25	15	10
3	7					27	19	8
5	11					30	18	12
5	12	10	31	33	26			
6	4	9	30	61				
6	5	11	29	36	24	27	17	10
6	6	13	20	47	20			
6	7	4	30	39	27	29	18	11
7	3	5	30	38	27	33	18	15
7	5	8	28	45	19	24	15	9
7	7	11	29	38	22	26	17	9
8	5	11	29	40	20	25	16	9
8	10	7	32	37	24	26	15	11

TABLE 5

Summary of Atterberg Limits and Grain Size Distribution

BOREHOLE NO.	SAMPLE NO.	GRAIN SIZE DISTRIBUTION (%)				ATTERBERG LIMITS		
		GRAVEL	SAND	SILT	CLAY	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
9	5	10	32	40	18	28	20	8
10	4	17	28	38	17			
10	6	7	15	53	25	27	16	11
10	7	0	6	66	28	28	17	11
10	8	0	7	62	31	29	18	11
11	4	12	31	38	19	26	17	9
11	5	5	31	43	21	28	19	9
12	9	9	14	59	18	26	16	10
13	9	0	3	79	18	25	16	9
14	6	2	25	47	26	28	18	10
15	4	14	17	45	24	34	21	13
16	9	5	38	37	20	28	17	11
17	4	0	10	63	27	35	23	12
18	5	6	35	44	15			
19	6	11	29	42	18			
20	6	7	28	40	25			

The results of the grain size analysis tests performed on 14 representative samples from the clayey silt samples of this deposit are provided on Figure GS-5. The test results indicate that this deposit consists of 3% to 35% gravel, 23% to 50% sand, and 29% to 49% silt and clay sized particles. Atterberg limits tests were performed on 10 selected samples and the result are provided on Figure PC-3. The test results indicate liquid limit values of 25 to 31, plastic limit values of 15 to 21, and corresponding plasticity index values of 8 to 15. Based on the test results, this deposit may generally be classified as Clayey Sand/Clayey Sand with Gravel (SC) in accordance with the USCS, and as

Clayey Sand/Gravelly Clayey Sand (SC) in the MTO classification system. The grain size analysis and Atterberg limit test results are summarized in Table 6.

TABLE 6

Summary of Atterberg Limits and Grain Size Distribution

BOREHOLE NO.	SAMPLE NO.	GRAIN SIZE DISTRIBUTION (%)				ATTERBERG LIMITS		
		GRAVEL	SAND	SILT	CLAY	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
1	5	3	48	49				
1	6	17	50	26	7	27	18	9
1	7	23	48	29				
1	10	11	43	31	15	27	16	11
2	7	24	30	31	15			
3	5	27	32	26	15	26	16	10
3	6	26	37	23	14	27	19	8
4	5	24	36	27	13	31	21	10
7	10	4	50	28	18	26	17	9
8	6	35	23	26	16	30	15	15
9	4	17	39	31	13	25	16	9
11	6	17	45	27	11	28	18	10

Consolidated undrained triaxial compression test was carried out on six (6) selected cohesive sample in accordance with ASTM D4767. Table 7 summarizes the test results. The complete test results are appended in Appendix A.

TABLE 7

Summary of Consolidated Undrained Triaxial Compression Test Results

BOREHOLE NO.	SAMPLE DEPTH	EFFECTIVE MAJOR PRINCIPAL STRESS (kPa)	EFFECTIVE MINOR PRINCIPAL STRESS (kPa)	DEVIATOR STRESS (kPa)	AXIAL STRAIN (%)
4	4.6 – 5.2	598.6	363.0	235.6	14.15
5	8.4 – 9.2	593.9	411.2	182.7	13.86
6	3.1 – 3.7	443.7	332.0	111.7	15.24
6	3.8 – 4.4	670.5	390.4	280.1	14.97
9	4.6 – 5.2	462.2	325.9	136.3	12.2
11	3.1 – 3.7	145.3	32.4	112.9	15.0

Standard Proctor test was carried out on five (5) auger samples. Table 8 summarizes the results. The complete results, Proc-1 to Proc-5, are appended in Appendix A.

TABLE 8

Summary of Standard Proctor Test

BOREHOLE ID	DEPTH (m)	MAXIMUM DRY DENSITY (kg/m^3)	CORRECTED MAXIMUM DRY DENSITY (kg/m^3)	OPTIMUM MOISTURE CONTENT (%)	CORRECTED OPTIMUM MOISTURE CONTENT (%)
BH3	2.3 -3.8	2035	2117	11.5	10.1
BH7	3.1-3.7	2005	2035	12.0	11.5
BH8	3.1-3.7	1910	1969	14.1	13.0
BH9	3.8-4.4	1980	2014	12.5	11.9
BH11	3.8-4.6	2035	2062	11.4	10.9

9.3.5 Shale Bedrock

Bedrock was encountered in Boreholes BH1 to BH8, immediately below the till deposit at elevation varying from EL. 68.9 to EL. 73.8. The presence of bedrock was confirmed by obtaining 1.5 m and 5.2 m of rock cores from Boreholes BH1 to BH8. These boreholes were advanced using HQ2 sized wireline core barrels. The rock core recovery ranged from 67% to 100% and the Rock Quality Designation (RQD) of the bedrock ranged from 34% to 100% with the exception of Run 2 in BH1 and Run1 in BH6 and BH8. Based on the RQD values, the quality of the bedrock at this site may be described as poor to excellent. The bedrock was identified as slightly weathered to unweathered shale. For complete descriptions of the bedrock, refer to the Rock Core Photographs and the Rock Core Description logs provided in Appendix A.

Unconfined compressive strength (UCS) of five (5) rock core samples selected from Boreholes BH1, BH6, and BH8 were 120.2 MPa, 110.5 MPa, 48.5 MPa, 120.2 MPa, and 170.0 MPa, respectively. Based on the unconfined compression test values of five samples, the bedrock may be classified as very strong to medium (R5 to R3) with respect to strength.

9.3.6 Laboratory Testing of Representative Rock Core Samples

9.3.6.1 Rock Moduli and Uniaxial Compressive Strength (UCS) Testing

A total of five (5) uniaxial compression strength tests were performed on selected rock core samples from tunneling/micro-tunnelling boreholes BH1 (2 test), BH6 (2 test) and BH8 (1 test). Testing was carried out in accordance with ASTM D7012. The test results are included in Appendix A and summarized in Table 9 below

TABLE 9

Summary of Rock Moduli Testing and Uniaxial Compression Strength Test Results

BOREHOLE NO.	ROCK CORE DEPTH (m)	UCS (MPa)	DENSITY (g/cm^3)	RANGE (g/cm^3)	AVERAGE (g/cm^3)	ELASTIC MODULI IN UNIAXIAL COMPRESSION (GPa)	NO. TESTS
BH1	9.9	120.2	2.662	2.662 – 2.668	2.664	99.2	2
BH1	10.6	110.5	2.668			81.6	
BH3	9.7	239.5	-	-	-	59.68	1
BH6	9.9	111.7	2.676	2.594 – 2676	2.464	52.3	2
BH6	10.3	48.4	2.594			2.4	
BH8	11.6	170.0	2.631	-	2.631	56.3	1

9.3.6.2 Point Load Index (PLI)

Point load testing was conducted on 20 rock core samples selected from borehole locations along the proposed sanitary sewer alignment to be constructed using tunneling/micro-tunnelling methods. Both diametrical and axial tests were conducted in accordance with ASTM D5731. PLI values ($I_{s(50)}$) were calculated using the following equations from ASTM D5731 as follows:

$I_{s(50)} = F \times I_s$

where: F = Size correction factor = $(D_e/50)^{0.45}$

I_s = Uncorrected point load strength = P/D_e^2, MPa

P = failure load, N

D_e = equivalent core diameter in mm, and is given by:

$D_e^2 = D^2$ for diametrical core tests without penetration, mm^2 and

$D_e^2 = 4A/\pi$ for axial, mm^2;

where:

$A = WD$ = minimum cross-sectional area of a plane through the platen contact points

The Point Load Index, $I_{s(50)}$ test results are included in Appendix A and summarized in Table 10.

TABLE 10

Summary of Point Load Index Test Results

BOREHOLE NO.	DEPTH (m)	RUN	ORIENTATION	AVERAGE $I_{S(50)}$ (MPa)	RANGE (MPa)	STANDARD DEVIATION	NO. OF TEST
BH1	9.8	Run 1	Diametrical	0.09	0.71 – 1.09	0.27	2
	10.2						
BH2	8.6	Run 1	Diametrical	0.81	0.03 – 2.27	1.27	3
	9.2						
	8.8						
	9.1		Axial	0.67	-	-	1
BH3	8.6	Run 1	Axial	5.31	5.17 – 5.45	0.19	2
	8.9						
	8.4		Diametrical	2.51	-	-	1
BH4	8.0	Run1	Axial	0.77	-	-	1
	8.7	Run 4	Diametrical	4.02	-	-	1
BH5	11.5	Run 1	Axial	0.50	-	-	1
	12.1		Diametrical	0.09	-	-	1
BH6	8.3	Run 2	Axial	0.85	-	-	1
BH7	9.8	Run 2	Diametrical	1.98	0.31 – 3.65	2.36	2
	10.8						
BH8	10.2	Run 1	Diametrical	3.33	2.71 – 3.96	0.88	2
	10.6						
	10.5		Axial	0.71	0.49 – 0.94	0.32	2
	11.5						

9.3.6.3 Slake Durability Testing

Slake durability testing was conducted on three (3) shale samples taken from the proposed trenchless segment in accordance with ASTM D4644.

The slake durability index (second cycle), was determined using the following formula:

$$I_d\,(2) = [(WF - C)/\,(B - C)]\;x\;100$$

where: $I_d\,(2)$ = slake durability index (second cycle),

B = mass of drum plus oven-dried specimen before the first cycle, g

WF = mass of drum plus oven-dried specimen retained after the second cycle, g, and

C = mass of drum, g.

The slake durability test results are included in Appendix A and summarized in Table 11.

TABLE 11

Summary of Slake Durability Test Results

BOREHOLE NO.	SAMPLE FORMATION	SAMPLE DEPTH (m)	SLAKE DURABILITY INDEX
BH1	Georgian Bay Formation	10.4	53.5
BH4		8.4	62.5
BH5		11.0	71.4

*9.3.6.4 CERCHAR Abrasivity Index (CAI)**

A total of three (3) rock core samples were selected for CERCHAR Abrasivity Index (CAI) testing. The CAI test was conducted in accordance with ASTM D7625. The test results are included in Appendix A and summarized in Table 12.

TABLE 12

Summary of Cerchar Abrasivity Test Results

BOREHOLE NO.	CORE ID	SAMPLE DEPTH (m)	ROCK TYPE	RESULTS		CERCHAR ABRASIVE INDEX CLASSIFICATION
				CERCHAR ABRASIVE INDEX		
				CAI_s	CAI	
BH3	Run 1	8.3	Shale	0.2	1.6	Medium
BH5	Run 1	11.4	Shale	0.1	1.0	Medium
BH8	Run 1	10.4	Shale	0.4	3.5	High

*According to ASTM D7625 – 10, TABLE 13 Criteria for the CERCHAR Abrasiveness Index are as follows:
Very low abrasiveness 0.30–0.50
Low abrasiveness 0.50–1.00
Medium abrasiveness 1.00–2.00
High abrasiveness 2.00–4.00
Extreme abrasiveness 4.00–6.00

Based on the test results, summarized in the above Table 13, the rock core samples of interbedded dark grey, slightly calcareous shales are falling within medium to high abrasiveness with CERCHAR abrasive index values of 1.50 to 3.50.

9.3.6.5 Rock Density Test

A total of ten (10) rock core samples were selected for density testing. Rock moisture content and density testing was conducted in PML laboratory following the standard procedure. The test results are included in Appendix A and summarized in Table 13.

TABLE 13

Summary of Rock Core Density Test Results

BOREHOLE NO.	CORE ID	SAMPLE DEPTH (m)	MOISTURE CONTENT (%)	AVERAGE DRY DENSITY, (kg/m^3)
BH1	Run 1	9.76 – 9.86	1.1	2607
BH3	Run 1	8.84 – 8.92	0.7	2491
		8.92 – 8.99	0.2	2670
BH4	Run 1	8.69 – 8.84	0.5	2604
BH5	Run 1	11.53 – 11.59	1.8	2435
BH6	Run 2	8.28 – 8.36	1.9	2483
BH7	Run 2	10.11 – 10.21	1.5	2507
BH8	Run 1	10.21 – 10.31	0.6	2619
		10.37 – 10.41	0.5	2704
		10.62 – 10.72	0.4	2582

9.3.6.6 Semi-Confined Swell Testing

Semi-confined swell testing test was performed on two (2) shale bedrock samples in accordance with the methodology developed by K. Y. Lo.

Shale samples were selected from boreholes BH3 and BH6 for two (2) Semi Confined Swell Testing (SCST). For the SCST, hydrostatic pressure was calculated based on observed water level as encountered in each borehole. The samples were submerged in water and the changes in dimension normal to horizontal direction were measured for 100 days while the load was applied in

the vertical direction and the results of the measured swelling strain (%) versus logarithm of elapsed time. SCST was commenced on July 7, 2021 and continued for 100 days. Table 14 summarizes the SCST results and details of laboratory test results are presented in Appendix A.

TABLE 14

Summary of Semi-confined Swell Test Results

BOREHOLE NO.	SAMPLE ID	DEPTH (m)	MAXIMUM APPLIED FORCE (kN)
BH3	Run 1	8.3 – 8.5	0.496
BH6	Run 4	11.0 – 11.2	0.343

10. GROUNDWATER

Groundwater levels were observed during drilling in Boreholes BH1, BH3, BH5, BH6, BH7, BH12 BH14, BH16 to BH18, and BH20 at depths ranging from 3.8 m to 6.8 m (EL. 77.5 to EL. 72.4) below the existing ground surface. Upon completion of drilling, groundwater was measured in Boreholes BH12 to BH14 at a depth of 1.5 m (EL. 75.5), 3.2 m (EL. 74.5), and 4.0 m (EL. 77.1) below the ground surface, respectively.

Monitoring wells consisting of 50 mm diameter PVC pipe were installed in Boreholes BH1, BH4, BH5, BH7, BH11, BH13 and BH16 to BH20. Refer to Table 15 for subsequent groundwater level readings following installation of the monitoring well.

TABLE 15

Ground Water Level Readings in Monitoring Wells

MONITORING WELL (MW) NO.(1)	GROUND SURFACE ELEVATION (m)(2)	MID-SCREEN DEPTH (m) (1) (ELEVATION, m)	HYDROSTATIC GROUND WATER LEVEL DEPTH (m)(3) (ELEVATION, m)				
			JULY 26, 2021	SEPT 27, 2021	OCT 01, 2021	NOV 5, 2021	DEC 10, 2021
BH1/MW1	81.1	8.3 (72.8)	1.17 (79.93)	4.8 (76.3)	4.8 (76.3)	4.8 (76.3)	1.23 (79.87)
BH4/MW2	78.15	7.8 (70.35)	2.27 (75.88)	4.9 (73.25)	4.8 (73.35)	4.75 (73.4)	2.3 (75.85)
BH5/MW3	79.86	9.5 (70.36)	3.5 (76.36)	-	3.6 (76.26)	-	3.6 (76.26)
BH7/MW4	81.43	10.1 (71.33)	1.5 (79.93)	-	5.0 (76.43)	-	3.85 (77.58)
BH11/MW5	77.92	4.6 (73.32)	2.64 (75.28)	1.8 (76.12)	2.0 (75.92)	2.0 (75.92)	2.75 (75.17)
BH13/MW6	77.69	4.5 (73.19)	3.0 (74.69)	2.7 (74.99)	2.8 (74.89)	2.89 (74.8)	3.05 (74.64)
BH16/MW-7	81.11	10.7 (70.41)	4.42 (76.69)	4.56 (76.55)	4.6 (76.51)	4.63 (76.48)	4.6 (76.51)
BH17/MW-8	82.1	10.7 (71.4)	3.92 (78.18)	4.8 (77.3)	4.7 (77.4)	4.7 (77.4)	3.85 (78.25)
BH18	81.31	5.6 (75.71)	3.75 (77.56)	-	3.8 (77.51)	-	4.0 (77.13)
BH19	80.79	4.6 (76.19)	5.6 (75.19)	-	3.5 (77.29)	-	3.7 (77.09)
BH20	77.83	6.2 (71.63)	4.2 (73.63)	-	4.2 (73.63)	-	3.2 (74.63)

Notes:
(1) See Drawings PP-1 to PP-8 for approximate monitoring well location plan and Log of Borehole sheets for details of monitoring well installation.
(2) Ground surface elevations at the monitoring well locations were surveyed by PML and are geodetic.
(3) Ground water levels measured using a Solinst flat tape water level reader.

11. PACKER TEST

A total of six (6) packer testing also known as hydraulic conductivity testing was conducted in accordance with ASTM D 4630 – 96 (Reapproved 2008). The packer testing was carried out upon completion of rock coring in anticipated micro-tunnelling boreholes BH1, BH2, BH3, BH4, BH6 and BH7. The test intervals were selected based on the results of the recovered rock coring samples and sub surface condition encountered in the bedrock. The packer system consisted of two inflatable packers approximately 0.9 m in length were set about 1.1 m to 2.9 m apart. A 25.4 mm diameter steel pipe containing offset holes to allow water to pressurize the test section was placed between the two packers. Testing was conducted using five pressures in BH2, BH3, BH4, BH6 and three pressures in BH1 and BH7. At medium and high pressure, in boreholes BH1 and BH7, the flow was constant with no changes in flow meter readings. The packer testing results are summarized in Table 16, and appended in Appendix D.

TABLE 16

Summary of the Packer (Hydraulic Conductivity) Testing

BOREHOLE NO./TEST NUMBER	DEPTH OF THE TEST (m)	LENGTH OF INTERVAL (m)	PRESSURE (psi)	HYDRAULIC CONDUCTIVITY (m/s)	AVERAGE HYDRAULIC CONDUCTIVITY (m/s)	LUGEON FLOW
BH 1	10.5 – 11.6	1.12	18	1.64E-08	5.95×10^{-8}	Laminar
			27	1.34E-07		
			36	0		
			27	0		
			18	0		
BH2	9.8 – 11.6	1.83	18	3.42E-06	4.79×10^{-6}	Dilation
			27	4.53E-06		
			35	4.84E-06		
			27	6.69E-06		
			18	4.46E-06		

TABLE 16

Summary of the Packer (Hydraulic Conductivity) Testing

BOREHOLE NO./TEST NUMBER	DEPTH OF THE TEST (m)	LENGTH OF INTERVAL (m)	PRESSURE (psi)	HYDRAULIC CONDUCTIVITY (m/s)	AVERAGE HYDRAULIC CONDUCTIVITY (m/s)	LUGEON FLOW
BH3	7.9 – 10.8	2.90	16	2.77E-06	9.81×10^{-6}	Washout
			24	1.18E-05		
			32	9.44E-06		
			24	1.11E-05		
			16	1.39E-05		
BH4	8.7 – 10.8	2.16	16	1.63E-06	8.23×10^{-6}	Washout
			24	3.38E-06		
			32	7.24E-06		
			25	1.31E-05		
			24	1.30E-05		
			16	1.10E-05		
BH6	9.2 – 11.3	2.13	17	5.77E-06	5.68×10^{-6}	Turbulent
			27	5.06E-06		
			34	4.55E-06		
			27	5.34E-06		
			17	7.30E-06		
BH7	10.1 – 11.6	1.52	18	1.48164E-07	5.61×10^{-8}	Turbulent
			27	8.91122E-08		
			36	0		
			27	0		
			18	3.29254E-08		

Packer testing was conducted at depths ranged from 7.9 m to 10.5 m, based on the bedrock profile encountered during the field investigation. Based on the interpretation of the packer testing results, the hydraulic conductivity obtained from the packer tests were ranged from 5.61 $x10^{-8}$ m/s (Borehole BH7) to 9.81$x10^{-6}$ m/s (Borehole BH3). The packer test results are presented in Appendix D.

12. GAS MONITORING

The QRAE 3 was used to detect the presence of methane, hydrogen sulphide, carbon monoxide and oxygen in Boreholes BH1, BH2, BH4 and BH16. Carbon monoxide (CO) was detected in Boreholes BH1 and BH16, which ranged from 4 ppm to 9 ppm from 0.2 m to 6.1 m depth below ground surface. The monitor did not detect/register presence of methane or hydrogen sulphide in the four (4) boreholes.

13. GEOPHYSICAL SURVEY

A geophysical survey was carried out in three different sections along the proposed micro-tunnel alignment (522 m along Lakeshore Road East, 442 m along Aviation Road and 249 m off-road section). With the exception of the off-road segment, this particular investigation utilized a streamer arrangement, where the geophones and seismic sources are dragged behind a vehicle with record being recorded at set intervals along the alignment. Two essentially independent techniques were used to analysis the resulting data, seismic refraction topography and 2D Multichannel Acquisition of Seismic Waves (MASW). Geophysics GPR International Inc. carried out seismic refraction and MASW for $\bar{V}_{s30}$ seismic site classification. The field work for the geophysical survey was carried out on August 24th and 26th, 2021. Refer to the Appendix C for details of the geophysical survey results including data acquisition, methodology, data quality, processing, interpretation results, conclusion and recommendation.

14. CHEMICAL (CORROSIVITY) ANALYSIS TESTING

SGS Canada Inc. (SGS) carried out the chemical analyses on selected seven (7) soil and five (5) shale bedrock samples. SGS is accredited by The Standards Council of Canada (SCC) and The Canadian Association for Laboratory Accreditation (CALA). The test results are included in Appendix E and summarized in Table 17.

TABLE 17

Summary of Chemical Test Results

BOREHOLE NO.	SAMPLE DEPTH (m)		MATRIX	CORROSIVITY INDEX	REDOX POTENTIAL (mV)	SULFIDE (%)	pH	RESISTIVITY (ohm.cm)	SULPHATE (µg/g)	CHLORIDE (µg/g)
	FROM	TO								
BH1	6.8	7.5	Soil	8	222	0.20	8.71	2430	300	41
BH4	4.6	5.2	Soil	10	265	0.17	8.50	1980	260	180
BH6	4.6	5.2	Soil	16	180	0.14	8.80	1610	230	230
BH9	5.3	5.9	Soil	8	219	0.23	8.68	2150	250	63
BH10	3.0	3.6	Soil	10	229	0.23	7.76	2020	300	170
BH12	3.8	4.4	Soil	11	226	<0.04	8.38	1080	180	380
BH14	4.6	5.2	Soil	6	206	0.09	8.38	2990	180	130
BH1	10.5	10.7	Shale	12	244	0.47	9.03	1850	480	170
BH4	8.1	8.2	Shale	8	249	0.15	8.89	2330	230	210
BH5	11.9	12.1	Shale	6	226	0.05	9.49	4740	100	130
BH6	6.4	6.5	Shale	12	244	0.09	9.05	1850	400	110
BH8	10.4	10.5	Shale	8	303	0.13	8.93	2330	180	420

Note: The complete results are appended in Appendix E

15. CLOSURE

The field work was carried out under the supervision of Mr. Akbar Hossain, P.Eng., and Mr. Almustafa Al-Doori, EIT, working under the direction of Mr. Mohammed Zamshad, P.Eng. The geotechnical laboratory work was carried out by PML (Toronto laboratory) and the geo-environmental testing was carried out by SGS Canada Inc., Toronto, Ontario.

The Geotechnical Data Report (GDR) was prepared by Mr. Nazibur Rahman, P.Eng. with the assistance of Almustafa Al Doori, EIT and reviewed by Mr. Mohammed Zamshad, P.Eng. in accordance with the RFP requirements. The report was independently reviewed by Mr. Geoffrey Uwimana, MEng, P.Eng., Discipline Head of Geotechnical Engineering Services.

We trust this report has been completed within the terms of reference and is sufficient for your current needs. Should you require additional information and/or clarification, please contact our office.

Sincerely

Peto MacCallum Ltd.

DRAFT

Almustafa Al Doori, EIT.
Geotechnical Engineering Services

DRAFT

Mohammed Zamshad, MEng, P.Eng.
Senior Engineer
Geotechnical Engineering Services

DRAFT

Geoffrey Uwimana, MEng, P.Eng.
Discipline Head
Geotechnical Engineering Services

AA/NR/MZ/GU:nk

APPENDIX A

Plan Nos. PP-1 to PP- 8 - Borehole Location Plans and Geotechnical Stratigraphic Data

List of Abbreviations

Record of Borehole Sheets BH1 to BH20

Figures GS-1, GS-2. GS-3, GS-4A to GS-4C, GS-5A and GS-5B – Grain Size Distribution Charts

Figures PC-1, PC-2, PC-3A to 3C and PC-4 – Plasticity Charts

Standard Proctor Test Results

Consolidated Undrained Triaxial Shear Test Results

Rock Core Description Logs and Photographs

Rock Moduli and Unconfined Compressive Strength Test Results

Point Load Index Test Results

Slake Durability Test Results

CERCHAR Abrasivity Test Results

Rock Density Test Results

Semi-confined Swell Test Results

SEE DWG No. PP 3
MATCH LINE STA. 2+160

SEE DWG No. PP 2

LAKESIDE AVENUE

250mm OVERFLOW CONNECTED TO EX. SMH-1783108

2+140

0+140 0+120 0+100

Lake Ontario

HAMPTON CRESCENT

REMOVE AND REPLACE EX. SMH-178309

MH 4

MH 5

BH12 MW-5

MH 6

MH 7

PROP. 250 mm DIA. PVC SAN. SEWER

PROP. 250 mm DIA. PVC SAN. SEWER

PROP. 250 mm DIA. PVC SAN. SEWER

Water Front Trail

McMillan Park

CONNECT EXISTING PARK WASHROOM SAN SERVICE LATERAL TO MH

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
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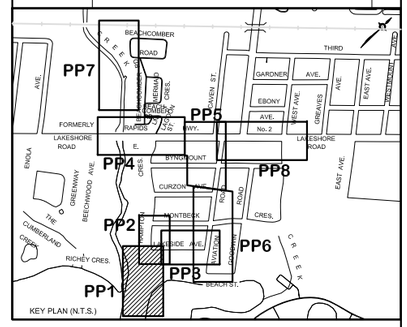
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JJA.



LEGEND:

- Water Level Observed During Drilling
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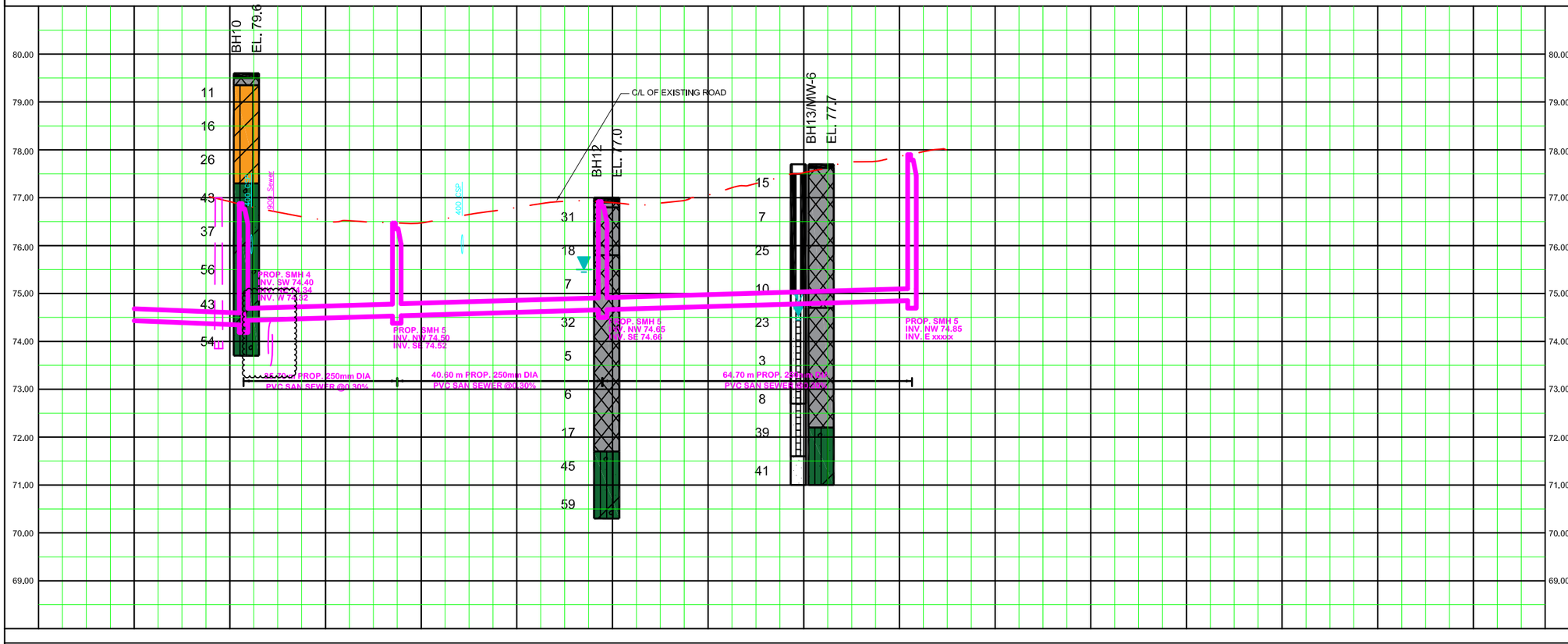
- Water Level Measured in Monitoring Well
- PML Borehole
- Previous Borehole
- Asphalt
- Fill
- Topsoil
- Silty Clay
- Sandy Clayey Silt/ Clayey Sand Till
- Shale Bedrock



General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

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All Horizontal And Vertical Bends Are In Degrees

All Pipes Size In mm

20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. Elev.
Description
Location

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Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
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CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
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ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

MC MILLAN PARK

FROM WATER FRONT TRAIL TO LAKESIDE AVE.

PROP. 250mm PVC SAN. SEWER

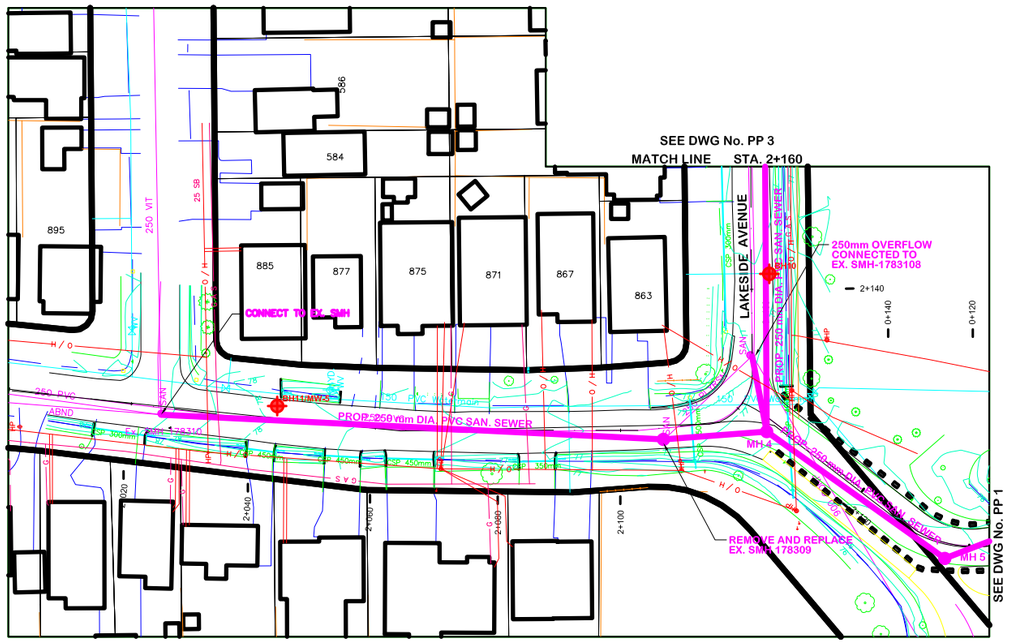
STA. 0+000 TO STA. 0+160

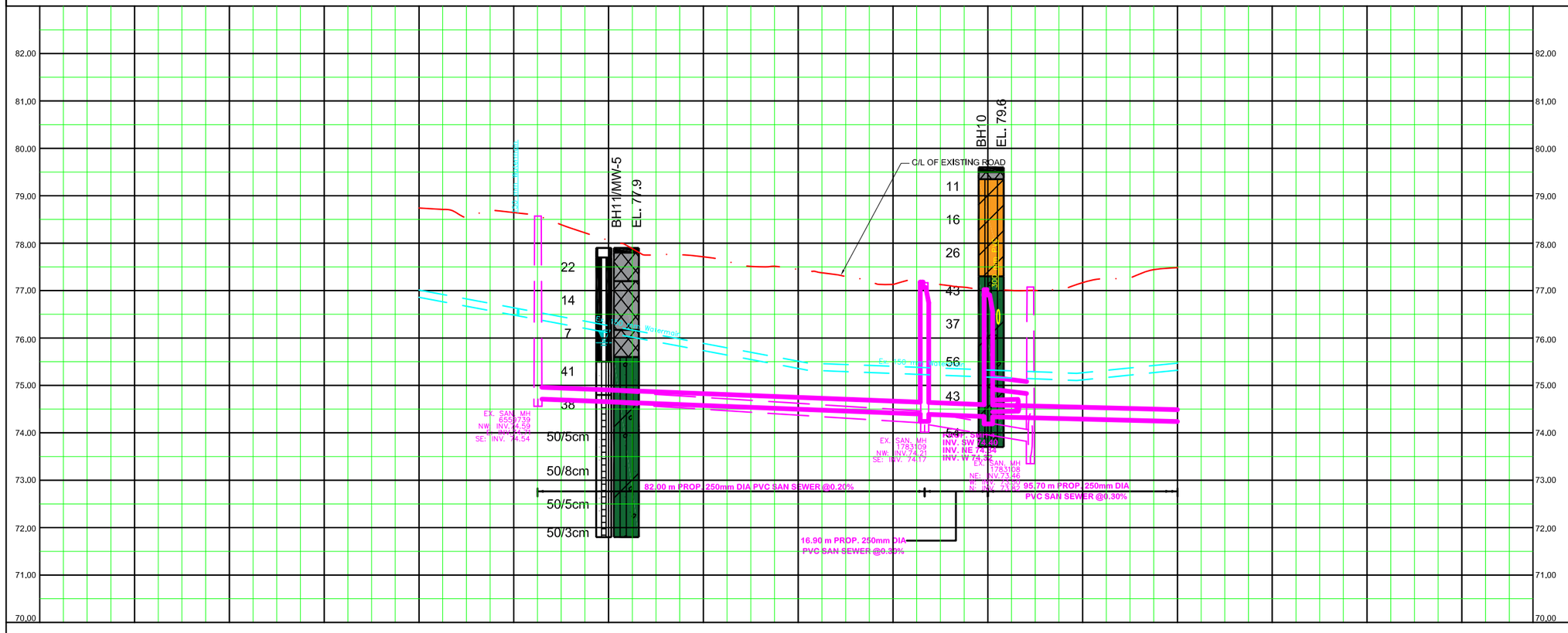
000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00
000.00	76.90	76.52	76.49	76.80	76.91	77.06	77.53	77.86	000.00	000.00
0+000	0+160	0+140	0+120	0+100	0+080	0+060	0+040	0+020	0+000	0-020

EX. ROAD ELEV.
ROAD CHAINAGE

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	1 of 8	Plan No.	PP-1

HAMPTON CRESCENT





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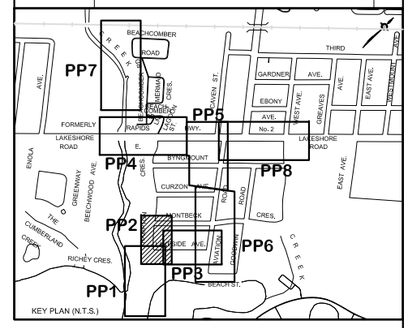
78.65	78.07	77.71	77.45	77.13	77.03	77.16	77.49	EX. ROAD ELEV.
2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JJA.



LEGEND:

- Water Level Observed During Drilling
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- Water Level Measured in Monitoring Well
- PML Borehole
- Previous Borehole
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- Fill
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WS25 Proposed Water Service, Size In mm

B.M. No. Elev.
Description
Location

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Designed by

Chkd.

Approved by

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HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

HAMPTON CRESCENT

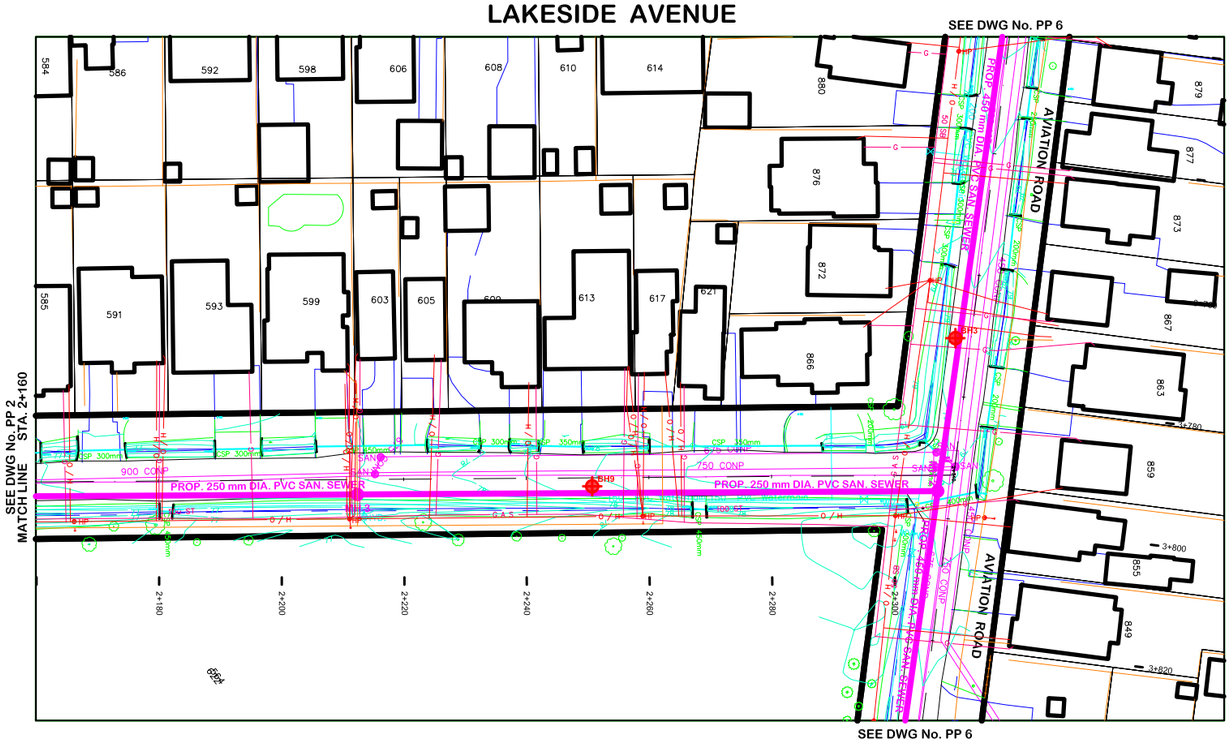
FROM MONTBECK CRESCENT TO LAKESIDE AVE.

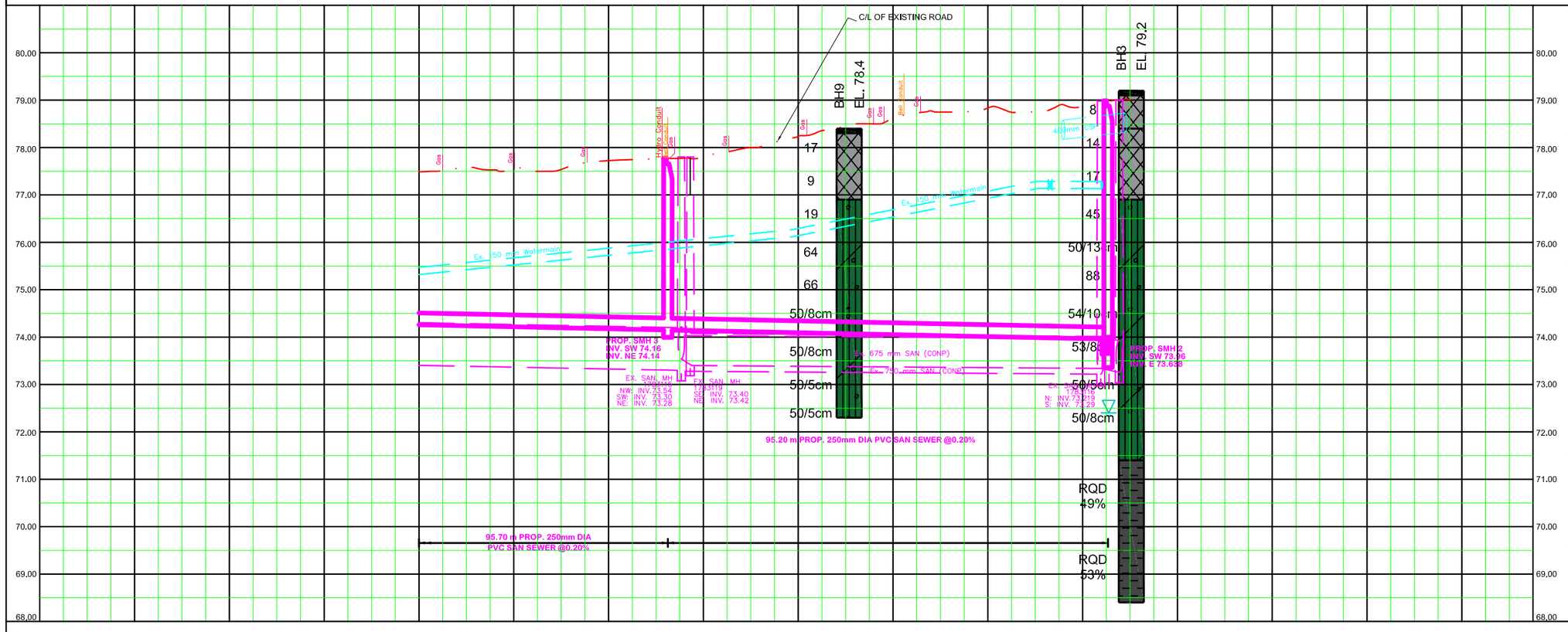
PROP. 250mm PVC SAN. SEWER

STA.2+000 TO STA. 2+160

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	2 of 8	Plan No.	**PP-2**

LAKESIDE AVENUE





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EX. ROAD ELEV.	77.49	77.55	77.50	77.81	78.24	78.61	78.84	78.78	00.00	
ROAD CHAINAGE	2+160	2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320	

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
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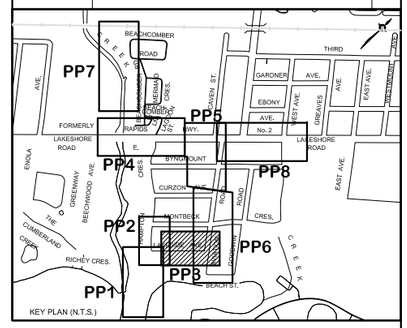
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JJA.



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B.M. No. Description Location — Elev.

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Designed by

Approved by

Chkd.

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ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

LAKESIDE AVENUE

FROM HAMPTON CRESCENT TO AVIATION ROAD

PROP. 250mm PVC SAN. SEWER

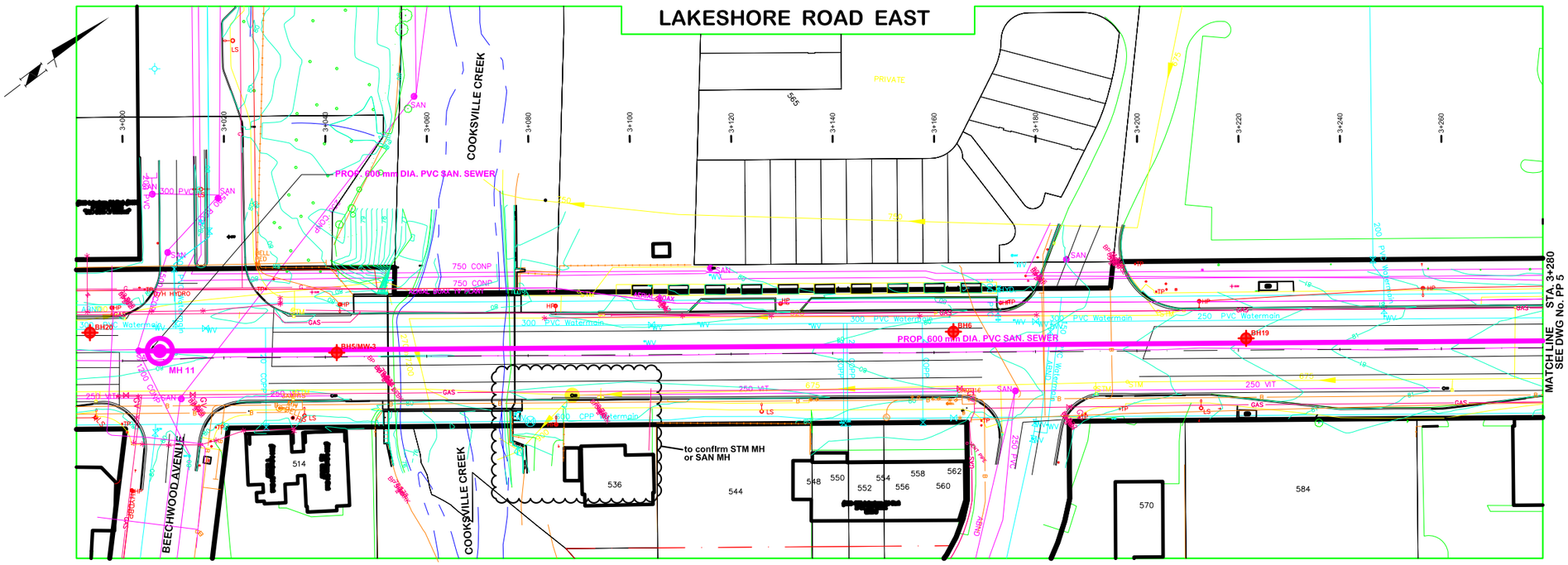
STA. 2+160 TO STA. 2+320

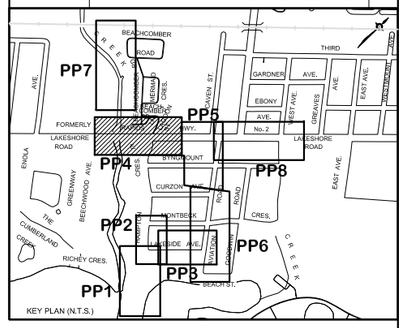
CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	3 of 8

Project No. 19M-00593

Plan No. **PP-3**

LAKESHORE ROAD EAST





SERVICE DATA

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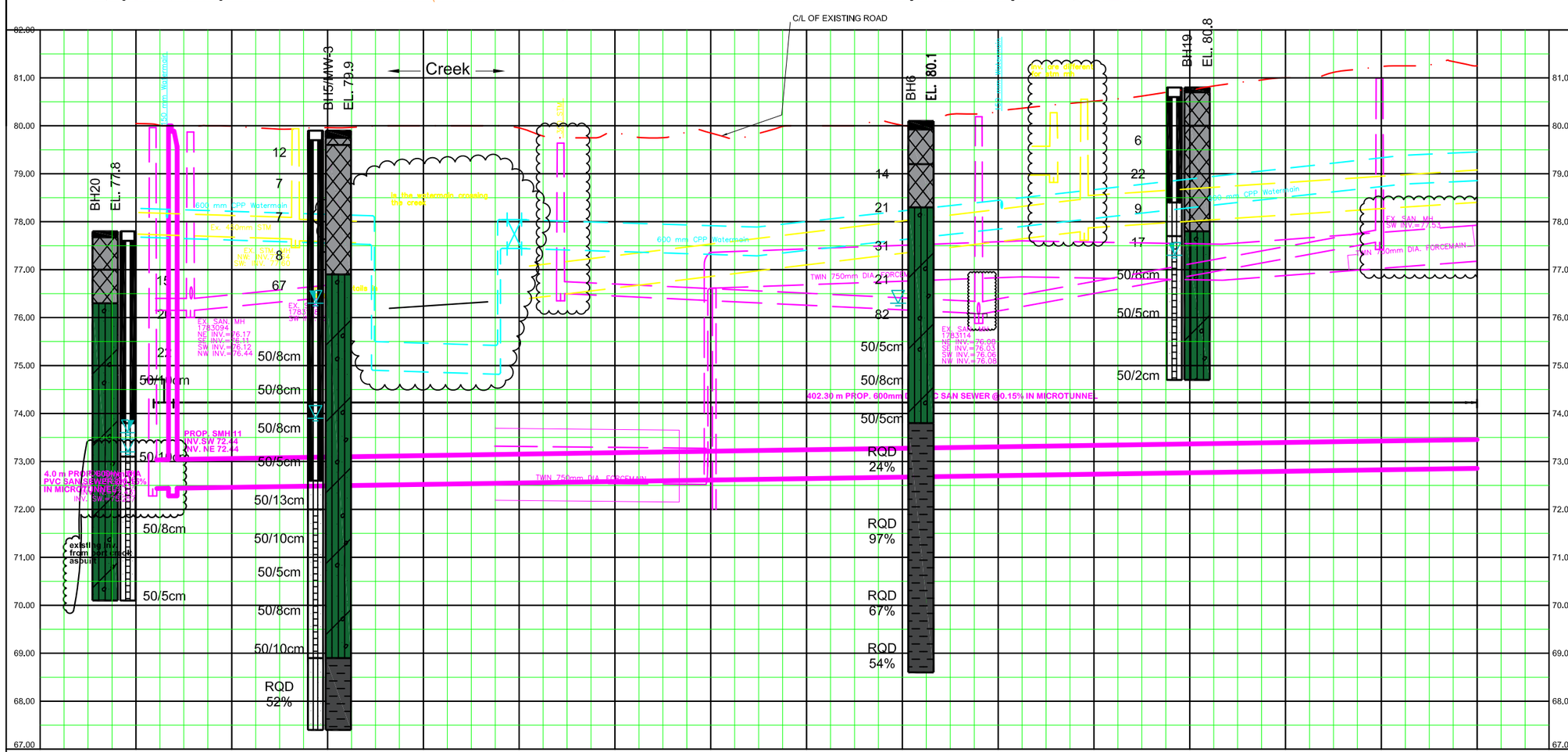
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



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80.05	79.98	79.96	80.00	79.96	79.87	79.85	80.00	80.02	80.30	80.51	80.75	81.00	81.23	81.25	EX. ROAD ELEV.	
3+000	3+020	3+040	3+060	3+080	3+100	3+120	3+140	3+160	3+180	3+200	3+220	3+240	3+260	3+280	ROAD CHAINAGE	

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B.M. No. Elev.
Description
Location

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Designed by _____ Chkd. _____

Approved by _____

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ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

FROM BEECHWOOD AVE. TO HAMPTON CRESCENT

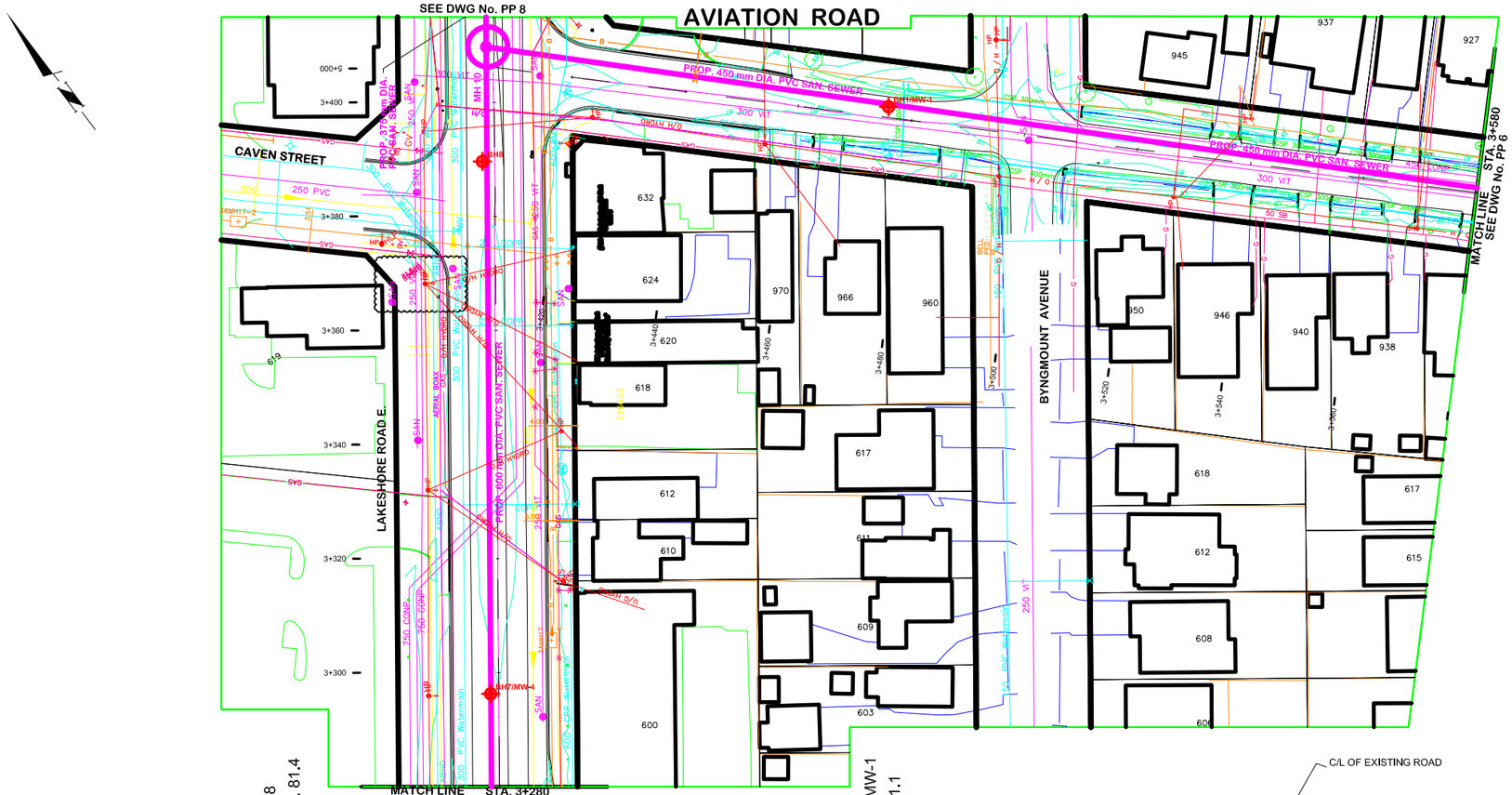
PROP. 600mm SAN. SEWER

STA. 3+000 TO STA. 3+280

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	4 of 8	Plan No.	**PP-4**

SEE DWG No. PP 8

AVIATION ROAD



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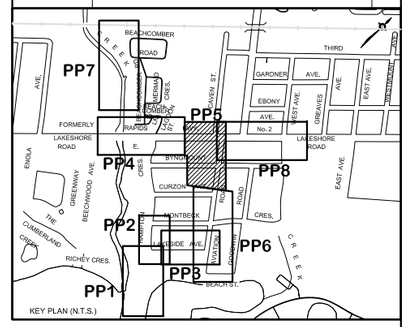
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JA.



LEGEND:

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- Water Level Measured After Drilling
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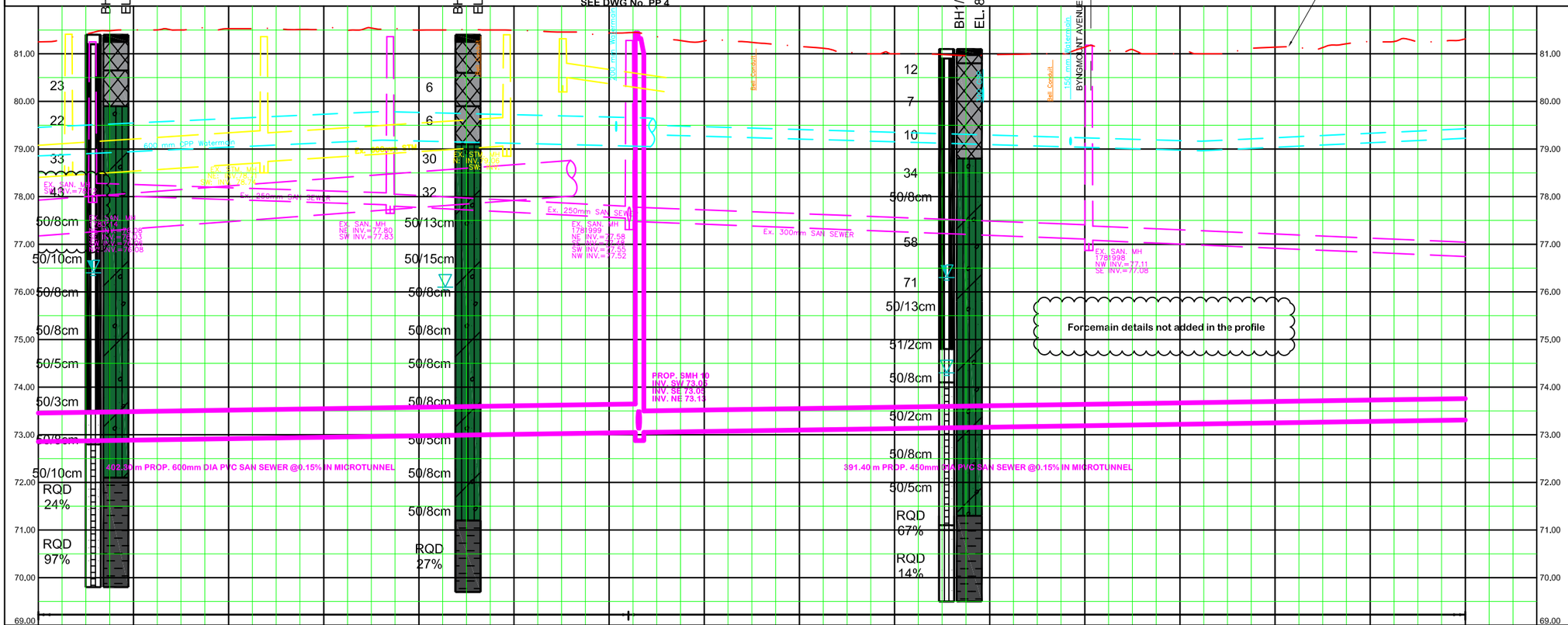
- PML Borehole
- Previous Borehole
- Asphalt
- Fill
- Topsoil
- Silty Clay
- Sandy Clayey Silt/ Clayey Sand Till
- Shale Bedrock

BH7/MW-4 EL. 81.4

BH8 EL. 81.4

BH1/MW-1 EL. 81.1



000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	
81.25	81.50	81.53	81.53	81.50	81.49	81.44	81.27	81.16	81.00	80.98	81.14	81.03	81.14	81.26	81.32	EX. ROAD ELEV.
3+280	3+300	3+320	3+340	3+360	3+380	3+400	3+420	3+440	3+460	3+480	3+500	3+520	3+540	3+560	3+580	ROAD CHAINAGE

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted
All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
All Horizontal And Vertical Bends Are In Degrees
All Pipes Size In mm
200 Existing Water Service, Size In mm
WS25 Proposed Water Service, Size In mm
B.M. No. Elev.
Description
Location
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Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

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TOWN OF CALEDON WORKS DEPT.
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ENERSOURCE, HYDRO MISSISSAUGA
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HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel working with you

AVIATION ROAD

FROM LAKESHORE ROAD E. TO BYNGMOUNT AVE.

PROP. 450 - 600mm SAN SEWER

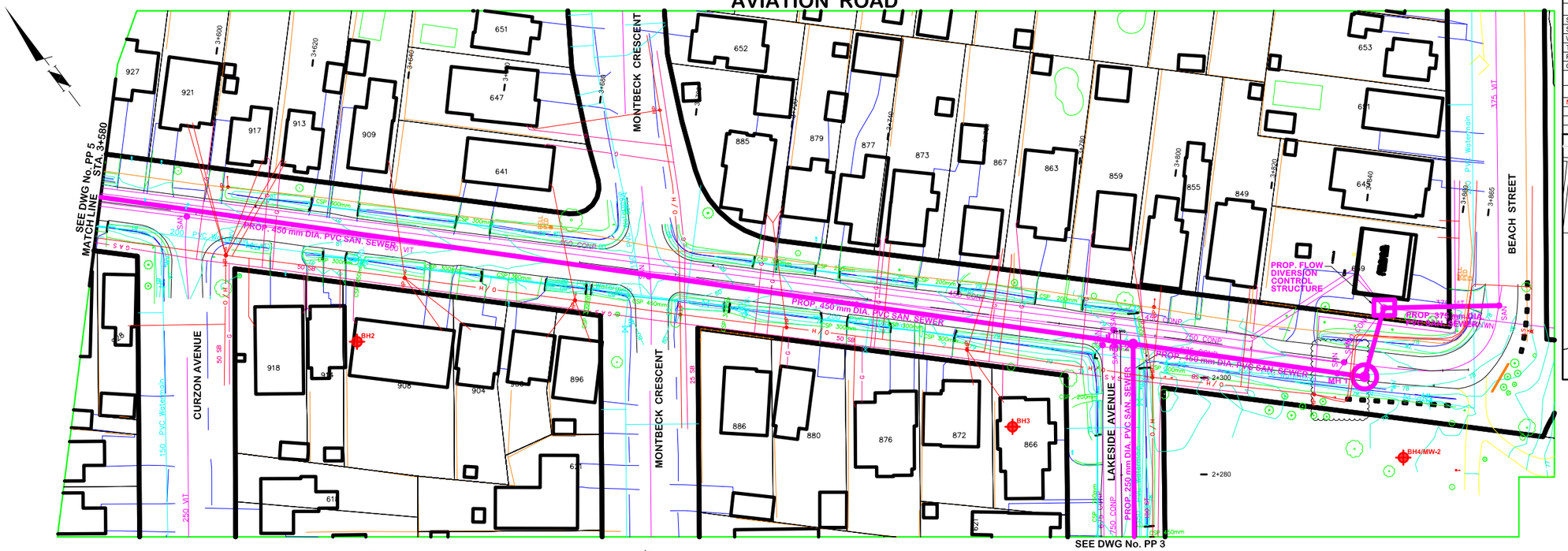
STA. 3+280 TO STA. 3+580

CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	5 of 8

Project No. 19M-00593

Plan No. **PP-5**

AVIATION ROAD

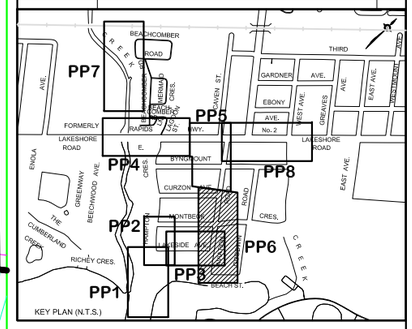


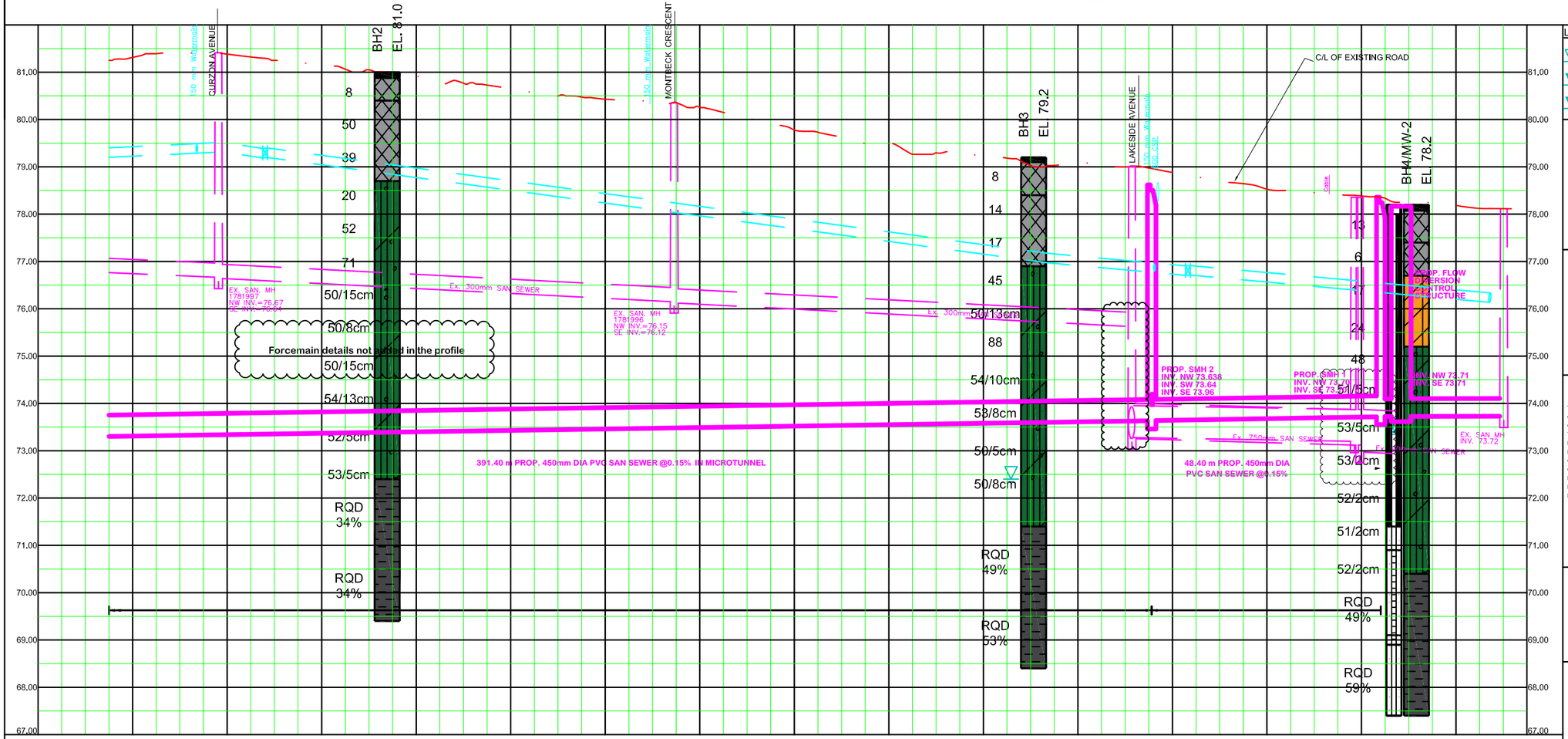
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JA.





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Designed by — Chkd.
Approved by

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10m 0 10 20 30m — HORIZONTAL SCALE
1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

AVIATION ROAD

FROM BYNGMOUNT AVE. TO BEACH STREET

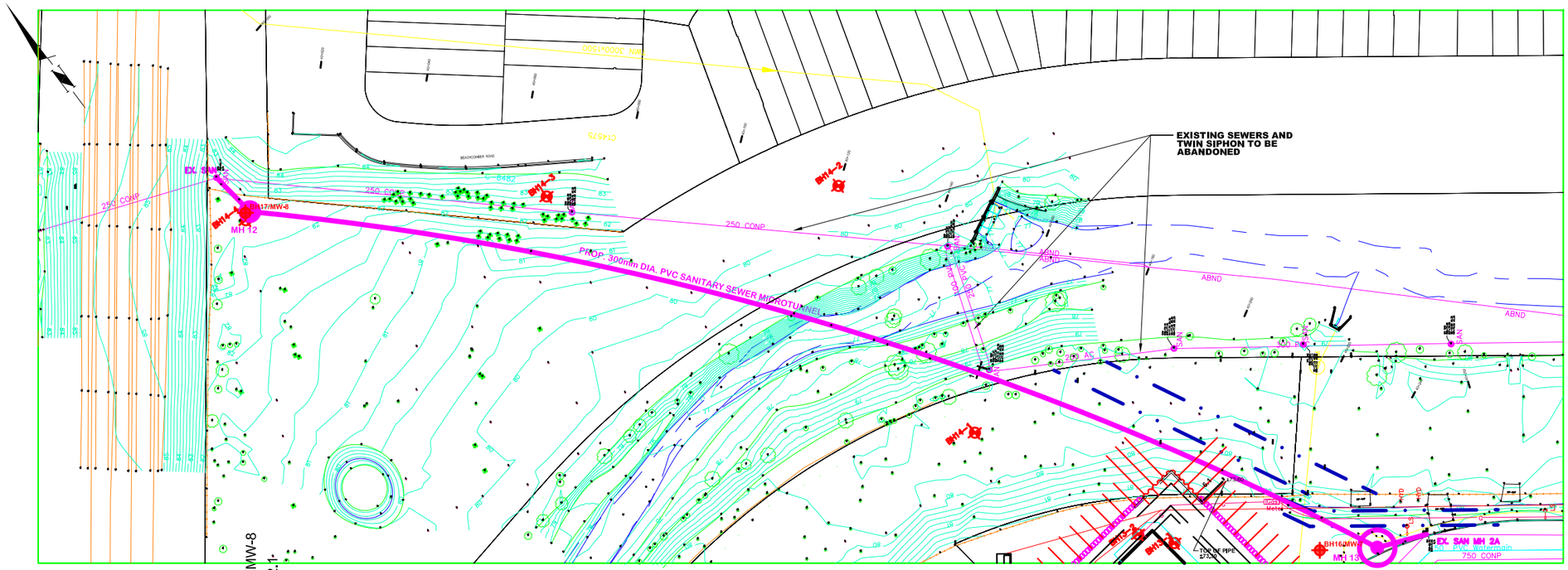
PROP. 375 - 450mm SAN SEWER

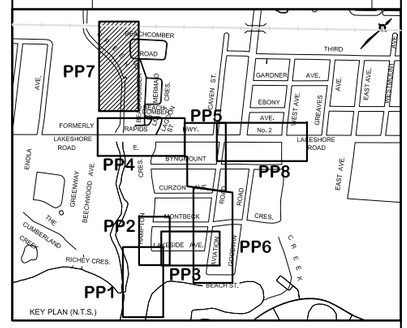
STA. 3+580 TO STA. 3+860

000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00		
81.32	81.38	81.16	80.92	80.65	80.43	80.26	79.78	79.50	79.25	79.09	78.88	78.53	78.37	78.19	EX. ROAD ELEV.	
3+580	3+600	3+620	3+640	3+660	3+680	3+700	3+720	3+740	3+760	3+780	3+800	3+820	3+840	3+860	ROAD CHAINAGE	

CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	6 of 8

Project No. 19M-00593
Plan No. **PP-6**





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TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
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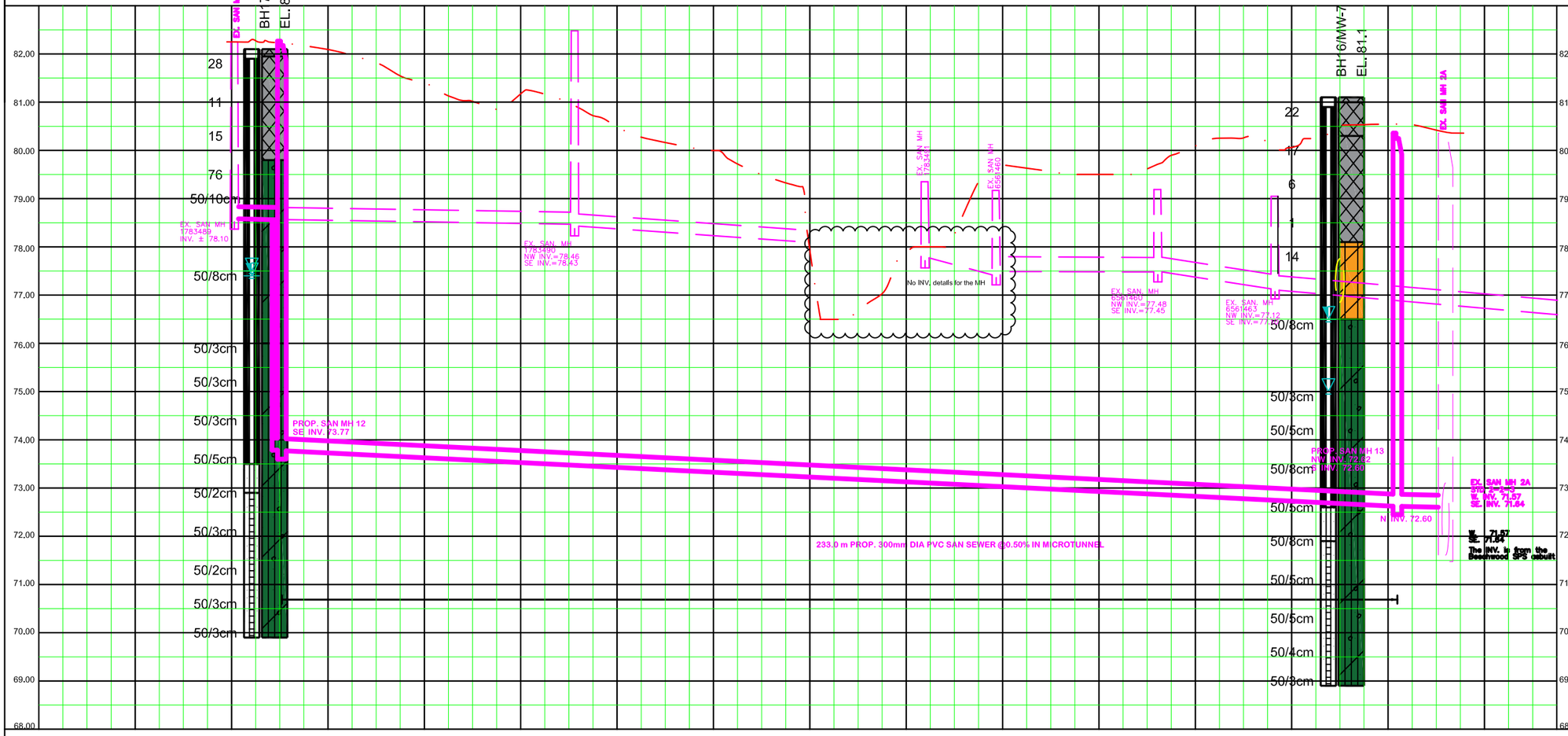
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JA.



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Designed by

Chkd.

Approved by

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10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

BEECHWOOD SPS

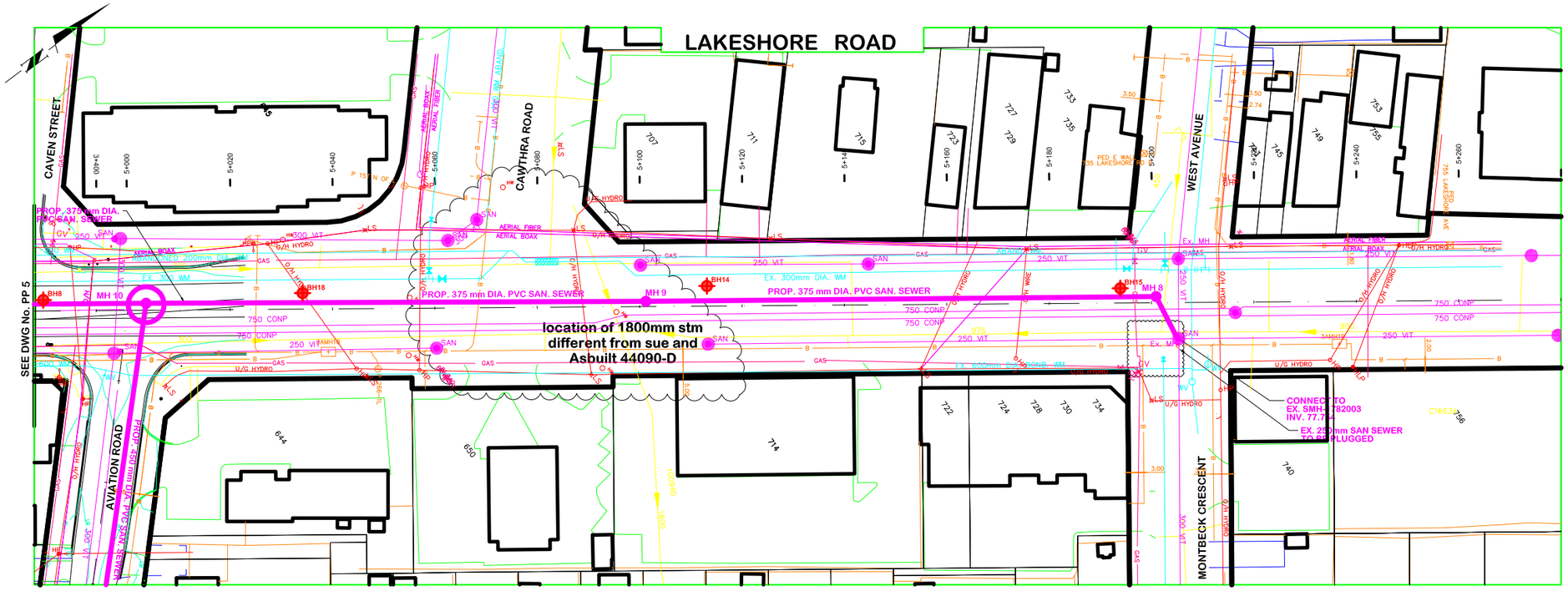
PROP. 300mm SAN SEWER

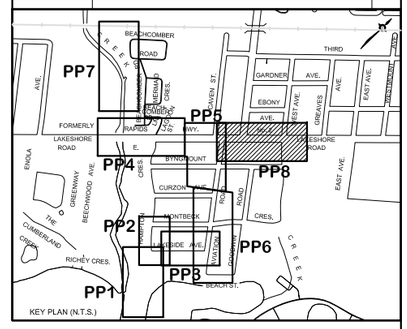
STA. 4+000 TO STA. 4+260

CAD Area	X-XX	Area	X-XX
Checked by	X-XX	Drawn by	X-XX
Date	DECEMBER 2020	Sheet	7 of 8

Project No. 19M-00593

Plan No. **PP-7**





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REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	JA.

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B.M. No. Elev.
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FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

FROM AVIATION ROAD TO WEST AVE..

PROP. 375mm SAN SEWER

STA. 5+000 TO STA. 5+240

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	X-XX	Drawn by	X-XX		
Date	DECEMBER 2020	Sheet	8 of 8	Plan No.	PP-8

81.49	81.47	81.40	81.34	81.26	81.21	81.19	81.15	81.15	81.20	81.30	81.46	81.64	81.83	82.03	EX. ROAD ELEV.
5+000	5+020	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180	5+200	5+220	5+240	5+260	5+280	ROAD CHAINAGE

LIST OF ABBREVIATIONS

PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m.

Dynamic Penetration Resistance: - The number of blows required to advance a 51 mm, 60 degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

CONSISTENCY	N (blows/0.3 m)	c (kPa)	DENSENESS	N (blows/0.3 m)
Very Soft	0 - 2	0 - 12	Very Loose	0 - 4
Soft	2 - 4	12 - 25	Loose	4 - 10
Firm	4 - 8	25 - 50	Compact	10 - 30
Stiff	8 - 15	50 - 100	Dense	30 - 50
Very Stiff	15 - 30	100 - 200	Very Dense	> 50
Hard	> 30	> 200		

WTPL	Wetter Than Plastic Limit
APL	About Plastic Limit
DTPL	Drier Than Plastic Limit

TYPE OF SAMPLE

SS	Split Spoon	TW	Thinwall Open
WS	Washed Sample	TP	Thinwall Piston
SB	Scraper Bucket Sample	OS	Oesterberg Sample
AS	Auger Sample	FS	Foil Sample
CS	Chunk Sample	RC	Rock Core
ST	Slotted Tube Sample		

PH	Sample Advanced Hydraulically
PM	Sample Advanced Manually

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH1/MW-1

17T; 4824985.5N; 615782.1E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 2, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH ELEV (metres)	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
	SURFACE ELEVATION 81.10					81
0.30	PAVEMENT STRUCTURE: 125mm asphaltic concrete		1	SS	12	
0.50	over 175mm granular base/subbase					
80.60	organics					
	FILL: firm to stiff, grey silty clay, sandy, wet		2	SS	7	80
			3	SS	10	
2.3						79
78.8	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, trace/some gravel, moist		4	SS	34	
			5	SS	50/8cm	78
			6	SS	58	77
			7	SS	71	
5.3						76
75.8	thinly laminated shale layers		8	SS	50/13cm	
			9	SS	51/2cm	75
			10	SS	50/8cm	
			11	SS	50/2cm	74
			12	SS	50/8cm	73
			13	SS	50/5cm	72
9.8	AUGER REFUSAL AT 9.8m					
71.3	SHALE BEDROCK: Unweathered to slightly weathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 67%	71
			RUN 2	RC	RQD 14%	70
11.6						
69.5	Borehole terminated at 11.6 m					

GAS READING NOTES:

1. CO=4 PPM, H_2S=0 PPM, and O_2=20.9% at 0.1 m
2. CO=9 PPM, H_2S=0 PPM, and O_2=20.9% at 3.0 m
3. CO=5 PPM, H_2S=0 PPM, and O_2=20.9% at 3.8 m
4. CO=0 PPM, H_2S=0 PPM, and O_2=20.3% at 4.6 m
5. CO=9 PPM, H_2S=0 PPM, and O_2=20.9% at 5.3 m

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS (ppm)

	GROUND WATER OBSERVATIONS AND REMARKS	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Flushmount Casing	
CO= 4 ppm	50 mm Dia. PVC pipe	
		0 31 42 27
		15 28 39 18
CO= 9 ppm	Bentonite Seal	3 48 (49)
CO= 5 ppm		17 50 26 7
CO= 0 ppm	El. 76.3	23 48 (29)
CO= 0 ppm		
	Filter Sand El. 74.3	11 43 31 15
	Screen	
	REC 94% UCS=120.2 MPa	
	REC 100% UCS=110.5 MPa	

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	1.2	79.9
2021-09-27	4.8	76.3
2021-10-01	4.8	76.3
2021-11-05	4.8	76.3

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH2

17T; 4824871.9N; 615892.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 3, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GAS READINGS (ppm)	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		SURFACE ELEVATION 81.00						
0.60	80.40	PAVEMENT STRUCTURE: 125mm asphaltic concrete over 475mm sand and gravel		1	SS	8		
		FILL: hard to very stiff, brown clayey silt, trace to some sand, some gravel, moist		2	SS	50		
				3	SS	39		
2.3	78.7	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, some gravel, moist		4	SS	20		13 32 (55)
				5	SS	52		
				6	SS	71		16 25 44 15
4.6	76.4	thinly laminated shale layers		7	SS	50/15cm		24 30 31 15
				8	SS	50/8cm		
				9	SS	50/15cm		
				10	SS	54/13cm		
				11	SS	52/5cm		
8.6		AUGER REFUSAL AT 8.6m		12	SS	53/5cm		
	72.4	SHALE BEDROCK: Slightly weathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 34%		REC 100%
				RUN 2	RC	RQD 34%		REC 92%
11.6	69.4	Borehole terminated at 11.6 m						Upon completion, no cave-in, groundwater level could not be established

GAS READING NOTES:

1. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 2.3 m

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q (50 100 150 200); DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20 40 60 80)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%) (10 20 30 40)

ELEVATION SCALE: 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH3

17T; 4824776.0N; 615989.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 10, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 79.20					
0.0	79.20	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 700mm granular base/subbase		1	SS	8	79
0.80	78.40	FILL: stiff, brown silty clay, trace sand, trace gravel, moist		2	SS	14	78
1.0				3	SS	17	
2.0							77
2.3	76.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, trace to some gravel, thinly laminated shale layers, moist		4	SS	45	
3.0				5	SS	50/13cm	76
4.0				6	SS	88	
				7	SS	54/10cm	75
5.0				8	SS	53/8cm	74
6.0				9	SS	50/5cm	73
7.0				10	SS	50/8cm	
7.8	71.4	AUGER REFUSAL AT 7.8m SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 49%	72
8.0							71
9.0				RUN 2	RC	RQD 53%	70
10.0							69
10.8	68.4	Borehole terminated at 10.8 m.					
11.0							
12.0							
13.0							
14.0							
15.0							

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

2 9 45 44
9 31 (60)
27 32 26 15
26 37 23 14

▽ El. 72.4

REC 97%
REC 98%

Upon completion, no cave-in, groundwater level could not be established

NOTES

▽ GROUND WATER STRIKE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH4/MW-2

17T; 4824722.1N; 616050.3E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 8, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	78.20	SURFACE ELEVATION 78.20			
0.0	78.20	PAVEMENT STRUCTURE: 125mm asphaltic concrete over 675mm granular base/subbase	1	SS	13
0.80	77.40	FILL: firm, brown clayey silt, trace sand, trace gravel, moist	2	SS	6
1.5	76.7	SILTY CLAY: very stiff, brown silty clay, some sand, trace gravel, moist	3	SS	17
			4	SS	24
3.0	75.2	SANDY CLAYEY SILT/CLAYEY SAND TILL: very stiff to hard, grey sandy clayey silt/clayey sand till, some gravel, moist	5	SS	48
3.8	74.4	thinly laminated shale layers	6	SS	51/5cm
			7	SS	53/5cm
			8	SS	53/2cm
			9	SS	52/2cm
			10	SS	51/2cm
7.8		AUGER REFUSAL AT 7.8m	11	SS	52/2cm
8.0	70.4	SHALE BEDROCK: Unweathered to slightly weathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds	RUN 1	RC	RQD 49%
10.0			RUN 2	RC	RQD 59%
10.8	67.4	Borehole terminated at 10.8m			

GAS READING NOTES:

1. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 0.1 m
2. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 0.8 m
3. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 1.5 m
4. CO=0 PPM, H_2S=0 PPM, and O_2=20.3% at 2.3 m
5. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 3.0 m

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
6 23 41 30
8 21 40 31
24 36 27 13
Bentonite Seal
El. 73.4 12 43 28 17
Filter Sand
Screen
REC 100%
REC 98%

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	2.3	75.9
2021-09-27	4.9	73.3
2021-10-01	4.8	73.4
2021-11-05	4.8	73.4

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH5/MW-3

17T; 4824741.6N; 615512.9E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 10, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
	79.90	SURFACE ELEVATION 79.90				
0.30	79.60	PAVEMENT STRUCTURE: 125mm asphaltic concrete over 175mm granular base/subbase		1	SS	12
		FILL: stiff to firm, brown clayey silt, some sand, trace gravel, moist		2	SS	7
				3	SS	7
				4	SS	8
3.0	76.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, grey sandy clayey silt/clayey sand till, trace to some gravel, moist		5	SS	67
4.6	75.3	thinly laminated shale layers		6	SS	50/8cm
				7	SS	50/8cm
				8	SS	50/8cm
				9	SS	50/5cm
				10	SS	50/13cm
				11	SS/AS	50/10cm
				12	SS	50/5cm
				13	SS	50/8cm
11.0	68.9	AUGER REFUSAL AT 11.0m SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		14 RUN 1	SS RC	50/10cm RQD 52%
12.5	67.4	Borehole terminated at 12.5m				

ELEVATION SCALE: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0 m; 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69, 68

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

El. 76.3
Bentonite Seal

El. 73.9

Filter Sand

10 31 33 26

Screen

REC 100%

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.5	76.4
2021-09-27	-	79.9
2021-10-01	3.6	76.3
2021-11-05	-	79.9

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH6

17T; 4824841.0N; 615583.0E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 11, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
	80.10	SURFACE ELEVATION					80
0.0		PAVEMENT STRUCTURE: 125mm asphaltic concrete over 775mm granular base/subbase		1	AS		
0.90	79.20	FILL: stiff to very stiff, brown clayey silt, trace sand, trace gravel, moist		2	SS	14	79
1.8	78.3	SANDY CLAYEY SILT TILL: very stiff to hard, brown sandy clayey silt till, trace/some gravel, moist		3	SS	21	78
				4	SS	31	
				5	SS	21	77
				6	SS	82	76
4.6	75.5	thinly laminated shale layers		7	SS/AS	50/5cm	
				8	SS	50/8cm	75
6.3		AUGER REFUSAL AT 6.3m		9	SS	50/5cm	74
	73.8	SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 24%	73
				RUN 2	RC	RQD 97%	72
				RUN 3	RC	RQD 67%	71
				RUN 4	RC	RQD 54%	70
11.5	68.6	Borehole terminated at 11.5m					69

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

9 30 (61)

11 29 36 24

▽ El. 76.3

13 20 47 20

4 30 39 27

REC 67%

REC 970%

REC 97%
UCS=48.4 MPa at 10.4m
UCS=120.2 MPa at 9.9m

REC 87%

Upon completion, no cave-in, groundwater level could not be established

NOTES

▽ GROUND WATER STRIKE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH7/MW-4

17T; 4824945.6N; 615664.3E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 14-15, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
0.0	81.40	SURFACE ELEVATION 81.40				
		PAVEMENT STRUCTURE: 150mm asphaltic concrete over 600mm granular base/subbase		1	AS	
0.75	80.65	FILL: very stiff, brown clayey silt, trace sand, trace gravel, moist		2	SS	23
1.5	79.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: very stiff, to hard brown sandy clayey silt/clayey sand till, trace/some gravel, moist		3	SS	22
				4	SS	33
				5	SS	43
3.8	77.6	thinly laminated shale layers		6	SS	50/8cm
				7	SS/AS	50/10cm
				8	SS	50/8cm
				9	SS	50/8cm
				10	SS/AS	50/5cm
				11	SS	50/3cm
				12	SS	50/8cm
9.3		AUGER REFUSAL AT 9.3m		13	SS	50/10cm
11.6	72.1	SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE with minor, unweathered, calcareous CARBONATE interbeds		RUN 1	RC	RQD 24%
				RUN 2	RC	RQD 97%
	69.8	Borehole terminated at 11.6m				

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q (50 100 150 200)

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20 40 60 80)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30 40)

GAS READINGS (ppm)

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

5 30 38 27

8 28 45 19

Bentonite Seal

11 29 38 22

▼ El. 76.4

4 50 28 18

Filter Sand

REC 67%

Screen

REC 97%

Upon completion, no cave-in, groundwater level could not be established

Water Level Readings:

Date	Depth	Elev.
2021-07-26	1.5	79.9
2021-09-27	-	81.4
2021-10-01	5.0	76.4
2021-11-05	-	81.4

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH8

17T; 4825020.9N; 615719.5E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 14-15, 2021 — ***ENGINEER*** M.Z.

BORING METHOD C.F.H.S.A and HQ Double Tube Core Barrels — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	GAS READINGS (ppm)	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	81.40	SURFACE ELEVATION 81.40				81		
		PAVEMENT STRUCTURE: 150mm asphaltic concrete over 650mm granular base/subbase	1	AS				
0.80	80.60	FILL: firm, brown to grey clayey silt, trace to some sand, trace gravel, moist	2	SS	6	80		
1.0			3	SS	6			
2.0						79		
2.3	79.1	SANDY CLAYEY SILT/CLAYEY SAND TILL: very stiff to hard, brown sandy clayey silt/clayey sand till, trace/some gravel, moist	4	SS	30			
3.0			5	SS	32	78		11 29 40 20
3.8								
4.0	77.6	thinly laminated shale layers	6	SS	50/13cm			35 23 26 16
			7	SS	50/15cm	77		
5.0								∇ El. 76.1
			8	SS	50/8cm	76		
6.0			9	SS	50/8cm			
						75		
7.0			10	SS	50/8cm			7 32 37 24
			11	SS	50/8cm	74		
8.0								
			12	SS	50/5cm	73		
9.0			13	SS	50/8cm			
						72		
10.0			14	SS	50/8cm			
10.2	71.2	AUGER REFUSAL AT 10.2m SHALE BEDROCK: Unweathered, thinly laminated, slightly calcareous, SHALE	RUN 1	RC	RQD 27%	71		REC 100% UCS=170.0 MPa
11.0						70		
11.7	69.7	Borehole terminated at 11.7m						Upon completion, no cave-in, groundwater level could not be established
12.0								
13.0								
14.0								
15.0								

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 50 100 150 200 / 20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40

NOTES

∇ GROUND WATER STRIKE

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH9

17T; 4824714.2N; 615973.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 10, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.A.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	SAMPLE TYPE	"N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 78.40					
0.0	78.30	PAVEMENT STRUCTURE: 100mm asphaltic concrete					
		FILL: stiff, brown silty clay, some sand, some gravel, moist		1	SS	17	78
1.0				2	SS	9	
1.5	76.9	SANDY CLAYEY SILT/CLAYEY SAND TILL: stiff to hard, brown sandy clayey silt/clayey sand till, some gravel, moist		3	SS	19	77
2.0				4	SS	64	76
3.0				5	SS	66	75
3.8	74.6	thinley lamintaed shale layers		6	SS	50/8cm	
4.0							74
				7	SS	50/8cm	
5.0				8	SS	50/5cm	73
6.0	72.3	Borehole terminated at 6.1m		9	SS	50/5cm	

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
17	39	31	13
10	32	40	18

Upon completion, cave-in at 3.7m, groundwater level could not be established

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH10

17T; 4824626.5N; 615909.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 11, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" VALUES	GAS READINGS ppm	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		SURFACE ELEVATION 79.60						
0.25	79.35	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 150mm granular base/subbase		1	SS	11		
		SILTY CLAY: stiff to very stiff, brown silty clay, trace sand, moist		2	SS	16		0 2 49 49
				3	SS	26		
2.3	77.3	CLAYEY SILT TILL: hard, grey clayey silt till, some to trace sand, trace gravel, shale fragments, moist		4	SS	43		17 28 38 17
				5	SS	37		
				6	SS	56		7 15 53 25
				7	SS	43		0 6 66 28
				8	SS	54		0 7 62 31
5.9	73.7	Borehole terminated at 5.9m						Upon completion, no cave-in, no water

ELEVATION SCALE: 79, 78, 77, 76, 75, 74

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30 40

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH11/MW-5

17T; 4824657.8N; 615832.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 16, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres) / ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	SURFACE ELEVATION 77.90			
0.0 / 77.90	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 600mm granular base/subbase	1	SS	22
0.70 / 77.20	FILL: compact to loose, brown silty sand and crusher run limestone, wet.	2	SS	14
1.7 / 76.2	firm, brown silty clay, trace sand, trace gravel, moist	3	SS	7
2.3 / 75.6	SANDY CLAYEY SILT/CLAYEY SAND TILL: hard, brown sandy clayey silt/clayey sand till, trace/some gravel, moist	4	SS	41
		5	SS	38
3.8 / 74.1	thinly laminated shale layers	6	SS	50/5cm
		7	SS	50/8cm
		8	SS	50/5cm
6.1 / 71.8	Borehole terminated at 6.1m	9	SS	50/3cm

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu; ▲ POCKET PENETROMETER ○ Q; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%)

GAS READINGS (ppm)

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
Bentonite Seal
El. 75.9
12 31 38 19
Filter Sand
5 31 43 21
17 45 27 11
Screen

Upon completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	2.6	75.3
2021-09-27	1.8	76.1
2021-10-01	2.0	75.9
2021-11-05	2.0	75.9

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH12

17T; 4824561.8N; 615947.0E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 2, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" VALUES
		SURFACE ELEVATION 77.00				
0.0	76.80	PAVEMENT STRUCTURE: 100mm asphaltic concrete over 100mm granular base/subbase		1	SS	31
		FILL: hard to very stiff, grey silty clay, trace sand, trace gravel, moist		2	SS	18
1.2	75.8	loose to dense, brown silty sand, trace gravel, moist		3	SS	7
				4	SS	32
				5	SS	5
				6	SS	6
				7	SS	17
5.3	71.7	CLAYEY SILT TILL: hard, grey clayey silt till, some sand, moist		8	SS	45
6.7	70.3	Borehole terminated at 6.7m		9	SS	59

ELEVATION SCALE: 76, 75, 74, 73, 72, 71

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

El. 75.5

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

0 46 (54)

9 14 59 18

Upon completion, no cave-in, water at 1.5m

NOTES

▽ GROUND WATER STRIKE
▼ GROUND WATER LEVEL MEASURED UPON COMPLETION OF DRILLING

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH13/MW-6

17T; 4824518.4N; 615960.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 2 & 22 , 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" VALUES
		SURFACE ELEVATION 77.70				
0.0	77.52	PAVEMENT STRUCTURE: 75mm asphaltic concrete over 100mm granular base/subbase		1	SS	15
1.0		FILL: stiff, brown silty clay, some gravel, mixed with topsoil, organics, brick and asphalt debris, moist		2	SS	7
2.0				3	SS	25
				4	SS	10
3.0	74.7	compact to very loose, brown silty sand, trace gravel, asphalt debris		5	SS	23
4.0				6	SS	3
5.0				7	SS	8
5.5	72.2	CLAYEY SILT TILL: hard, brown clayey silt till, trace sand, moist		8	SS	39
6.0				9	SS	41
6.7	71.0	Borehole terminated at 6.7m				
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						

ELEVATION SCALE: 77, 76, 75, 74, 73, 72, 71

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
Bentonite Seal
El. 74.8
El. 74.5
Filter Sand
Screen
6 59 (35)
0 3 79 18

Upon completion, no cave-in, water at 3.2m

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.0	74.7
2021-09-27	2.7	75.0
2021-10-01	2.8	74.9
2021-11-05	2.9	74.8

NOTES

▼ GROUND WATER LEVEL MEASURED UPON COMPLETION OF DRILLING
▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH14

17T; 4825125.9N; 615795.6E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 14, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	ELEVATION SCALE
		SURFACE ELEVATION 81.10					
0.0		PAVEMENT STRUCTURE: 150mm asphaltic concrete over 650mm granular base/subbase		1	AS		81
0.80	80.30	very stiff to firm, grey silty clay, trace sand, trace gravel, moist		2	SS	26	80
1.0							
2.0				3	SS	5	79
2.4	78.7	SANDY CLAYEY SILT TILL: very stiff to hard, brown sandy clayey silt till, trace gravel, thinly laminted shale layers, moist		4	SS	20	
3.0				5	SS	50/13cm	78
4.0				6	SS	50/10cm	77
5.0				7	SS	50/10cm	
				8	SS	50/8cm	76
6.0				9	SS	50/8cm	75
7.0	74.1	Borehole terminated at 7m		10	SS	50/10cm	
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							
14.0							
15.0							

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ● Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

▽ El. 77.3
▼ El. 77.1
2 25 47 26

Upon completion, no cave-in, water at 4.0m

NOTES

▽ GROUND WATER STRIKE
▼ GROUND WATER LEVEL MEASURED UPON COMPLETION OF DRILLING

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH15

17T; 4825190.0N; 615844.7E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 1 & 14, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 81.30				
0.0	81.30	PAVEMENT STRUCTURE: 150mm asphaltic concrete over 450mm granular base/subbase		1	AS	
0.60	80.70	FILL: stiff to very stiff, brown clayey silt/silty clay, trace sand, some gravel, moist		2	SS	12
1.0				3	SS	24
2.0						
2.3	79.0	SANDY CLAYEY SILT TILL: hard, brown sandy clayey silt till, some gravel, moist		4	SS	31
3.0						
3.0	78.3	thinly laminated shale layers		5	SS	50/15cm
4.0				6	SS	50/3cm
5.0				7	SS	50/5cm
				8	SS	50/8cm
5.9				9	SS	50/2cm
6.0	75.4	Borehole terminated at 5.9m				

ELEVATION SCALE: 81, 80, 79, 78, 77, 76

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%); 10 20 30 40

GAS READINGS (ppm)

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

5 22 (73)

14 17 45 24

Upon completion, no cave-in, no water

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH16/MW-7

17T; 4824803.7N; 615388.2E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** June 29-30, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 81.10				
0.0	81.00	organics				
		FILL: compact, brown sandy silt, trace clay, trace gravel, moist		1	SS	22
0.80	80.30	very stiff to soft, brown clayey silt, trace sand, trace gravel, moist		2	SS	17
1.0						
2.0				3	SS	6
				4	SS	1
3.0	78.1	SILTY CLAY: stiff, brown silty clay, sandy, moist		5	SS	14
4.0						
4.6	76.5	SANDY CLAYEY SILT TILL: hard, grey sandy clayey silt till, trace gravel, thinly lamiated shale layers, moist to wet		6	SS	50/8cm
5.0						
6.0				7	SS	50/3cm
				8	SS	50/5cm
7.0						
				9	SS	50/8cm
8.0						
				10	SS	50/5cm
9.0				11	SS	50/8cm
10.0				12	SS	50/5cm
11.0				13	SS	50/5cm
				14	SS	50/4cm
12.0						
12.2				15	SS	50/3cm
	68.9	Borehole terminated 12.2m				
13.0		GAS READING NOTES:				
		1. CO=0 PPM, H_2S=0 PPM, and O_2=20.9% at 0.8 m				
		2. CO=3 PPM, H_2S=0 PPM, and O_2=20.9% at 2.3 m				
14.0		3. CO=8 PPM, H_2S=0 PPM, and O_2=20.9% at 6.1 m				
15.0						

ELEVATION SCALE: 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

1 42 (57)

0 29 53 18

Bentonite Seal

El. 76.5

El. 75.0

5 38 37 20

Filter Sand

Screen

Upon completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	4.4	76.7
2021-09-27	4.6	76.5
2021-10-01	4.6	76.5
2021-11-05	4.6	76.5

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH17/MW-8

17T; 4824984.2N; 615259.8E

PROJECT Beach St. Pumping Station Diversion — **PML REF.** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — **BORING DATE** June 28, 2021 — **ENGINEER** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — **TECHNICIAN** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 82.10				
0.15	81.95	organics				
		FILL: very stiff to stiff, brown clayey silt, some sand, topsoil, some gravel, moist		1	SS	28
				2	SS	11
				3	SS	15
2.3	79.8	CLAYEY SILT TILL: hard, brown clayey silt till, trace sand, trace gravel, moist		4	SS	76
				5	SS	50/10cm
				6	SS	50/8cm
6.1	76.0	thinly laminted shale layers		7	SS	50/3cm
				8	SS	50/3cm
				9	SS	50/3cm
				10	SS	50/5cm
				11	SS	50/2cm
				12	SS	50/3cm
				13	SS	50/2cm
				14	SS	50/3cm
12.2	69.9	Borehole terminated at 12.2M		15	SS	50/3cm

ELEVATION SCALE: 82, 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

2 41 (57)

0 10 63 27

Bentonite Seal

El. 77.5

El. 77.4

Filter Sand

Screen

Upon Completion, cave-in at 9.1m, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.9	78.2
2021-09-27	4.8	77.3
2021-10-01	4.7	77.4
2021-11-05	4.7	77.4

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH18

17T; 4825062.1N; 615749.0E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 22, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.A.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
		SURFACE ELEVATION 81.30				
0.0	81.30	PAVEMENT STRUCTURE: 150mm asphaltic concrete over 300mm concrete slab over 350mm granular base/subbase		1	AS	
0.80	80.50	FILL: stiff, grey clayey silt, trace sand, trace gravel, moist		2	SS	13
1.5	79.8	SANDY CLAYEY SILT TILL: stiff to hard, grey sandy clayey silt till, trace gravel, moist		3	SS	22
				4	SS	34
				5	SS	49
4.6	76.7	thinly laminted shale layers		6	SS	50/5cm
				7	SS	50/8cm
				8	SS	50/10cm
7.1	74.2	Borehole terminated at 7.1M.		9	SS	50/8cm

ELEVATION SCALE: 81, 80, 79, 78, 77, 76, 75

SHEAR STRENGTH (kPa)
+FIELD VANE △TORVANE ○ Qu
▲POCKET PENETROMETER ○ Q
50 100 150 200
DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

Bentonite Seal

6 35 44 15

Filter Sand
El. 77.5

Screen

El. 75.7

Upon Completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	3.4	77.9
2021-09-27	-	81.3
2021-10-01	3.8	77.5
2021-11-05	-	81.3

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH19

17T; 4824886.2N; 615618.9E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 23, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	NUMBER	TYPE	"N" VALUES
	80.80	SURFACE ELEVATION 80.80			
0.0		PAVEMENT STRUCTURE: 100mm asphaltic concrete over 300mm concrete slab over 400mm granular base/subbase	1	AS	
0.80	80.00	FILL: firm to very stiff, brown clayey silt, trace sand, trace gravel, moist	2	SS	6
1.0					
2.0			3	SS	22
			4	SS	9
3.0	77.8	SANDY CLAYEY SILT TILL: hard, grey sandy clayey silt till, moist	5	SS	17
3.8	77.0	thinly laminated shale layers	6	SS	50/8cm
4.0			7	SS	50/5cm
5.0					
6.0	6.1		8	SS	50/2cm
	74.7	Borehole terminated at 6.1m			

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●

ELEVATION SCALE: 80, 79, 78, 77, 76, 75

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing
50 mm Dia. PVC pipe
Bentonite Seal
Filter Sand
El. 77.3
11 29 42 18
Screen

Upon completion, no cave-in, no water

Water Level Readings:

Date	Depth	Elev.
2021-07-26	5.6	75.2
2021-09-27	-	80.8
2021-10-01	3.5	77.3
2021-11-05	-	80.8

NOTES

▼ GROUND WATER LEVEL IN MONITORING WELL

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE/MONITORING WELL NO. BH20

17T; 4824705.2N; 615480.4E

PROJECT Beach St. Pumping Station Diversion — ***PML REF.*** 21TF001A

LOCATION Lakeshore Road East, Mississauga, Ontario — ***BORING DATE*** July 23, 2021 — ***ENGINEER*** M.Z.

BORING METHOD Continuous Flight Hollow Stem Augers — ***TECHNICIAN*** A.H.

DEPTH (metres)	ELEV	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES
		SURFACE ELEVATION 77.80				
0.0		PAVEMENT STRUCTURE: 125mm asphaltic concrete over 300mm concrete slab over 375mm granular base/subbase				
0.80	77.00	FILL: stiff, brown clayey silt, trace sand, trace gravel, moist		1	SS	15
1.5	76.3	SANDY CLAYEY SILT TILL: very stiff to hard, brown to grey sandy clayey silt till, trace gravel, moist		2	SS	20
2.0				3	SS	22
3.0	74.8	thinly laminted shale layers		4	SS	50/10cm
4.0				5	SS	50/10cm
5.0						
6.0				6	SS	50/8cm
7.0						
7.7	70.1	Borehole terminated at 7.7m		7	SS	50/5cm
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						
14.0						
15.0						

ELEVATION SCALE: 77, 76, 75, 74, 73, 72, 71

SHEAR STRENGTH (kPa)
+ FIELD VANE △ TORVANE ○ Qu
▲ POCKET PENETROMETER ○ Q
50 100 150 200

DYNAMIC CONE PENETRATION ×
STANDARD PENETRATION TEST ●
20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30 40

GAS READINGS ppm

GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Flushmount Casing

50 mm Dia. PVC pipe

Bentonite Seal

El. 73.6
Filter Sand

El. 73.2

Screen

7 28 40 25

Upon completion, no cave-in, no water

Water Level Readings:

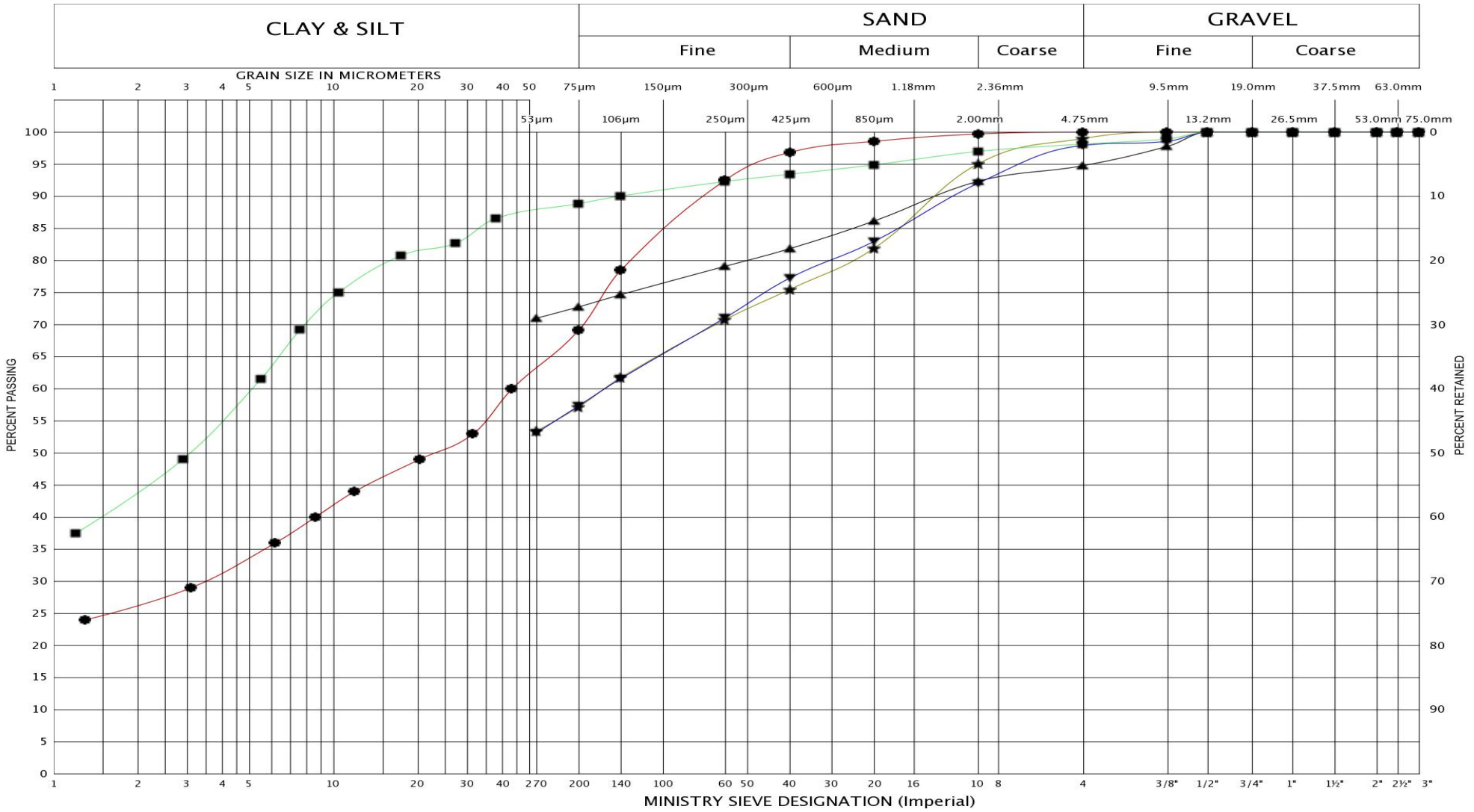
Date	Depth	Elev.
2021-07-26	4.2	73.6
2021-09-27	-	77.8
2021-10-01	4.2	73.6
2021-11-05	-	77.8

NOTES

▽ GROUND WATER STRIKE

▼ GROUND WATER LEVEL IN MONITORING WELL

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	1	3	15	16	17
	SAMPLE	3	3	3	3	3
	SYMBOL	●	■	▲	★	▼

Peto MacCallum Ltd.
CONSULTING ENGINEERS

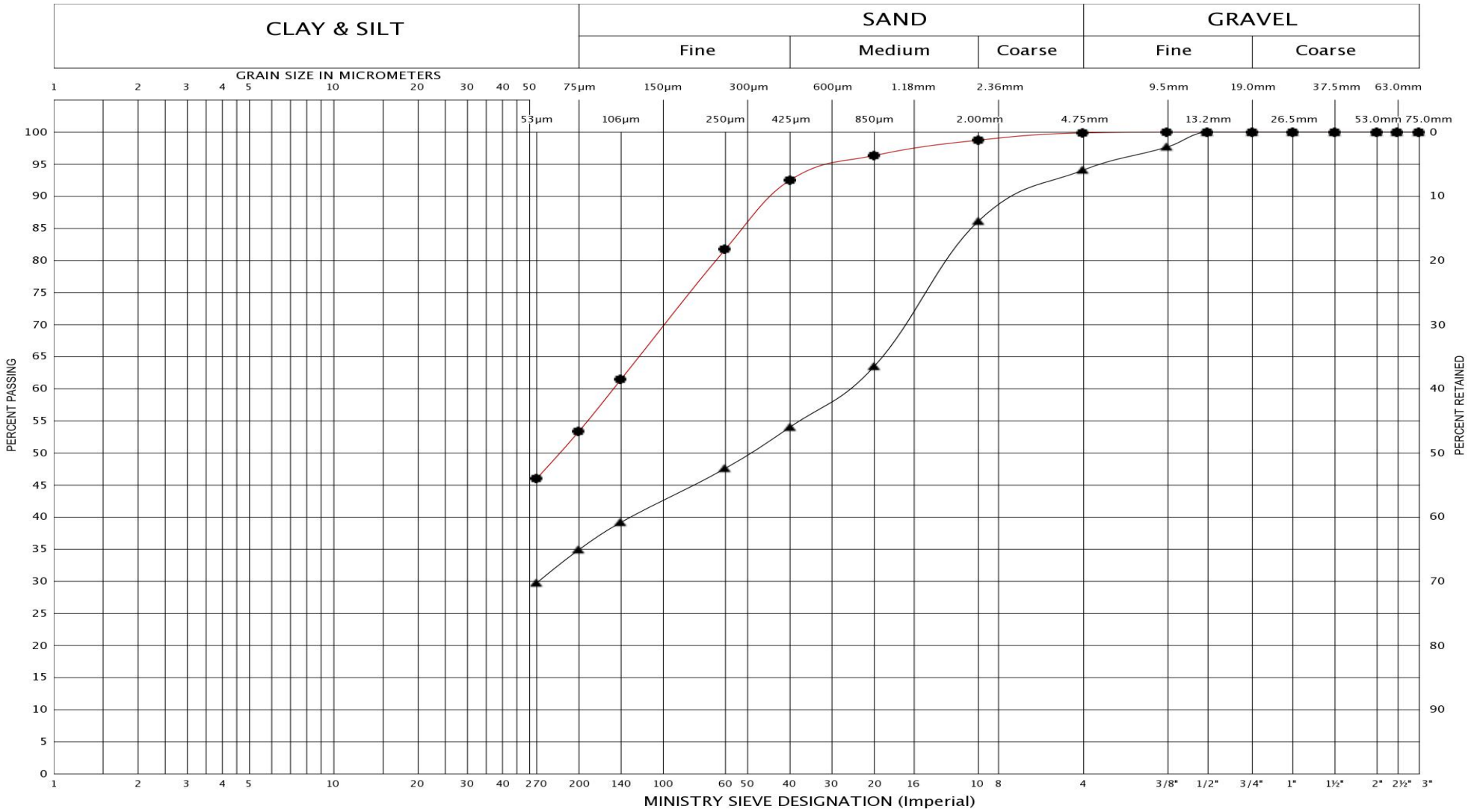
GRAIN SIZE DISTRIBUTION

CLAYEY SILT/SILTY CLAY, trace sand/sandy, trace gravel (Fill)

FIG No.: GS-1

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	12	13
	SAMPLE	6	7
	SYMBOL	●	▲

Peto MacCallum Ltd.
CONSULTING ENGINEERS

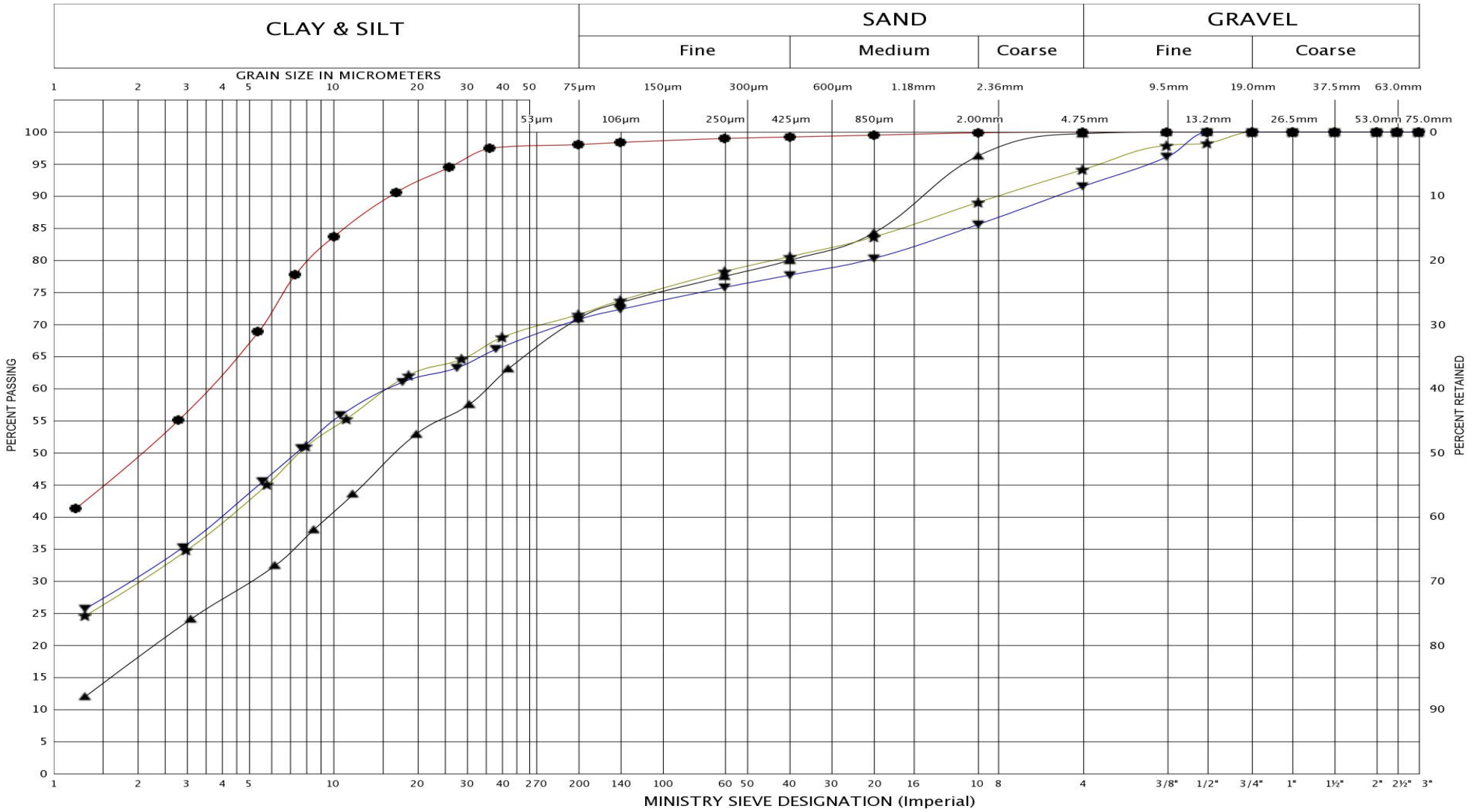
GRAIN SIZE DISTRIBUTION

SANDY SILT/SILTY SAND, trace gravel (Fill)

FIG No.: GS-2

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	4	4	10	16
	SAMPLE	3	4	2	5
	SYMBOL	✱	▼	●	▲

PML Peto MacCallum Ltd. CONSULTING ENGINEERS

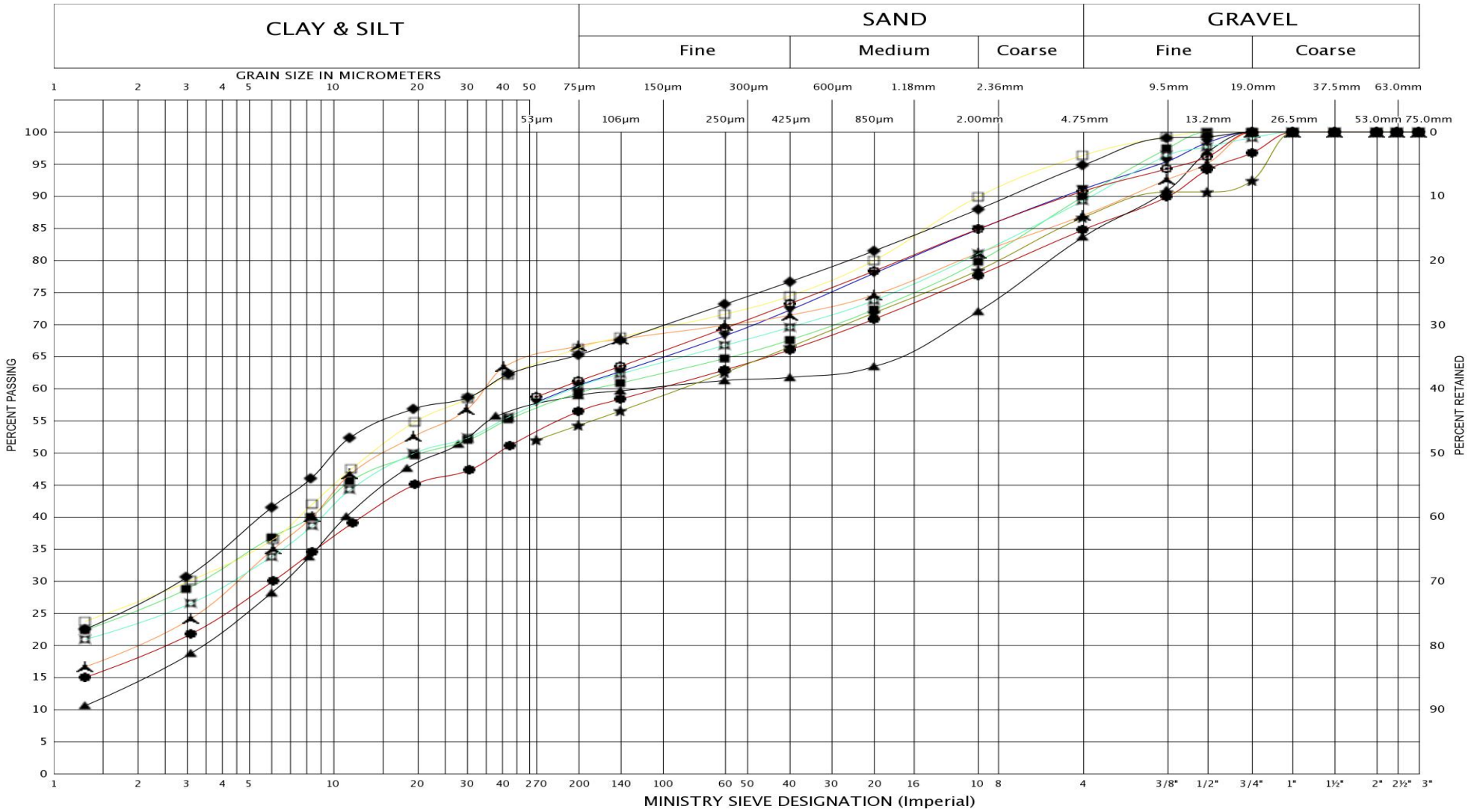
GRAIN SIZE DISTRIBUTION

SILTY CLAY, trace sand/sandy, trace gravel

FIG No.: GS-3

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	1	2	2	3	5	6	6	6	6	7
	SAMPLE	4	4	6	4	11	4	5	6	7	3
	SYMBOL	●	✱	▲	▼	■	⊕	✖	⅄	□	◆

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CONSULTING ENGINEERS

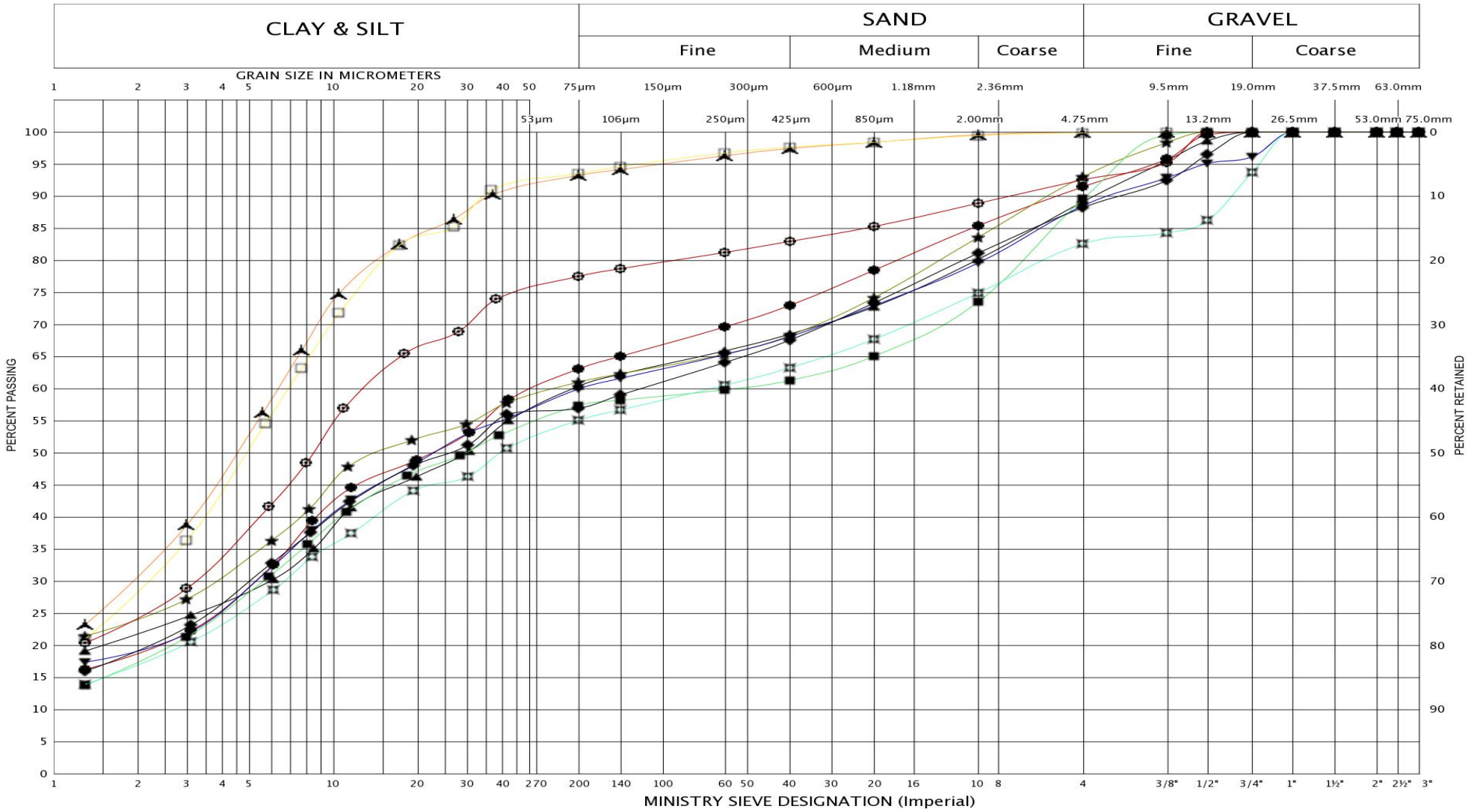
GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: GS-4A

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	7	7	8	8	9	10	10	10	10	11
	SAMPLE	5	7	5	10	5	4	6	7	8	4
	SYMBOL	●	▲	▼	★	■	⊠	⊙	□	⅄	◆

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

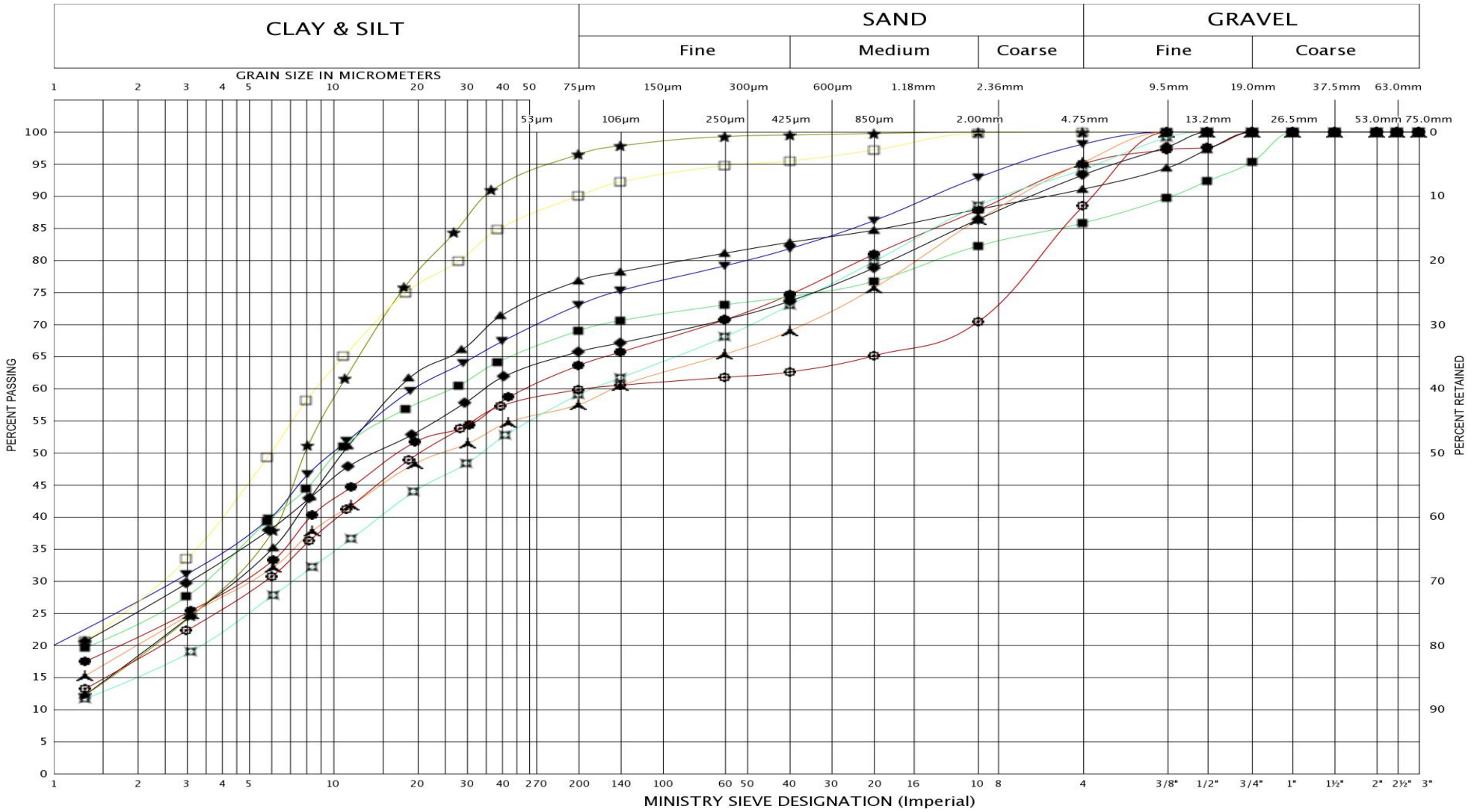
GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: GS-4B

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	11	12	13	14	15	16	17	18	19	20
	SAMPLE	5	9	9	6	4	9	4	5	6	6
	SYMBOL	●	▲	★	▼	■	⅄	□	⊠	⊕	◆

PML Peto MacCallum Ltd. CONSULTING ENGINEERS

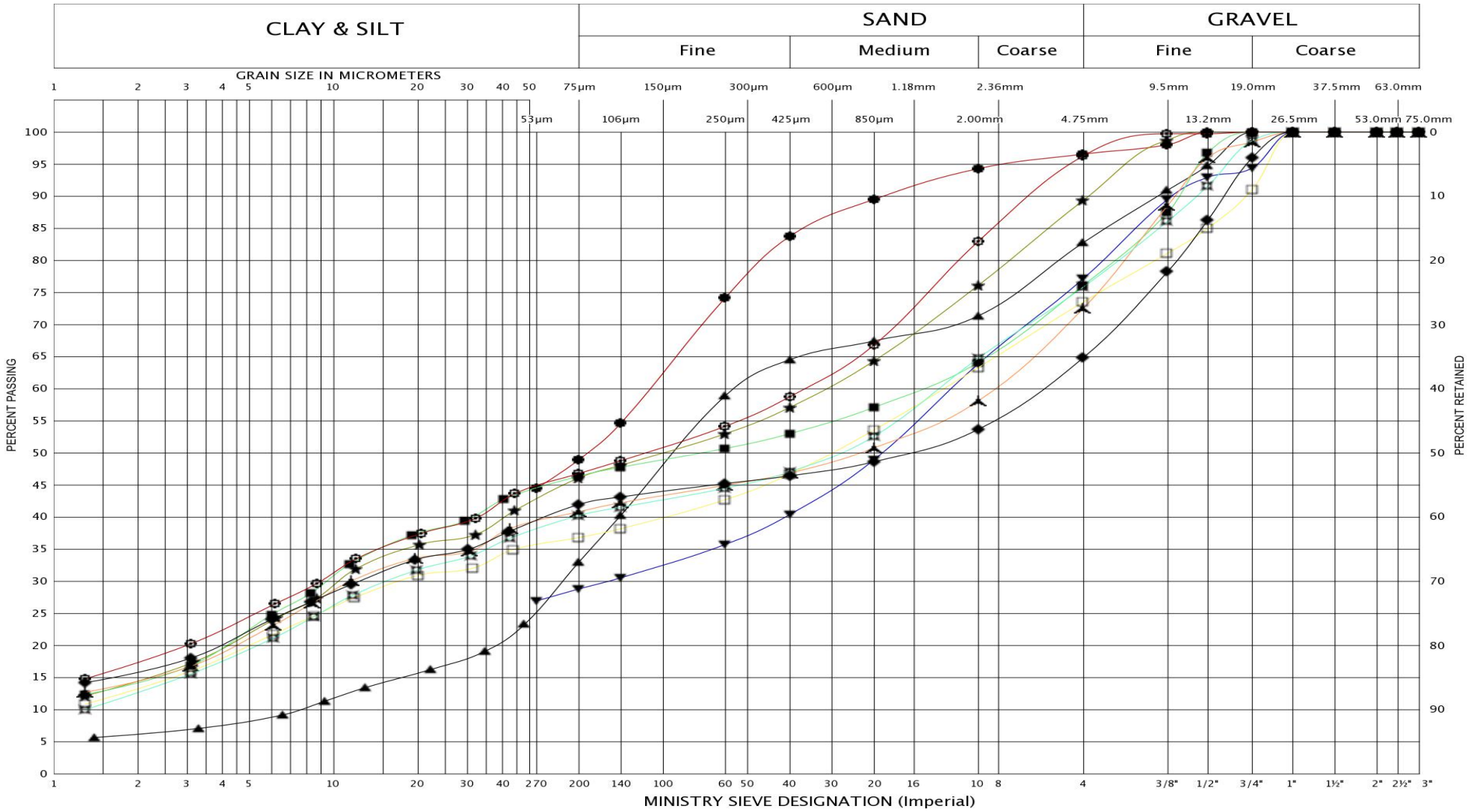
GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: GS-4C

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	1	1	1	1	2	3	3	4	7	8
	SAMPLE	5	6	7	10	7	5	6	5	10	6
	SYMBOL	●	▲	▼	★	■	⅄	□	⊠	⊙	◆

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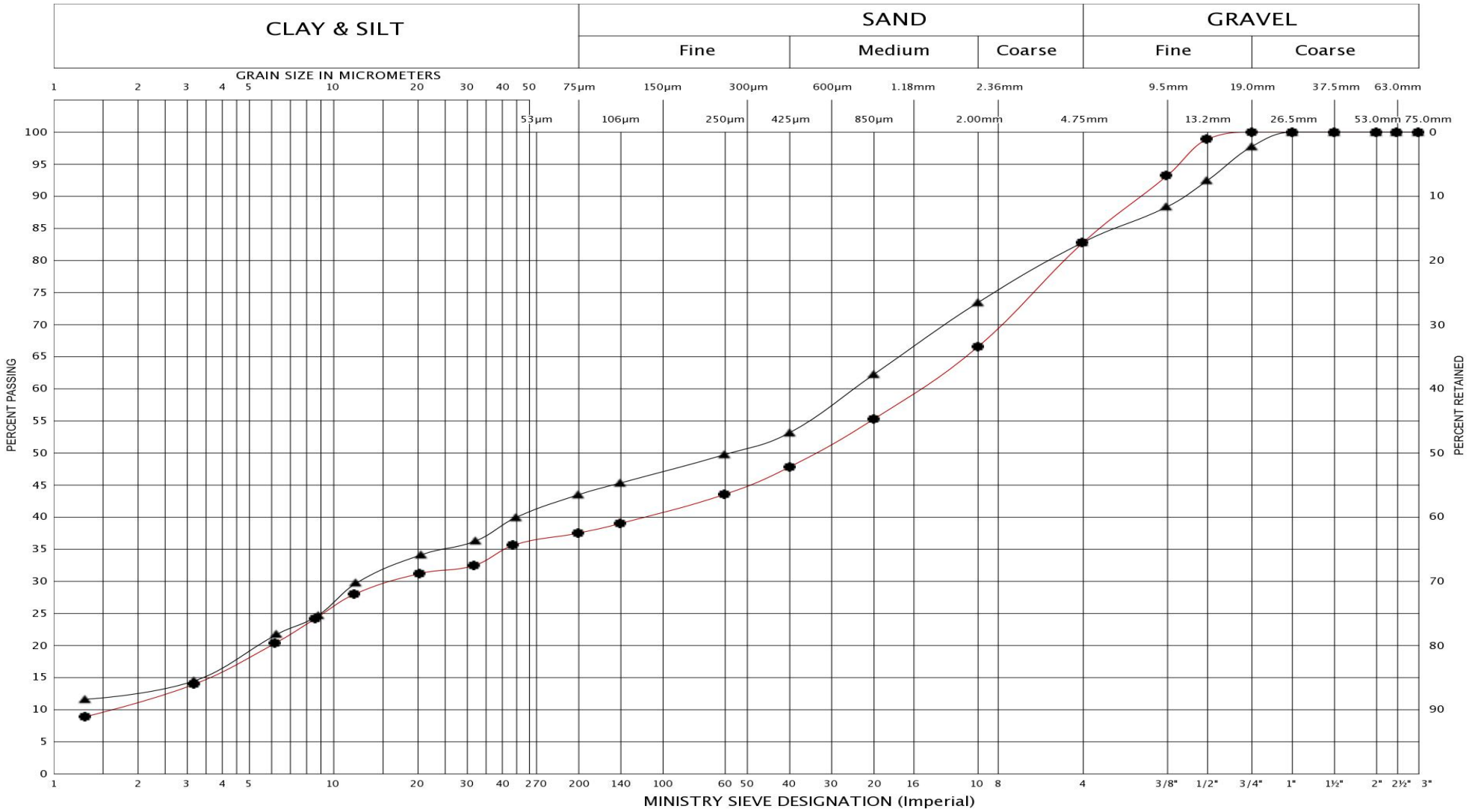
GRAIN SIZE DISTRIBUTION

CLAYEY SAND, trace gravel to gravelly (Till)

FIG No.: GS-5A

Project No.: 21TF001A

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND	BH	9	11
	SAMPLE	4	6
	SYMBOL	▲	●

Peto MacCallum Ltd.
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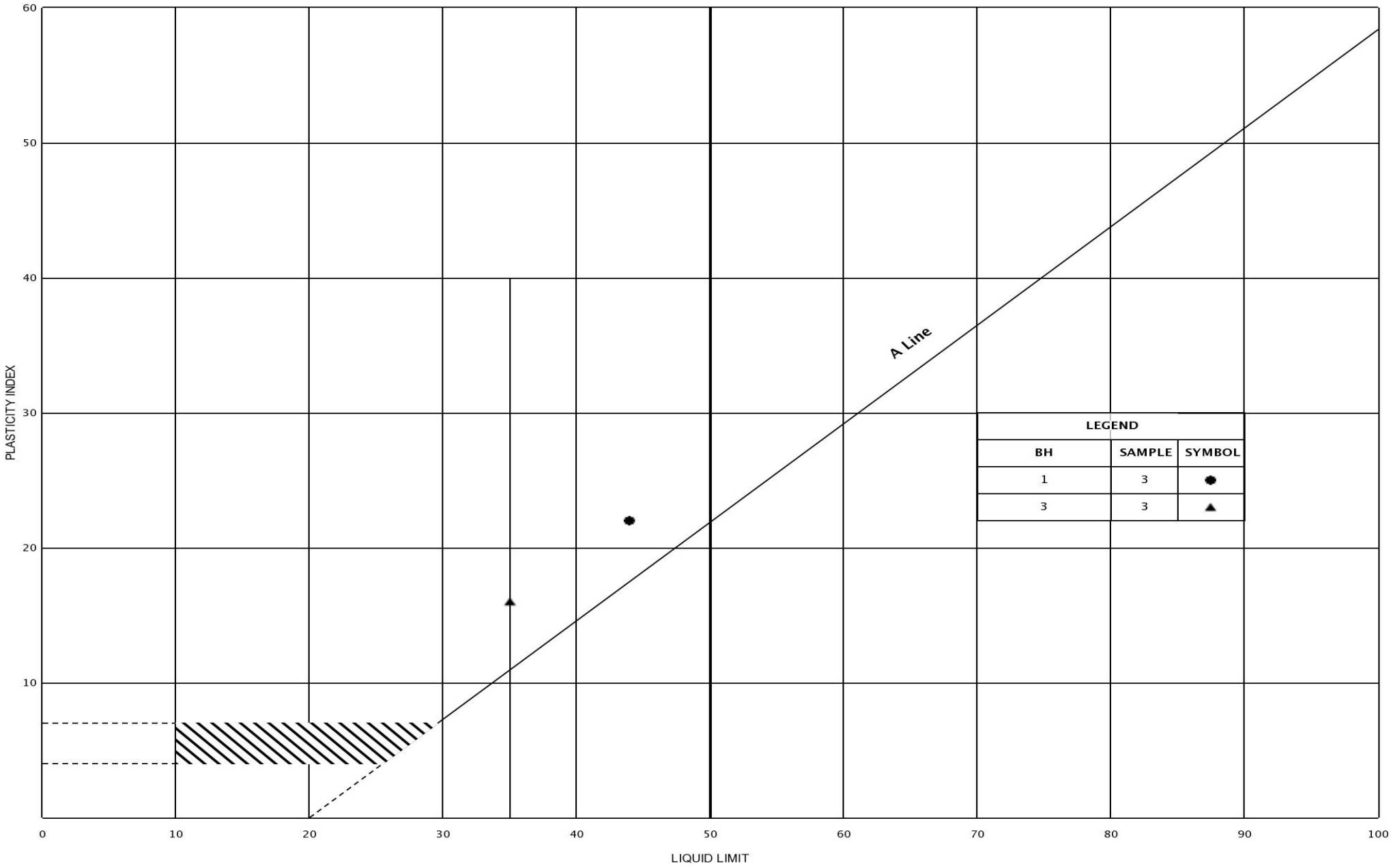
GRAIN SIZE DISTRIBUTION

CLAYEY SAND, trace gravel to gravelly (Till)

FIG No.: GS-5B

Project No.: 21TF001A



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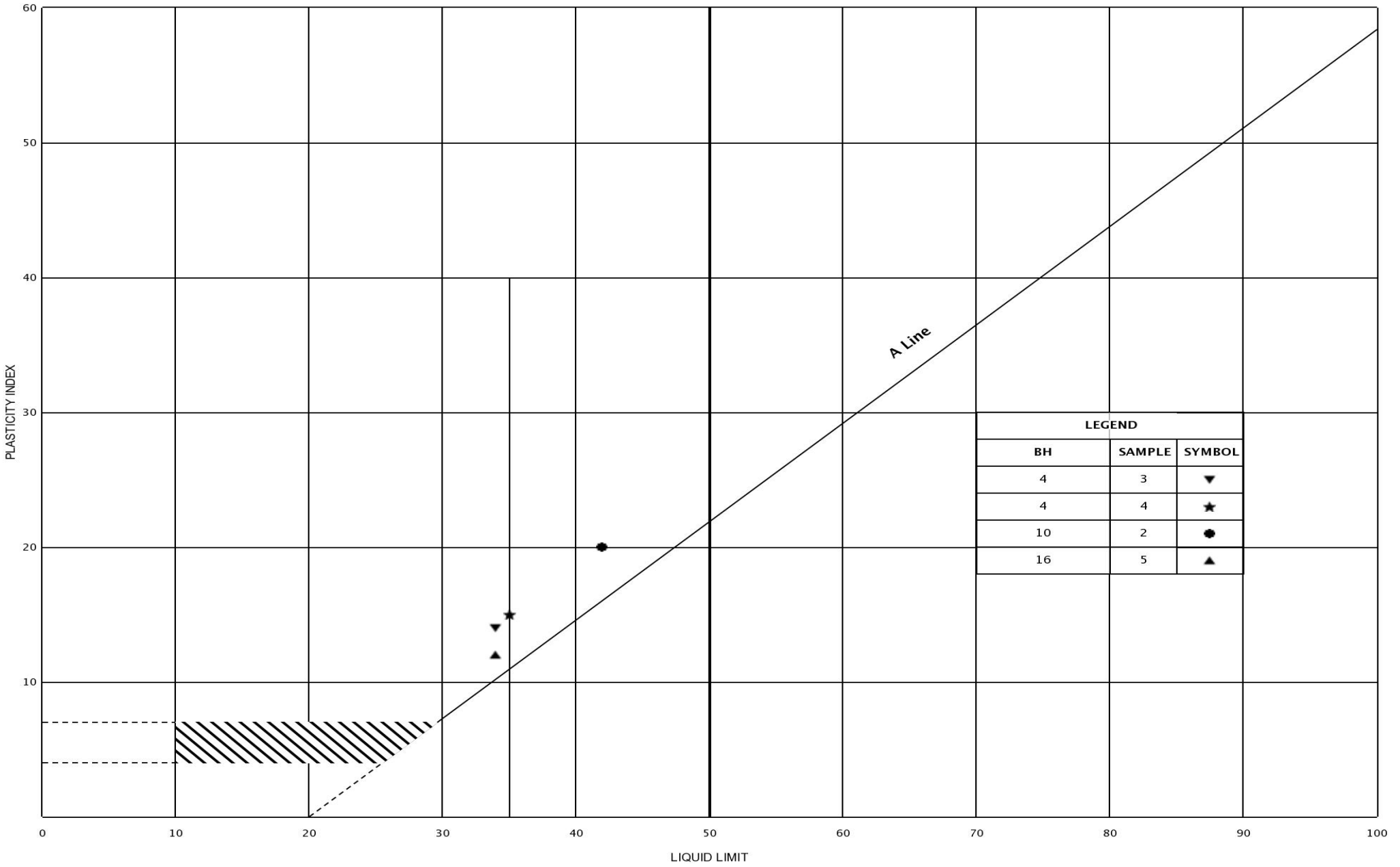
PLASTICITY CHART

CLAYEY SILTSILTY CLAY, trace sandsandy, trace gravel
(Fill)

FIG No.: PC-1

HWY.:

Assg No.



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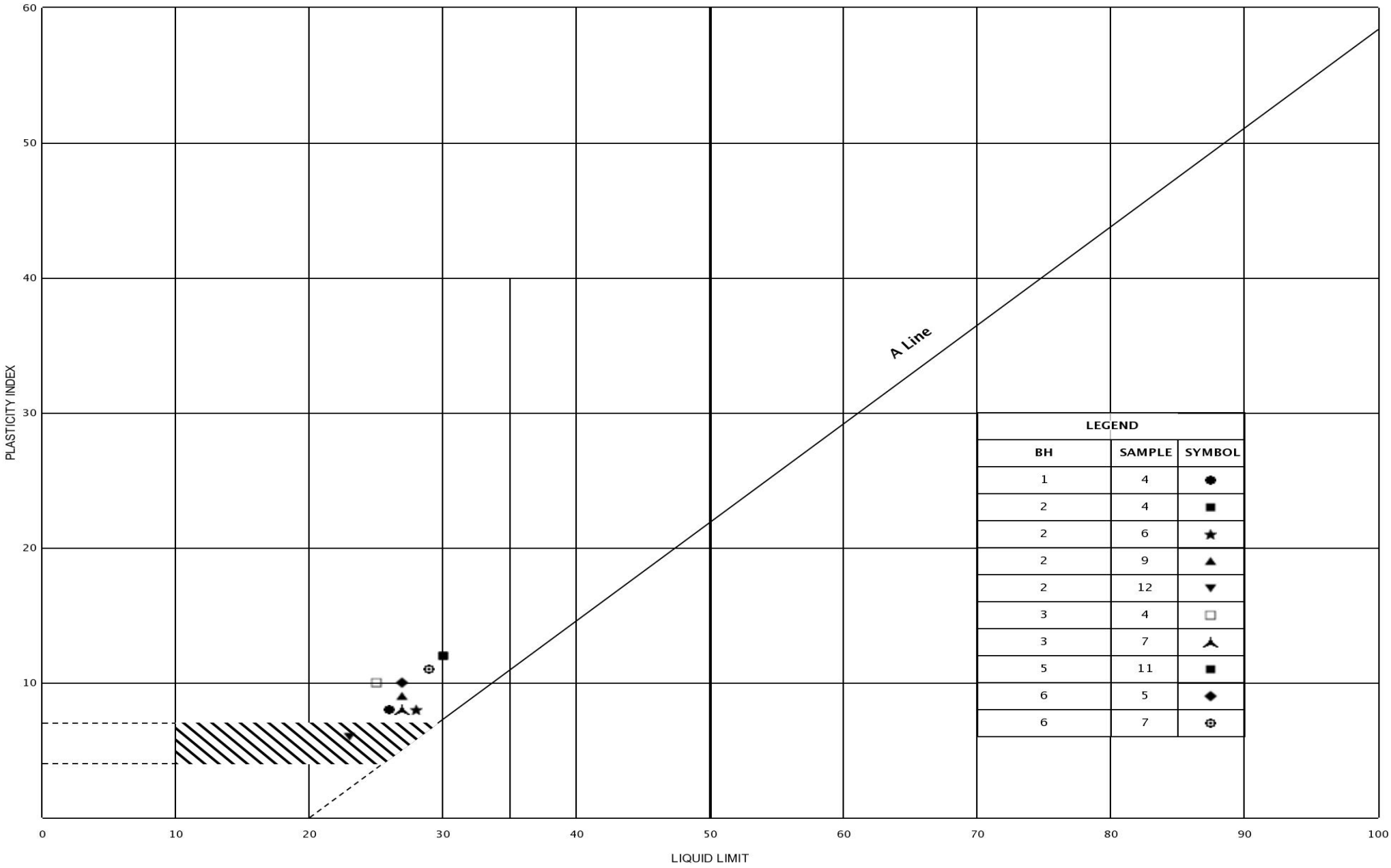
PLASTICITY CHART

SILTY CLAY, trace sand/sandy, trace gravel

FIG No.: PC-2

HWY.:

Assg No.



LEGEND		
BH	SAMPLE	SYMBOL
1	4	●
2	4	■
2	6	★
2	9	▲
2	12	▼
3	4	□
3	7	⅄
5	11	■
6	5	◆
6	7	⊙

PML Peto MacCallum Ltd.
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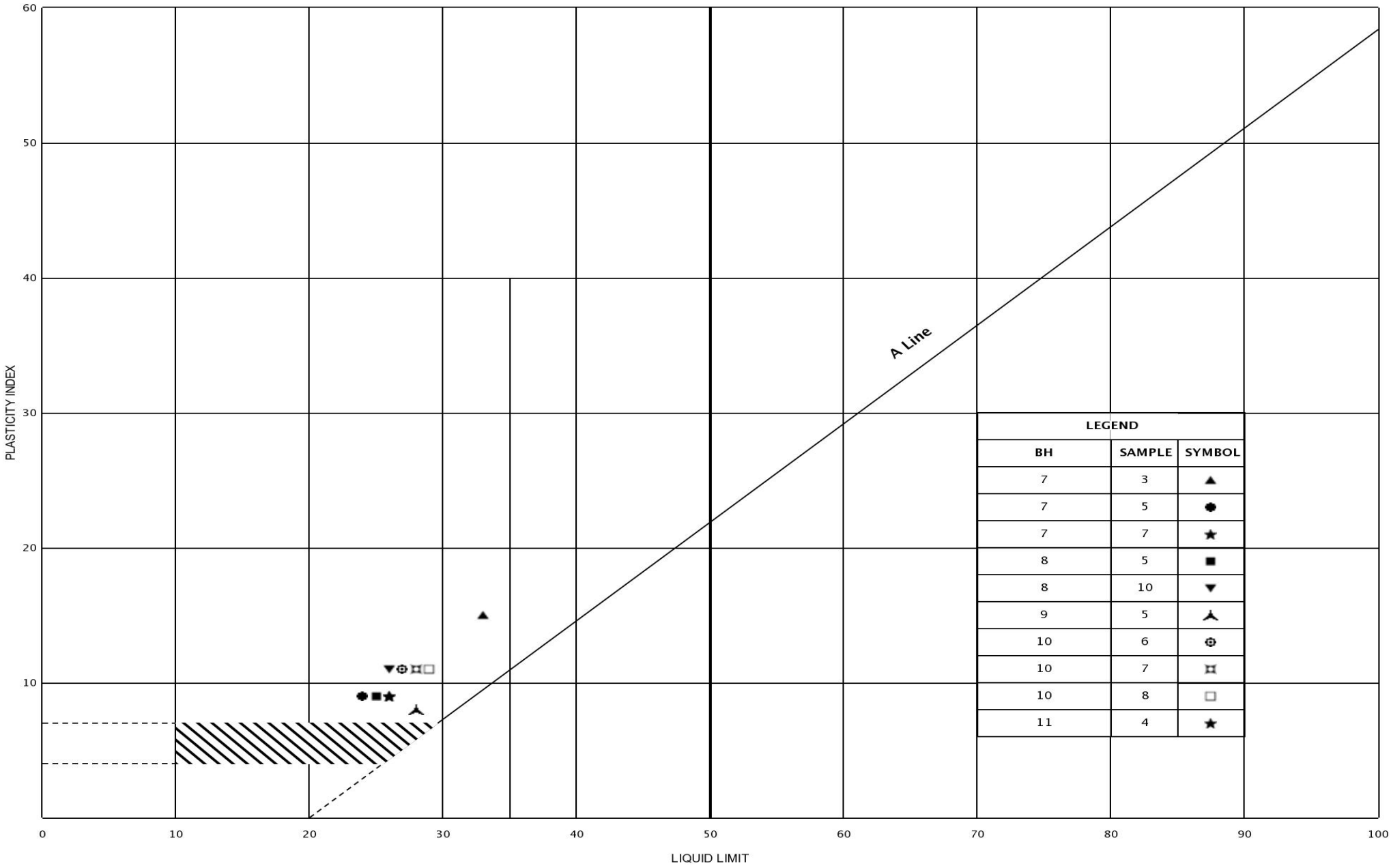
PLASTICITY CHART

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: PC-3A

HWY.:

Assg No.



LEGEND		
BH	SAMPLE	SYMBOL
7	3	▲
7	5	●
7	7	★
8	5	■
8	10	▼
9	5	⅄
10	6	⊕
10	7	⌑
10	8	□
11	4	★

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

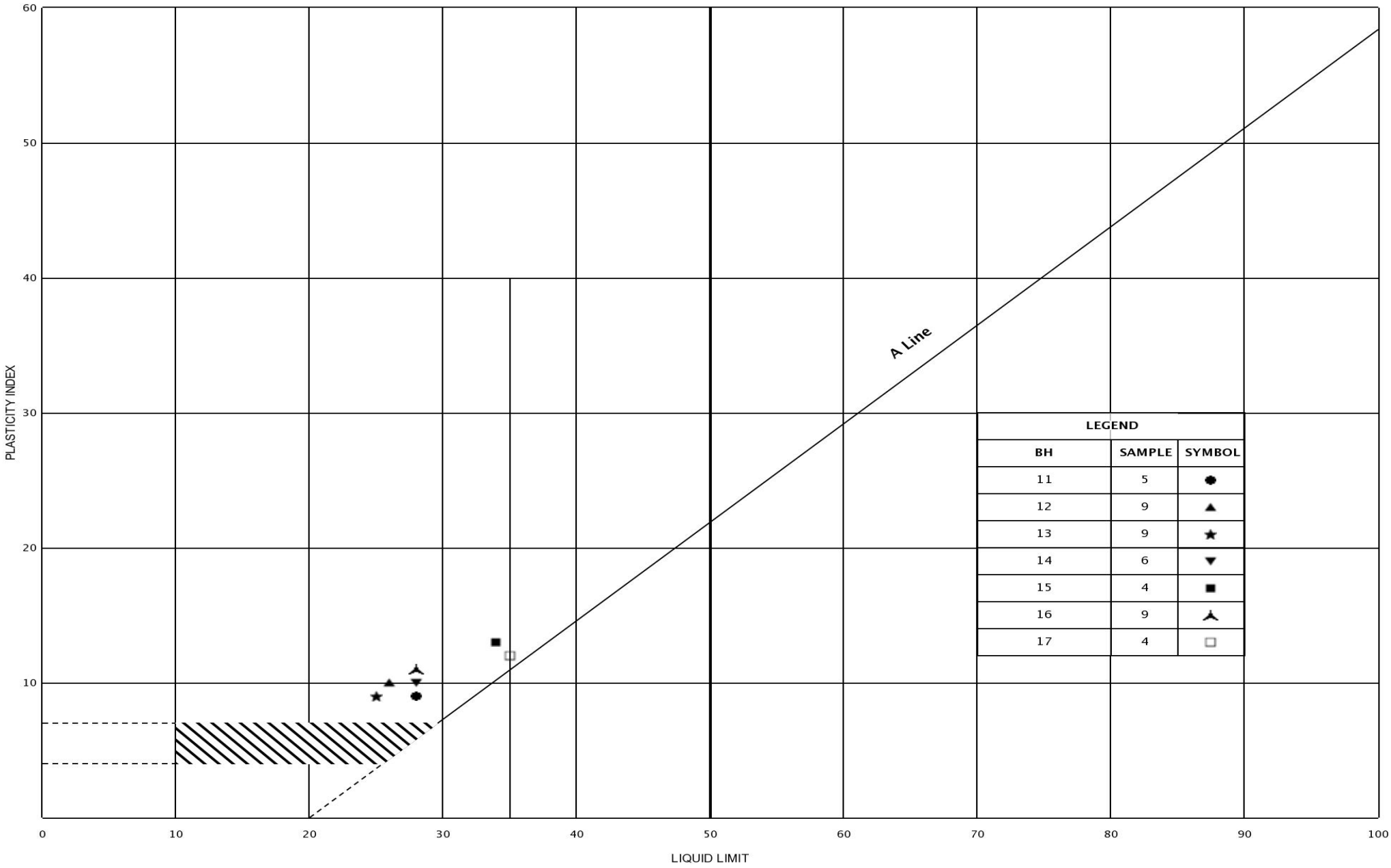
PLASTICITY CHART

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: PC-3B

HWY.:

Assg No.



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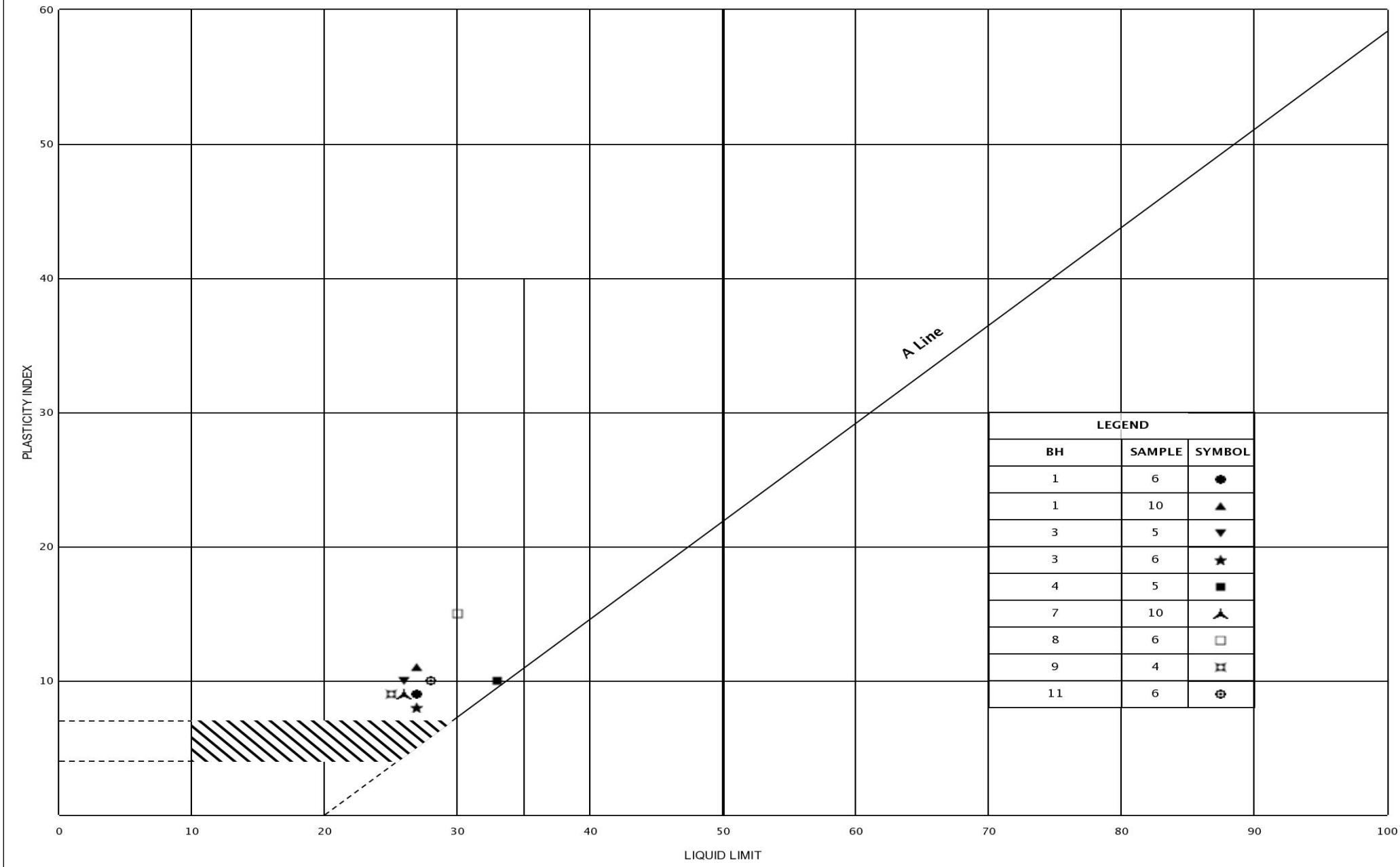
PLASTICITY CHART

CLAYEY SILT, trace sand to sandy, trace to some gravel
(Till)

FIG No.: PC-3C

HWY.:

Assg No.



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PLASTICITY CHART

CLAYEY SAND, trace gravel to gravelly (Till)

FIG No.: PC-4

HWY.:

Assg No.

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MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	Proc - 1
LOCATION	Mississauga, Ontario	*ENCLOSURE*	

SAMPLE TYPE	Brown Sandy Silt, with some Clay and Gravel	*SAMPLE NO*	2103595
SOURCE	Onsite Native	*DATE SAMPLED*	June 09, 2021
SAMPLED FROM	Auger Cut, BH3, Depth from 7.5 to 12.5 ft	*SAMPLED BY*	Akbar Hossain
DATE TESTED	June 21, 2021	*DATE RECEIVED*	June 18, 2021

PROCTOR TEST RESULTS

TEST METHOD	*ASTM D698 METHOD*	☑ A ☐ B ☐ C
	ASTM D1557 METHOD	☐ A ☐ B ☐ C
	MTO LS-706 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	AIRPORT	☐
MATERIAL RETAINED ON 4.75 mm SIEVE (%)		15.9
MATERIAL RETAINED ON 9.5 mm SIEVE (%)		
MATERIAL RETAINED ON 19 mm SIEVE (%)		
MATERIAL RETAINED ON 26.5 mm SIEVE (%)		
MOISTURE CONTENT, AS RECEIVED (%)		6.2
MAXIMUM DRY DENSITY (kg/m³)		2035
OPTIMUM MOISTURE CONTENT(%)		11.5
CORRECTED MAXIMUM DRY DENSITY (kg/m³)		2117
CORRECTED OPTIMUM MOISTURE CONTENT (%)		10.1

REMARKS Corrected Max. Dry Density=2117Kg/m3 at 10.1% Moisture

REVIEWED BY: Jalil Al Noor, B.Sc.

DATE ISSUED: June 24, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

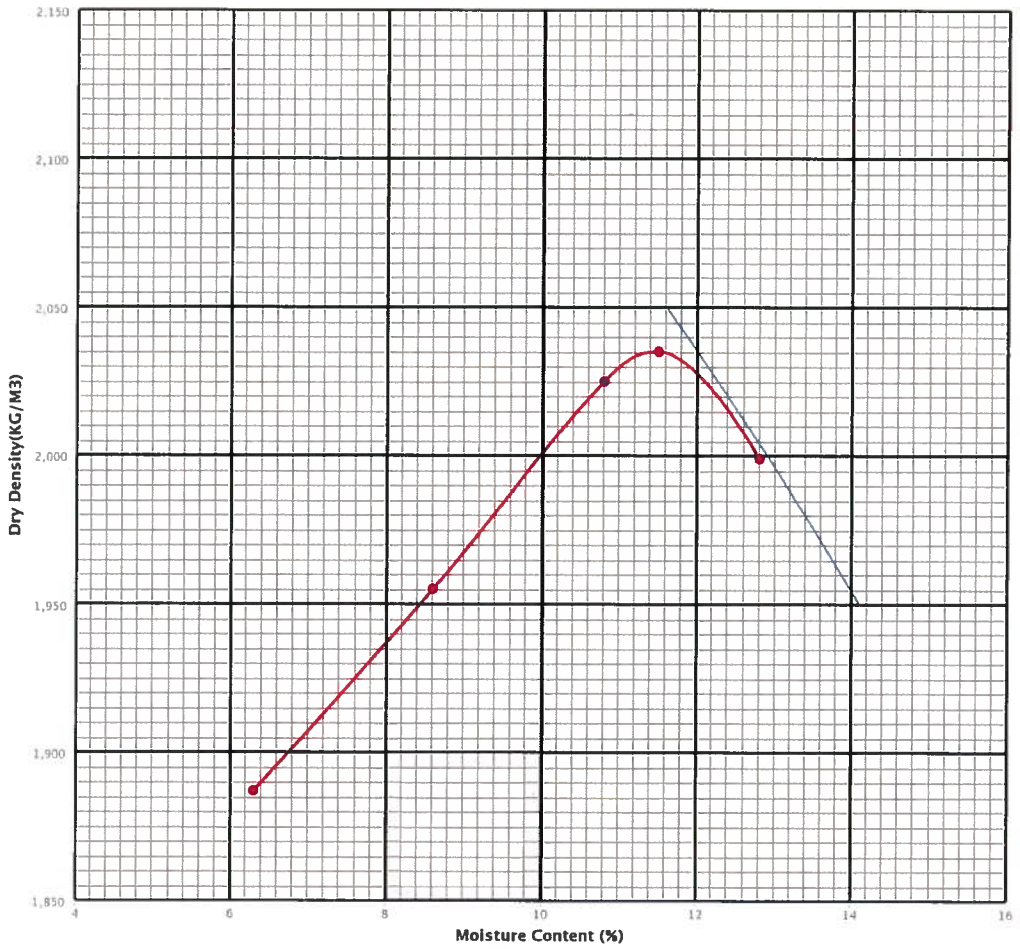
MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	Proc - 1
LOCATION	Mississauga, Ontario	*ENCLOSURE*	

SAMPLE TYPE	Brown Sandy Silt, with some Clay and Gravel	*SAMPLE NO*	2103595
SOURCE	Onsite Native	*DATE SAMPLED*	June 09, 2021
SAMPLED FROM	Auger Cut, BH3, Depth from 7.5 to 12.5 ft	*SAMPLED BY*	Akbar Hossain
DATE TESTED	June 21, 2021	*DATE RECEIVED*	June 18, 2021

MOISTURE CONTENT AS RECEIVED	6.2	*ASTM D698 METHOD*	☑ A ☐ B ☐ C
MAX.DRY DENSITY (kg/m³)	2035	*ASTM D1557 METHOD*	☐ A ☐ B ☐ C
OPTIMUM MOISTURE (%)	11.5	*MTO LS-706 PROCEDURE*	☐ 1 ☐ 2 ☐ 3
		MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
		AIRPORT	☐

REMARKS: Corrected Max. Dry Density=2117Kg/m3 at 10.1% Moisture



Peto MacCallum Ltd.
CONSULTING ENGINEERS

MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	REPORT NO	Proc - 2
LOCATION	Mississauga, Ontario	ENCLOSURE	

SAMPLE TYPE	Brown Sandy Silt, trace of Gravel	SAMPLE NO	2103620
SOURCE	On site	DATE SAMPLED	June 14, 2021
SAMPLED FROM	BH7, 10'-12'	SAMPLED BY	Almustafa
DATE TESTED	June 23, 2021	DATE RECEIVED	June 21, 2021

PROCTOR TEST RESULTS		
TEST METHOD	ASTM D698 METHOD	☑ A ☐ B ☐ C
	ASTM D1557 METHOD	☐ A ☐ B ☐ C
	MTO LS-706 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	AIRPORT	☐
MATERIAL RETAINED ON 4.75 mm SIEVE (%)		5.8
MATERIAL RETAINED ON 9.5 mm SIEVE (%)		
MATERIAL RETAINED ON 19 mm SIEVE (%)		
MATERIAL RETAINED ON 26.5 mm SIEVE (%)		
MOISTURE CONTENT, AS RECEIVED (%)		8.3
MAXIMUM DRY DENSITY (kg/m³)		2005
OPTIMUM MOISTURE CONTENT(%)		12.0
CORRECTED MAXIMUM DRY DENSITY (kg/m³)		2035
CORRECTED OPTIMUM MOISTURE CONTENT (%)		11.5

REMARKS Corrected Max. Dry Density=1035Kg/m3 at 11.5% Moisture

REVIEWED BY: Jalil A. Noor, B.Sc.

DATE ISSUED: June 25, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

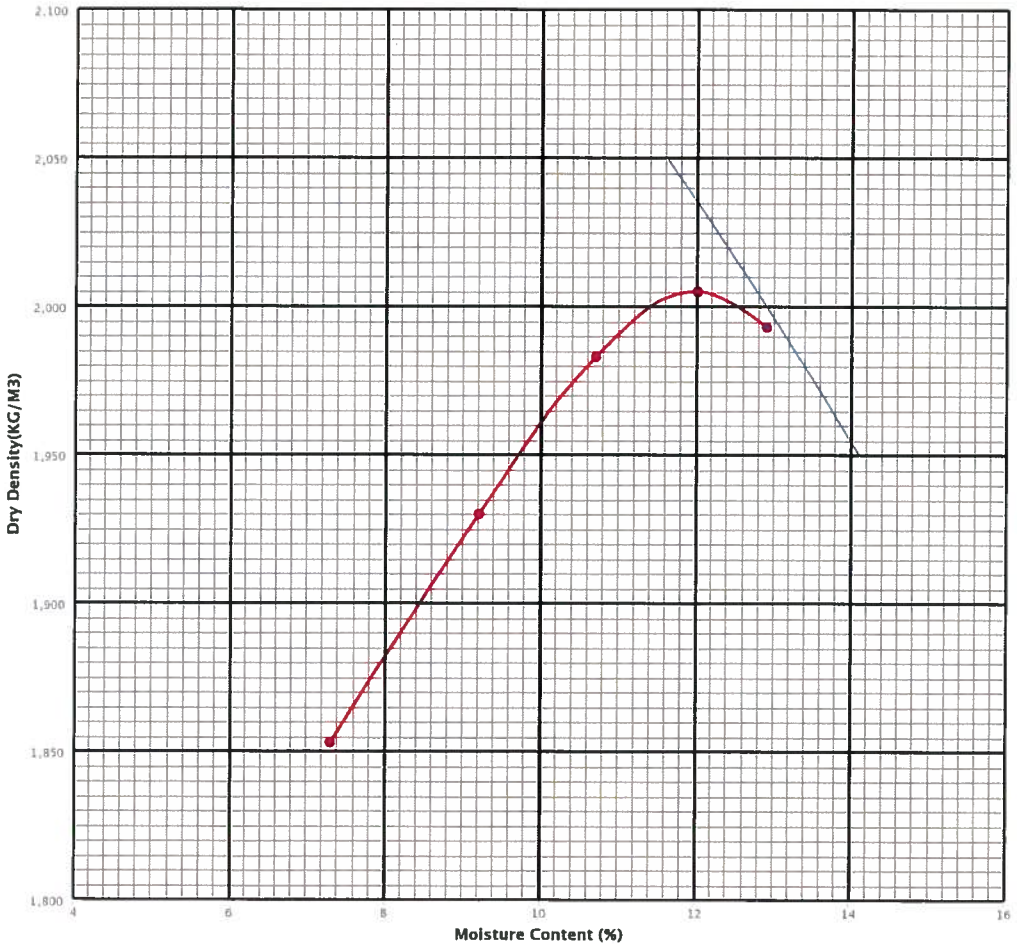
MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	Proc - 2
LOCATION	Mississauga, Ontario	*ENCLOSURE*	

SAMPLE TYPE	Brown Sandy Silt, trace of Gravel	*SAMPLE NO*	2103620
SOURCE	On site	*DATE SAMPLED*	June 14, 2021
SAMPLED FROM	BH7, 10'-12'	*SAMPLED BY*	Almustafa
DATE TESTED	June 23, 2021	*DATE RECEIVED*	June 21, 2021

MOISTURE CONTENT AS RECEIVED	8.3	*ASTM D698 METHOD*	☑ A ☐ B ☐ C
MAX.DRY DENSITY (kg/m³)	2005	*ASTM D1557 METHOD*	☐ A ☐ B ☐ C
OPTIMUM MOISTURE (%)	12.0	*MTO LS-706 PROCEDURE*	☐ 1 ☐ 2 ☐ 3
		MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
		AIRPORT	☐

REMARKS: Corrected Max. Dry Density=1035Kg/m3 at 11.5% Moisture



Peto MacCallum Ltd.
CONSULTING ENGINEERS

MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	REPORT NO	Proc - 3
LOCATION	Mississauga, Ontario	ENCLOSURE	

SAMPLE TYPE	Brown Clayey Silt, trace of Sand and Gravel	SAMPLE NO	2103613
SOURCE	On Site Material	DATE SAMPLED	June 14, 2021
SAMPLED FROM	BH8 10'-12'	SAMPLED BY	Akbar/Almustafa
DATE TESTED	June 23, 2021	DATE RECEIVED	June 21, 2021

PROCTOR TEST RESULTS		
TEST METHOD	ASTM D698 METHOD	☑ A ☐ B ☐ C
	ASTM D1557 METHOD	☐ A ☐ B ☐ C
	MTO LS-706 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	AIRPORT	☐
MATERIAL RETAINED ON 4.75 mm SIEVE (%)		10.3
MATERIAL RETAINED ON 9.5 mm SIEVE (%)		
MATERIAL RETAINED ON 19 mm SIEVE (%)		
MATERIAL RETAINED ON 26.5 mm SIEVE (%)		
MOISTURE CONTENT, AS RECEIVED (%)		10.8
MAXIMUM DRY DENSITY (kg/m³)		1910
OPTIMUM MOISTURE CONTENT(%)		14.1
CORRECTED MAXIMUM DRY DENSITY (kg/m³)		1969
CORRECTED OPTIMUM MOISTURE CONTENT (%)		13.0

REMARKS Corrected Max. Dry Density=1969Kg/m3 at 13.0% Moisture

REVIEWED BY: Jalil A. Noor, B.Sc.

DATE ISSUED: June 28, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	Proc - 3
LOCATION	Mississauga, Ontario	*ENCLOSURE*	

SAMPLE TYPE	Brown Clayey Silt, trace of Sand and Gravel	*SAMPLE NO*	2103613
SOURCE	On Site Material	*DATE SAMPLED*	June 14, 2021
SAMPLED FROM	BH8 10'-12'	*SAMPLED BY*	Akbar/Almustafa
DATE TESTED	June 23, 2021	*DATE RECEIVED*	June 21, 2021

MOISTURE CONTENT AS RECEIVED	10.8	*ASTM D698 METHOD*	☑ A ☐ B ☐ C
MAX.DRY DENSITY (kg/m³)	1910	*ASTM D1557 METHOD*	☐ A ☐ B ☐ C
OPTIMUM MOISTURE (%)	14.1	*MTO LS-706 PROCEDURE*	☐ 1 ☐ 2 ☐ 3
		MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
		AIRPORT	☐

REMARKS: Corrected Max. Dry Density=1969Kg/m3 at 13.0% Moisture

Peto MacCallum Ltd.
CONSULTING ENGINEERS

MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	Proc - 4
LOCATION	Mississauga, Ontario	*ENCLOSURE*	

SAMPLE TYPE	Brown Sandy Silty, trace of Clay and Gravel	*SAMPLE NO*	2103627
SOURCE	On Site Material	*DATE SAMPLED*	June 10, 2021
SAMPLED FROM	BH9, 12.5'-14.5'	*SAMPLED BY*	Almustafa
DATE TESTED	June 23, 2021	*DATE RECEIVED*	June 21, 2021

PROCTOR TEST RESULTS

TEST METHOD	*ASTM D698 METHOD*	☑ A ☐ B ☐ C
	ASTM D1557 METHOD	☐ A ☐ B ☐ C
	MTO LS-706 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	AIRPORT	☐
MATERIAL RETAINED ON 4.75 mm SIEVE (%)		6.4
MATERIAL RETAINED ON 9.5 mm SIEVE (%)		
MATERIAL RETAINED ON 19 mm SIEVE (%)		
MATERIAL RETAINED ON 26.5 mm SIEVE (%)		
MOISTURE CONTENT, AS RECEIVED (%)		5.9
MAXIMUM DRY DENSITY (kg/m³)		1980
OPTIMUM MOISTURE CONTENT(%)		12.5
CORRECTED MAXIMUM DRY DENSITY (kg/m³)		2014
CORRECTED OPTIMUM MOISTURE CONTENT (%)		11.9

REMARKS Corrected Max. Dry Density=2014Kg/m3 at 11.9% Moisture

REVIEWED BY: Jalil A. Noor, B.Sc.

DATE ISSUED: June 25, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

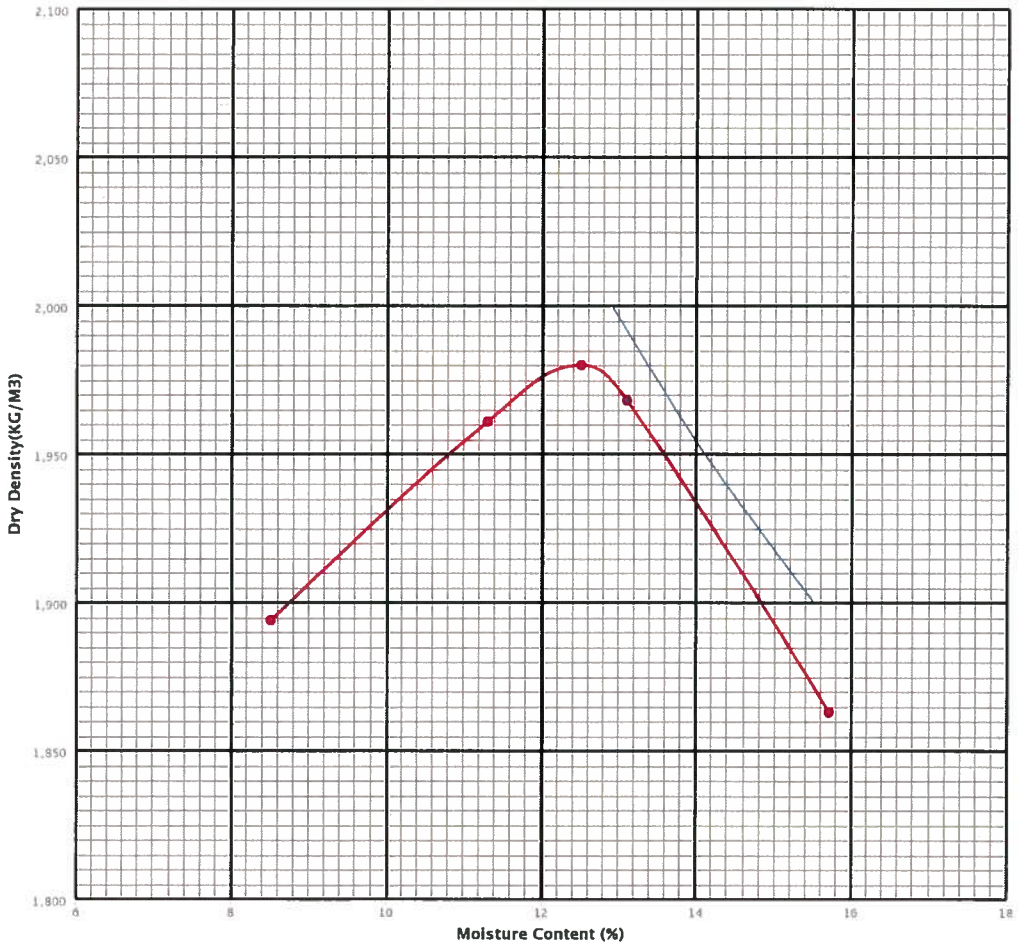
MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	Proc - 4
LOCATION	Mississauga, Ontario	*ENCLOSURE*	

SAMPLE TYPE	Brown Sandy Silty, trace of Clay and Gravel	*SAMPLE NO*	2103627
SOURCE	On Site Material	*DATE SAMPLED*	June 10, 2021
SAMPLED FROM	BH9, 12.5'-14.5'	*SAMPLED BY*	Almustafa
DATE TESTED	June 23, 2021	*DATE RECEIVED*	June 21, 2021

MOISTURE CONTENT AS RECEIVED	5.9	*ASTM D698 METHOD*	☑ A ☐ B ☐ C
MAX.DRY DENSITY (kg/m³)	1980	*ASTM D1557 METHOD*	☐ A ☐ B ☐ C
OPTIMUM MOISTURE (%)	12.5	*MTO LS-706 PROCEDURE*	☐ 1 ☐ 2 ☐ 3
		MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
		AIRPORT	☐

REMARKS: Corrected Max. Dry Density=2014Kg/m3 at 11.9% Moisture



Peto MacCallum Ltd.
CONSULTING ENGINEERS

MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	REPORT NO	Proc - 5
LOCATION	Mississauga, Ontario	ENCLOSURE	

SAMPLE TYPE	Brown Sandy Silty, trace of Gravel	SAMPLE NO	2103658
SOURCE	On Site Material	DATE SAMPLED	June 16, 2021
SAMPLED FROM	BH11, 12.5'-15.0'	SAMPLED BY	Almustafa
DATE TESTED	June 23, 2021	DATE RECEIVED	June 22, 2021

PROCTOR TEST RESULTS		
TEST METHOD	ASTM D698 METHOD	☑ A ☐ B ☐ C
	ASTM D1557 METHOD	☐ A ☐ B ☐ C
	MTO LS-706 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
	AIRPORT	☐
MATERIAL RETAINED ON 4.75 mm SIEVE (%)		5.4
MATERIAL RETAINED ON 9.5 mm SIEVE (%)		
MATERIAL RETAINED ON 19 mm SIEVE (%)		
MATERIAL RETAINED ON 26.5 mm SIEVE (%)		
MOISTURE CONTENT, AS RECEIVED (%)		6.4
MAXIMUM DRY DENSITY (kg/m³)		2035
OPTIMUM MOISTURE CONTENT(%)		11.4
CORRECTED MAXIMUM DRY DENSITY (kg/m³)		2062
CORRECTED OPTIMUM MOISTURE CONTENT (%)		10.9

REMARKS Corrected Max. Dry Density=1062Kg/m3 at 10.9% Moisture

REVIEWED BY: Jalil A. Noor B.Sc.

DATE ISSUED: June 25, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

MOISTURE DENSITY RELATIONSHIP TEST REPORT

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	Proc - 5
LOCATION	Mississauga, Ontario	*ENCLOSURE*	

SAMPLE TYPE	Brown Sandy Silty, trace of Gravel	*SAMPLE NO*	2103658
SOURCE	On Site Material	*DATE SAMPLED*	June 16, 2021
SAMPLED FROM	BH11, 12.5'-15.0'	*SAMPLED BY*	Almustafa
DATE TESTED	June 23, 2021	*DATE RECEIVED*	June 22, 2021

MOISTURE CONTENT AS RECEIVED	6.4	*ASTM D698 METHOD*	☑ A ☐ B ☐ C
MAX.DRY DENSITY (kg/m³)	2035	*ASTM D1557 METHOD*	☐ A ☐ B ☐ C
OPTIMUM MOISTURE (%)	11.4	*MTO LS-706 PROCEDURE*	☐ 1 ☐ 2 ☐ 3
		MTO LS-707 PROCEDURE	☐ 1 ☐ 2 ☐ 3
		AIRPORT	☐

REMARKS: Corrected Max. Dry Density=1062Kg/m3 at 10.9% Moisture

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103623 B.bhl\[B.xlsx]Report
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-06
Approved by: G. Uwimana Date: 2021-07-06

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details		**Specimen 1**
Borehole		4
Sample Number		AS7
Depth	ft	15-17
Sample Date		
Lab Ref		2103623 B
Technician Name		L. Gowry/ Azar/ JG/ NK

Soil Description & Classification

Silty Clay , some Sand and Gravel		
Specific Gravity of Solids		2.700
Liquid Limit	%	29
Plastic Limit	%	11
Plasticity Index	%	0

Additional Notes (unusual conditions or other information necessary to interpret the test results):

Specimen was reconstituted at received moisture content.

Departures from the test procedure outlined in ASTM D4767-11:

Grain Size Distribution

Gravel, retained on No. 4 Sieve	%	10.7
Coarse Sand, retained on No. 10 Sieve	%	14.8
Medium Sand, retained on No. 40 Sieve	%	6.5
Fine Sand, retained on No. 200 Sieve	%	1.3
Silt, 0.074 to 0.005 mm	%	2.0
Clay, smaller than 0.005 mm	%	25.0
Colloids, smaller than 0.001 mm	%	12.0

Initial Specimen Conditions

Height	mm	109.58
Diameter	mm	51.16
Dry Unit Weight	Mg/m^3	2.048
Void Ratio		0.32
Water Content	%	11.56
Degree of Saturation	%	97.5
Method used for obtaining water content		Cutting

Membrane Properties

Young's Modulus	kPa	1400
Thickness	mm	0.530

Filter-Paper Strip Properties

Load carried per unit length	kN/mm	0.00019
Specimen perimeter covered by strips	mm	78.9

Peto MacCallum Ltd.

CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details		Specimen 1
Borehole		4
Sample No.		AS7
Depth	ft	15-17
Sample Date		
Lab Ref		2103623 B
Technician Name		L. Gowry/ Azar/ JG/ NK

Test Setup

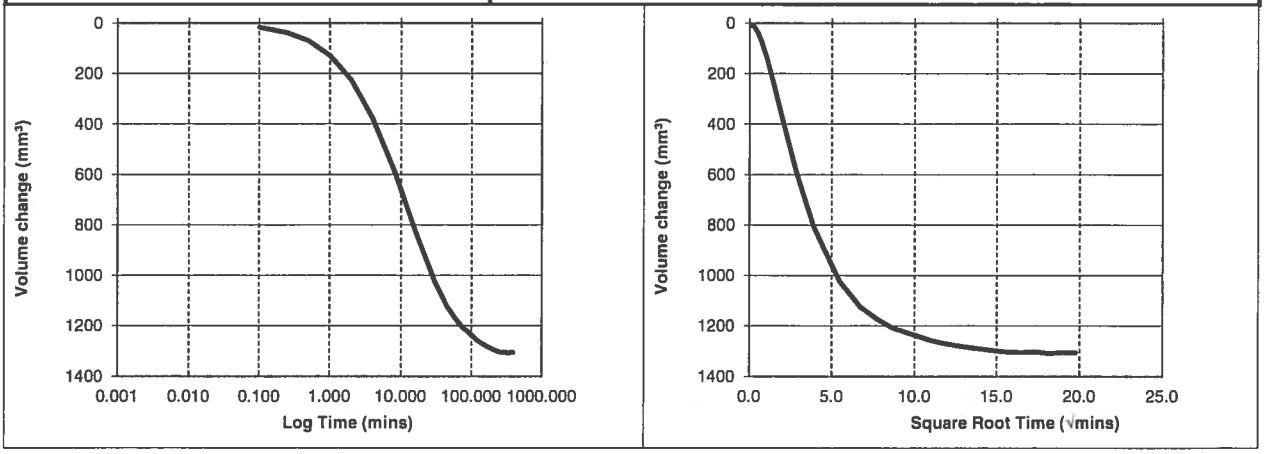
Date Started	2021-06-21
Date Finished	2021-06-30
Top Drain Used	Y
Base Drain Used	Y
Side Drains Used (Filter-Paper Strips)	Y
Pressure System Number	1
Cell Number	3

Measurement of Pore Pressure Parameter

Cell Pressure Increment	kPa	35.0
Cell Pressure at B determination	kPa	335.0
Back Pressure at B determination	kPa	290.0
Pore Pressure at B determination	kPa	322.2
Pore Pressure Parameter B at 2 min		0.954
Method used for specimen saturation		Wet

End of Consolidation Stage

Effective Consolidation Stress	kPa	63.5
Total Back Pressure	kPa	272.0
Time to 50 % primary consolidation	min	4.9
Interpretation method used for t50		2
Dry Unit Weight	Mg/m^3	2.022
Void Ratio		0.33
Water Content	%	12.33
Degree of Saturation	%	100.0
Cross-sectional Area, A_c	mm^2	2061.1
Method used to determine Area, A_c		B



*Solid line = Volume change
Dashed line = Axial displacement

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103623 B.bh\[B.xlsx]Report
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-06
Approved by: G. Uwimana Date: 2021-07-06

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

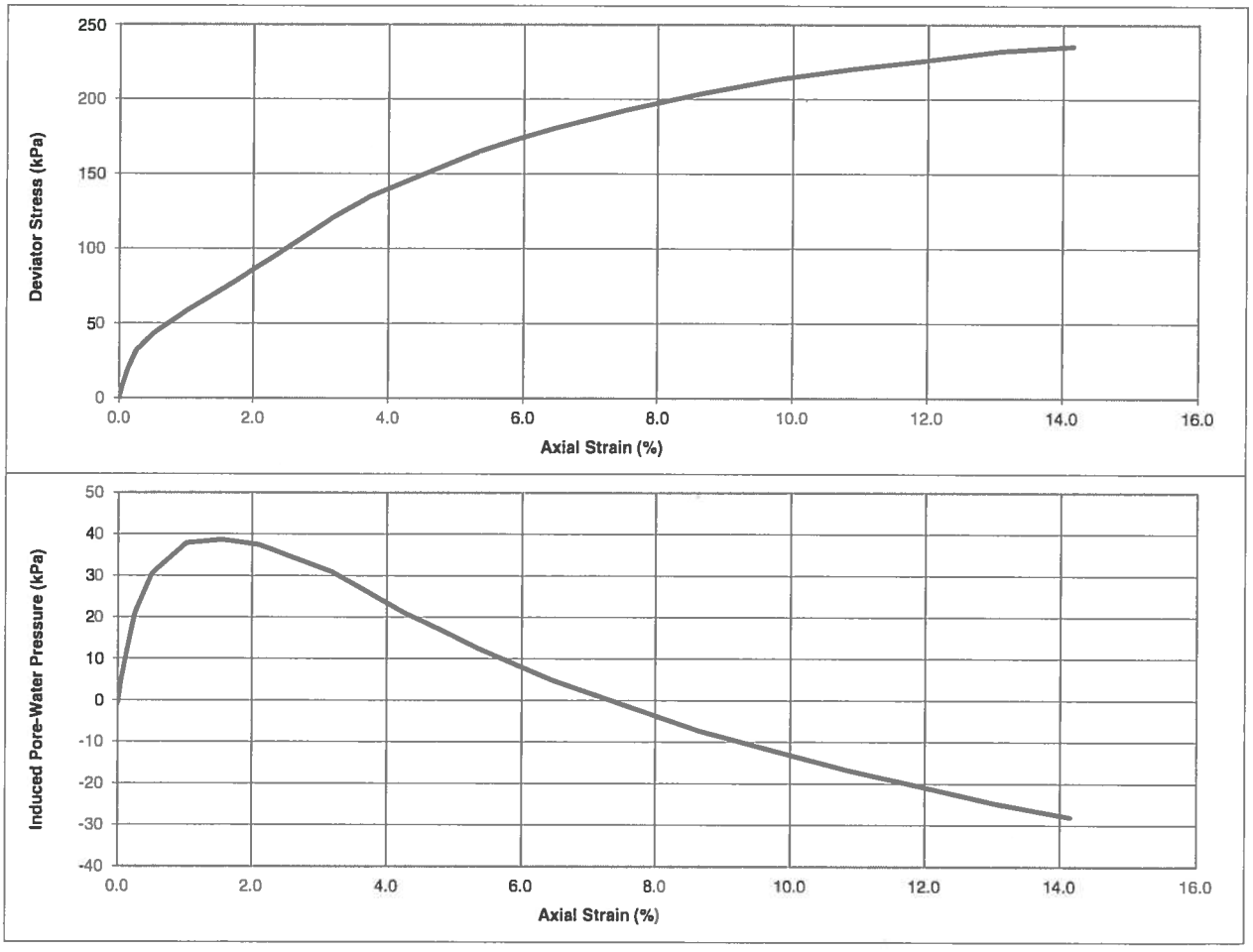
Sample Details		**Specimen 1**
Borehole		4
Sample No.		AS7
Depth	ft	15-17
Sample Date		
Lab Ref		2103623 B
Technician Name		L. Gowry/ Azar/ JG/ NK

Shearing Stage

Failure Criterion		Deviator stress at 15% strain
Rate of axial strain	%/min	0.036

Response at Failure

Deviator Stress	kPa	235.6
Axial Strain	%	14.15
Effective Major Principal Stress	kPa	598.6
Effective Minor Principal Stress	kPa	363.0
Values corrected for membrane?		Yes
Values corrected for filter-paper strips?		Yes



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Date: 2021-12-13

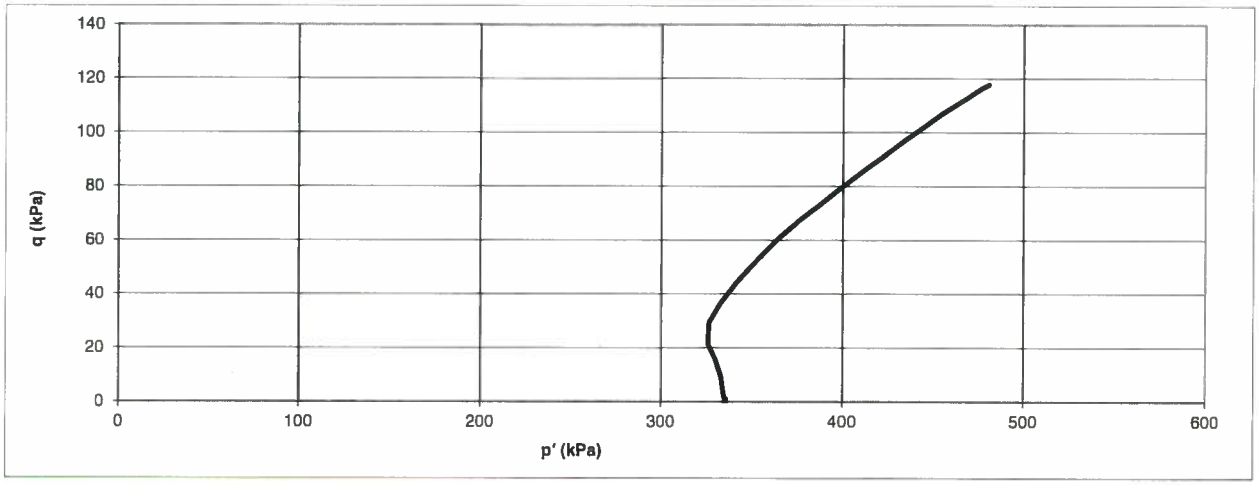
Checked by: J. Noor Date: 2021-07-06
Approved by: G. Uwimana Date: 2021-07-06

Peto MacCallum Ltd.
CONSULTING ENGINEERS

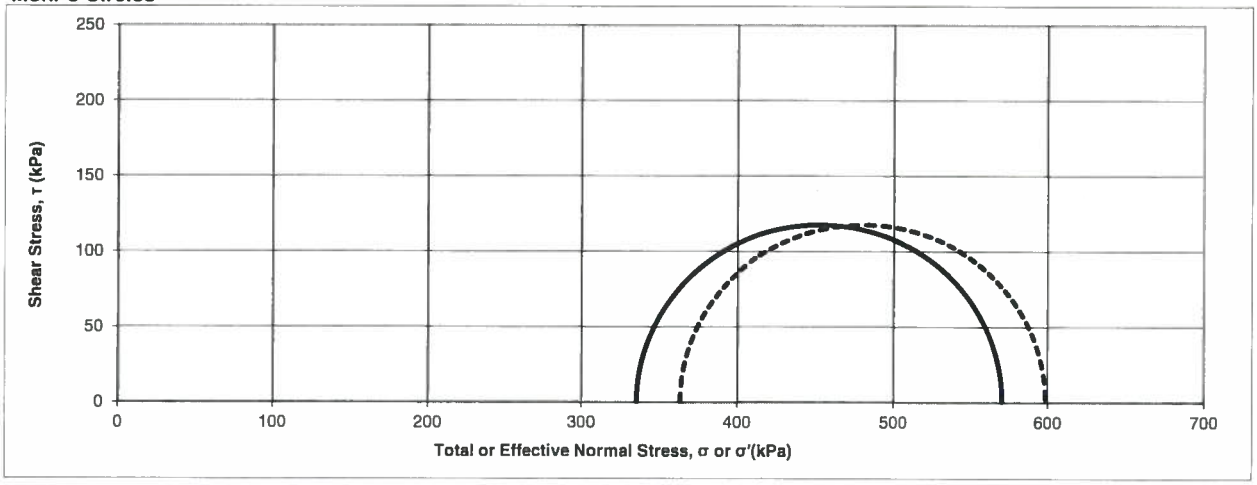
Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details		**Specimen 1**
Borehole		4
Sample No.		AS7
Depth	ft	15-17
Sample Date		
Lab Ref		2103623 B
Technician Name		L. Gowry/ Azar/ JG/ NK



Mohr's Circles



*Solid circle = Total Stress Dashed circle = Effective Stress

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103623 B.bh\[B.xlsx]Report
Date: 2021-12-13
Checked by: J. Noor Approved by: G. Uwimana
Date: 2021-07-06 Date: 2021-07-06

Peto MacCallum Ltd.
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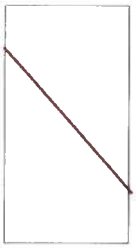
Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details		Specimen 1
Borehole		4
Sample No.		AS7
Depth	ft	15-17
Sample Date		
Lab Ref		2103623 B
Technician Name		L. Gowry/ Azar/ JG/ NK

Failure Sketch of the Specimen



Photograph of the Specimen

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103623 B.bhl\[B.xlsx]Report
Date: 2021-12-13

Checked by: J. Noor Date: 2021-07-06
Approved by: G. Uwimana Date: 2021-07-06

Peto MacCallum Ltd.
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Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

Borehole 4, Sample AS7, Depth 15-17

Soil Type		Silty Clay , some Sand and Gravel
Specimen Height	(mm)	109.58
Specimen Diameter	(mm)	51.16
W_o	(%)	11.6
Dry Density	(Mg/m^3)	2.048
Confining Pressure	(kPa)	335
Average Rate of Strain	(%/hr)	0.03614
Maximum Deviator Stress (σ1-σ3)	(kPa)	235.6
Axial Strain at maximum (σ1-σ3),	(%)	14.2
Shear Stress at maximum (σ1-σ3)/2	(kPa)	117.8
γ	(kN/m^3)	0.02007

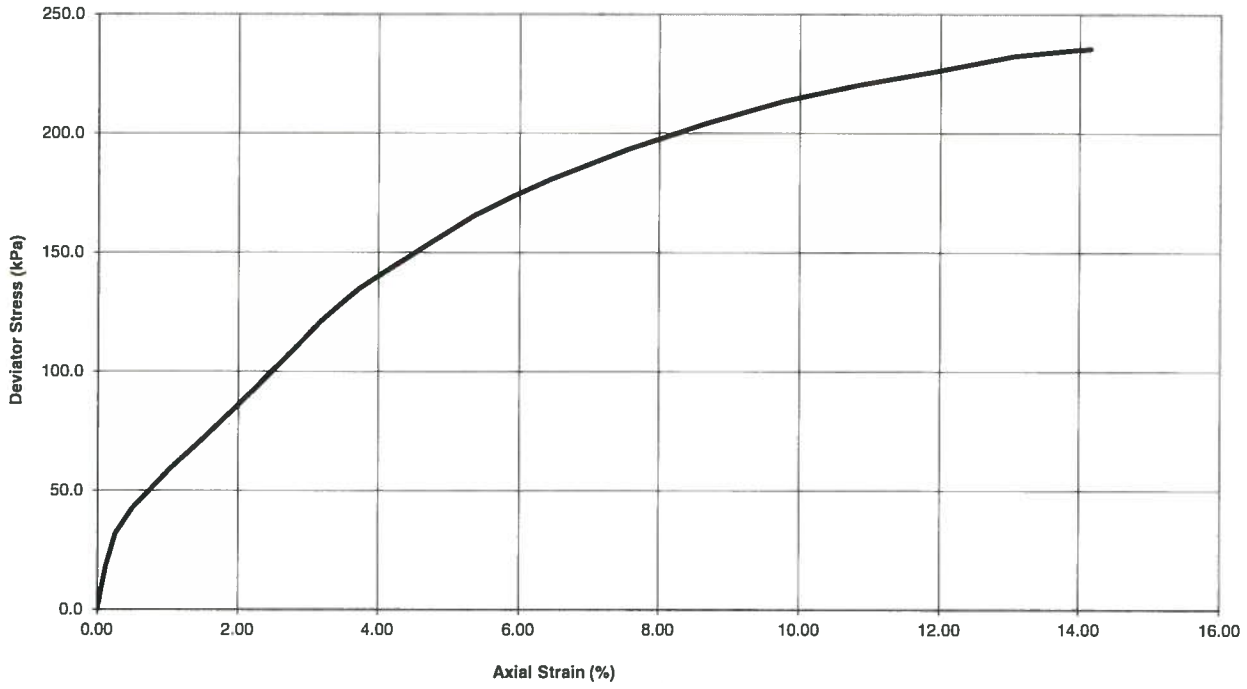

FIGURE No:

PML Ref: 21TF001A
Lab Ref: 2103623 B

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 A1.bhl\2103910 A CUT
Date: 2021-12-13
Checked by: J. Noor
Approved by: G. Uwimana
Date: 2021-07-23
Date: 2021-07-23

Peto MacCallum Ltd.
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Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details		**Specimen 1**
Borehole		5
Sample Number		AS
Depth	ft	27.5-30
Sample Date		
Lab Ref		2103910 A
Technician Name		L. Gowry

Soil Description & Classification

Silty Clay and some Gravel		
Specific Gravity of Solids		2.700
Liquid Limit	%	-
Plastic Limit	%	-
Plasticity Index	%	-

Additional Notes (unusual conditions or other information necessary to interpret the test results):

Specimen was reconstituted at optimum moisture content.

Departures from the test procedure outlined in ASTM D4767-11:

Grain Size Distribution

Gravel, retained on No. 4 Sieve	%	
Coarse Sand, retained on No. 10 Sieve	%	
Medium Sand, retained on No. 40 Sieve	%	
Fine Sand, retained on No. 200 Sieve	%	
Silt, 0.074 to 0.005 mm	%	
Clay, smaller than 0.005 mm	%	
Colloids, smaller than 0.001 mm	%	

Initial Specimen Conditions

Height	mm	107.61
Diameter	mm	50.99
Dry Unit Weight	Mg/m^3	1.953
Void Ratio		0.38
Water Content	%	13.84
Degree of Saturation	%	98.3
Method used for obtaining water content		Entire Specimen

Membrane Properties

Young's Modulus	kPa	1400
Thickness	mm	0.530

Filter-Paper Strip Properties

Load carried per unit length	kN/mm	0.00019
Specimen perimeter covered by strips	mm	78.6

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 A1.bhl\[2103910 A CUTC
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-23
Approved by: G. Uwimana Date: 2021-07-23

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details		**Specimen 1**
Borehole		5
Sample No.		AS
Depth	ft	27.5-30
Sample Date		
Lab Ref		2103910 A
Technician Name		L. Gowry

Test Setup

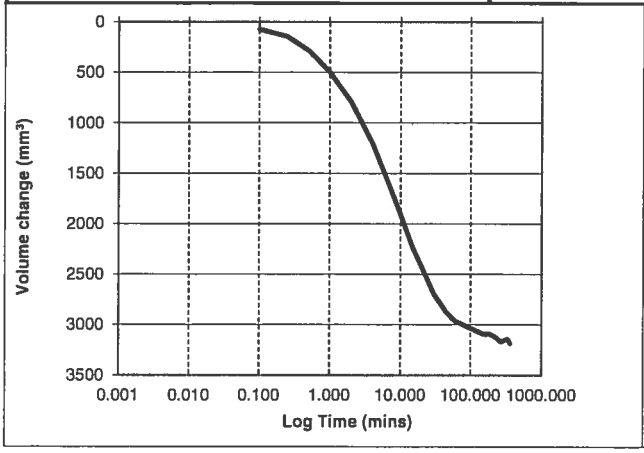
Date Started		2021-07-19
Date Finished		2021-07-21
Top Drain Used		Y
Base Drain Used		Y
Side Drains Used (Filter-Paper Strips)		Y
Pressure System Number		3
Cell Number		5

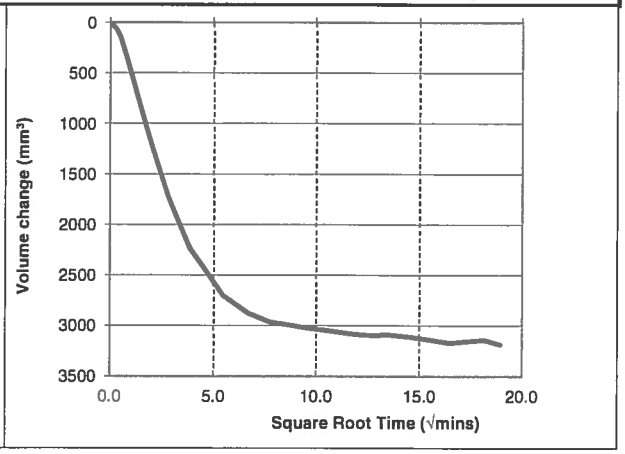
Measurement of Pore Pressure Parameter

Cell Pressure Increment	kPa	35.0
Cell Pressure at B determination	kPa	320.0
Back Pressure at B determination	kPa	275.0
Pore Pressure at B determination	kPa	308.5
Pore Pressure Parameter B		0.954
Method used for specimen saturation		Wet

End of Consolidation Stage

Effective Consolidation Stress	kPa	113.3
Total Back Pressure	kPa	308.0
Time to 50 % primary consolidation	min	3.4
Interpretation method used for t50		2
Dry Unit Weight	Mg/m^3	1.908
Void Ratio		0.41
Water Content	%	15.27
Degree of Saturation	%	100.0
Cross-sectional Area, A_c	mm^2	2087.5
Method used to determine Area, A_c		B





*Solid line = Volume change
Dashed line = Axial displacement

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Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

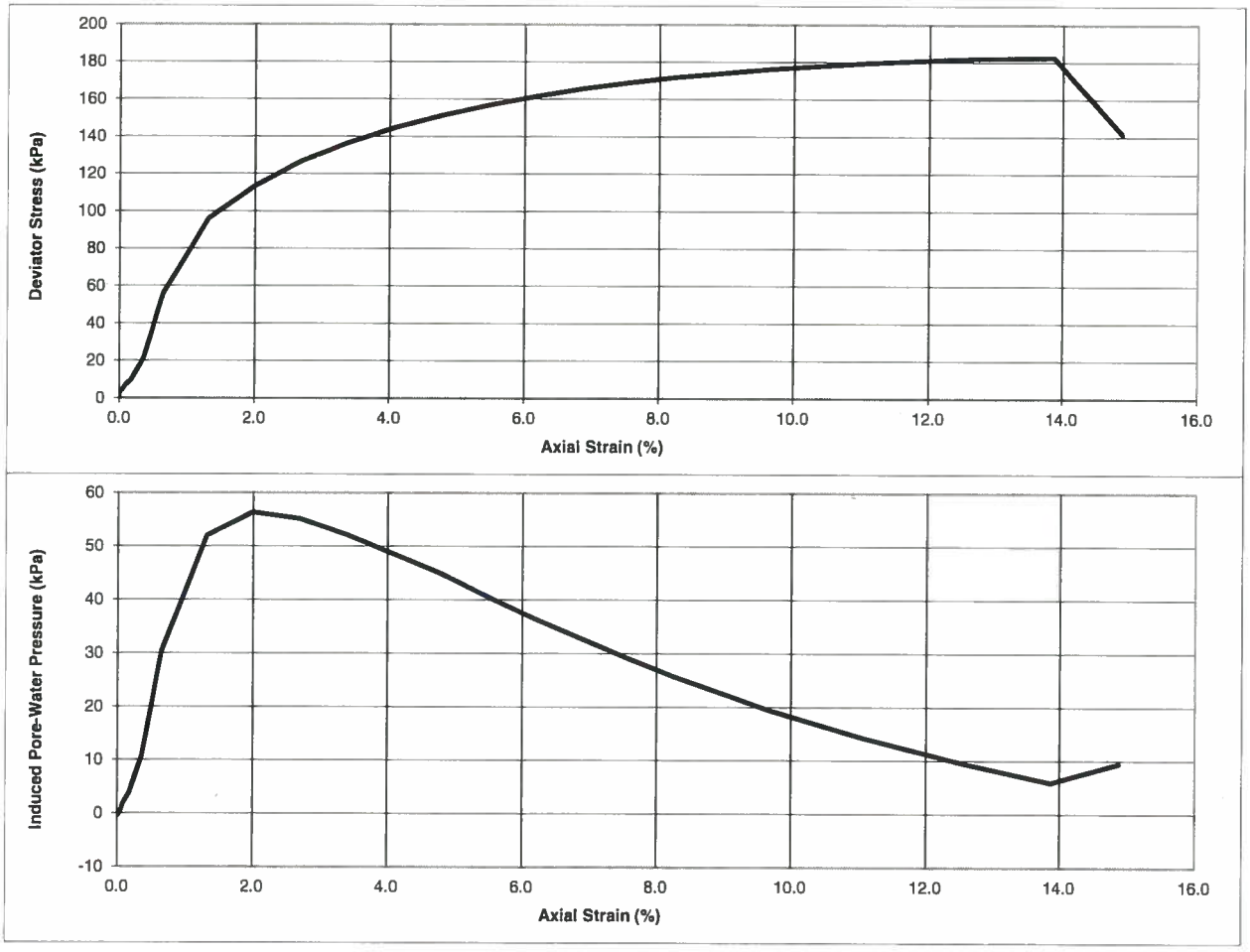
Sample Details		**Specimen 1**
Borehole		5
Sample No.		AS
Depth	ft	27.5-30
Sample Date		
Lab Ref		2103910 A
Technician Name		L. Gowry

Shearing Stage

Failure Criterion		Deviator stress at 15% strain
Rate of axial strain	%/min	0.046

Response at Failure

Deviator Stress	kPa	182.7
Axial Strain	%	13.86
Effective Major Principal Stress	kPa	593.9
Effective Minor Principal Stress	kPa	411.2
Values corrected for membrane?		Yes
Values corrected for filter-paper strips?		Yes



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Date: 2021-12-13

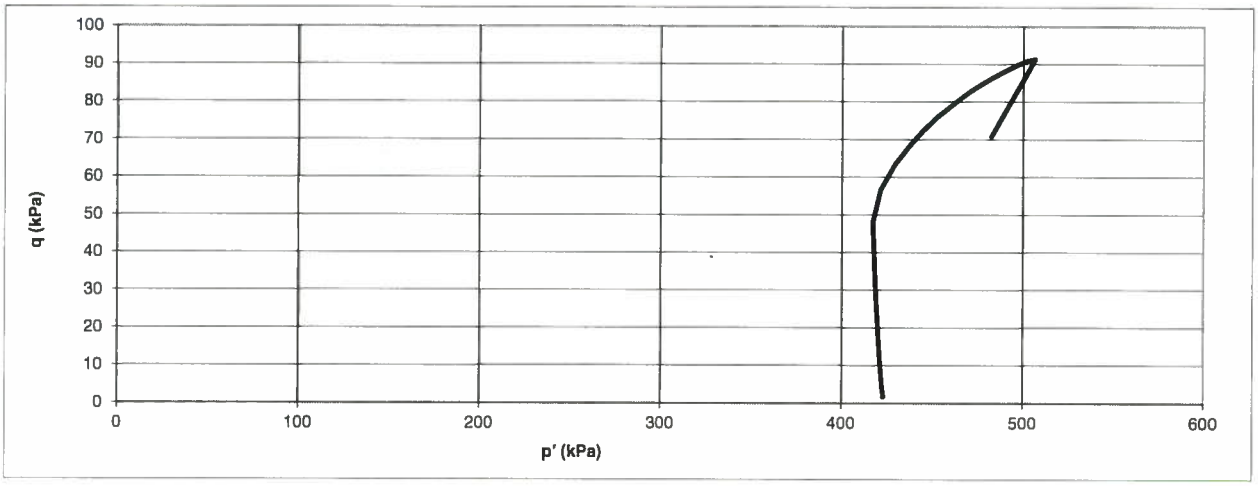
Checked by: J. Noor Date: 2021-07-23
Approved by: G. Uwimana Date: 2021-07-23

Peto MacCallum Ltd.
CONSULTING ENGINEERS

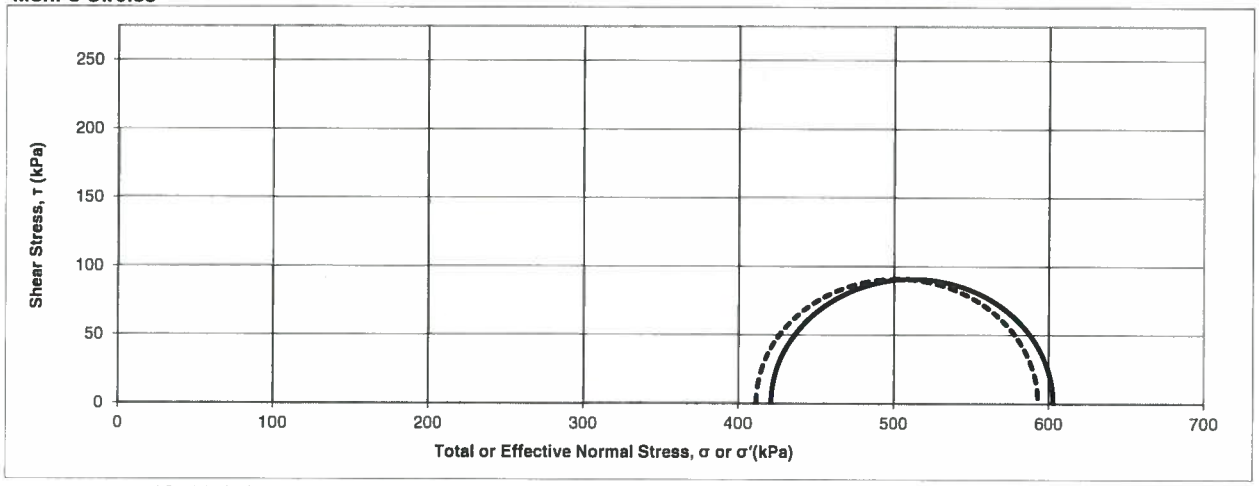
Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details		**Specimen 1**
Borehole		5
Sample No.		AS
Depth	ft	27.5-30
Sample Date		
Lab Ref		2103910 A
Technician Name		L. Gowry



Mohr's Circles



*Solid circle = Total Stress Dashed circle = Effective Stress

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 A1.bhl\2103910 A CU
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-23
Approved by: G. Uwimana Date: 2021-07-23

Peto MacCallum Ltd.

CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

## ##	PML Ref.	21TF001A
	Client	The Regional Municipality of Peel
	Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Date: Date:	Project Location	Mississauga, Ontario

Sample Details		**Specimen 1**
Borehole		5
Sample No.		AS
Depth	ft	27.5-30
Sample Date		
Lab Ref		2103910 A
Technician Name		L. Gowry

J. Noor G. Uwimana

Checked by: Approved by:

Failure Sketch of the Specimen

Photograph of the Specimen

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 A1.bhl\2103910 A CU

Date: 2021-12-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

Borehole 5, Sample AS, Depth 27.5-30

Soil Type		Silty Clay and some Gravel
Specimen Height	(mm)	107.61
Specimen Diameter	(mm)	50.99
W_0	(%)	13.8
Dry Density	(Mg/m^3)	1.953
Confining Pressure	(kPa)	421
Average Rate of Strain	(%/hr)	0.05
Maximum Deviator Stress (σ1-σ3)	(kPa)	182.7
Axial Strain at maximum (σ1-σ3),	(%)	13.9
Shear Stress at maximum (σ1-σ3)/2	(kPa)	91.4
γ	(kN/m^3)	0.0191

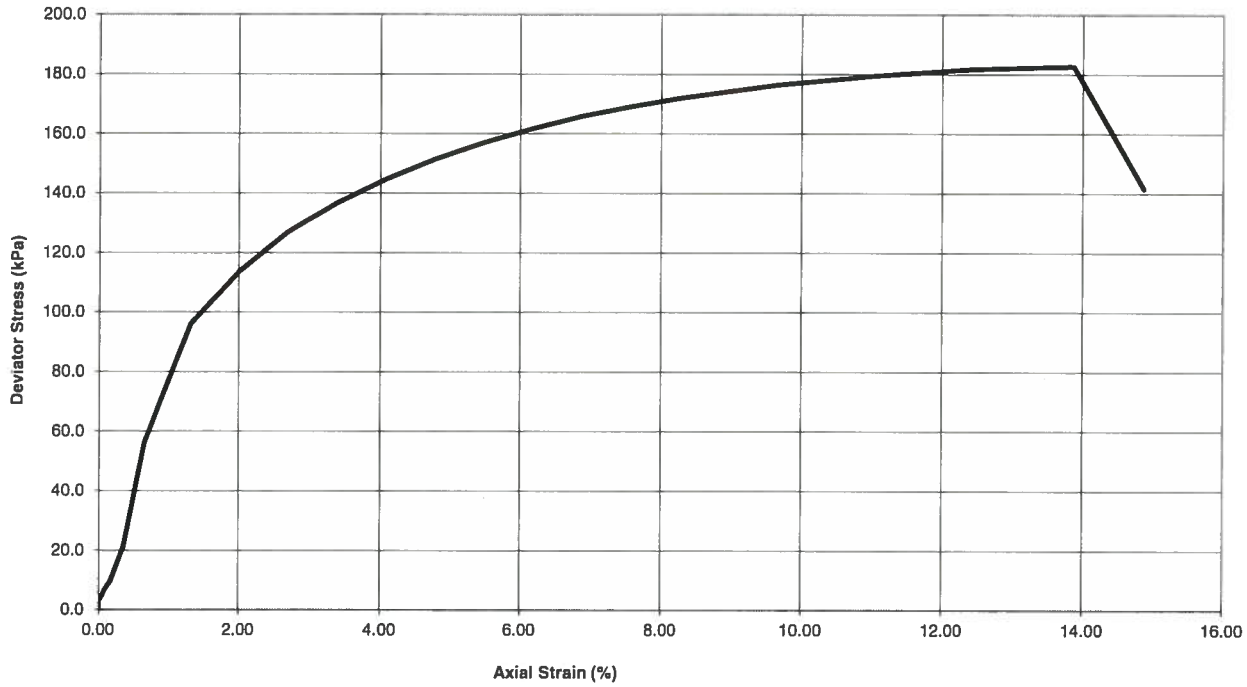


FIGURE No:

PML Ref: 21TF001A
Lab Ref: 2103910 A

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 B.bhl\[2103910 B CUTC
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwmana Date: 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	20TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	6
Sample Number	-
Depth	10-12 ft
Sample Date	
Lab Ref	2103910 B
Technician Name	L. Gowry/ Azar

Soil Description & Classification

Silty Clay and some Gravel		
Specific Gravity of Solids		2.700
Liquid Limit	%	-
Plastic Limit	%	-
Plasticity Index	%	-

Additional Notes (unusual conditions or other information necessary to interpret the test results):

Specimen was reconstituted at optimum moisture content.

Departures from the test procedure outlined in ASTM D4767-11:

Grain Size Distribution

Gravel, retained on No. 4 Sieve	%	
Coarse Sand, retained on No. 10 Sieve	%	
Medium Sand, retained on No. 40 Sieve	%	
Fine Sand, retained on No. 200 Sieve	%	
Silt, 0.074 to 0.005 mm	%	
Clay, smaller than 0.005 mm	%	
Colloids, smaller than 0.001 mm	%	

Initial Specimen Conditions

Height	mm	106.84
Diameter	mm	51.43
Dry Unit Weight	Mg/m^3	1.904
Void Ratio		0.42
Water Content	%	13.97
Degree of Saturation	%	89.8
Method used for obtaining water content		Entire Specimen

Membrane Properties

Young's Modulus	kPa	1400
Thickness	mm	0.530

Filter-Paper Strip Properties

Load carried per unit length	kN/mm	0.00019
Specimen perimeter covered by strips	mm	78.6

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	20TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	Specimen 1
Borehole	6
Sample No.	-
Depth	10-12 ft
Sample Date	
Lab Ref	2103910 B
Technician Name	L. Gowry/ Azar

Test Setup

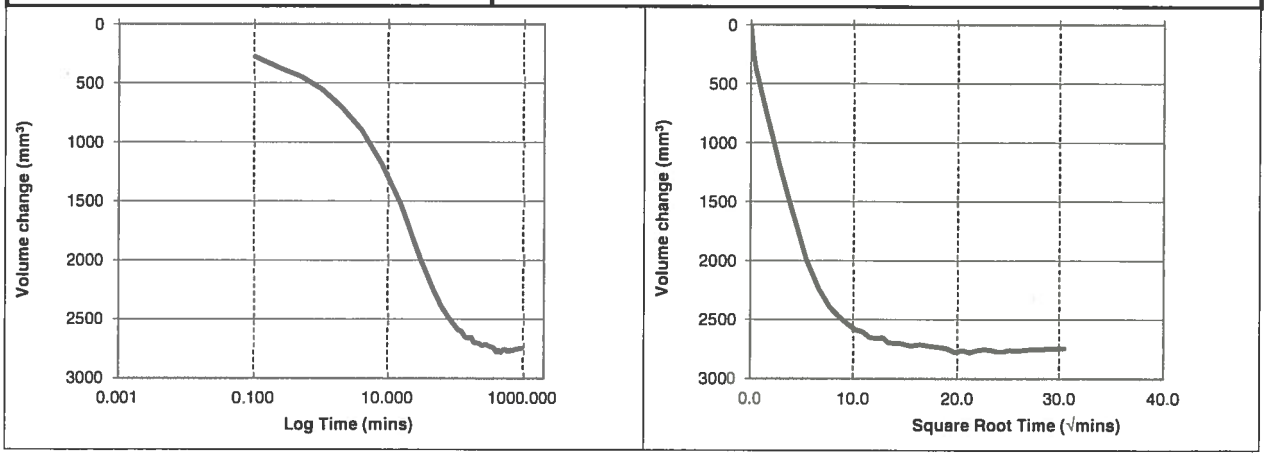
Date Started	2021-07-01
Date Finished	2021-07-08
Top Drain Used	Y
Base Drain Used	Y
Side Drains Used (Filter-Paper Strips)	Y
Pressure System Number	1
Cell Number	3

Measurement of Pore Pressure Parameter

Cell Pressure Increment	kPa	35.0
Cell Pressure at B determination	kPa	285.0
Back Pressure at B determination	kPa	240.0
Pore Pressure at B determination	kPa	272.9
Pore Pressure Parameter B		0.95
Method used for specimen saturation		Wet

End of Consolidation Stage

Effective Consolidation Stress	kPa	43.3
Total Back Pressure	kPa	273.0
Time to 50 % primary consolidation	min	9.5
Interpretation method used for t50		2
Dry Unit Weight	Mg/m^3	1.980
Void Ratio		0.36
Water Content	%	13.39
Degree of Saturation	%	100.0
Cross-sectional Area, A_c	mm^2	1998.2
Method used to determine Area, A_c		B



*Solid line = Volume change
Dashed line = Axial displacement

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Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	20TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

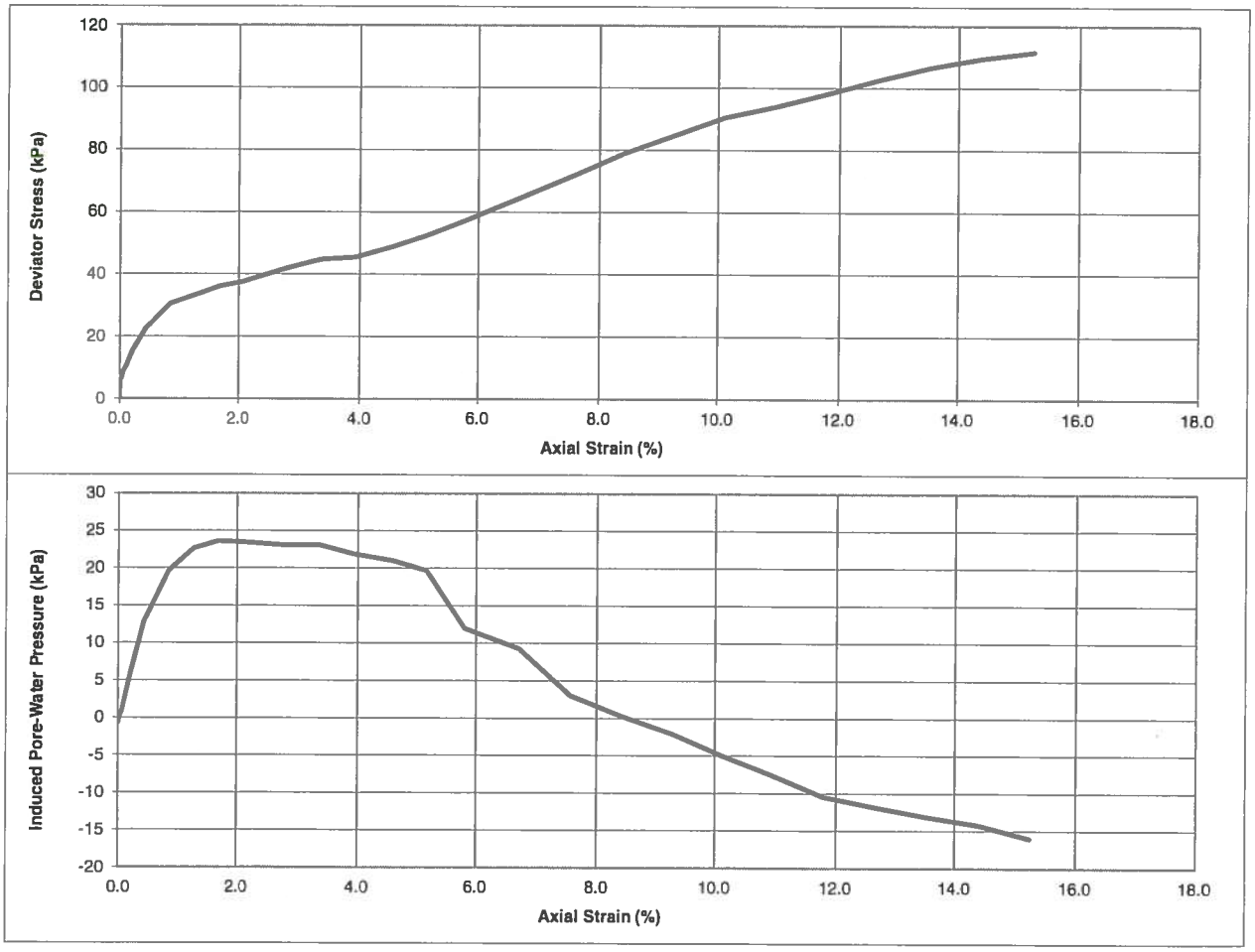
Sample Details	**Specimen 1**
Borehole	6
Sample No.	-
Depth	10-12 ft
Sample Date	
Lab Ref	2103910 B
Technician Name	L. Gowry/ Azar

Shearing Stage

Failure Criterion		Deviator stress at 15% strain
Rate of axial strain	%/min	0.03

Response at Failure

Deviator Stress	kPa	111.7
Axial Strain	%	15.24
Effective Major Principal Stress	kPa	443.7
Effective Minor Principal Stress	kPa	332.0
Values corrected for membrane?		Yes
Values corrected for filter-paper strips?		Yes



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Date: 2021-12-13

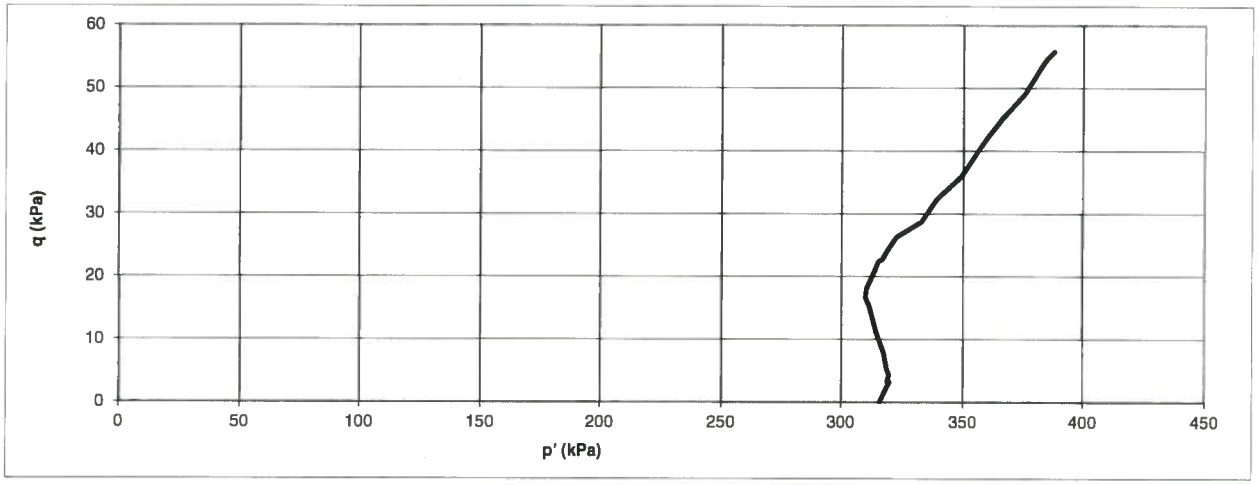
Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

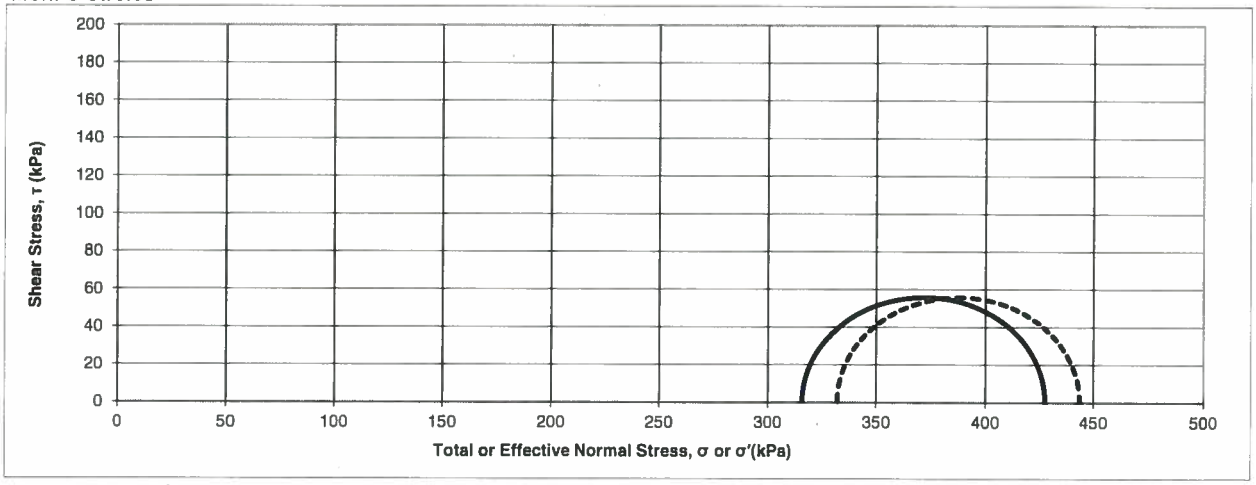
Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	20TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	6
Sample No.	-
Depth	10-12 ft
Sample Date	
Lab Ref	2103910 B
Technician Name	L. Gowry/ Azar



Mohr's Circles



*Solid circle = Total Stress Dashed circle = Effective Stress

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 B.bh\[2103910 B CUT
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

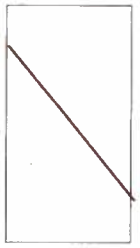
Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

PML Ref.	20TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	Specimen 1
Borehole	6
Sample No.	-
Depth	10-12 ft
Sample Date	
Lab Ref	2103910 B
Technician Name	L. Gowry/ Azar

Failure Sketch of the Specimen



Photograph of the Specimen

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 B.bhl\2103910 B CUT
Date: 2021-12-13

Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

Borehole 6, Sample -, Depth 10-12 ft

Soil Type		Silty Clay and some Gravel
Specimen Height	(mm)	106.84
Specimen Diameter	(mm)	51.43
W_0	(%)	14.0
Dry Density	(Mg/m^3)	1.904
Confining Pressure	(kPa)	316
Average Rate of Strain	(%/hr)	0.03
Maximum Deviator Stress (σ1-σ3)	(kPa)	111.7
Axial Strain at maximum (σ1-σ3),	(%)	15.2
Shear Stress at maximum (σ1-σ3)/2	(kPa)	55.8
γ	(kN/m^3)	0.01866

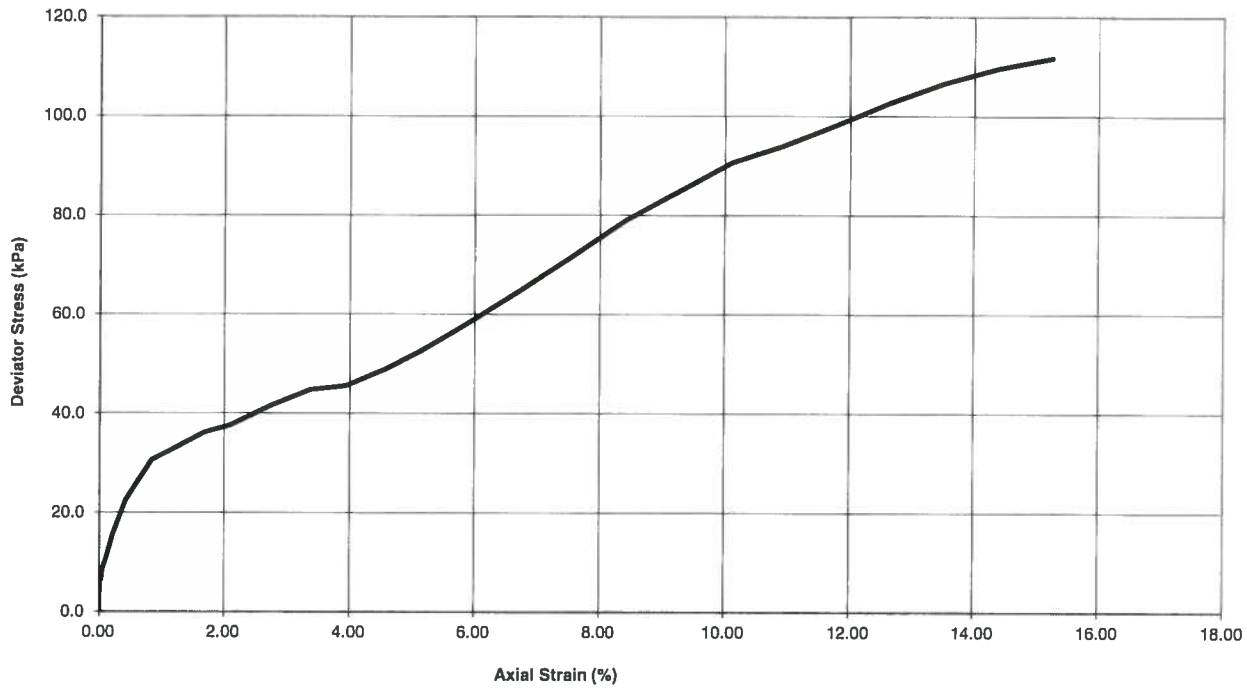


FIGURE No:

PML Ref: 21TF001A
Lab Ref: 2103910 B

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103623 A.bhl\2103623 A CUTC
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-01
Approved by: G. Uwimana Date: 2021-07-01

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	1
Sample Number	6
Depth	12.5-14.5 ft
Sample Date	
Lab Ref	2103623 A
Technician Name	L. Gowry/ Azar

Soil Description & Classification

Clayey Silt with Sand and Gravel

Specific Gravity of Solids		2.700
Liquid Limit	%	27
Plastic Limit	%	18
Plasticity Index	%	9

Additional Notes (unusual conditions or other information necessary to interpret the test results):

Specimen was reconstituted at received moisture content.

Departures from the test procedure outlined in ASTM D4767-11:

Grain Size Distribution

Gravel, retained on No. 4 Sieve	%	8.2
Coarse Sand, retained on No. 10 Sieve	%	11.5
Medium Sand, retained on No. 40 Sieve	%	2.9
Fine Sand, retained on No. 200 Sieve	%	7.3
Silt, 0.074 to 0.005 mm	%	24.0
Clay, smaller than 0.005 mm	%	8.0
Colloids, smaller than 0.001 mm	%	6.0

Initial Specimen Conditions

Height	mm	107.80
Diameter	mm	51.13
Dry Unit Weight	Mg/m^3	2.060
Void Ratio		0.31
Water Content	%	11.41
Degree of Saturation	%	99.4
Method used for obtaining water content		Cutting

Membrane Properties

Young's Modulus	kPa	1400
Thickness	mm	0.530

Filter-Paper Strip Properties

Load carried per unit length	kN/mm	0.00019
Specimen perimeter covered by strips	mm	78.6

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Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	1
Sample No.	6
Depth	12.5-14.5 ft
Sample Date	
Lab Ref	2103623 A
Technician Name	L. Gowry/ Azar

Test Setup

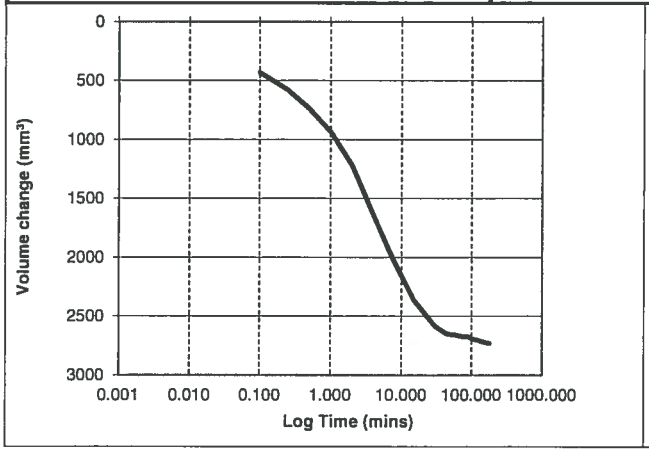
Date Started	2021-06-21
Date Finished	2021-06-24
Top Drain Used	Y
Base Drain Used	Y
Side Drains Used (Filter-Paper Strips)	Y
Pressure System Number	3
Cell Number	5

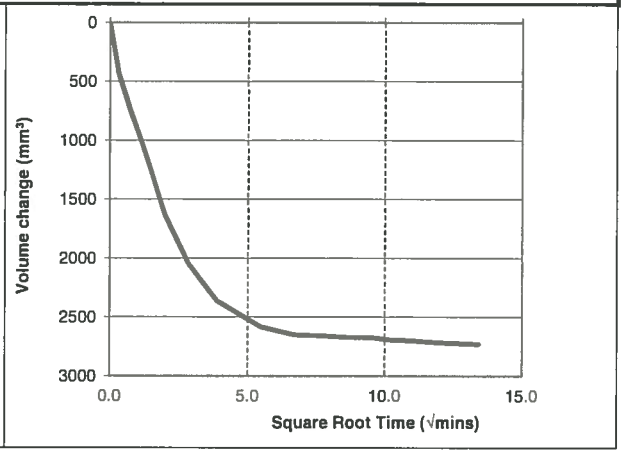
Measurement of Pore Pressure Parameter

Cell Pressure Increment	kPa	35.0
Cell Pressure at B determination	kPa	285.0
Back Pressure at B determination	kPa	240.0
Pore Pressure at B determination	kPa	275.0
Pore Pressure Parameter B		0.950
Method used for specimen saturation		Wet

End of Consolidation Stage

Effective Consolidation Stress	kPa	51.3
Total Back Pressure	kPa	272.0
Time to 50 % primary consolidation	min	2.1
Interpretation method used for t50		2
Dry Unit Weight	Mg/m^3	2.028
Void Ratio		0.33
Water Content	%	12.20
Degree of Saturation	%	99.8
Cross-sectional Area, A_c	mm^2	2082.9
Method used to determine Area, A_c		B





*Solid line = Volume change
Dashed line = Axial displacement

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Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-01
Approved by: G. Uwimana Date: 2021-07-01

Peto MacCallum Ltd.
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Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details

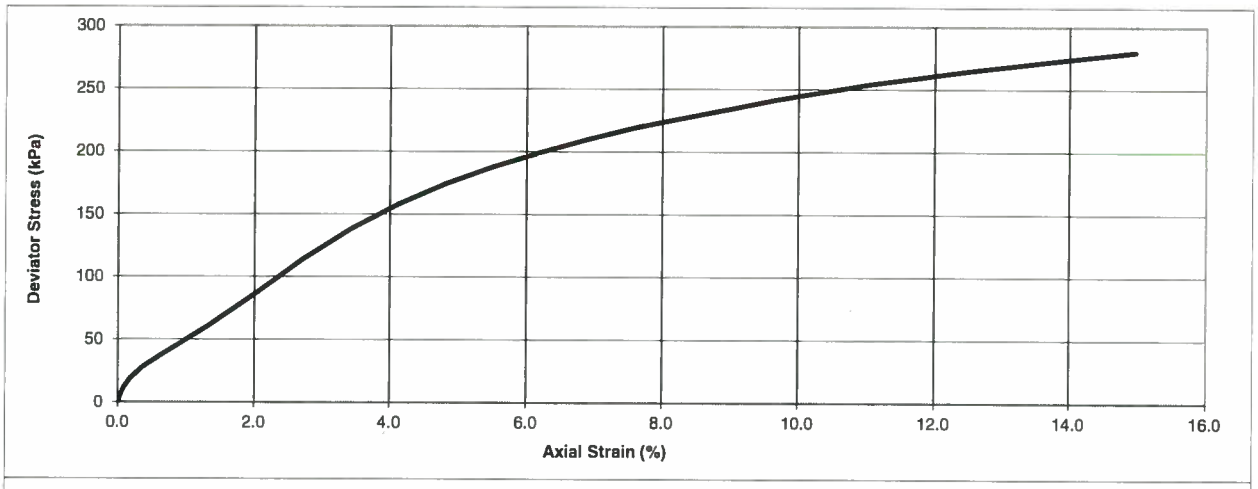
	Specimen 1
Borehole	1
Sample No.	6
Depth	12.5-14.5 ft
Sample Date	
Lab Ref	2103623 A
Technician Name	L. Gowry/ Azar

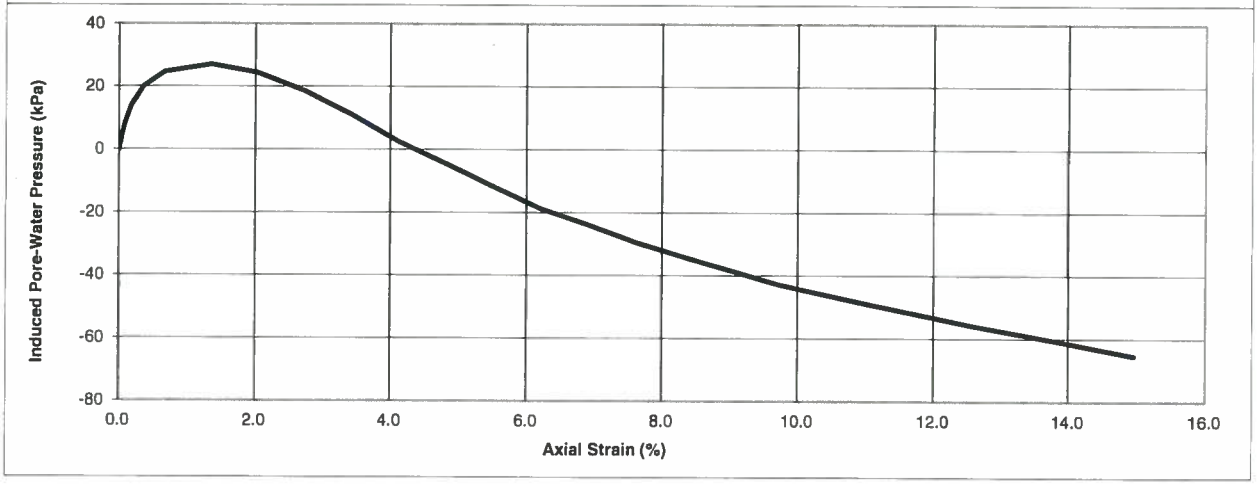
Shearing Stage

Failure Criterion		Deviator stress at 15% strain
Rate of axial strain	%/min	0.046

Response at Failure

Deviator Stress	kPa	280.1
Axial Strain	%	14.97
Effective Major Principal Stress	kPa	670.5
Effective Minor Principal Stress	kPa	390.4
Values corrected for membrane?		Yes
Values corrected for filter-paper strips?		Yes





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Date: 2021-12-13

Checked by: J. Noor Date: 2021-07-01
Approved by: G. Uwimana Date: 2021-07-01

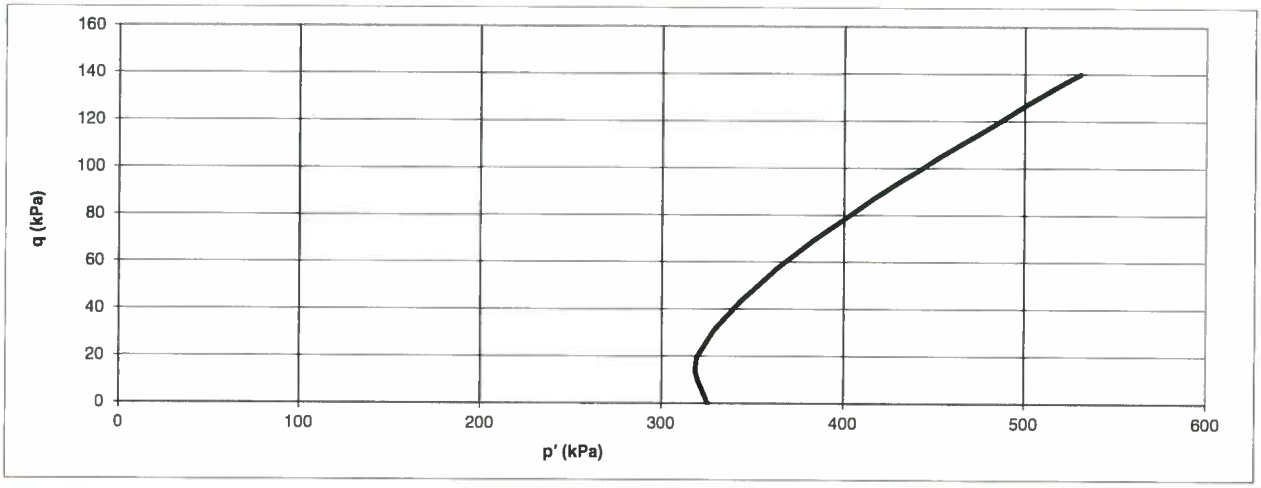
Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils

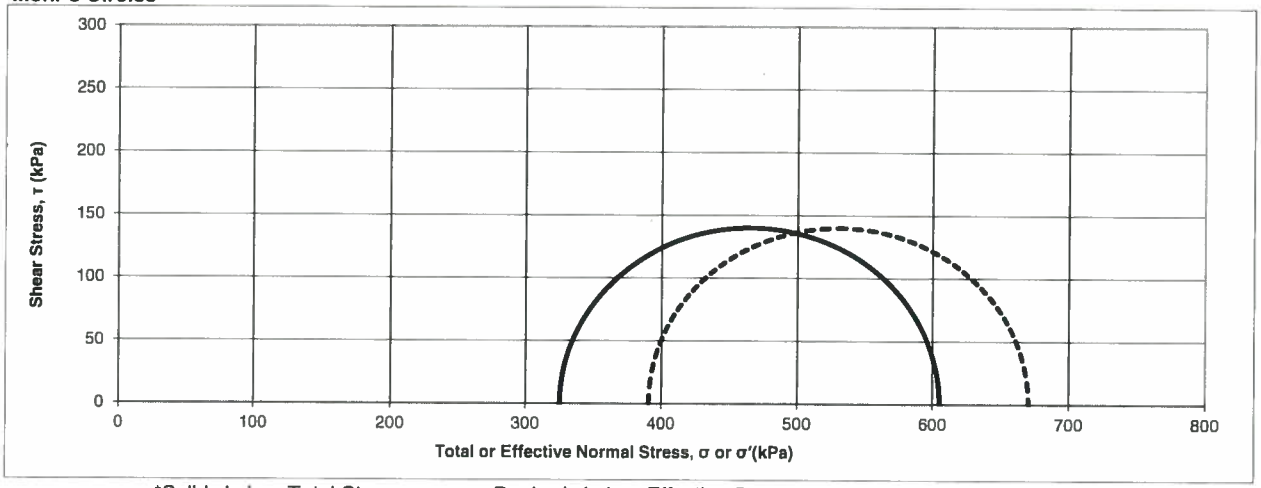
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	1
Sample No.	6
Depth	12.5-14.5 ft
Sample Date	
Lab Ref	2103623 A
Technician Name	L. Gowry/ Azar



Mohr's Circles



*Solid circle = Total Stress Dashed circle = Effective Stress

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Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-01
Approved by: G. Uwimana Date: 2021-07-01

Peto MacCallum Ltd.
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Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Proje
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	1
Sample No.	6
Depth	12.5-14.5 ft
Sample Date	
Lab Ref	2103623 A
Technician Name	L. Gowry/ Azar

Failure Sketch of the Specimen

Photograph of the Specimen

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103623 A.bhl\2103623 A CUT
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-01
Approved by: G. Uwimana Date: 2021-07-01

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Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

Borehole 1, Sample 6, Depth 12.5-14.5 ft

Soil Type		Clayey Silt with Sand and Gravel
Specimen Height	(mm)	107.8
Specimen Diameter	(mm)	51.13
W_o	(%)	11.4
Dry Density	(Mg/m^3)	2.060
Confining Pressure	(kPa)	325
Average Rate of Strain	(%/hr)	0.0463
Maximum Deviator Stress (σ1-σ3)	(kPa)	280.1
Axial Strain at maximum (σ1-σ3),	(%)	15.0
Shear Stress at maximum (σ1-σ3)/2	(kPa)	140.1
γ	(kN/m^3)	0.02019

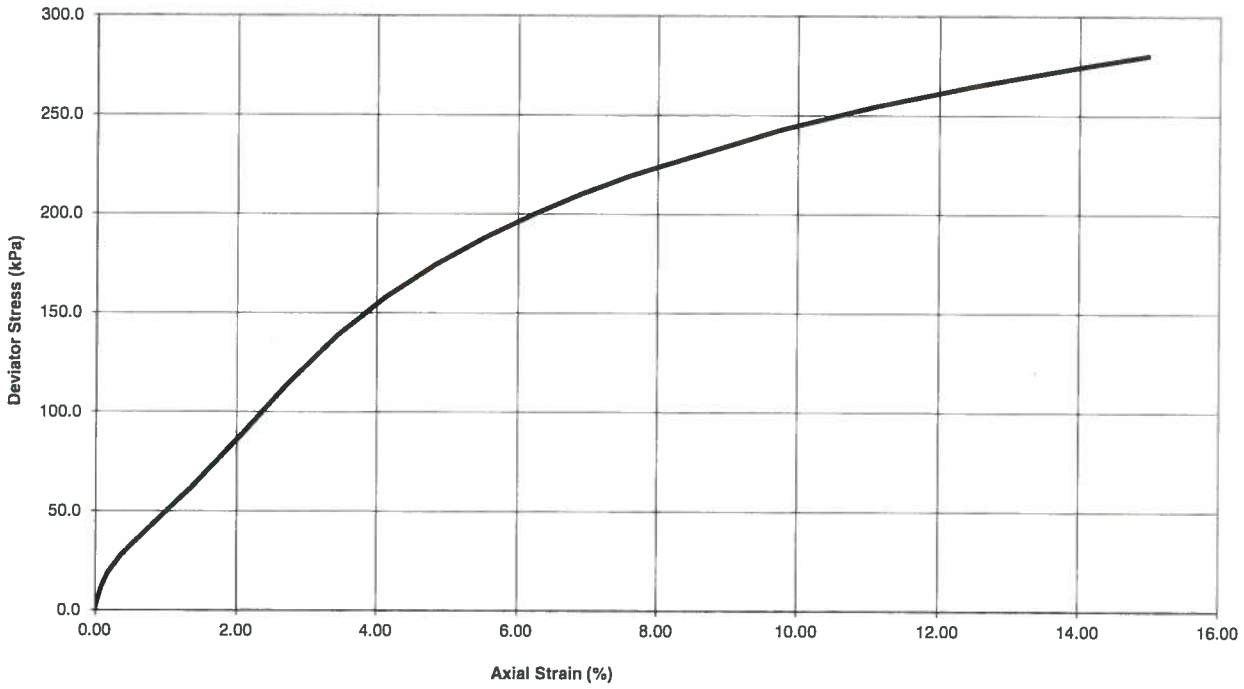

FIGURE No:

PML Ref: 21TF001A
Lab Ref: 2103623 A

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 C.bhl\2103910 C CUT(Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

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Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	9
Sample Number	AS7
Depth	15-17 ft
Sample Date	
Lab Ref	2103910 C
Technician Name	L. Gowry/ Azar

Soil Description & Classification

Silty Clay and some Gravel		
Specific Gravity of Solids		2.700
Liquid Limit	%	-
Plastic Limit	%	-
Plasticity Index	%	-

Additional Notes (unusual conditions or other information necessary to interpret the test results):

Specimen was reconstituted at optimum moisture content.

Departures from the test procedure outlined in ASTM D4767-11:

Grain Size Distribution

Gravel, retained on No. 4 Sieve	%	
Coarse Sand, retained on No. 10 Sieve	%	
Medium Sand, retained on No. 40 Sieve	%	
Fine Sand, retained on No. 200 Sieve	%	
Silt, 0.074 to 0.005 mm	%	
Clay, smaller than 0.005 mm	%	
Colloids, smaller than 0.001 mm	%	

Initial Specimen Conditions

Height	mm	110.39
Diameter	mm	50.70
Dry Unit Weight	Mg/m^3	2.083
Void Ratio		0.29
Water Content	%	11.39
Degree of Saturation	%	106.0
Method used for obtaining water content		Entire specimen

Membrane Properties

Young's Modulus	kPa	1400
Thickness	mm	0.530

Filter-Paper Strip Properties

Load carried per unit length	kN/mm	0.00019
Specimen perimeter covered by strips	mm	78.6

Peto MacCallum Ltd.
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Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	Specimen 1
Borehole	9
Sample No.	AS7
Depth	15-17 ft
Sample Date	
Lab Ref	2103910 C
Technician Name	L. Gowry/ Azar

Test Setup

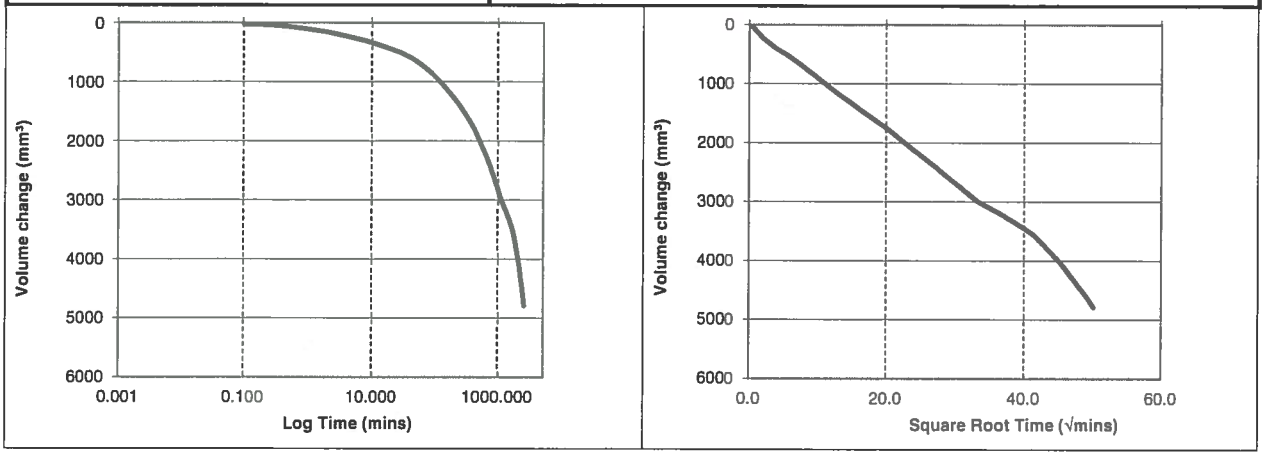
Date Started	2021-07-01
Date Finished	2021-07-08
Top Drain Used	Y
Base Drain Used	Y
Side Drains Used (Filter-Paper Strips)	Y
Pressure System Number	3
Cell Number	5

Measurement of Pore Pressure Parameter

Cell Pressure Increment	kPa	35.0
Cell Pressure at B determination	kPa	245.0
Back Pressure at B determination	kPa	200.0
Pore Pressure at B determination	kPa	233.6
Pore Pressure Parameter B at 2 min		0.951
Method used for specimen saturation		Wet

End of Consolidation Stage

Effective Consolidation Stress	kPa	61.3
Total Back Pressure	kPa	224.0
Time to 50 % primary consolidation	min	5.1
Interpretation method used for t50		2
Dry Unit Weight	Mg/m^3	1.991
Void Ratio		0.35
Water Content	%	13.11
Degree of Saturation	%	101.1
Cross-sectional Area, A_c	mm^2	2471.4
Method used to determine Area, A_c		B



*Solid line = Volume change
Dashed line = Axial displacement

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Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

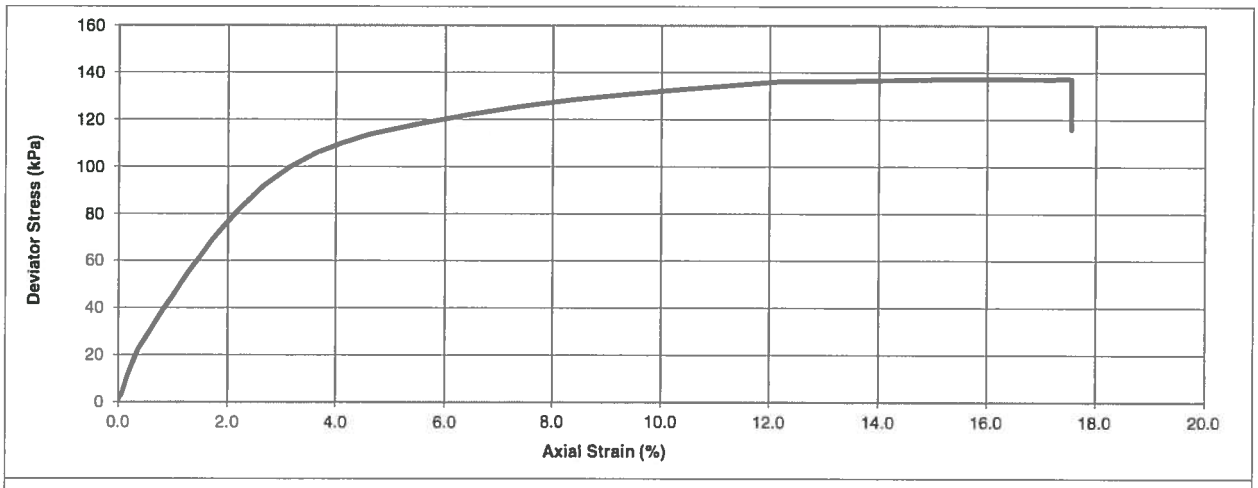
Sample Details		Specimen 1
Borehole		9
Sample No.		AS7
Depth	ft	15-17 ft
Sample Date		
Lab Ref		2103910 C
Technician Name		L. Gowry/ Azar

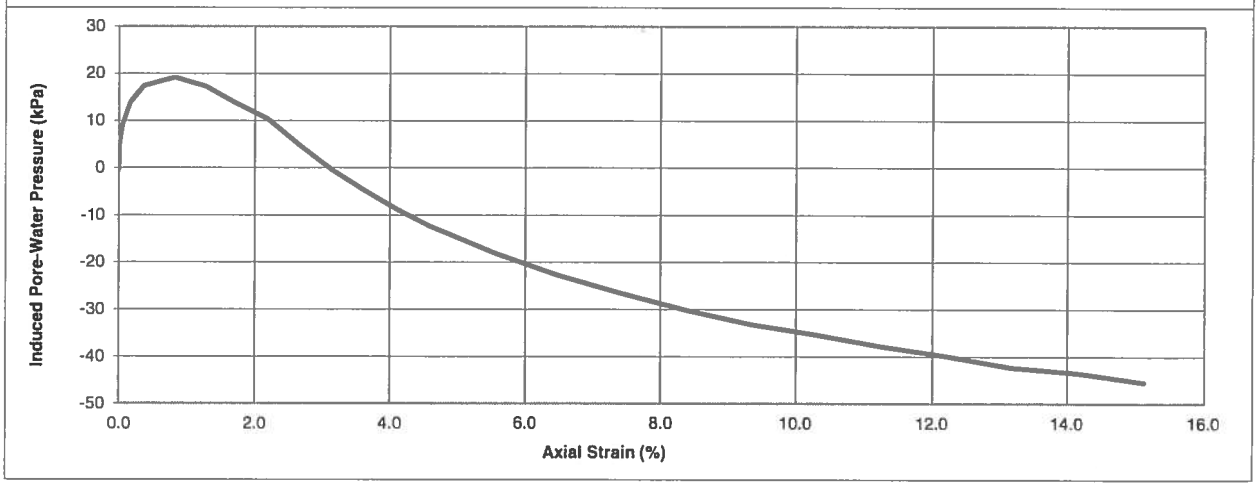
Shearing Stage

Failure Criterion		Deviator stress at 15% strain
Rate of axial strain	%/min	0.032

Response at Failure

Deviator Stress	kPa	136.3
Axial Strain	%	12.20
Effective Major Principal Stress	kPa	462.2
Effective Minor Principal Stress	kPa	325.9
Values corrected for membrane?		No
Values corrected for filter-paper strips?		Yes





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Date: 2021-12-13

Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
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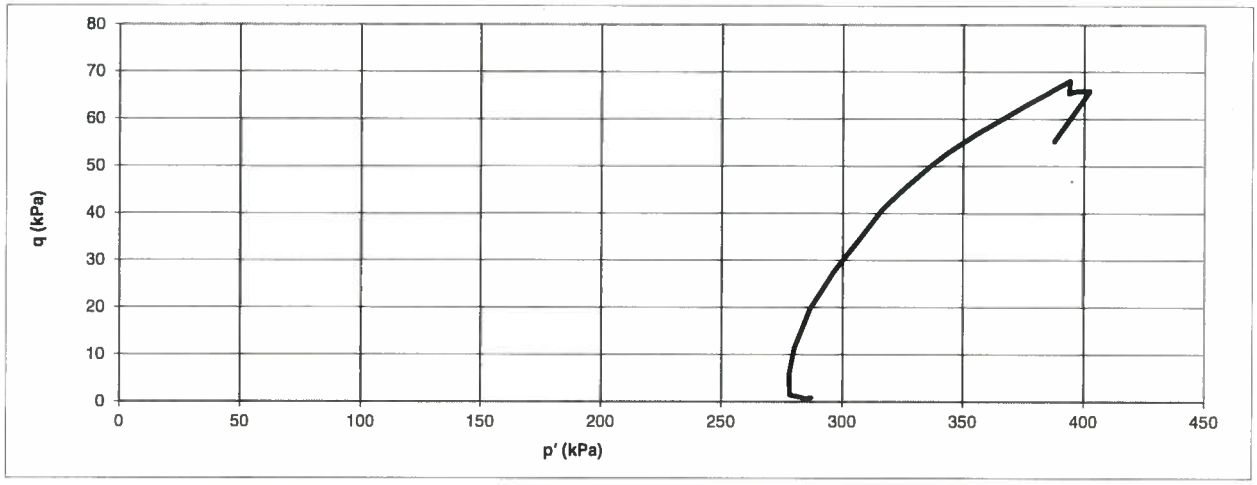
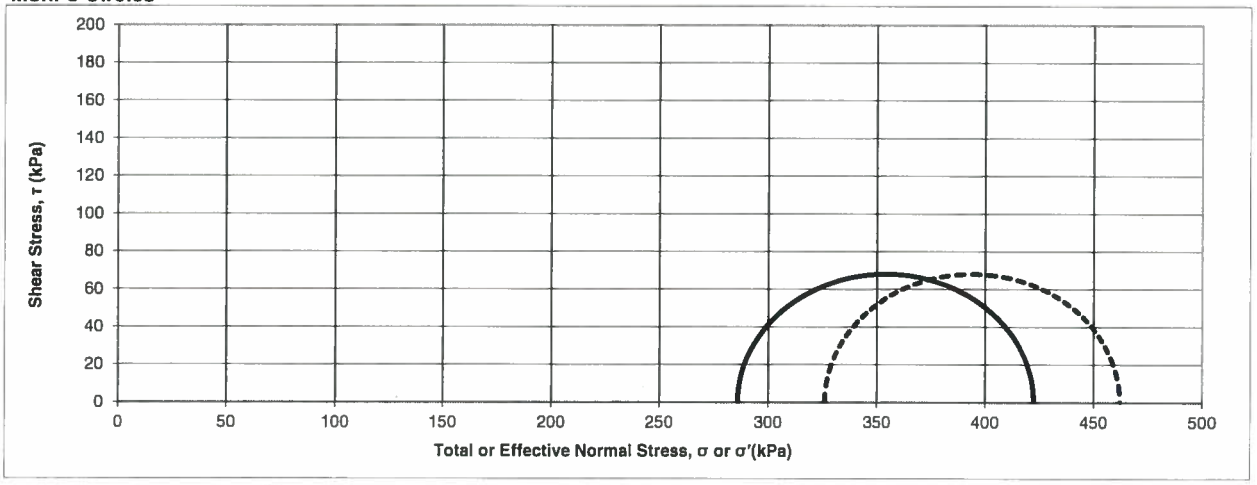
Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	9
Sample No.	AS7
Depth	15-17 ft
Sample Date	
Lab Ref	2103910 C
Technician Name	L. Gowry/ Azar



Mohr's Circles



*Solid circle = Total Stress Dashed circle = Effective Stress

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2103910 C.bhl\2103910 C CUT
Date: 2021-12-13
Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
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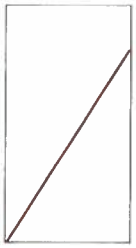
Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4764

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	Specimen 1
Borehole	9
Sample No.	AS7
Depth	15-17 ft
Sample Date	
Lab Ref	2103910 C
Technician Name	L. Gowry/ Azar

Failure Sketch of the Specimen



Photograph of the Specimen

Filename: C:\Users\User\Documents\GDS\21TF001A.jobl\2103910 C.bhl\[2103910 C CUT
Date: 2021-12-13

Checked by: J. Noor Date: 2021-07-13
Approved by: G. Uwimana Date: 2021-07-13

Peto MacCallum Ltd.
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Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

Borehole 9, Sample AS7, Depth 15-17 ft

Soil Type		Silty Clay and some Gravel
Specimen Height	(mm)	110.39
Specimen Diameter	(mm)	50.7
W_o	(%)	11.4
Dry Density	(Mg/m^3)	2.083
Confining Pressure	(kPa)	286
Average Rate of Strain	(%/hr)	0.03
Maximum Deviator Stress (σ1-σ3)	(kPa)	136.3
Axial Strain at maximum (σ1-σ3),	(%)	12.2
Shear Stress at maximum (σ1-σ3)	(kPa)	68.1
γ	(kN/m^3)	0.02041

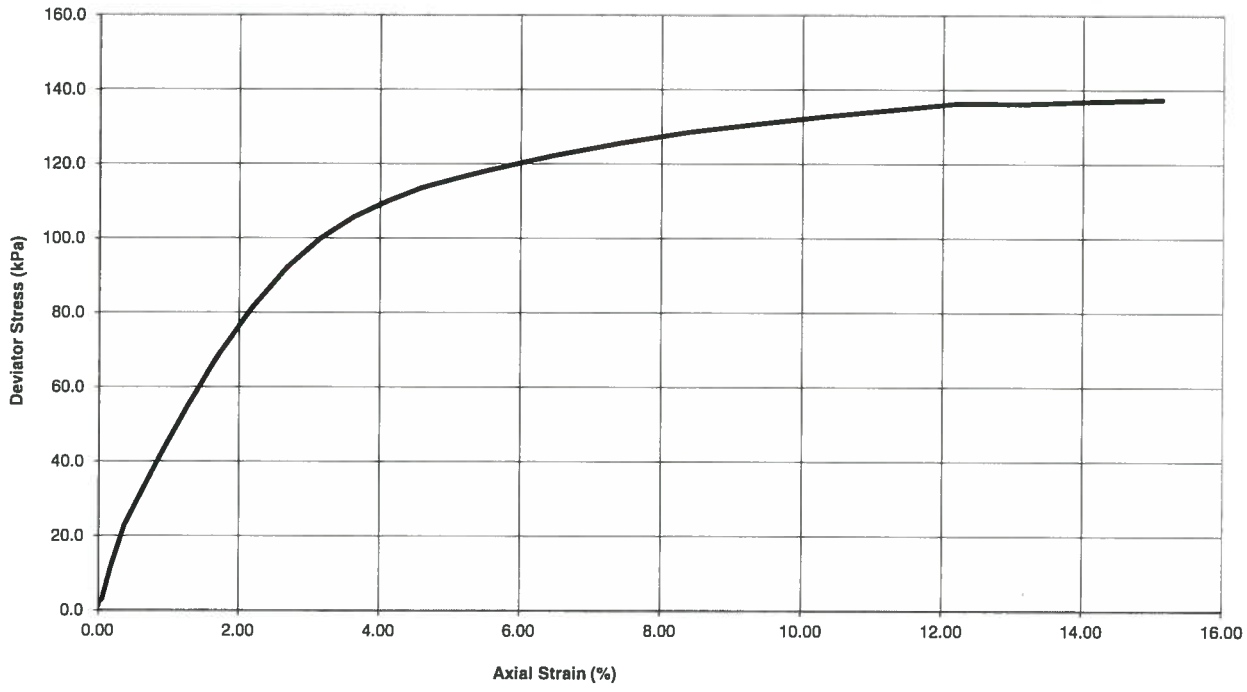

FIGURE No:

PML Ref: 21TF001A
Lab Ref: 2103910 C

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Date: 2021-12-13
Checked by: J. Noor Date: 2021-09-30
Approved by: G. Uwimana Date: 2021-09-30

Peto MacCallum Ltd.
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Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details

Borehole	11
Sample Number	5
Depth	10-12 ft
Sample Date	
Lab Ref	2104619 B
Technician Name	L. Gowry

Soil Description & Classification

Grey Clayey Silt and Sand

Specific Gravity of Solids		2.700
Liquid Limit	%	28
Plastic Limit	%	19
Plasticity Index	%	9

Additional Notes (unusual conditions or other information necessary to interpret the test results):

Specimen was reconstituted at optimum moisture content.

Departures from the test procedure outlined in ASTM D4767-11:

Grain Size Distribution

Gravel, retained on No. 4 Sieve	%	2.2
Coarse Sand, retained on No. 10 Sieve	%	7.2
Medium Sand, retained on No. 40 Sieve	%	6.3
Fine Sand, retained on No. 200 Sieve	%	2.1
Silt, 0.074 to 0.005 mm	%	32.7
Clay, smaller than 0.005 mm	%	31.0
Colloids, smaller than 0.001 mm	%	17.0

Initial Specimen Conditions

Height	mm	106.35
Diameter	mm	50.79
Dry Unit Weight	Mg/m^3	2.050
Void Ratio		0.32
Water Content	%	11.54
Degree of Saturation	%	98.9
Method used for obtaining water content		Entire Specimen

Membrane Properties

Young's Modulus	kPa	1400
Thickness	mm	0.530

Filter-Paper Strip Properties

Load carried per unit length	kN/mm	0.00019
Specimen perimeter covered by strips	mm	78.6

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	11
Sample No.	5
Depth	10-12 ft
Sample Date	
Lab Ref	2104619 B
Technician Name	L. Gowry

Test Setup

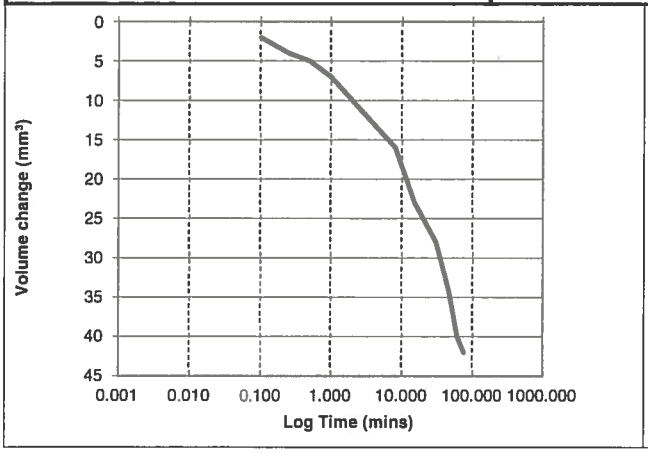
Date Started	2021-08-31
Date Finished	2021-09-07
Top Drain Used	Y
Base Drain Used	Y
Side Drains Used (Filter-Paper Strips)	Y
Pressure System Number	2
Cell Number	4

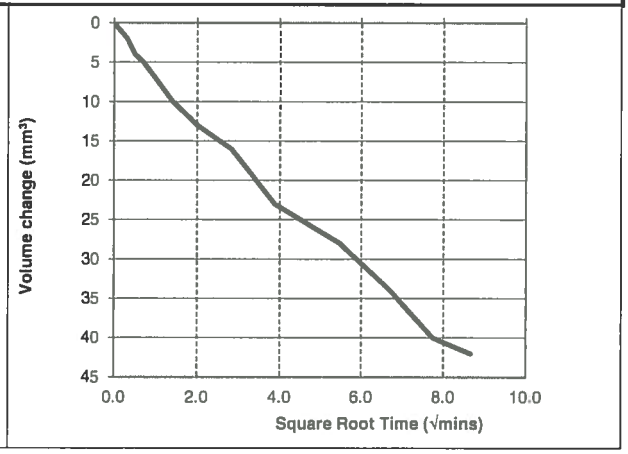
Measurement of Pore Pressure Parameter

Cell Pressure Increment	kPa	35.0
Cell Pressure at B determination	kPa	370.0
Back Pressure at B determination	kPa	325.0
Pore Pressure at B determination	kPa	358.2
Pore Pressure Parameter B		0.949
Method used for specimen saturation		Wet

End of Consolidation Stage

Effective Consolidation Stress	kPa	13.5
Total Back Pressure	kPa	356.0
Time to 50 % primary consolidation	min	10.2
Interpretation method used for t50		2
Dry Unit Weight	Mg/m^3	2.007
Void Ratio		0.34
Water Content	%	12.70
Degree of Saturation	%	100.0
Cross-sectional Area, A_c	mm^2	2069.2
Method used to determine Area, A_c		B





*Solid line = Volume change
Dashed line = Axial displacement

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2104619 B final.bhl\[2104619 B.xls
Date: 2021-12-13
Checked by: J. Noor Date: 2021-09-30
Approved by: G. Uwimana Date: 2021-09-30

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

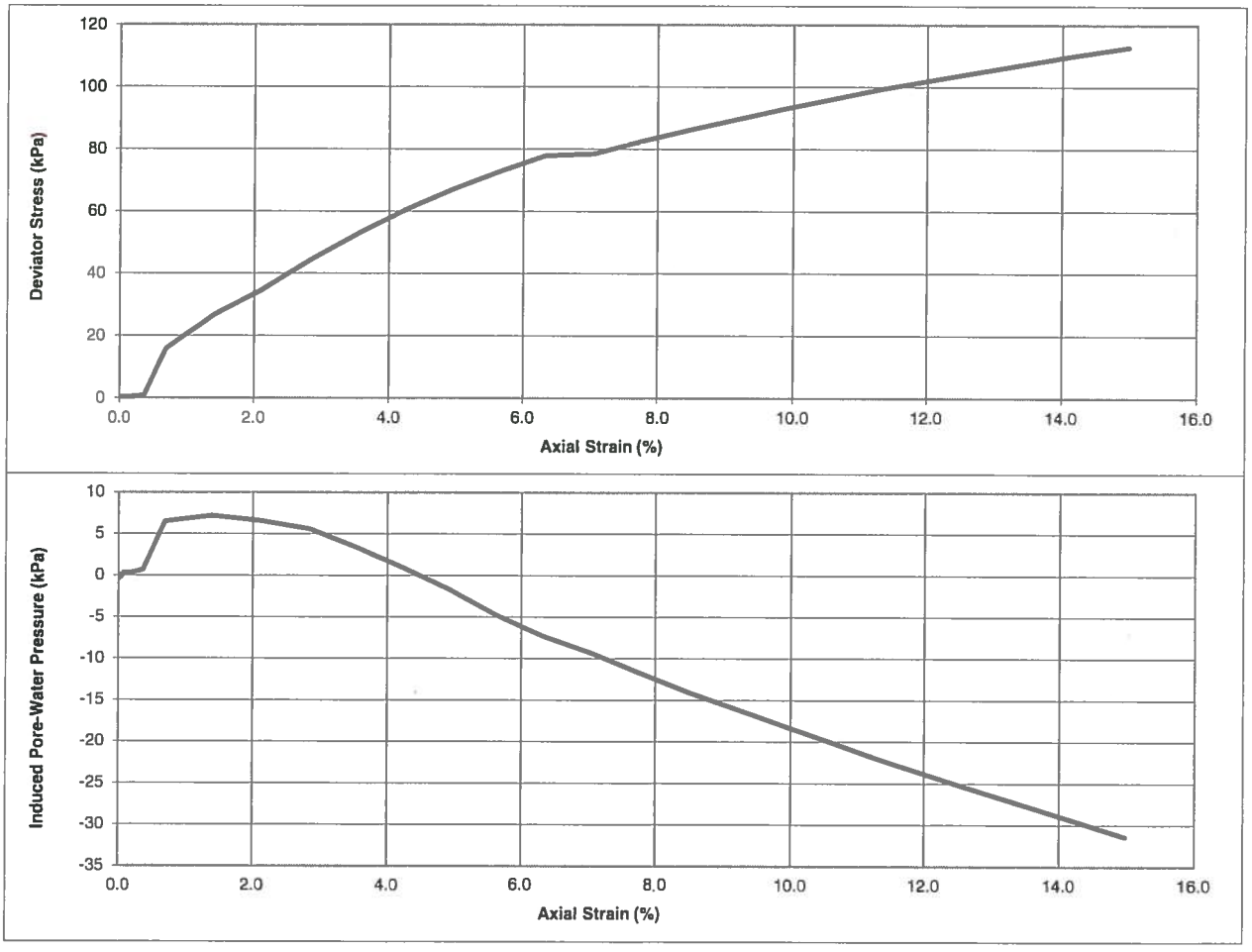
Sample Details	**Specimen 1**
Borehole	11
Sample No.	5
Depth	10-12 ft
Sample Date	
Lab Ref	2104619 B
Technician Name	L. Gowry

Shearing Stage

Failure Criterion		Deviator Stress at 15% strain
Rate of axial strain	%/min	0.047

Response at Failure

Deviator Stress	kPa	112.9
Axial Strain	%	15.00
Effective Major Principal Stress	kPa	145.3
Effective Minor Principal Stress	kPa	32.4
Values corrected for membrane?		Yes
Values corrected for filter-paper strips?		Yes



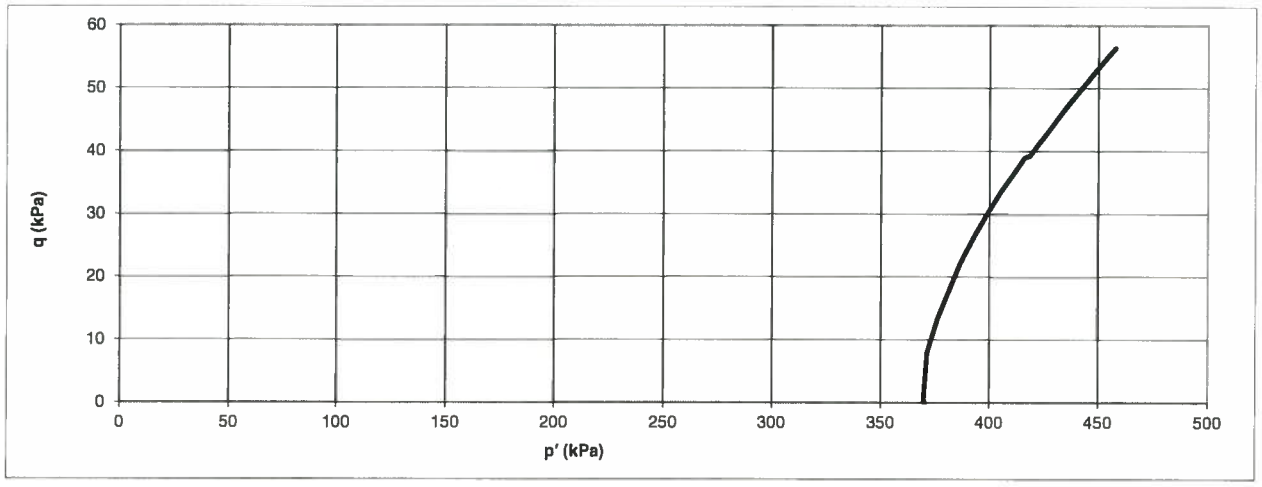
Filename: C:\Users\User\Documents\GDS\21TF001A.jpb\2104619 B final.bh\[2104619 B.
Date: 2021-12-13
Checked by: J. Noor Date: 2021-09-30
Approved by: G. Uwimana Date: 2021-09-30

Peto MacCallum Ltd.
CONSULTING ENGINEERS

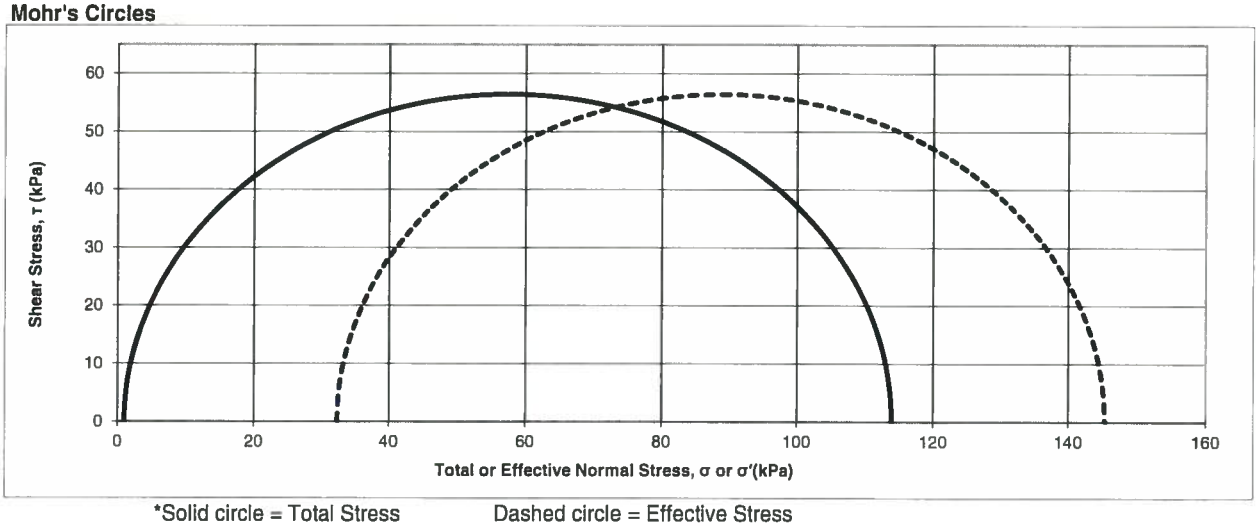
Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	Specimen 1
Borehole	11
Sample No.	5
Depth	10-12 ft
Sample Date	
Lab Ref	2104619 B
Technician Name	L. Gowry



Mohr's Circles



*Solid circle = Total Stress Dashed circle = Effective Stress

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2104619 B final.bhl\[2104619 B
Date: 2021-12-13
Checked by: J. Noor Approved by: G. Uwimana
Date: 2021-09-30 Date: 2021-09-30

Filename: C:\Users\User\Documents\GDS\21TF001A.job\2104619 B final.bht\2104619 B.
Date: 2021-12-13
Checked by: J. Noor Date: 2021-09-30
Approved by: G. Uwimana Date: 2021-09-30

Peto MacCallum Ltd.
CONSULTING ENGINEERS

Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D4767

PML Ref.	21TF001A
Client	The Regional Municipality of Peel
Project	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion
Project Location	Mississauga, Ontario

Sample Details	**Specimen 1**
Borehole	11
Sample No.	5
Depth	10-12 ft
Sample Date	
Lab Ref	2104619 B
Technician Name	L. Gowry

Failure Sketch of the Specimen

Photograph of the Specimen

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Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D4767

Borehole 11, Sample 5, Depth 10-12 ft

Soil Type		Grey Clayey Silt and Sand
Specimen Height	(mm)	106.35
Specimen Diameter	(mm)	50.79
W_o	(%)	11.5
Dry Density	(Mg/m^3)	2.050
Confining Pressure	(kPa)	370
Average Rate of Strain	(%/hr)	0.047
Maximum Deviator Stress (σ1-σ3)	(kPa)	112.9
Axial Strain at maximum (σ1-σ3),	(%)	15.0
Shear Stress at maximum (σ1-σ3)/2	(kPa)	56.4
γ	(kN/m^3)	0.02009

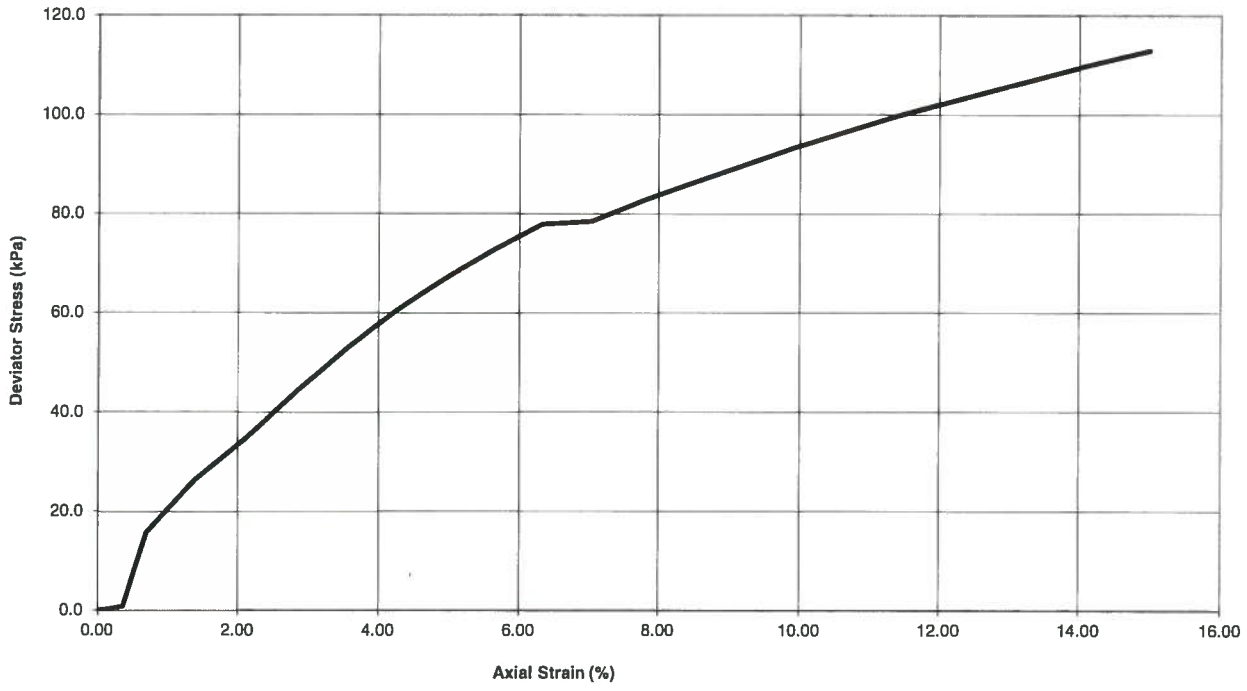

FIGURE No:

PML Ref: 21TF001A
Lab Ref: 2104619B

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STRENGTH
VH = Very High = >200 MPa
H = High = 50-200 MPa
M = Medium = 15-50 MPa
L = Low = 4-15 MPa
VL = Very Low = 1-4 MPa

WEATHERING
U = Unweathered = No signs
S = Slightly = Oxidized
M = Moderately = Discoloured
H = Highly = Friable
C = Completely = Soil-Like

DISCONTINUITY TYPE
B = Bedding Joint
J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
F = Flat = 0-20°
D = Dipping = 20-50°
V = Vertical >50°

SPACING
VW = Very Wide = >3 m
W = Wide = 1-3 m
M = Moderate = 0.3-1 m
C = Close = 5-30 cm
VC = Very Close = <5 cm

ROUGHNESS
RU = Rough Undulating
RP = Rough Planar
SU = Smooth Undulating
SP = Smooth Planar
LU = Slickensided Undulating
LP = Slickensided Planar

FILLING
T = Tight, Hard
O = Oxidized
SA = Slightly Altered, Clay Free
S = Sandy, Clay Free
Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
SC = Swelling, Soft Clay

CORE LOG IDENTIFICATION

BOREHOLE #: BH 1
PML REF.: 21TF001A
PROJECT: Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION: Aviation Road, Mississauga, Ontario
DATE: June 24, 2021
LOGGED BY: H. Racher, P.Geo.

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MI-47

RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES							OCCASIONAL FEATURES	DRILLING OBSERVATIONS
								# OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING		
1	9.75	94 (0.34 m)	67 (0.24 m)	10.11	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/L	U	3	J	F	C	RP	-	-	Large carbonate interbed at 9.93-10.11 m.	
2	10.11	100 (1.52 m)	14 (0.53 m)	11.63	GEORGIAN BAY FORMATION Slightly weathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/VL	S/U	21	J	F	VC/C	RP	-	-	Weathered shale/clay at 11.05-11.10 m; clay seam at 11.05-11.06 m & 11.10-11.28 m; large carbonate interbed at 10.54-10.67 m.	End of Borehole.

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STRENGTH
VH = Very High = >200 MPa
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VL = Very Low = 1-4 MPa

WEATHERING
U = Unweathered = No signs
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M = Moderately = Discoloured
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C = Completely = Soil-Like

DISCONTINUITY TYPE
B = Bedding Joint
J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
F = Flat = 0-20°
D = Dipping = 20-50°
V = Vertical >50°

SPACING
VW = Very Wide = >3 m
W = Wide = 1-3 m
M = Moderate = 0.3-1 m
C = Close = 5-30 cm
VC = Very Close = <5 cm

ROUGHNESS
RU = Rough Undulating
RP = Rough Planar
SU = Smooth Undulating
SP = Smooth Planar
LU = Slickensided Undulating
LP = Slickensided Planar

FILLING
T = Tight, Hard
O = Oxidized
SA = Slightly Altered, Clay Free
S = Sandy, Clay Free
Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
SC = Swelling, Soft Clay

CORE LOG IDENTIFICATION

BOREHOLE #: BH 2
PML REF.: 21TF001A
PROJECT: Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION: Aviation Road, Mississauga, Ontario
DATE: June 24, 2021
LOGGED BY: H. Racher, P.Geo.

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RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES							OCCASIONAL FEATURES	DRILLING OBSERVATIONS
								# OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING		
1	8.54	100 (1.52 m)	34 (0.51 m)	10.06	GEORGIAN BAY FORMATION Slightly weathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/VL	S/U	19	J	F	C	RP	-	-	Vertical fracture and large carbonate interbed at 8.64-8.71 m; broken/weathered rock at 8.53-8.56 m & 8.94-9.02 m; fossiliferous and bioturbation in carbonate interbeds.	
								1	J	V	-	RP	-	-		
								2	BR	-	M	-	-	-		
2	10.06	92 (1.40 m)	34 (0.51 m)	11.58	GEORGIAN BAY FORMATION Slightly weathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/VL	S/U	6	J	F	C	RP	-	-	Weathered shale/clay/broken rock at 10.21-10.36 m & 10.85-11.46 m; vertical fracture and large carbonate interbed at 10.06-10.21 m.	End of Borehole.
								1	J	D	-	RP	-	-		
								1	J	V	-	RP	-	-		
								2	BR	-	-	-	-	-		

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STRENGTH
VH = Very High = >200 MPa
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VL = Very Low = 1-4 MPa

WEATHERING
U = Unweathered = No signs
S = Slightly = Oxidized
M = Moderately = Discoloured
H = Highly = Friable
C = Completely = Soil-Like

DISCONTINUITY TYPE
B = Bedding Joint
J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
F = Flat = 0-20°
D = Dipping = 20-50°
V = Vertical >50°

SPACING
VW = Very Wide = >3 m
W = Wide = 1-3 m
M = Moderate = 0.3-1 m
C = Close = 5-30 cm
VC = Very Close = <5 cm

ROUGHNESS
RU = Rough Undulating
RP = Rough Planar
SU = Smooth Undulating
SP = Smooth Planar
LU = Slickensided Undulating
LP = Slickensided Planar

FILLING
T = Tight, Hard
O = Oxidized
SA = Slightly Altered, Clay Free
S = Sandy, Clay Free
Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
SC = Swelling, Soft Clay

CORE LOG IDENTIFICATION
BOREHOLE #: BH 3
PML REF.: 21TF001A
PROJECT: Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION: Aviation Road, Mississauga, Ontario
DATE: June 24, 2021
LOGGED BY: H. Racher, P.Geo.

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RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES # OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING	OCCASIONAL FEATURES	DRILLING OBSERVATIONS
1	7.78	97 (1.47 m)	49 (0.74 m)	9.30	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/VL	U	15	J	F	C	RP	-	-	Large carbonate interbeds at 7.97-8.20 m & 8.31-8.51 m; fossiliferous and bioturbation in carbonate interbeds; weathered broken rock at 7.95-7.97 m .	
								1	J	D	-	SP	-	-		
								1	BR	-	-	-	-	-		
2	9.30	98 (1.50 m)	53 (0.81 m)	10.82	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/VL	U	10	J	F	C	RP	-	-	Large carbonate interbed at 9.42-9.63 m; broken rock at 9.30-9.37 m, 10.01-10.06 m & 10.19-10.21 m.	End of Borehole.
								3	BR	-	C/M	-	-	-		

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STRENGTH
VH = Very High = >200 MPa
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M = Medium = 15-50 MPa
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VL = Very Low = 1-4 MPa

WEATHERING
U = Unweathered = No signs
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M = Moderately = Discoloured
H = Highly = Friable
C = Completely = Soil-Like

DISCONTINUITY TYPE
B = Bedding Joint
J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
F = Flat = 0-20°
D = Dipping = 20-50°
V = Vertical >50°

SPACING
VW = Very Wide = >3 m
W = Wide = 1-3 m
M = Moderate = 0.3-1 m
C = Close = 5-30 cm
VC = Very Close = <5 cm

ROUGHNESS
RU = Rough Undulating
RP = Rough Planar
SU = Smooth Undulating
SP = Smooth Planar
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LP = Slickensided Planar

FILLING
T = Tight, Hard
O = Oxidized
SA = Slightly Altered, Clay Free
S = Sandy, Clay Free
Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
SC = Swelling, Soft Clay

CORE LOG IDENTIFICATION
BOREHOLE #: BH 4
PML REF.: 21TF001A
PROJECT: Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION: Aviation Road, Mississauga, Ontario
DATE: June 24, 2021
LOGGED BY: H. Racher, P.Geo.

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MI-47

RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES							OCCASIONAL FEATURES	DRILLING OBSERVATIONS
								# OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING		
1	7.78	100 (1.52 m)	49 (0.74 m)	9.30	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/VL	U	15	J	F	C	RP	-	-	Vertical fracture and large carbonate interbed at 9.12-9.30 m; fossiliferous and bioturbation in carbonate interbeds.	
								1	J	D	-	SP	-	-		
								1	J	V	-	RP	-	-		
2	9.30	98 (1.50 m)	59 (0.89 m)	10.82	GEORGIAN BAY FORMATION Slightly weathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/L	S/U	12	J	F	VC/C	RP	-	-	Clay/weathered shale at 9.91-10.11 m; large carbonate interbed and vertical fracture at 9.38-9.47 m; broken rock at 9.80 - 10.11 m.	End of Borehole.
								1	BR	-	C/M	-	-	-		
								1	J	V	-	RP	-	-		

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WEATHERING
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C = Completely = Soil-Like

DISCONTINUITY TYPE
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J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
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D = Dipping = 20-50°
V = Vertical >50°

SPACING
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W = Wide = 1-3 m
M = Moderate = 0.3-1 m
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FILLING
T = Tight, Hard
O = Oxidized
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Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
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CORE LOG IDENTIFICATION

BOREHOLE #:	BH 5
PML REF.:	21TF001A
PROJECT:	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION:	Aviation Road, Mississauga, Ontario
DATE:	June 24, 2021
LOGGED BY:	H. Racher, P.Geo.

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RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES							OCCASIONAL FEATURES	DRILLING OBSERVATIONS
								# OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING		
1	10.98	100 (1.52 m)	52 (0.79 m)	12.50	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/L	U	14	J	F	C	RP	-	-	Large carbonate interbed at 10.98-11.08 m; fossiliferous and bioturbation in carbonate interbeds.	End of Borehole.

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CONSULTING ENGINEERS

STRENGTH
VH = Very High = >200 MPa
H = High = 50-200 MPa
M = Medium = 15-50 MPa
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VL = Very Low = 1-4 MPa

WEATHERING
U = Unweathered = No signs
S = Slightly = Oxidized
M = Moderately = Discoloured
H = Highly = Friable
C = Completely = Soil-Like

DISCONTINUITY TYPE
B = Bedding Joint
J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
F = Flat = 0-20°
D = Dipping = 20-50°
V = Vertical >50°

SPACING
VW = Very Wide = >3 m
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M = Moderate = 0.3-1 m
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ROUGHNESS
RU = Rough Undulating
RP = Rough Planar
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FILLING
T = Tight, Hard
O = Oxidized
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S = Sandy, Clay Free
Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
SC = Swelling, Soft Clay

CORE LOG IDENTIFICATION
BOREHOLE #: BH 6
PML REF.: 21TF001A
PROJECT: Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION: Aviation Road, Mississauga, Ontario
DATE: June 24, 2021
LOGGED BY: H. Racher, P.Geo.

Provincial Highways: A Guide to the Description of Rock for Engineering Purposes
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RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES # OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING	OCCASIONAL FEATURES	DRILLING OBSERVATIONS
1	6.20	67 (1.02 m)	24 (0.36 m)	7.72	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/VL	U	3	J	F	C	RP	-	-	Large carbonate interbed at 6.20-6.30 m; clay seam at 6.88-6.91 m; broken rock at 6.20-6.30 m, 6.55-6.57 m, 6.81-6.83 m, 6.91-6.93 m & 7.04-7.22 m.	
								5	BR	-	C/M	-	-	-		
2	7.72	97 (1.47 m)	97 (1.47 m)	9.24	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE.	L	U	2	J	F	M	SP	-	-		
3	9.24	97 (1.47 m)	67 (1.02 m)	10.76	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/L	U	10	J	F	C	RP	-	-	Clay seam at 10.64-10.71 m ; broken rock at 9.35-9.37 m; large carbonate interbed at 9.78-9.98 m; fossiliferous and bioturbation within carbonate interbeds and shale.	
								1	BR	-	-	-	-	-		
4	10.76	87 (0.61 m)	54 (0.38 m)	11.46	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/L	U	5	J	F	C	RP	-	-	Fossiliferous within carbonate interbeds; large carbonate interbed at 10.97-11.46 m.	End of Borehole.

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STRENGTH
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H = High = 50-200 MPa
M = Medium = 15-50 MPa
L = Low = 4-15 MPa
VL = Very Low = 1-4 MPa

WEATHERING
U = Unweathered = No signs
S = Slightly = Oxidized
M = Moderately = Discoloured
H = Highly = Friable
C = Completely = Soil-Like

DISCONTINUITY TYPE
B = Bedding Joint
J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
F = Flat = 0-20°
D = Dipping = 20-50°
V = Vertical >50°

SPACING
VW = Very Wide = >3 m
W = Wide = 1-3 m
M = Moderate = 0.3-1 m
C = Close = 5-30 cm
VC = Very Close = <5 cm

ROUGHNESS
RU = Rough Undulating
RP = Rough Planar
SU = Smooth Undulating
SP = Smooth Planar
LU = Slickensided Undulating
LP = Slickensided Planar

FILLING
T = Tight, Hard
O = Oxidized
SA = Slightly Altered, Clay Free
S = Sandy, Clay Free
Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
SC = Swelling, Soft Clay

CORE LOG IDENTIFICATION
BOREHOLE #: BH 7
PML REF.: 21TF001A
PROJECT: Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION: Aviation Road, Mississauga, Ontario
DATE: June 24, 2021
LOGGED BY: H. Racher, P.Geo.

Provincial Highways: A Guide to the Description of Rock for Engineering Purposes
MI-47

RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES # OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING	OCCASIONAL FEATURES	DRILLING OBSERVATIONS
1	9.25	85 (0.69 m)	57 (0.46 m)	10.06	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE.	L	U	4	J	F	C	RP	-	-	Broken rock at 9.25-9.27 m.	
								1	BR	-	C/M	-	-	-		
2	10.06	+100 (1.72 m)	55 (0.84 m)	11.58	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE with minor, unweathered, fine to medium grained, thin bedded, grey, moderately hard, calcareous CARBONATE interbeds.	M/L	U	10	J	F	C	RP	-	-	Large carbonate interbeds at 10.19-10.36 m, 11.07-11.18 m & 11.45-11.51 m; broken rock at 10.72-10.74 m, 10.90-11.07 m, 11.25-11.28 m, 11.40-11.43 m & 11.71-11.76 m; large carbonate interbed and vertical fracture at 10.54-10.72 m; fossiliferous within carbonate interbeds.	End of Borehole.
								1	J	V	-	RP	-	-		
								5	BR	-	C/M	-	-	-		

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STRENGTH
VH = Very High = >200 MPa
H = High = 50-200 MPa
M = Medium = 15-50 MPa
L = Low = 4-15 MPa
VL = Very Low = 1-4 MPa

WEATHERING
U = Unweathered = No signs
S = Slightly = Oxidized
M = Moderately = Discoloured
H = Highly = Friable
C = Completely = Soil-Like

DISCONTINUITY TYPE
B = Bedding Joint
J = Cross Joint
F = Fault
S = Shear Plane
BR = Broken Rock

ORIENTATION
F = Flat = 0-20°
D = Dipping = 20-50°
V = Vertical >50°

SPACING
VW = Very Wide = >3 m
W = Wide = 1-3 m
M = Moderate = 0.3-1 m
C = Close = 5-30 cm
VC = Very Close = <5 cm

ROUGHNESS
RU = Rough Undulating
RP = Rough Planar
SU = Smooth Undulating
SP = Smooth Planar
LU = Slickensided Undulating
LP = Slickensided Planar

FILLING
T = Tight, Hard
O = Oxidized
SA = Slightly Altered, Clay Free
S = Sandy, Clay Free
Si = Sandy, Silty, Minor Clay
NC = Non-softening Clay
SC = Swelling, Soft Clay

CORE LOG IDENTIFICATION

BOREHOLE #:	BH 8
PML REF.:	21TF001A
PROJECT:	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION:	Aviation Road, Mississauga, Ontario
DATE:	June 24, 2021
LOGGED BY:	H. Racher, P.Geo.

Provincial Highways: A Guide to the Description of Rock for Engineering Purposes
MI-47

RUN #	DEPTH TO (m)	CORE RECOVERY (%)	RQD (%)	DEPTH TO (m)	GENERAL DESCRIPTION	STRENGTH	WEATHERING	DISCOUNTINUITIES							OCCASIONAL FEATURES	DRILLING OBSERVATIONS
								# OF SETS	TYPE	ORIENTATION	SPACING	ROUGHNESS	APERTURE	FILLING		
1	10.21	100 (1.52 m)	27 (0.41 m)	11.73	GEORGIAN BAY FORMATION Unweathered, very fine grained to fissile, thinly laminated, dark grey, soft, slightly calcareous, SHALE.	M/VL	U	24	J	F	VC/C	RP	-	-	Large carbonate interbeds at 10.21-10.31 m, 10.62-10.77m & 10.61-11.73 m.	End of Borehole.

Core Photographs

Borehole 1

RC1 and RC2

Borehole 2

RC1 and RC2

Borehole 3

RC1 and RC2

Borehole 4

RC1 and RC1

Borehole 5

RC1

Borehole 6

RC1 and RC1

RC3 and RC4

Borehole 7

RC1 and RC1

Borehole 8

RC1

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UNIAXIAL COMPRESSIVE STRENGTH OF ROCK CORE

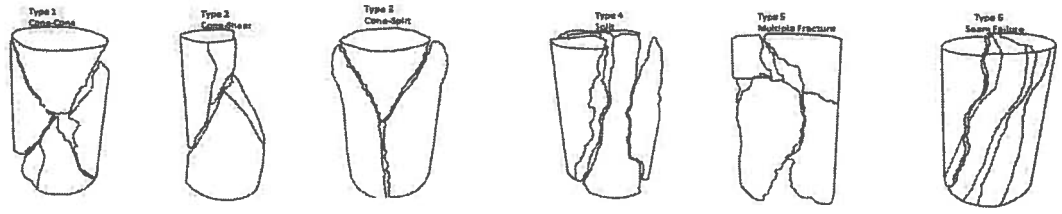
ASTM D7012

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	LAB NO.	2103911 K
SAMPLE IDENTIFICATION	BH1, Run1, 32'7"-33'	DATE SAMPLED	
		DATE TESTED	2021-07-16
		TESTED BY	L. Gowry

CORE DIMENSIONS		COMPRESSIVE STRENGTH	
SPECIMEN DIAMETER (in.)	2.4693	TEST TIME (min) (spec. 2 to 15)	9:36
SPECIMEN LENGTH (in.)	4.768	MAXIMUM LOAD APPLIED (kN)	371.40
	4.774		
	4.768	COMPRESSIVE STRENGTH (MPa)	120.2
AVE.	4.77	TYPE OF FAILURE	5
SURFACE AREA (sq mm)	3090	LENGTH TO DIAMETER RATIO (spec 2-2.5)	1.93

MOISTURE CONTENT		UNIT WEIGHT	
WEIGHT OF WET SAMPLE + TARE (g)	1024.76	WEIGHT OF DRY SAMPLE IN AIR (g)	996.35
WEIGHT OF DRY SAMPLE + TARE (g)	1019.50	VOLUME OF SAMPLE (cu m)	0.000374
WEIGHT OF WATER (g)	5.26	Density (kg/cu m)	2662
WEIGHT OF TARE (g)	148.52	UNIT WEIGHT (γ)	26.08
WEIGHT OF DRY SAMPLE (g)	870.98		
MOISTURE CONTENT (%)	0.6		

REMARKS Length to Diameter ratio is less than 2.



REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
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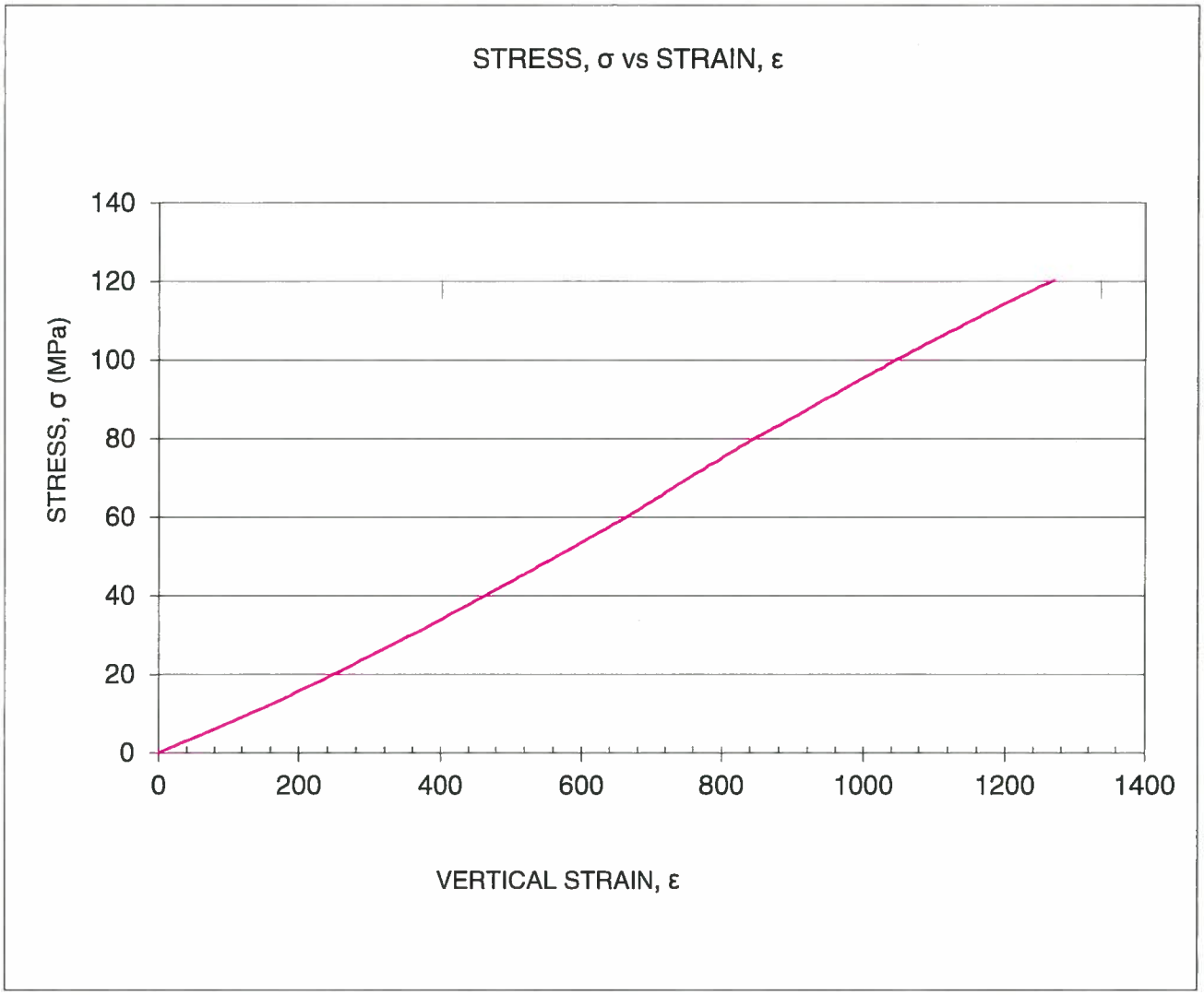
ELASTIC MODULI OF ROCK CORE IN UNIAXIAL COMPRESSION

ASTM D7012

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	*LAB NO.*	2103911 K
SAMPLE IDENTIFICATION	BH1, Run1, 32'7"-33'	*DATE SAMPLED*	
YOUNG'S MODULUS, E_{tan} (at 50% σ)	107.9 GPa	*DATE TESTED*	2021-07-16
YOUNG'S MODULUS, E_{sec} (at 50% σ)	90.5 GPa	*TESTED BY*	L. Gowry
YOUNG'S MODULUS, $E_{ave.}$ (at 50% σ)	99.2 GPa	*POISSON'S RATIO*	0.427



REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
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ROCK CORE DIMENSIONS
ASTM D4543

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street F
SAMPLE IDENTIFICATION BH1, Run1, 32'7"-33'

PML REF 21TF001A
LAB NO. 2103911 K
DATE SAMPLED
DATE TESTED 2021-07-13
TESTED BY TA/ L. Gowry

DEVIATION FROM STRAIGHTNESS

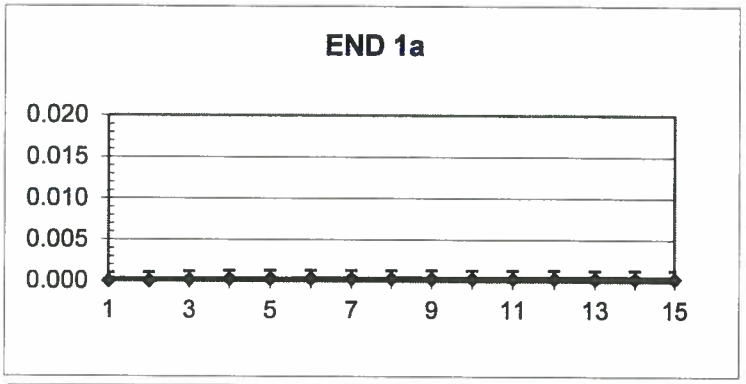
DIAL READING (IN)	TRIAL 1	2	3
MINIMUM	0.0000	0.0070	0.0030
MAXIMUM	0.0020	0.0090	0.0080
DIFFERENCE	0.0020	0.0020	0.0050
MAX DIFF.	0.005	SPEC.	0.020 max.

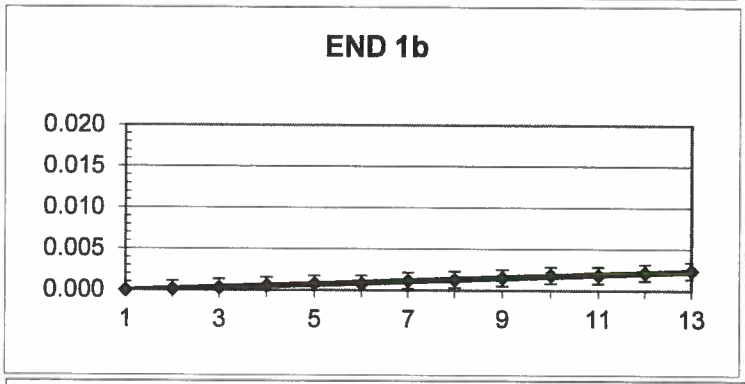
FLATNESS TOLERANCE

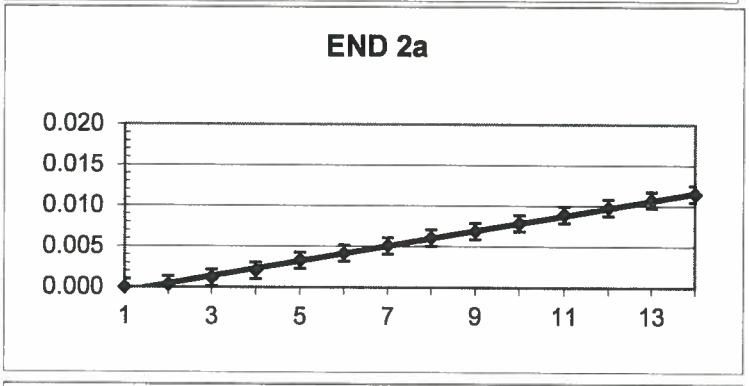
DIAL READING (IN)	END 1 SET 1	SET 2	END 2 SET 1	SET 2
RDG 1	0.0000	0.0000	0.0000	0.0000
RDG 2	0.0001	0.0001	0.0003	0.0010
RDG 3	0.0002	0.0003	0.0012	0.0019
RDG 4	0.0003	0.0005	0.0020	0.0031
RDG 5	0.0003	0.0008	0.0033	0.0039
RDG 6	0.0003	0.0008	0.0042	0.0051
RDG 7	0.0003	0.0012	0.0051	0.0064
RDG 8	0.0003	0.0013	0.0061	0.0073
RDG 9	0.0003	0.0015	0.0069	0.0086
RDG 10	0.0003	0.0019	0.0079	0.0106
RDG 11	0.0003	0.0019	0.0089	0.0115
RDG 12	0.0003	0.0022	0.0098	0.0125
RDG 13	0.0003	0.0024	0.0107	0.0131
RDG 14	0.0003		0.0115	0.0129
RDG 15	0.0003			
RDG 16				
RDG 17				
RDG 18				
RDG 19				
RDG 20				

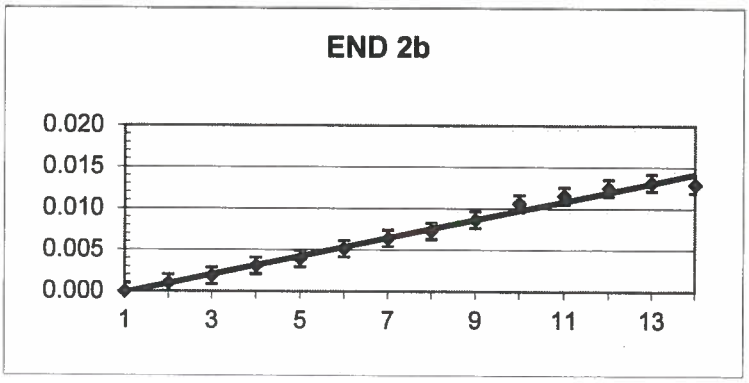
FLATNESS TOLERANCE= .001 in.

CORE DIAMETER (in.)		2.4735	2.4660	2.4685
AVE:		2.4693	PERPENDICULARITY RATIO (Specified .0043 max.)	
SLOPE OF BEST FIT LINE				
	MINIMUM	MAXIMUM		
END 1A	0.0001	0.0003	0.0001	
END 2B	0.0000	0.0024	0.0010	
END 2A	0.0000	0.0116	0.0047	
END 2B	0.0000	0.0131	0.0053	









REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK CORE

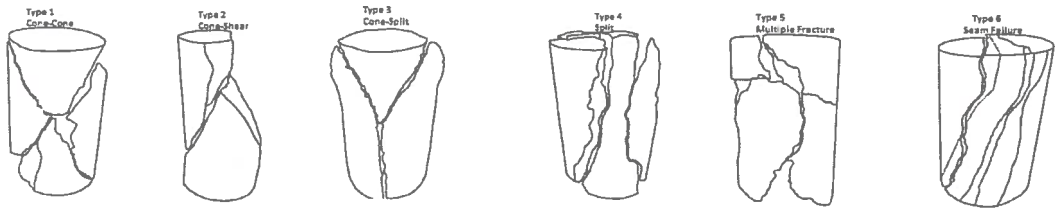
ASTM D7012

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	LAB NO.	2103911 M
SAMPLE IDENTIFICATION	BH1, Run2, 34'9"-35'2"	DATE SAMPLED	
		DATE TESTED	2021-07-15
		TESTED BY	L. Gowry

CORE DIMENSIONS		COMPRESSIVE STRENGTH	
SPECIMEN DIAMETER (in.)	2.4900	TEST TIME (min) (spec. 2 to 15)	9:36
SPECIMEN LENGTH (in.)	3.866	MAXIMUM LOAD APPLIED (kN)	347.00
	3.868		
	3.861	COMPRESSIVE STRENGTH (MPa)	110.5
AVE.	3.865	TYPE OF FAILURE	2
SURFACE AREA (sq mm)	3142	LENGTH TO DIAMETER RATIO (spec 2-2.5)	1.55

MOISTURE CONTENT		UNIT WEIGHT	
WEIGHT OF WET SAMPLE + TARE (g)	854.62	WEIGHT OF DRY SAMPLE IN AIR (g)	823.00
WEIGHT OF DRY SAMPLE + TARE (g)	853.26	VOLUME OF SAMPLE (cu m)	0.000308
WEIGHT OF WATER (g)	1.36	Density (kg/cu m)	2668
WEIGHT OF TARE (g)	98.69	UNIT WEIGHT (γ)	26.15
WEIGHT OF DRY SAMPLE (g)	754.57		
MOISTURE CONTENT (%)	0.2		

REMARKS 1.Length to Diameter ratio is less than 2.
2. No Poisson ratio was obtained due to strain gauage failure.



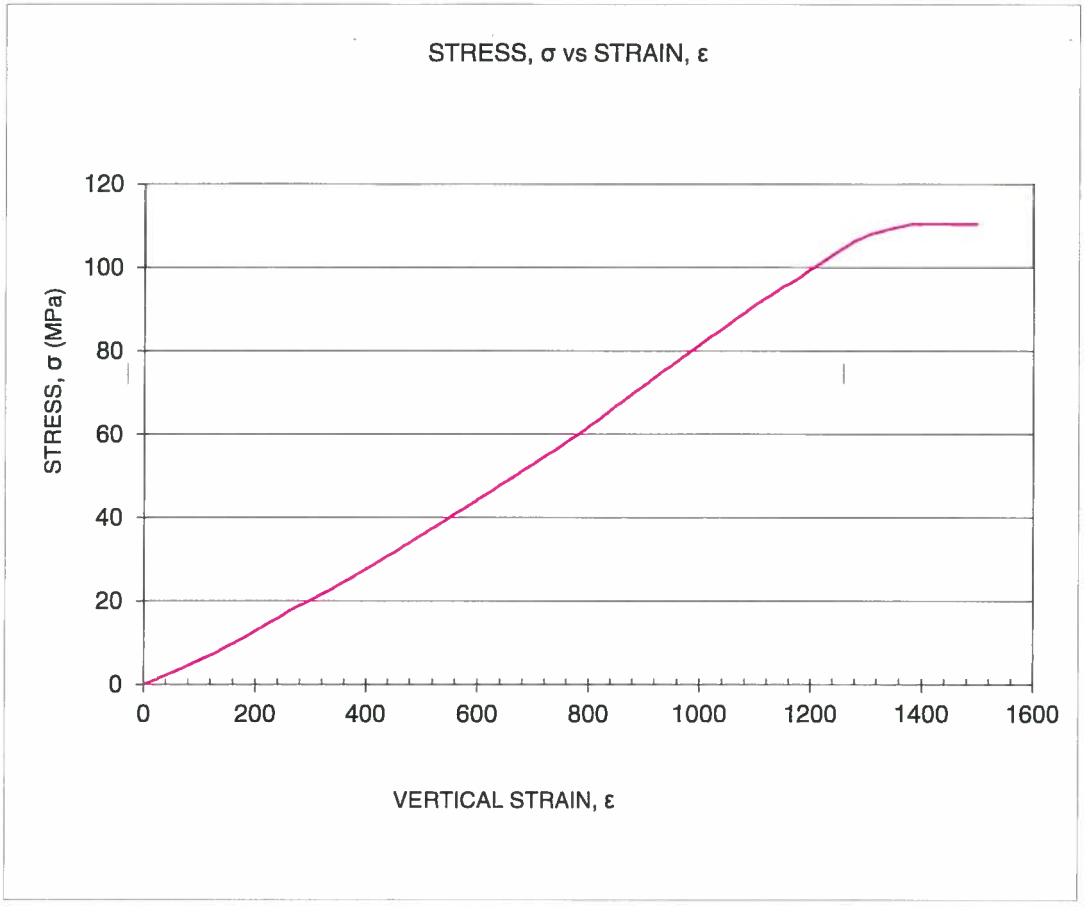
REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ELASTIC MODULI OF ROCK CORE IN UNIAXIAL COMPRESSION

ASTM D7012

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	*LAB NO.*	2103911 M
SAMPLE IDENTIFICATION	BH1, Run2, 34'9"-35'2"	*DATE SAMPLED*	
YOUNG'S MODULUS, E_{tan} (at 50% σ)	87.3 GPa	*DATE TESTED*	2021-07-15
YOUNG'S MODULUS, E_{sec} (at 50% σ)	76.0 GPa	*TESTED BY*	L. Gowry
YOUNG'S MODULUS, $E_{ave.}$ (at 50% σ)	81.6 GPa	*POISSON'S RATIO*	



REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DIMENSIONS

ASTM D4543

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street P
SAMPLE IDENTIFICATION BH1, Run2, 34'9"-35'2"

PML REF 21TF001A
LAB NO. 2103911 M
DATE SAMPLED
DATE TESTED 2021-07-13
TESTED BY TA/ L. Gowry

DEVIATION FROM STRAIGHTNESS

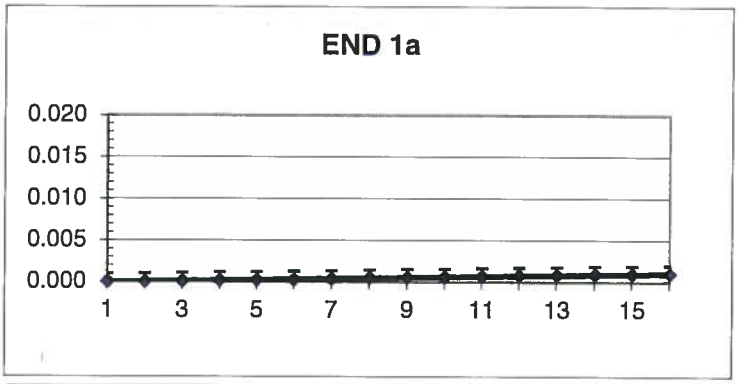
DIAL READING (IN)	TRIAL 1	TRIAL 2	TRIAL 3
MINIMUM	0.0000	0.0040	0.0030
MAXIMUM	0.0010	0.0090	0.0080
DIFFERENCE	0.0010	0.0050	0.0050
MAX DIFF.	0.005	SPEC.	0.020 max.

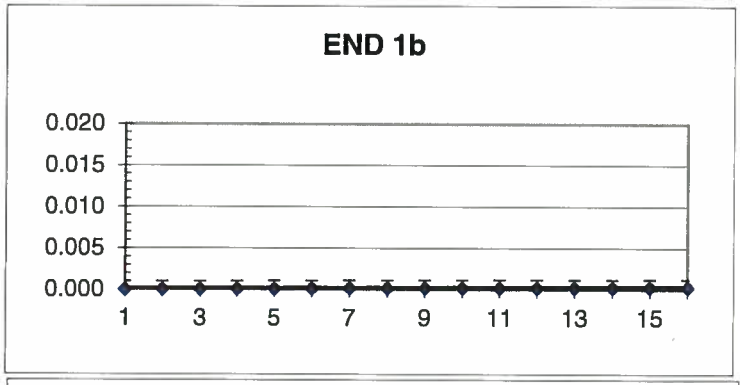
FLATNESS TOLERANCE

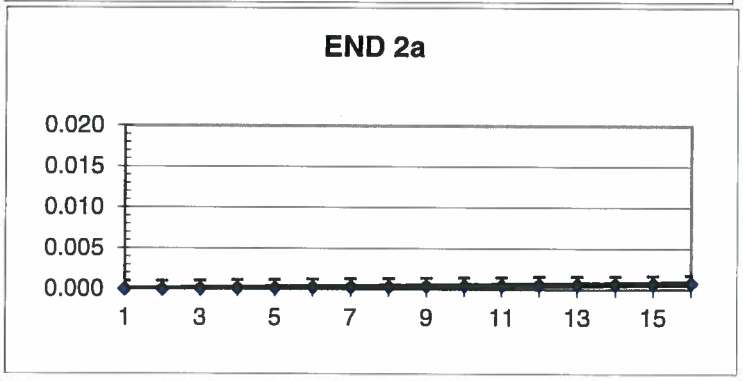
DIAL READING (IN)	END 1 SET 1	END 1 SET 2	END 2 SET 1	END 2 SET 2
RDG 1	0.0000	0.0000	0.0000	0.0000
RDG 2	0.0000	0.0000	0.0000	0.0000
RDG 3	0.0001	0.0000	0.0001	0.0000
RDG 4	0.0002	0.0001	0.0001	0.0001
RDG 5	0.0002	0.0001	0.0002	0.0001
RDG 6	0.0003	0.0001	0.0002	0.0001
RDG 7	0.0003	0.0001	0.0003	0.0001
RDG 8	0.0005	0.0001	0.0003	0.0001
RDG 9	0.0005	0.0002	0.0004	0.0001
RDG 10	0.0006	0.0002	0.0004	0.0002
RDG 11	0.0007	0.0002	0.0005	0.0002
RDG 12	0.0007	0.0002	0.0005	0.0002
RDG 13	0.0008	0.0002	0.0006	0.0002
RDG 14	0.0009	0.0002	0.0006	0.0002
RDG 15	0.0009	0.0003	0.0007	0.0002
RDG 16	0.0010	0.0003	0.0008	0.0002
RDG 17				
RDG 18				
RDG 19				
RDG 20				

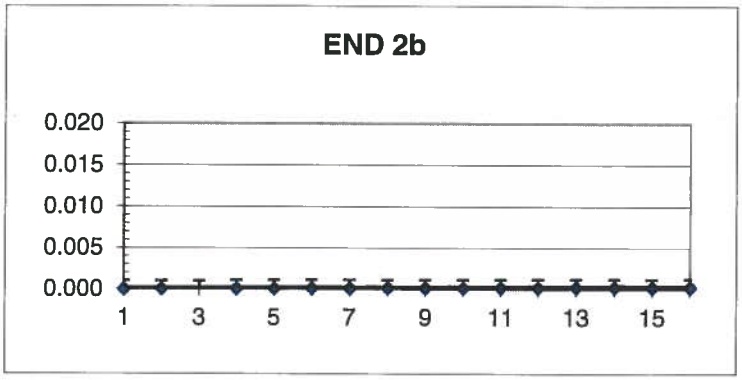
FLATNESS TOLERANCE= .001 in.

CORE DIAMETER (in.)		2.4940	2.4900	2.4860
AVE:		2.4900	PERPENDICULARITY RATIO (Specified .0043 max.)	
SLOPE OF BEST FIT LINE				
	MINIMUM	MAXIMUM		
END 1A	0.0000	0.0010	0.0004	
END 2B	0.0000	0.0003	0.0001	
END 2A	0.0000	0.0007	0.0003	
END 2B	0.0000	0.0002	0.0001	









REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

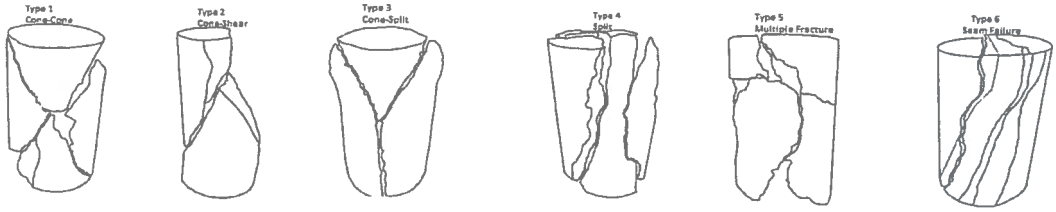
UNIAXIAL COMPRESSIVE STRENGTH OF ROCK CORE

ASTM D7012

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	LAB NO.	2106994A
SAMPLE IDENTIFICATION	BH3, Run2, 31' 8"	DATE SAMPLED	
		DATE TESTED	2021-11-16
		TESTED BY	L. Gowry

CORE DIMENSIONS		COMPRESSIVE STRENGTH	
SPECIMEN DIAMETER (in.)	2.4768	TEST TIME (min) (spec. 2 to 15)	9:36
SPECIMEN LENGTH (in.)	5.807	MAXIMUM LOAD APPLIED (kN)	744.40
	5.855		
	5.820	COMPRESSIVE STRENGTH (MPa)	239.5
AVE.	5.827	TYPE OF FAILURE	TYPE4
SURFACE AREA (sq mm)	3108	LENGTH TO DIAMETER RATIO (spec 2-2.5)	2.35

MOISTURE CONTENT		UNIT WEIGHT	
WEIGHT OF WET SAMPLE + TARE (g)	1215.30	WEIGHT OF DRY SAMPLE IN AIR (g)	1240.56
WEIGHT OF DRY SAMPLE + TARE (g)	1212.61	VOLUME OF SAMPLE (cu m)	0.000460
WEIGHT OF WATER (g)	2.69	UNIT WEIGHT (kg/cu m)	2696
WEIGHT OF TARE (g)	173.65		
WEIGHT OF DRY SAMPLE (g)	1038.96		
MOISTURE CONTENT (%)	0.3		
REMARKS			



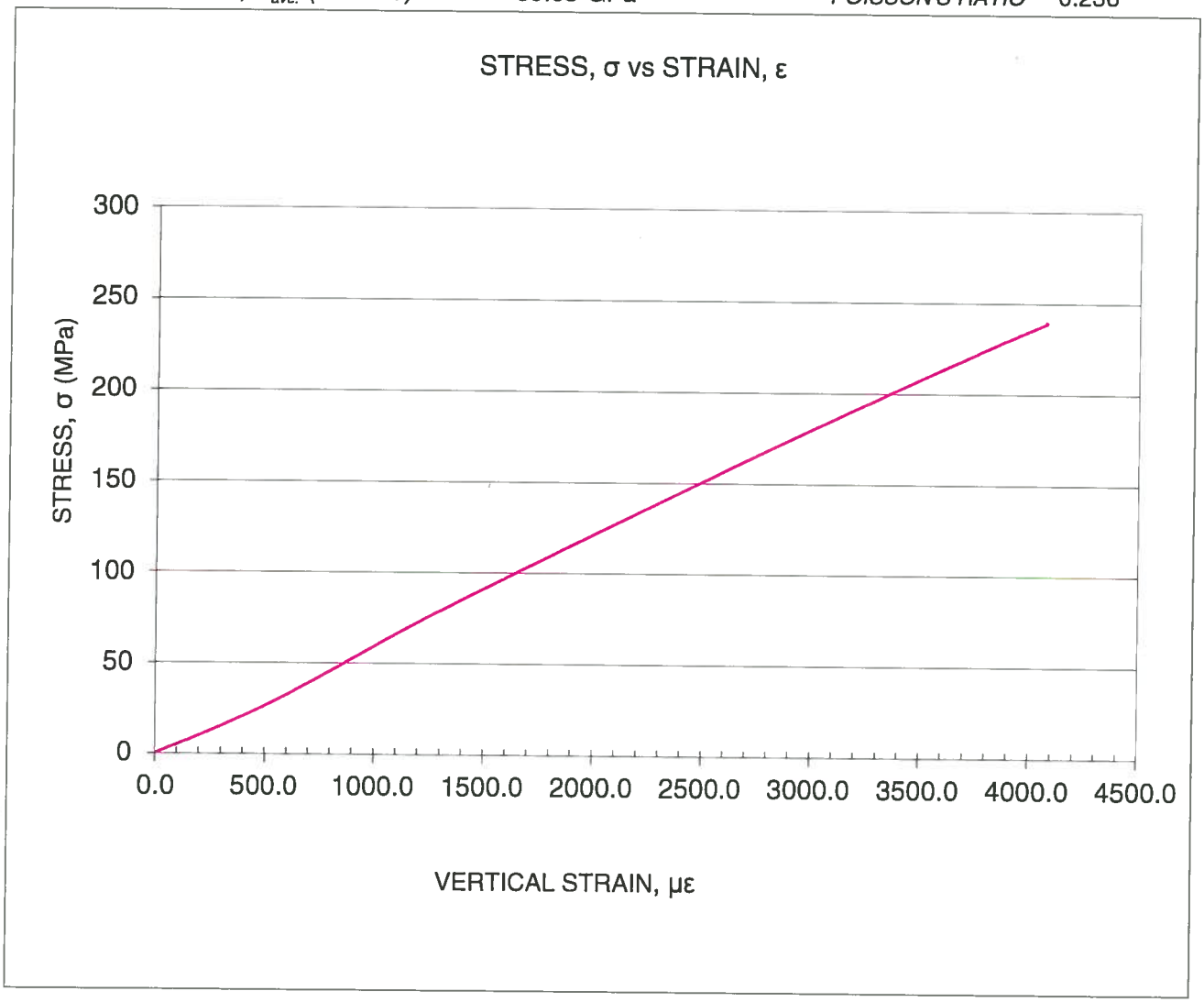
REVIEWED BY J. Noor *DATE* 2021-11-16

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ELASTIC MODULI OF ROCK CORE IN UNIAXIAL COMPRESSION

ASTM D7012

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	*LAB NO.*	2106994A
SAMPLE IDENTIFICATION	BH3, Run2, 31' 8"	*DATE SAMPLED*	
YOUNG'S MODULUS, E_{tan} (at 50% σ)	58.81 GPa	*DATE TESTED*	2021-11-16
YOUNG'S MODULUS, E_{sec} (at 50% σ)	60.56 GPa	*TESTED BY*	L. Gowry
YOUNG'S MODULUS, $E_{ave.}$ (at 50% σ)	59.68 GPa	*POISSON'S RATIO*	0.236



REVIEWED BY J. Noor *DATE* 2021-11-16

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DIMENSIONS

ASTM D4543

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street P
SAMPLE IDENTIFICATION BH3, Run2, 31' 8"

PML REF 21TF001A
LAB NO. 2106994A
DATE SAMPLED
DATE TESTED 2021-11-15
TESTED BY L. Gowry

DEVIATION FROM STRAIGHTNESS

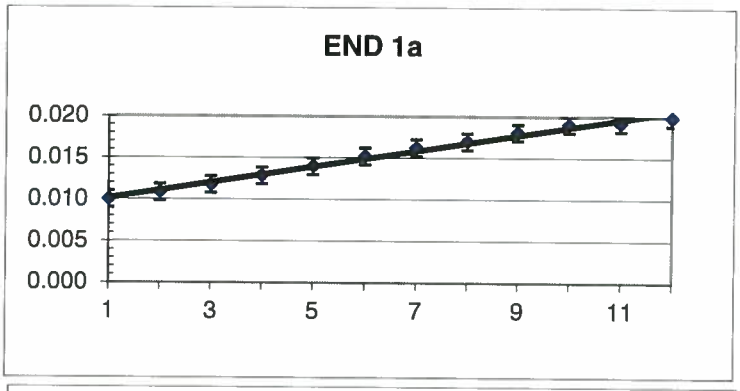
DIAL READING (IN)	TRIAL 1	TRIAL 2	TRIAL 3
MINIMUM	0.0470	0.0590	0.0620
MAXIMUM	0.0580	0.0620	0.0640
DIFFERENCE	0.0110	0.0030	0.0020
MAX DIFF.	0.011	SPEC.	0.020 max.

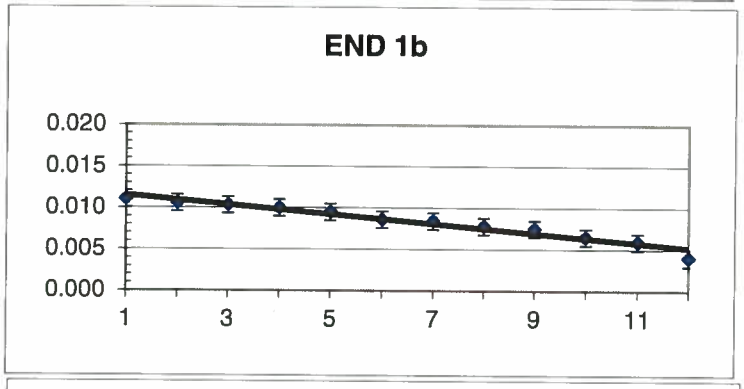
FLATNESS TOLERANCE

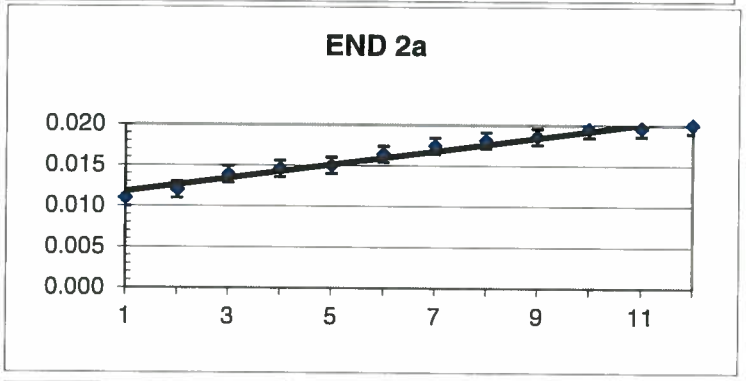
DIAL READING (IN)	END 1 SET 1	END 1 SET 2	END 2 SET 1	END 2 SET 2
RDG 1	0.0100	0.0110	0.0110	0.0105
RDG 2	0.0109	0.0106	0.0120	0.0100
RDG 3	0.0118	0.0103	0.0139	0.0099
RDG 4	0.0129	0.0100	0.0146	0.0095
RDG 5	0.0140	0.0095	0.0150	0.0087
RDG 6	0.0152	0.0086	0.0164	0.0082
RDG 7	0.0162	0.0084	0.0174	0.0078
RDG 8	0.0170	0.0078	0.0181	0.0075
RDG 9	0.0181	0.0075	0.0186	0.0064
RDG 10	0.0191	0.0065	0.0195	0.0065
RDG 11	0.0192	0.0059	0.0196	0.0056
RDG 12	0.0199	0.0040	0.0200	0.0047
RDG 13				0.0035
RDG 14				
RDG 15				
RDG 16				
RDG 17				
RDG 18				
RDG 19				
RDG 20				

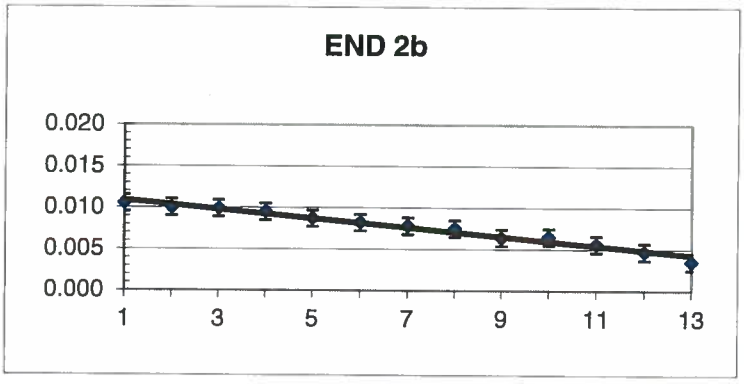
FLATNESS TOLERANCE= .001 in.

CORE DIAMETER (in.)		2.4790	2.4715	2.4800
AVE:		2.4768	PERPENDICULARITY RATIO (Specified .0043 max.)	
SLOPE OF BEST FIT LINE				
	MINIMUM	MAXIMUM		
END 1A	0.0100	0.0199	0.0040	
END 2B	0.0040	0.0110	0.0028	
END 2A	0.0110	0.0200	0.0036	
END 2B	0.0035	0.0105	0.0028	









REVIEWED BY J. Noor *DATE* 2021-11-16

Peto MacCallum Ltd.
CONSULTING ENGINEERS

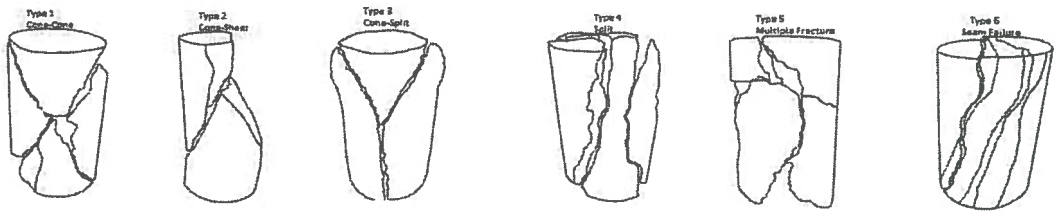
UNIAXIAL COMPRESSIVE STRENGTH OF ROCK CORE

ASTM D7012

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	LAB NO.	2103911 F
SAMPLE IDENTIFICATION	BH6, Run3, 32'4"-33'	DATE SAMPLED	
		DATE TESTED	2021-07-16
		TESTED BY	L. Gowry

CORE DIMENSIONS		COMPRESSIVE STRENGTH	
SPECIMEN DIAMETER (in.)	2.4883	TEST TIME (min) (spec. 2 to 15)	9:36
SPECIMEN LENGTH (in.)	5.989	MAXIMUM LOAD APPLIED (kN)	350.50
	6.013		
	6.004	COMPRESSIVE STRENGTH (MPa)	111.7
AVE.	6.002	TYPE OF FAILURE	2
SURFACE AREA (sq mm)	3137	LENGTH TO DIAMETER RATIO (spec 2-2.5)	2.41

MOISTURE CONTENT		UNIT WEIGHT	
WEIGHT OF WET SAMPLE + TARE (g)	1306.04	WEIGHT OF DRY SAMPLE IN AIR (g)	1280.10
WEIGHT OF DRY SAMPLE + TARE (g)	1301.60	VOLUME OF SAMPLE (cu m)	0.000478
WEIGHT OF WATER (g)	4.44	Density (kg/cu m)	2676
WEIGHT OF TARE (g)	170.23	UNIT WEIGHT (γ)	26.23
WEIGHT OF DRY SAMPLE (g)	1131.37		
MOISTURE CONTENT (%)	0.4		
REMARKS			



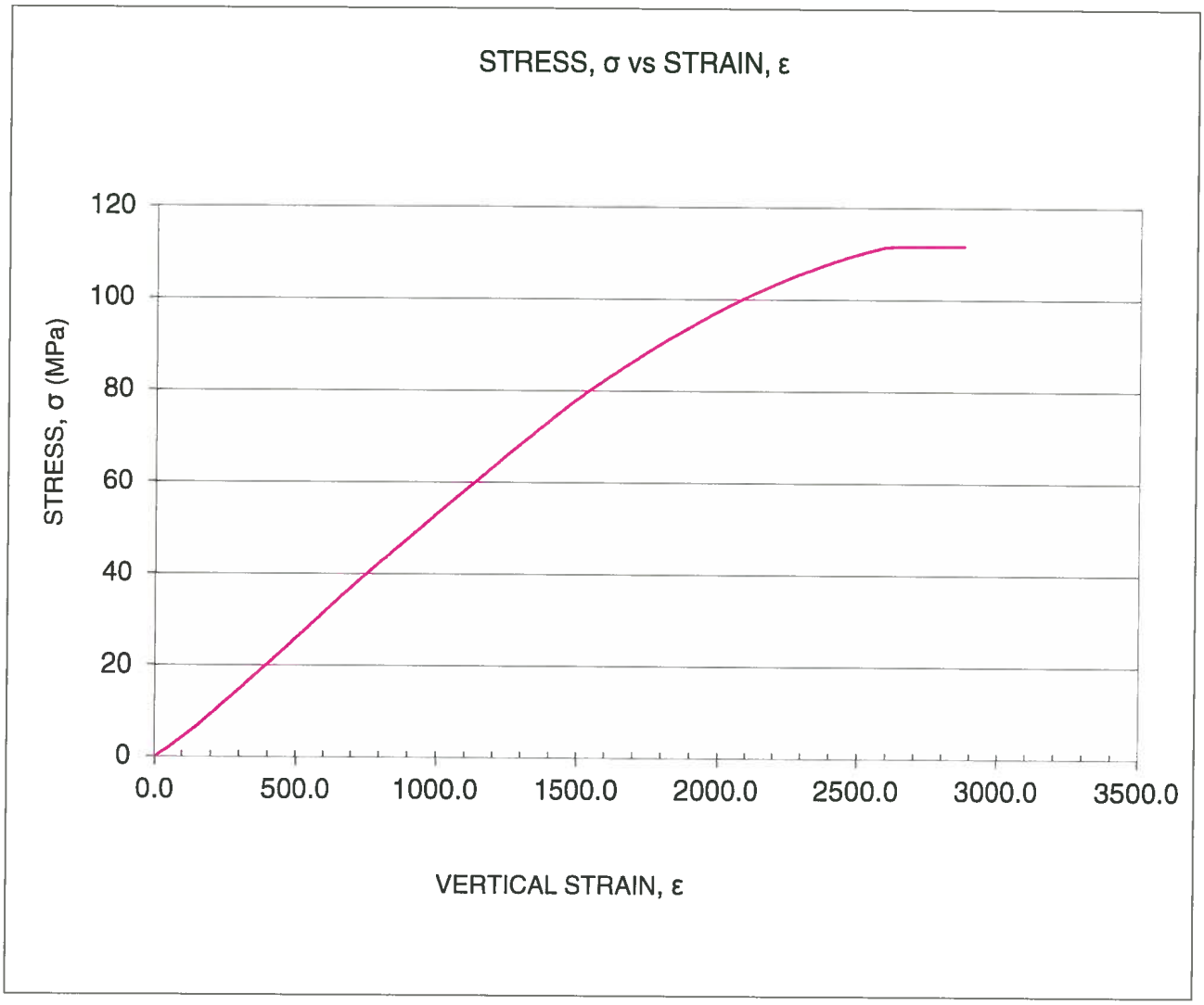
REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ELASTIC MODULI OF ROCK CORE IN UNIAXIAL COMPRESSION

ASTM D7012

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	*LAB NO.*	2103911 F
SAMPLE IDENTIFICATION	BH6, Run3, 32'4"-33'	*DATE SAMPLED*	
YOUNG'S MODULUS, E_{tan} (at 50% σ)	51.6 GPa	*DATE TESTED*	2021-07-16
YOUNG'S MODULUS, E_{sec} (at 50% σ)	53.1 GPa	*TESTED BY*	L. Gowry
YOUNG'S MODULUS, $E_{ave.}$ (at 50% σ)	52.3 GPa	*POISSON'S RATIO*	0.363



REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DIMENSIONS

ASTM D4543

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street F
SAMPLE IDENTIFICATION BH6, Run3, 32'4"-33'

PML REF 21TF001A
LAB NO. 2103911 F
DATE SAMPLED
DATE TESTED 2021-07-13
TESTED BY TA/ L. Gowry

DEVIATION FROM STRAIGHTNESS

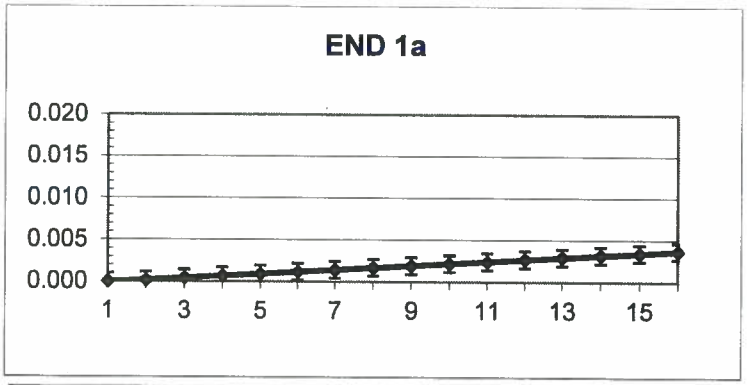
DIAL READING (IN)	TRIAL 1	2	3
MINIMUM	0.0000	0.0010	0.0000
MAXIMUM	0.0030	0.0030	0.0025
DIFFERENCE	0.0030	0.0020	0.0025
MAX DIFF.	0.003	SPEC.	0.020 max.

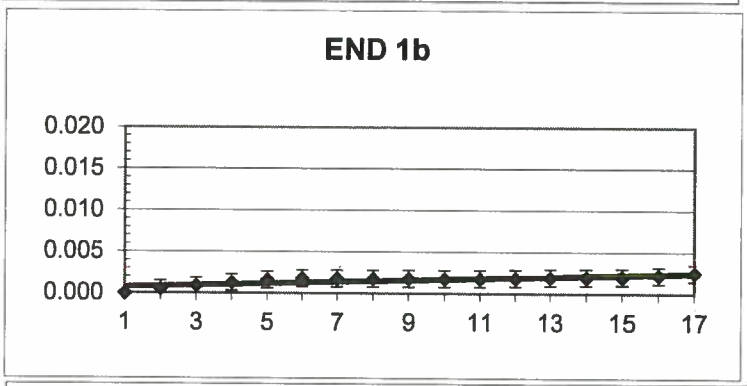
FLATNESS TOLERANCE

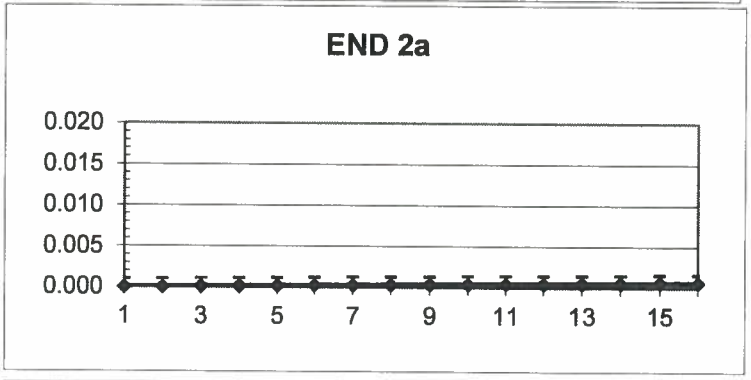
DIAL READING (IN)	END 1 SET 1	SET 2	END 2 SET 1	SET 2
RDG 1	0.0000	0.0000	0.0000	0.0000
RDG 2	0.0002	0.0005	0.0000	0.0000
RDG 3	0.0005	0.0009	0.0001	0.0000
RDG 4	0.0007	0.0013	0.0001	0.0000
RDG 5	0.0009	0.0016	0.0002	0.0000
RDG 6	0.0012	0.0018	0.0002	0.0000
RDG 7	0.0014	0.0018	0.0002	0.0001
RDG 8	0.0017	0.0018	0.0003	0.0001
RDG 9	0.0019	0.0018	0.0003	0.0001
RDG 10	0.0022	0.0018	0.0004	0.0002
RDG 11	0.0024	0.0018	0.0004	0.0002
RDG 12	0.0027	0.0019	0.0004	0.0002
RDG 13	0.0029	0.0020	0.0005	0.0003
RDG 14	0.0032	0.0020	0.0005	0.0003
RDG 15	0.0035	0.0020	0.0006	0.0003
RDG 16	0.0037	0.0022	0.0006	0.0003
RDG 17		0.0025		
RDG 18				
RDG 19				
RDG 20				

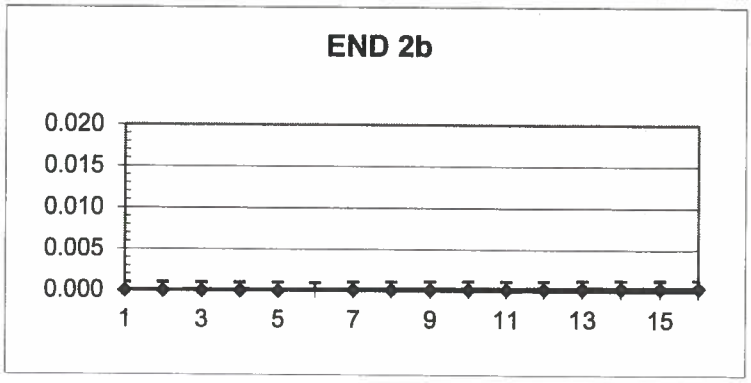
FLATNESS TOLERANCE= .001 in.

CORE DIAMETER (in.)	2.4890	2.4875	2.4885
AVE:	2.4883	PERPENDICULARITY RATIO (Specified .0043 max.)	
SLOPE OF BEST FIT LINE			
	MINIMUM	MAXIMUM	
END 1A	0.0000	0.0037	0.0015
END 2B	0.0008	0.0025	0.0007
END 2A	0.0000	0.0006	0.0002
END 2B	0.0000	0.0003	0.0001









REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

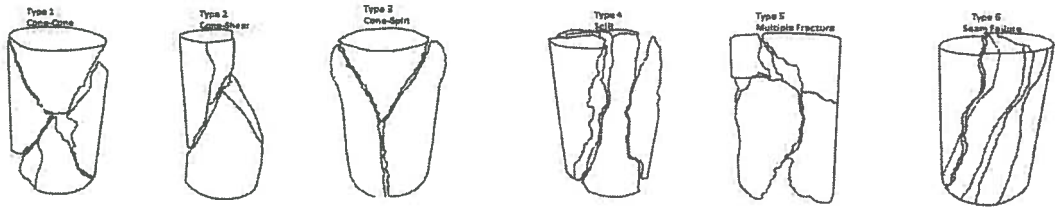
UNIAXIAL COMPRESSIVE STRENGTH OF ROCK CORE

ASTM D7012

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	LAB NO.	2103911 G
SAMPLE IDENTIFICATION	BH6, Run3, 34'-34'7"	DATE SAMPLED	
		DATE TESTED	2021-07-16
		TESTED BY	L. Gowry

CORE DIMENSIONS		COMPRESSIVE STRENGTH	
SPECIMEN DIAMETER (in.)	2.4917	TEST TIME (min) (spec. 2 to 15)	9:36
SPECIMEN LENGTH (in.)	5.202	MAXIMUM LOAD APPLIED (kN)	152.30
	5.194		
	5.209	COMPRESSIVE STRENGTH (MPa)	48.4
AVE.	5.201	TYPE OF FAILURE	4
SURFACE AREA (sq mm)	3146	LENGTH TO DIAMETER RATIO (spec 2-2.5)	2.09

MOISTURE CONTENT		UNIT WEIGHT	
WEIGHT OF WET SAMPLE + TARE (g)	1142.48	WEIGHT OF DRY SAMPLE IN AIR (g)	1078.16
WEIGHT OF DRY SAMPLE + TARE (g)	1130.10	VOLUME OF SAMPLE (cu m)	0.000416
WEIGHT OF WATER (g)	12.38	Density (kg/cu m)	2594
WEIGHT OF TARE (g)	98.66	UNIT WEIGHT (γ)	25.42
WEIGHT OF DRY SAMPLE (g)	1031.44		
MOISTURE CONTENT (%)	1.2		
REMARKS			



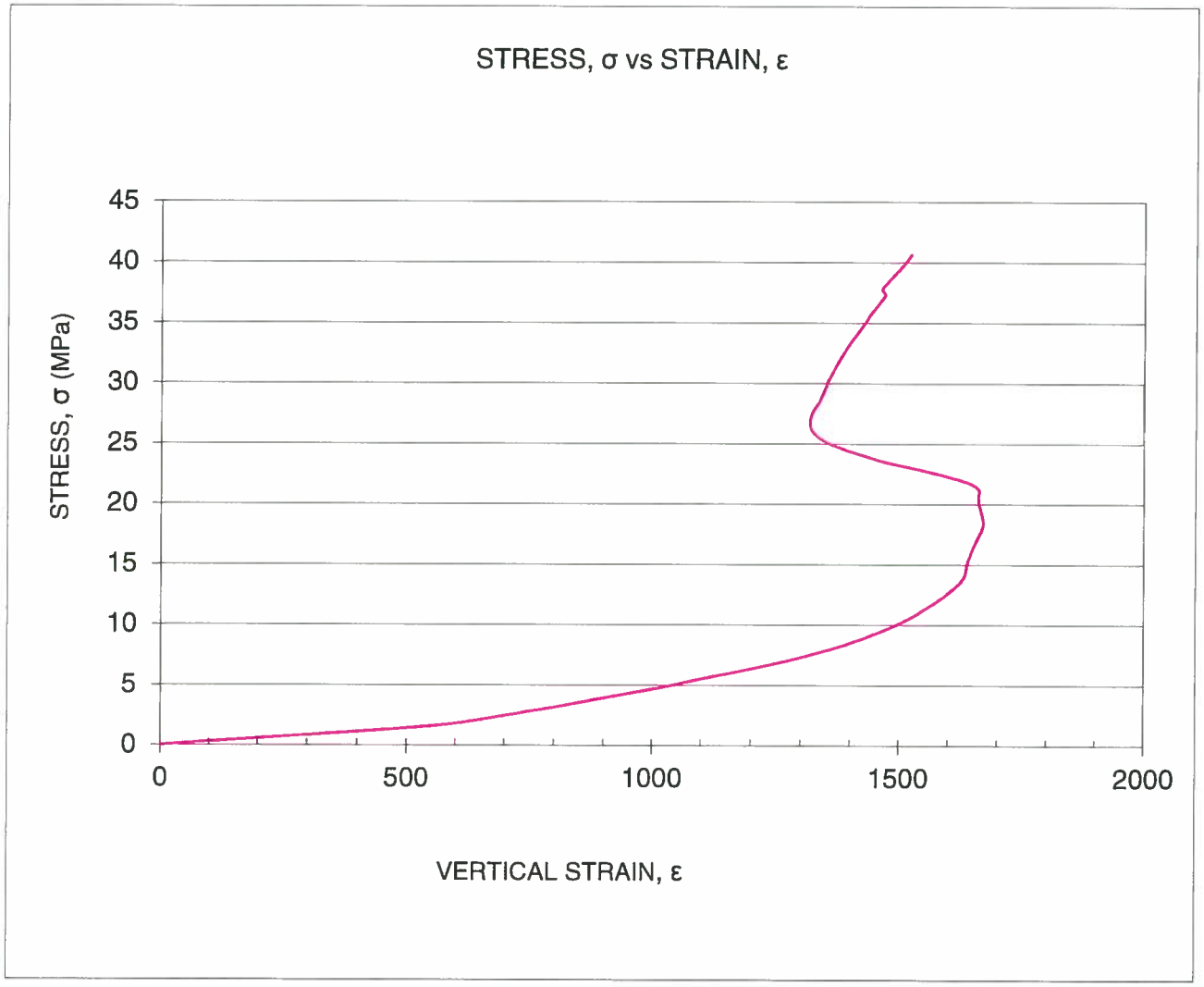
REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ELASTIC MODULI OF ROCK CORE IN UNIAXIAL COMPRESSION

ASTM D7012

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	*LAB NO.*	2103911 G
SAMPLE IDENTIFICATION	BH6, Run3, 34'-34'7"	*DATE SAMPLED*	
YOUNG'S MODULUS, E_{tan} (at 50% σ)	-12.0 GPa	*DATE TESTED*	2021-07-16
YOUNG'S MODULUS, E_{sec} (at 50% σ)	16.8 GPa	*TESTED BY*	L. Gowry
YOUNG'S MODULUS, $E_{ave.}$ (at 50% σ)	2.4 GPa	*POISSON'S RATIO*	0.194



REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DIMENSIONS

ASTM D4543

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street F
SAMPLE IDENTIFICATION BH6, Run3, 34'-34'7"

PML REF 21TF001A
LAB NO. 2103911 G
DATE SAMPLED
DATE TESTED 2021-07-13
TESTED BY TA/ L. Gowry

DEVIATION FROM STRAIGHTNESS

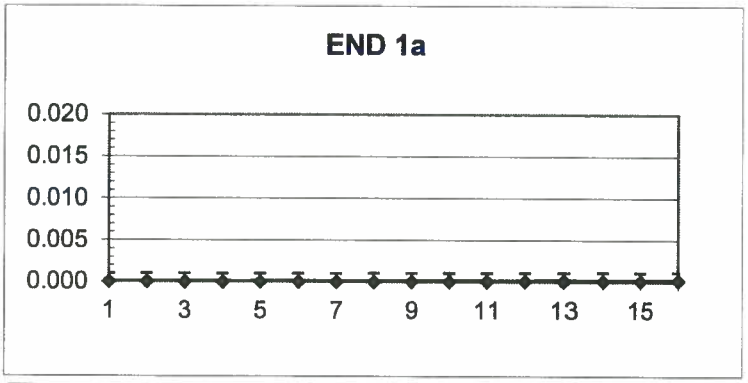
DIAL READING (IN)	TRIAL 1	2	3
MINIMUM	0.0010	0.0020	0.0000
MAXIMUM	0.0050	0.0040	0.0030
DIFFERENCE	0.0040	0.0020	0.0030
MAX DIFF.	0.004	SPEC.	0.020 max.

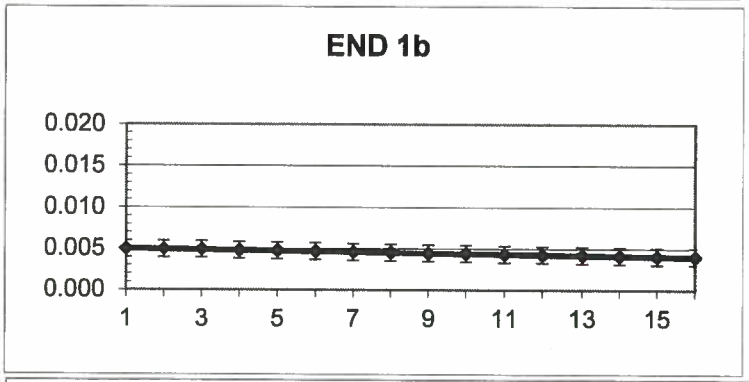
FLATNESS TOLERANCE

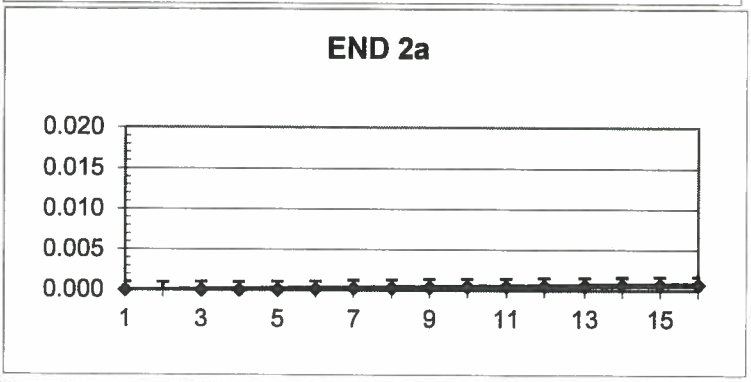
DIAL READING (IN)	END 1 SET 1	SET 2	END 2 SET 1	SET 2
RDG 1	0.0000	0.0050	0.0000	0.0000
RDG 2	0.0000	0.0050	0.0000	0.0000
RDG 3	0.0000	0.0049	0.0000	0.0001
RDG 4	0.0000	0.0048	0.0000	0.0002
RDG 5	0.0000	0.0048	0.0001	0.0003
RDG 6	0.0000	0.0047	0.0001	0.0005
RDG 7	0.0000	0.0046	0.0002	0.0006
RDG 8	0.0000	0.0045	0.0003	0.0007
RDG 9	0.0001	0.0045	0.0004	0.0008
RDG 10	0.0001	0.0044	0.0004	0.0009
RDG 11	0.0001	0.0044	0.0005	0.0010
RDG 12	0.0001	0.0043	0.0005	0.0012
RDG 13	0.0001	0.0042	0.0006	0.0013
RDG 14	0.0001	0.0042	0.0006	0.0013
RDG 15	0.0001	0.0041	0.0007	0.0015
RDG 16	0.0002	0.0040	0.0007	0.0015
RDG 17				
RDG 18				
RDG 19				
RDG 20				

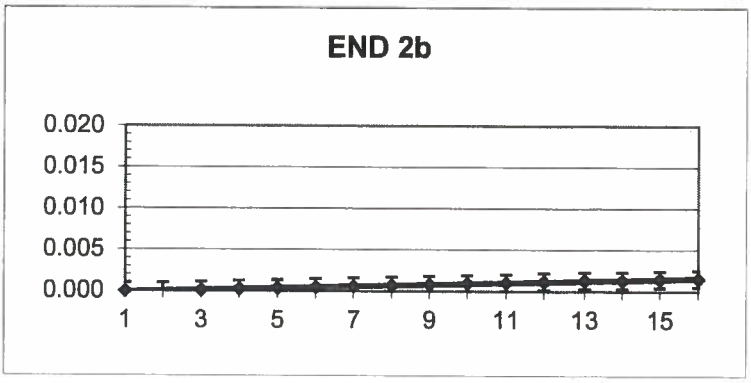
FLATNESS TOLERANCE= .001 in.

CORE DIAMETER (in.)	2.4885	2.4995	2.4870
AVE:	2.4917	PERPENDICULARITY RATIO (Specified .0043 max.)	
SLOPE OF BEST FIT LINE			
	MINIMUM	MAXIMUM	
END 1A	0.0000	0.0001	0.0000
END 2B	0.0040	0.0050	0.0004
END 2A	0.0000	0.0007	0.0003
END 2B	0.0000	0.0016	0.0006









REVIEWED BY J. Noor *DATE* 2021-07-19

Peto MacCallum Ltd.
CONSULTING ENGINEERS

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK CORE

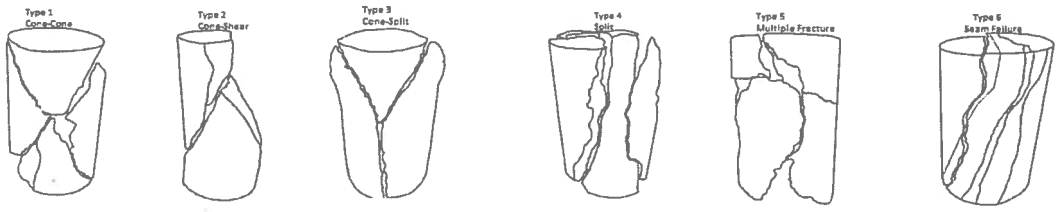
ASTM D7012

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	LAB NO.	2105012 C
SAMPLE IDENTIFICATION	BH8, Run1, 38'1"-38'6"	DATE SAMPLED	
		DATE TESTED	2021-08-25
		TESTED BY	L. Gowry

CORE DIMENSIONS		COMPRESSIVE STRENGTH	
SPECIMEN DIAMETER (in.)	2.4880	TEST TIME (min) (spec. 2 to 15)	9:36
SPECIMEN LENGTH (in.)	3.844	MAXIMUM LOAD APPLIED (kN)	533.30
	3.855		
	3.843	COMPRESSIVE STRENGTH (MPa)	170.0
AVE.	3.847	TYPE OF FAILURE	5
SURFACE AREA (sq mm)	3137	LENGTH TO DIAMETER RATIO (spec 2-2.5)	1.55

MOISTURE CONTENT		*UNIT WEIGHT*	
WEIGHT OF WET SAMPLE + TARE (g)	956.46	WEIGHT OF DRY SAMPLE IN AIR (g)	806.45
WEIGHT OF DRY SAMPLE + TARE (g)	952.49	VOLUME OF SAMPLE (cu m)	0.000306
WEIGHT OF WATER (g)	3.97	Density (kg/cu m)	2631
WEIGHT OF TARE (g)	238.83	UNIT WEIGHT (γ)	25.79
WEIGHT OF DRY SAMPLE (g)	713.66		
MOISTURE CONTENT (%)	0.6		

REMARKS Length to Diameter ratio is less than 2.



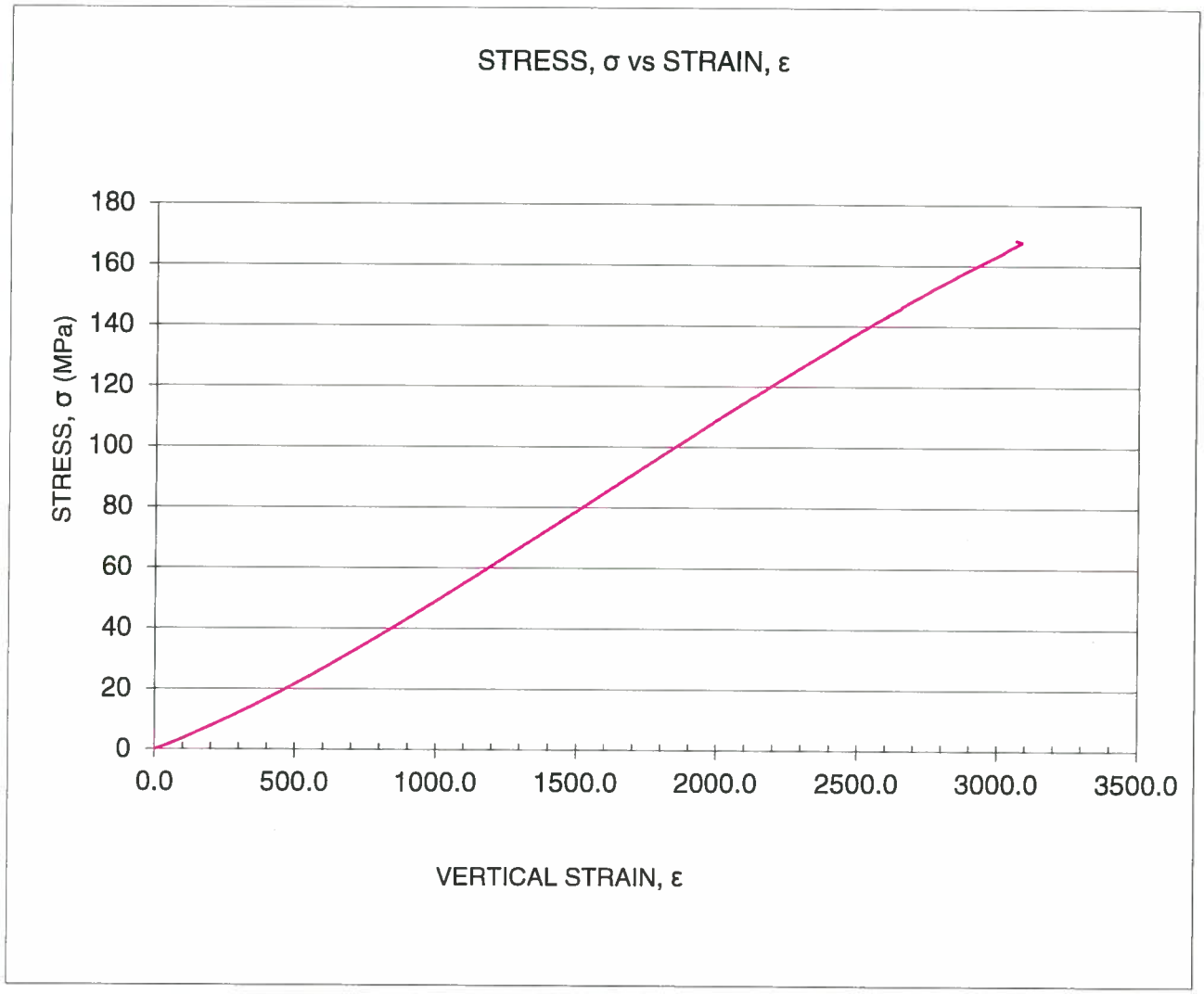
REVIEWED BY J. Noor *DATE* 2021-08-26

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ELASTIC MODULI OF ROCK CORE IN UNIAXIAL COMPRESSION

ASTM D7012

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street F	*LAB NO.*	2105012 C
SAMPLE IDENTIFICATION	BH8, Run1, 38'1"-38'6"	*DATE SAMPLED*	
YOUNG'S MODULUS, E_{tan} (at 50% σ)	59.6 GPa	*DATE TESTED*	2021-08-25
YOUNG'S MODULUS, E_{sec} (at 50% σ)	53.0 GPa	*TESTED BY*	L. Gowry
YOUNG'S MODULUS, $E_{ave.}$ (at 50% σ)	56.3 GPa	*POISSON'S RATIO*	0.230



REVIEWED BY J. Noor *DATE* 2021-08-26

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DIMENSIONS

ASTM D4543

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street P
SAMPLE IDENTIFICATION BH8, Run1, 38'1"-38'6"

PML REF 21TF001A
LAB NO. 2105012 C
DATE SAMPLED
DATE TESTED 2021-08-24
TESTED BY L. Gowry

DEVIATION FROM STRAIGHTNESS

DIAL READING (IN)	TRIAL 1	2	3
MINIMUM	0.0900	0.0930	0.0990
MAXIMUM	0.0920	0.0960	0.1020
DIFFERENCE	0.0020	0.0030	0.0030
MAX DIFF.	0.003	SPEC.	0.020 max.

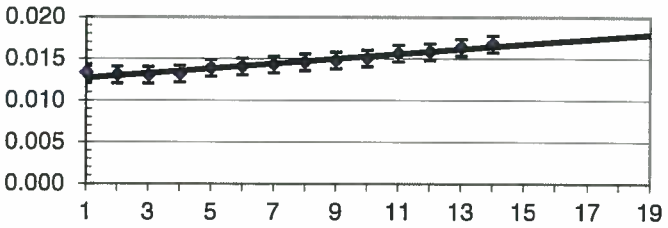
FLATNESS TOLERANCE

DIAL READING (IN)	END 1 SET 1	SET 2	END 2 SET 1	SET 2
RDG 1	0.0133	0.0139	0.0149	0.0104
RDG 2	0.0131	0.0137	0.0144	0.0101
RDG 3	0.0130	0.0135	0.0140	0.0105
RDG 4	0.0132	0.0148	0.0138	0.0110
RDG 5	0.0139	0.0153	0.0138	0.0119
RDG 6	0.0141	0.0154	0.0138	0.0125
RDG 7	0.0143	0.0155	0.0136	0.0131
RDG 8	0.0146	0.0155	0.0133	0.0137
RDG 9	0.0148	0.0155	0.0131	0.0142
RDG 10	0.0151	0.0156	0.0131	0.0149
RDG 11	0.0157	0.0157	0.0130	0.0156
RDG 12	0.0158	0.0159	0.0128	0.0160
RDG 13	0.0164	0.0161	0.0128	0.0168
RDG 14	0.0168	0.0161	0.0128	0.0175
RDG 15				
RDG 16				
RDG 17				
RDG 18				
RDG 19				
RDG 20				

FLATNESS TOLERANCE= .001 in.

CORE DIAMETER (in.)	2.4840	2.4910	2.4890
AVE:	2.4880	PERPENDICULARITY RATIO (Specified .0043 max.)	
SLOPE OF BEST FIT LINE			
	MINIMUM	MAXIMUM	
END 1A	0.0127	0.0165	0.0015
END 2B	0.0140	0.0164	0.0010
END 2A	0.0126	0.0145	0.0008
END 2B	0.0096	0.0173	0.0031

END 1a



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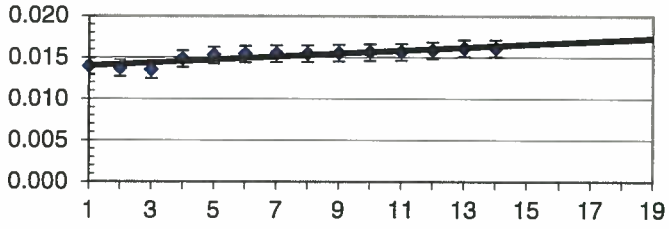

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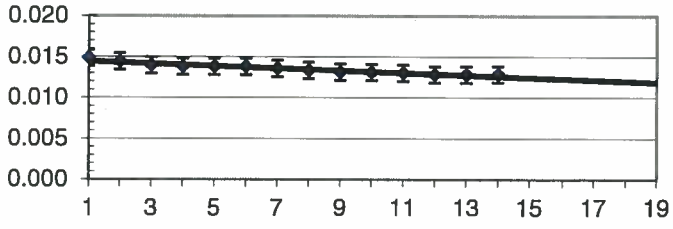

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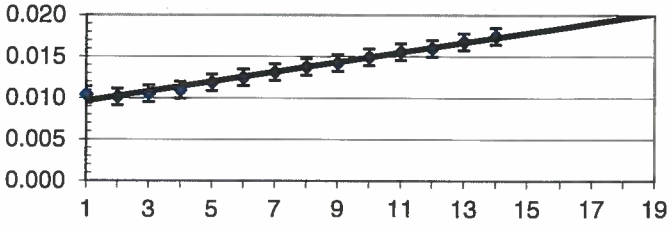

REVIEWED BY J. Noor *DATE* 2021-08-26

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2103911 L
DATE TESTED 2021-07-12

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	1					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥											
Diametrical	∥	2103911 L/ Run1	32'-32'4"	34.67	64.50	396.00	2.626	4160.3	64.5	0.63	1.12	0.71
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
AVERAGE OF DIAMETRIC TESTS												0.71
AVERAGE OF AXIAL TESTS												#DIV/0!

⊥ = Perpendicular to plane of weakness ∥ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2103911 L/ Run1	32'-32'4"	124.00	729.94	722.96	6.98	82.61	640.35	1.09

REVIEWED BY J. Noor DATE 2021-07-12

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2105014 F
DATE TESTED 2021-08-24

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	1					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥	2105014 F/ Run2	33'4"-33'6"	62.48	36.00	455.00	3.018	2863.9	53.5	1.05	1.03	1.09
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												#DIV/0!
AVERAGE OF AXIAL TESTS												1.09

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2105014 F/ Run2	33'4"-33'6"	AL	373.73	370.31	3.42	115.92	254.39	1.34

REVIEWED BY J. Noor DATE 2021-08-26

Peto MacCallum Ltd.
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POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2105014 G
DATE TESTED 2021-08-24

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	2					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥											
Diametrical	∥	2105014 G/ Run1	28'9"-29'	33.14	64.50	17.00	0.113	4160.3	64.5	0.03	1.12	0.03
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
AVERAGE OF DIAMETRIC TESTS												0.03
AVERAGE OF AXIAL TESTS												#DIV/0!

⊥ = Perpendicular to plane of weakness ∥ = Parallel to plane of weakness

MOISTURE CONTENT								
SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2105014 G/ Run1	28'9"-29'	GEO41	594.09	579.74	14.35	145.15	434.59	3.30

REVIEWED BY J. Noor DATE 2021-08-26

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2103911 Q, R, S
DATE TESTED 2021-07-08

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	2					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Diametrical	‖	2103911 Q/ Run1	28'10"-29'	41.11	64.50	72.00	0.478	4160.3	64.5	0.11	1.12	0.13
Axial	⊥											
Diametrical	‖	2103911 R/ Run1	31'2"-31'4"	63.03	51.75	377.00	2.500	4153.1	64.4	0.60	1.12	0.67
Axial	⊥											
Diametrical	‖	2103911 S/ Run1	30'-30'2"	36.19	64.50	1269.00	8.416	4160.3	64.5	2.02	1.12	2.27
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												1.20
AVERAGE OF AXIAL TESTS												0.67

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2103911 Q/ Run1	28'10"-29'	A2	686.40	675.71	10.69	121.05	554.66	1.93
2103911 R/ Run1	31'2"-31'4"	297.00	502.28	496.56	5.72	108.45	388.11	1.47
2103911 S/ Run1	30'-30'2"	GEO2	621.19	620.17	1.02	112.87	507.30	0.20

REVIEWED BY J. Noor DATE 2021-07-12

Peto MacCallum Ltd.
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POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2105014 H
DATE TESTED 2021-08-24

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	3					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥											
Diametrical	‖	2105014 H/ Run1	27'6"-27'9"	35.19	64.30	1398.00	9.272	4134.5	64.3	2.24	1.12	2.51
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												2.51
AVERAGE OF AXIAL TESTS												#DIV/0!

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2105014 H/ Run1	27'6"-27'9"	GEO9	547.51	540.40	7.11	108.28	432.12	1.65

REVIEWED BY J. Noor DATE 2021-08-26

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POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2103911 D, E
DATE TESTED 2021-07-08

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	3					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥	2103911 D/ Run1	29'-29'3"	63.20	54.50	3173.00	21.043	4385.5	66.2	4.80	1.13	5.45
Diametrical	‖											
Axial	⊥	2103911 E/ Run1	29'3"-29'6"	62.74	55.50	3040.00	20.161	4433.5	66.6	4.55	1.14	5.17
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												#DIV/0!
AVERAGE OF AXIAL TESTS												5.31

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2103911 D/ Run1	29'-29'3"	Geo/F	558.20	555.24	2.96	128.11	427.13	0.69
2103911 E/ Run1	29'3"-29'6"	GEO10	571.53	570.56	0.97	105.63	464.93	0.21

REVIEWED BY J. Noor DATE 2021-07-08

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2105014 E
		DATE TESTED	2021-08-24

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	4					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥	2105014 E/ Run1	26'2"-26'4"	63.17	34.50	316.00	2.096	2774.9	52.7	0.76	1.02	0.77
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												#DIV/0!
AVERAGE OF AXIAL TESTS												0.77

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2105014 E/ Run1	26'2"-26'4"	GEOF	388.89	380.57	8.32	128.11	252.46	3.30

REVIEWED BY J. Noor DATE 2021-08-26

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2103911 B
DATE TESTED 2021-07-12

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	4					SAMPLE TYPE	
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥											
Diametrical	∥	2103911 B	28'6"-29'	34.68	65.00	2277.00	15.101	4225.0	65.0	3.57	1.13	4.02
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
AVERAGE OF DIAMETRIC TESTS												4.02
AVERAGE OF AXIAL TESTS												#DIV/0!

⊥ = Perpendicular to plane of weakness ∥ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2103911 B	28'6"-29'	B	690.92	688.02	2.90	117.72	570.30	0.51

REVIEWED BY J. Noor DATE 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2105014
DATE TESTED 2021-08-24

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	5					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥			63.10	24.50	157.00	1.041	1968.4	44.4	0.53	0.95	0.50
Diametrical	‖	2105014 A/ Run1	37'7"-37'9"									
Axial	⊥											
Diametrical	‖	2105014 B/ Run1	39'7"-39;9"	32.46	62.50	46.00	0.305	3906.3	62.5	0.08	1.11	0.09
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												0.09
AVERAGE OF AXIAL TESTS												0.50

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2105014 A/ Run1	37'7"-37'9'	G9	246.23	239.99	6.24		81.52	7.65
2105014 B/ Run1	39'7"-39;9"	GEO10	464.67	451.43	13.24		105.61	12.54

REVIEWED BY J. Noor DATE 2021-08-26

Peto MacCallum Ltd.
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POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2103911 H
DATE TESTED 2021-07-08

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	6					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥	2103911 H/ Run2	27'2"-27'5"	63.09	30.00	313.00	2.076	2409.9	49.1	0.86	0.99	0.85
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												#DIV/0!
AVERAGE OF AXIAL TESTS												0.85

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2103911 H/ Run2	27'2"-27'5"	GEO52	583.18	574.32	8.86	107.94	466.38	1.90

REVIEWED BY J. Noor DATE 2021-07-12

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2103911 O, P
DATE TESTED 2021-07-12

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	7					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥											
Diametrical	∥	2103911 O/ Run2	32'2"-33'6"	33.40	64.00	174.00	1.154	4096.0	64.0	0.28	1.12	0.31
Axial	⊥											
Diametrical	∥	2103911 P/ Run2	35'6"-35'9"	34.84	64.50	2039.00	13.523	4160.3	64.5	3.25	1.12	3.65
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
Axial	⊥											
Diametrical	∥											
AVERAGE OF DIAMETRIC TESTS												1.98
AVERAGE OF AXIAL TESTS												#DIV/0!

⊥ = Perpendicular to plane of weakness ∥ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2103911 O/ Run2	32'2"-33'6"	GEO71	663.04	654.97	8.07	133.69	521.28	1.55
2103911 P/ Run2	35'6"-35'9"	GEO30	641.20	636.12	5.08	88.41	547.71	0.93

REVIEWED BY J. Noor DATE 2021-07-13

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2103911 I, J
		DATE TESTED	2021-07-08

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	8					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥											
Diametrical	‖	2103911 I/ Run1	33'6"-33'10"	33.16	64.80	2231.00	14.796	4199.0	64.8	3.52	1.12	3.96
Axial	⊥											
Diametrical	‖	2103911 J/ Run1	34'10"35'2"	45.20	64.80	1526.00	10.120	4199.0	64.8	2.41	1.12	2.71
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												3.33
AVERAGE OF AXIAL TESTS												#DIV/0!

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2103911 I/ Run1	33'6"-33'10"	C	753.08	750.31	2.77	133.80	616.51	0.45
2103911 J/ Run1	34'10"35'2"	69.00	825.37	821.05	4.32	81.51	739.54	0.58

REVIEWED BY A. Moor DATE 2021-07-12

Peto MacCallum Ltd.
CONSULTING ENGINEERS

POINT LOAD STRENGTH INDEX OF ROCK

ASTM D5731

CLIENT The Regional Municipality of Peel
PROJECT Geotechnical Investigation Services for the Beach Street Pumping Station Diversion (Project 16-2905)
LOCATION Mississauga, Ontario

PML REF 21TF001A
REPORT NO
ENCLOSURE
LAB NUMBER 2105014
DATE TESTED 2021-08-24

POINT LOAD TESTER							
MODEL	JHP73	DATE CALIBRATED	2019-05-27	SERIAL NO	048A1305	CALIBRATION FACTOR	0.006632
SAMPLE DETAILS							
BH	8					SAMPLE TYPE	Core
DESCRIPTION							

TEST TYPE	ORIENTATION	SAMPLE NO	DEPTH	W (mm)	POINT GAP D (mm)	GUAGE READING (PSI)	LOAD (P) kN	D_e^2	D_e	I_s MPa	F	$I_{s(50)}$ MPa
Axial	⊥	2105014 C/ Run1	34'6"-34'8"	62.53	36.10	206.00	1.366	2874.1	53.6	0.48	1.03	0.49
Diametrical	‖											
Axial	⊥	2105014 D/ Run1	37'9"-37'11"	63.26	36.40	400.00	2.653	2931.8	54.1	0.90	1.04	0.94
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
Axial	⊥											
Diametrical	‖											
AVERAGE OF DIAMETRIC TESTS												#DIV/0!
AVERAGE OF AXIAL TESTS												0.71

⊥ = Perpendicular to plane of weakness ‖ = Parallel to plane of weakness

MOISTURE CONTENT

SAMPLE NO	DEPTH	TARE NUMBER	WET SAMPLE WITH TARE (g)	DRY SAMPLE WITH TARE (g)	WATER (g)	TARE (g)	DRY SAMPLE (g)	WATER CONTENT (%)
2105014 C/ Run1	34'6"-34'8"	N11	389.46	380.32	9.14	117.82	262.50	3.48
2105014 D/ Run1	37'9"-37'11"	M8	360.69	356.14	4.55	108.79	247.35	1.84

REVIEWED BY J. Noor DATE 2021-08-26

Peto MacCallum Ltd.
CONSULTING ENGINEERS

SLAKE DURABILITY OF ROCK

ASTM D4644

CLIENT	The Regional Municipality of Peel	PML REF	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station I	REPORT NO	
LOCATION	Mississauga, Ontario	ENCLOSURE	
		LAB NUMBER	2103911 N
		DATE TESTED	2021-07-06

SAMPLE DETAILS							
BH	1	SAMPLE NO	Run2	DEPTH	34'-34'6"	TYPE	Core
DESCRIPTION	Shale						

INITIAL MOISTURE CONTENT	
TARE + WET SAMPLE (g)	564.5
TARE + DRY SAMPLE (g)	550.8
WATER (g)	13.7
TARE (g)	111.4
DRY SAMPLE (g)	439.4
MOISTURE CONTENT (%)	3.1
INITIAL SLAKE CONDITION	
DRUM + DRY SAMPLE (g)	1695.8
SLAKE CYCLE 1	
DRUM + WET SAMPLE (g)	1601.8
DRUM + DRY SAMPLE (g)	1580.2
WATER (g)	21.6
DRUM (g)	1256.7
DRY SAMPLE (g)	323.5
MOISTURE CONTENT (%)	6.7
SLAKE CYCLE 2	
DRUM + WET SAMPLE (g)	1517.2
DRUM + DRY SAMPLE (g)	1491.6
WATER (g)	25.6
DRUM (g)	1256.7
DRY SAMPLE (g)	234.9
MOISTURE CONTENT (%)	10.9
FINAL SLAKE CONDITION	
RETAINED SPECIMEN TYPE	TYPE II
SLAKE DURABILITY INDEX	53.5

Initial

Final

REVIEWED BY J. Noor DATE 2021-07-09

Peto MacCallum Ltd.
CONSULTING ENGINEERS

SLAKE DURABILITY OF ROCK

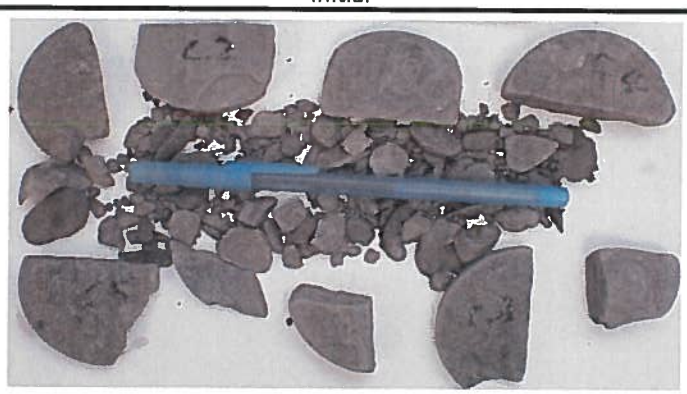
ASTM D4644

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station I	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2103911 C
		DATE TESTED	2021-07-06

SAMPLE DETAILS							
BH	4	SAMPLE NO	Run1	DEPTH	27'6"--28'	TYPE	Core
DESCRIPTION	Shale						

INITIAL MOISTURE CONTENT	
TARE + WET SAMPLE (g)	572.4
TARE + DRY SAMPLE (g)	560.3
WATER (g)	12.1
TARE (g)	110.4
DRY SAMPLE (g)	449.9
MOISTURE CONTENT (%)	2.7
INITIAL SLAKE CONDITION	
DRUM + DRY SAMPLE (g)	1706.5
SLAKE CYCLE 1	
DRUM + WET SAMPLE (g)	1638.8
DRUM + DRY SAMPLE (g)	1617.7
WATER (g)	21.1
DRUM (g)	1257.2
DRY SAMPLE (g)	360.5
MOISTURE CONTENT (%)	5.9
SLAKE CYCLE 2	
DRUM + WET SAMPLE (g)	1570.8
DRUM + DRY SAMPLE (g)	1537.9
WATER (g)	32.9
DRUM (g)	1257.2
DRY SAMPLE (g)	280.7
MOISTURE CONTENT (%)	11.7
FINAL SLAKE CONDITION	
RETAINED SPECIMEN TYPE	TYPE II
SLAKE DURABILITY INDEX	62.5

Initial


Final

REVIEWED BY J. Noor DATE 2021-07-09

Peto MacCallum Ltd.
CONSULTING ENGINEERS

SLAKE DURABILITY OF ROCK

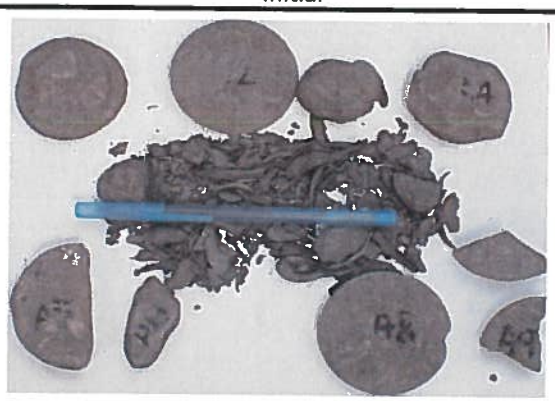
ASTM D4644

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2103911 A
		DATE TESTED	2021-07-06

SAMPLE DETAILS							
BH	5	SAMPLE NO	Run1	DEPTH	36-37'	TYPE	Core
DESCRIPTION	Shale						

INITIAL MOISTURE CONTENT	
TARE + WET SAMPLE (g)	688.3
TARE + DRY SAMPLE (g)	674.7
WATER (g)	13.5
TARE (g)	198.1
DRY SAMPLE (g)	476.6
MOISTURE CONTENT (%)	2.8
INITIAL SLAKE CONDITION	
DRUM + DRY SAMPLE (g)	1733.0
SLAKE CYCLE 1	
DRUM + WET SAMPLE (g)	1693.5
DRUM + DRY SAMPLE (g)	1677.8
WATER (g)	15.7
DRUM (g)	1256.7
DRY SAMPLE (g)	421.1
MOISTURE CONTENT (%)	3.7
SLAKE CYCLE 2	
DRUM + WET SAMPLE (g)	1625.7
DRUM + DRY SAMPLE (g)	1596.8
WATER (g)	28.9
DRUM (g)	1256.7
DRY SAMPLE (g)	340.1
MOISTURE CONTENT (%)	8.5
FINAL SLAKE CONDITION	
RETAINED SPECIMEN TYPE	TYPE II
SLAKE DURABILITY INDEX	71.4

Initial


Final

REVIEWED BY J. Noor

DATE 2021-07-09

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ABRASIVENESS OF ROCK USING CERCHAR METHOD

ASTM D7625

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversi	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2105012
		DATE TESTED	August 30, 2021

SAMPLE ID	BH	RUN	DEPTH	ROCK TYPE	ORIENTATION	MOISTURE CONDITION	CAI_S	CAI	ABRASIVITY CLASSIFICATION
2105012A	8	1	34'-34'2"	Limestone	Parallel	As Received		3.50	High
2105012D	3	1	27'1"-27'3"	Shale	Parallel	As Received		1.60	Medium

REVIEWED BY _____
Jalil Noor, B.Sc./ Geoffrey Uwimana, M. Eng., P. Eng.

DATE August 30, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ABRASIVENESS OF ROCK USING CERCHAR METHOD

ASTM D7625

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Statio	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2105012
		DATE TESTED	2021-08-30

PHYSIAL DESCRIPTION

TEST SPECIMEN	SURFACE TYPE	SAMPLE ORIENTATION	MOISTURE CONDITION	ABRADED DIAMETERS (mm) 1	2
2105012A/ BH8/Run1/34'-34'2"	Natural	PARALLEL	As Received	0.0	0.0
		PARALLEL	As Received	0.0	0.0
		PARALLEL	As Received	0.6	1.0
		PARALLEL	As Received	0.2	0.4
		PARALLEL	As Received	0.7	0.6
	CEHCHER INDEX - Natural SURFACE			**3.500**	
2105012B/BH3/Run 1/27'1"-27'3"	Natural	PARALLEL	As Received	0.0	0.0
		PARALLEL	As Received	0.2	0.0
		PARALLEL	As Received	0.2	0.8
		PARALLEL	As Received	0.4	0.0
		PARALLEL	As Received	0.0	0.0
	CEHCHER INDEX - Natural SURFACE			**1.60**	
	CEHCHER INDEX - SURFACE				
	CEHCHER INDEX - SURFACE				
	CEHCHER INDEX - SURFACE				

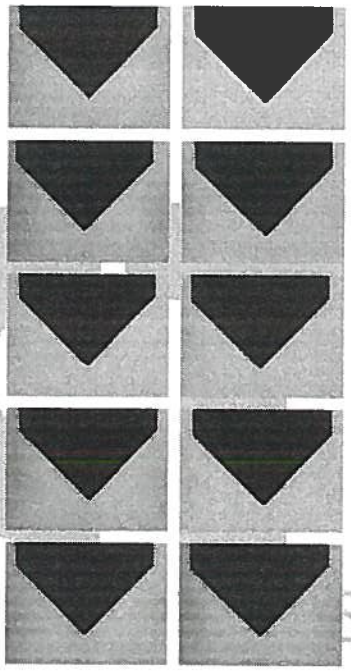
REVIEWED BY _____ DATE August 30, 2021

Jalil Noor, B.Sc./ Geoffrey Uwimana, M. Eng., P. Eng.

The Municipality of Peel

Cerchar Rock Abrasivity Report

Sample ID: 2105012 A,BH8,Run1
Depth: 34-34'2"
Surface: Natural
*** Stylus Hardness/HRC:** 55



Stylus 1	0.0	0.0
Stylus 2	0.0	0.0
Stylus 3	0.6	1.0
Stylus 4	0.2	0.4
Stylus 5	0.7	0.6

Average = 0.4

CAI= 0.4

GCTS

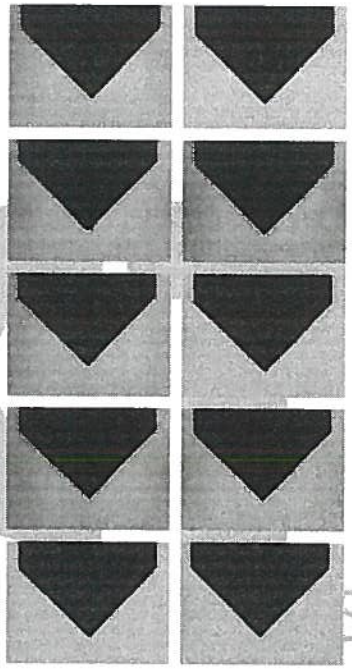
* HRC is necessary for interpretation of cerchar rock abrasivity and for completeness is displayed as part of this report but the value is not used in calculating the CAI result in this report.

07000000030000000000000000000000149BF77FA4BC407FD851C3FB001753

The Regional Municipality of Peel

Cerchar Rock Abrasivity Report

Sample ID: 2105012D,BH3,Run1
Depth: 27'1"-27'3"
Surface: Natural
*** Stylus Hardness/HRC:** 55



Stylus 1	0.0	0.0
Stylus 2	0.2	0.0
Stylus 3	0.2	0.8
Stylus 4	0.4	0.0
Stylus 5	0.0	0.0

Average = 0.2

CAI= 0.2

GCTS

* HRC is necessary for interpretation of cerchar rock abrasitivity and for completeness is displayed as part of this report but the value is not used in calculating the CAI result in this report.

0700000003000000000000000000000149BF77FA4BC407FD851C3FB001753

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ABRASIVENESS OF ROCK USING CERCHAR METHOD
ASTM D7625

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Station Diversi	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2105337A
		DATE TESTED	September 3, 2021

SAMPLE ID	BH	RUN	DEPTH	ROCK TYPE	ORIENTATION	MOISTURE CONDITION	CAI_5	CAI	ABRASIVITY CLASSIFICATION
2105337A	5	1	37'4"-37'6"	Shale	Parallel	As Received		1.00	Medium

REVIEWED BY _____ DATE September 3, 2021

Jalil Noor, B.Sc./ Geoffrey Uwimana, M. Eng., P. Eng.

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ABRASIVENESS OF ROCK USING CERCHAR METHOD

ASTM D7625

CLIENT	The Regional Municipality of Peel	*PML REF*	21TF001A
PROJECT	Geotechnical Investigation Services for the Beach Street Pumping Statio	*REPORT NO*	
LOCATION	Mississauga, Ontario	*ENCLOSURE*	
		LAB NUMBER	2105337A
		DATE TESTED	2021-09-03

PHYSIAL
DESCRIPTION

TEST SPECIMEN	SURFACE TYPE	SAMPLE ORIENTATION	MOISTURE CONDITION	ABRADED DIAMETERS (mm) 1	2
2105337A/BH5/Run 1/37'4"-37'6"	Natural	PARALLEL	As Received	0.0	0.0
		PARALLEL	As Received	0.0	0.0
		PARALLEL	As Received	0.0	0.3
		PARALLEL	As Received	0.0	0.7
		PARALLEL	As Received	0.0	0.0
	CEHCHER INDEX - Natural SURFACE			**1.000**	
	CEHCHER INDEX - SURFACE				
	CEHCHER INDEX - SURFACE				
	CEHCHER INDEX - SURFACE				
	CEHCHER INDEX - SURFACE				

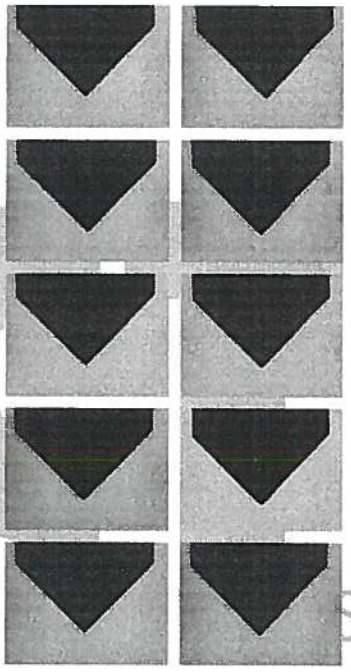
REVIEWED BY _____ DATE September 7, 2021

Jalil Noor, B.Sc./ Geoffrey Uwimana, M. Eng., P. Eng.

Geotechnical Investigation Services

Cerchar Rock Abrasivity Report

Sample ID: 2105337 A/ BH5/ Run1
Depth: 37'4"-37'6"
Surface: Natural
*** Stylus Hardness/HRC:** 55



Stylus 1	0.0	0.0
Stylus 2	0.0	0.0
Stylus 3	0.0	0.3
Stylus 4	0.0	0.7
Stylus 5	0.0	0.0

Average = 0.1

CAI= 0.1

GCTS

* HRC is necessary for interpretation of cerchar rock abrasitivity and for completenes is displayed as part of this report but the value is not used in calculating the CAI result in this report.

07000000030000000000000000000000149BF77FA4BC407FD851C3FB001753

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	The Regional Municipality of Peel	PROJECT NO.	21TF001A
PROJECT:	Geotechnical Investigation Services	DATE	2021-07-05
		TESTED BY	L. Gowry

LAB NUMBER	21039911 L			
BOREHOLE NUMBER	BH1			
SAMPLE NUMBER	Run1			
DEPTH	32'-32'4"			
WEIGHT OF SAMPLE IN AIR (g)	651.36			
DIAMETER OF SAMPLE (mm)	62.02			
HEIGHT OF SAMPLE (mm)	81.82			
VOLUME OF SAMPLE (m^3)	0.0002472			
DENSITY (Kg/m^3)	2635			
DRY DENSITY(Kg/m^3)	2607			
AVERAGE DRY DENSITY (Kg/m^3)	2607			
TARE NUMBER	124			
WT. OF TARE + WET SAMPLE (g)	729.94			
WT. OF TARE + DRY SAMPLE (g)	722.96			
WT OF WATER (g)	6.98			
WT. OF TARE (g)	82.61			
WT. OF DRY SAMPLE (g)	640.35			
MOISTURE CONTENT (%)	1.1			
SAMPLE DESCRIPTION				

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	The Regional Municipality of Peel	PROJECT NO.	21TF001A
PROJECT:	Geotechnical Investigation Services	DATE	2021-07-05
		TESTED BY	L. Gowry

LAB NUMBER	2103911 D			
BOREHOLE NUMBER	BH3			
SAMPLE NUMBER	Run1			
DEPTH	29'-29'3"			
WEIGHT OF SAMPLE IN AIR (g)	430.91			
DIAMETER OF SAMPLE (mm)	63.24			
HEIGHT OF SAMPLE (mm)	54.70			
VOLUME OF SAMPLE (m^3)	0.0001718			
DENSITY (Kg/m^3)	2508			
DRY DENSITY(Kg/m^3)	2491			
AVERAGE DRY DENSITY (Kg/m^3)	2491			
TARE NUMBER	GeoF			
WT. OF TARE + WET SAMPLE (g)	558.2			
WT. OF TARE + DRY SAMPLE (g)	555.24			
WT OF WATER (g)	2.96			
WT. OF TARE (g)	128.11			
WT. OF DRY SAMPLE (g)	427.13			
MOISTURE CONTENT (%)	0.7			
SAMPLE DESCRIPTION				

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	*The Regional Municipality of Peel*	*PROJECT NO.*	21TF001A
PROJECT:	*Geotechnical Investigation Services*	*DATE*	2021-07-05
		TESTED BY	L. Gowry

LAB NUMBER	2103911 E			
BOREHOLE NUMBER	BH3			
SAMPLE NUMBER	Run1			
DEPTH	29'3"-29'6"			
WEIGHT OF SAMPLE IN AIR (g)	452.72			
DIAMETER OF SAMPLE (mm)	62.94			
HEIGHT OF SAMPLE (mm)	54.38			
VOLUME OF SAMPLE (m^3)	0.0001692			
DENSITY (Kg/m^3)	2676			
DRY DENSITY(Kg/m^3)	2670			
AVERAGE DRY DENSITY (Kg/m^3)	2670			
TARE NUMBER	Geo10			
WT. OF TARE + WET SAMPLE (g)	571.53			
WT. OF TARE + DRY SAMPLE (g)	570.56			
WT OF WATER (g)	0.97			
WT. OF TARE (g)	105.63			
WT. OF DRY SAMPLE (g)	464.93			
MOISTURE CONTENT (%)	0.2			
SAMPLE DESCRIPTION				

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	The Regional Municipality of Peel	PROJECT NO.	21TF001A
PROJECT:	Geotechnical Investigation Services	DATE	2021-07-05
		TESTED BY	L. Gowry

LAB NUMBER	2103911 B			
BOREHOLE NUMBER	BH4			
SAMPLE NUMBER	Run1			
DEPTH	28'6"-29'			
WEIGHT OF SAMPLE IN AIR (g)	574.18			
DIAMETER OF SAMPLE (mm)	63.47			
HEIGHT OF SAMPLE (mm)	69.34			
VOLUME OF SAMPLE (m^3)	0.0002194			
DENSITY (Kg/m^3)	2617			
DRY DENSITY(Kg/m^3)	2604			
AVERAGE DRY DENSITY (Kg/m^3)	2604		#DIV/0!	
TARE NUMBER	BH4			
WT. OF TARE + WET SAMPLE (g)	690.92			
WT. OF TARE + DRY SAMPLE (g)	688.02			
WT OF WATER (g)	2.9			
WT. OF TARE (g)	117.72			
WT. OF DRY SAMPLE (g)	570.3			
MOISTURE CONTENT (%)	0.5			
SAMPLE DESCRIPTION				

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	The Regional Municipality of Peel	PROJECT NO.	21TF001A
PROJECT:	Geotechnical Investigation Services for the Beach S	DATE	2021-08-24
		TESTED BY	JOY/ L. GOWRY

LAB NUMBER	2105012 B			
BOREHOLE NUMBER	BH5			
SAMPLE NUMBER	Run1			
DEPTH	37'10"-38'			
WEIGHT OF SAMPLE IN AIR (g)	239.74			
DIAMETER OF SAMPLE (mm)	63.03			
HEIGHT OF SAMPLE (mm)	31.00			
VOLUME OF SAMPLE (m^3)	0.0000967			
DENSITY (Kg/m^3)	2479			
DRY DENSITY(Kg/m^3)	2435			
AVERAGE DRY DENSITY (Kg/m^3)	2435			
TARE NUMBER	22			
WT. OF TARE + WET SAMPLE (g)	624.67			
WT. OF TARE + DRY SAMPLE (g)	620.64			
WT OF WATER (g)	4.03			
WT. OF TARE (g)	393.96			
WT. OF DRY SAMPLE (g)	226.68			
MOISTURE CONTENT (%)	1.8			
SAMPLE DESCRIPTION				

REVIEWED: Jalil Noor, B.Sc.

DATE REVIEWED: August 31, 2021

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	*The Regional Municipality of Peel*	*PROJECT NO.*	21TF001A
PROJECT:	*Geotechnical Investigation Services*	*DATE*	2021-07-05
		TESTED BY	L. Gowry

LAB NUMBER	2103911 H			
BOREHOLE NUMBER	BH6			
SAMPLE NUMBER	Run2			
DEPTH	27'2"-27'5"			
WEIGHT OF SAMPLE IN AIR (g)	477.98			
DIAMETER OF SAMPLE (mm)	63.16			
HEIGHT OF SAMPLE (mm)	60.29			
VOLUME OF SAMPLE (m^3)	0.0001889			
DENSITY (Kg/m^3)	2530			
DRY DENSITY(Kg/m^3)	2483			
AVERAGE DRY DENSITY (Kg/m^3)	2483			
TARE NUMBER	Geo52			
WT. OF TARE + WET SAMPLE (g)	583.18			
WT. OF TARE + DRY SAMPLE (g)	574.32			
WT OF WATER (g)	8.86			
WT. OF TARE (g)	107.94			
WT. OF DRY SAMPLE (g)	466.38			
MOISTURE CONTENT (%)	1.9			
SAMPLE DESCRIPTION				

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	The Regional Municipality of Peel	PROJECT NO.	21TF001A
PROJECT:	Geotechnical Investigation Services	DATE	2021-07-05
		TESTED BY	L. Gowry

LAB NUMBER	2103911 O			
BOREHOLE NUMBER	BH7			
SAMPLE NUMBER	Run2			
DEPTH	33'2"-33'6"			
WEIGHT OF SAMPLE IN AIR (g)	538.22			
DIAMETER OF SAMPLE (mm)	63.07			
HEIGHT OF SAMPLE (mm)	67.68			
VOLUME OF SAMPLE (m^3)	0.0002114			
DENSITY (Kg/m^3)	2545			
DRY DENSITY(Kg/m^3)	2507			
AVERAGE DRY DENSITY (Kg/m^3)	2507			
TARE NUMBER	GEO71			
WT. OF TARE + WET SAMPLE (g)	663.04			
WT. OF TARE + DRY SAMPLE (g)	654.97			
WT OF WATER (g)	8.07			
WT. OF TARE (g)	133.69			
WT. OF DRY SAMPLE (g)	521.28			
MOISTURE CONTENT (%)	1.5			
SAMPLE DESCRIPTION				

Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	*The Regional Municipality of Peel*	*PROJECT NO.*	21TF001A
PROJECT:	*Geotechnical Investigation Services*	*DATE*	2021-07-05
		TESTED BY	L. Gowry

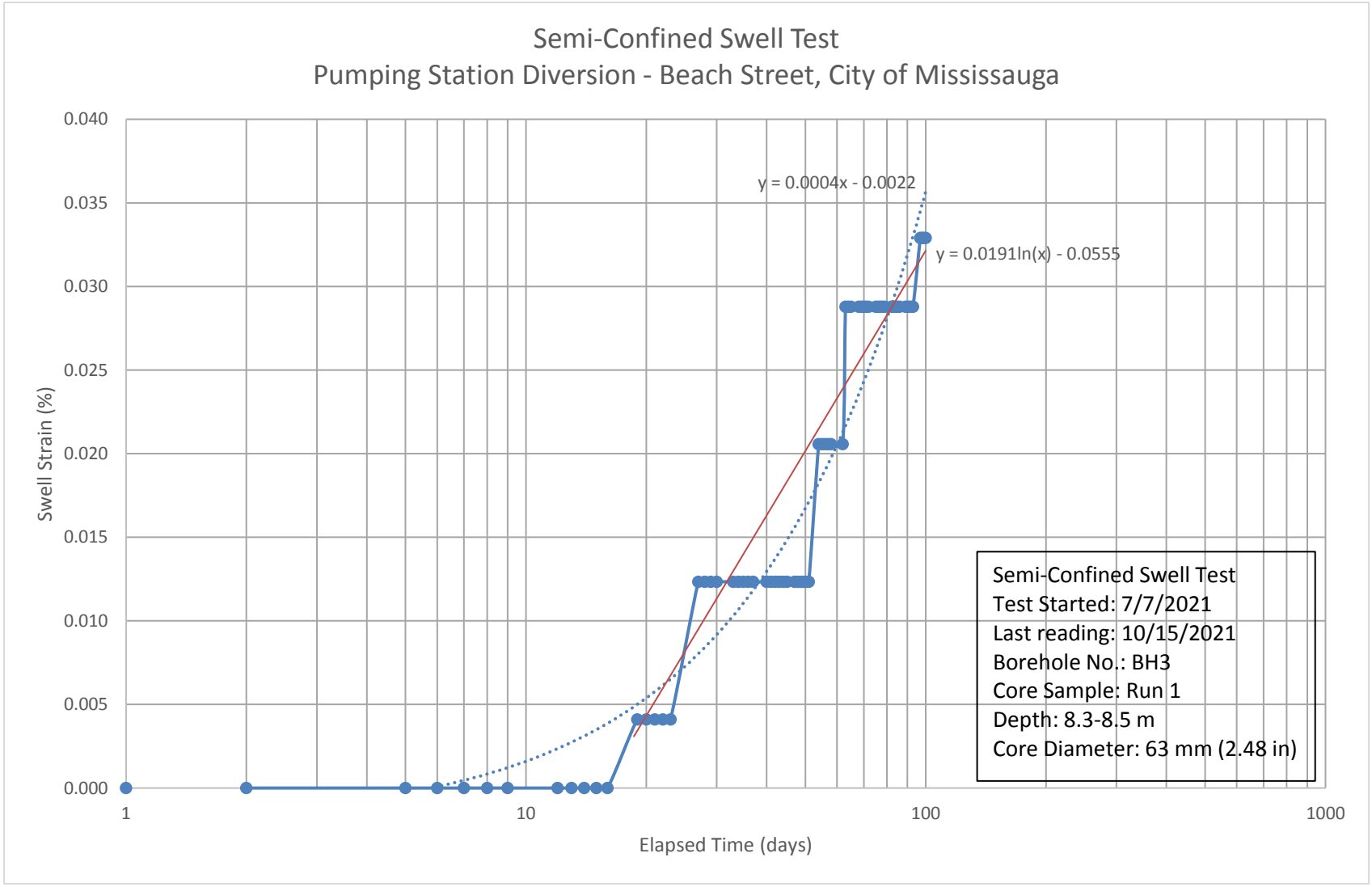
LAB NUMBER	2103911 I			
BOREHOLE NUMBER	BH8			
SAMPLE NUMBER	Run1			
DEPTH	33'6"-33'10"			
WEIGHT OF SAMPLE IN AIR (g)	620.14			
DIAMETER OF SAMPLE (mm)	62.99			
HEIGHT OF SAMPLE (mm)	75.55			
VOLUME OF SAMPLE (m^3)	0.0002354			
DENSITY (Kg/m^3)	2634			
DRY DENSITY(Kg/m^3)	2619			
AVERAGE DRY DENSITY (Kg/m^3)	2619			
TARE NUMBER	69			
WT. OF TARE + WET SAMPLE (g)	825.37			
WT. OF TARE + DRY SAMPLE (g)	821.05			
WT OF WATER (g)	4.32			
WT. OF TARE (g)	81.51			
WT. OF DRY SAMPLE (g)	739.54			
MOISTURE CONTENT (%)	0.6			
SAMPLE DESCRIPTION				

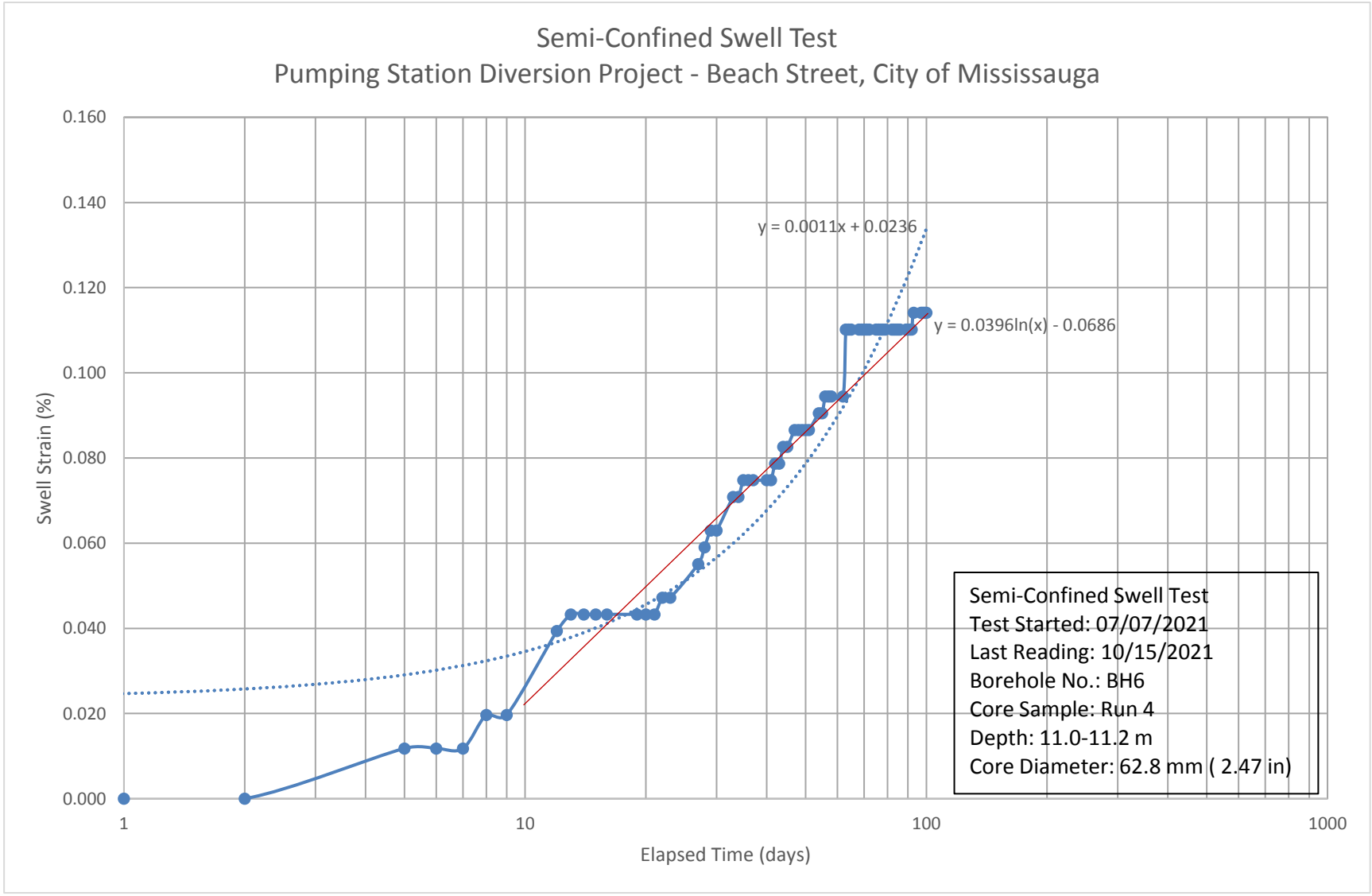
Peto MacCallum Ltd.
CONSULTING ENGINEERS

ROCK CORE DENSITY TEST

CLIENT:	The Regional Municipality of Peel	PROJECT NO.	21TF001A
PROJECT:	Geotechnical Investigation Services	DATE	2021-07-05
		TESTED BY	L. Gowry

LAB NUMBER	2103911 J			
BOREHOLE NUMBER	BH8			
SAMPLE NUMBER	1			
DEPTH	34'10"-35'2"			
WEIGHT OF SAMPLE IN AIR (g)	744.51			
DIAMETER OF SAMPLE (mm)	63.06			
HEIGHT OF SAMPLE (mm)	91.90			
VOLUME OF SAMPLE (m^3)	0.0002870			
DENSITY (Kg/m^3)	2594			
DRY DENSITY(Kg/m^3)	2582			
AVERAGE DRY DENSITY (Kg/m^3)	2582			
TARE NUMBER	C			
WT. OF TARE + WET SAMPLE (g)	753.08			
WT. OF TARE + DRY SAMPLE (g)	750.31			
WT OF WATER (g)	2.77			
WT. OF TARE (g)	133.8			
WT. OF DRY SAMPLE (g)	616.51			
MOISTURE CONTENT (%)	0.4			
SAMPLE DESCRIPTION				


Semi-Confined Swell Test
Pumping Station Diversion - Beach Street, City of Mississauga
Swell Strain (%)
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1
10
100
1000
Elapsed Time (days)
y = 0.0004x - 0.0022
y = 0.0191ln(x) - 0.0555
Semi-Confined Swell Test
Test Started: 7/7/2021
Last reading: 10/15/2021
Borehole No.: BH3
Core Sample: Run 1
Depth: 8.3-8.5 m
Core Diameter: 63 mm (2.48 in)


Semi-Confined Swell Test
Pumping Station Diversion Project - Beach Street, City of Mississauga
Swell Strain (%)
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
1
10
100
1000
Elapsed Time (days)
y = 0.0011x + 0.0236
y = 0.0396ln(x) - 0.0686
Semi-Confined Swell Test
Test Started: 07/07/2021
Last Reading: 10/15/2021
Borehole No.: BH6
Core Sample: Run 4
Depth: 11.0-11.2 m
Core Diameter: 62.8 mm (2.47 in)

APPENDIX B

Site Photographs

Photograph 1: Drilling on Aviation Road at Borehole BH4 location.

Photograph 2: Packer Testing at Borehole BH4.

Photograph 3: Drilling on Lakeshore Avenue East at Borehole BH5.

Photograph 4: PDO and traffic control during drilling on Lakeshore Avenue East at Borehole BH5 location.

Photograph 5: Drilling on Lakeshore Avenue East at Borehole BH6 location.

Photograph 6: PDO and traffic control during drilling on Lakeshore Avenue East at Borehole BH6 location.

Photograph 7: PDO and traffic control during drilling on Lakeshore Avenue East at Borehole BH6 location.

Photograph 8: Drilling on Lakeshore Avenue East at Borehole BH7 location.

Photograph 9: Drilling on Lakeshore Avenue East at Borehole BH8 location.

Photograph 10: Pavement reinstatement at Borehole BH8 location.

Photograph 11: Drilling on Hampton Crescent at Borehole BH11 location.

APPENDIX C

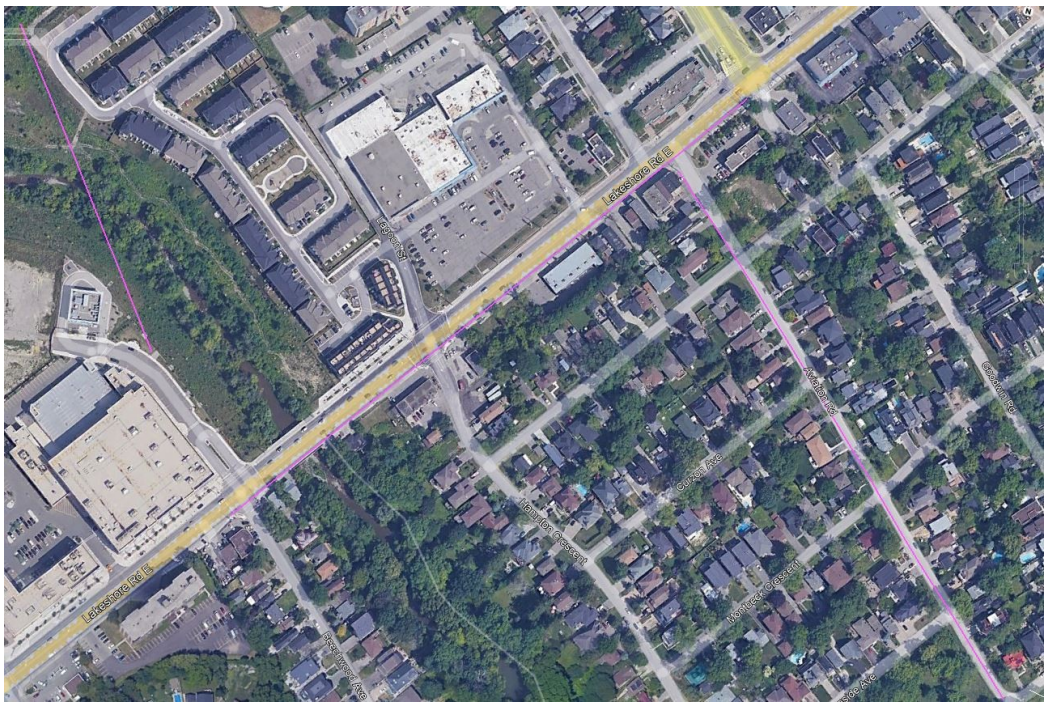
Geophysical Survey Report

GEOPHYSICS GPR
INTERNATIONAL INC.

BEACH STREET PUMPING STATION DIVERSION PROJECT
SEISMIC INVESTIGATION
MISSISSAUGA

Presented to:

Peto MacCallum Ltd.
165 Cartwright Avenue
Toronto, ON
M6A 1V5



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info@geophysicsgpr.com
October 2021 GPR-21-3228

TABLE OF CONTENT

1INTRODUCTION.....1

2METHODOLOGY.....3

2.1Positioning, Topography and Units of Measurement.....3

2.2Seismic Methods.....3

2.2.1Seismic Refraction.....3

2.2.2Surface Wave Analysis (MASW).....5

3RESULTS.....7

4CONCLUSIONS & RECOMMENDATIONS.....10

Illustration Index

Figure 1: Site plan with seismic lines.....2

Figure 2: Seismic Refraction Operating Principle.....4

Figure 3: 1-D MASW Operating Principle.....6

Figure 4: MASW Processing Work Flow – Raw shot record, phase velocity/frequency curve and resulting 1d shear wave velocity model.....6

Index of Tables

Table 1: Profile start and end shot locations (NAD83 coordinate system).....3

Appendices:
Appendix A: Seismic Methodology Fact Sheets
Appendix B: Drawings T213228_A1

1 INTRODUCTION

Geophysics GPR International Inc. was requested by Peto MacCallum Ltd. to carry out geophysical seismic survey along Lakeshore Road East, Aviation Road and the segment north of Lakeshore Road East across Cooksville Creek as a component of the Beach Street Pumping Station Diversion Project, Mississauga, Ontario (Figure 1)

The purpose of this investigation was to produce seismic wave velocity profiles for the bedrock and to map variations in subsurface materials that could influence the design options.

The seismic refraction as per ASTM D5777 and Multi-channel Analysis of Surface Waves (MASW) methods were applied.

A total of approximately 1.2 km of seismic data were collected.

Data were collected on August 24th and August 26th, 2021.

This report deals with the various aspects of the survey including field techniques, interpretation techniques, and finally an interpretation in the form of depth to bedrock profiles.

Throughout this report, geophysical parameters (seismic velocities) are used to infer the nature of the subsurface materials. The term overburden, will refer to both the fill material and native sediments. The terms bedrock and interpreted bedrock refer to high velocity layers typical of rock or potentially very dense tills.

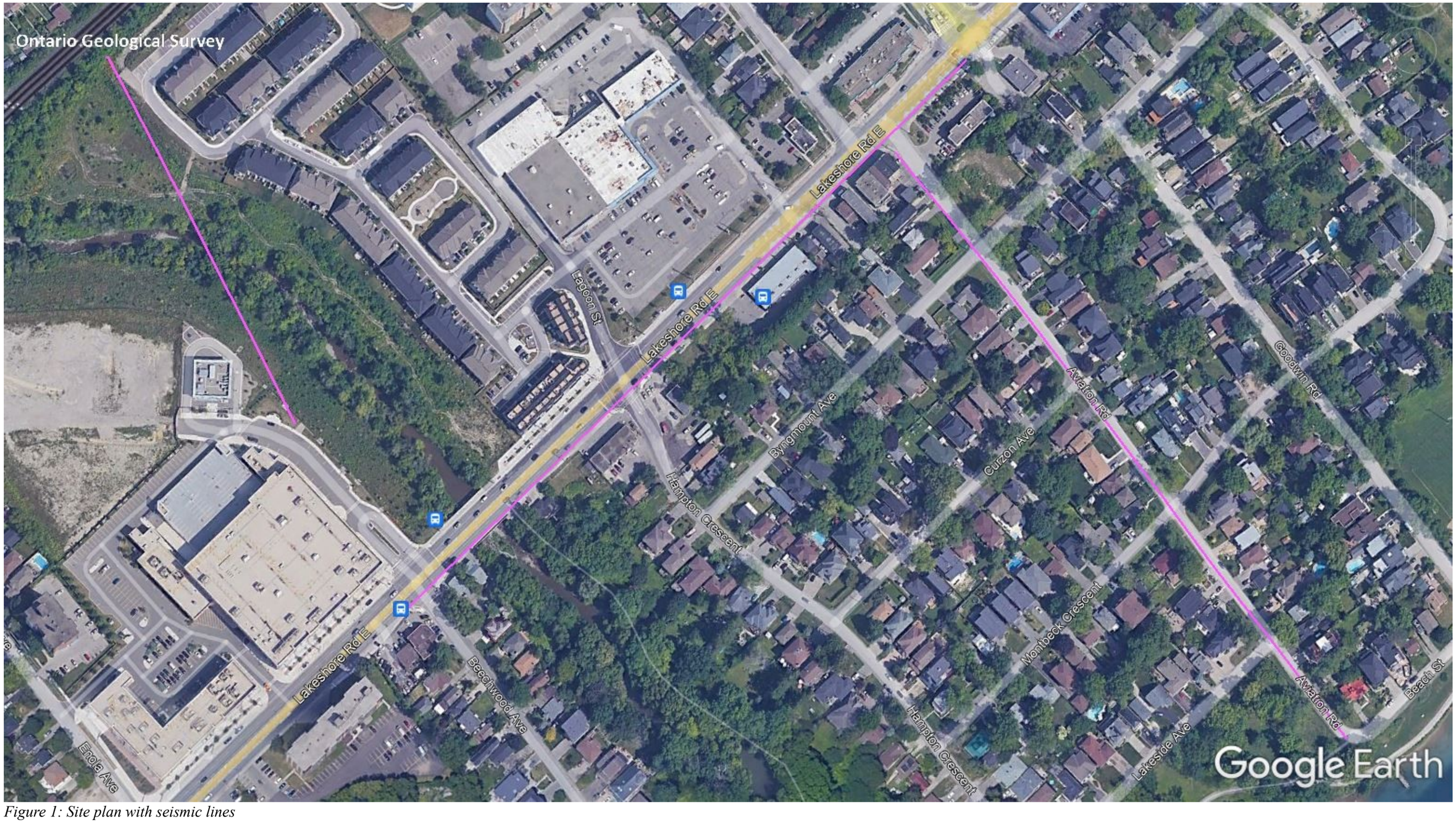


Figure 1: Site plan with seismic lines

2 METHODOLOGY

2.1 Positioning, Topography and Units of Measurement

Positioning was controlled by a combination of global navigation satellite system with differential corrections (DGPS) and chaining. The accuracy of the DGPS measurements are typically sub-metre. The overall accuracy of the positioning along the roadways is estimated to be on the order of +/- 1 m.

The horizontal positioning along the off-road profile is estimated to be on the order of +/- 2 to 3 m.

The start/end coordinates of the profiles are outlined in Table 1. The coordinate system is NAD83 zone 17T.

Interpreted profiles were generated as depths below ground surface.

Table 1: Profile start and end shot locations (NAD83 coordinate system)

Seismic Profile	Start of Line		End of Line		Length (m)
	Easting (m)	Northing (m)	Easting (m)	Northing (m)	
Lakeshore Road East	615491	4824699	615773	4825078	522
Aviation Road	615738	4825017	616060	4824710	442
Off-road segment	615408	4824796	615260	4824998	249

2.2 Seismic Methods

Seismic methods for geologic mapping involve measuring/recording the response of vibration sensors. Multiple techniques and methodologies are available for analysis of the data depending on the ultimate goal of the investigation. With the exception of the segments of data collected off-road, this particular investigation utilized a streamer arrangement; whereby the geophones and seismic sources are dragged behind a vehicle with records being recorded at set intervals along the alignment. Two essentially independent techniques were used to analysis the resulting data; namely, seismic refraction tomography and 2D MASW.

2.2.1 Seismic Refraction

Basic Theory

The seismic refraction method relies on measuring the transit time of the wave that takes the shortest time to travel from the shot-point to each geophone. The fastest seismic waves are the compressional (P) or acoustic waves, where displaced particles oscillate in the direction of wave propagation. The energy that follows this first arrival (including reflected waves, transverse (S) waves and resonance) is not considered under routine seismic refraction interpretation. Figure 2 illustrates the basic operating principle for refraction surveys.

Survey Design

The seismic spread consisted of 24 vibration monitoring devices (geophones) connected in line to a seismograph (ABEM Terraloc Mark 6/Pro). Spacing between geophones was set to 2 m. The seismic source was an elastic propelled weight drop. The shot offset was 6 m from one end of the spread. The distance between shots was 10 m for the majority of the profile.

The off-road seismic profiles used a stationary geophone arrays with a geophone spacings of 3m.

Interpretation Method and Accuracy of Results

The interpretation of the seismic refraction data was based on the refraction tomography and critical distance methods. A full refraction analysis (which gives the "true" material velocity and determines the depth beneath each geophone) would require multiple shot locations for a given spread location and a more thorough data analysis/interpretation.

The refraction tomography processing was done using the SeisImager Plotrefa software package (ver 3.1.0.5). The refraction tomography method involves a computer ray tracing inversion process to fit a velocity model to the interpreted time-distance arrival time data. How well the travel-times computed from the velocity model match the interpreted travel-times from the raw data are reported as an RMS error in milliseconds. This RMS error gives an indication of the accuracy of the model but are not a true measure of the velocities. Noisier data will, in general, give higher RMS error values. Tomographic inversion can provide more accurate models than the standard interpretation method in areas of gradational changes in velocity and in areas of extreme topography.

Typically the accuracy of a full refraction surveys is +/- 1m for depths less than 10m and +/-10% for depths greater than 10m. The estimated error from simple critical distance calculations and the tomography modelling with no reverse shots will be higher.

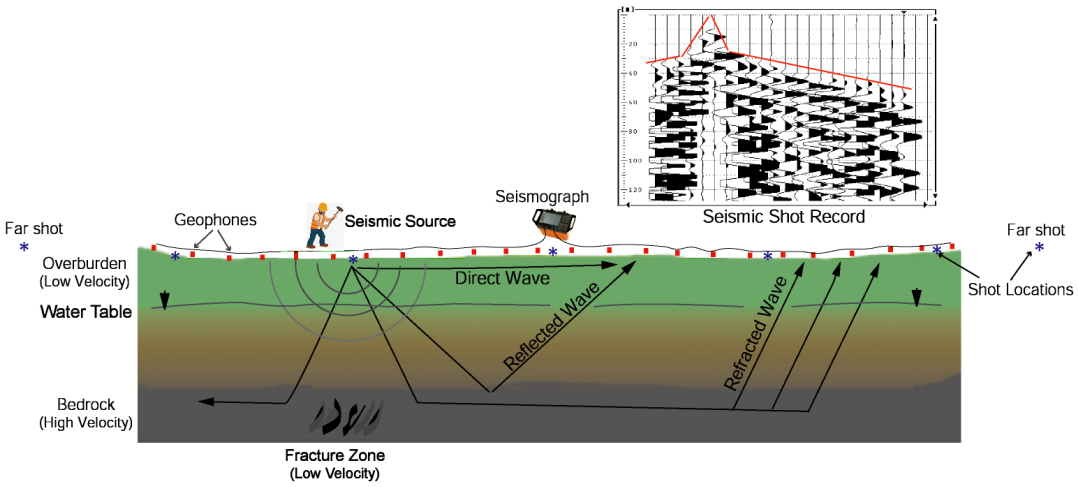


Figure 2: Seismic Refraction Operating Principle

2.2.2 Surface Wave Analysis (MASW)

Basic Theory

The Multi-channel Analysis of Surface Waves (MASW) is a seismic method used to evaluate the shear-wave velocities of subsurface materials through the analysis of the dispersion properties of Rayleigh surface waves ("ground roll"). The dispersion properties are measured as a change in phase velocity with frequency. Surface wave energy will decay exponentially with depth. Lower frequency surface waves will travel deeper and thus be more influenced by deeper velocity layering than the shallow higher frequency waves. Inversion of the Rayleigh wave dispersion curve yields a shear-wave (Vs) velocity depth profile (sounding). Figure 3 and Figure 4 outline the basic operating procedure for the MASW method. A more detailed description of the method can be found in the paper Multi-channel Analysis of Surface Waves, Park, C.B., Miller, R.D. and Xia, J. Geophysics, Vol. 64, No. 3 (May-June 1999); P. 800–808.

The two dimensional Multi-channel Analysis of Surface Waves (2D-MASW) is an extension of the 1D analysis and the basic theory behind the method is similar. The 2D method involves collecting multiple shot records along a profile. The shot records are compared and combined based on shot/receiver geometry (common-mid-point (CMP)). A multi-channel analysis is then performed on the CMP gathers to generate a phase dispersion curve for calculating the surface wave phase velocities. A non-linear least-squares inversion is run to generate a 2D shear wave velocity model. A more detailed description of the method can be found in the paper CMP Cross-Correlation Analysis of Multi-Channel Surface-Wave Data, Hayashi, K., and Suzuki, H. Exploration Geophysics, (2004) 35, 7-13.

Survey Design

The MASW data analysis used the same data set as the seismic refraction survey discussed above.

Interpretation Method and Accuracy of Results

The main processing sequence involved the use of the SeisimagerSW-2D software package for compiling the common-mid-point gathers, picking of the dispersion curves and 2D inversion of the MASW shot records.

The theoretical maximum depth of investigation is approximately half of the total spread geophone length. In practice, the maximum depth of investigation is controlled by the lowest frequency of the dispersion curve that can be resolved and the material velocity. This in turn is controlled primarily by the geology, background noise and energy source. The model resolution will decrease with depth and will be horizontally smoothed/interpolated.

The main sources of error are generally related to the identification of the fundamental mode of the dispersion curve. Typically, the fundamental mode is the dominant mode; however, it some cases, higher modes can be dominant. An additional source of error is in the modelling/inversion process. As with most inversion problems, the solution is non-unique and must be judged geologically realistic.

The accuracy of the shear-wave velocities modelled from the MASW method is on the order of +/- 10 to 15% for overburden material. The estimated error is higher for shear-wave velocities within rock formations and, in general, the resolution decreases with depth.

The accuracy of the interpreted layer contacts with the MASW method is on the order of +/- 10 % to 15%. The estimated error will be higher for contacts between materials of lower velocity contrast (e.g. dense till over weathered shale).

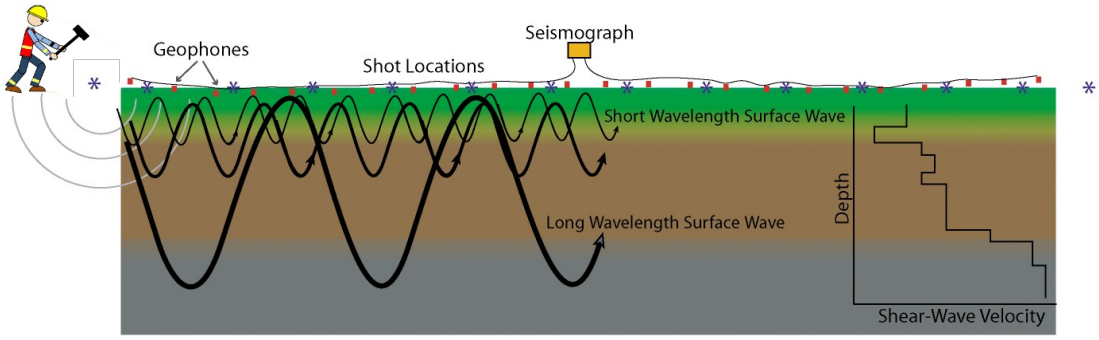


Figure 3: 1-D MASW Operating Principle

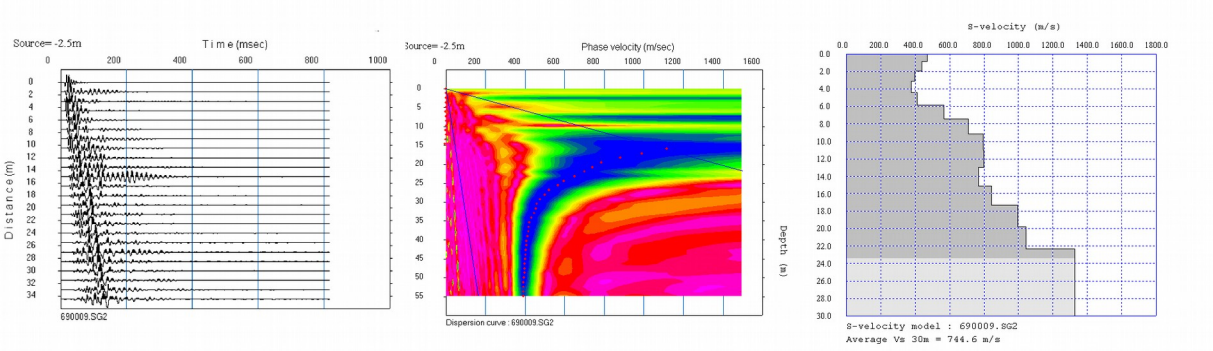


Figure 4: MASW Processing Work Flow – Raw shot record, phase velocity/frequency curve and resulting 1d shear wave velocity model

3 RESULTS

The results of the 2D seismic surveys along Queen's Quay from Bay St. to Parliament St and along segment east of the Parliament Slip, are presented as Drawings in Appendix B.

The plan view plot overlain on earth imagery are provided as Figure 1.

The quality of the MASW dispersion curves were not well defined for the majority of the shot records. The contrast between the very low velocity overburden material and higher velocity till or bedrock led to poorly constrained velocities within the bedrock.

The quality of the refracted P-wave velocities was good in general. Lakeshore data was meduim, this is primarily attributed to the heavy traffic on the road. Additional factors relating to the poor refracted signal arrival are the suspected soft fill material and urban environment (e.g background vibrations/noise, buried utilities etc) which both limit the signal-to-noise ratio.

The following are descriptions of the features presented in the seismic profile drawings:

Topography – The topography data should be used for reference purposes only.

Interpreted Top of Potential Bedrock – The interpreted bedrock depth is based on a combined interpretation of the P-wave and S-wave velocities.

Interpreted Overburden Contact (Water Table or Till) – The light blue line is derived from the P-wave refraction tomography model and approximately follows the 1700 m/s contour. This layer is interpreted to represent the top of saturated material, till, or potentially heavily weathered shale

Interpreted Overburden Contact (Vp=400 to 800 m/s) – The P-wave velocities from the refraction tomography model of 400 m/s represent the soft/loose overburden. P-wave velocities greater than 800 m/s are typical for hard/dense overburden.

Potential Zone of Increased Bedrock Weathering – The hatched area along the profiles provide a relative estimate of the potential of bedrock weathering based on a combination of the steepness of the seismic velocity gradients and variation between the compressional and shear-wave models. As such, this zone can also provide a relative indicator of interpretation confidence.

Appendix A contains a tables of seismic velocities for various soil and rock types.

The following paragraphs provide a summary of the results for each segment

Lakeshore Road East

The seismic profile along Lakeshore Road East is presented in Drawing T213228_A1 and plan view Figure 1.

The data were collected in the eastbound curb lane from west of Beechwood Avenue to the east of Aviation Road

The seismic shear-wave velocities suggest four layers. The uppermost layer, is dominated by very low shear-wave velocities in the range of 100 m/s to 250 m/s. This layer of suspected fill material extends to approximately 3 to 4 m below grade.

The second overburden layer, with velocities in the range of 250 m/s to 400 m/s is interpreted as stiff/compact material, potentially sandy to clayey silt.

The third overburden layer, with s-wave velocities greater than 400 m/s, is interpreted as a denser native overburden material or till.

The top of more competent bedrock has been interpreted along the steepest gradient of the s-wave velocity model. This corresponds to a velocity contour of approximately 900 m/s. The depth to shale indicate in the boreholes corresponds well with this contour value.

The model shear-wave velocities of the bedrock are poorly constrained. The modelled shear-wave velocities for the shale bedrock are the order of 750 m/s to 1100 m/s varying from heavily weathered to more competent rock.

The quality of the compressional (P) wave arrivals for the bedrock surface, were in general, good.

The interpreted bedrock depth is on the order of 7 to 12 m along the alignment, with more shallow depth between the chainages 250 m and 350 m.

Areas of potentially increased bedrock weathering (based on lower seismic modelled velocities) are indicated on the drawing. Boreholes are recommended to better define the extent of weathering along the alignment.

Aviation Road

The data were collected in the southbound curb lane from Lakeshore Road East to Beach Street.

The seismic profile along Aviation Road is presented in Drawing T213228_A1 and plan view Figure 1. As with the Lakeshore profile, the seismic shear-wave velocities suggest four layers.

The quality of the compressional (P) wave arrivals for the bedrock surface were good.

The interpreted bedrock depth is on the order of 10 to 12 m along the alignment.

Areas of potentially increased bedrock weathering (based on lower seismic modelled velocities) are indicated on the drawing. Boreholes are recommended to better define the extent of weathering along the alignment.

Off-road segment north of Lakeshore(Across Cooksville Creek)

Six stationary seismic spreads with overlap were collected within the properties north of Lakeshore Road East. Data was collected from south to north.

The seismic profiles are presented in Drawing T213228_A1 and plan view Figure 1. As with the previous profiles, the seismic shear-wave velocities suggest four layers.

The quality of the compressional (P) wave arrivals for the bedrock surface were good.

The interpreted bedrock depth is relatively flat and is on the order of 11 to 13 m along the alignment.

Areas of potentially increased bedrock weathering (based on lower seismic modelled velocities) are indicated on the drawing. Boreholes are recommended to better define the extent of weathering along the alignment.

4 CONCLUSIONS & RECOMMENDATIONS

Seismic refraction and MASW interpretation techniques were performed on common data sets along a segment of Lakeshore Road East, Aviation Road and the segment on the property north of Lakeshore Road East as a component of The Beach Street Pumping Station Diversion Project.

Seismic data were collected over a total length of approximately 1.2 km. The chainages are relative to the starting points of the seismic data.

The results of the 2D MASW and refraction tomography modelling are presented in Drawings T213228_A1. The corresponding plan view plots are presented as in Figure 1.

The MASW results are presented as colour contoured plots of S-wave velocities. The accuracy of the shear-wave velocities modelled from the MASW method is on the order of +/- 10 to 15% for overburden material. The accuracy of the modelled shear-wave velocities within the bedrock are typically higher. The resolution decreases with depth and will be horizontally smoothed/interpolated. The accuracy of the interpreted layer contacts with the MASW method is on the order of +/- 10 % to 15%. The estimated error will be higher for contacts between materials of lower velocity contrast (e.g. dense till over weathered shale).

The seismic refraction data are presented as colour contoured plots of the refraction tomography models. The refraction models are based on apparent velocities as opposed to true velocities as data were collected in one direction only. The quality of the P-wave refraction models is good.

The interpreted geological profile is based on the combined S-wave and P-wave velocity models with a larger preference given to the refraction data. Areas where bedrock weathering may occur are indicated in the drawings.

Borehole data were provided by the client to aid in the interpretation. If additional borehole data becomes available it can be used to further refine the interpreted bedrock profile based on the seismic velocities. The boreholes, in general, indicated the top of weathered shale shallower than the seismic data. The RQD values were present for the shale suggest poor quality.

Cross-hole and down-hole seismic methods provide direct measurements of the shear-wave velocity (as opposed to modelled velocities obtained through the MASW method) and will have better resolution at depth. If more accurate wave velocities are required, it is recommended that down-hole seismic tests are performed as a component of an intrusive drilling program. Borehole geophysical tools, including optical and acoustic televiewers, can be used to provide additional insights in to the bedrock geology.

This report has been written by lhoucin Taghya, P.Geo.

_____
Lhoucin Taghya, P.Geo.
Geophysicist

APPENDIX A

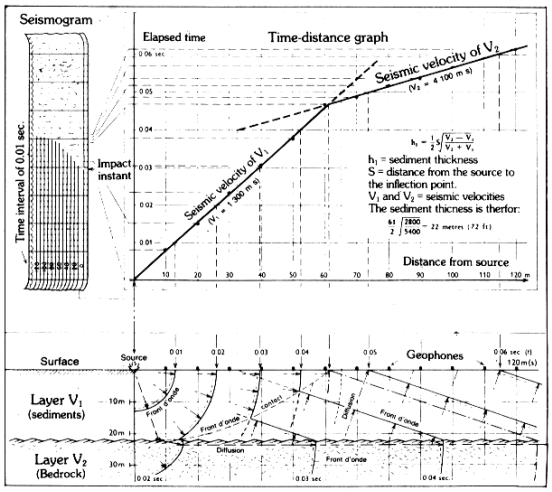
Seismic Methodology Fact Sheets

GEOPHYSICS G P R INTERNATIONAL INC.

SEISMIC REFRACTION

Seismic refraction consists of recording the length of time taken for an artificially provoked surface vibration to propagate through the earth. By processing the data, the seismic velocities and depths of the underlying rock layers can be determined. These velocities are characteristic of the nature and quality of the bedrock; a fissured, fractured or sheared rock will be characterized by reduced seismic velocities.

The method is generally used to obtain a better geological analysis of the sub-surface and to determine the following characteristics: the quality, profile and depth of bedrock, its nature, degree of alteration and any other physical contrasts. Seismic refraction ensures that maximum information may be gained from geological field work, and that direct investment costs (drilling, excavation), will be reduced.



PRINCIPLE OF SEISMIC REFRACTION

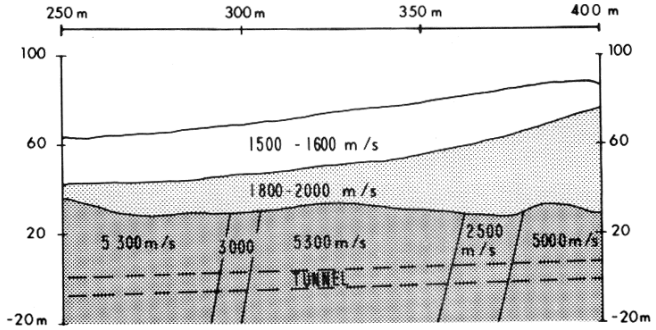
FEATURES

- Precise determination of soil thickness .
- Precise determination of the seismic velocities (rock type and quality).
- Localization and identification of geological units.
- Detailed analysis of soil.
- Year-round use.
- Sea and land surveys (above and below ground).
- Great accessibility possible to rough terrain and remote regions.

AREAS OF APPLICATION

Civil Engineering/Mining Exploration - Exploitation/Petroleum and Gas Sectors/ Geotechnology/Geology/ Hydrology.

- Identification of faults, fractures, shear zones.
- Detection of rock differences (veins, dykes, cavities, etc.).
- Determination of rock topography.
- Evaluation of volume of soil present or to be excavated.
- Excellent complement to geological mapping.
- Recognition of geophysical anomalies such as VLF, gravimetry, etc.
- Drill site selection, better target identification.
- Evaluation of the size, thickness and condition of surface shafts (mining exploitation).
- Mass Rock Quality Determination (MRQD).
- Detection of rock irregularities and breaks.
- Hydrogeology (detection of water tables, veins, reservoirs).
- Excellent complement to any geological analysis.



Interpretation results of a seismic profile

ADDITIONAL REMARKS

Geophysics GPR International Inc. has been recognized for the past fifteen years as a leader in both the application and the development of seismic methods. Seismic refraction is currently used in both civil and mining engineering; the use of lighter high-performance equipment and better tomographical interpretation of the results have contributed to its growing popularity.

GEOPHYSICS G P R INTERNATIONAL INC.

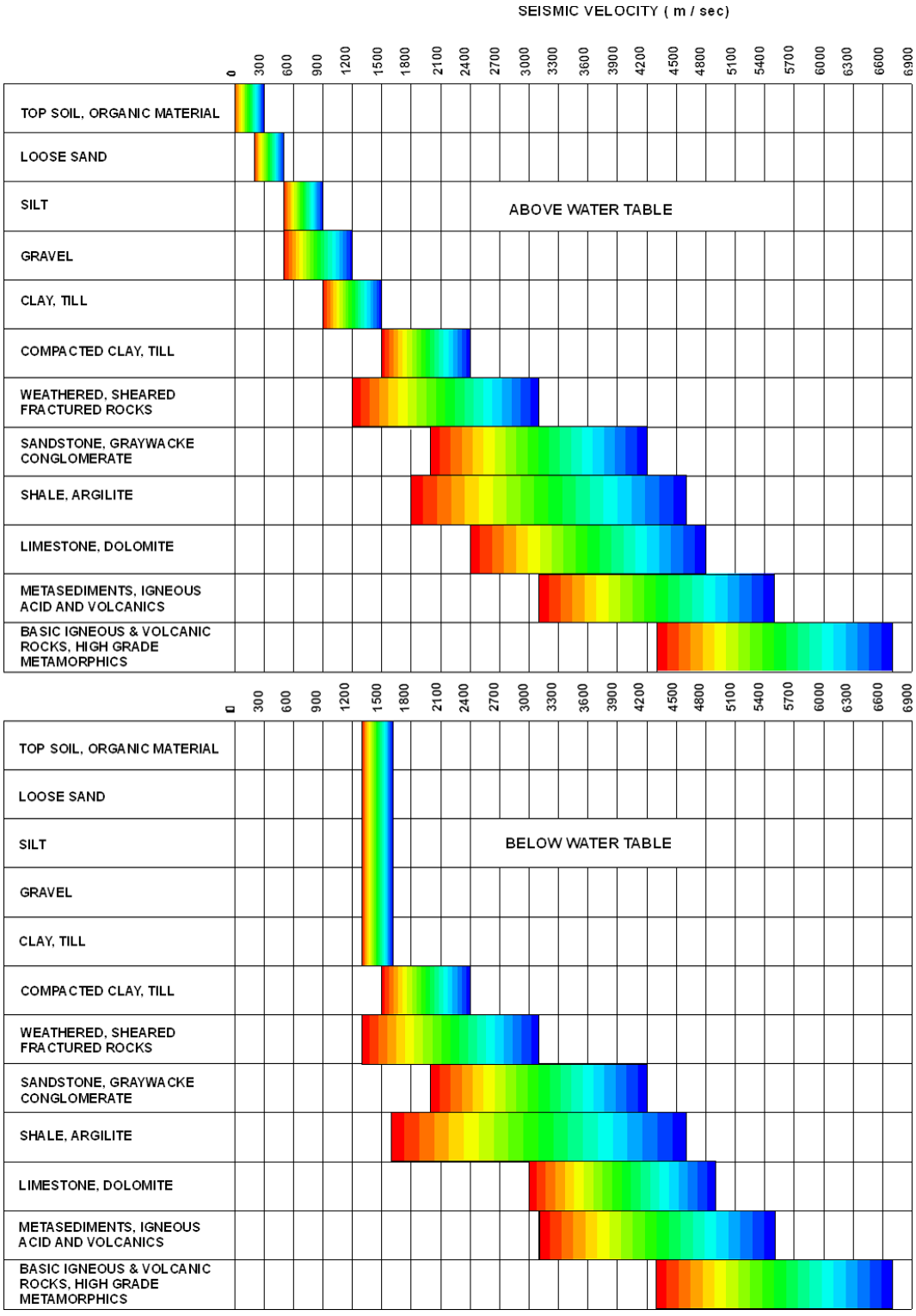


Table of P-wave velocities for given materials

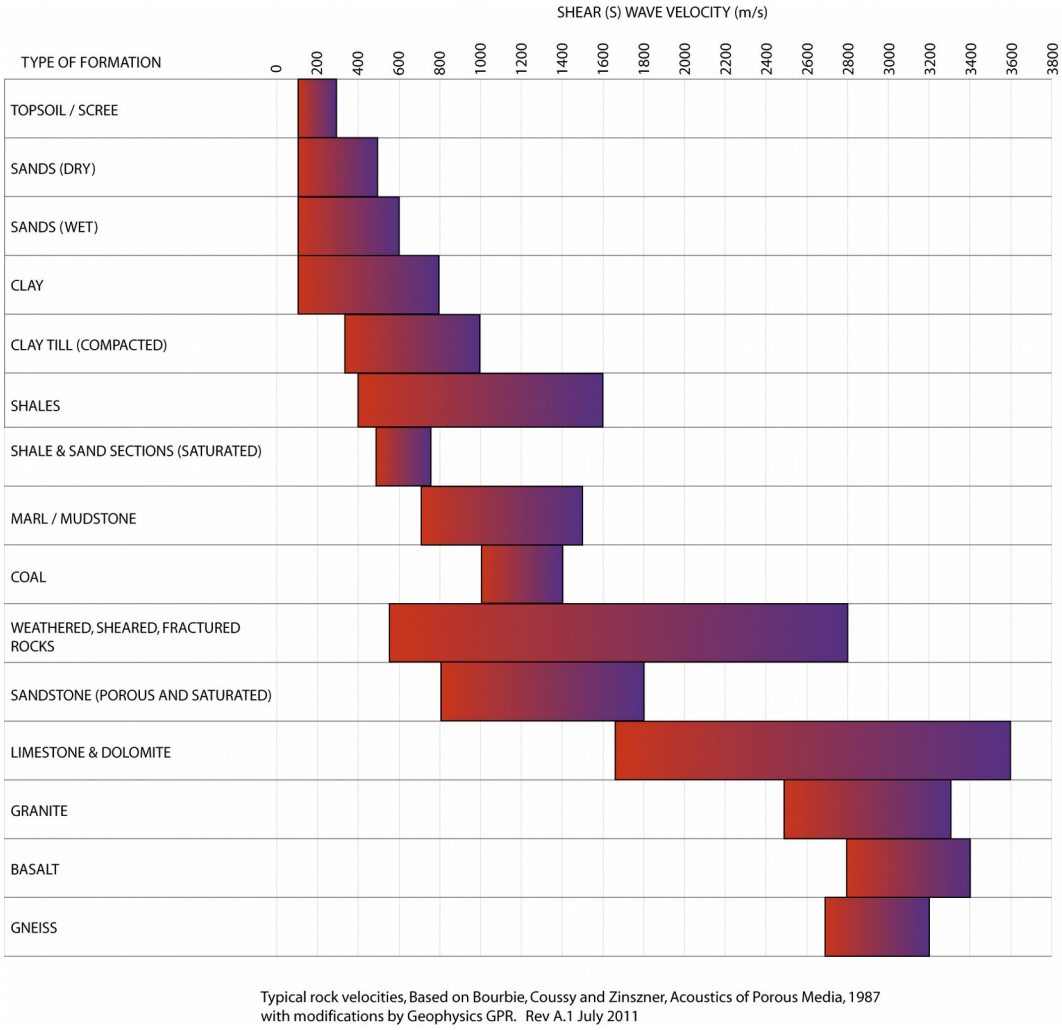
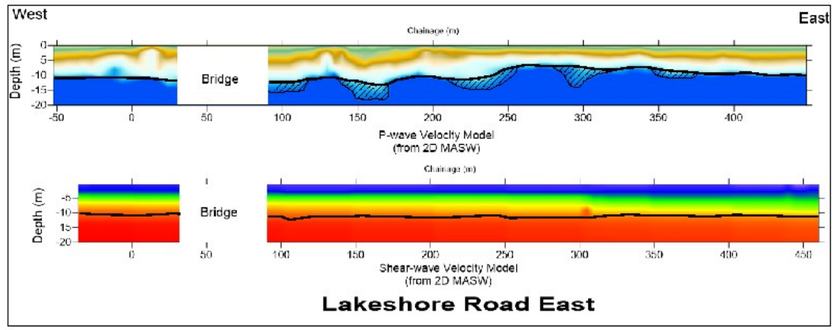
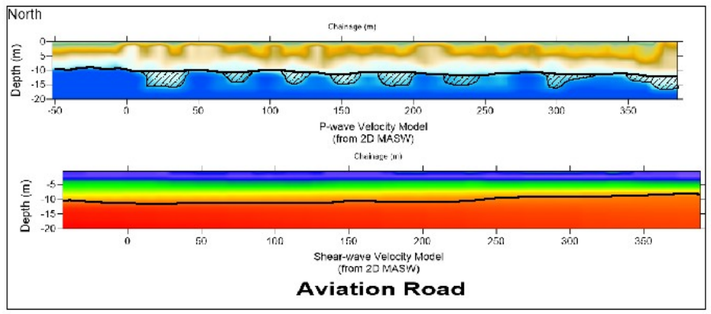


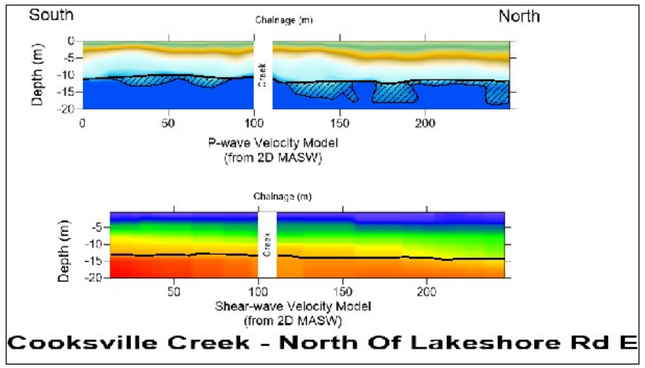
Table of S-wave velocities for given materials

APPENDIX B

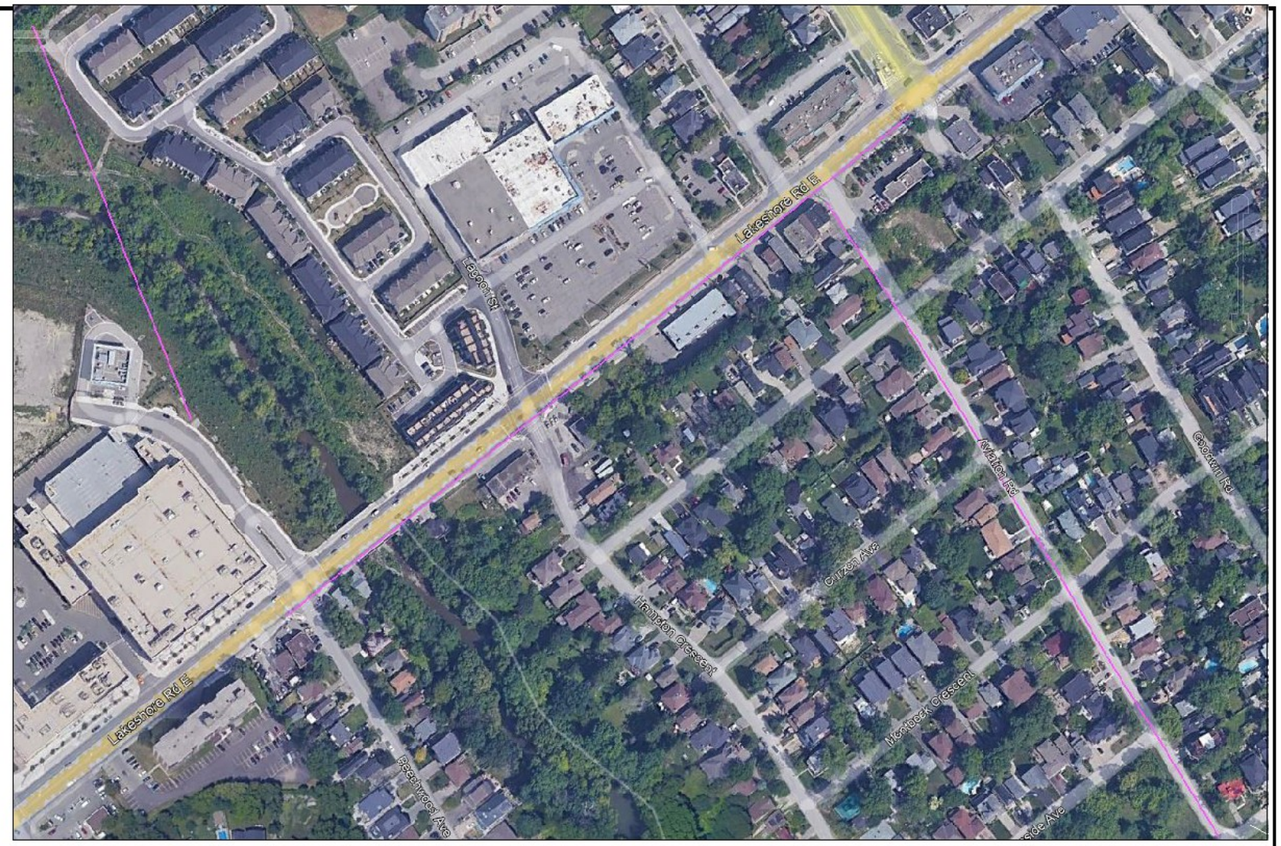
Drawings
T213228_A1: Lakeshore Road East, Aviation Road and the Segment north of Lakeshore Road East

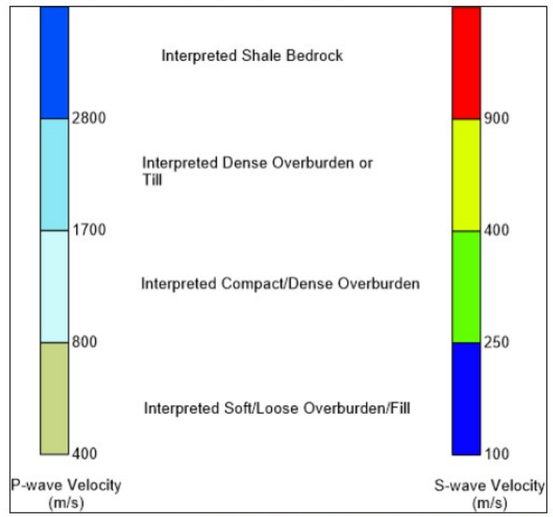






* Poor Dispersion curves from MASW data with potantial interference from possible infrastructures and surrounding noise





LEGEND

- Topography profile
- Shale or Weathered Bedrock
- Possible Very weatherd Shale or Till

NOT VALID FOR CONSTRUCTION

No	NOTES
1	THE SEISMIC SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. August 2021
2	COORDINATE SYSTEM: NAD83 Zone 17T
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLGIES, RESULTS AND LIMITATIONS
4	
5	
6	

No	DATE	MODIFICATIONS	GPR APP.

GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR / DRAWN BY	Lhoucin Taghya, P.Geo
VERIFIÉ PAR / CHECKED BY	L.T, P.Geo
APPROUVÉ PAR / APPROVED BY	
# CONTRAT / CONTRACT #	T-213228
DATE	October 2021
ÉCHELLE / SCALE	AS SHOWN
# DESSIN / DRAWING #	T-21-3228_A1

CLIENT: Peto MacCallum Ltd.

PROJET / PROJECT: Beach St. Pumping Station Diversion Project
Mississauga, ONTARIO

TITRE / TITLE: SEISMIC Survey

APPENDIX D

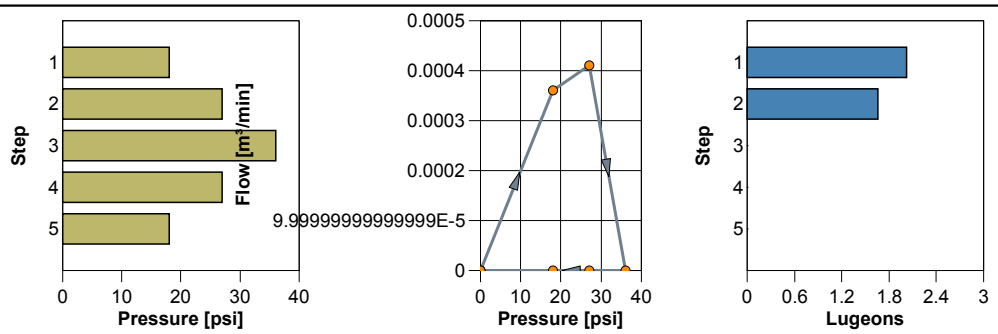
Packer Test Results

Lugeon Test Summary - BH1

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

Client: The Regional Municipality of Peel

Test Interval Top Bottom	Graphs	Result
10.52 m 11.64 m		Laminar Lugeon: 0.7 Hydraulic Conductivity: 5.95E-8 m/s Hydraulic Conductivity: 0.005 m/d

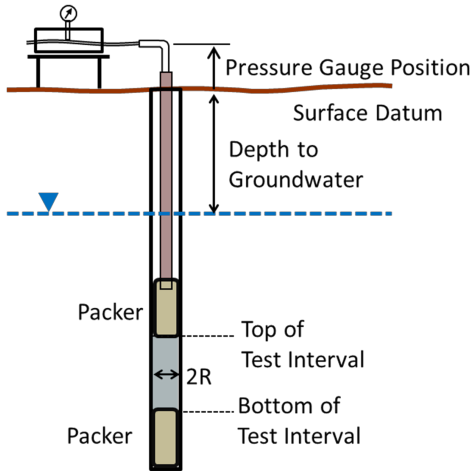
Lugeon Test Analysis Report

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

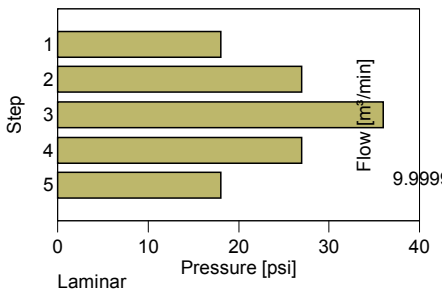
Client: The Regional Municipality of Peel

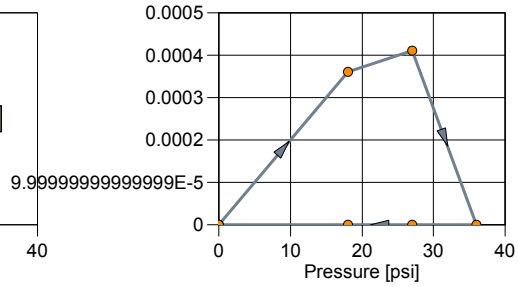
Location: Beach Street PS, City of Mississauga	Lugeon Test: Packer Test 1	Tested bore: BH1
Test Conducted by: Drilltech Drilling Ltd. / Akbar Hossain		Test Date: 6/2/2021
Analysis Performed by: Mohammed Zamshad		Analysis Date: 11/11/2021
Lithology:		

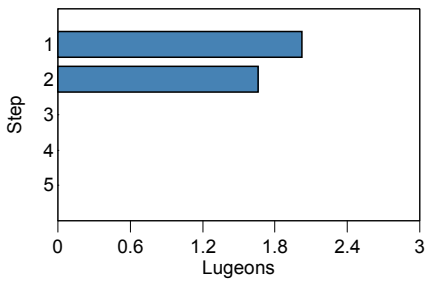


Top of Test Interval: 10.52 m
Bottom of Test Interval: 11.64 m
Length of Test Interval: 1.12 m
Gauge Position: 0.92 m
Depth to Groundwater: 2.62 m
Radius of Test Section: 0.05 m

Step	Pressure [psi]	Flow Meter Readings [m³]											Average Flow Rate [m³/min]	Hydraulic Conductivity		
		1	2	3	4	5	6	7	8	9	10	11		[m/s]	[m/d]	Lugeon
1	18.0	9.8446	9.8446	9.8453	9.8463	9.8474	9.8482	9.8482	9.8482	9.8482	9.8482	9.8482	0.0004	1.64×10^{-7}	0.014	2.0
2	27.0	9.8460	9.8470	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	0.0004	1.34×10^{-7}	0.012	1.7
3	36.0	9.8416	9.8416	9.8416	9.8416	9.8416	9.8416	9.8416	9.8416	9.8416	9.8416	9.8416	0.0000	0.00×10^{-1}	0.000	0.0
4	27.0	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	0.0000	0.00×10^{-1}	0.000	0.0
5	18.0	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	0.0000	0.00×10^{-1}	0.000	0.0
													Average	5.95×10^{-8}	0.005	0.7







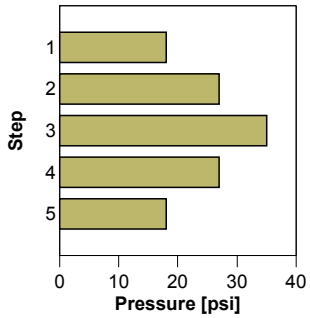
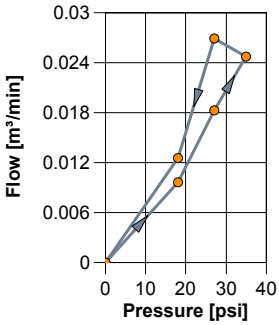
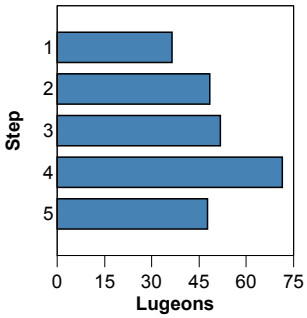
Laminar
Lugeon: 0.7
Hydraulic Conductivity: 5.95E-8 m/s
Hydraulic Conductivity: 0.005 m/d

Lugeon Test Summary - BH2

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

Client: The Regional Municipality of Peel

Test Interval Top Bottom	Graphs	Result
9.76 m 11.59 m	  	Dilation Lugeon: 36.5 Hydraulic Conductivity: 3.42E-6 m/s Hydraulic Conductivity: 0.295 m/d

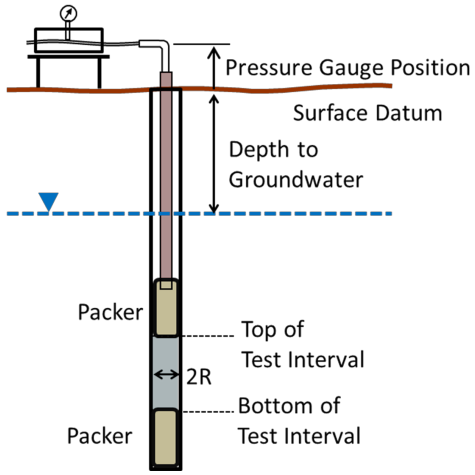
Lugeon Test Analysis Report

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

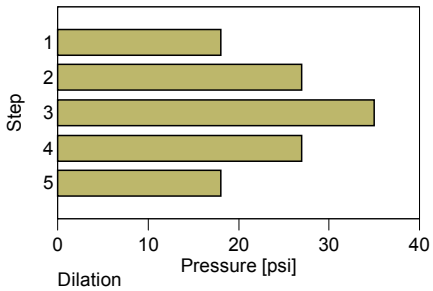
Client: The Regional Municipality of Peel

Location: Beach Street PS, City of Mississauga	Lugeon Test: Packer Test 2	Tested bore: BH2
Test Conducted by: Drilltech Drilling Ltd. / Akbar Hossain		Test Date: 6/8/2021
Analysis Performed by: Mohammed Zamshad		Analysis Date: 11/11/2021
Lithology:		

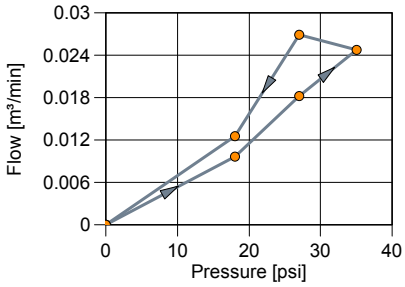


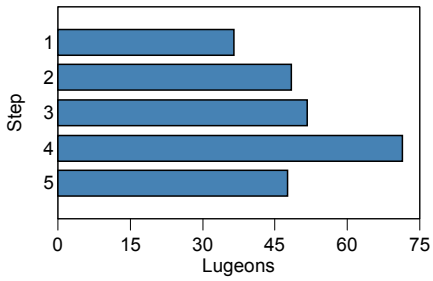
Top of Test Interval: 9.76 m
Bottom of Test Interval: 11.59 m
Length of Test Interval: 1.83 m
Gauge Position: 0.90 m
Depth to Groundwater: 1.10 m
Radius of Test Section: 0.05 m

Step	Pressure [psi]	Flow Meter Readings [m³]											Average Flow Rate [m³/min]	Hydraulic Conductivity		
		1	2	3	4	5	6	7	8	9	10	11		[m/s]	[m/d]	Lugeon
1	18.0	9.8577	9.8721	9.8826	9.8870	9.8968	9.9057	9.9150	9.9247	9.9346	9.9441	9.9537	0.0096	3.42×10^{-6}	0.295	36.5
2	27.0	9.9733	9.9918	10.0102	10.0283	10.0462	10.0643	10.0821	10.1013	10.1186	10.1369	10.1556	0.0182	4.53×10^{-6}	0.392	48.4
3	35.0	10.1879	10.2161	10.2436	10.2683	10.2987	10.3153	10.3398	10.3634	10.3876	10.4116	10.4349	0.0247	4.84×10^{-6}	0.419	51.7
4	27.0	10.4680	10.4942	10.5212	10.5486	10.5748	10.6015	10.6283	10.6552	10.6823	10.7098	10.7369	0.0269	6.69×10^{-6}	0.578	71.4
5	18.0	10.7687	10.7802	10.7921	10.8045	10.8171	10.8298	10.8427	10.8554	10.8681	10.8810	10.8939	0.0125	4.46×10^{-6}	0.385	47.6
													Average	4.79×10^{-6}	0.414	51.1



Dilation
Lugeon: 36.5
Hydraulic Conductivity: 3.42E-6 m/s
Hydraulic Conductivity: 0.295 m/d



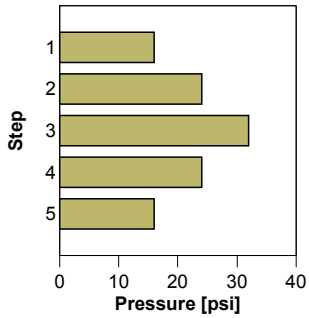
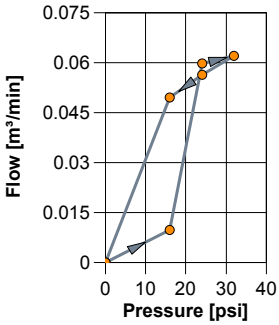
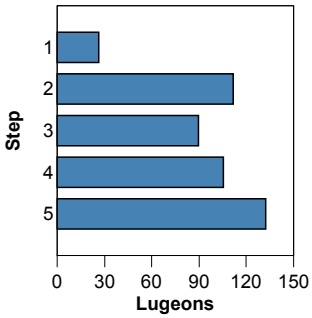


Lugeon Test Summary - BH3

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

Client: The Regional Municipality of Peel

Test Interval Top Bottom	Graphs	Result
7.93 m 10.82 m	  	Wash out Lugeon: 131.9 Hydraulic Conductivity: 1.4058833E-3 cm/s Hydraulic Conductivity: 1.215 m/d

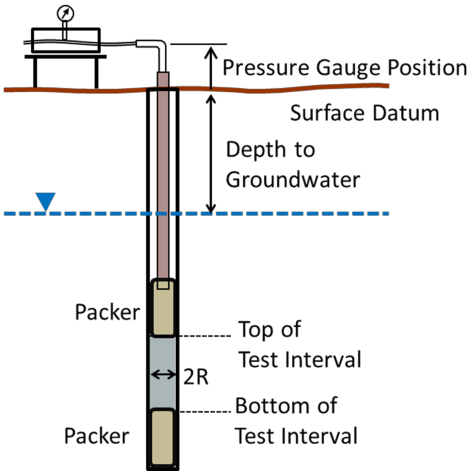
Lugeon Test Analysis Report

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

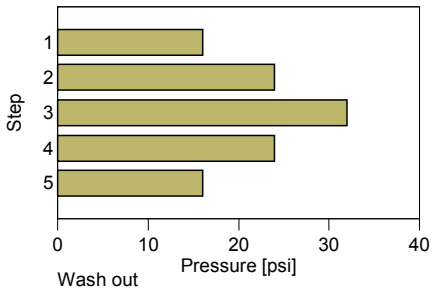
Client: The Regional Municipality of Peel

Location: Beach Street PS, City of Mississauga	Lugeon Test: Packer Test 3	Tested bore: BH3
Test Conducted by: Drilltech Drilling Ltd. / Akbar Hossain		Test Date: 6/10/2021
Analysis Performed by: Mohammed Zamshad		Analysis Date: 11/11/2021
Lithology:		

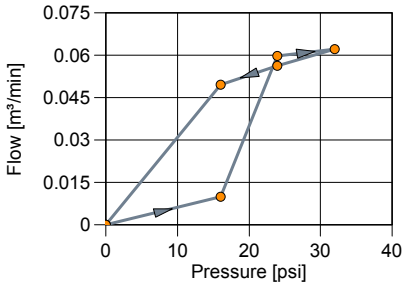


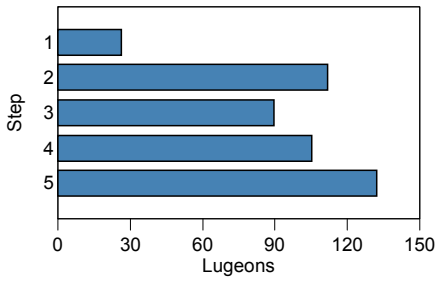
Top of Test Interval: 7.93 m
Bottom of Test Interval: 10.82 m
Length of Test Interval: 2.89 m
Gauge Position: 0.90 m
Depth to Groundwater: 1.10 m
Radius of Test Section: 0.05 m

Step	Pressure [psi]	Flow Meter Readings [m³]											Average Flow Rate [m³/min]	Hydraulic Conductivity		
		1	2	3	4	5	6	7	8	9	10	11		[m/s]	[m/d]	Lugeon
1	16.0	12.5948	12.6002	12.6090	12.6182	12.6280	12.6382	12.6489	12.6599	12.6707	12.6819	12.6932	0.0098	2.77×10^{-6}	0.239	26.2
2	24.0	12.7053	12.7261	12.7478	12.7701	12.7936	12.8241	12.8588	12.8945	12.9310	12.9756	13.3029	0.0598	1.18×10^{-5}	1.019	111.7
3	32.0	13.0705	13.1273	13.1848	13.2450	13.3082	13.3695	13.4326	13.4951	13.5586	13.6249	13.6918	0.0621	9.44×10^{-6}	0.816	89.5
4	24.0	13.7226	13.7791	13.8354	13.8915	13.9471	14.0034	14.0597	14.1154	14.1725	14.2281	14.2853	0.0563	1.11×10^{-5}	0.959	105.2
5	16.0	14.3279	14.3761	14.4253	14.4739	14.5328	14.5732	14.6243	14.6733	14.7235	14.7736	14.8238	0.0496	1.39×10^{-5}	1.204	132.1
													Average	9.81×10^{-6}	0.847	92.9



Wash out
Lugeon: 131.9
Hydraulic Conductivity: 1.4058833E-3 cm/s
Hydraulic Conductivity: 1.215 m/d



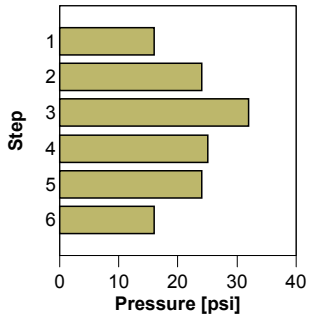
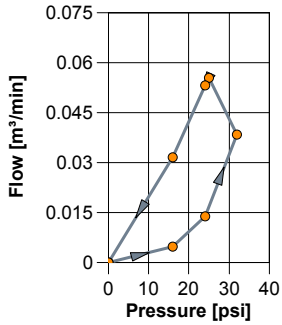
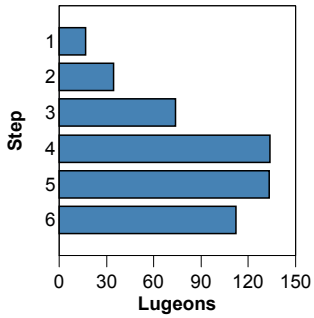


Lugeon Test Summary - BH4

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

Client: The Regional Municipality of Peel

Test Interval Top Bottom	Graphs	Result
8.69 m 10.85 m	  	Wash out Lugeon: 133.0 Hydraulic Conductivity: 1.30E-5 m/s Hydraulic Conductivity: 1.126 m/d

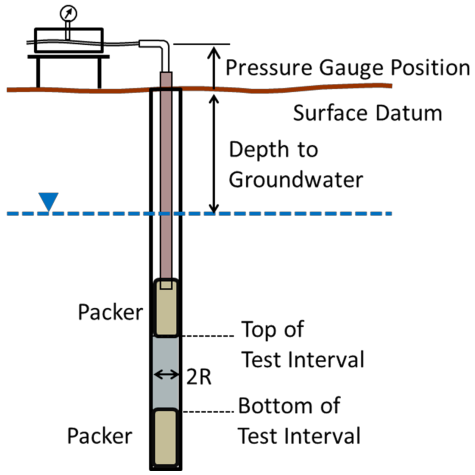
Lugeon Test Analysis Report

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

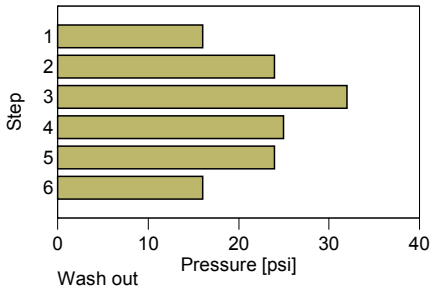
Client: The Regional Municipality of Peel

Location: Beach Street PS, City of Mississauga	Lugeon Test: Packer Test 4	Tested bore: BH4
Test Conducted by: Drilltech Drilling Ltd. / Akbar Hossain		Test Date: 6/9/2021
Analysis Performed by: Mohammed Zamshad		Analysis Date: 11/11/2021
Lithology:		

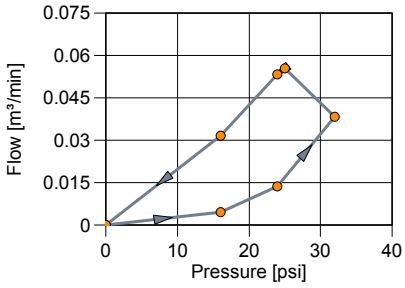


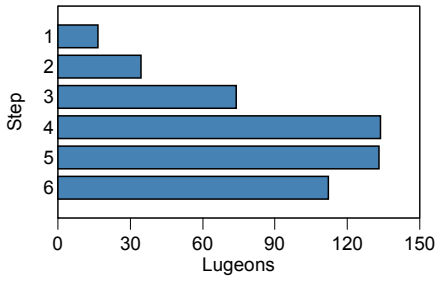
Top of Test Interval: 8.69 m
Bottom of Test Interval: 10.85 m
Length of Test Interval: 2.16 m
Gauge Position: 0.90 m
Depth to Groundwater: 1.10 m
Radius of Test Section: 0.05 m

Step	Pressure [psi]	Flow Meter Readings [m³]											Average Flow Rate [m³/min]	Hydraulic Conductivity		
		1	2	3	4	5	6	7	8	9	10	11		[m/s]	[m/d]	Lugeon
1	16.0	10.8823	10.8864	10.8904	10.8944	10.8986	10.9029	10.9175	10.9121	10.9175	10.9233	10.9291	0.0047	1.63×10^{-6}	0.141	16.7
2	24.0	10.9231	10.9364	10.9492	10.9627	10.9754	10.9887	11.0021	11.0169	11.0302	11.0455	11.0609	0.0138	3.38×10^{-6}	0.292	34.5
3	32.0	11.0869	11.1243	11.1620	11.2019								0.0383	7.24×10^{-6}	0.625	73.9
4	25.0	11.2420	11.2931	11.3436	11.3967	11.4553	11.5124	11.5745					0.0554	1.31×10^{-5}	1.131	133.6
5	24.0	11.6536	11.7071	11.7593	11.8132	11.8665	11.9187	11.9716	12.0253	12.0785	12.1319	12.1853	0.0532	1.30×10^{-5}	1.126	133.0
6	16.0	12.2519	12.2833	12.3144	12.3453	12.3764	12.4073	12.4383	12.4697	12.5009	12.5326	12.5669	0.0315	1.10×10^{-5}	0.950	112.2
													Average	8.23×10^{-6}	0.711	84.0



Wash out
Lugeon: 133.0
Hydraulic Conductivity: 1.30E-5 m/s
Hydraulic Conductivity: 1.126 m/d



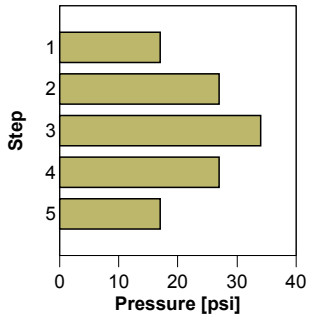
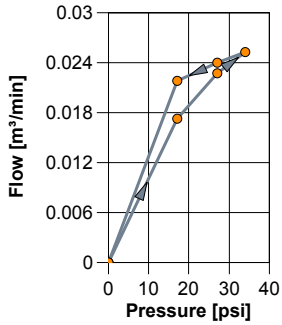
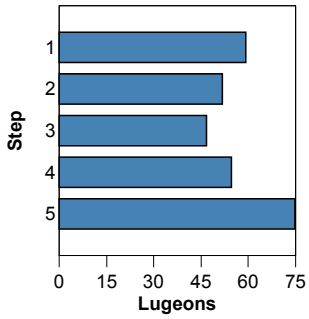


Lugeon Test Summary - BH6

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

Client: The Regional Municipality of Peel

Test Interval Top Bottom	Graphs	Result
9.15 m 11.28 m	  	Turbulent Lugeon: 51.9 Hydraulic Conductivity: 5.1241456E-4 cm/s Hydraulic Conductivity: 0.443 m/d

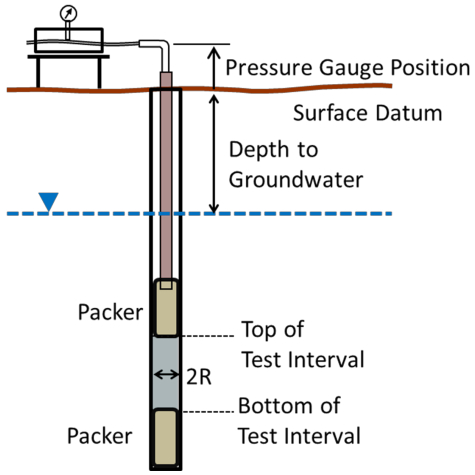
Lugeon Test Analysis Report

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

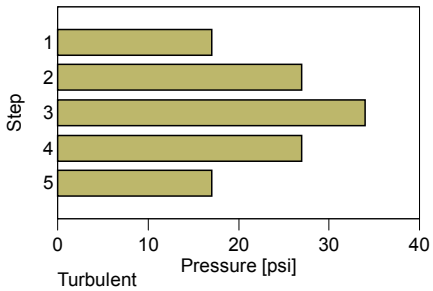
Client: The Regional Municipality of Peel

Location: Beach Street PS, City of Mississauga	Lugeon Test: Packer Test 5	Tested bore: BH6
Test Conducted by: Drilltech Drilling Ltd. / Akbar Hossain		Test Date: 6/15/2021
Analysis Performed by: Mohammed Zamshad		Analysis Date: 11/11/2021
Lithology:		

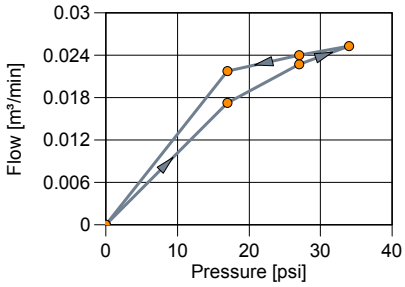


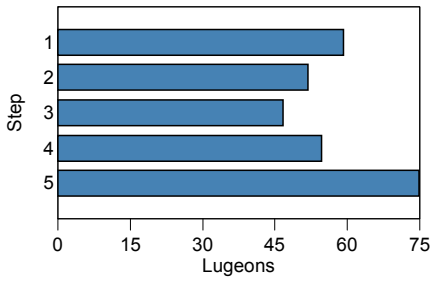
Top of Test Interval: 9.15 m
Bottom of Test Interval: 11.28 m
Length of Test Interval: 2.13 m
Gauge Position: 0.90 m
Depth to Groundwater: 1.10 m
Radius of Test Section: 0.05 m

Step	Pressure [psi]	Flow Meter Readings [m³]											Average Flow Rate [m³/min]	Hydraulic Conductivity		
		1	2	3	4	5	6	7	8	9	10	11		[m/s]	[m/d]	Lugeon
1	17.0	14.8552	14.8698	14.8872	14.9048	14.9227	14.9401	14.9573	14.9749	14.9926	15.0101	15.0276	0.0172	5.77×10^{-6}	0.499	59.2
2	27.0	15.0466	15.0703	15.0928	15.1158	15.1384	15.1603	15.1831	15.2056	15.2280	15.2514	15.2739	0.0227	5.06×10^{-6}	0.437	51.9
3	34.0	15.3016	15.3281	15.3532	15.3784	15.4036	15.4284	15.4531	15.4783	15.5029	15.5284	15.5541	0.0252	4.55×10^{-6}	0.394	46.7
4	27.0	15.5817	15.6064	15.6301	15.6549	15.6792	15.7028	15.7266	15.7502	15.7743	15.7978	15.8214	0.0240	5.34×10^{-6}	0.461	54.7
5	17.0	15.8433	15.8659	15.8882	15.9103	15.9324	15.9547	15.9763	15.9983	16.0199	16.0415	16.0613	0.0218	7.30×10^{-6}	0.631	74.8
													Average	5.61×10^{-6}	0.484	57.4



Turbulent
Lugeon: 51.9
Hydraulic Conductivity: 5.1241456E-4 cm/s
Hydraulic Conductivity: 0.443 m/d



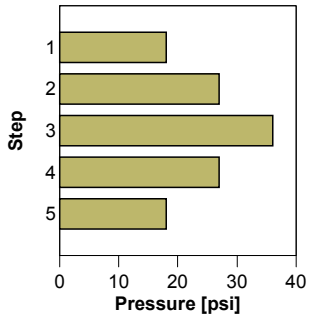
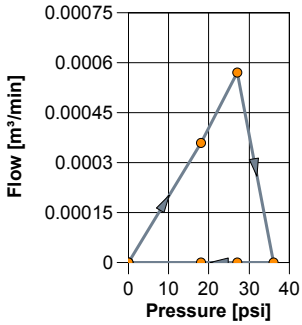
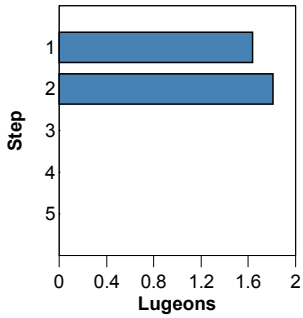


Lugeon Test Summary - BH7

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

Client: The Regional Municipality of Peel

Test Interval Top Bottom	Graphs	Result
10.06 m 11.59 m	  	Laminar Lugeon: 0.7 Hydraulic Conductivity: 6.14E-8 m/s Hydraulic Conductivity: 0.005 m/d

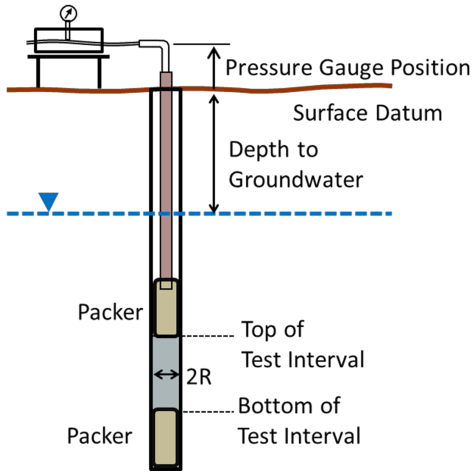
Lugeon Test Analysis Report

Project: Beach St. Pumping Station Diversion

Number: 21TF001A

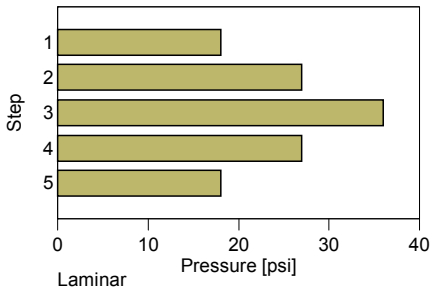
Client: The Regional Municipality of Peel

Location: Beach Street PS, City of Mississauga	Lugeon Test: Packer Test 6	Tested bore: BH7
Test Conducted by: Drilltech Drilling Ltd. / Akbar Hossain		Test Date: 6/16/2021
Analysis Performed by: Mohammed Zamshad		Analysis Date: 11/11/2021
Lithology:		

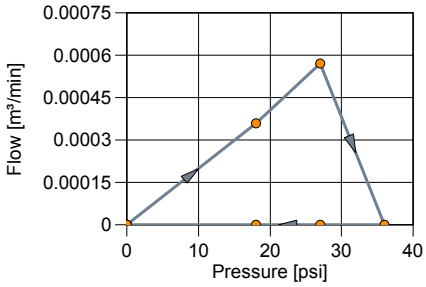


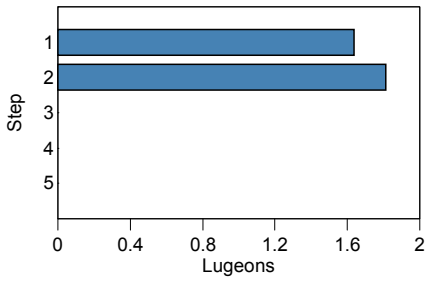
Top of Test Interval: 10.06 m
Bottom of Test Interval: 11.59 m
Length of Test Interval: 1.53 m
Gauge Position: 0.90 m
Depth to Groundwater: 1.10 m
Radius of Test Section: 0.05 m

Step	Pressure [psi]	Flow Meter Readings [m³]											Average Flow Rate [m³/min]	Hydraulic Conductivity		
		1	2	3	4	5	6	7	8	9	10	11		[m/s]	[m/d]	Lugeon
1	18.0	9.8446	9.8446	9.8453	9.8463	9.8474	9.8482	9.8482	9.8482	9.8482	9.8482	9.8482	0.0004	1.46×10^{-7}	0.013	1.6
2	27.0	9.8444	9.8470	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	9.8501	0.0006	1.61×10^{-7}	0.014	1.8
3	36.0	0.4160	0.4160	0.4160	0.4160	0.4160	0.4160	0.4160	0.4160	0.4160	0.4160	0.4160	0.0000	0.00×10^{-1}	0.000	0.0
4	27.0	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	0.0000	0.00×10^{-1}	0.000	0.0
5	18.0	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	9.8341	0.0000	0.00×10^{-1}	0.000	0.0
													Average	6.14×10^{-8}	0.005	0.7



Laminar
Lugeon: 0.7
Hydraulic Conductivity: 6.14E-8 m/s
Hydraulic Conductivity: 0.005 m/d





APPENDIX E

Soil Chemical Analyses Results by SGS Environment

FINAL REPORT

CA14170-AUG21 R1

21TF001A

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14170-AUG21 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Mohammad Zamshad	Telephone	2165
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	jill.campbell@sgs.com
Email	mzamshad@petomaccallum.com	SGS Reference	CA14170-AUG21
Project	21TF001A	Received	08/16/2021
Order Number		Approved	08/23/2021
Samples	Soil (5)	Report Number	CA14170-AUG21 R1
		Date Reported	08/23/2021

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:017690

Corrosivity Index is based on the American Water Works Corrosivity Scale according to AWWA C-105. An index greater than 10 indicates the soil matrix may be corrosive to cast iron alloys.

pH past Holding Time

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

First Page..... 1-2
Index..... 3
Results..... 4-5
QC Summary..... 6-7
Legend..... 8
Annexes..... 9

Client: Peto MacCallum Ltd
Project: 21TF001A
Project Manager: Mohammad Zamshad
Samplers: N/A

PACKAGE: **- Corrosivity Index** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH8, 34'2"-34'5"	BH5, 39'-39'6"	BH6, 21'-21'4"	BH4, 26'6"-26'8"	BH1, 34'8"-35'
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			15/06/2021	10/06/2021	11/06/2021	08/06/2021	02/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
Corrosivity Index							
Corrosivity Index	none	1	8	6	12	8	12
Soil Redox Potential	mV	-	303	226	244	249	244
Sulphide (Na2CO3)	%	0.04	0.13	0.05	0.09	0.15	0.47
pH	pH Units	0.05	8.93	9.49	9.05	8.89	9.03
Resistivity (calculated)	ohms.cm	-9999	2300	4740	1850	2330	1850

PACKAGE: **- General Chemistry** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH8, 34'2"-34'5"	BH5, 39'-39'6"	BH6, 21'-21'4"	BH4, 26'6"-26'8"	BH1, 34'8"-35'
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			15/06/2021	10/06/2021	11/06/2021	08/06/2021	02/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
General Chemistry							
Conductivity	uS/cm	2	434	211	542	429	542

PACKAGE: **- Metals and Inorganics** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH8, 34'2"-34'5"	BH5, 39'-39'6"	BH6, 21'-21'4"	BH4, 26'6"-26'8"	BH1, 34'8"-35'
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			15/06/2021	10/06/2021	11/06/2021	08/06/2021	02/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics							
Moisture Content	%	0.1	3.1	3.9	3.7	3.9	3.7
Sulphate	µg/g	0.4	180	100	400	230	480

Client: Peto MacCallum Ltd
Project: 21TF001A
Project Manager: Mohammad Zamshad
Samplers: N/A

PACKAGE: **- Other (ORP)** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH8, 34'2"-34'5"	BH5, 39'-39'6"	BH6, 21'-21'4"	BH4, 26'6"-26'8"	BH1, 34'8"-35'
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			15/06/2021	10/06/2021	11/06/2021	08/06/2021	02/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
Other (ORP)							
Chloride	µg/g	0.4	420	130	110	210	170

PACKAGE: **- UNDEFINED** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH8, 34'2"-34'5"	BH5, 39'-39'6"	BH6, 21'-21'4"	BH4, 26'6"-26'8"	BH1, 34'8"-35'
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			15/06/2021	10/06/2021	11/06/2021	08/06/2021	02/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
UNDEFINED							
	-	-	1	1	1	1	1

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Chloride	DIO0355-AUG21	µg/g	0.4	<0.4	3	35	100	80	120	81	75	125
Sulphate	DIO0355-AUG21	µg/g	0.4	<0.4	5	35	100	80	120	109	75	125

Carbon/Sulphur

Method: ASTM E1915-07A | Internal ref.: ME-CA-[ENV]ARD-LAK-AN-020

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
Sulphide (Na2CO3)	ECS0038-AUG21	%	0.04	< 0.04	ND	20	84	80	120			

Conductivity

Method: SM 2510 | 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
Conductivity	EWL0367-AUG21	uS/cm	2	< 2	0	20	99	90	110	NA		

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-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
pH	EWL0367-AUG21	pH Units	0.05	NA	11		100			NA		

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

Samples analysed as received. 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" 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. 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.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

SGS

Request for Laboratory Services and CHAIN OF CUSTODY

No: 017690

Environment, Health & Safety - 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

Page _____ of _____

Laboratory Information Section - Lab use only

Received By: Seth
Received Date: 08 / 16 / 2021 (mm/dd/yy)
Received Time: 11 40 (hr. min)
Received By (signature): S
Custody Seal Present: Yes ☒ No ☐
Custody Seal Intact: Yes ☒ No ☐
Cooling Agent Present: Yes ☐ No ☐ Type: Ice
Temperature Upon Receipt (°C): 9.5 c. 8c
LAB LIMS #: CA14170-AUG21

REPORT INFORMATION	INVOICE INFORMATION
Company: PETROMACCALLUM LTD	☐ (same as Report Information)
Contact: 416 526 9107	Company:
Address: 165 CARTWRIGHT AVE, NORTH YORK, ON M6A 1V5	Contact:
Phone: 416 526 9107	Address:
Fax:	Phone:
Email: MBAMSHAD@PETROMACCALLUM.COM	Email:

Quotation #: PML
Project #: 21TF001A
P.O. #:
Site Location/ID:

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 _____

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:

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,	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: CORROSIVITY PACKAGE AND PH	Other:	Other:	Other:	Other: Appendix 2: 406/19 Leachate Screening Levels Table :	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended	TCLP: Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.	COMMENTS:
1	BH8, 34'2"-34'5"	AUG 13, 2021		1	SHALE BEDROCK													/							
2	BH5, 39'-39'6"	AUG 13, 2021		1	"													/							
3	BH6, 21'-21'4"	AUG 13, 2021		1	"													/							
4	BH4, 26'6"-26'8"	AUG 13, 2021		1	"													/							
5	BH1, 34'8"-35	AUG 13, 2021		1	"													/							
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME):	**Signature:**	Date: ____/____/____ (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME):	**Signature:**	Date: ____/____/____ (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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.

FINAL REPORT

CA14226-AUG21 R1

21TF001A

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14226-AUG21 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Mohammad Zamshad	Telephone	2165
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	jill.campbell@sgs.com
Email	mzamshad@petomaccallum.com	SGS Reference	CA14226-AUG21
Project	21TF001A	Received	08/18/2021
Order Number		Approved	08/23/2021
Samples	Soil (5)	Report Number	CA14226-AUG21 R1
		Date Reported	08/23/2021

COMMENTS

Temperature of Sample upon Receipt: 16 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:025885

Corrosivity Index is based on the American Water Works Corrosivity Scale according to AWWA C-105. An index greater than 10 indicates the soil matrix may be corrosive to cast iron alloys.

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

First Page..... 1-2
Index..... 3
Results..... 4-5
QC Summary..... 6-7
Legend..... 8
Annexes..... 9

Client: Peto MacCallum Ltd
Project: 21TF001A
Project Manager: Mohammad Zamshad
Samplers: AA

PACKAGE: **- Corrosivity Index** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH1, AS10, 22.5-24.5	BH4, SS7, 15-17	BH6, AS7, 15-17	BH9, AS8, 17.5-19.5	BH10, AS6, 10-12
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			02/06/2021	08/06/2021	11/06/2021	10/06/2021	11/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
Corrosivity Index							
Corrosivity Index	none	1	8	10	16	8	10
Soil Redox Potential	mV	-	222	265	180	219	229
Sulphide (Na2CO3)	%	0.04	0.20	0.17	0.14	0.23	0.23
pH	pH Units	0.05	8.71	8.50	8.80	8.68	8.35
Resistivity (calculated)	ohms.cm	-9999	2430	1980	1610	2150	2020

PACKAGE: **- General Chemistry** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH1, AS10, 22.5-24.5	BH4, SS7, 15-17	BH6, AS7, 15-17	BH9, AS8, 17.5-19.5	BH10, AS6, 10-12
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			02/06/2021	08/06/2021	11/06/2021	10/06/2021	11/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
General Chemistry							
Conductivity	uS/cm	2	412	504	622	466	496

PACKAGE: **- Metals and Inorganics** (SOIL)

Sample Number			5	6	7	8	9
Sample Name			BH1, AS10, 22.5-24.5	BH4, SS7, 15-17	BH6, AS7, 15-17	BH9, AS8, 17.5-19.5	BH10, AS6, 10-12
Sample Matrix			Soil	Soil	Soil	Soil	Soil
Sample Date			02/06/2021	08/06/2021	11/06/2021	10/06/2021	11/06/2021
Parameter	**Units**	**RL**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics							
Moisture Content	%	0.1	4.3	5.0	16.3	4.2	10.2

Client: Peto MacCallum Ltd
Project: 21TF001A
Project Manager: Mohammad Zamshad
Samplers: AA

PACKAGE: **- Metals and Inorganics** (SOIL)

			Sample Number	5	6	7	8	9
			Sample Name	BH1, AS10, 22.5-24.5	BH4, SS7, 15-17	BH6, AS7, 15-17	BH9, AS8, 17.5-19.5	BH10, AS6, 10-12
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	02/06/2021	08/06/2021	11/06/2021	10/06/2021	11/06/2021
Parameter	**Units**	**RL**		**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics (continued)								
Sulphate	µg/g	0.4		300	260	230	250	300

PACKAGE: **- Other (ORP)** (SOIL)

			Sample Number	5	6	7	8	9
			Sample Name	BH1, AS10, 22.5-24.5	BH4, SS7, 15-17	BH6, AS7, 15-17	BH9, AS8, 17.5-19.5	BH10, AS6, 10-12
			Sample Matrix	Soil	Soil	Soil	Soil	Soil
			Sample Date	02/06/2021	08/06/2021	11/06/2021	10/06/2021	11/06/2021
Parameter	**Units**	**RL**		**Result**	**Result**	**Result**	**Result**	**Result**
Other (ORP)								
Chloride	µg/g	0.4		41	180	230	63	170

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Chloride	DIO0355-AUG21	µg/g	0.4	<0.4	3	35	100	80	120	81	75	125
Sulphate	DIO0355-AUG21	µg/g	0.4	<0.4	5	35	100	80	120	109	75	125

Carbon/Sulphur

Method: ASTM E1915-07A | Internal ref.: ME-CA-[ENV]ARD-LAK-AN-020

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
Sulphide (Na2CO3)	ECS0038-AUG21	%	0.04	< 0.04	ND	20	84	80	120			

Conductivity

Method: SM 2510 | 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
Conductivity	EWL0338-AUG21	uS/cm	2	< 2	0	20	99	90	110	NA		

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-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
pH	EWL0338-AUG21	pH Units	0.05	NA	0		100			NA		

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

Samples analysed as received. 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" 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. 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.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 025885
Page _____ of _____

Laboratory Information Section - Lab use only

Received By: _____ Received By (signature): _____
Received Date: 08/18/2021 (mm/dd/yy) Custody Seal Present: Yes ☑ No ☐ Cooling Agent Present: Yes ☑ No ☐ Type: Ice
Received Time: 12:20 (hr : min) Custody Seal Intact: Yes ☑ No ☐ Temperature Upon Receipt (°C) 16C 16C 16C
LAB LIMS #: CA14226-Aug21

REPORT INFORMATION	INVOICE INFORMATION
Company: PETO MACCALLUM LTD	☑ (same as Report Information)
Contact: MOHAMMED ZAMSHAD	Company:
Address: 165 CARD WRSTE, NORTH YORK, ON, M6A 1V5	Contact:
Phone: 416 785 5110	Address:
Fax:	Phone:
Email: MZAMSHAD@PETOMACCALLUM.COM	Email:

Quotation #: PML P.O. #:
Project #: 21TF001A Site Location/ID:

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: _____

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH1, AS10, 22.5-24.5	JUNE 2, 2021		2	SOIL SAMPLES
2	BH4, SS7, 15-17	JUNE 8, 2021		2	"
3	BH6, AS7, 15-17	JUNE 11, 2021		2	"
4	BH9, AS8, 17.5-19.5	JUNE 10, 2021		2	"
5	BH10, AS6, 10-12	JUNE 11, 2021		2	"
6					
7					
8					
9					
10					
11					
12					

	M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)						SPLP	TCLP	
	Field Filtered (Y/N)	Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs ☐ Aroclor ☐ Total	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other	CORROSIVITY PACKAGE AND PH				Sewer Use: Specify pkg:	Water Characterization Pkg ☐ General ☐ Extended	Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1													/								
2													/								
3													/								
4													/								
5													/								

Observations/Comments/Special Instructions

Sampled By (NAME): AA Signature: Date: AUG / 18 / 2021 (mm/dd/yy) Pink Copy - Client

Relinquished by (NAME): Signature: Date: / / (mm/dd/yy) Yellow & White Copy - SGS

Revision #: 1.5
Date of Issue: 11 June 2021

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.

FINAL REPORT

CA14253-AUG21 R1

21TF001A

Prepared for

Peto MacCallum Ltd

FINAL REPORT

CA14253-AUG21 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Peto MacCallum Ltd	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
Address	165 Cartwright Ave Toronto, ON M6A 1V5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Mohammad Zamshad	Telephone	705-652-2000
Telephone	416-785-5110	Facsimile	705-652-6365
Facsimile	416-785-5120	Email	Maarit.Wolfe@sgs.com
Email	mzamshad@petomaccallum.com	SGS Reference	CA14253-AUG21
Project	21TF001A	Received	08/19/2021
Order Number		Approved	08/24/2021
Samples	Soil (2)	Report Number	CA14253-AUG21 R1
		Date Reported	08/24/2021

COMMENTS

Temperature of Sample upon Receipt: 19 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:022439

Corrosivity Index is based on the American Water Works Corrosivity Scale according to AWWA C-105. An index greater than 10 indicates the soil matrix may be corrosive to cast iron alloys.

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

TABLE OF CONTENTS

First Page..... 1

Index..... 2

Results..... 3-4

QC Summary..... 5-6

Legend..... 7

Annexes..... 8

Client: Peto MacCallum Ltd
Project: 21TF001A
Project Manager: Mohammad Zamshad
Samplers: AA

PACKAGE: **- Corrosivity Index** (SOIL)

			Sample Number	5	6
			Sample Name	BH14, AS7, 15'-17'	BH12, SS6, 12'6"-14'6"
			Sample Matrix	Soil	Soil
			Sample Date	14/06/2021	02/07/2021
Parameter	**Units**	**RL**		**Result**	**Result**
Corrosivity Index					
Corrosivity Index	none	1		6	11
Soil Redox Potential	mV	-		206	226
Sulphide (Na2CO3)	%	0.04		0.09	< 0.04
pH	pH Units	0.05		8.38	7.76
Resistivity (calculated)	ohms.cm	-9999		2990	1080

PACKAGE: **- General Chemistry** (SOIL)

			Sample Number	5	6
			Sample Name	BH14, AS7, 15'-17'	BH12, SS6, 12'6"-14'6"
			Sample Matrix	Soil	Soil
			Sample Date	14/06/2021	02/07/2021
Parameter	**Units**	**RL**		**Result**	**Result**
General Chemistry					
Conductivity	uS/cm	2		334	922

PACKAGE: **- Metals and Inorganics** (SOIL)

			Sample Number	5	6
			Sample Name	BH14, AS7, 15'-17'	BH12, SS6, 12'6"-14'6"
			Sample Matrix	Soil	Soil
			Sample Date	14/06/2021	02/07/2021
Parameter	**Units**	**RL**		**Result**	**Result**
Metals and Inorganics					
Moisture Content	%	0.1		5.5	19.3

Client: Peto MacCallum Ltd
Project: 21TF001A
Project Manager: Mohammad Zamshad
Samplers: AA

PACKAGE: **- Metals and Inorganics** (SOIL)

			Sample Number	5	6	
			Sample Name	BH14, AS7, 15'-17'	BH12, SS6, 12'6"-14'6"	
			Sample Matrix	Soil	Soil	
			Sample Date	14/06/2021	02/07/2021	
Parameter	**Units**	**RL**		**Result**	**Result**	
Metals and Inorganics (continued)						
Sulphate	µg/g	0.4		180	180	

PACKAGE: **- Other (ORP)** (SOIL)

			Sample Number	5	6	
			Sample Name	BH14, AS7, 15'-17'	BH12, SS6, 12'6"-14'6"	
			Sample Matrix	Soil	Soil	
			Sample Date	14/06/2021	02/07/2021	
Parameter	**Units**	**RL**		**Result**	**Result**	
Other (ORP)						
Chloride	µg/g	0.4		130	380	

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-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
Chloride	DIO0355-AUG21	µg/g	0.4	<0.4	3	35	100	80	120	81	75	125
Sulphate	DIO0355-AUG21	µg/g	0.4	<0.4	5	35	100	80	120	109	75	125

Carbon/Sulphur

Method: ASTM E1915-07A | Internal ref.: ME-CA-[ENV]ARD-LAK-AN-020

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
Sulphide (Na2CO3)	ECS0039-AUG21	%	0.04	< 0.04	ND	20	106	80	120			

Conductivity

Method: SM 2510 | 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
Conductivity	EWL0384-AUG21	uS/cm	2	< 2	0	20	100	90	110	NA		

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-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
pH	EWL0384-AUG21	pH Units	0.05	NA	0		100			NA		

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

Samples analysed as received. 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" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - 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: 022439 Page _____ of _____

Laboratory Information Section - Lab use only

Received By: Scott Ren | Received By (signature): | Cooling Agent Present: Yes ☑ No ☐ Type: Ice
Received Date: 08/19/2021 (mm/dd/yy) | Custody Seal Present: Yes ☐ No ☐ | Temperature Upon Receipt (°C): 19c 19c
Received Time: 13:20 (hr : min) | Custody Seal Intact: Yes ☑ No ☐ | LAB LIMS # CA14253-AUG21

REPORT INFORMATION	INVOICE INFORMATION
Company: PETO MACCALLUM LTD	☑ (same as Report Information)
Contact: MOHAMMED ZAMSHAD	Company:
Address: 165 CARTWRIGHT AVE, NORTHYORK, ON, M6A 1V5	Contact:
Phone: 416 526 9107	Address:
Fax:	Phone:
Email: MZAMSHAD@PETOMACCALLUM.COM	Email:

Quotation #: PML | P.O. #:
Project #: 21TF001A | Site Location/ID:

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 _____
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: _____

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1 BH[illegible] 6, 12'6" - 14'6"	[illegible]		1	SOIL SAMPLE
2 BH14, AS7, 15'-17'	JUNE 14, 2021		1	SOIL SAMPLE
3 BH12, SS6, 12'6" - 14'6"	JULY 2, 2021		1	"
4				
5				
6				
7				
8				
9				
10				
11				
12				

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,	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: CORROSIVITY PACKAGE and PH	Other: Appendix 2: 406/19 Leachate Screening Levels Table : _____	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	TCLP: Specify TCLP tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.
												1			
												1			

COMMENTS:

Observations/Comments/Special Instructions

Sampled By (NAME): D.A	**Signature:**	Date: Aug / 19 / 2021 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME):	**Signature:**	Date: ____ / ____ / ____ (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May. 2020

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MEMO

TO: Kelsey Hinsperger, PMP

FROM: Peter Hayes, P.Geo, Laifa Cao, P.Eng, and Shabnam Aziznejad, P.Eng.

SUBJECT: Beach Street Sewage Pumping Station (SPS) Diversion Municipal Class Environmental Assessment (EA) – Hydrogeological and Geotechnical Desktop Assessment

DATE: June 16, 2022

PROJECT #: 19M-00593-00

This memo provides the hydrogeological and geotechnical desktop assessment, including geomorphology considerations, in support of the Class EA for the diversion between Beach Street SPS and Beechwood SPS, known as the Beach Street Diversion EA. WSP reviewed the two Beach Street Diversion Alternative Options as shown on the attached figure, Option 1 – Aviation Tunnel and Option 2 – No Tunnel.

The site is located on the north shore of Lake Ontario in the City of Mississauga, Regional Municipality of Peel, Ontario.

NATURAL FEATURES AND LAND USES

The site generally consists of residential land uses south of Lakeshore Road East and a mix of commercial and residential land uses north of Lakeshore Road East.

Cooksville Creek is located within the eastern side of the study area, between Beechwood Avenue and Hampton Crescent, the corridor adjacent to the creek is natural with wooded areas. Lake Ontario is located to the south of the site and a number of parks are located along the shore of Lake Ontario within the vicinity of the site.

TOPOGRAPHY AND DRAINAGE

The project area slopes gradually downward from 90 metres above sea level north of the site to Lake Ontario. Additionally, Cooksville Creek is located in a valley setting. Local drainage is anticipated to be directed to storm sewers which flow into Cooksville Creek and ultimately discharge to Lake Ontario.

GEOLOGY

As per Chapman and Putnam (1984) the site is located in the Iroquois Plain physiographic region. This area consists of Bevelled Till Plains. Based on surficial geology mapping the Cooksville Creek is palezoic bedrock up to just south of Lakeshore

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Road East followed by modern alluvial deposits into Lake Ontario. South of Lakeshore Road East the surficial geology at the site consists of fine textured glaciolacustrine deposits (silt and clay). North of Lakeshore Road East the surficial geology at the site consists coarse textured glaciolacustrine deposits (sand and gravel).

HYDROGEOLOGY

WSP (formerly Genivar) completed dewatering assessments in the area of this site in 2010 and 2014. These assessments found the geology at the site to consist of a thin layer of fill overlying sandy clayey silt/clayey sand till over shale bedrock (Georgian Bay Formation). Bedrock depth ranges from ground surface (at Cooksville Creek) to 5 m below ground surface (bgs). Groundwater levels ranged from 1.0 m to 6.4 m bgs. Hydraulic conductivities of the overburden / shallow bedrock were found to range from $4x10^{-7}$ to $1x10^{-5}$ m/s based on slug tests completed at the site. It is anticipated that temporary construction dewatering would be required for each option.Detailed calculations would need to be completed to confirm if a water taking, Environmental Activity and Sector Registry (EASR) or Category 3 Permit to Take Water would be required.

GEOTECHNICAL

The objectives of this assessment are to characterize the general geotechnical conditions at the subject site, to provide a preliminary interpretation of the ground and groundwater conditions as relevant to the overall geotechnical design, and construction of the proposed diversion. Additional boreholes to verify the site-specific subsurface conditions are required.

Geotechnical desktop studies involved review of information available from previous studies carried out within the vicinity of the project area by Peto MacCallum Ltd. (PML). These are documented in the following reports:

- Draft Geotechnical Data Report (GDR), The Beach Street Pumping Station Diversion, City of Mississauga, Ontario, Project 16-2905, PML Ref.:21TF001, dated December 17, 2021.

- Draft Hydrogeological Impact Assessment Report (HIAR), The Beach Street Pumping Station Diversion, City of Mississauga, Ontario, PML Ref.:21TF001B, dated May 31, 2022.

Desktop studies also involved review of information from historical boreholes available from the geotechnical borehole database of the Ministry of Northern Development, Mines, Natural Resources and Forestry.

Subsurface Condition

In June 2021, a total of twenty (20) boreholes were drilled within the vicinity of the project area by PML and monitoring wells consisting of 50 mm diameter PVC pipe were installed in eleven (11) of the boreholes.

Based on the borehole findings, the project area was covered by topsoil with thickness ranging from 100 to 150 mm and pavement structure with thickness of 300 to 900 mm.

The topsoil/pavement layers were underlain by the following main soil/rock layers in descending order:

- Earth fill with thickness of 0.7 to 5.3 m;
- Silty clay with thickness of 1.3 to 2.1 m in some locations (Boreholes BH4, BH10, and BH16);
- Sandy clayey silt/clayey sand till with thickness of 4.5 to 9.0 m; and
- Shale bedrock below approximate depths of 6.3 to 11.0 m bgs (Elevation 73.8 to 68.9 m).

As of March 10, 2022, the groundwater level in the monitoring wells installed by PML ranged from 1.2 to 5.6 m bgs (Elevation 73.2 to 79.9 m).

Proposed Diversion Alternatives (Option 1 and 2)

It is understood that the proposed diversion sewer for Option 1 includes:

- Installation of a diversion sewer along Lakeshore Road East from Beachwood Avenue to Aviation Road and along Aviation Road to Lakeside Avenue by microtunnel due to the required depth of installation and site constraints;
- New sewer extension on Lakeshore Road East from Aviation Road to West Avenue constructed by open-cut method;
- Sewer replacement along Lakeside Avenue constructed by open-cut method.

However, Option 2 includes:

- Upsizing of existing sewer along Aviation Road constructed by open-cut;
- Sewer replacement along Beach St, Goodwin Road, and Montbeck Crescent constructed by open-cut;
- Sewer replacement along Lakeside Avenue constructed by open-cut.

Excavation Details

For Option 1, the microtunnel and open-cut excavation depths are proposed as follows:

– The **microtunnel along Lakeshore Road East** is proposed at approximate depths of 7.5 to 8.5 m bgs (Elevation 72.4 to 73.0 m). Boreholes BH5 through BH8, BH19, and BH20 were advanced within this section by PML. Based on the results of the investigation, the tunnel will be advanced generally through hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles and shale bedrock interbedded with limestone/siltstone below the groundwater table.

– The **microtunnel along Aviation Road** is proposed at approximate depths of 8.4 to 5.3 m bgs (Elevation 73.0 to 73.6 m). Boreholes BH1 through BH3 were advanced within this section by PML. Based on the results of the investigation, the tunnel will be advanced generally through hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles generally below the groundwater table.

– The **open cut excavation for the new sewer extension on Lakeshore Road East** is proposed at approximate depths of 5.8 to 3.7 m bgs (Elevation 75.7 to 77.5 m). Boreholes BH8, BH14, BH15, and BH18 were advanced within this section by PML. Based on the results of the investigation, the proposed excavations will generally be

carried out within the pavement structure, the fill material, and hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles generally below the groundwater table.

- The **open-cut excavation for the sewer replacement along Lakeside Avenue** is proposed at approximate depths of 2.6 to 5.0 m bgs (Elevation 74.3 to 73.7 m). Boreholes BH9 and BH10 were advanced within this section by PML. Based on the results of the investigation, the proposed excavations will generally be carried out within the pavement structure, the fill material, stiff to very stiff silty clay, and hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles.

For Option 2, the open-cut excavation depths are proposed as follows:

- The **open-cut excavation for the upsizing of existing sewer along Aviation Road Avenue** is proposed at approximate depths of 3.7 to 4.8 m bgs (Elevation 77.6 to 76.2 m). Boreholes BH1 through BH3 were advanced within this section by PML. Based on the results of the investigation, the proposed excavations will generally be carried out within the pavement structure, the fill material, and hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles.
- The **open-cut excavation for the sewer replacement along Beach St, Goodwin Road, and Montbeck Crescent** is proposed at approximate depths of 2.7 to 4.3 m bgs (Elevation 75.6 to 74.0 m). Borehole BH4 was advanced at the west end of Beach St. by PML. Based on the results of the investigation, the proposed excavations will generally be carried out within the pavement structure, the fill material, very stiff silty clay, and hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles.
- The **open-cut excavation for the sewer replacement along Lakeside Avenue** is proposed at approximate depths of 2.6 to 5.0 m bgs (Elevation 74.3 to 73.7 m). Boreholes BH9 and BH10 were advanced within this section by PML. Based on the results of the investigation, the proposed excavations will generally be carried out within the pavement structure, the fill material, stiff to very stiff silty clay, and hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles.

Geotechnical Considerations

Open-Cut Excavation

Excavation of the soils at this site can be carried out with hydraulic excavators. Due to the hard/very dense condition of the till with cobbles and boulders, excavation progress in the overburden soils may be slow. Heavy equipment should be considered.

To minimize the size of the open-cut excavations within the existing roadway, a properly designed trench box or shoring system must be used to brace the sides of the excavation to prevent sloughing during the works.

Excavation at some location will be below groundwater level. Active dewatering using well points/eductors is likely required. The groundwater should be lowered to 1 m below the groundwater table to keep dry subgrade condition.

Bedding and Backfill

The stiff fill and native soils can provide adequate support for the sewer pipes and will allow the use of normal Class B type bedding. The bedding should conform to the current Ontario Provincial and Peel Region Standard specifications. If the soft to firm/loose fill (SPT N-value < 8) is encountered, the weak fill must be sub-excavated and replaced with compacted Granular 'A' material. Geotechnical inspection is required to confirm suitable subgrade condition.

The minimum bedding thickness should be 150 mm but this should be increased as dictated by the pipe diameter and/or aforementioned specifications. It is recommended that the bedding material consist of well-graded granular material such as Granular 'A' (OPSS 1010). After installing the pipe on the bedding, a granular surround of approved bedding material, which extends at least 300 mm above the obvert of the pipe, or as set out by the local Authority, should be placed.

Based on existing borehole information, the on-site excavated inorganic soils are suitable for re-use as backfill provided their moisture contents at the time of construction are at or near (±2%) optimum in the area outside the existing road. Unsuitable materials such as organic soils, boulders, cobbles, frozen soils, etc. should not be used for backfilling. Below the existing road, Granular 'B' material should be used as backfill.

In order to minimize any long-term drainage effects caused by the sewer installation, it is recommended that clay trench cut-off rings (i.e. "trench plugs") be constructed around the pipe and through the bedding at intervals of 50 to 100 m. Use of concrete in place of clay is not recommended for trench plug construction due to point loading concerns.

Microtunnel

The information provided by PML's boreholes indicate that within the proposed tunnelling zone, the soils mainly consist of hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles and shallow shale bedrock interbedded with limestone/siltstone with a RQD value of 24% below the groundwater table.

The hard/very dense sandy clayey silt/clayey sand till with boulders/cobbles below groundwater table should be consider as "fast ravelling" to "flowing" and "bouldery" ground in accordance with the behaviouristic ground classification system.

The shallow shale bedrock interbedded with limestone/siltstone with a RQD value of 24% can be classified as "blocky, disturbed/seamy" to "disintegrated" with "fair" to "very poor" surface conditions.

In general, tunnelling condition is considered to be challenging due to mixed face condition ranged from hard/very dense till with boulders/cobbles to shale interbedded with limestone/siltstone and high groundwater table.

Microtunnelling is considered to be the method that minimizes the risk of ground losses and the ground surface settlement and would not require dewatering along the tunnel alignment at this site. The jacking pipe can be used as temporary ground support as well as permanent pipe. However, it is relatively expensive to mobilize this type of machine,

The primary risks associated with this trenchless method are encountering boulders/cobbles within the till and limestone/siltstone within the shale along the tunnel invert, which would impact the vertical and horizontal alignment, reduce production rates, or halt advance if the MTBM is not properly selected or outfitted. Groundwater flow along the excavated annulus is also a concern.

For the detailed design stage, additional borehole drilling/coring as well as testing are recommended to verify the ground conditions.

CONCLUSIONS

From a hydrogeological perspective, both Options will likely require temporary construction dewatering and a detailed dewatering assessment. Option 1 requires a crossing of Cooksville Creek at Lakeshore Road East and Option 2 does not require a crossing of Cooksville Creek. Therefore, Option 2 is preferred from a hydrogeological perspective.

From a geomorphology perspective, Option 1 requires a crossing of Cooksville Creek at Lakeshore Road East and Option 2 does not require a crossing of Cooksville Creek. Therefore, Option 2 is preferred from a geomorphology perspective.

From a geotechnical perspective, Option 1 includes microtunnelling construction method due to the required depth of installation and site constraints. Tunnelling will reduce the excavated volume of soil and rock and less influence on environment. Additional borehole drilling/coring and testing are required to determine boulders/cobbles and rock conditions. Geophysical survey along Lakeshore Road East including Cooksville Creek crossing is recommended to confirm the bedrock surface. Option 2 includes open-cut excavation which has less challenge in construction. However more soil removal is required. Additional borehole drilling and testing are required to verify the ground conditions on Beach St, Goodwin Road, and Montbeck Crescent.

REFERENCES

Ministry of Environment, Conservation and Parks, 2021. Source Protection Information Atlas. https://www.lioapplications.lrc.gov.on.ca/SourceWaterProtection/index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-CA

Genivar, 2010. Port Credit Trunk Sewers and Forcemains, City of Mississauga Infrastructure Stimulus Funding Project ID: 25353 Category 3 – Permit to Take Water Application Amendment PTTW#5873-86HL5G

APPENDIX

A-5 Geomorphic Assessment

PARISH
aquatic services
A Division of Matrix Solutions Inc.

Report Prepared for:
WSP INC.

Prepared by:
PARISH AQUATIC SERVICES

April 2015
Mississauga, Ontario

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COOKSVILLE CREEK GEOMORPHIC ASSESSMENT

RECOMMENDATIONS REGARDING SANITARY SEWER WORKS

Report prepared for WSP Inc., April 2015

(digitally signed)
Jennifer Henshaw, M.Sc.
Junior Fluvial Geomorphologist

(digitally stamped)
John Parish, P.Geo
Principal, Fluvial Geomorphologist

DISCLAIMER

We certify that this report is accurate and complete and accords with the information available during the site investigation. Information obtained during the site investigation or provided by third parties is believed to be accurate but is not guaranteed. We have exercised reasonable skill, care and diligence in assessing the information obtained during the preparation of this report.

This report was prepared for WSP Inc. The report may not be relied upon by any other person or entity without our written consent and that of WSP Inc. Any uses of this report by a third party, or any reliance on decisions made based on it, are the responsibility of that party. We are not responsible for damages or injuries incurred by any third party, as a result of decisions made or actions taken based on this report.

TABLE OF CONTENTS

1 INTRODUCTION 1
2 BACKGROUND REVIEW 2
3 PREVIOUS FIELD ASSESSMENTS (2005, 2009) 3
4 EXISTING GEOMORPHIC CONDITIONS (JANUARY 2015) 4
4.1 Rapid Assessments 5
4.1.1 Rapid Assessment Results 6
5 RECOMMENDATIONS 7
6 SUMMARY 12
REFERENCES 13

APPENDICES

APPENDIX A Site Photographs

LIST OF FIGURES

Figure 1: Cooksville Creek Study Reach, Depicting Site Specific Information 1
Figure 2: Existing Sewer Detailed Design Drawings from 1965. 8
..... 8
Figure 3: Manhole Protected by Gabion along Right Bank of Cooksville Creek. 9
Figure 4: East Bank of Cooksville Creek at the Area of Proposed Works 11
Figure 5: Vegetated Rip-Rap Detail (N.T.S). 11

LIST OF TABLES

Table 1: RGA Classification 5
Table 2: Summary of the RSAT Survey Results. 6
Table 3: Summary of the RGA Survey Results 6

1 INTRODUCTION

PARISH Aquatic Services (PARISH), formerly PARISH Geomorphic, has been retained by WSP Inc., to provide fluvial geomorphic expertise and recommendations regarding the replacement of an existing sanitary infrastructure, which consists of siphon geometry to lower the infrastructure at the point of the watercourse crossing, with a gravity sewer under Cooksville Creek within the City of Mississauga (**Figure 1**).

Figure 1: Cooksville Creek Study Reach, Depicting Site Specific Information.

The Region of Peel has installed two 750 mm diameter sewage forcemains along the north side of Lakeshore Road bridge crossing between Beechwood Ave. and Hampton Cres., in Mississauga, ON. To successfully complete a proper installation, the sewage forcemains cross beneath the main channel of Cooksville Creek, near its confluence with Lake Ontario. The installation of new sanitary infrastructure will ultimately decommission the existing siphon sewer. The following assessment was initiated based upon queries of the Credit Valley Conservation Authority (CVC) who identified concerns regarding the timeline for exposure of the existing siphon sewer infrastructure as high risk to health and safety and

the environment. Due to the geomorphological characteristics of Cooksville Creek and concerns regarding future exposure of the new sewer infrastructure, the CVC has requested that a fluvial geomorphologist assess whether the proposed 2.0 m cover will be sufficient over a 100-year planning horizon. Recommendations for decommissioning the existing sewer for the protection of the overall environment are also provided.

2 BACKGROUND REVIEW

The geomorphic conditions of Cooksville Creek have been investigated through detailed field reconnaissance, as well as desktop study revealing historic conditions and anthropogenic manipulation. Site specific investigations built upon findings on the *Cooksville Creek at Lakeshore Road - Geomorphic Assessment (2005) as well as the Port Credit Sewage Forcemains Crossing of Lakeshore Road- Memo (2009) previously completed by PARISH*, where channel erosion and infrastructure were identified as at risk for potential exposure and in turn high risk to public health, safety and environment.

Cooksville Creek is a warm water tributary of Lake Ontario, with a watershed area of 33.9 km^2. Of the total drainage area, 60% is residential, 34% is industrial/commercial and 6% is open space. The creek has been channelized for 92% of its length and has significant erosion problems. Of the total length of the creek, 41% is trapezoidal and lined with grass; 24% is lined with gabion baskets; 16% is lined with armourstone; 11% is lined with concrete and 8% is natural, eroded channel. Much of the lower reach of the study site has been altered by past in stream works. A large portion of the channel bed is lined with gabion baskets, providing limited habitat diversity, particularly at the downstream end where the creek begins to encounter its outlet to Lake Ontario.

The bedrock geology of the Cooksville Creek drainage basin is composed of the Georgian Bay Formation, consisting of dark grey shale with interbeds of limestone (Johnson et al, 1992) which influences the rate of channel change (e.g. migration), the sediment input (i.e. amount and type), and channel geometry. Within the study area, lacustrine deposits composed of silt and clay overlay this bedrock, with thicknesses ranging up to 3 meters.

Cooksville Creek at Lakeshore Road - Geomorphic Assessment, 2005 (PARISH)

In 2005, a geomorphic assessment was conducted for a section of Cooksville Creek flowing under Lakeshore Road in Mississauga, Ontario. The work was completed in fulfillment of the Municipal Class Environmental Assessment for the proposed Lakeshore Road culvert enlargement/replacement intended to mitigate flood levels and associated risk to adjacent properties. Concluding the assessment, the culvert crossing at Lakeshore Road was recommended to be replaced by a single span bridge structure which incorporated bank and bed treatments as part of the design. As part of the following scour assessment, much of the information demonstrated in the Cooksville Creek at Lakeshore Road - Geomorphic Assessment, 2005 will be utilized to provide insight to whether the proposed 2.0 m cover over the sewage forcemains will be sufficient over a 100-year planning horizon.

Port Credit Sewage Forcemains Crossing of Lakeshore Road- Memo, 2009 (PARISH)

Further to the 2005 assessment, the 2009 memo provided a geomorphic assessment of Cooksville Creek study Reach to assess the long-term scour potential of the channel. A background review of relevant studies was conducted and identified historical conditions and detailed field work previously conducted within the study Reach. Due to the natural of the bedrock system, a scour depth analysis utilizing traditional equations and modelling was deemed inappropriate. In such case, it was deemed appropriate to investigate the historical information and the fluvial geomorphological conditions at the site area. Upon evaluating the available information, the proposed 2.0 m of cover was deemed appropriate and should ensure that enough cover is available for the new sanitary sewage infrastructure to remain subsurface over the proposed 100-year planning horizon.

3 PREVIOUS FIELD ASSESSMENTS (2005, 2009)

As part of the 2005 geomorphic assessment, a detailed field data collection was performed in the vicinity of the Lakeshore Road crossing. The data collection included cross-sectional information of the channel, surveying of the channel bed, and a description of the geomorphic conditions.

Results of the detailed field work indicated that bankfull width ranged from 16.5-28.7 meters, with an average of 22 meters for Cooksville Creek. Bankfull depths, meanwhile, averaged 0.44 meters, with a range 0.32-0.58 meters. Wetted width for the channel averaged 11.4 meters while water depth averaged 0.09 meters. The maximum pool depth for the site measured 1.8 meters. Bankfull gradient was 0.80% and the entrenchment ratio for the site was 1.87.

Riparian vegetation at the site consisted of short grasses, trees, shrubs and herbaceous species. Existing channel disturbances included a storm sewer outfall, the Lakeshore Road crossing and gabion basket bank protection. Field observations from the site included the presence of deposition in the overbank zone and the formation of mid-channel bars.

In October 2009, a field reconnaissance was conducted to verify the site conditions following the replacement of the Lakeshore Road culvert. As recommended in the 2005 report, the culvert crossing at Lakeshore Rd. had been upgraded to a single span bridge crossing. The installations of the recommended stone treatments along the bed and bank areas were also confirmed. A large depositional feature was present underneath the bridge which has formed due to the increased cross-sectional area associated with the revised bridge crossing.

4 EXISTING GEOMORPHIC CONDITIONS (JANUARY 2015)

Field reconnaissance was conducted in January 2015 by PARISH fluvial geomorphologists, a photographic inventory compiled from the site visit is displayed in **Appendix A**. Access to the study area was gained via Lakeshore Road East. At the Lakeshore Road East crossing location, banks are lined with an armourstone retaining wall, approximately 20 m upstream from the crossing the armourstone ends and the historical gabion bank treatments remains in place extending from approximately the toe-of-slope to the top-of-bank.

The channel valley corridor is approximately 35 m wide, extending for a couple metres into the floodplain beyond the top-of-bank. Bankfull widths measured across riffle sections during the site visit ranged from 12 m to 15 m wide. Bankfull widths measured are narrower then what has previously been recorded for the study area, however this should not be considered unusual as ice-cover across the channel limited the ability for measurements to be taken in a safe manner across wider sections of the channel. Bankfull depths measured ranged from 0.4 m to 0.55 m deep. Due to ice cover, pool depths were not measured.

The length of channel walked during the site visit extends from Lakeshore Road East, upstream approximately 400 m to the Rail crossing. At the Lakeshore crossing, a large depositional bar feature is present along the left bank and extends the length of the culvert and forcing the channel thalweg to flow along the right bank. This feature was present in the 2009 field reconnaissance after the culvert was widened.

Approximately 185 m upstream from the Lakeshore culvert, a storm outfall culvert is located along the right bank. The outfall is a double barrel concrete box culvert, with each box approximately 3.0 m x 2.0 m, and is elevated 1 m above the water surface. The outfall uses a gabion scour pad structure to dissipate energy prior to the confluence with the main channel. Much of the gabion has been undermined and failed, having detached from the banks and shifted as a large mass a few meters downstream. Since the gabion scour pad has detached from the gabion bank protection; the gabion along the bank (downstream) at this location has also become detached promoting increased bank erosion. This erosion has produced an undercut 0.4 m deep. Upstream the gabion protecting the bank is in the process of failing, once it fails a sewer manhole will become exposed. Since the outfall structure is located at the tail-end of an outside meander bend, the channel thalweg is actively forced against the gabion, further increasing the likelihood of failure. Along the left bank at this location, a large depositional bar feature is present spanning the entire length of the inside meander bend. Grain size along the bar ranges from an average of 10 cm diameter to a maximum 47 cm and is consistent with fractured shale.

Further upstream, 130 m from the storm outfall, a bridge crossing has been torn down leaving only the concrete abutments. The abutment along the left bank is in direct contact with active flow, however as the upstream side is protected with gabion basket retaining wall the abutment is not in danger of being

outflanked. The abutment along the left bank is situated 8 m into the bank, and is protected during low flows by a depositional bar that extends downstream from the rail crossing. Differing from other depositional features within the Reach, this bar has a veneer of fine to medium grain sand capping coarser material. Along the opposing bank, the slope is entirely protected with gabion retaining wall until the rail crossing.

4.1 Rapid Assessments

The RGA was designed by the Ontario Ministry of Environment (2003) to assess reaches in rural and urban channels. This qualitative technique documents indicators of channel instability. Observations are quantified using an index that identifies channel sensitivity based on the presence or absence of evidence of aggradation, degradation, channel widening, and planform adjustment. Overall the index produces values that indicate whether the channel is stable/ in regime (score ≤0.20), stressed/transitional (score 0.21-0.40), or adjusting (score ≥0.40) (**Table 1**).

Table 1: RGA Classification.

Factor Value	Classification	Interpretation
≤0.20	In Regime or Stable (Least Sensitive)	The channel morphology is within a range of variance for streams of similar hydrographic characteristics – evidence of instability is isolated or associated with normal river meander propagation processes
0.21-0.40	Transitional or Stressed (Moderately Sensitive)	Channel morphology is within the range of variance for streams of similar hydrographic characteristics but the evidence of instability is frequent
≥0.41	In Adjustment (Most Sensitive)	Channel morphology is not within the range of variance and evidence of instability is wide spread

The RSAT was developed by John Galli at the Metropolitan Washington Council of Governments (Galli, 1996). The RSAT provides a more qualitative and broader assessment of the overall health and functions of a reach. This system integrates visual estimates of channel conditions and numerical scoring of stream parameters using six categories:

- Channel Stability
- Erosion and Deposition
- In-stream Habitat
- Water Quality
- Riparian Conditions
- Biological Indicators

Once a condition has been assigned a score, these scores are totaled to produce an overall rating that is based on a 50 point scoring system, divided into three classes:

- <20 Low
- 20-35 Moderate
- >35 High

While the RSAT scores streams from a more biological and water quality perspective than the RGA, this information is also of relevance within a geomorphic context. This is based on the fundamental notion that, in general, the types of physical features that generate good fish habitat tend to represent good geomorphology as well (i.e. fish prefer a variety of physical conditions – pools provide resting areas while riffle provide feeding areas and contribute oxygen to the water – good riparian conditions provide shade and food – woody debris and overhanging banks provide shade). Additionally, the RSAT approach includes semi-quantitative measures of bankfull dimensions, type of substrate, vegetative cover, and channel disturbance.

4.1.1 Rapid Assessment Results

In an attempt to quantify the fluvial geomorphic form and function of Cooksville Creek between Lakeshore Road East and the rail line, the overall condition of channel stability and health were undertaken using two established reconnaissance techniques, the Rapid Geomorphic Assessment (RGA) and the Rapid Stream Assessment Technique (RSAT).

Results of the RGA conclude that the study Reach is in a transitional state with multiple indicators of aggradation and degradation. Accretion on point bars, poor sorting of bed materials and coarse materials embedded in riffles all indicate active aggradation while undermined gabion, scour pools and exposed bedrock are indicators of degradation.

Table 2: Summary of the RSAT Survey Results.

Study Reach	Factor Value						Overall Score	Condition
	Channel stability	Scour / deposition	In stream Habitat	Water Quality	Riparian Condition	Biological Indicators		
Max. Score	11	8	8	8	7	8	50	
Cooksville Creek	5	4	4	4	4	3	24	Moderate

Table 3: Summary of the RGA Survey Results.

Study Reach	Factor Value				Stability Index	Condition
	Aggradation	Degradation	Widening	Planimetric Adjustment		
Cooksville Creek	0.57	0.5	0.2	0.0	0.32	Transitional

5 RECOMMENDATIONS

As the project of installing a new sewer line beneath Cooksville Creek continues to move forward, additional queries brought forward by the CVC need to be addressed. The following discussion aims to address issues regarding the timeline for both existing pipe exposure along the bed and exposure of the existing manhole along the bank as well as the recommended depth of the new sanitary sewer beneath the channel.

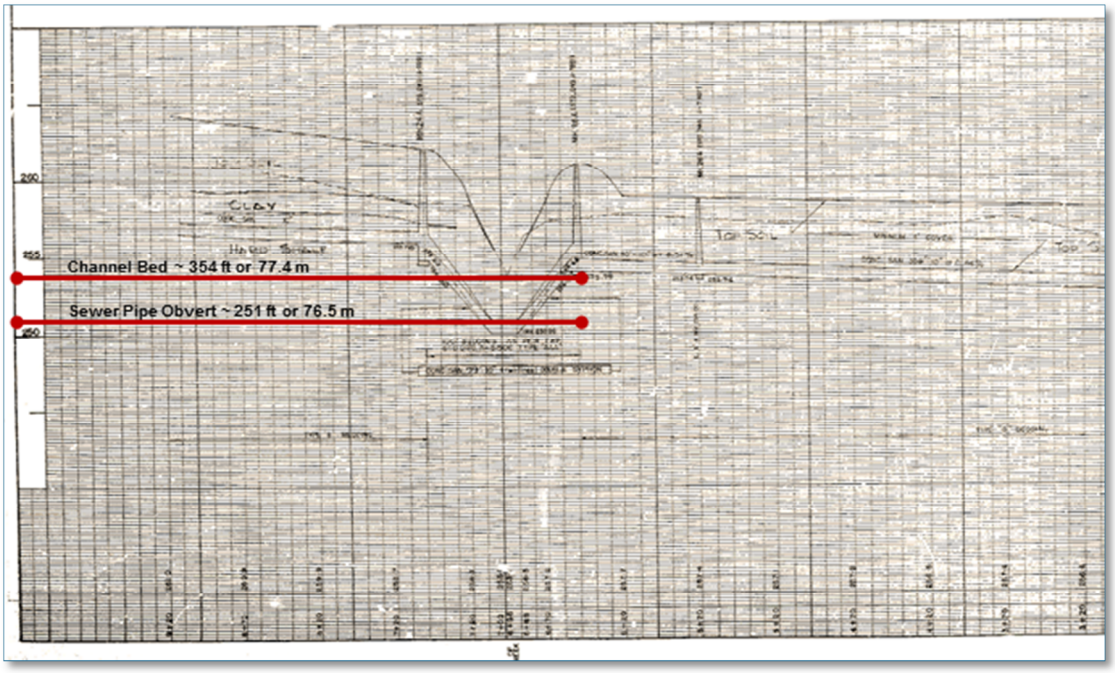
Timeline to Existing Pipe Exposure:

The existing sanitary sewer crossing was installed circa. 1965 (**Figure 2**). A cross section schematic shows the pipe obvert was placed at an approximate elevation of 76.5 masl below the channel bed with an approximate elevation of 77.4 masl, giving the pipe approximately 0.9 m of cover when it was installed. The pipe crosses the channel at a near parallel angel, from the manhole located along the right bank immediately upstream from the storm outfall and connects downstream to a manhole near the Lakeshore Road crossing on the left bank. The near parallel angle increases the length of pipe at risk due to channel down cutting significantly, with as much as 30 m of pipe below the channel.

A topographic survey of the study area was commissioned in 2014 in which the channel was extensively surveyed, including valley cross sections and channel centreline. Within the channel, along the approximate crossing location, the lowest bed elevation ranges from 76.96 masl to 76.25 masl. Based on the recently surveyed elevations, erosion along the bed can be estimated at a maximum of 1.14 m to a minimum of 0.43 m over the course of 50 years. While the existing sewer pipe has not yet been exposed, making the higher erosion value unlikely, it is noted that the location of maximum erosion is where the storm outfall scour pad has detached and formed a gabion mass which currently acts to protect the pipe under the bed. Changes in bed erosion due to the weathering of shale indicate the high likelihood the pipe will become exposed at some point within the next 50 years assuming a conservative erosion rate of 0.01 m or 1 cm per year.

In order to limit the disturbance to the highly sensitive channel bed, removal of the existing sewer pipe after decommissioning is not recommended.

Figure 2: Existing Sewer Detailed Design Drawings from 1965.



Timeline to Manhole Exposure:

The existing manhole at risk for exposure is located along the right bank, immediately upstream from the storm sewer outfall. Currently the manhole is situated approximately 1 m into the bank, and is protected by gabion baskets (**Figure 3**). The gabion in turn is further protected by a few mature trees located upstream along the bank. Due to the failing of gabion in the vicinity of the storm outfall, the gabion protecting the manhole is also at risk to fail. Since the manhole is located along the outer meander bend, flow and all associated erosive forces are directly in contacts with the manhole location. Erosion occurs when the hydraulic forces in the flow exceed the resisting forces of the channel boundary, which in this case is represented by gabion. If the gabion if functioning properly, it can be expected to with stand shear stress up to 475 N/m^2 and with an associated velocity that ranges from 4.3 m/sec to 5.8 m/sec (Fischenich, 2001). Prior assessments within the study Reach determined bankfull discharge to be approximately 11.5 m^3/sec, and that shear stress along the banks at bankfull stage ranges from 24.42 N/m^2 to 45.48 N/m^2 with an associated average bankfull velocity of 1.5 m/sec. While the recorded shear stress and velocity are well below the threshold for gabion erosion, even when the thresholds are not exceeded, erosion in select locations may occur (Fischenich, 2001). This is evident through failing gabion along the banks throughout the study Reach, both upstream and downstream from the manhole. Erosion can occur below the exceedance threshold depending on the duration of the flow, and upon the ability of the channel to transport the eroded sediments. Bankfull discharge noted in prior assessments is also significantly lower than the 2-year peak flow rate of 62 m^3/sec indicated in the *Cooksville Creek Rehabilitation Study (1996)* at the CN Rail crossing upstream from the manhole. This

indicates that erosion and undermining of the gabion has been taking place at relatively low return periods of 2-year to 5-year flows (62 m^3/sec – 81 m^3/sec).

Since partial failure and undermining of the gabion near the manhole has already occurred, it is expected to continue occurring. Based on the existing conditions of the gabion protecting the manhole, as well as expected flows within the channel, it is expected the manhole could become exposed within 10 to 15 years should current conditions continue.

Figure 3: Manhole Protected by Gabion along Right Bank of Cooksville Creek.

Depth of New Gravity Sewer:

It was previously determined in the 2009 memo, that due to the close proximity between the Lakeshore Road crossing and the Cooksville Creek outlet to Lake Ontario (approx. 500 m), scour depths may ultimately be dependent on the alternating water levels of Lake Ontario.; where the downstream lake levels act as a natural grade control measure that mitigates the degree of incision occurring within the creek as a result the urbanized flow regime, channel hardening practices, and exposed bedrock geology.

Increased Lake Ontario levels, causing backwater affects upstream along Cooksville Creek, submerge the channel bed and eliminate channel gradient, which would typically supply the necessary energy required for erosion to continue downstream. Therefore the extent at which backwater effects extend upstream will indicate the boundary at which erosion and scour will cease to occur. Following this thought process it was determined that the maximum scour depth of Cooksville Creek within the study Reach is 1.6 m below existing channel grade.

Assuming a continued erosion rate of 0.01 m per year, and disregarding the bed and bank treatments put in place at the Lakeshore crossing to control grade and limit scour, the timeline for this extent of bed erosion well exceeds the 100-year planning horizon. Following prior recommendations, the new

sanitary sewer pipe to be placed at a depth of 2 m below the channel bed. Upon evaluating the available information, it is concluded that is recommendations remains the same.

Protection of New Sewer Manhole (MH4A):

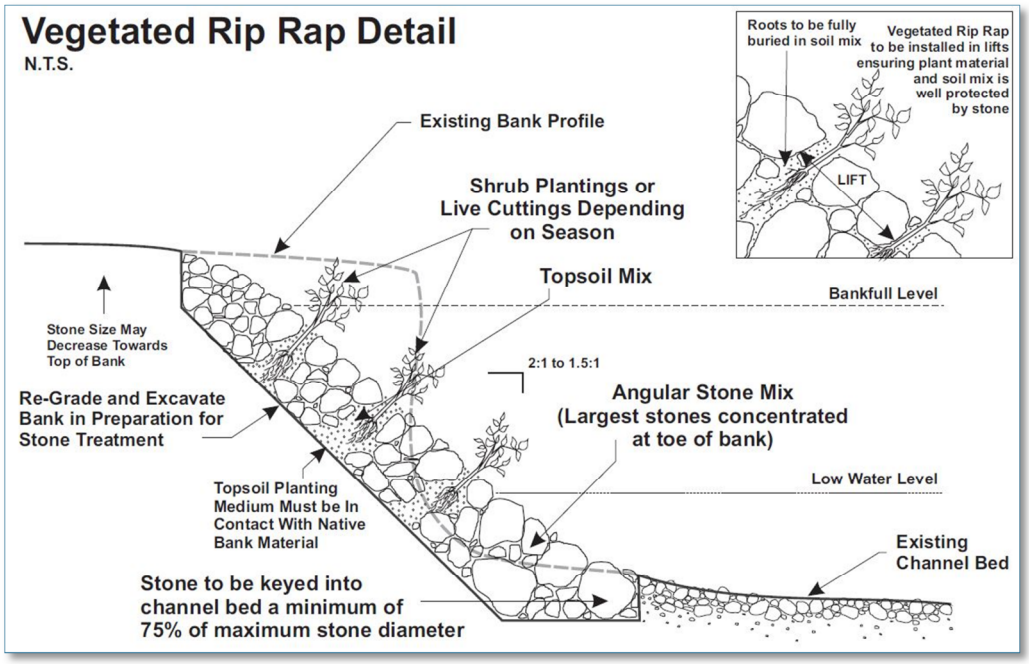
Due to the erodible nature of Cooksville Creek in the vicinity of the proposed pipeline works, as well as the degraded nature of existing gabion bank protection, it is necessary to recommend enhanced protection for the proposed manhole (MH4A).

In addition to the existing gabion bank protection, a second line of defence for mitigating risks to the proposed manhole can be recommended. The proposed manhole (MH4A) will be located approximately 6 m away from the existing top of bank, where based on existing erosion rates, if no additional stabilization measures are implemented, the bank can be expected to erode into the proposed manhole within the 100-year planning horizon. In order to protect the manhole from future erosion, a two-staged protection feature can be implemented around the manhole when it is constructed. An armourstone protection wall can be constructed around the manhole, and bridged over the sanitary pipe, with an additional apron of rip-rap extending to the toe of armourstone which will subsequently be buried with top soil and restored with restoration plantings. In the future, if the existing gabion fails and the channel erodes towards the manhole, the buried rip rap will be encountered first, offering time for additional mitigation measures to be installed.

The proposed works are not likely to adversely impact the stability of the east bank at the crossing location. Existing conditions at the time of the geomorphic field investigation concluded that while the gabion bank protection is at risk of failure, there are several mature deciduous trees located along the bank which provide additional protection and stabilization (**Figure 4**, background). It is recommended that these trees remain intact and undisturbed during construction so the root matrix continues to offer support to the gabion during and after construction. To add further protection to the proposed manhole, restabilising the failing gabion along the east bank is recommended within 10 to 15 years when the existing manhole is expected to become exposed. Re-stabilization can occur in areas where the gabion has become detached from the bank or undermined, the recommendation would be to place vegetated rep-rap below extent of failing gabion with additional plant cuttings being introduced to the gabion to offer further support (**Figure 5**). The stone for the bank treatment should be sized to adequately withstand bankfull flow conditions (11.5 m^3/sec). Restabilising the gabion is preferred to full replacement and channel works in order to limit disturbance to the highly erodible bedrock channel as well as to preserve the existing trees and the extensive root matrix that provides stability to the bank.

Figure 4: East Bank of Cooksville Creek at the Area of Proposed Works.

Figure 5: Vegetated Rip-Rap Detail (N.T.S).



Note: Due to the bedrock nature of Cooksville Creek, it is not recommended that stone be keyed into the channel bed. Instead, use the existing bed topography to place keystones at the toe.

6 SUMMARY

In order to provide geomorphic expertise regarding the replacement of sanitary sewer infrastructure within the Cooksville Creek valley corridor at the Lakeshore Road East crossing and address concerns brought forward by the CVC, a fluvial geomorphic assessment was conducted to assess long-term scour and erosion potential within the channel. From the assessment, recommendations are made regarding the timeline for the existing sanitary sewer infrastructure to become exposed along the channel bed and banks as well as recommendations to further solidify the depth of cover required for the proposed replacement infrastructure. Recommendations were also made to mitigate future bank erosion an exposure of the proposed manhole (MH4A).

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APPENDIX A
SITE PHOTOGRAPHS

Notes:

Photographs are displayed in order starting from the Lakeshore Road crossing and working upstream to the CN Rail crossing.

Left bank and right bank are ALWAYS described as if the viewer is facing the downstream direction. I.e., if the photograph is “looking downstream” left bank will be to the left of the photo, however if the photograph is “looking upstream” left bank will be to the right of the photo.

2. Looking downstream underneath the Lakeshore Road crossing; large depositional feature along right bank while channel thalweg concentrated towards left bank armor stone treatment.

2. Looking upstream along Cooksville Creek; channel is concentrated along the right bank and slope where bank erosion is active, left bank is an area of deposition, with a moderate ~5 m wide floodplain before toe-of-slope.

3. Looking downstream towards Lakeshore Road Crossing. Valley slopes are populated with mature deciduous vegetation.

4. Looking upstream towards storm outfall culvert. Deposition of platy shale material forming lateral bar along right bank. Undercutting visible along left bank.

5. Looking across the channel towards the left bank, upstream from manhole and storm outfall; bank is significantly undercut.

6. Example of gabion protecting the right valley slope at location of proposed sewer crossing.

7. Left bank of channel immediately downstream from storm outfall; gabions have detached from bank and are at risk of full failure. Bank is undercut and tree roots are exposed.

Photograph taken by: J. Henshaw – Jan. 20, 2015

8. Looking across the channel towards storm outfall.

Photograph taken by: J. Henshaw – Jan. 20, 2015

9. Gabion scour pad failure downstream from storm outfall; exposed scour hole approx. 1 m deep. No indicator that buried sewer pipe is exposed.

10. Looking across the channel towards the left bank immediately upstream from the storm outfall. Gabion bank protection is in disrepair, manhole casing visible along bank.

11. Sanitary manhole on Left bank, upstream from storm outfall. Manhole is protected with gabion, trees along bank upstream further protect bank through rooting matrix.

12. Looking downstream along channel from right bank. Storm outfall confluence in background.

13. Gabion bank protection undermined along left bank (outer meander bend) upstream from sanitary sewer manhole.

Photograph taken by: J. Henshaw – Jan. 20, 2015

14. Looking upstream along channel from right bank. Extensive platy shale deposit along right bank.

Photograph taken by: J. Henshaw – Jan. 20, 2015

15. Historic bridge crossing abutment along left bank. Abutment is not in contact with channel during low flow and is situated within a sand veneer depositional bar.

16. Historic bridge crossing abutment along right bank. Abutment is in direct contact with channel during low flow but is protected upstream by a gabion retaining wall structure.

17. Looking upstream along channel towards CN Rail crossing. Right bank is protected with gabion retaining wall, left bank is composed of platy shale depositional feature interspersed with sand deposition.

18. CN Rail crossing at upstream extent of study Reach. Sandy deposit along left bank immediately downstream from crossing.

APPENDIX

A-6 Stage 1 Archaeological Assessment

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Ontario

Nov 4, 2022

Alexandra Mullan (P1006)
WSP Canada
739 Lansdowne Toronto ON M6H 3Y9

RE: Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 1 Archaeological Assessment Beach Street Sewage Pumping Station Diversion Municipal Class EA, Regional Municipality of Peel, Part of Lots 11 and 12, Concession 2 South of Dundas Street, and Part of Lots 9, 10, and 11, Concession 3 South of Dundas Street, Geographic Township of Toronto, County of Peel, now City of Mississauga, Ontario", Dated Nov 3, 2022, Filed with MCM Toronto Office on N/A, MCM Project Information Form Number P1006-0067-2022, MCM File Number 0016574

Dear Miss Mullan:

The above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18, has been entered into the Ontario Public Register of Archaeological Reports without technical review.[1]

Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require further information, please do not hesitate to send your inquiry to Archaeology@Ontario.ca

cc. Archaeology Licensing Officer
Troy Leyburne,Peel Region
TBD TBD,MECP

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REGIONAL MUNICIPALITY OF PEEL

STAGE 1 ARCHAEOLOGICAL ASSESSMENT

BEACH STREET SEWAGE PUMPING STATION DIVERSION MUNICIPAL CLASS EA

SEPTEMBER 28, 2022

PIF P1006-0067-2022
ALEXANDRA MULLAN– P1006

STAGE 1 ARCHAEOLOGICAL ASSESSMENT

BEACH STREET SEWAGE PUMPING STATION DIVERSION MUNICIPAL CLASS EA

REGIONAL MUNICIPALITY OF PEEL

PART OF LOTS 11 AND 12, CONCESSION 2 SOUTH OF DUNDAS STREET, AND PART OF LOTS 9, 10 AND 11, CONCESSION 3 SOUTH OF DUNDAS STREET, GEOGRAPHIC TOWNSHIP OF TORONTO, COUNTY OF PEEL, NOW CITY OF MISSISSAUGA, ONTARIO

PROJECT NO.: 19M-00593-00
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September 28, 2022

Stage 1 Archaeological Assessment

Beach Street Sewage Pumping Station Diversion Municipal Class EA

Part of Lots 11 and 12, Concession 2 South of Dundas Street, and Part of Lots 9, 10 and 11, Concession 3 South of Dundas Street, Geographic Township of Toronto, County of Peel, now City of Mississauga, Ontario

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SIGNATURES AND DISCLAIMERS

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The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

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EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by the Regional Municipality of Peel to conduct a Stage 1 archaeological assessment for the Beach Street Sewage Pumping Station Diversion Municipal Class Environmental Assessment (EA) in the City of Mississauga, Ontario. This project includes a diversion between Beach Street Sewer Pumping Station (SPS) and Beechwood SPS, and is known as the Beach Street Diversion EA. The study area is located on part of Lots 11-12, Concession 2 South of Dundas Street (SDS), and part of Lots 9-11, Concession 3 SDS, in the Geographic Township of Toronto, County of Peel, now the City of Mississauga, Ontario (Figure 1 and 2).

This archaeological assessment was triggered by the Schedule B Class Environmental Assessment process under *the Environmental Assessment Act (1990)* and is required to ensure that the Client is compliant with the *Ontario Heritage Act, 1990*. The archaeological assessments were carried out in accordance with the Ministry of Heritage, Sport, Tourism and Culture Industries'(MHSTCI) 2011 *Standards and Guidelines for Consultant Archaeologists*.

The Stage 1 archaeological assessment includes a review of previous archaeological research, historic maps, land registry documents, and local histories. A property inspection of the study area was conducted on May 11th, 2022 from public lands to better understand current conditions. The boundaries of the assessment correspond to limits provided by the Client at the outset of the assessment.

The results of the Stage 1 archaeological assessment found that the majority of the study area was visually confirmed to have been significantly previously disturbed; however, parts of the study area hold potential for the presence of archaeological resources. Based on the results of the Stage 1 background study and property inspection, **a Stage 2 archaeological assessment is recommended for those parts of the study area determined to retain archaeological potential should they be impacted by future development (Figure 8).**

The Stage 2 archaeological assessment is to be conducted following Section 2.1 of the *Standards and Guidelines for Consultant Archaeologists* (MHSTCI, 2011). The recommendations are as follows:

- Following Section 2.1.2 of the Standards and Guidelines for Consultant Archaeologists (MHSTCI, 2011), the areas of manicured lawn, parkland, and woodlot must be subject to test pit survey at 5 m intervals;
- If areas of confirmed disturbance are encountered, test pit survey can be increased to 10 m intervals based on professional judgement to confirm the extent of disturbance; and,
- The remainder of the study area has been identified as previously disturbed, and no further assessment is required in these areas.

It should be noted that this report is not considered final until the MHSTCI has agreed with the above-stated recommendations and the report has been entered into the Ontario Public Register of Archaeological Reports.

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TABLE OF CONTENTS

1 PROJECT CONTEXT 8

1.1 Objectives 8

1.2 Development Context 8

1.3 Historical Context 8

1.3.1 Historical Documentation 8

1.3.2 Pre-Contact Period 9

1.3.3 Post-Contact Period 14

1.3.4 Study Area Specific History 17

1.4 Archaeological Context 18

1.4.1 Current Conditions 18

1.4.2 Physiography and Ecology 18

1.4.3 Previous Archaeological Assessments 19

1.4.4 Registered Archaeological Sites 20

1.4.5 Listed and Designated Heritage Properties 20

2 FIELD METHODS 21

2.1 Property Inspection 21

2.2 Inventory of Documentary Records 21

3 ANALYSIS AND CONCLUSIONS 22

4 RECOMMENDATIONS 23

5 ADVICE ON COMPLIANCE WITH LEGISLATION 24

6 REFERENCES 25

7 IMAGES 28

8 FIGURES 34

TABLES

TABLE 1: PREVIOUS ARCHAEOLOGICAL ASSESSMENTS ON OR WITHIN 50 M OF THE STUDY AREA 19
TABLE 2: REGISTERED ARCHAEOLOGICAL SITES WITHIN 1 KM OF THE STUDY AREA 20

FIGURES

FIGURE 1: PROJECT LOCATION 35
FIGURE 2: STUDY AREA IN DETAIL 36
FIGURE 3: 1859 TREMAINE MAP OF THE COUNTY OF PEEL 37
FIGURE 4: 1877 WALKER & MILES' ILLUSTRATED HISTORICAL ATLAS OF THE COUNTY OF PEEL 38
FIGURE 5: AERIAL IMAGERY (1954) 39
FIGURE 6: AERIAL IMAGERY (1977) 40
FIGURE 7: PREVIOUS ARCHAEOLOGICAL ASSESSMENTS 41
FIGURE 8: RESULTS OF THE STAGE 1 ARCHAEOLOGICAL ASSESSMENT 42

APPENDICES

A MIICHI SAAGIG HISTORIES

B FEATURES OF ARCHAEOLOGICAL POTENTIAL

1 PROJECT CONTEXT

1.1 OBJECTIVES

The objectives of a Stage 1 Archaeological Assessment are as follows:

- To provide information regarding the property's geography, history, previous archaeological fieldwork, and current land condition;
- To provide a detailed evaluation of the property's archaeological potential; and,
- To recommend appropriate strategies for Stage 2 survey when required.

A property inspection provides first-hand knowledge of the geography, topography, and current conditions of the study area, which allows for a more accurate determination of archaeological potential.

1.2 DEVELOPMENT CONTEXT

WSP Canada Inc. (WSP) was retained by the Regional Municipality of Peel to conduct a Stage 1 archaeological assessment for the Beach Street Sewage Pumping Station Diversion Municipal Class Environmental Assessment (EA) in the City of Mississauga, Ontario. This project includes a diversion between Beach Street Sewer Pumping Station (SPS) and Beechwood SPS, and is known as the Beach Street Diversion EA. The study area is located on part of Lots 11-12, Concession 2 South of Dundas Street (SDS), and part of Lots 9-11, Concession 3 SDS, in the Geographic Township of Toronto, County of Peel, now the City of Mississauga, Ontario (Figure 1 and 2).

This archaeological assessment was triggered by the Schedule B Class Environmental Assessment process under *the Environmental Assessment Act (1990)* and is required to ensure that the Client is compliant with the *Ontario Heritage Act, 1990*. The archaeological assessments were carried out in accordance with the Ministry of Heritage, Sport, Tourism and Culture Industries'(MHSTCI) 2011 *Standards and Guidelines for Consultant Archaeologists*.

The Stage 1 archaeological assessment includes a review of previous archaeological research, historic maps, land registry documents, and local histories. A property inspection of the study area was conducted on May 11th, 2022 from public lands to better understand current conditions. The boundaries of the assessment correspond to limits provided by the Client at the outset of the assessment.

1.3 HISTORICAL CONTEXT

1.3.1 HISTORICAL DOCUMENTATION

The following sections provide a general review of the pre-contact and post-contact periods of southern Ontario as well as the history of the project areas to provide a generalized historical framework for the archaeological assessment.

1.3.2 PRE-CONTACT PERIOD

The pre-contact period in Ontario has been reconstructed, primarily, from the archaeological record and interpretations made by archaeologists through an examination of material culture and site settlement patterns. Technological and temporal divisions of the pre-contact period have been defined by archaeologists based on changes to natural, cultural, and political environments that are observable in the archaeological record. It is pertinent to state that although these divisions provide a generalized framework for understanding the broader events of the pre-contact period, they are not an accurate reflection of the fluidity and intricacies of cultural practices that spanned thousands of years. The following presents a sequence of Indigenous land-use from the earliest human occupation following deglaciation to the more recent past based on the following periods as defined by archaeologists:

- The Paleo Period
- The Archaic Period
- The Woodland Period
- The Post-Contact Period

PALEO PERIOD

Paleo period populations were the first to occupy what is now southern Ontario, moving into the region following the retreat of the Laurentide Ice Sheet approximately 11,000 years before present (BP). The first Paleo period populations to occupy southern Ontario are referred to by archaeologists as Early Paleo (Ellis & Deller, 1990).

Early Paleo period groups are identified by their distinctive projectile point morphological types, exhibiting long grooves, or 'flutes', that likely functioned as a hafting mechanism (method of attaching the point to a wooden shaft). These Early Paleo group projectile point types include Gainey (ca. 10,900 BP), Barnes (ca. 10,700), and Crowfield (ca. 10,500) (Ellis & Deller, 1990). By approximately 10,400 BP, Paleo projectile points transitioned to various unfluted varieties, such as Holcombe (ca. 10,300 BP), Hi Lo (ca. 10,100 BP), and Unstemmed and Stemmed Lanceolate (ca. 10,400 to 9,500 BP). These tool types were used by Late Paleo period groups (Ellis & Deller, 1990). Both Early and Late Paleo period populations were highly mobile, participating in the hunting of large game animals. Paleo period sites often functioned as small campsites where stone tool production and maintenance occurred (Ellis & Deller, 1990).

ARCHAIC PERIOD

By approximately 8,000 BP, climatic warming supported the growth of deciduous forests in southern Ontario. These forests introduced new flora and faunal resources, which resulted in subsistence shifts and a number of cultural adaptations. This change is reflected in the archaeological record by new tool-kits that are reflective of a shift in subsistence strategies and has been categorized as the Archaic period.

The Archaic period in southern Ontario is sub-divided into the Early Archaic (ca. 10,000 to 8,000 BP), Middle Archaic (ca. 8,000 to 4,500 BP), and the Late Archaic (ca. 4,500 to 2,800 BP) periods. Generally, in North America, the Archaic period represents a transition from big game hunting to broader, more generalized subsistence strategies based on local resource availability. This period is characterized by the following traits:

- An increase in stone tool variation and reliance on local stone sources,
- The emergence of notched and stemmed projectile point types,
- A reduction in extensively flaked tools,

- The use of native copper,
- The use of bone tools for hooks, gorges, and harpoons,
- An increase in extensive trade networks, and
- The production of ground stone tools and an increase in larger, less portable tools

The Archaic period is also marked by population growth with archaeological evidence suggesting that, by the end of the Middle Archaic period (ca. 4,500 BP), populations had steadily increased in size (Ellis, et al., 1990).

Over the course of the Archaic period, populations began to rely on more localized hunting and gathering territories and were shifting to more seasonal encampments. From the spring into the fall, settlements were focused in lakeshore/riverine locations where a variety of different resources could be exploited. Settlement in the late fall and winter months moved to interior sites where the focus shifted to deer hunting and the foraging of wild plants (Ellis et al., 1990, p. 114). The steady increase in population size and the adoption of a more localized seasonal subsistence strategy led to the transition into the Woodland period.

EARLY AND MIDDLE WOODLAND PERIODS

The beginning of the Woodland period is defined by the emergence of ceramic technology. Similar to the Archaic period, the Woodland period is separated into three timeframes: the Early Woodland (ca. 2,800 to 2,000 BP), the Middle Woodland (ca. 2,000 to 1,200 BP), and the Late Woodland (ca. 1,200 to 350 BP) (Spence et al., 1990; Fox, 1990).

The Early Woodland period is represented in southern Ontario by two cultural complexes: the Meadowood Complex (ca. 2,900 to 2,500 BP), and the Middlesex Complex (ca. 2,500 to 2,000 BP). During this period, the life ways of Early Woodland populations differed little from that of the Late Archaic with hunting and gathering representing the primary subsistence strategies. The pottery of this period is characterized by its relatively crude construction and lack of decoration. These early ceramics exhibit cord impressions, which are likely the result of the techniques used during manufacture rather than decoration (Spence et al., 1990).

The Middle Woodland period has been differentiated from the Early Woodland period by changes in lithic tool forms (e.g. projectile points, expedient tools), and the increased decorative elaboration of ceramic vessels (Spence et al., 1990). Additionally, archaeological evidence suggests the rudimentary use of maize (corn) horticulture by the end of the Middle Woodland Period (Warrick, 2000).

In southern Ontario, the Middle Woodland has been divided into three different complexes based on regional cultural traditions: the Point Peninsula Complex, the Couture Complex, and the Saugeen Complex. These groups are differentiated by sets of characteristics that are unique to regions within the province, specifically regarding ceramic decorations.

The Point Peninsula Complex extends from south-central and eastern Ontario into southern Quebec. The northernmost borders of the complex can be found along the Mattawa and French Rivers. Ceramics are coil constructed with conical bases, outflaring rims, and flat, rounded, or pointed lips. The interior surfaces of vessels are often channelled with a comb-like implement, creating horizontal striations throughout. The exterior is smoothed, or brushed, and decoration generally includes pseudo-scallop stamps or dentate impressions. Occasionally, ceramics will have been treated with a red ochre wash (Spence et al, 1990).

The Saugeen Complex is found generally in south-central Ontario and along the eastern shores of Lake Huron. The Saugeen Complex ceramics are similar in style to Point Peninsula Complex; however, the vessels tended to be cruder than their Point Peninsula counterparts. They were characterized by coil construction with thick walls, wide

necks, and poorly defined shoulders. Usually, the majority of the vessel was decorated with pseudo-scallop stamps or dentate impressions, with the latter occurring more frequently at later dates (Spence et al., 1990).

LATE WOODLAND PERIOD

There is much debate as to whether a transitional phase between the Middle and Late Woodland Periods is present in Ontario, but it is generally agreed that the Late Woodland period of occupation begins around 1,100 BP. The Late Woodland period in southern Ontario can be divided into three cultural sub-phases: The early, middle, and late Late Woodland periods. The early Late Woodland is characterized by the Glen Meyer and Pickering cultures and the middle Late Woodland is characterized by the Uren and Middleport cultures. These groups are ancestral to the Iroquoian-speaking Neutral-Erie (Neutral), the Huron-Wendat (Huron), and Petun Nations that inhabited southern Ontario during the late Late Woodland period (Smith, 1990, p. 285).

The Pickering and Glen Meyer cultures co-existed within southern Ontario during the early Late Woodland period (ca. 1250-700 BP). Pickering territory is understood to encompass the area north of Lake Ontario to Georgian Bay and Lake Nipissing (Williamson, 1990). Glen Meyer is centred around Oxford and Norfolk counties, but also includes the southeastern Huron basin and the western extent is demarcated by the Ekfrid Clay Plain southwest of London, Ontario (Noble, 1975). Villages of either tradition were generally smaller in size (~1 ha) and composed of smaller oval structures, which were later replaced by larger structures in the Late Woodland period. Archaeological evidence suggested a mixed economy where hunting and gathering played an important role, but small-scale horticulture was present, indicating a gradual shift from hunting-gathering to a horticultural economy (Williamson, 1990).

The first half of the middle Late Woodland period is represented by the Uren culture (700-650 BP) and the second half by the Middleport (650-600 BP). Uren and Middleport sites of the middle Late Woodland share a similar distribution pattern across much of southwestern and south-central Ontario. (Dodd et al., 1990). Significant changes in material culture and settlement-subsistence patterns are noted during this short time. Iroquois Linear, Ontario Horizontal, and Ontario Oblique pottery types are the most well-represented ceramic assemblages of the middle Late Woodland period (Dodd et al., 1990). At Middleport sites, material culture changes included an increase in the manufacture and use of clay pipes as well as bone tools and adornments (Dodd et al., 1990; Ferris & Spence, 1995).

The appearance of evidence of small year-round villages, secondary ossuary burials, and what are thought to be semi-subterranean sweat lodges suggest a marked increase in sedentism in southern Ontario during the Uren and Middleport cultures (Ferris & Spence, 1995). The increasing permanency of settlements resulted in the development of small-scale cultivation and a subsequent increased reliance on staple crops such as maize, beans, and squash (Dodd et al., 1990; Warrick, 2000; Ferris & Spence, 1995).

Archaeological evidence from the middle Late Woodland sites also documents increases in population size, community organization and village fissioning, and the expansion of trade networks. The development of trade networks with northern Algonquian peoples has also been inferred from findings at Middleport sites along the northern parts of southwestern and south-central Ontario. These changes resulted in the more organized and complex social structures observed in the late Late Woodland period.

During the late Late Woodland period, village size significantly increased as did the complexity of community and political systems. Villages were often fortified with palisade walls and ranged in size from a few longhouses to over 100 longhouses observed in large villages. Larger longhouses oriented differently than others in the village have been associated with primary familial groups and it has been suggested that longhouses that were located outside of palisade walls may have been for visiting groups for the purposes of trade or social gatherings (Ramsden, 1990). More recent research has indicated that smaller, temporary camp or cabin sites were often used seasonally for the

tending of agricultural fields or as fishing camps (Ramsden, 1990). By this time, large-scale agriculture had taken hold, making year-round villages even more practical as a result of the ability to store large crop yields over winter.

The villages in the vicinity of the study area were typically associated with the Huron-Wendat nations who occupied areas as far east as the Trent River and as far west as the Niagara Escarpment. They typically inhabited each village for several decades until the agricultural land was exhausted, and communities moved to more fertile areas. Throughout the fifteenth and sixteenth century, community movement often included northern migrations and the incorporation of multiple smaller villages into larger coalescent villages.

The Huron-Wendat eventually dispersed from the Toronto area in the seventeenth century, during the period of French contact, to settle in their historic homeland of Wendake, which included territory in present-day Simcoe and Grey Counties. Today, "Wendake" is the name of the Huron-Wendat reserve located in Quebec, Ontario, which was formerly known as the village of Huronia. This coalescence and subsequent movement northward was thought to be the result of a number of socio-political factors, including increased conflict with the Haudenosaunee, an increased complexity in political organization, stronger trade relations with northern Algonquian groups, and interactions with early European traders (Ramsden, 1990; Birch, 2012; Ferris & Spence, 1995).

Oral histories of the Michi Saagiig (Mississauga Anishinaabeg) reflect increasing levels of inter-community relationships, integration, and trade between different groups. For example, these oral histories speak to the arrival of, and relationships with, the Huron "corn growers" (Migizi & Kapyrka, 2015, pp. 127-136). In addition to archaeological interpretations, oral histories also provide a valuable contribution to our understanding of the occupation and movement of Indigenous peoples in Ontario. The following oral history, provided by Michi Saagiig elder Gitiga Migizi, speaks to the occupation of this area of southern Ontario by the Anishinaabeg throughout the pre-contact and post-contact periods (see Appendix A for the full text):

> The traditional homelands of the Michi Saagiig (Mississauga Anishinaabeg) encompass a vast area of what is now known as southern Ontario. The Michi Saagiig occupied and fished the north shore of Lake Ontario where the various tributaries emptied into the lake. Their territories extended north into and beyond the Kawarthas as winter hunting grounds onwhich they would break off into smaller social groups for the season, hunting and trapping on these lands, then returning to the lakeshore in spring for the summer months.
>
> The Michi Saagiig were a highly mobile people, travelling vast distances to procure subsistence for their people. They were also known as the "Peacekeepers" among Indigenous nations. The Michi Saagiig homelands were located directly between two very powerful Confederacies: The Three Fires Confederacy to the north and the Haudenosaunee Confederacy to the south. The Michi Saagiig were the negotiators, the messengers, the diplomats, and they successfully mediated peace throughout this area of Ontario for countless generations.
>
> Michi Saagiig oral histories speak to their people being in this area of Ontario for thousands of years. These stories recount the "Old Ones" who spoke an ancient Algonquian dialect. The histories explain that the current Ojibwa phonology is the 5th transformation of this language, demonstrating a linguistic connection that spans back into deep time. The Michi Saagiig of today are the descendants of the ancient peoples who lived in Ontario during the Archaic and Paleo periods. They are the original inhabitants of southern Ontario, and they are still here today.
>
> The traditional territories of the Michi Saagiig span from Gananoque in the east, all along the north shore of Lake Ontario, west to the north shore of Lake Erie at Long Point. The territory spreads as far north as the tributaries that flow into these lakes, from Bancroft and north of the Haliburton highlands. This also includes all the tributaries that flow from the height of land north of Toronto like the Oak

Ridges Moraine, and all of the rivers that flow into Lake Ontario (the Rideau, the Salmon, the Ganaraska, the Moira, the Trent, the Don, the Rouge, the Etobicoke, the Humber, and the Credit, as well as Wilmot and 16 Mile Creeks) through Burlington Bay and the Niagara region including the Welland and Niagara Rivers, and beyond. The western side of the Michi Saagiig Nation was located around the Grand River which was used as a portage route as the Niagara portage was too dangerous. The Michi Saagiig would portage from present-day Burlington to the Grand River and travel south to the open water on Lake Erie.

Michi Saagiig oral histories also speak to the occurrence of people coming into their territories sometime between 500-1000 A.D. seeking to establish villages and a corn growing economy – these newcomers included peoples that would later be known as the Huron-Wendat, Neutral, Petun/Tobacco Nations. The Michi Saagiig made Treaties with these newcomers and granted them permission to stay with the understanding that they were visitors in these lands. Wampum was made to record these contracts, ceremonies would have bound each nation to their respective responsibilities within the political relationship, and these contracts would have been renewed annually (see Gitiga Migizi and Kapyrka 2015). These visitors were extremely successful as their corn economy grew as well as their populations. However, it was understood by all nations involved that this area of Ontario were the homeland territories of the Michi Saagiig.

The Odawa Nation worked with the Michi Saagiig to meet with the Huron-Wendat, the Petun, and Neutral Nations to continue the amicable political and economic relationship that existed – a symbiotic relationship that was mainly policed and enforced by the Odawa people.

Problems arose for the Michi Saagiig in the 1600s when the European way of life was introduced into southern Ontario. Also, around the same time, the Haudenosaunee were given firearms by the colonial governments in New York and Albany which ultimately made an expansion possible for them into Michi Saagiig territories. There began skirmishes with the various nations living in Ontario at the time. The Haudenosaunee engaged in fighting with the Huron-Wendat and between that and the onslaught of European diseases, the Iroquoian speaking peoples in Ontario were decimated.

The onset of colonial settlement and missionary involvement severely disrupted the original relationships between these Indigenous nations. Disease and warfare had a devastating impact upon the Indigenous peoples of Ontario, especially the large sedentary villages, which mostly included Iroquoian speaking peoples. The Michi Saagiig were largely able to avoid the devastation caused by these processes by retreating to their wintering grounds to the north, essentially waiting for the smoke to clear.

Often times, southern Ontario is described as being “vacant” after the dispersal of the Huron-Wendat peoples in 1649 (who fled east to Quebec and south to the United States). This is misleading as these territories remained the homelands of the Michi Saagiig Nation.

The Michi Saagiig participated in eighteen treaties from 1781 to 1923 to allow the growing number of European settlers to establish in Ontario. Pressures from increased settlement forced the Michi Saagiig to slowly move into small family groups around the present day communities: Curve Lake First Nation, Hiawatha First Nation, Alderville First Nation, Scugog Island First Nation, New Credit First Nation, and Mississauga First Nation. The Michi Saagiig have been in Ontario for thousands of years, and they remain here to this day.

Migizi and Kapyrka pp. 127-136 (2015)

Early contact with European settlers at the end of the Late Woodland period resulted in extensive changes to the traditional lifestyles of most populations inhabiting Ontario including settlement size, population distribution, and material culture. The introduction of European-borne diseases significantly increased mortality rates, resulting in a drastic drop in population size (Warrick, 2000).

1.3.3 POST-CONTACT PERIOD

Early European presence within the study areas began as early as 1615 with the travels of the French explorer Etienne Brulé who travelled with the Huron along the major portage route known as the Toronto Carrying Place Trail, also known as the Humber Portage, which connected Lake Ontario with Lake Simcoe and the northern Great Lakes (Steckley, 1987; Ramsden, 1990). From Lake Ontario, the trail ran northward along the eastern branch of the Humber River.

In 1615-1616, Samuel De Champlain also travelled with the Huron northward to Georgian Bay. By the 1640s, the Huron, Petun, Neutral, and Mississauga Anishinaabeg had dispersed out of this region of southern Ontario as a result of the warfare and disease that had arrived with European colonization. The large-scale population dispersals gave way for the Haudenosaunee to occupy the territory along the north shore of Lake Ontario where they settled along inland-running trade routes. These settlements included the villages of Ganatsekwyagon on the Rouge River and Teiaiagon on the Humber River at the head of the Toronto Carrying Place Trail (Steckley, 1987; Ramsden, 1990). Due to increased military pressure from the French in the late 1600s, and the return of the Anishinaabe Nations (Ojibwa, Odawa, Potawatomi, and Mississauga) who had previously retreated to the north, the Haudenosaunee abandoned their villages along the north shore of Lake Ontario.

The land on which the study area falls is located falls within the boundaries of the Head the Lake Purchase (Treaty No. 14). The Head the Lake Purchase was signed by the Crown and the Mississauga of the Credit First Nation in 1806 and included an area of previously unceded land between the Toronto Purchase (Treaty No. 13a) of 1805 and the Brant Tract (Treaty No. 8) ceded in 1797 (Duric, 2017a). Present day cities included within the Head of the Lake Purchase include Mississauga, Oakville, and parts of Burlington.

MISSISSAUGAS OF THE CREDIT FIRST NATION

When the Mississaugas of the Credit First Nation signed the Ajetance Treaty with the Crown in 1818, the Nation was left with three remaining reserves on the banks of 12 Mile Creek, 16 Mile Creek, and the Credit River. William Claus, Deputy Superintendent of the Indian Department, oversaw the surrender of these remaining lands in 1820 with Treaties 22 and 23. The former saw the surrender of 12 Mile and 16 Mile Creeks along with the northern and southern segments of the Credit River lands. The latter, signed the same day, saw the remaining land on the Credit River surrendered. In exchange, they were offered instruction in Christianity, education for their children, fifty pounds sterling, and 200 acres on the Credit River Reserve where they were to establish a village (Duric, 2017). The increasing number of Euro-Canadians in the area had impacted both game and fish sources which made traditional methods of subsistence increasingly difficult (Plummer, 2015).

The Credit Village, located to the south east of the study area on present-day Mississauga Road, was established in 1826. In April of that year, Peter Jones and approximately 100 Methodist Mississauga erected temporary bark structures and began to clear the land. Over the next few years, it developed into a thriving and self-sufficient village. By the late 1830s, it is recorded as having approximately forty log and frame houses, a Methodist church, a two-storey Mission House, a schoolhouse, a blacksmith's shop, a carpenter's shop, two stores, a hospital, and two saw mills. The Mississauga also had boats, warehouses, and shipping facilities at the river mouth as majority shareholders in the Credit Harbour Company. While some residents maintained traditional subsistence strategies, the establishment of this village also represented a significant subsistence shift as many of the residents grew corn, wheat, oats, and vegetables while raising livestock (Plummer, 2015).

Despite this prosperity, they eventually abandoned the village in 1847. The government considered the land that they had settled upon as surrendered, making it Crown Land. Despite a decades long legal battle, the Mississauga were unable to secure proper legal title to the land. There were other pressures facing the Mississauga as well, including disease introduced by European settlers, increasing Euro-Canadian encroachment, and cultural discrimination. Some of the village residents left for Port Credit, while others went to the Saugeen Peninsula. The majority of the Mississauga, however, went to live on 1,940 ha of land on the Six Nations Reserve on the Treaty land known as the Haldimand Tract. The Haldimand Tract was land that had been originally surrendered by the Mississauga to the Six Nations, led by Joseph Brant, in the eighteenth century (Plummer, 2015).

PEEL COUNTY

The County of Peel is a narrow municipality on the western edge of Lake Ontario. To its east was York County, now the Regional Municipality of York and the City of Toronto. To the north are the counties of Wellington, Dufferin, and Simcoe. To the west was former Halton County, now Regional Municipality of Halton.

In 1794, Lieutenant-Colonel John Graves Simcoe oversaw the construction of a roadway called Dundas Street. It was undertaken to improve transportation and communication between the new capital (Town of York) and the western district of the province. This road followed an old Indigenous trail that ran from Cataraqui (Kingston) around Lake Ontario to Niagara. In 1798, another military road was opened along another old Indigenous trail, which now forms the modern Lakeshore Road and passes through the current study area. It opened up even more lands to Euro-Canadian \ traders and settlers in later years (Riendeau, 1985).

In 1806, the British Crown purchased 84,000 acres from the Mississauga of the Credit First Nation for 1,000 pounds sterling as part of their effort to secure more land for 'United Empire Loyalists' who had left America in 1783 after having fought for the British. This transaction was often referred to as the Head of the Lake Purchase (Treaty No. 14) and included land to the southwest of Treaty 13 (the Toronto Purchase) and along the north shore of Lake Ontario. The newly acquired land constituted a significant portion of the southern part of Peel County where the study area is situated. It was divided into three townships: Nelson Township, Trafalgar Township and Toronto Township. The remainder of Peel County was obtained from the Mississaugas in Treaties 19 (1818), 22 (1820), and 23 (1820) (Mississaugas of the Credit First Nation, 2017; Ministry of Indigenous Affairs, 2019). As a result, the area saw some Euro-Canadian immigration after this treaty, but these population migrations were halted by the War of 1812. A large influx of Irish settlers in 1819 reinvigorated the settlement of Peel County from which the area continued to grow over the coming decades (Mika & Mika, 1983, p. 177)

In the early settlement days, the county had an established industry of timber, specifically tall pines used as mast on in the British Navy ships (Riendeau, 1985). As more land was cleared and settled a new industry was needed to sustain the economy of the county. In the 1850s, by capitalizing on the trade demands with the United States, the County of Peel was established as an agricultural hub. Rather then focusing on cereal crops the county developed a niche in the breeding of livestock and dairy industries. These agricultural industries brought economic growth to the county well into the early 1900s (Riendeau, 1985).

In 1854, the County of Peel was established and was named after Sir Robert Peel, Prime Minister of Great Britain. Originally, the County was united with the County of York, but many inhabitants wanted independent county status. In October of 1866, a vote was taken which favoured separation. Eventually, the Village of Brampton was chosen as the county town. On January 22, 1867, the first county council of Peel met at the newly constructed courthouse in Brampton. At this time, the County of Peel included the Townships of Albion, Caledon, Chinguacousy, Toronto, and Toronto Gore, and the Town of Brampton and the Village of Streetsville (Mika & Mika, 1983).

The Regional Municipality of Peel was incorporated on October 15, 1973, and included the City of Brampton, the City of Mississauga, and the Town of Caledon. The City of Mississauga had been formed by the amalgamation of

the towns of Port Credit, Streetsville, and Mississauga. By 1980, the population of Peel was 464,500 with 298,000 within Mississauga (Mika & Mika, 1983, p. 180).

TOWNSHIP OF TORONTO

The original survey of Toronto Township, completed in 1805, was laid out with two concessions north of Base Line (now Eglinton Avenue) and three concessions south to the Lake Ontario lakefront, excluding the reserve lands encompassing the Credit River (Riendeau, 1985). Settlement in the township concentrated around Base Line and Dundas Road. By the 1830s, four distinct villages had developed: Summerville, Dixie, Cooksville, and Erindale (Riendeau, 1985). Communities along the Lakeshore Road to the south were much slower to develop than those along Dundas Street. However, by the end of the 1830s, the community of Port Credit had taken shape along with several communities to the west of the Credit River.

The communities to the west of the Credit River included the hamlet of Burnhamthorpe, named after the birthplace of Lord Horatio Nelson. It was originally named Sandhill but confusion arose with a nearby community of the same name. Centered on the intersection of modern Dixie Road and Burnhamthorpe Road, it was founded as a Methodist Village with the first buildings situated on the northwest corner of the intersection adjacent to an early pioneer cemetery. Burnhamthorpe grew to include a school, a Methodist church, general store, a Sons of Temperance Hall, an Orange Lodge, a steam-powered grist mill, blacksmith, carriage shop, cheese factory, and shoemaker shop (Heritage Mississauga, 2018).

In the latter half of the nineteenth century the population of Toronto Township began to decline due to the urbanization of larger communities in proximity to the township such as Toronto, Hamilton, and Brampton. These larger communities drew people from their farms into more lucrative factory work and this change in lifestyle marked a change in how small communities would develop in the township. Villages started to develop into large neighbourhoods, rather than into small towns. These communities were surrounded by land used for commercial agriculture which branched out from the wheat industry into livestock and orchards (Riendeau, 1985). After World War I, the township developed into the suburbs and neighborhoods of Toronto (Riendeau, 1985). By 1969, Lakeview, Cooksville, Erindale, Sheridan, Dixie, Meadowvale Village, and Malton were amalgamated to form the Town of Mississauga (Riendeau, 1985). The population continued to grow quickly and by 1974, the Town of Mississauga was incorporated as the City of Mississauga (Statistics Canada, 2016; Mika & Mika, 1983, p. 180).

PORT CREDIT

Port Credit is an early settlement area located at the mouth of the Credit River along the shore of Lake Ontario. The mouth of the river was long used as a location of Indigenous settlement and a trading post was established there in 1720 for trade with Europeans. Following treaty negotiations with the Crown, the Mississaugas of the Credit retained the land for one mile on each side of the Credit River as reserve land and, for that reason, European settlement at Port Credit was established much later than other villages in the area. In 1798, an inn was built at the mouth of the Credit River and following the War of 1812, an influx of new settlers prompted the Crown to begin negotiations with the Mississauga for this land. Once the land around the Credit River was purchased, the plot for the village of Port Credit was laid out in 1834. Port Credit thrived as a shipping centre for agricultural goods and lumber and had a population of 150 by 1846. By this time a shipbuilding yard had been established, as well as two stores, a post office, and a church (Clarkson, 1967, pp. 66).

In 1855, a branch of the Great Western Railway was completed linking Toronto and Hamilton, which included a stop in Port Credit. By the mid-1870's, the speed of the trains increased, and five trains ran daily between Toronto and Hamilton (Clarkson, 1967, pp. 108). The emergence of the railway for moving goods for trade decreased Port Credit's importance as a shipping centre and by the late nineteenth century it became more reliant on other industries for employment, such as the Terra Cotta Brick Company and the St. Lawrence Starch Company

(Clarkson, 1967, pp. 158). The village of Port Credit was eventually incorporated as a town in 1961 and was amalgamated into the City of Mississauga in 1974.

1.3.4 STUDY AREA SPECIFIC HISTORY

To better understand the historic land use of the study area, the 1859 Tremaine's *Map of the County of Peel* and the 1877 Walker & Miles *Illustrated Historical Atlas of the County of Peel* were reviewed to examine whether historic features are located within, or in proximity, to the study area. This analysis contributes to the determination of archaeological potential. Table 1 provides a summary of the review of the historic maps of the study area.

Lot	Concession	1858 Tremaine Map		1877 Atlas Map	
		Occupants	**Features**	**Occupants**	**Features**
11	2 South of Dundas	William Cavan (east third)	Structure, Great Western Railway	Mrs. William Cavan (east third)	Structure, orchard, Great Western Railway
		Joseph Cavan (middle third)	Structure, Great Western Railway	Mrs. Joseph Cavan (middle third)	Structure, orchard, Great Western Railway
		Hugh Cavan (west third)	Structure, Great Western Railway	Henry Saul (west third)	Structure, orchard, Great Western Railway
12		Joseph Shaw (east half)	Structure, Great Western Railway	Richard Richie (east half)	Structure, two orchards, Great Western Railway
		R. Shaw (west half)	Structure, Great Western Railway	James R. Shaw (west half)	Structure, orchard, Great Western Railway
9	3 South of Dundas	William Cawthra	Two structures	Henry Cawthra N.R.	No Features Illustrated
10		William Cawthra	No Features Illustrated	Henry Cawthra N.R.	Structure, orchard
11		Wesley Watson	Structure	Stephen Crawford N.R.	Two structures

The 1858 Tremaine map illustrates that present-day Lakeshore Road East and Cawthra Road had been constructed along historic lot and concession lines. All surrounding lots are owned as indicated by landowner names, and several structures are illustrated along the north and south side of Lakeshore Road East within the current study area boundaries or directly adjacent. The Great Western Railway line had also been constructed north of the current study area and the historic village of Port Credit is illustrated to the west (Figure 3).

By 1877, the study area appears largely unchanged with the landscape seemingly under use for agricultural purposes. The structures located on the middle and west thirds of Lot 11, Concession 2 SDS are now illustrated further north from Lakeshore Road East, set back from the roadway. Six structures are located within, or directly adjacent to, the study area boundaries. Additionally, several orchards are now illustrated within Lots 11 and 12, Concession 2 SDS. Both Lakeshore Road East and Cawthra Road are still depicted, as is the Great Western Railway.

The two structures previously shown on the north side of Lakeshore Road East adjacent to the eastern portion of the study area are no longer illustrated (Figure 4).

AERIAL IMAGERY

To better understand the more recent land use of the study area, aerial imagery from 1954 and 1977 was consulted (City of Mississauga, n.d.). By 1954, the residential neighbourhoods north and south of Lakeshore Road East had been constructed and the land directly adjacent to the south side of Lakeshore Road East was comprised of commercial development. The land surrounding Cooksville Creek had been partially cleared and was predominantly made up of residential yards associated with the homes built along Beechwood Avenue and Hampton Crescent. A baseball field within the southeastern portion of the study area was free from development, and what is now RK McMillian Park was primarily treed and appears to include several residential homes. At this time, lake-filling activities that historically have occurred along Lake Ontario had not yet been started and the shoreline is set approximately 20 m further inland than its present-day location (Figure 5).

By 1977, very little had changed with the exception of the construction of several commercial and industrial developments along the north side of Lakeshore Road East. The work to fill the lakeshore in along Lake Ontario and construct a peninsula is evident at this time which includes a part of the southern portion of the current study area (Figure 6).

1.4 ARCHAEOLOGICAL CONTEXT

1.4.1 CURRENT CONDITIONS

The study area is located along the north shore of Lake Ontario and is generally bound to the east by East Avenue, the north by Lakeshore Road East, the west by Beechwood Avenue, and Lake Ontario to the south. The study area is urbanized and includes both residential and commercial areas, city streets, and associated infrastructure. Cooksville Creek runs through the western portion of the study, as do as several other walking trails and RK McMillian Park.

1.4.2 PHYSIOGRAPHY AND ECOLOGY

The study area is situated within the Iroquois Plains physiographic region of southern Ontario. The Iroquois Plains region is described as a former zone of beaches of ancient glacial Lake Iroquois (Chapman & Putnam, 1984, p. 190). The Iroquois Plain physiographic region borders the western portion of Lake Ontario. It reaches from the Niagara River in the south, around the Golden Horseshoe to the west and continues to the Trent River in the northeast. The Iroquois Plain was formed as a result of glacial recession and the emptying of Lake Iroquois towards New York State (Chapman & Putnam, 1984, pp. 190-196). The study area would have been inundated by glacial Lake Iroquois until lake levels receded.

The glacial lake has left a significant number of cliffs, bars, beaches and boulder pavements after its recession. The former northern boundary of the lake is most notable around Casa Loma, where it formed a 23-m high bluff. Northwest of the study area, in the vicinity of Cooksville, the old shoreline can be seen cut into grey shale. The soil within this physiographic region is comprised of myriad variations. Within the vicinity of the study area, the soil is sandy and well suited for agriculture, with the proximity of the lake protecting it from frost damage and proving a direct route to take crops to market. While this area had a shorter growing season than the Niagara region, it was still able to produce fruits such as apples, pears, and strawberries (Chapman & Putnam, 1984, p. 192).

The study area is located along the shoreline of Lake Ontario and Cooksville Creek runs through the western portion of the study area. The Credit River is located approximately 2 km west of the study area and Etobicoke Creek is 2 km to the east. These environmental features would have served as important sources of potable water, riverine and lake resources, and transportation routes during the pre- and post-contact periods and made for attractive settlement areas for Euro-Canadians and early Euro-Canadian industries.

1.4.3 PREVIOUS ARCHAEOLOGICAL ASSESSMENTS

A search of the *Ontario Public Register of Archaeological Reports* indicates that four archaeological assessments have been conducted on or within 50 m of the study area boundaries (Figure 7). These reports are detailed in Table 1 and those that have been conducted for land within the boundaries of the current study area are bolded.

Table 1: Previous archaeological assessments on or within 50 m of the study area

Year	PIF	Title	Researcher
2004	**P049-079**	**Stage 1 and 2 Archaeological Assessment of 565 Lakeshore Road East Proposed Lakeshore Village Townhouse Development Geographic Township of Toronto, County of Peel Now the City of Mississauga, RM of Peel**	**Archaeological Services Inc. (ASI)**
2013	P384-0092-2013	Stage 1-2 Archaeological Assessment of Byngmount Beach Elementary School, 930 East Ave., Part of Lots 9 & 10, Con. 3 SDS (Geographic Twp. Of Toronto, County of Peel), City of Mississauga, RM of Peel	AMICK Consultants Ltd. (AMICK)
2017a	**P365-0109-2017**	**Stage 1 Archaeological Assessment 930 East Avenue, Parts of Lot 10 and 9, Concession 3 SDS, City of Mississauga, Township of Toronto, Regional Municipality of Peel, Historic County of Peel, Province of Ontario**	**WSP**
2021	**P449-0483-2021**	**Stage 1 Archaeological Assessment of 579-619 Lakeshore Road East and 1022 and 1028 Caven Street Part of Lots 81, 82, 83, 84, and 85, All of Lots 86, 88, 89 and 90, Registered Plan B-19, Part of Lot 11, Concession 2 SDS, Geographic Township of Toronto, Former Peel County City of Mississauga, R.M. Peel, Ontario**	**ASI**

In 2004, ASI was retained by Beaverbrook Homes Inc. to conduct a Stage 1-2 archaeological assessment of 565 Lakeshore Road West, in the City of Mississauga. This assessment included a portion of the current study area north of Lakeshore Road East surrounding Cooksville Creek and a townhouse complex. No archaeological resources were identified during the assessment and no further work was recommended (ASI, 2004).

AMICK conducted a Stage 1-2 archaeological assessment in 2013 of Byngmount Beach Elementary School, located at 930 East Avenue, in the City of Mississauga. This assessment was conducted immediately adjacent to the eastern portion of the current study area. No archaeological resources were identified during the assessment and no further work was recommended (AMICK, 2013).

In 2017, WSP conducted a Stage 1 archaeological assessment of 930 East Avenue, in the City of Mississauga, which included the property covered AMICK's 2013 Stage 1-2 archaeological assessment. This assessment included a portion of the current study area at East Avenue. WSP concluded that parts of the study area required Stage 2 archaeological assessment; however, the portion of the current study area that falls within this assessment was found to be disturbed and no further work was recommended (WSP, 2017a). A subsequent Stage 2 survey for deeply

buried archaeological potential was carried out by WSP in 2017. The focus of this study was located approximately 100 m east of the current study area (WSP, 2017b)

ASI conducted a Stage 1 archaeological assessment in 2021 on behalf of Star Seeker Inc. for the properties located at 579-619 Lakeshore Road East and 1022 and 1028 Cavan Street in the City of Mississauga. This assessment included a small portion of the current study area north of Lakeshore Road East, as well as the adjacent property. The results of this Stage 1 assessment found that the entire study area had been previously disturbed, and no further work was recommended (ASI, 2021).

1.4.4 REGISTERED ARCHAEOLOGICAL SITES

A search of the *Ontario Archaeological Sites Database* (OASD) indicates that there are two registered archaeological sites within 1 km of the study area (MHSTCI, 2022). Details on the sites identified are provided in Table 2.

Table 2: Registered Archaeological Sites within 1 km of the Study Area

Borden	Site Name	Time Period	Cultural Affinity	Site Type	Current Development Status
AjGv-51	Hillerman	Pre-Contact	Indigenous	Scatter	No further work required
AjGv-39	Adamson Estate	Post-Contact	Euro-Canadian	Other: building	Further work required

The Hillerman Site (AjGv-51) is located approximately 880 metres (m) northwest of the current study and was subject to Stage 4 archaeological assessment by Fisher Archaeological Consultants (FAC) in 2001. The site consisted of small lithic scatter with calcined bone, one Late Archaic small point and one Early Woodland Meadowood projectile point. The site is considered fully mitigated and no further work is recommended.

The Adamson Estate Site (AjGv-39) is located approximately 200 m west of the current study area and was identified by Archaeological Services Inc. (ASI) in 1994. The site consists of a foundation and associated cisterns and wells associated with an early settler of the area. Further work is recommended.

1.4.5 LISTED AND DESIGNATED HERITAGE PROPERTIES

A search of the City of Mississauga Heritage Register indicates that there is one designated heritage property (875 Enola Avenue) and one listed heritage property (95 Lakefront Promenade) within 300 m of the study area (The City of Mississauga, n.d.). The Derry House, located at 875 Enola Avenue, was built in 1932 and is a good representation of the Regency and Greek Revival styles, illustrating Ontario's architectural and historical past (Canada's Historic Places, Derry House, n.d.). The property located at 95 Lakefront Promenade is part of a large park built on landfill within the Lakeview area of Mississauga (ASI, 2022). While this is a listed heritage property, it's construction is modern and does not contribute to the archaeological potential of the study area.

2 FIELD METHODS

2.1 PROPERTY INSPECTION

A property inspection was completed on May 11, 2022, under sunny skies with lighting adequate for documenting features of archaeological potential. The temperature was 25 ° Celsius and at no point did field conditions inhibit the identification of features of archaeological potential. The assessment was conducted from public lands, and areas of private property were not accessed.

The property inspection determined that approximately 82% of the study area has been previously disturbed, 13% is potentially undisturbed areas comprised of open parkland, woodlot, and manicured lawn along Cooksville Creek, 3% is low-lying and permanently wet, and 1% is steeply sloped (>20º) area along the paved trail on each side of Cooksville Creek. The areas of previous disturbance are the result of significant grading and construction activities associated with roadway, housing, and building developments, drainage ditches, a paved walking trail along Cooksville Creek and the installation of subsurface utilities, including water and electrical infrastructure.

Several large backyards for private residences that back onto Cooksville Creek could not be visually assessed during the property inspection and it is unclear if these areas would have been graded during residential construction. Ground truthing in these areas is required to confirm the extent of disturbance.

The results of the background review, property inspection, and location and direction of all images are provided on Figure 8.

2.2 INVENTORY OF DOCUMENTARY RECORDS

The following represents all the documentation taken in the field relating to the project and are being retained by WSP:

- 4 page of field notes
- 143 digital photographs in JPG format

3 ANALYSIS AND CONCLUSIONS

The criteria for determining the level of archaeological potential are primarily focused on physiographic variables that include distance and nature of the nearest source/body of water, distinguishing features in the landscape (e.g. ridges, knolls, eskers, wetlands), the agricultural viability of soils, resource availability, and other features which would have made the area desirable for settlement and occupation. A more comprehensive list of features indicative of archaeological potential, as outlined in the *Standards and Guidelines for Consultant Archaeologists* (MHSTCI, 2011), can be found in Appendix B.

Based on the results of the Stage 1 archaeological assessment, there is potential for the presence of pre- and post-contact Indigenous and Euro-Canadian archaeological resources to be present within the parts of the study area that could not be confirmed to have been previously disturbed. The potential for the presence of pre- and post-contact Indigenous resources is high due to the proximity to a known Indigenous archaeological site within 1 km of the study area, as well as the proximity of the study area to Cooksville Creek, Lake Ontario, the Credit River, and Etobicoke Creek, which would have provided significant food resources and convenient transportation for pre- and post-contact populations. The potential for the presence of Euro-Canadian archaeological resources is also high given the early settlement of the nearby village of Port Credit, the presence of numerous historic structures within, and immediately adjacent to the study area as depicted on the 1859 and 1877 historic mapping, the presence of listed and designated heritage properties within 300 m, and the location of the study area along historic Lakeshore Road East.

Based on the results of the property inspection, archaeological potential has been removed from the majority of the study area as a result of extensive deep disturbance associated with the construction of roadways, residential and commercial developments, significant landscaping and grading, ditching, and the installation of underground water and electrical utilities. Additionally, the southern portion of the study area was developed as a result of lake-filling activities and, therefore, does not hold archaeological potential (Figure 8).

4 RECOMMENDATIONS

The Stage 1 archaeological assessment was carried out in accordance with the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* to meet the requirements for compliance with the *Ontario Heritage Act, 1990*. The majority of the study area was visually confirmed to have been significantly previously disturbed; however, parts of the study area hold potential for the presence of archaeological resources. Based on the results of the Stage 1 background study and property inspection, **a Stage 2 archaeological assessment is recommended for those parts of the study area determined to retain archaeological potential should they be impacted by future development (Figure 8).**

The Stage 2 archaeological assessment is to be conducted following Section 2.1 of the *Standards and Guidelines for Consultant Archaeologists* (MHSTCI, 2011). The recommendations are as follows:

- Following Section 2.1.2 of the Standards and Guidelines for Consultant Archaeologists (MHSTCI, 2011), the areas of manicured lawn, parkland, and woodlot must be subject to test pit survey at 5 m intervals;
- If areas of confirmed disturbance are encountered, test pit survey can be increased to 10 m intervals based on professional judgement to confirm the extent of disturbance; and,
- The remainder of the study area has been identified as previously disturbed, and no further assessment is required in these areas.

It should be noted that this report is not considered final until the MHSTCI has agreed with the above-stated recommendations and the report has been entered into the Ontario Public Register of Archaeological Reports.

5 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the Standards and Guidelines for Consultant Archaeologists (2011a) that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the Ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence

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7 IMAGES

Image 1: Significant previous disturbance due to residential development (previously assessed area). Image facing northwest.

Image 2: Area of significant disturbance within northwestern portion of the study area. Image facing west.

Image 3: Typical disturbance from subsurface utility installation along Lakeshore Road East. Photo facing south.

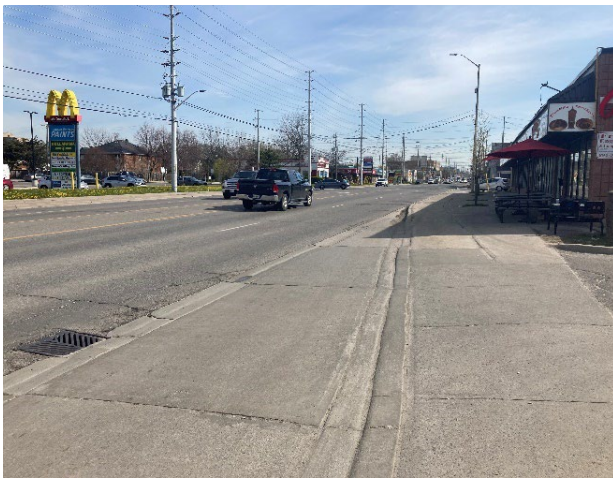


Image 4: Typical conditions along Lakeshore Road East, sewer grate visible within roadway. Image facing north.

Image 5: Typical disturbed conditions within the residential portions of the study area. Image facing northwest.

Image 6: Potentially undisturbed park area consisting of manicured lawn. Image facing south.

Image 7: Potentially undisturbed manicured lawn within park area. Image facing south.

Image 8: Potentially undisturbed manicured lawn within park area. Image facing south.

Image 9: Disturbance within residential portion of study area from ditch and roadway construction. Image facing west.

Image 10: Disturbance within residential portion of study area from ditch and roadway construction. and utility pole installation. Image facing northeast.

Image 11: Disturbance within residential portion of study area from ditch and roadway construction. Image facing east.

Image 12: Disturbance within residential portion of study area from ditch and roadway construction. Image facing west.

Image 13: Disturbance within residential portion of study area, note fire hydrant indicating presence of subsurface infrastructure. Image facing southwest.

Image 14: Disturbance related to roadway and utilities, note utility box and sewer grate visible. Photo facing west.

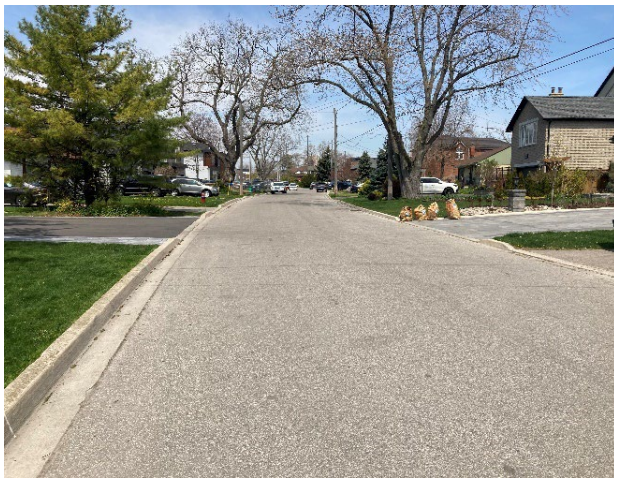


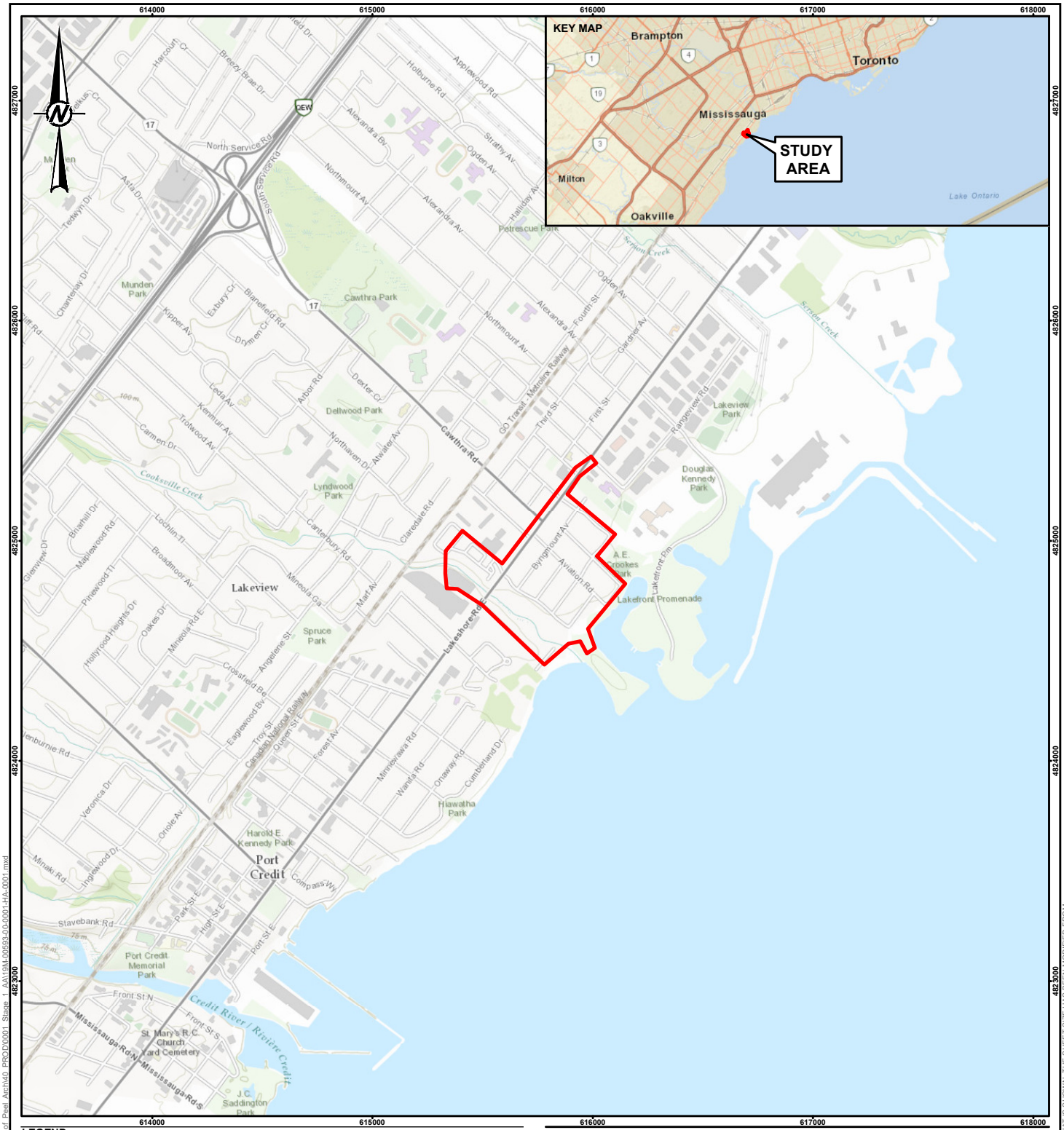
Image 15: Paved roadway within residential neighbourhood. Image facing northwest.

Image 16: Paved trail along Cooksville Creek. Image facing northwest.

Image 17: Steeply sloped area adjacent to Cooksville Creek. Image facing north.

Image 18: Manicured lawn in southern extent of study area within area of lakefill. Image facing east.

8 FIGURES



LEGEND

STUDY AREA

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NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 17 VERTICAL DATUM: CGVD28

CLIENT
PEEL REGION

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE
PROJECT LOCATION

CONSULTANT
wsp

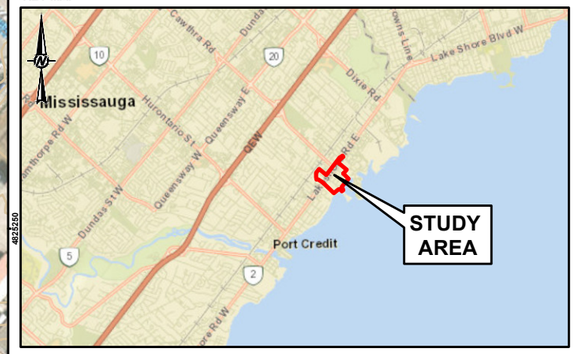
YYYY-MM-DD	2022-09-28
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT NO.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	**1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

Path: S:\Client\Region of Peel\Beach Street Mississauga\99 PROJ\19M00593\00 Region of Peel Arch\40 PROD\0001 Stage 1 AA\19M-00593-00-0001-HA-0001.mxd

KEY MAP



SCALE 1:150,000

LEGEND

- STUDY AREA
- PUMPING STATION
- OPTION 1 - AVIATION TUNNEL
- OPTION 2 - NO TUNNEL
- ROADWAY
- RAILWAY
- TOPOGRAPHIC CONTOUR, METRES
- WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY WSP GOLDER UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2022
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 17, VERTICAL DATUM: CGVD28

0 40 80 160
1:4,000 METRES

CLIENT
PEEL REGION

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE
STUDY AREA

CONSULTANT
wsp

YYYY-MM-DD	2022-09-28
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT No.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	**2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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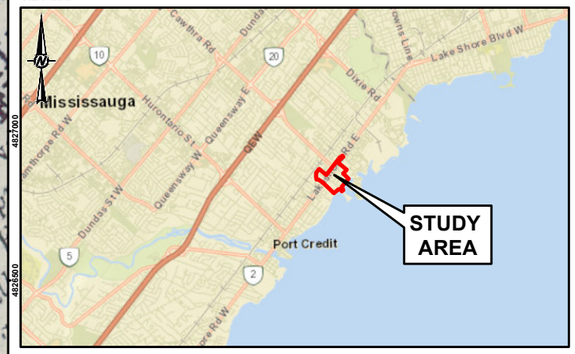

SCALE 1:150,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. HISTORICAL COUNTY MAP OF PEEL COUNTY, PUBLISHED BY TREMAINE, YEAR OF PUBLICATION1859.
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17, VERTICAL DATUM: CGVD28

0 200 400 800

1:20,000 METRES

CLIENT
PEEL REGION

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE
1859 TREMAINE MAP OF THE COUNTY OF PEEL

CONSULTANT
wsp

YYYY-MM-DD	2022-06-06
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT No.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	**3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0

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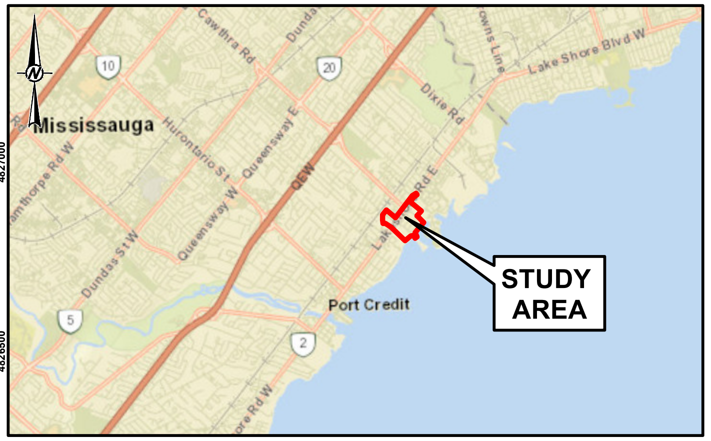

SCALE 1:150,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. SOUTHERN HALF, TORONTO TOWNSHIP, 1877 WALKER & MILES' ILLUSTRATED HISTORICAL ATLAS OF THE COUNTY OF PEEL, 1877
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17, VERTICAL DATUM: CGVD28

0 200 400 800

1:20,000 METRES

CLIENT

PEEL REGION

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE

1877 WALKER & MILES' ILLUSTRATED HISTORICAL ATLAS OF THE COUNTY OF PEEL

CONSULTANT

wsp

YYYY-MM-DD	2022-06-06
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT No.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	4

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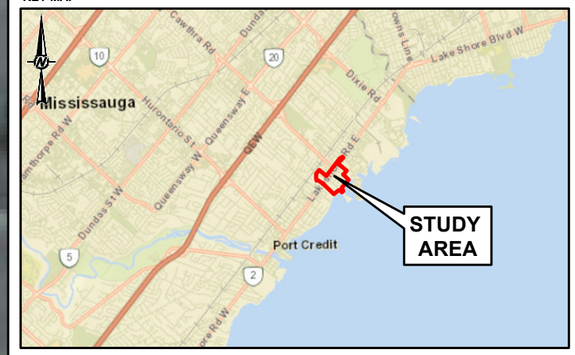
25mm

KEY MAP



SCALE 1:150,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. SOUTHERN ONTARIO, 1954: PHOTO 435793, ONTARIO. DEPARTMENT OF LANDS AND FORESTS
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17, VERTICAL DATUM: CGVD28

0 40 80 160
1:4,000 METRES

CLIENT
PEEL REGION

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE
AERIAL IMAGERY (1954)

CONSULTANT
wsp

YYYY-MM-DD	2022-06-06
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT No.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	**5**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm 0

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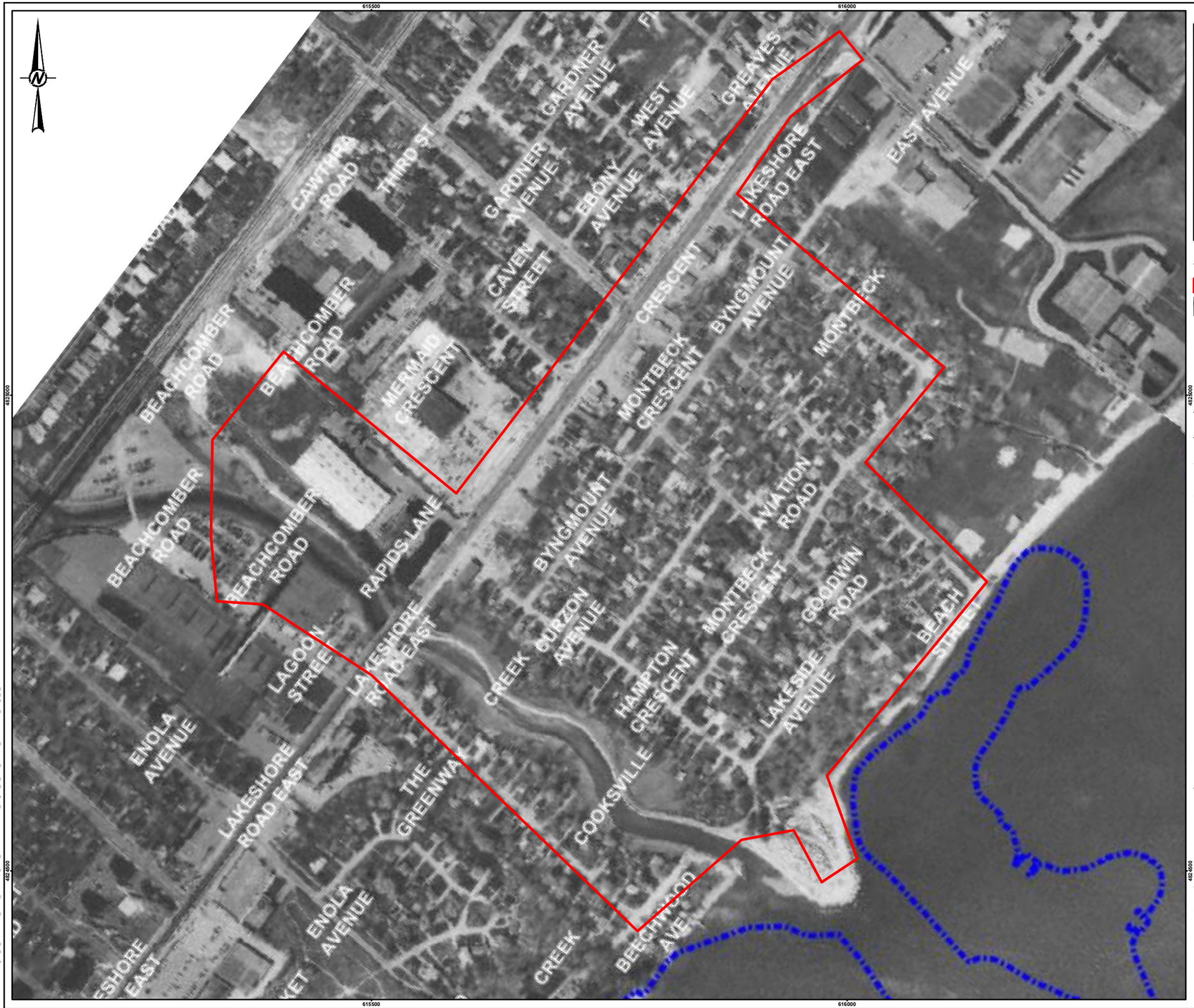
615500

616000

4825000

4824500



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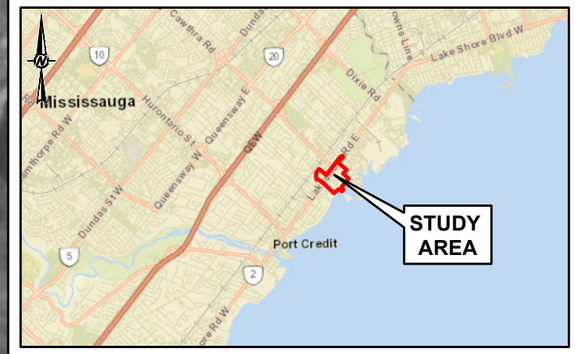

SCALE 1:150,000

LEGEND

- STUDY AREA
- CURRENT SHORELINE

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1977 AERIAL, CITY OF MISSISSAUGA
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17, VERTICAL DATUM: CGVD28

0 40 80 160

1:4,000 METRES

CLIENT
PEEL REGION

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE
AERIAL IMAGERY (1977)

CONSULTANT
wsp

YYYY-MM-DD	2022-06-06
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT No.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	**6**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:

0 25mm

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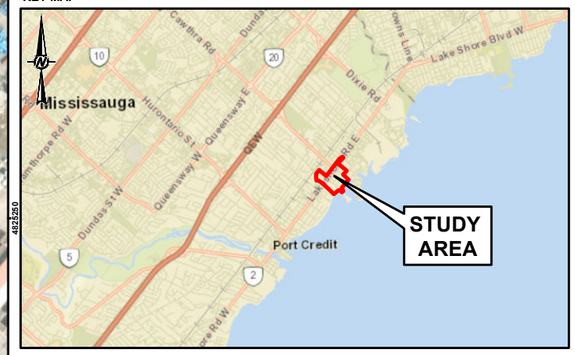
KEY MAP



SCALE 1:150,000

LEGEND

- STUDY AREA

PREVIOUS ARCHAEOLOGICAL ASSESSMENTS

- P049-079, ASI, 2004
- P365-0109-2017 WSP 2017
- P449-0483-2021, ASI, 2021
- ROADWAY
- RAILWAY
- WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY WSP GOLDER UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2022
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 17, VERTICAL DATUM: CGVD28

0 40 80 160
1:4,000 METRES

CLIENT
PEEL REGION

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE
PREVIOUS ARCHAEOLOGICAL ASSESSMENTS

CONSULTANT

YYYY-MM-DD	2022-09-28
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT No.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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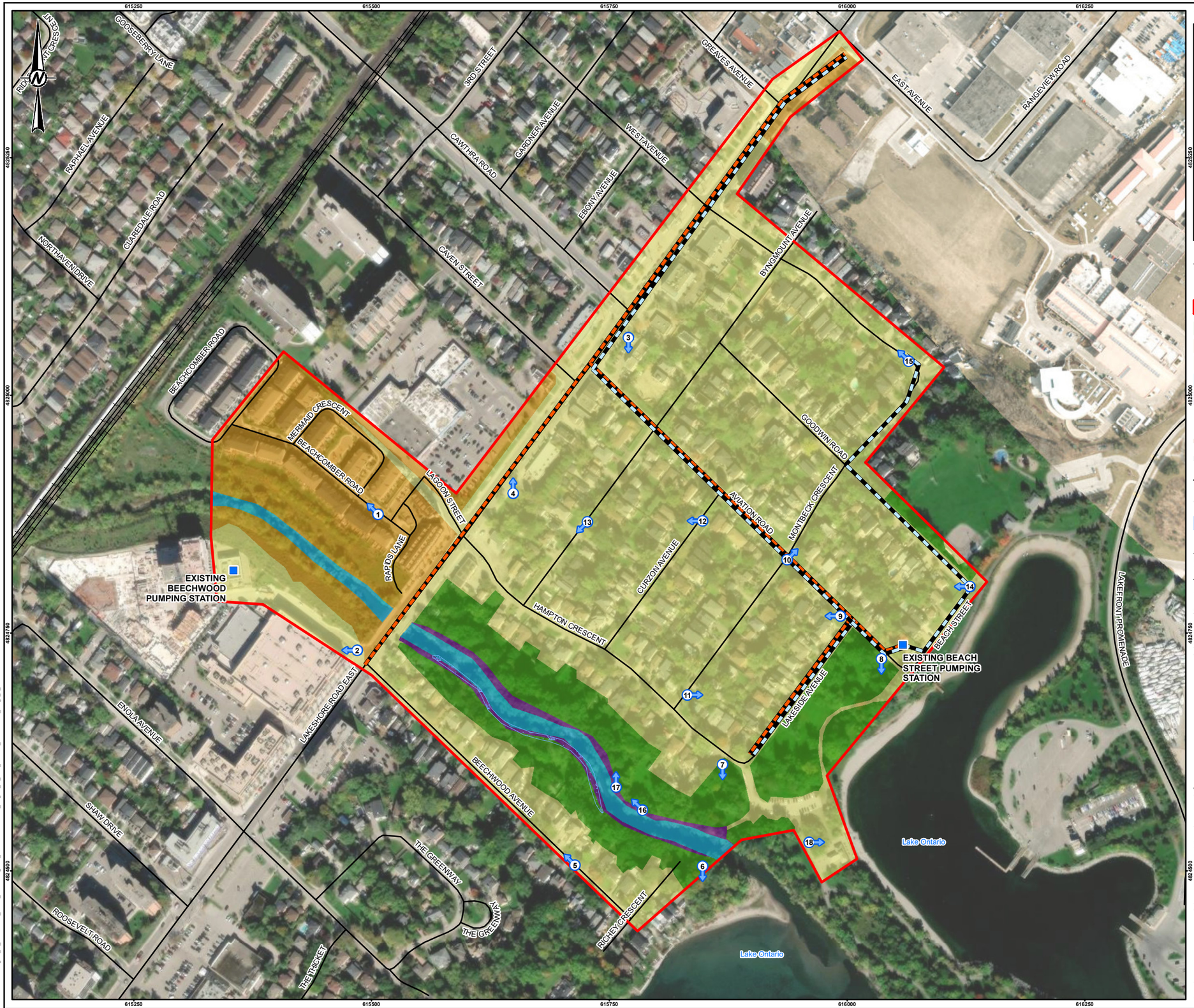
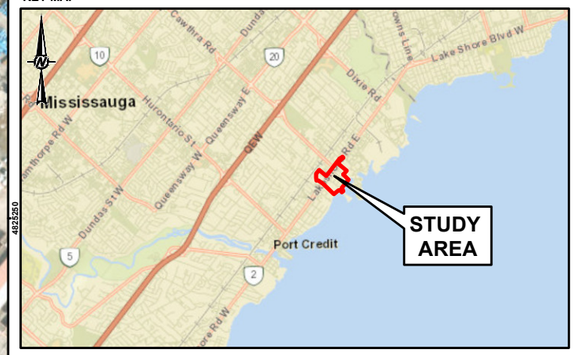


KEY MAP



SCALE 1:150,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- STAGE 2 TEST PIT SURVEY REQUIRED
- PREVIOUSLY ASSESSED, NO FURTHER WORK REQUIRED
- VISUALLY CONFIRMED DISTURBANCE
- LOW AND WET
- STEEPLY SLOPED (>20˚)
- PUMPING STATION
- OPTION 1 - AVIATION TUNNEL
- OPTION 2 - NO TUNNEL
- ROADWAY
- RAILWAY
- WETLAND

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY WSP GOLDER UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2022
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 17, VERTICAL DATUM: CGVD28

0 40 80 160
1:4,000 METRES

CLIENT
PEEL REGION

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT BEACH STREET DIVERSION CLASS EA

TITLE
RESULTS OF THE STAGE 1 ARCHAEOLOGICAL ASSESSMENT

CONSULTANT
wsp

YYYY-MM-DD	2022-09-28
DESIGNED	AM
PREPARED	BR
REVIEWED	AM
APPROVED	JM

PROJECT No.	CONTROL	REV.	FIGURE
19M-00593-00	0001	0	8

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 0 25mm

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APPENDIX

A MIICHI SAAGIG HISTORIES

APPENDIX

MICHI SAAGIIG HISTORICAL/BACKGROUND CONTEXT

The traditional homelands of the Michi Saagiig (Mississauga Anishinaabeg) encompass a vast area of what is now known as southern Ontario. The Michi Saagiig are known as “the people of the big river mouths” and were also known as the “Salmon People” who occupied and fished the north shore of Lake Ontario where the various tributaries emptied into the lake. Their territories extended north into and beyond the Kawarthas as winter hunting grounds on which they would break off into smaller social groups for the season, hunting and trapping on these lands, then returning to the lakeshore in spring for the summer months.

The Michi Saagiig were a highly mobile people, travelling vast distances to procure subsistence for their people. They were also known as the “Peacekeepers” among Indigenous nations. The Michi Saagiig homelands were located directly between two very powerful Confederacies: The Three Fires Confederacy to the north and the Haudenosaunee Confederacy to the south. The Michi Saagiig were the negotiators, the messengers, the diplomats, and they successfully mediated peace throughout this area of Ontario for countless generations.

Michi Saagiig oral histories speak to their people being in this area of Ontario for thousands of years. These stories recount the “Old Ones” who spoke an ancient Algonquian dialect. The histories explain that the current Ojibwa phonology is the 5th transformation of this language, demonstrating a linguistic connection that spans back into deep time. The Michi Saagiig of today are the descendants of the ancient peoples who lived in Ontario during the Archaic and Paleo-Indian periods. They are the original inhabitants of southern Ontario, and they are still here today.

The traditional territories of the Michi Saagiig span from Gananoque in the east, all along the north shore of Lake Ontario, west to the north shore of Lake Erie at Long Point. The territory spreads as far north as the tributaries that flow into these lakes, from Bancroft and north of the Haliburton highlands. This also includes all the tributaries that flow from the height of land north of Toronto like the Oak Ridges Moraine, and all of the rivers that flow into Lake Ontario (the Rideau, the Salmon, the Ganaraska, the Moira, the Trent, the Don, the Rouge, the Etobicoke, the Humber, and the Credit, as well as Wilmot and 16 Mile Creeks) through Burlington Bay and the Niagara region including the Welland and Niagara Rivers, and beyond. The western side of the Michi Saagiig Nation was located around the Grand River which was used as a portage route as the Niagara portage was too dangerous. The Michi Saagiig would portage from present-day Burlington to the Grand River and travel south to the open water on Lake Erie.

Michi Saagiig oral histories also speak to the occurrence of people coming into their territories sometime between 500-1000 A.D. seeking to establish villages and a corn growing economy – these newcomers included peoples that would later be known as the Huron-Wendat, Neutral, Petun/Tobacco Nations. The Michi Saagiig made Treaties with these newcomers and granted them permission to stay with the understanding that they were visitors in these lands. Wampum was made to record these contracts, ceremonies would have bound each nation to their respective responsibilities within the political relationship, and these contracts would have been renewed annually (see Gitiga Migizi and Kapyrka 2015). These visitors were extremely successful as their corn economy grew as well as their populations. However, it was understood by all nations involved that this area of Ontario were the homeland territories of the Michi Saagiig.

The Odawa Nation worked with the Michi Saagiig to meet with the Huron-Wendat, the Petun, and Neutral Nations to continue the amicable political and economic relationship that existed – a symbiotic relationship that was mainly policed and enforced by the Odawa people.

Problems arose for the Michi Saagiig in the 1600s when the European way of life was introduced into southern Ontario. Also, around the same time, the Haudenosaunee were given firearms by the colonial governments in New York and Albany which ultimately made an expansion possible for them into Michi Saagiig territories. There began skirmishes with the various nations living in Ontario at the time. The Haudenosaunee engaged in fighting with the Huron-Wendat and between that and the onslaught of European diseases, the Iroquoian speaking peoples in Ontario were decimated.

APPENDIX

The onset of colonial settlement and missionary involvement severely disrupted the original relationships between these Indigenous nations. Disease and warfare had a devastating impact upon the Indigenous peoples of Ontario, especially the large sedentary villages, which mostly included Iroquoian speaking peoples. The Michi Saagiig were largely able to avoid the devastation caused by these processes by retreating to their wintering grounds to the north, essentially waiting for the smoke to clear.

Michi Saagiig Elder Gitiga Migizi (2017) recounts:

"We weren't affected as much as the larger villages because we learned to paddle away for several years until everything settled down. And we came back and tried to bury the bones of the Huron but it was overwhelming, it was all over, there were bones all over – that is our story.

There is a misnomer here, that this area of Ontario is not our traditional territory and that we came in here after the Huron-Wendat left or were defeated, but that is not true. That is a big misconception of our history that needs to be corrected. We are the traditional people, we are the ones that signed treaties with the Crown. We are recognized as the ones who signed these treaties and we are the ones to be dealt with officially in any matters concerning territory in southern Ontario.

We had peacemakers go to the Haudenosaunee and live amongst them in order to change their ways. We had also diplomatically dealt with some of the strong chiefs to the north and tried to make peace as much as possible. So we are very important in terms of keeping the balance of relationships in harmony.

Some of the old leaders recognized that it became increasingly difficult to keep the peace after the Europeans introduced guns. But we still continued to meet, and we still continued to have some wampum, which doesn't mean we negated our territory or gave up our territory – we did not do that. We still consider ourselves a sovereign nation despite legal challenges against that. We still view ourselves as a nation and the government must negotiate from that basis."

Often times, southern Ontario is described as being "vacant" after the dispersal of the Huron-Wendat peoples in 1649 (who fled east to Quebec and south to the United States). This is misleading as these territories remained the homelands of the Michi Saagiig Nation.

The Michi Saagiig participated in eighteen treaties from 1781 to 1923 to allow the growing number of European settlers to establish in Ontario. Pressures from increased settlement forced the Michi Saagiig to slowly move into small family groups around the present day communities: Curve Lake First Nation, Hiawatha First Nation, Alderville First Nation, Scugog Island First Nation, New Credit First Nation, and Mississauga First Nation.

Note: This historical context was prepared by Gitiga Migizi, a respected Elder and Knowledge Keeper of the Michi Saagiig Nation.

SOURCE

Migizi, G. & J Kapyrka (2015). Before, During, and After: Mississauga Presence in the Kawarthas. In D. Verhulst (eds.) *Peterborough Archaeology* (pp.127-136). Peterborough, Ontario: Peterborough Chapter of the Ontario Archaeological Society.

APPENDIX

B

FEATURES OF ARCHAEOLOGICAL POTENTIAL

APPENDIX

FEATURES INDICATING ARCHAEOLOGICAL POTENTIAL

The following are features or characteristics that indicate archaeological potential:

- Previously identified archaeological sites.
- Water sources:
- Primary water sources (lakes, rivers, streams, creeks).
- Secondary water sources (intermittent streams and creeks, springs, marshes, swamps).
- Features indicating past water sources (e.g. glacial lake shorelines, relic river or stream channels, shorelines of drained lakes or marshes, cobble beaches).
- Accessible or inaccessible shoreline (e.g. high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh).
- Elevated topography (e.g. eskers, drumlins, large knolls, plateaux).
- Pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground.
- Distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases.
- Resource areas, including:
  - Food or medicinal plants (e.g. migratory routes, spawning areas, prairie).
  - Scarce raw materials (e.g. quartz, copper, ochre, or outcrops of chert).
  - Early Euro-Canadian industry (e.g. fur trade, logging, prospecting, mining).
- Areas of early Euro-Canadian settlement. These include places of early military or pioneer settlement (e.g. pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches and early cemeteries.
- Early historical transportation routes (e.g. trails, passes, roads, railways, portage routes).
- Property listed on a municipal register or designated under the Ontario Heritage Act or that is federal, provincial or municipal historic landmark or site.
- Property that local histories or informants have identified with possible archaeological sites, historic events, activities, or occupations

SOURCE

Section 1.3. Ministry of Heritage, Sport, Tourism, and Culture Industries. (2011). *Standards and Guidelines for Consultant Archaeologists.* Toronto, Ontario: Queen's Printer for Ontario.

APPENDIX

A-7 Cultural Heritage Report

REGION OF PEEL

CULTURAL HERITAGE REPORT: EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT

BEACH STREET SEWER PUMPING STATION

JANUARY 25, 2023

CULTURAL HERITAGE REPORT: EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT

BEACH STREET SEWER PUMPING STATION

REGION OF PEEL

ORIGINAL REPORT

PROJECT NO.: 19M-00593-00

DATE: JANUARY 25, 2023

WSP

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THORNHILL, ON
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F: +1 519 743-8778

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SIGNATURES AND DISCLAIMERS

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Cultural Heritage Specialist

REVIEWED BY

Joel Konrad, PhD, CAHP

Cultural Heritage Lead, Ontario

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The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

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In preparing this report, WSP has relied in good faith on information provided by others, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

Benchmark and elevations used in this report are primarily to establish relative elevation differences between the specific testing and/or sampling locations and should not be used for other purposes, such as grading, excavating, construction, planning, development, etc.

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This limitations statement is considered an integral part of this report.

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) has been retained by The Regional Municipality of Peel (the Region) to undertake a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment (Cultural Heritage Report) for the Beach Street Sewage Pumping Station Diversion Municipal Class Environmental Assessment (MCEA) in the City of Mississauga, Ontario. This Project includes a diversion between the Beach Street Sewer Pumping Station (SPS) and Beechwood SPS, and is known as the Beach Street Diversion EA. The Study Area is located in part of Lots 11-12, Concession 2 South of Dundas Street (SDS), and part of Lots 10-11, Concession 3 SDS, in the Geographic Township of Toronto, County of Peel, now the City of Mississauga, Ontario (Figure 1, Appendix A).

This Cultural Heritage Report identifies existing and potential Built Heritage Resources (BHRs) and Cultural Heritage Landscapes (CHLs) within the Study Area. Further, the report includes a review of the background history of the Study Area, the results of a property visit undertaken to confirm existing conditions, a preliminary impact assessment to identify negative impacts to BHRs and CHLs, preliminary mitigation recommendations, and determination of whether a Cultural Heritage Evaluation Report (CHER) or Heritage Impact Assessment (HIA) is required for all or parts of the Study Area to be impacted.

The cultural heritage identification and evaluation documented in this Cultural Heritage Report follows the process set out in the Draft Existing Conditions and Preliminary Impact Assessment Report Guidelines provided by the Ministry of Citizenship and Multiculturalism (MCM, 2019). In addition, best practice in heritage identification and assessment has been used, as outlined in the Standards and Guidelines for the Conservation of Provincial Heritage Properties (MCM, 2010), Identification and Evaluation Process (2014) and the Ontario Heritage Toolkit (2006a).

This Cultural Heritage Report was prepared by Joel Konrad, PhD, CAHP, Cultural Heritage Lead, Ontario and Claire Forward BA (Hons.), MA, MSc, Cultural Heritage Specialist. A property visit was conducted on July 25, 2022, which confirmed that there were no built heritage resources (BHRs) and 1 cultural heritage landscape (CHL) within the Study Area. The preliminary impact determined that there will be no impacts to the cultural heritage landscape.

The report has resulted in the following recommendations:

1. Staging and construction activities should be appropriately located and/or planned to avoid impacts to the identified CHL.
2. Construction activities should seek to avoid direct impacts to Lake Ontario, including the shoreline as well as direct impacts to trees and medicinal plants. Where avoidance is not possible, mitigation measures should be developed in consultation with Indigenous Communities.
3. Should future work require expansion of the Beach Street Sewer Pumping Station EA Study Area or the alternative alignments are changed, a qualified heritage consultant should be contacted to confirm the impacts of the proposed work on known or potential BHRs and CHLs.

PROJECT PERSONNEL

CLIENT

Project Manager	Troy Leyburne, BSc (Eng.) *Project Manager, Region of Peel*

WSP

Project Manager	Kelsey Hinsperger, PMP *Project Manager and Team Lead*
Report Preparation	Claire Forward, BA (Hons.), MA, MSc *Cultural Heritage Specialist*
Mapping/GIS	Tanya Peterson, BA (Hons.) *Senior GIS Technician*
Report Review	Joel Konrad, PhD, CAHP *Cultural Heritage Lead, Ontario*

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 Study Purpose and Objectives 1
1.2 Project Description and Study Area 2
1.3 Statement of Professional Qualifications 2

2 LEGISLATIVE FRAMEWORK 5
2.1 United Nations Declaration on the Rights of Indigenous Peoples 5
2.2 Provincial Policy Statement 6
2.3 Ontario Heritage Act 6
2.3.1 Ontario Regulation 9/06 7
2.4 Region of Peel's Official Plan 8
2.5 City of Mississauga's Official Plan 8
2.5.1 Lakeview Local Area Plan 9

3 METHODOLOGY 10
3.1 Consultation 10
3.2 Field Assessment 10
3.3 Identification of Cultural Heritage Value or Interest 11
3.4 Agency Data Requests 11

4 HISTORICAL CONTEXT 13
4.1 Historical Context Overview 13
4.1.1 Pre-Contact Period 13
4.1.2 Post-Contact Period 18
4.1.3 Historical Mapping Review 20

5 EXISTING CONDITIONS 22
5.1 Property Visit 22
5.2 Description of Existing Conditions 22
5.2.1 Beechwood Avenue 22
5.2.2 Richey Crescent 22
5.2.3 Cooksville Creek 23
5.2.4 Lagoon Street 23
5.2.5 Lakeshore Road East 24
5.2.6 Hampton Crescent 25
5.2.7 Lakefront Promenade Park 25
5.2.8 Byngmount Avenue 26

5.2.9 Curzon Avenue 27
5.2.10 Montbeck Crescent 28
5.2.11 Lakeside Avenue 29
5.2.12 Aviation Road 30
5.2.13 Beach Street 31
5.2.14 Goodwin Road 32
5.3 Previous Cultural Heritage Assessments 33
5.4 Identified Cultural Heritage Resources 33
6 PRELIMINARY IMPACT ASSESSMENT 36
6.1 Preliminary Impacts on Cultural Heritage Resources 36
7 CONCLUSIONS 38
8 RECOMMENDATIONS 39
9 REFERENCES 40

TABLES

TABLE 3-1: AGENCY DATA REQUESTS 12

TABLE 5-1: IDENTIFIED BHRS AND CHLS WITH KNOWN OR POTENTIAL CHVI 35

TABLE 6-1: IMPACTS AND PRELIMINARY MITIGATION STRATEGIES FOR BHRS AND CHLS 37

APPENDICES

A: FIGURES 1-10 43

1 INTRODUCTION

1.1 STUDY PURPOSE AND OBJECTIVES

The Regional Municipality of Peel (the Region) retained WSP Canada Inc. to undertake a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment (Cultural Heritage Report) as a part of Beach Street Sewage Pumping Station Diversion Municipal Class Environmental Assessment (MCEA) study that will provide a comprehensive and environmentally sound planning process, open to public participation, to select the preferred solution which fully addresses the current issues regarding the diversion of flows from the Beach Street Sewer Pumping Station (SPS) to the Beechwood SPS. The study will ensure that the preferred solution will address environmental, social and technical concerns and will be acceptable to the majority of residents, stakeholders and review agencies.

This Cultural Heritage Report was undertaken to identify municipally, provincially, and federally recognized heritage properties as well as potential heritage properties within the Study Area and assess the impacts that the Project may have on cultural heritage resources.

A Cultural Heritage Report is required for the Secondary Plan review process to: identify existing and potential built heritage resources (BHR) and cultural heritage landscapes (CHL); review the background history of the Study Area; complete a site visit to confirm existing conditions; provide a preliminary impact assessment to conserve BHRs and CHLs; identify mitigation and/or monitoring for potential impacts; and determine whether additional heritage reporting is required.

To meet these objectives, the report will:

- Introduce the study including the purpose and methodology used to undertake the work.
- Review background studies to complete a summary history of the Study Area using local histories, historical mapping and aerial photographs. This work will trace the evolution of the Study Area and aid in the identification of existing and potential BHRs and CHLs.
- Obtain information regarding the City of Mississauga's heritage recognitions and identification of listed and/or designated heritage properties within the Study Area.
- Confirm the presence of previously recognized built heritage resources and cultural heritage landscapes. This process will aid in the identification of built heritage resources and cultural heritage landscapes that may be impacted by the undertaking. This task will include a review of municipal, provincial, and federal heritage registers and inventories, including the City of Mississauga's Heritage Register for Mississauga (2018).

This work will be conducted in accordance with the *Ontario Heritage Act* (OHA, 2005), the *Provincial Policy Statement* (2020), and the *City of Mississauga Official Plan* (2021).

1.2 PROJECT DESCRIPTION AND STUDY AREA

The Beach Street SPS previously received sewer flows from the communities of Port Credit and Lakeview in southern Mississauga. To increase resiliency of the system and adequately manage overflow events, to the Region is evaluating options for diverting flows by gravity from the existing Beach Street SPS to the Beechwood SPS and to upgrade the system for future development flows.

Proposed options for the new Beach Street Pumping Diversion are shown in Figure 1 and consist of the following works:

Option 1 – Aviation Tunnel:

- 847 m of 600mm pipe within a 1200mm microtunnel between Beach Street SPS and Beechwood SPS via Aviation Avenue and Lakeshore Road East
- 198m of 375mm sewer addition on Lakeshore Road East
- Replacement of 200m of existing 250mm sewer on Lakeside Drive
- Necessary Beach St. WWPS station upgrades

Option 2 – No Tunnel:

- Replacement of 374 m of existing 375mm pipe with 450mm pipe on Goodwin Avenue and Montbeck Crescent
- Replacement of existing 200 m of 250mm sewer on Lakeside Avenue.
- Upsizing of existing sewer on Aviation Avenue
- Necessary Beach St. WWPS station upgrades

The Study Area (Figure 1) for this report is irregularly shaped and includes the entire Claredale sanitary catchment which could be impacted by the work. The area is generally bound by Beachcomber Road and Lakeshore Road East to the north; East Avenue, Lakeshore Road East, and Montbeck Crescent to the east; Beach Street, Lakeside Avenue, and Richey Crescent to the south; and Beechwood Avenue to the west.

1.3 STATEMENT OF PROFESSIONAL QUALIFICATIONS

The project team for this Cultural Heritage Report includes the following Cultural Heritage Specialists:

- **Joel Konrad, PHD, CAHP**: Cultural Heritage Lead
    - Dr. Konrad is Cultural Heritage Lead, Ontario, and a Senior Cultural Heritage Specialist at WSP. He is trained in both historical research and heritage planning with over twelve years' experience

in the field of cultural heritage resource management. Dr. Konrad's work in cultural heritage planning has resulted in an extensive knowledge of heritage legislation, policy, practice, and conservation standards in both the public and private sectors. As a trained historian, he has an expert knowledge of archival research, data management, and heritage evaluation. This knowledge has been foundational in his approach to the strategic development of environmental and land-use-planning studies and guides his resource-based approach to heritage conservation. Dr. Konrad's areas of expertise include transportation infrastructure projects, cultural heritage landscapes, participatory GIS, heritage conservation, heritage impact assessment, and heritage policy. Dr. Konrad provided the project management for the Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment as well as senior review and QA/QC for the report.

- **Claire Forward, BA (Hons.), MA, MSc**: Cultural Heritage Specialist

    - Claire Forward is a Cultural Heritage Specialist with over 7 years of experience working in both historical research and heritage planning fields in Canada, Europe, and the UK. She also has experience working in the field of cultural heritage resource planning and management. Claire brings an interdisciplinary approach to research and writing in a diverse range of milieus including social histories, heritage evaluation, policy documents, technical conservation consultation, and adaptive reuse management plans. She has experience conducting background research, field and condition assessments, and heritage impact assessments and cultural heritage reports for various resources including buildings and cultural heritage landscapes. Claire is the technical lead and prepared the Cultural Heritage Report: Existing Conditions and Preliminary Assessment, and reported to Cultural Heritage Lead, Dr. Konrad.

Prepared By: Tanya.Peterson

LEGEND:

- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TITLE:
LOCATION MAP

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

	PROJECT NO.:	REVIEWED BY:
wsp GOLDER	19M-00593-00	JK
	DATE: SEPTEMBER 2022	FIGURE: 1

C:\aProjects\19M-00593-0012022\MXD\19M-00593-00 Figure 1 Location Map.mxd

2 LEGISLATIVE FRAMEWORK

This report reviews BHRs and CHLs within the Study Area to ensure that the Beach Street Sewage Pumping Station Diversion takes into consideration these resources. This section outlines the various legislative frameworks and policies relevant to the report.

2.1 UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES

On June 21st, 2021, the Canadian federal government enacted *United Nations Declaration on the Rights of Indigenous Peoples Act* and confirmed that the *United Nations Declaration on the Rights of Indigenous Peoples* (Declaration - 2007) "must be implemented in Canada." As a result, Indigenous peoples in Canada are recognized as having unique rights, including those that pertain to the conservation of Indigenous heritage. As per Articles 11 and 31 of the Declaration:

> 11. 1) Indigenous peoples have the right to practice and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature.
>
> 31. 1) Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.
>
> 2) In conjunction with Indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights.

These rights to historical sites, ceremonies, cultural traditions, etc. (collectively understood as Indigenous heritage) are pertinent to the Environmental Assessment process through Articles 25 and 26 of the Declaration, which state that:

> 25. Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.
>
> 26. 1) Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.
>
> 2) Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.

3) States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions, and land tenure systems of the Indigenous peoples concerned.

2.2 PROVINCIAL POLICY STATEMENT

The *Provincial Policy Statement* (PPS) (2020) outlines provincial "policy direction on matters of provincial interest related to land use planning and development" (Part I: Preamble PPS 2020). The intent is to provide for appropriate development that protects resources of public interest, public health and safety and the quality of the natural and built environment. The PPS 2020 identifies the conservation of significant built heritage resources and cultural heritage landscapes as a provincial interest in Section 2.6.1.

Relevant definitions from the PPS 2020 include:

Built Heritage Resources (BHR): means a building, structure, monument, installation or any manufactured or constructed part or remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Indigenous community. *Built heritage resources* are located on property that may be designated under Parts IV or V of the OHA, or that may be included on local, provincial, federal and/or international registers.

Cultural Heritage Landscapes (CHL): means a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may include features such as buildings, structures, spaces, views, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. *Cultural heritage landscapes* may be properties that have been determined to have cultural heritage value or interest under the OHA, or have been included on federal and/or international registers, and/or protected through official plan, zoning by-law, or other land use planning mechanisms.

Conserved: means the identification, protection, management and use of *built heritage resources*, *cultural heritage landscapes* and *archaeological resources* in a manner that ensures their cultural heritage value or interest is retained. This may be achieved by the implementation of recommendations set out in a conservation plan, archaeological assessment, and/or heritage impact assessment that has been approved, accepted or adopted by the relevant planning authority and/or decision-maker. Mitigative measures and/or alternative development approaches can be included in these plans and assessments.

2.3 ONTARIO HERITAGE ACT

The OHA (2005) gives municipalities and the provincial government powers to preserve the heritage of Ontario, with a primary focus on protecting heritage properties and archaeological sites. The OHA grants the authority to municipalities and to the province to identify and designate properties of heritage significance, provide standards and guidelines for the preservation of heritage properties and enhance protection of heritage conservation districts, marine heritage sites and archaeological resources.

Designation ensures the conservation of important places and can take the form of individual designations (Part IV of the OHA) or as part of a larger group of properties, known as a Heritage Conservation District (Part V of the OHA). An evaluation using the criteria outlined in Ontario Regulation (O. Reg) 9/06 is used to determine whether a

property possesses cultural heritage value or interest and may be worthy of designation under the OHA. Designation offers protection for properties under Sections 33, 34 and 42 of the OHA, prohibiting the owner of a designated property from altering, demolishing or removing a building or structure on the property unless the owner applies to the council of the municipality and receives written consent to proceed with the alteration, demolition or removal.

In addition to designated properties, the OHA allows municipalities to list properties that are considered to have cultural heritage value or interest on their Municipal Heritage Register. Under Part IV, Section 27 of the OHA, municipalities must maintain a Register of properties situated in the municipality that are of cultural heritage value or interest. Section 27 (1.1) states that the register shall be kept by the clerk and that it must list all designated properties (Part IV and V). Under Section 27 (1.2), the Register may include property that has not been designated, but that council believes to be of cultural heritage value or interest. Listed properties, although recognized as having cultural heritage value or interest, are not protected under the OHA to the same extent as designated properties, but are acknowledged under Section 2 of the PPS 2020 under the *Planning Act*. An owner of a listed heritage property must provide the municipality with 60 days' notice of their intention to demolish a building or structure on the property.

The OHA also allows for the designation of provincial heritage properties (PHP). Part III.1 of the OHA enables the preparation of standards and guidelines that set out the criteria and process for identifying the cultural heritage value or interest of PHPs (Part II of the OHA) and cultural heritage value or interest of provincial heritage properties of provincial significance (PHPPS) (Ontario Regulation (O. Reg.) 10/06 of the OHA) and to set standards for their protection, maintenance, use, and disposal.

2.3.1 ONTARIO REGULATION 9/06

The criteria for deterimining cultural heritage value or interest is defined in O. Reg. 9/06. This regulation was created to ensure a consistent approach to the designation of heritage properties under the OHA. All designations under the OHA made after 2006 must meet the criteria outlined in the regulation.

A property may be designated under Section 29 of the OHA if it meets one or more of the following criteria for determining whether it is of cultural heritage value or interest:

1. The property has design value or physical value because it,
   i. is a rare, unique, representative or early example of a style, type, expression, material or construction method,
   ii. displays a high degree of craftsmanship or artistic merit, or
   iii. demonstrates a high degree of technical or scientific achievement.
2. The property has historical value or associative value because it,
   i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,
   ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or
   iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.
3. The property has contextual value because it,
   i. is important in defining, maintaining or supporting the character of an area,
   ii. is physically, functionally, visually or historically linked to its surroundings, or,

iii. is a landmark.

2.4 REGION OF PEEL'S OFFICIAL PLAN

The Region of Peel's Official Plan (2022) is currently awaiting Provincial approval. The 1996 Region of Peel Official Plan as amended (2021) consists of policies for the sustainable development of the Region (Caledon, Brampton, and Mississauga).

In terms of cultural heritage in Mississauga in the Region of Peel's Official Plan, the Mississauga area is mentioned throughout. In Chapter 1, the plan emphasizes the importance of enriching the natural and cultural heritage of the Region. In Chapter 2, policies on the natural environment and the protection of natural heritage are addressed. Both chapters underline the interrelationship and importance between these types of resources to provide a sense of identity and place.

2.5 CITY OF MISSISSAUGA'S OFFICIAL PLAN

The Mississauga Official Plan was approved by the Region of Peel on October 5, 2011 and was consolidated on October 21, 2021. Section 7.4 of the Mississauga Official Plan provides policies specific to heritage planning.

Relevant policies include:

7.4.1.2	Mississauga will discourage the demolition, destruction or inappropriate alteration or reuse of cultural heritage resources.
7.4.1.3	Mississauga will require development to maintain locations and settings for cultural heritage resources that are compatible with and enhance the character of the cultural heritage resource.
7.4.1.11	Cultural heritage resources designated under the Ontario Heritage Act, will be required to preserve the heritage attributes and not detract or destroy any of the heritage attributes in keeping with the Ontario Heritage Tool Kit, the Ontario Ministry of Culture, and the Standards and Guidelines for the Conservation of Historic Places in Canada, Parks Canada.
7.4.1.12	The proponent of any construction, development, or property alteration that might adversely affect a listed or designated cultural heritage resource or which is proposed adjacent to a cultural heritage resource will be required to submit a Heritage Impact Assessment, prepared to the satisfaction of the City and other appropriate authorities having jurisdiction.
7.4.1.14	Cultural heritage resources will be integrated with development proposals.
7.4.1.17	Public works will be undertaken in a way that minimizes detrimental impacts on cultural heritage resources.
7.4.2.3	Development adjacent to a cultural heritage property will be encouraged to be compatible with the cultural heritage property.

2.5.1 LAKEVIEW LOCAL AREA PLAN

The Study Area is situated in southeast Mississauga and is a part of the Lakeview Local Area Plan, an identified Neighbourhood Character Area. The plan covers an array of topics including: historical context, current context, collaboration, vision, direct growth, valuing the environment, completing communities, multi-modal city, desirable urban form, and strong economy.

In Section 8.2, the plan describes the cultural heritage and features of the area including the Lakefront Promenade Park, which provides scenic views and is also considered a significant feature and landmark. Other relevant policies include:

8.2.1 Cultural heritage sites are places that have the opportunity to provide attractive streetscape. Streetscape improvements are encouraged to accentuate the site through landscaping, signate, lighting, benches, public art, interpretive signs, or other means.

8.2.2 The City will explore through a Community Improvement Plan, incentives to protect, preserve, and reuse cultural heritage sites in Lakeview.

8.2.3 Development adjacent to heritage sites will integrate and enhance the character of the cultural heritage resource.

3 METHODOLOGY

3.1 CONSULTATION

BHRs and CHLs already recognized by the municipality, the Ontario Heritage Trust (OHT), provincially and federally were identified by reviewing the following:

- The inventory of OHT easements;
- The OHT's Ontario Heritage Plaque Guide, an online, searchable database of Ontario Heritage Plaques;
- Ontario's Historical Plaques website;
- The Ontario Genealogical Society's Ontario Cemetery Index
- Parks Canada's Historic Places website, an online, searchable register that provides information on historic places recognized at the local, provincial/territorial and national levels;
- Parks Canada's Directory of Federal Heritage Designations, a searchable on-line database that identifies National Historic Sites, National Historic Events, National Historic People, Heritage Railway Stations, Federal Heritage Buildings and Heritage Lighthouses;
- Canadian Heritage River System, a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage; and,
- UNESCO World Heritage Sites.

In addition, the mapping tool on the City of Mississauga's website was consulted to review the properties included on their Heritage Register in the Study Area.

For the purposes of this study, any property previously identified by a municipality, municipal staff, provincial or federal agencies as containing, or having the potential to contain, cultural heritage value or interest (CHVI) will be determined to be a BHR or CHL, and if applicable, will be discussed in Section 5.4.

3.2 FIELD ASSESSMENT

Field assessment for this report included a survey of the cultural heritage Study Area from the publicly accessible right-of-way to confirm or identify existing and/or potential BHRs and CHLs. Where identified, potential resources were photographed and mapped, and physical characteristics visible from the right-of-way or aerial imagery were described.

The use of a 40-year-old threshold is a guiding principle when conducting a preliminary identification of cultural heritage resources (MCM, 2016). While identification of a resource that is 40 years old or older does not confer outright heritage significance, this threshold provides a means to collect information about resources that may retain heritage value.

Similarly, if a resource is younger than 40 years old it does not preclude this resource from having CHVI, however it does provide a systematic means of identifying properties that have a higher likelihood of retaining cultural heritage value.

This report includes background research that summarizes the history of the Study Area. In addition to textual sources, historical mapping and aerial photography was consulted to identify the presence of structures/building, settlement patterns and other previously recognized BHRs and CHLs.

3.3 IDENTIFICATION OF CULTURAL HERITAGE VALUE OR INTEREST

Properties identified during field review were screened by employing an application of the 40-year threshold used to identify potential BHRs and/or CHLs, followed by a high-level and cursory assessment based on a theoretical understanding of the criteria outlined in O. Reg. 9/06 for determining CHVI (see Section 2.3.1 for full criteria). The criteria in O. Reg. 9/06 were established to identify properties with sufficient CHVI to warrant designation under the OHA. It is considered best practice when identifying potential BHRs and CHLs to employ O. Reg. 9/06 as it provides a general framework for understanding and interpreting heritage value. It should be noted, however, that the application of this framework is used as a theoretical underpinning, not as a strict measurement applied, to a greater or lesser degree, to each property under study. This report does not provide a comprehensive evaluation of a property according to O. Reg. 9/06 and does not satisfy the requirement for a Cultural Heritage Evaluation Report (CHER).

3.4 AGENCY DATA REQUESTS

As part of this study, the City of Mississauga's online Heritage Register was reviewed to determine if properties and structures have been previously identified and/or have been designated under the OHA. A request was sent to the City on July 21, 2022 to obtain confirm if any properties within the Study Area had been previously identified or designated. A response was received on July 26, 2022 confirming that no properties within the Study Area alternatives were listed or designated, however the Lakeshore Promenade Park Cultural Landscape does border Alternative 2.

A request was sent to the OHT on July 21, 2022 to obtain information related to OHT easements and owned properties. No response has been received to date, however, a review of the OHT plaque database and the OHT easements identified on the OHT's website, revealed neither within the Study Area.

A request was sent to MCM on July 21, 2022 to confirm if any provincial heritage properties (PHPs) were located within the Study Area. A response was received on July 22, 2022 confirming that no properties have been designated by the Minister in the Study Area, nor is the MCM aware of any PHPs located within or adjacent to the Study Area.

A summary of data requested through consultation with the agencies noted above is provided in Table 3-1.

Table 3-1: Agency Data Requests

Contact Name / Position	Organization	Contact Information	Dates of Communication	Description of Information Received
Andrew Douglas, Heritage Planner	City of Mississauga	Andrew.douglas@mississauga.ca	**Sent:** July 21, 2022 **Received:** July 26, 2022	Mr. Douglas indicated that there are not any listed nor designated properties within the Study Area alternatives, however the Lakefront Promenade Park Cultural Landscape does border Alternative 2.
Krystal Power, OHT Registrar	OHT	krystal.power@heritagetrust.on.ca	**Sent:** July 21, 2022	No response received to date.
Laura Hatcher, Heritage Planner	MCM	laura.e.hatcher@ontario.ca	**Sent:** July 21, 2022 **Received:** July 22, 2022	Ms. Hatcher confirmed that there are no properties designated by the Minister in the Study Area, nor is the MCM aware of any PHPs in or adjacent to the Study Area.

4 HISTORICAL CONTEXT

4.1 HISTORICAL CONTEXT OVERVIEW

The Study Area is located on part of Lots 11-12, Concession 2 South of Dundas Street, and part of Lots 10-11, Concession 3 South of Dundas Street in the Township of Toronto, County of Peel, now the City of Mississauga. The following provides a generalized cultural history of the Indigenous people within the Study Area's surroundings.

The sections below present a sequence of Indigenous land-use for the region from the earliest known human occupation following deglaciation, as well as more recent Euro-Canadian land-use history in the region. These periods are the Pre-Contact period and the Post-Contact (Historic) period.

4.1.1 PRE-CONTACT PERIOD

The pre-contact period in Ontario has been reconstructed, primarily, from the archaeological record and interpretations made by archaeologists through an examination of material culture and site settlement patterns. Technological and temporal divisions of the pre-contact period have been defined by archaeologists based on changes to natural, cultural, and political environments that are observable in the archaeological record. It is pertinent to state that although these divisions provide a generalized framework for understanding the broader events of the pre-contact period, they are not an accurate reflection of the fluidity and intricacies of cultural practices that spanned thousands of years. The following presents a sequence of Indigenous land-use from the earliest human occupation following deglaciation to the more recent past based on the following periods as defined by archaeologists:

- The Paleo Period
- The Archaic Period
- The Woodland Period
- The Post-Contact Period

PALEO PERIOD

Paleo period populations were the first to occupy what is now southern Ontario, moving into the region following the retreat of the Laurentide Ice Sheet approximately 11,000 years before present (BP). The first Paleo period populations to occupy southern Ontario are referred to by archaeologists as Early Paleo (Ellis & Deller, 1990).

Early Paleo period groups are identified by their distinctive projectile point morphological types, exhibiting long grooves, or 'flutes', that likely functioned as a hafting mechanism (method of attaching the point to a wooden shaft). These Early Paleo group projectile point types include Gainey (ca. 10,900 BP), Barnes (ca. 10,700), and Crowfield (ca. 10,500) (Ellis & Deller, 1990). By approximately 10,400 BP, Paleo projectile points transitioned to various unfluted varieties, such as Holcombe (ca. 10,300 BP), Hi Lo (ca. 10,100 BP), and Unstemmed and Stemmed Lanceolate (ca. 10,400 to 9,500 BP). These tool types were used by Late Paleo period groups (Ellis & Deller, 1990). Both Early and Late Paleo period populations were highly mobile, participating in the hunting of large game animals. Paleo period sites often functioned as small campsites where stone tool production and maintenance occurred (Ellis & Deller, 1990).

ARCHAIC PERIOD

By approximately 8,000 BP, climatic warming supported the growth of deciduous forests in southern Ontario. These forests introduced new flora and faunal resources, which resulted in subsistence shifts and a number of cultural adaptations. This change is reflected in the archaeological record by new tool-kits that are reflective of a shift in subsistence strategies and has been categorized as the Archaic period.

The Archaic period in southern Ontario is sub-divided into the Early Archaic (ca. 10,000 to 8,000 BP), Middle Archaic (ca. 8,000 to 4,500 BP), and the Late Archaic (ca. 4,500 to 2,800 BP) periods. Generally, in North America, the Archaic period represents a transition from big game hunting to broader, more generalized subsistence strategies based on local resource availability. This period is characterized by the following traits:

- An increase in stone tool variation and reliance on local stone sources,
- The emergence of notched and stemmed projectile point types,
- A reduction in extensively flaked tools,
- The use of native copper,
- The use of bone tools for hooks, gorges, and harpoons,
- An increase in extensive trade networks, and
- The production of ground stone tools and an increase in larger, less portable tools.

The Archaic period is also marked by population growth with archaeological evidence suggesting that, by the end of the Middle Archaic period (ca. 4,500 BP), populations had steadily increased in size (Ellis, et al., 1990).

Over the course of the Archaic period, populations began to rely on more localized hunting and gathering territories and were shifting to more seasonal encampments. From the spring into the fall, settlements were focused in lakeshore/riverine locations where a variety of different resources could be exploited. Settlement in the late fall and winter months moved to interior sites where the focus shifted to deer hunting and the foraging of wild plants (Ellis et al., 1990, p. 114). The steady increase in population size and the adoption of a more localized seasonal subsistence strategy led to the transition into the Woodland period.

EARLY AND MIDDLE WOODLAND PERIODS

The beginning of the Woodland period is defined by the emergence of ceramic technology. Similar to the Archaic period, the Woodland period is separated into three timeframes: the Early Woodland (ca. 2,800 to 2,000 BP), the Middle Woodland (ca. 2,000 to 1,200 BP), and the Late Woodland (ca. 1,200 to 350 BP) (Spence et al., 1990; Fox, 1990).

The Early Woodland period is represented in southern Ontario by two cultural complexes: the Meadowood Complex (ca. 2,900 to 2,500 BP), and the Middlesex Complex (ca. 2,500 to 2,000 BP). During this period, the life ways of Early Woodland populations differed little from that of the Late Archaic with hunting and gathering representing the primary subsistence strategies. The pottery of this period is characterized by its relatively crude construction and lack of decoration. These early ceramics exhibit cord impressions, which are likely the result of the techniques used during manufacture rather than decoration (Spence et al., 1990).

The Middle Woodland period has been differentiated from the Early Woodland period by changes in lithic tool forms (e.g. projectile points, expedient tools), and the increased decorative elaboration of ceramic vessels (Spence et al., 1990). Additionally, archaeological evidence suggests the rudimentary use of maize (corn) horticulture by the end of the Middle Woodland Period (Warrick, 2000).

In southern Ontario, the Middle Woodland has been divided into three different complexes based on regional cultural traditions: the Point Peninsula Complex, the Couture Complex, and the Saugeen Complex. These groups are differentiated by sets of characteristics that are unique to regions within the province, specifically regarding ceramic decorations.

The Point Peninsula Complex extends from south-central and eastern Ontario into southern Quebec. The northernmost borders of the complex can be found along the Mattawa and French Rivers. Ceramics are coil constructed with conical bases, outflaring rims, and flat, rounded, or pointed lips. The interior surfaces of vessels are often channelled with a comb-like implement, creating horizontal striations throughout. The exterior is smoothed, or brushed, and decoration generally includes pseudo-scallop stamps or dentate impressions. Occasionally, ceramics will have been treated with a red ochre wash (Spence et al, 1990).

The Saugeen Complex is found generally in south-central Ontario and along the eastern shores of Lake Huron. The Saugeen Complex ceramics are similar in style to Point Peninsula Complex; however, the vessels tended to be cruder than their Point Peninsula counterparts. They were characterized by coil construction with thick walls, wide necks, and poorly defined shoulders. Usually, the majority of the vessel was decorated with pseudo-scallop stamps or dentate impressions, with the latter occurring more frequently at later dates (Spence et al., 1990). The Couture Complex is found in southwestern Ontario and outside of the scope of the Study Area.

LATE WOODLAND PERIOD

There is much debate as to whether a transitional phase between the Middle and Late Woodland periods is present in southern Ontario, but it is generally agreed that the Late Woodland period begins around 1,100 BP. The Late Woodland period in southern Ontario can be divided into three cultural sub-phases: The early, middle, and late Late Woodland periods. The early Late Woodland is characterized by the Glen Meyer and Pickering cultures and the middle Late Woodland is characterized by the Uren and Middleport cultures. These groups are ancestral to the Iroquoian-speaking Neutral-Erie (Neutral), the Huron-Wendat (Huron), and Petun Nations that inhabited southern Ontario during the late Late Woodland period (Smith, 1990, p. 285).

The Pickering and Glen Meyer cultures co-existed within southern Ontario during the early Late Woodland period (ca. 1250-700 BP). Pickering territory is understood to encompass the area north of Lake Ontario to Georgian Bay and Lake Nipissing (Williamson, 1990). Glen Meyer is centred around Oxford and Norfolk counties, but also includes the southeastern Huron basin and the western extent is demarcated by the Ekfrid Clay Plain southwest of London, Ontario (Noble, 1975). Villages of either tradition were generally smaller in size (~1 ha) and composed of smaller oval structures, which were later replaced by larger structures later in the Late Woodland period. Archaeological evidence suggested a mixed economy where hunting and gathering played an important role, but small-scale horticulture was present, indicating a gradual shift from hunting-gathering to a horticultural economy (Williamson, 1990).

The first half of the middle Late Woodland period is represented by the Uren culture (700-650 BP) and the second half by the Middleport (650-600 BP). Uren and Middleport sites of the middle Late Woodland share a similar distribution pattern across much of southwestern and south-central Ontario. (Dodd et al., 1990). Significant changes in material culture and settlement-subsistence patterns are noted during this short time. Iroquois Linear, Ontario Horizontal, and Ontario Oblique pottery types are the most well-represented ceramic assemblages of the middle Late Woodland period (Dodd et al., 1990). At Middleport sites, material culture changes included an increase in the manufacture and use of clay pipes as well as bone tools and adornments (Dodd et al., 1990; Ferris & Spence, 1995).

During this period, evidence in the archaeological record of small year-round villages, secondary ossuary burials, and what are thought to be semi-subterranean sweat lodges suggest a marked increase in sedentism in southern Ontario during the Uren and Middleport cultures (Ferris & Spence, 1995). The increasing permanency of settlements was a result of the development of small-scale cultivation and a subsequent increased reliance on staple crops such as maize, beans, and squash (Dodd et al., 1990; Warrick, 2000; Ferris & Spence, 1995).

Archaeological evidence from the middle Late Woodland sites also documents increases in population size, community organization and village fissioning, and the expansion of trade networks. The development of trade networks with northern Algonquian peoples has also been inferred from findings at Middleport sites along the northern parts of southwestern and south-central Ontario. These changes resulted in the more organized and complex social structures observed in the late Late Woodland period.

During the late Late Woodland period, village size significantly increased as did the complexity of community and political systems. The settlement patterns of the period can be categorized into three types: large village sites, smaller hamlets or cabin sites, and special resource extraction sites. The larger villages and smaller hamlets are typically on small creeks with sandy soils suitable for agriculture. Both larger village and small hamlet sites were both typically surrounded by palisades and activities were focused on subsistence (Lennox & Fitzgerald, 1990, p. 441). Larger longhouses oriented differently than others in the village have been associated with primary familial groups, while longhouses that were located outside of palisade walls may have been for visiting groups for the purposes of trade or social gatherings (Ramsden, 1990). The cabin sites were occupied on a more seasonal basis and typically only had one or two longhouses. By this time, large-scale agriculture had taken hold, making year-round villages even more practical with the improved ability to store large crop yields over winter.

The villages in the vicinity of the Study Area were typically associated with the Huron-Wendat nations who occupied areas as far east as the Trent River and as far west as the Niagara Escarpment. They typically inhabited each village for several decades until the agricultural land was exhausted and communities moved to more fertile areas. Throughout the fifteenth and sixteenth century, community movement often included northern migrations and the incorporation of multiple smaller villages into larger coalescent villages.

The Huron-Wendat eventually dispersed from the Toronto area in the 17th century, during the period of French contact, to settle in their historic homeland of Wendake, which included territory in present-day Simcoe and Grey Counties. Today, “Wendake” is the name of the Huron-Wendat reserve located in Quebec, Ontario, which was formerly known as the village of Huronia. This coalescence and subsequent movement northward was thought to be the result of a number of socio-political factors, including increased conflict with the Five Nations Iroquois, an increased complexity in political organization, stronger trade relations with northern Algonquian groups, and interactions with early European traders (Ramsden, 1990; Birch, 2012; Ferris & Spence, 1995).

Oral histories of the Michi Saagiig (Mississauga Anishinaabeg) reflect increasing levels of inter-community relationships, integration, and trade between different groups. For example, these oral histories speak to the arrival of, and relationships with, the Huron “corn growers” (Migizi & Kapyrka, 2015, pp. 127-136). In addition to archaeological interpretations, oral histories also provide a valuable contribution to our understanding of the occupation and movement of Indigenous peoples in Ontario. The following oral history, provided by Michi Saagiig elder Gitiga Migizi, speaks to the occupation of this area of southern Ontario by the Anishinaabeg throughout the pre-contact and post-contact periods:

> The traditional homelands of the Michi Saagiig (Mississauga Anishinaabeg) encompass a vast area of what is now known as southern Ontario. The Michi Saagiig occupied and fished the north shore of Lake Ontario where the various tributaries emptied into the lake. Their territories extended north into and beyond the

Kawarthas as winter hunting grounds on which they would break off into smaller social groups for the season, hunting and trapping on these lands, then returning to the lakeshore in spring for the summer months.

The Michi Saagiig were a highly mobile people, travelling vast distances to procure subsistence for their people. They were also known as the "Peacekeepers" among Indigenous nations. The Michi Saagiig homelands were located directly between two very powerful Confederacies: The Three Fires Confederacy to the north and the Haudenosaunee Confederacy to the south. The Michi Saagiig were the negotiators, the messengers, the diplomats, and they successfully mediated peace throughout this area of Ontario for countless generations.

Michi Saagiig oral histories speak to their people being in this area of Ontario for thousands of years. These stories recount the "Old Ones" who spoke an ancient Algonquian dialect. The histories explain that the current Ojibwa phonology is the 5th transformation of this language, demonstrating a linguistic connection that spans back into deep time. The Michi Saagiig of today are the descendants of the ancient peoples who lived in Ontario during the Archaic and Paleo periods. They are the original inhabitants of southern Ontario, and they are still here today.

The traditional territories of the Michi Saagiig span from Gananoque in the east, all along the north shore of Lake Ontario, west to the north shore of Lake Erie at Long Point. The territory spreads as far north as the tributaries that flow into these lakes, from Bancroft and north of the Haliburton highlands. This also includes all the tributaries that flow from the height of land north of Toronto like the Oak Ridges Moraine, and all of the rivers that flow into Lake Ontario (the Rideau, the Salmon, the Ganaraska, the Moira, the Trent, the Don, the Rouge, the Etobicoke, the Humber, and the Credit, as well as Wilmot and 16 Mile Creeks) through Burlington Bay and the Niagara region including the Welland and Niagara Rivers, and beyond. The western side of the Michi Saagiig Nation was located around the Grand River which was used as a portage route as the Niagara portage was too dangerous. The Michi Saagiig would portage from present-day Burlington to the Grand River and travel south to the open water on Lake Erie.

Michi Saagiig oral histories also speak to the occurrence of people coming into their territories sometime between 500-1000 A.D. seeking to establish villages and a corn growing economy – these newcomers included peoples that would later be known as the Huron-Wendat, Neutral, Petun/Tobacco Nations. The Michi Saagiig made Treaties with these newcomers and granted them permission to stay with the understanding that they were visitors in these lands. Wampum was made to record these contracts, ceremonies would have bound each nation to their respective responsibilities within the political relationship, and these contracts would have been renewed annually (see Gitiga Migizi and Kapyrka, 2015). These visitors were extremely successful as their corn economy grew as well as their populations. However, it was understood by all nations involved that this area of Ontario were the homeland territories of the Michi Saagiig.

The Odawa Nation worked with the Michi Saagiig to meet with the Huron-Wendat, the Petun, and Neutral Nations to continue the amicable political and economic relationship that existed – a symbiotic relationship that was mainly policed and enforced by the Odawa people.

Problems arose for the Michi Saagiig in the 1600s when the European way of life was introduced into southern Ontario. Also, around the same time, the Haudenosaunee were given firearms by the colonial governments in New York and Albany which ultimately made an expansion possible for them into Michi Saagiig territories. There began skirmishes with the various nations living in Ontario at the time. The

> Haudenosaunee engaged in fighting with the Huron-Wendat and between that and the onslaught of European diseases, the Iroquoian speaking peoples in Ontario were decimated.
>
> The onset of colonial settlement and missionary involvement severely disrupted the original relationships between these Indigenous nations. Disease and warfare had a devastating impact upon the Indigenous peoples of Ontario, especially the large sedentary villages, which mostly included Iroquoian speaking peoples. The Michi Saagiig were largely able to avoid the devastation caused by these processes by retreating to their wintering grounds to the north, essentially waiting for the smoke to clear.
>
> Often times, southern Ontario is described as being "vacant" after the dispersal of the Huron-Wendat peoples in 1649 (who fled east to Quebec and south to the United States). This is misleading as these territories remained the homelands of the Michi Saagiig Nation.
>
> The Michi Saagiig participated in eighteen treaties from 1781 to 1923 to allow the growing number of European settlers to establish in Ontario. Pressures from increased settlement forced the Michi Saagiig to slowly move into small family groups around the present-day communities: Curve Lake First Nation, Hiawatha First Nation, Alderville First Nation, Scugog Island First Nation, New Credit First Nation, and Mississauga First Nation. The Michi Saagiig have been in Ontario for thousands of years, and they remain here to this day.
>
> Migizi and Kapyrka pp. 127-136 (2015)

Early contact with European settlers at the end of the Late Woodland period resulted in extensive changes to the traditional lifestyles of most populations inhabiting Ontario including settlement size, population distribution, and material culture. The introduction of European-borne diseases significantly increased mortality rates, resulting in a drastic drop in population size (Warrick, 2000).

4.1.2 POST-CONTACT PERIOD

Early European presence within the Study Area began as early as 1615 with the travels of the French explorer Etienne Brulé who travelled with the Huron along the major portage route known as the Toronto Carrying Place Trail, also known as the Humber Portage, which connected Lake Ontario with Lake Simcoe and the northern Great Lakes (Steckley, 1987; Ramsden, 1990). From Lake Ontario, the trail ran northward along the eastern branch of the Humber River.

In 1615-1616, Samuel De Champlain also travelled with the Huron northward to Georgian Bay. By the 1640s, the Huron, Petun, Neutral, and Mississauga Anishinaabeg had dispersed out of this region of southern Ontario as a result of the warfare and disease that had arrived with European colonization. The large-scale population dispersals gave way for the Haudenosaunee to occupy the territory along the north shore of Lake Ontario where they settled along inland-running trade routes. These settlements included the villages of Ganatsekwyagon on the Rouge River and Teiaiagon on the Humber River at the head of the Toronto Carrying Place Trail (Steckley, 1987; Ramsden, 1990). Due to increased military pressure from the French in the late 1600s, and the return of the Anishinaabe Nations (Ojibwa, Odawa, Potawatomi, and Mississauga) who had previously retreated to the north, the Haudenosaunee abandoned their villages along the north shore of Lake Ontario.

TREATY NO. 13A, 1805/HEAD OF THE LAKE PURCHASE

The Study Area is situated within the boundaries of Treaty No. 13A, also known as the 1805/Head of the Lake Purchase. This treaty was signed after the Toronto Purchase, Treaty No. 13, on September 6, 1805, between the Crown and the Mississaugas (Shanahan, 2021). Before this signing, the Crown had obtained nearly all of the north shore of Lake Ontario all the way to Niagara, less the area of approximately 35 miles at the head of the Lake between Niagara and York. In August 1805, the Mississaugas stated their conditions for ceding this area of land which included keeping three areas of land for themselves: Twelve Mile Creek, Sixteen Mile Creek, and at the mouth of the Credit River. They wished to keep the entire waterfront along the stretch of the land parcel, as they had been forced off of the waterfront in other treaties. A compromise was struck where the Mississaugas were promised the use of the waterfront, and another area of the parcel would be reimbursed back to the Tuscaroras after they acquired the land from the Crown in a previous deal. Eventually the treaty was drawn up and officially covered part of the Mississauga Tract beginning on the east at the Etobicoke River and extending westward to a parcel of land previously granted to Joseph Brant. A few areas were retained for the Mississaugas including a reserve on the Credit River and fishing stations at 16 Mile Creek and 12 Mile Creek. With the completion of this treaty, the Crown finally gained control over the continuous waterfront along Lake Ontario.

TORONTO TOWNSHIP

In 1805, another land purchase was conducted by the British government and the newly acquired land was divided into three townships: Nelson Township, Trafalgar Township and Toronto Township (Riendeau, 1985). The Toronto Township surveys were completed in 1805, and settlement began soon after. Much of the land was used for farming and many small hamlets began to form throughout the township (Mississauga Heritage, 2012).

The original survey of Toronto Township, completed in 1805, was laid out with two concessions north of Base Line (now Eglinton Avenue) and three concessions south to the lakefront, excluding the reserve lands encompassing the Credit River (Riendeau, 1985). Settlement in the township concentrated along Dundas Road and by the 1830s three distinct villages had developed; Summerville, Dixie, Cooksville and Erindale (Riendeau, 1985). Communities along the Lakeshore road were much slower to develop than those along Dundas, and by the end of the 1830s several communities to the west of the Credit River began to take shape.

In the latter half of the nineteenth century, the population of Toronto Township began to decline due to the urbanization of larger communities in proximity to the township such as Toronto, Hamilton and Brampton. These larger communities drew people off their farms into the more lucrative factory work and this change in lifestyle marked a change in how small communities would develop in the township. The villages started to develop urban sprawl (neighbourhoods), rather than developing into small towns, that were surrounded by lands used for commercial agriculture which branched out from the wheat industry into livestock and orchards.

At the end of the First World War the boundaries of the City of Toronto began to expand towards Toronto Township and the population of the township boomed. The continued urbanization focused on subdivisions spreading from the eastern edge of the township absorbing communities in its wake (Riendeau, 1985). By 1920, a small settlement known as Lakeview had developed along the north side of Lakeshore Road which at first served as country homes for the affluent Torontonians. In the 1940s Lakeview had transformed from an area for the affluent to an area for the unemployed to purchase cheap land and be able to sustain themselves with small gardens. At the end of the Second World War the community of Lakeview had grown drastically into a subdivision where bungalows constructed during the war and free building lots were offered to veterans. In 1969 the communities of Lakeview, Cooksville, Erindale, Sheridan, Dixie, Meadowvale Village, and Malton were amalgamated to form the Town of Mississauga

(Riendeau, 1985). The steady population growth of the community resulted in the incorporation of the City of Mississauga in 1974.

LAKEVIEW

The Study Area is located within the Lakeview community settlement. Originally, the area consisted of large farms and orchards, and many of the existing street names pay homage to the farm families including Hair, Cavan, Cawthra, Ogden, Halliday, and Shaw. In 1806, the basic lot size in the area was 200 acres (Riendeau, 2002). From the middle of the 1800s up until 1900 there was significant rural depopulation in Toronto Township, similar to the rest of rural Ontario (Riendau, 2002). Small-scale industries dominated the industrial landscape before the turn of the twentieth century that produced both capital and consumer goods. In 1915, Lakeshore Road became Canada's first concrete highway (Heritage Mississauga, n.d.). Various transportation routes, including the Grand Trunk Railway's mainline, made the area attractive to Toronto commuters.

Lakeview developed significant industrial and military activities in the area including the Long Branch Rifle Ranges at the end of Dixie Road at Lakeshore Road East, which were used as a site for military training during the Second World War. In 1940, a munitions factory opened and made arms for the war until 1974 at the Arsenal Lands. During post-war times, housing was built to accommodate the shortage of housing for both returning veterans and the works at the munitions factory. By 1950, the area had fully transformed from a rural area into a suburban area with land used for a diverse range of functions including commercial, residential, industrial, and public spaces. The Lakeview Generating Station, the Lakeview Water Treatment, and the Lakeview Wastewater Treatment Plant (later named the G.E. Booth Wastewater Treatment Facility) were constructed during this time, which served central roles for regional servicing needs. In fact, the Lakeview Generating Station was thought to be "the world's largest thermal electric generating plant" constructed in 1962 by Ontario Hydro (Riendeau, 1985).

Today, the area is characterized by residential neighbourhoods made up of semi-detached and detached housing with many post-war houses being replaced by new detached housing.

4.1.3 HISTORICAL MAPPING REVIEW

A review of historical mapping and aerial photography was undertaken to understand the changing landscape and built environment within the Study Area. To determine the presence of historical features, nineteenth century historical county maps, twentieth century topographic maps, and aerial photos were reviewed. While these maps and photographs were not the only visual sources consulted for the purposes of this study, they were determined to provide the best overview of land development in the Study Area. The maps and aerial photos consulted include: the 1877 Illustrated Historical Atlas for the County of Peel, the National Defence's Topographic maps from 1909, 1922, and 1931, the 1954 Aerial, and the Department of Energy, Mines, and Resources' maps from 1974 and 1994.

Late-nineteenth century development is illustrated in the 1877 Illustrated Historical Atlas for the County of Peel (Figure 2). The map shows that the Study Area was originally a part of Henry Saul, Mrs Jas Cavan, Rich Richie, Stephen Crawford, and Henry Cawthra's lands, south of Lake Shore Road. The map also demonstrates how lots were divided into 200 acres. There are two buildings north of Lake Shore Road and one building identified immediately south of Lake Shore Road on Crawford's land. The 1909 Topographic Map (Figure 3) shows that the lands were further developed around Crawford's and Cawthra's land parcels, and a street is visible in the middle of the two parcels, which is present-day Aviation Road. The Long Branch Rifle Ranges are also included in this map to the east of the Study Area. By this time the main north-south and east-west roadways were established in Mississauga including Lake Shore Road and Dundas Street.

Twentieth century development in the Study Area is recorded on both topographic maps from 1922 and 1931, and the 1954 Aerial (Figures 4-6). A subdivision of lots to the west of the Study Area is visible in 1922. By 1931 the subdivision of the Study Area has dwellings appear on present-day Beechwood Avenue, Hampton Crescent, and Aviation Road. The dwellings that were originally visible on the 1877 and 1909 maps are no longer recorded. Areal imagery from 1954 records a large influx of post-war housing in the Study Area. Also visible in the aerial are the rifle ranges recorded in1909 mapping.

The 1974 Department of Energy, Mines, and Resources' map (Figure 7) shows the Study Area and its present-day street configuration along with many additionally planned communities north of the Study Area that accommodated post-war growth. In these areas communities were developed around parks, businesses, schools, recreation facilities and malls. Where the rifle ranges were to the east there is now the generating station, a part of a large industrial area. The 1994 1974 Department of Energy, Mines, and Resources' map (Figure 8) illustrates the addition of the Lakefront Promenade Park immediately south of the Study Area, which was constructed on landfill in the late 1970s.

5 EXISTING CONDITIONS

5.1 PROPERTY VISIT

A field visit was conducted on July 25, 2022 by Claire Forward, Cultural Heritage Specialist, to record the existing conditions of the Project Study Area. The field review was preceded by a review of available historical and current aerial photographs and maps. These photographs and maps were reviewed for any potential BHRs and CHLs that may be extant in the Study Area. The existing conditions of the Study Area are described below.

5.2 DESCRIPTION OF EXISTING CONDITIONS

The Study Area subject to the scope of the Project is composed of residential neighbourhoods and commercial facilities around Lakeshore Road East, north of Lake Ontario.

5.2.1 BEECHWOOD AVENUE

Beechwood Avenue is a paved road that is oriented north-south and accessed from Lakeshore Road East (Image 1-Image 2). Both sides of the street are dominated by housing slightly set back from the road with a diverse range of trees. The south section of Beechwood Avenue is intersected by the small street of Richey Crescent.

Image 1: View of two dwellings on the west side of Beechwood Avenue.

Image 2: View of Beechwood Avenue looking south from the north end of the street.

5.2.2 RICHEY CRESCENT

Richey Crescent is a narrow, paved road that is oriented east-west and accessed from Beechwood Avenue (Image 3-Image 4). The south side of street contains a varied series of residences. On either end of the street there are waterfront trails.

Image 3: View of Richey Crescent looking east from the west end of street.

Image 4: View of two dwellings on the south side of Richey Crescent.

5.2.3 COOKSVILLE CREEK

Cooksville Creek oriented north-south, is situated in between Hampton Crescent and Beechwood Avenue. It also extends north throughout the Lakeview area. From Lakeshore Road East it is visible from a bridge carrying that road across the creek (Image 5- Image 6).

Image 5: View of Cooksville Creek looking north from Lakeshore Road East.

Image 6: View of bridge that crosses Cooksville Creek on Lakeshore Road East, looking south.

5.2.4 LAGOON STREET

Lagoon Street is a narrow, paved road oriented north-south that runs north off of Lakeshore Road East (Image 7). It connects to the newly developed Lakeshore Village, which is private property that contains Beachcomber Road, Mermaid Crescent, and Rapids Lane (Image 8). Lagoon Street also connects to a commercial area to the east.

Image 7: View of Lagoon Street looking north from the southeast corner of the Lakeshore Road East intersection.

Image 8: View of the private community signage at Beachcomber Road and Lagoon Street.

5.2.5 LAKESHORE ROAD EAST

Lakeshore Road East is an east-west oriented wide paved road with two lanes for traffic in each direction and sidewalks on either shoulder. The road is lined with one to two storey commercial businesses and a large apartment building on the corner of Lagoon Street. It links to Cawthra Road in the east to connect to the Queen Elizabeth Way. (Image 9 – Image 12)

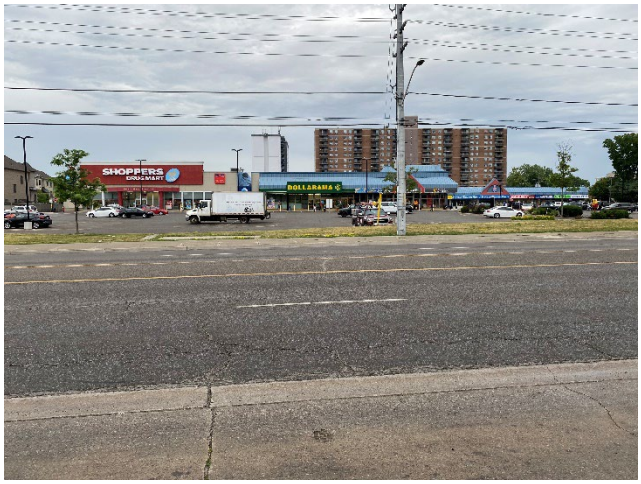

Image 9: View of commercial development, looking north from Lakeshore Road East.

Image 10: View of additional commercial development, looking north from Lakeshore Road East.

Image 11: Image of commercial development, looking south from Lakeshore Road East.

Image 12: Image of commercial development, looking south from Lakeshore Road East.

5.2.6 HAMPTON CRESCENT

Hampton Crescent is a paved road that is oriented north-south and accessed from Lakeshore Road East, and cuts through Byngmount Avenue, Curzon Avenue, and terminates at Lakeside Avenue (Image 13-Image 14). Both sides of the street are dominated by a varied style of houses slightly set back from the road. At the south end of the street there are several waterfront trails and a park that connect to the Lakeside Promenade CHL.

Image 13: View of Hampton Crescent looking south from the north end of the street.

Image 14: View of dwellings on the east side of Hampton Crescent.

5.2.7 LAKEFRONT PROMENADE PARK

Lakefront Promenade Park is a large, landscaped park that contains several paved paths and parking lots. It is directly accessible from the Study Area at the south side of Hampton Crescent (Image 15 – Image 16). The promenade also has a modern pavilion with various amenities and street furniture along the paths (Image 17 – Image 18).

Image 15: View of Lakefront Promenade Park looking south from a parking lot at the base of Hampton Crescent.

Image 16: View of the various paved paths at Lakefront Promenade Park.

Image 17: View of the pavilion located immediately south of the parking lot at Lakefront Promenade Park.

Image 18: View of the south side of the Study Area from Lakefront Promenade Park.

5.2.8 BYNGMOUNT AVENUE

Byngmount Avenue is an east-west oriented paved road and consists of a single lane of traffic in each direction. The road is lined on either side with houses and is accessible by Beechwood Avenue in the west and Montbeck Crescent in the east. There is a diverse range of housing types along the road (Image 19 – Image 22).

Image 19: View of Byngmount Avenue looking east from the west end of street near the intersection of Goodwin Road.

Image 20: View of Byngmount Avenue looking west from the east end of the street.

Image 21: View of dwellings on Byngmount Avenue.

Image 22: View of the west end of Byngmount Avenue, looking towards Hampton Crescent.

5.2.9 CURZON AVENUE

Curzon Avenue is an east-west oriented paved road and consists of a single lane of traffic in each direction (Image 23 – Image 24). The road is lined on either side with houses and is accessible by Beechwood Avenue in the west and Gordon Road in the east.

Image 23: View of Curzon Avenue looking east from west end of street.

Image 24: View of dwellings on Curzon Avenue.

5.2.10 MONTBECK CRESCENT

Montbeck Crescent is an east-west and north-south oriented paved road and consists of a single lane of traffic in each direction. The road is accessible from Hampton Crescent in the west and Lakeshore Road East to the north (Image 25 – Image 26). It cuts across both Aviation Road and Goodwin Road before curving up to Lakeshore Road East (Image 27 – Image 28). The road is lined on either side with houses, predominately modern in style.

Image 25: View of Montbeck Crescent looking east from Hampton Crescent.

Image 26: View of Montbeck Crescent after Aviation Road.

Image 27: View of the curve up Montbeck Crescent, looking east from the Goodwin Road and Montbeck Crescent intersection.

Image 28: View of the Montbeck Crescent looking south from the north end of the street at Byngmount Avenue.

5.2.11 LAKESIDE AVENUE

Lakeside Avenue is an east-west oriented narrow, paved road and consists of a single lane of traffic in each direction. The road is accessible from Hampton Crescent in the west and Aviation Road in the east. On the north side of the road is a row of houses. The road faces RK McMillan Park and the Lakefront Promenade Park.

Image 29: View of dwellings along Lakeside Avenue.

Image 30: View of RK McMillan Park, with the Lakefront Promenade Park visible in the south.

Image 31: View of Lakeside Avenue looking east from west end of street.

Image 32: View of Lakeside Avenue looking west from east end of street.

5.2.12 AVIATION ROAD

Aviation Road is a north-south oriented paved road and consists of a single lane of traffic in each direction (Image 33 – Image 36). The road is accessible from Lakeshore Road East in the north, and cuts through Byngmount Avenue, Curzon Avenue, Montbeck Crescent, Lakeside Avenue, and terminates at Beach Street in the south.

Image 33: View of Aviation Road looking north from the intersection with Byngmount Avenue.

Image 34: View of Aviation Road looking south from the north end of the street.

Image 35: View of dwellings on Aviation Road.

Image 36: View of Aviation Road looking south from the intersection with Montbeck Crescent.

5.2.13 BEACH STREET

Beach Street is an east-west oriented small paved road and consists of a single lane of traffic in each direction (Image 37 – Image 40). The road is accessible from Aviation Road to the west and Goodwin Road to the east. The road has houses on the north side and faces a waterfront trail and the Lakefront Promenade Park.

Image 37: View of Beach Street looking east from west end of street.

Image 38: The Lakefront Promenade Park located in front of Beach Street.

Image 39: The pumping station on the west side of Beach Street.

Image 40: View of dwellings on Beach Street.

5.2.14 GOODWIN ROAD

Goodwin Road is a north-south oriented paved road and consists of a single lane of traffic in each direction (Image 41 – Image 44). The road is accessible from Byngmount Avenue in the north, and cuts through Mountbeck Crescent and terminates at Beach Street in the south. On the south portion of the road there is a baseball diamond and a view of the Lakefront Promenade Park.

Image 41: View of Goodwin Road, looking north from the south end of the street.

Image 42: Image of the baseball diamond located at the south end of Goodwin Road.

Image 43: View of dwellings on Goodwin Road.

Image 44: View of Goodwin Road, looking north from the intersection with Montbeck Crescent.

5.3 PREVIOUS CULTURAL HERITAGE ASSESSMENTS

There have been several cultural heritage assessments whose Study Area overlaps the current Study Area. These include:

- The Cultural Landscape Inventory (The Landplan Collaborative Ltd., Goldsmith Borgal and Company Ltd. Architects, North South Environmental Inc., Geodata Resources Inc.,2005);
- Conserving Heritage Landscapes, Cultural Heritage Landscape Project: Volume 1 (ASI, 2022);
- Conserving Heritage Landscapes, Cultural Heritage Landscape Project: Volume 2 (ASI, 2022); and
- Conserving Heritage Landscapes, Cultural Heritage Landscape Project: Volume 3 (ASI, 2022)

All extant cultural heritage resources identified in these studies that fall within the current Study Area have been identified in Table 5 1: Identified BHRs and CHLs with Known or Potential CHVI.

5.4 IDENTIFIED CULTURAL HERITAGE RESOURCES

A desktop study and a field visit were completed to identify known and potential BHRs and CHLs older than 40 years of age located within or adjacent to the Study Area as described in Section 3. A review was conducted to determine previously identified heritage resources documented within or adjacent to the Study Area, including listed (registered non-designated) and designated properties, heritage conservation districts and known CHLs. This included a review of the City of Mississauga's Heritage Register for Mississauga (2018). One (1) CHL was identified in the Study Area.

During the field review, the Study Area was examined for potential heritage resources by employing a high-level and cursory evaluation based on an understanding of the criteria identified in the MCM's Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes. As a result of this review, no BHRs nor

CHLs were identified in the Study Area. See Table 5-1 on the following page for a description of the single heritage resource and Figure 9 in Appendix A for an illustration of its location within the Study Area.

Table 5-1: Identified BHRs and CHLs with Known or Potential CHVI

BHR or CHL #	Type of Property	Location	Heritage Recognition	Description of Known or Potential CHVI	Photographs
CHL 1	Waterfront Park	800 Lakefront Promenade	Identified as a Cultural Landscape in 2005 by Landplan Collective Ltd. et al. (previously called "Lakefront Promenade"). Identified as a Significant Cultural Heritage Landscape in 2022 by ASI and a part of the City of Mississauga's Heritage Register as a Cultural Heritage Landscape.	The Lakefront Promenade Park was constructed on landfill during the late 1970s. The park houses various recreation activities and ample greenspace along with the Lakefront Promenade Marina, the Port Credit Yacht Club, and the Mississauga Sailing Club. In 2005, the park was identified for its "landscape environment, historical associations, built environment, outstanding features or interest and landmark value" (The Landplan Collective Ltd. Et al., 2005). The description in the inventory also makes mention of the development being one of the most successful among Lake Ontario projects of the 1960s to the 1980s. Hough Stansbury Woodland Associates of Toronto designed the park. Changes in the landscape aesthetics have allowed some areas of shoreline to be naturalized over time to provide better habitat for fish, mammals, and shore birds (ASI, 2022).	

6 PRELIMINARY IMPACT ASSESSMENT

To establish potential impacts, identified BHRs and CHLs were considered against a range of possible impacts as outlined in the MCM's *Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties* (2017) (see Section 1.2 for a full description of impacts).

Where any BHRs and CHLs may experience direct or indirect impacts, appropriate mitigation measures will be developed. If appropriate, this may require the completion of a CHER to identify the property's CHVI and heritage attributes if the property's heritage attributes have yet to be defined. For properties that have been subject to a CHER or their CHVI has otherwise been defined, an HIA may be required to determine appropriate mitigation measures.

6.1 PRELIMINARY IMPACTS ON CULTURAL HERITAGE RESOURCES

This section provides a preliminary assessment of the potential adverse affects that may result from the Project's preferred alternatives. The conservation of BHRs and CHLs in planning is considered to be a matter of public interest. Changes to transit infrastructure have the potential to adversely affect BHRs and CHLs by displacement and/or disruption during and after construction. These heritage resources may experience displacement (i.e., removal) if they are located within the footprint of the undertaking. There may also be potential for disruption or indirect impacts to BHRs and CHLs by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and/or setting.

Methods of minimizing or avoiding a negative impact on a BHR or CHL include, but are not limited to:

- Alternative development approaches;
- Isolating development and site alteration from significant built and natural features and vistas;
- Design guidelines that harmonize mass, setback, setting and materials;
- Limiting height and density;
- Allowing only compatible infill and additions;
- Reversible alterations;
- Buffer zones, site plan control and other planning mechanisms;
- Recommendations for additional studies, including CHERs, HIAs and Strategic Conservation Plans; and,
- Alterations to project design during construction planning and project controls (i.e., vibration reduction, dust suppression or other measures).

Table 6-1 considers the potential impacts of the preferred alternatives on known or potential BHRs and CHLs. The Study Area for the Beach Street Sewer Pumping Station was reviewed to assess impacts to identified heritage resources (Figure 9 in Appendix A).

Table 6-1: Impacts and Preliminary Mitigation Strategies for BHRs and CHLs

RESOURCE	ADDRESS/LOCATION	DISCUSSION OF IMPACT	MITIGATION STRATEGIES
CHL 1	800 Lakefront Promenade	**No Impact** Rationale: One of the alternative alignments travels along Beach Street, but it will be limited to the existing right-of-way and therefore, no impacts are anticipated to CHL 1.	**None required.**

7 CONCLUSIONS

The results of the background historical research and review of the secondary source materials, including historic mapping, revealed that the part of the Study Area consists of lands that have been shaped by early rural settlement dating from the nineteenth and early twentieth centuries. The Study Area also served a continuous residential function throughout its existence, notably increasing in size after WWII.

The following provides a summary of the assessment results:

- One (1) CHL was identified for the Beach Street Sewer Pumping Station Environmental Assessment

- The one (1) CHL was included in the City of Mississauga's Heritage Register, and zero (0) were identified during field review

8 RECOMMENDATIONS

Since the preliminary impact determined that there will be no impacts to the single identified CHL, this Cultural Heritage Report has resulted in the following recommendations:

1. Staging and construction activities should be appropriately located and/or planned to avoid impacts to the identified CHL.
2. Construction activities should seek to avoid direct impacts to Lake Ontario including the shoreline as well as direct impacts to trees and medicinal plants. Where avoidance is not possible, mitigation measures should be developed in consultation with Indigenous Communities.
3. Should future work require expansion of the Beach Street Sewer Pumping Station EA Study Area or the alternative alignments are changed, a qualified heritage consultant should be contacted to confirm the impacts of the proposed work on known or potential BHRs and CHLs.

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APPENDIX

A FIGURES 1-10

Prepared By: Tanya.Peterson

LEGEND:

- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TITLE:
LOCATION MAP

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

	PROJECT NO.:	REVIEWED BY:
wsp GOLDER	19M-00593-00	JK
	DATE: SEPTEMBER 2022	FIGURE: 1

C:\aProjects\19M-00593-0012022\MXD\19M-00593-00 Figure 1 Location Map.mxd

Prepared By: Tanya.Peterson

N

LEGEND:

- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

0 75 150 300 450 Metres

TITLE:
1877 ILLUSTRATED HISTORICAL ATLAS
FOR THE COUNTY OF PEEL

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

wsp GOLDER

PROJECT NO.:	REVIEWED BY:
19M-00593-00	JK
DATE: SEPTEMBER 2022	FIGURE: 2

C:\aProjects\19M-00593-00\2022MXD\19M-00593-00 Figure 2 1877.mxd

Prepared By: Tanya.Peterson

N

LEGEND:

- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TRUNK

SHORE

RIFLE RANGES

MIDDLE

GRAND

LAKE

Port Credit

325 300 275 250 283

0 75 150 300 450 Metres

TITLE:
1909 TOPOGRAPHIC MAP

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

	PROJECT NO.:	REVIEWED BY:
wsp GOLDER	19M-00593-00	JK
	DATE: SEPTEMBER 2022	FIGURE: 3

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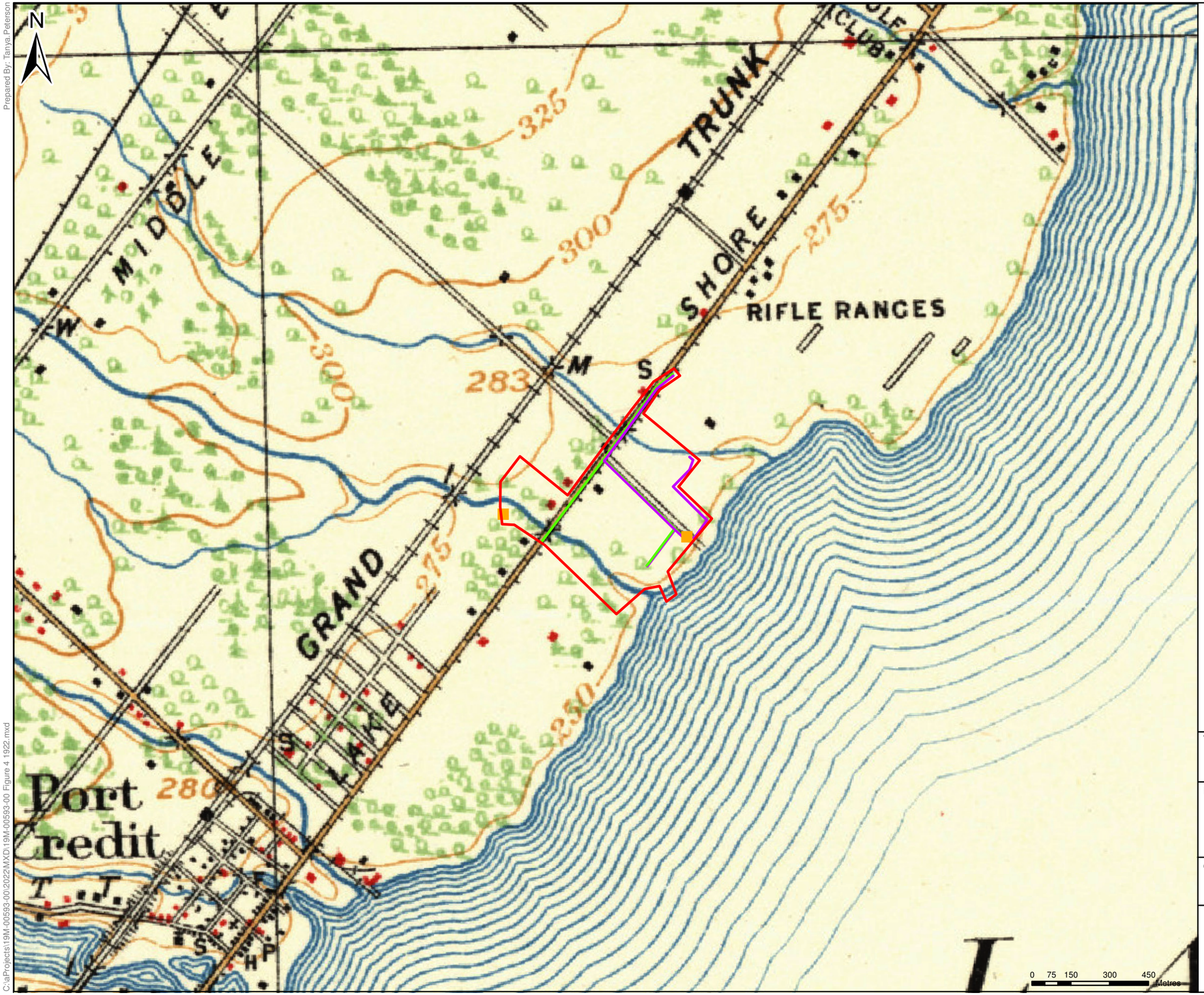


LEGEND:

- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TITLE:
1922 TOPOGRAPHIC MAP

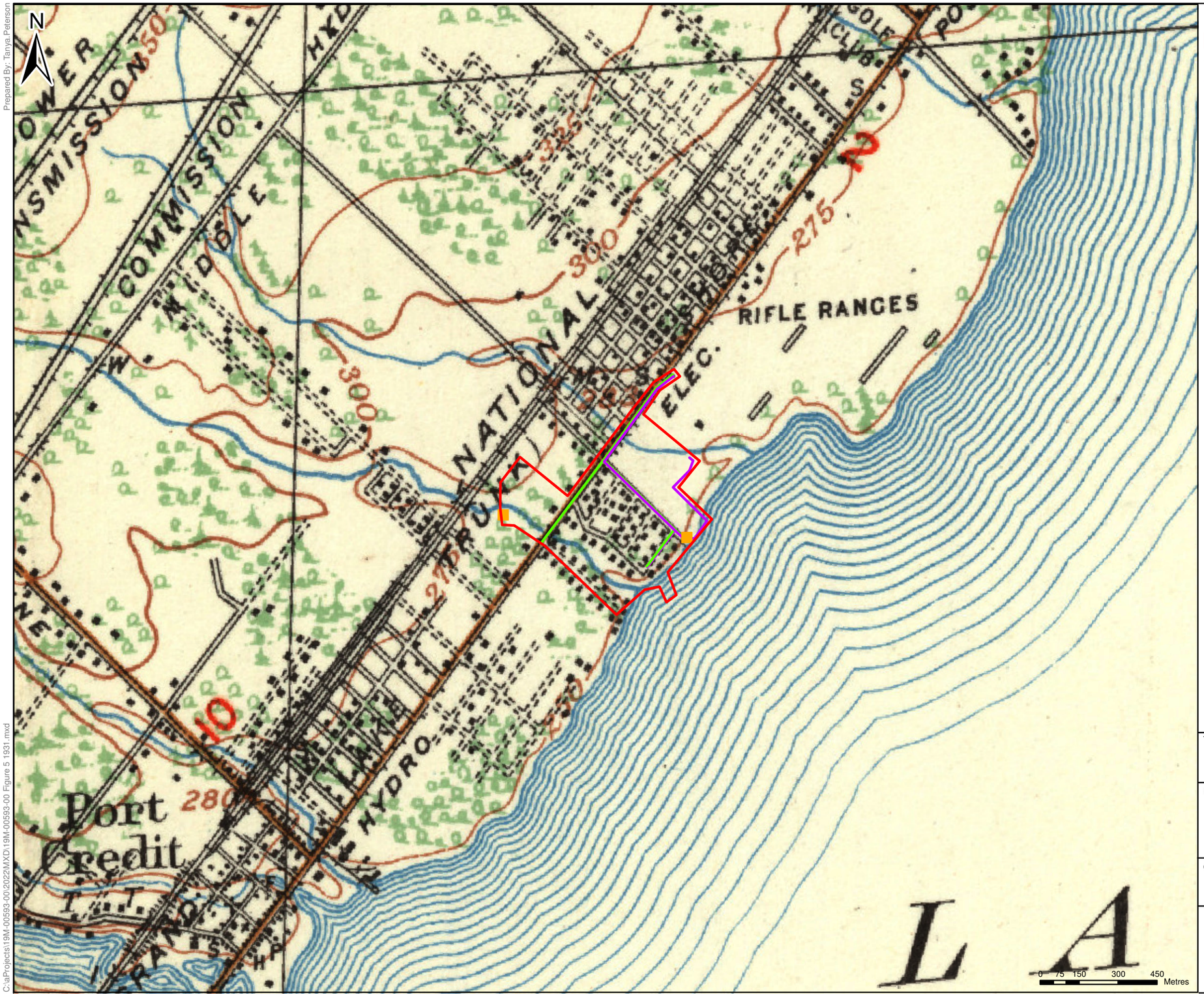
PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

GOLDER	PROJECT NO.: 19M-00593-00	REVIEWED BY: JK
	DATE: SEPTEMBER 2022	FIGURE: 4

Prepared By: Tanya.Peterson

C:\aProjects\19M-00593-00\2022\MXD\19M-00593-00 Figure 4 1922.mxd



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- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TITLE:
1931 TOPOGRAPHIC MAP

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

	PROJECT NO.:	REVIEWED BY:
wsp GOLDER	19M-00593-00	JK
	DATE: SEPTEMBER 2022	FIGURE: 5

Prepared By: Tanya.Peterson

C:\aProjects\19M-00593-00\2022MXD\19M-00593-00 Figure 5 1931.mxd

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- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TITLE:
1954 AERIAL PHOTOGRAPH

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

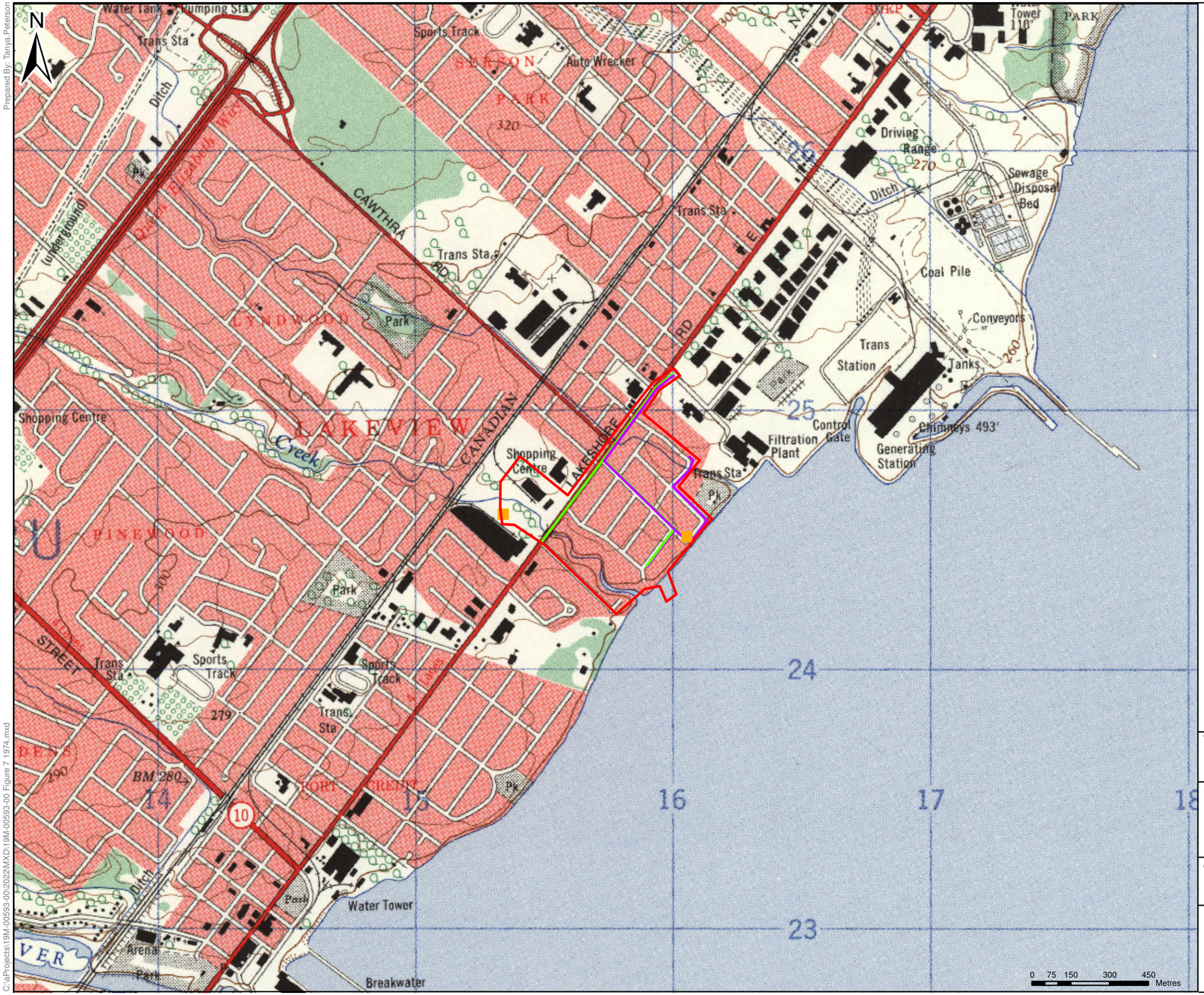
CLIENT:
TROY LEYBURNE

	PROJECT NO.:	REVIEWED BY:
GOLDER	19M-00593-00	JK
	DATE: SEPTEMBER 2022	FIGURE: 6

Prepared By: Tanya.Peterson

C:\aProjects\19M-00593-00\2022MXD\19M-00593-00 Figure 6 1954.mxd

Prepared By: Tanya.Peterson



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- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TITLE:
1974 NATIONAL TOPOGRAPHIC MAP

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

	PROJECT NO.:	REVIEWED BY:
wsp GOLDER	19M-00593-00	JK
	DATE: SEPTEMBER 2022	FIGURE: 7

C:\aProjects\19M-00593-00\2022MXD\19M-00593-00 Figure 7 1974.mxd

LEGEND:

- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION

TITLE:
1994 NATIONAL TOPOGRAPHIC MAP

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

GOLDER

PROJECT NO.:	REVIEWED BY:
19M-00593-00	JK
DATE: SEPTEMBER 2022	FIGURE: 8

Prepared By: Tanya.Peterson

C:\aProjects\19M-00593-00\2022MXD\19M-00593-00 Figure 8 1994.mxd

Prepared By: Tanya.Peterson

LEGEND:

- STUDY AREA
- ALTERNATIVE 1
- ALTERNATIVE 2
- PUMPING STATION
- LAKEFRONT PROMENADE CHR

TITLE:
CULTURAL HERITAGE RESOURCE

PROJECT:
CULTURAL HERITAGE REPORT:
EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT: BEACH STREET SEWER PUMPING STATION

CLIENT:
TROY LEYBURNE

wsp GOLDER

PROJECT NO.:	REVIEWED BY:
19M-00593-00	JK
DATE: SEPTEMBER 2022	FIGURE: 9

C:\aProjects\19M-00593-00\2022MXD\19M-00593-00 Figure 9 CHR.mxd

B Technical Memos

APPENDIX

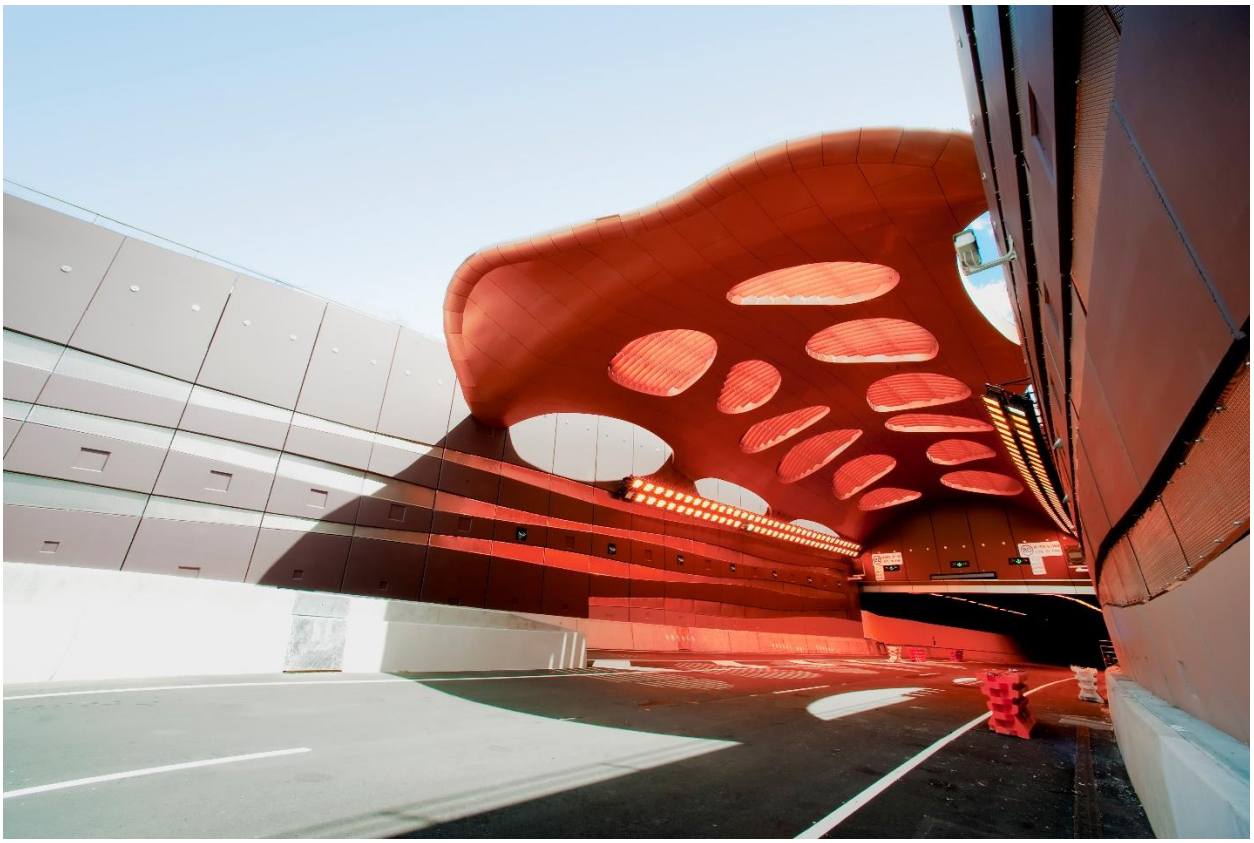
B-1 Beechwood SPS And Beach Street SPS Operating Scenarios Analysis

REGION OF PEEL

REGION OF PEEL WASTEWATER MODELLING ROSTER

BEECHWOOD SPS AND BEACH STREET SPS OPERATING SCENARIOS ANALYSIS

OCTOBER 30, 2022



REGION OF PEEL WASTEWATER MODELLING ROSTER

BEECHWOOD SPS AND BEACH STREET SPS OPERATING SCENARIOS ANALYSIS

REGION OF PEEL

VERSION 1.0

PROJECT NO.: 181-13778-00
DATE: OCTOBER 2022

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QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE
Date	October 30, 2022
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Project number	181-13778-00

1 INTRODUCTION 1
1.1 Background 1
1.2 Overview 1
1.3 Existing (2022) Sewer System 1
2 HYDRAULIC GRADE LINE ANALYSIS 2
2.1 Sewer Design Evaluated 2
2.2 Acceptable Level of Service 3
2.3 Design Criteria for New Sewers 4
2.4 Limit of Analysis 4
2.5 Base Model 4
2.6 Model Updates 4
2.6.1 Future Developments 4
2.6.2 Sewer Network Scenarios 5
2.7 Operating Scenarios 5
2.8 Modelling Methodology 6
3 OPERATING SCENARIO 1 ANALYSIS 7
3.1 Existing Network Results 7
3.1.1 Dry Weather Flow (DWF) Condition 7
3.1.2 Wet Weather Flow (WWF) Condition 8
3.2 Ultimate Network Results 8
3.2.1 Dry Weather Flow (DWF) Condition 9
3.2.2 Wet Weather Flow (WWF) Condition 9
4 OPERATING SCENARIO 2 ANALYSIS 12
4.1 Existing Network Results 12
4.1.1 Dry Weather Flow (DWF) Condition 12
4.1.2 Wet Weather Flow (WWF) Condition 13
4.2 Ultimate Network Results 13
4.2.1 Dry Weather Flow (DWF) Condition 14
4.2.2 Wet Weather Flow (WWF) Condition 14

5 CONCLUSION 17

6 BIBLIOGRAPHY 18

TABLES

TABLE 2-1 FUTURE DEVELOPMENTS 5
TABLE 3-1 OPERATING SCENARIO 1 - EXISTING NETWORK – DRY WEATHER FLOW MODEL RESULTS 7
TABLE 3-2 OPERATING SCENARIO 1 - EXISTING NETWORK - WET WEATHER FLOW MODEL RESULTS 8
TABLE 3-3 OPERATING SCENARIO 1 - ULTIMATE NETWORK – DRY WEATHER FLOW MODEL RESULTS 9
TABLE 3-4 OPERATING SCENARIO 1 - ULTIMATE NETWORK – WET WEATHER FLOW MODEL RESULTS 10
TABLE 3-5 OPERATING SCENARIO 1 - ULTIMATE NETWORK – COMPARISON AGAINST EXISTING NETWORK RESULTS 11
TABLE 4-1 OPERATING SCENARIO 2 - EXISTING NETWORK – DRY WEATHER FLOW MODEL RESULTS 12
TABLE 4-2 OPERATING SCENARIO 2 - EXISTING NETWORK – WET WEATHER FLOW MODEL RESULTS 13
TABLE 4-3 OPERATING SCENARIO 2 - ULTIMATE NETWORK – DRY WEATHER FLOW MODEL RESULTS 14
TABLE 4-4 OPERATING SCENARIO 2 - ULTIMATE NETWORK – WET WEATHER FLOW MODEL RESULTS 15
TABLE 4-5 OPERATING SCENARIO 2 - ULTIMATE NETWORK – COMPARISON AGAINST EXISTING NETWORK RESULTS 16

APPENDICES

A **Figures**

B **Operating Scenario 1 Results**

B-1 Operating Scenario 1 Existing Network Results

B-2 Operating Scenario 1 Ultimate Network Results

C **Operating Scenario 2 Results**

C-1 Operating Scenario 2 Existing Network Results

C-2 Operating Scenario 2 Ultimate Network Results

1 INTRODUCTION

1.1 BACKGROUND

WSP was retained by the Region of Peel (Region) to complete the design for the diversion of flows from the Beach Street Sewage Pumping Station (SPS). In November 2017, WSP presented a review of three independent options for servicing of the Beach Street SPS catchment area to the Region. The Region selected the option to divert flows from Beach Street SPS to Beechwood SPS, optimize the gravity sewer alignment, and upgrade Beach Street SPS to current regulatory standards for service as a training facility and as a back-up pumping station to Beechwood SPS. The sewer route along Aviation Road and Lakeshore Road East was recommended as the preferred gravity sewer alignment.

By August 2022, WSP advanced the design past the 30% design stage, incorporating a 1200 mm diameter sewer with low flow channel by tunnel along Lakeshore Road East and Aviation Road, and other sewer upgrades along Hampton Cres and Lakeside Avenue. The Region asked WSP to examine the performance of the design in the 2041 population scenario.

1.2 OVERVIEW

In June 2022, WSP Canada Inc. (WSP) was retained by the Region of Peel (the Region) to complete the analysis of two operational failure scenarios within the sewershed of Beechwood Sewage Pumping Station (SPS) and Beach Street SPS in support of the design of proposed sewers and the Beach Street SPS Diversion Environmental Assessment. This report provides an assessment of the sanitary sewer network capacity in its existing (2022) state and in its ultimate (2041) state in the 2041 population scenario under two operating scenarios where in one or both of Beechwood SPS and Beach Street SPS do not have power. The purpose of the report is to evaluate the effectiveness of the sewers proposed as part of WSP's design in providing hydraulic capacity within the system and mitigating basement flooding in emergency operating conditions.

1.3 EXISTING (2022) SEWER SYSTEM

There are some key characteristics of the existing (2022) sewer system that should be noted. The Beach Street SPS has an overflow to Lake Ontario (Lake).

Due to the hydraulic conditions of the catchment area, should a flooding event occur at the Beechwood SPS, the sewage would be diverted to the siphons under Cooksville Creek (south of Lakeshore Road East) until it reaches Beach Street SPS and eventually outlets to Lake Ontario through the pumping station's overflow pipe. This diversion occurs once the water reaches the elevation of 74.814 m at the 900 mm overflow pipe located at SMH-6569719 along Beechwood Avenue. Beechwood SPS does not have its own emergency overflow. Rather, it shares the same overflow pipe that is located at the Beach Street SPS.

2 HYDRAULIC GRADE LINE ANALYSIS

Using the InfoWorks model provided by the Region, this report provides an assessment of sanitary sewer capacity within the sewer network connecting Beach Street SPS to the Beechwood SPS under the 2041 population scenario. The sewer networks assessed were the existing (2022) sewer network and the ultimate (2041) sewer network, which included the proposed sewers.

2.1 SEWER DESIGN EVALUATED

Since November 2017, the detailed design of the preferred gravity sewer alignment has been and continues to be developed by WSP in discussion with the Region. As of August 2, 2022, the proposed design evaluated in this memorandum within the scope of the Beach Street SPS Diversion project composed of the following:

- Proposed 1200 mm diameter sewer with low flow channel by deep tunnel along Lakeshore Road East from Beechwood Avenue to Aviation Road and along the entirety of Aviation Road. An approximate cross section of the pipe is shown in **Figure 2-1**.
- Proposed 525 mm sewer along Lakeshore Rd East from Aviation Road to West Avenue.
- Upgrade of Hampton Cres sewer to 375 mm from Montbeck Crescent to Lakeside Avenue.
- Proposed 375 mm sewer along Lakeside Avenue to Aviation Road.
    - Local flows from Hampton Cres and Lakeside Avenue are directed to the proposed 375 mm sewer on Lakeside Ave and eventually conveyed to the 1200 mm diameter sewer with low flow channel on Aviation Road.
- Proposed weir (crest elevation 74.625 m) at Hampton Cres and Lakeside Avenue that enables overflow from proposed 375 mm sewer to existing 900 mm under surcharge conditions.
    - The existing 900 mm sewer, 675 mm, and 750 mm sewer along Lakeside Ave are only used to convey flow from the siphon under Cooksville Creek or overflow from the proposed 375 mm local sewer on Lakeside Avenue.
- Proposed weir (crest elevation 74.034 m) at Lakeside Ave and Aviation Rd that enables overflow from proposed 375 mm to the existing 750 mm sewer along Lakeside Rd that conveys flow southwards to the Beach Street SPS, which is the existing flow path.
- Upgrade 300 mm sewer connecting Cawthra Road sewer to proposed Lakeshore Road East sewer to 450 mm.

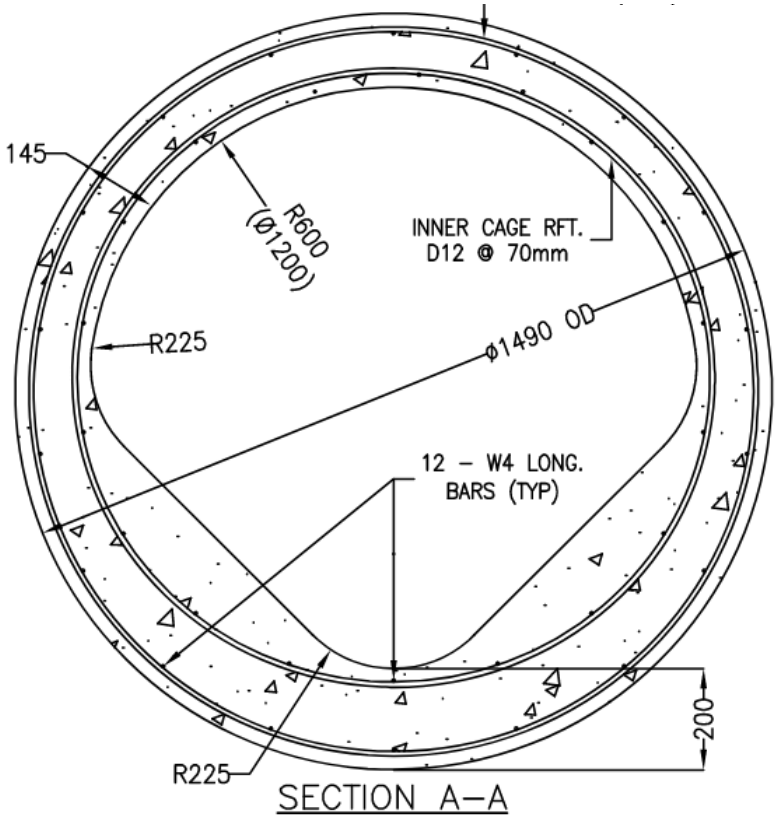

Figure 2-1 Cross Section of Proposed 1200 mm Sewer with Low Flow Channel

However, the sanitary sewer system upgrades implemented in the model are not limited to the proposed design sewers within WSP's design scope for the ultimate (2041) network condition analysis. The additional upgrades are described in detail in **Section 2.6.2.**

Figure 2-2 in **Appendix A** illustrates the design sewers evaluated within this memorandum alongside with the proposed upgrades outside of WSP's design scope. Since the sewer design has only proceeded past the 30% design stage, the design is subject to change after the completion of the HGL analysis.

2.2 ACCEPTABLE LEVEL OF SERVICE

During extreme wet weather flow events, the sewer system must perform in a manner that ensures that all surrounding properties are adequately safeguarded from flooding. This requirement has been translated to the following Level of Service (LOS) criteria by the Region:

- In 5-year 12-hour SCS storm, sewer pipes are not greater than 85% full (d/D < 85%).
- In 25-year 12-hour SCS storm, the HGL elevation in the sewers is lower (deeper) than 1.8 m below ground surface.
- In 100-year 12-hour SCS storm, the HGL elevation in the sewers is below ground surface.

Satisfying these criteria allows the Region to properly operate the sanitary sewer system. The HGL freeboard requirement of depth greater than 1.8 m below the road grade for both existing and proposed sewers will also prevent property damage as a result of sewer backups that may be caused by the high flow rates experienced by the overall sewer system during a 25-year storm event. However, for sewers located in an area where there

are no service connections, such as ravines and parks, this requirement is waived as there are no service connections to protect.

2.3 DESIGN CRITERIA FOR NEW SEWERS

The following criteria are used to design new (upsized) sewers. The criteria are from Region of Peel, Public Works Design Criteria Manual, Sanitary Sewers, 2009 (modified March 2017).

- Maximum flow velocity: 3.5 m/s;
- Minimum flow velocity: 0.75 m/s.

2.4 LIMIT OF ANALYSIS

The limit of analysis is bounded by Lakeshore Road East to the north, East Avenue to the east, Richey Crescent, Lakeside Avenue, and Beach Street to the south, and Beechwood Avenue to the west. The sewers and manholes included within the limit of analysis are sewer pipes and nodes that connect Beechwood SPS and Beach Street SPS or are within a close proximity of these pipes. The limit of analysis is depicted in **Figure 2-3** in **Appendix A.**

The limit of analysis is composed of 83 nodes (manholes or junctions) that are adjacent to pipes that are connected to basements of residential or ICI properties via sanitary laterals. Nodes connected only to sewers that are not connected to basements, such as those connected to inverted siphons, were excluded from the HGL analysis.

2.5 BASE MODEL

The base model used was the ultimate condition model provided by the Region. This model had the sanitary sewer network updated until September 2016 and 2041 population projections. This model originated as a master plan model from the Region.

2.6 MODEL UPDATES

2.6.1 FUTURE DEVELOPMENTS

Three future developments within the sewershed of Beechwood SPS and Beach Street SPS were incorporated into the model as per the direction of the Region. These developments are expected to be constructed by 2041. The Region provided the estimated design flows of the developments. The future developments incorporated and their sanitary design flows are listed in **Table 2-1**. The proposed sanitary flows were added as additional flows on top of the 2041 population base model and incorporated into all network scenarios analyzed.

Table 2-1 Future Developments

DEVELOPMENT ADDRESS/NAME	PROPOSED SANITARY DESIGN FLOW (L/S)
725 Village Green Blvd	11
958-960 East Avenue	5
Rangeview Development	151

2.6.2 SEWER NETWORK SCENARIOS

This model runs two different sewer network scenarios:

- Existing (2022) Network - This is the 2022 existing sewer network.
- Ultimate (2041) Network – This is the existing sewer network with planned upgrades in the sanitary sewer system.

Through a review of the sewer network within the limit of analysis, the existing sewer network was found to be different from that on the Region of Peel's sewer asset GIS data along Beechwood Ave, Richey Cres, Montbeck Cres, and Hampton Cres. These pipes were upgraded and modified after the base model was developed in 2016. The model network was updated to match the Region's sewer asset data within the limit of analysis. This model scenario was deemed to be the existing network scenario.

The ultimate (2041) sewer network was developed by appending wastewater infrastructure upgrades to the updated existing sewer network. The modelled sewer infrastructure upgrades included:

- Proposed sewer design detailed in Section 2.1 which are within WSP's scope for the design of the Beach Street SPS diversion sewers.
- An assumed design of 300 to 525 mm sewers from West Avenue to Hydro Rd. that conveys flow from the planned Rangeview development to the proposed 1200 mm tunnel sewer. Only flows from this development are incorporated as the detail design of these sewers is outside of the project scope.
- Proposed 1800 mm sewer diverting all flows from Front Street SPS to Richard Memorial SPS, which is outside the scope of the Beach Street SPS diversion project.

Figure 2-2 in **Appendix A** illustrates the proposed upgrades in the ultimate sewer network.

2.7 OPERATING SCENARIOS

To analyze the behaviour of the sanitary sewer system under operational failure scenarios, this model runs two different operating scenarios:

- Operating scenario 1: No power at Beechwood SPS and power at Beach Street SPS.
- Operating scenario 2: No power at Beechwood SPS and no power at Beach Street SPS.

Pumps at pumping station are modelled as off during the no-power state. Flows continue to fill up the wet well at each pumping station in the no-power state.

2.8 MODELLING METHODOLOGY

A digital copy of the InfoWorks model was provided to WSP by the Region. The model includes two networks representing the existing and ultimate conditions. The model uses the calibrated sanitary flow generation rates for both existing and future population. The calibrated generation rate for the pertinent sewershed was assigned to the future developments. To be conservative, the inflow and infiltration from the existing condition was assumed to be the same as that in the post-redevelopment condition.

An analysis was performed to identify the impacts of operational scenarios to the existing sanitary sewer system and ultimate sanitary sewer system using 2041 population conditions. The sanitary capacity was investigated under dry-weather flow (DWF), 5-year, 25-year, 100-year, and July 8, 2013 storm conditions. The 5-year to 100-year storms are simulated using the respective Brampton 12-hour SCS storms. These SCS design storms start at 12:00 AM and end at 12:00 PM, with the peak intensity rainfall occurring at 6:00 AM.

July 8, 2013 is a historical extreme storm that was simulated using GARR data provided by the Region. Within the limit of analysis, the rainfall in the July 8, 2013 event begins at 3:45 PM on July 8, 2013 and has a peak rainfall intensity of 137 mm/hr, equivalent to 100-year storm in the local system.

The following scenarios were modelled and examined:

- Existing network with operational scenario 1 (baseline)
- Ultimate network with operational scenario 1 (ultimate)
- Existing network with operational scenario 2 (baseline)
- Ultimate network with operational scenario 2 (ultimate)

The results for each operating scenario were compared between the two networks to determine the impact of the proposed upgrades on the hydraulic capacity of the sanitary sewer system. The hydraulic performance of the system was quantified using 4 metrics:

- the number of nodes violating HGL criteria (HGL freeboard of less than 1.8 m).
- time of spill at 900 mm pipe at SMH-6569719, which connects flows from Beechwood Avenue to that at Aviation Road.
- time to first node violating HGL criteria, representing time to first basement flooding, within the limit of analysis for manholes with sufficient cover of 1.8 m or over.
- the total volume of overflow from Beach Street SPS to Lake Ontario during the simulation period.

3 OPERATING SCENARIO 1 ANALYSIS

Operating scenario 1 was simulated for both the existing and ultimate network scenarios as described in Section 2.7. In this scenario, Beechwood SPS has no power and while Beach Street SPS has power. As such, the pumps at Beechwood SPS are not functioning while those at Beach Street PS are functioning in operating scenario 1.

Capacity of the sanitary system is investigated under the 2041 population scenario for both the existing and ultimate network scenarios. This section discusses the results of the HGL analysis for the two networks discussed in **Section 2.6.2**.

3.1 EXISTING NETWORK RESULTS

The simulation for the existing (2022) sanitary sewer network in operating scenario 1 is discussed in this section. This simulation determines the baseline state for the sanitary sewer network to compare against the impacts of the proposed sewer infrastructure upgrades on the hydraulic grade line. Complete modeling results are shown in **Appendix B-1**.

3.1.1 DRY WEATHER FLOW (DWF) CONDITION

Simulation results under DWF conditions show that the sanitary system is surcharging upstream of the Beach St SPS under operating scenario 1. Sewers along Beach Street and upstream of Beach Street SPS are surcharged due to capacity constraints or due to backwater effects. Results also show that some sewers upstream of the Beach Street SPS does not operate within the acceptable level of service in operating scenario 1 under DWF conditions. Note that the dry weather simulation has a 2-day run time.

Dry weather flow modelling results for the existing network in operating scenario 1 is summarized in **Table 3-1** and displayed in **Figure B-1-1** in **Appendix B-1**.

Table 3-1 Operating Scenario 1 - Existing Network – Dry Weather Flow Model Results

PARAMETER	VALUE
% of nodes with HGL freeboard of less than 1.8 m	13%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	2:55
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	10:20
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	0

13% of the manholes within the limit of analysis did not meet the HGL freeboard criteria of 1.8 m in operating scenario 1 under DWF conditions. Most of these manholes are located upstream of Beach Street SPS, along Montbeck Cres and upstream of those sewers. There was no overflow from Beach Street SPS to Lake Ontario.

3.1.2 WET WEATHER FLOW (WWF) CONDITION

The performance of the sanitary sewer system under wet weather flow (WWF) conditions is modelled using four rainfall events described in Section 2.8.

Simulation results show that the sanitary system is surcharging due to backwater effects or capacity constraints for the majority of the pipes within the limit of analysis due to pump failure at Beechwood SPS. Sanitary sewers immediately upstream of the Beach Street SPS are surcharged due to capacity constraints. Results also show that the majority of the existing sanitary sewer system does not operate within the acceptable level of service under the 5-year and 25-year WWF conditions.

Wet weather flow modelling results for the existing (2022) network analysis are summarized in **Table 3-2** and displayed in **Figure B-1-2 to B-1-5** in **Appendix B-1**.

Table 3-2 Operating Scenario 1 - Existing Network - Wet Weather Flow Model Results

PARAMETER	5-YEAR	25-YEAR	100-YEAR	2013-07-08
% of nodes with HGL freeboard of less than 1.8 m (basement flooding)	25%	42%	63%	52%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	2:45	2:40	2:35	16:05
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	6:00	5:55	5:55	16:55
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	0	0	646	0

Across the four rainfall events, 25% to 63% of the manholes within the limit of analysis did not meet the HGL freeboard criteria. The time to first basement flooding decreased as the peak intensity of the storms increased. There was no overflow from the Beach Street SPS under the 5-year, 25-year, and 2013-07-08 storm event under operating scenario 1. However, there was overflow to the Lake under the 100-year design storm.

3.2 ULTIMATE NETWORK RESULTS

The simulation for the ultimate (2041) sanitary sewer network under operating scenario 1 is discussed in this section. This simulation determines the ultimate state for the sanitary sewer network used to determine the impacts of the proposed sewer infrastructure upgrades on the hydraulic grade line. Complete modeling results are shown in **Appendix B-2**.

3.2.1 DRY WEATHER FLOW (DWF) CONDITION

Simulation results under DWF conditions show that the sanitary system is surcharging upstream of the Beach St SPS under operating scenario 1. Note that the dry weather simulation has a 2-day run time.

The sewer pipes that are connected to basements that are surcharged due to backwater effects include sewers along Beach Street and Goodwin Road just upstream of Beach Street and along Richey Crescent. The proposed 1200 mm sewer along Lakeshore Road East and Aviation Road is also surcharged, however, it is not directly connected to basements via laterals. These pipes do not operate within the acceptable level of service under DWF conditions. Results show that most of the existing sanitary sewer system operates within the acceptable level of service in operating scenario 1 under DWF conditions.

Compared with the existing network condition, the proposed sewer system upgrades provided a 11% reduction in manholes that have HGL freeboard of less than 1.8 m and eliminates basement flooding at all locations where cover is sufficient (greater than 1.8 m) within the limit of analysis.

Dry weather flow modelling results for the ultimate network and the net improvement over the existing network are summarized in **Table 3-3** and displayed in **Figure B-2-1** in **Appendix B-2**.

Table 3-3 Operating Scenario 1 - Ultimate Network – Dry Weather Flow Model Results

PARAMETER	VALUE	INCREASE COMPARED TO EXISTING NETWORK
% of nodes with HGL freeboard of less than 1.8 m	2%*	-11%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	6:10	3:15
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	N/A	∞
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	0	0

*The 2% is accounted for by two manhole locations where the cover depth of its adjacent sewers is less than 1.8 m. These locations will always have a HGL freeboard of less than 1.8 m.

3.2.2 WET WEATHER FLOW (WWF) CONDITION

The performance of the ultimate sanitary sewer system under wet weather flow (WWF) conditions is modelled using four rainfall events described in Section 2.8.

Simulation results show that the following sewers do not operate within the acceptable level of service under the 5-year storm:

- Existing sewers along Beechwood Ave, Richey Cres, Beach Street, Goodwin Road
- Proposed 1200 mm sewer with low flow channel via tunnel along Aviation Road and Lakeshore Rd East to the Beechwood SPS. (Not connected directly to basements)

However, the majority of the sanitary system operates within the acceptable level of service under the 5-year storm. The sanitary system meets the HGL freeboard criteria of 1.8 m at all manholes where cover depth is sufficient in the 5-year storm.

Some sewers do not operate within the acceptable level of service under the 25-year storm. Simulation results show that the sanitary system is surcharging due to backwater effects for the majority of the pipes within the limit of analysis due to pump failure at Beechwood SPS for the 25-year, 100-year, and 2013-07-08 storms. In the 25-year storm, all except one manhole location with sufficient cover operates within the acceptable level of service.

Compared with the existing network scenario, the proposed sewer system upgrades provided, on average, a 25% reduction in manholes that have HGL freeboard of less than 1.8 m, most of which are located in the sanitary network upstream of the Beach Street SPS. The proposed design sewers eliminated basement flooding in the 5-year storm within the limit of analysis. However, it provided minimal additional time to the first basement flooding occurrence and minimal reduction in the overflow volume to Lake Ontario.

Moreover, the surcharging due to capacity constraints upstream of Beach Street pumping station in the existing network scenario is changed to surcharging due to backwater in the ultimate network scenario. This is due to the additional capacity provided by the proposed sewer upgrades.

Wet weather flow modelling results for the ultimate network analysis are summarized in **Table 3-4** and displayed in **Figure B-2-2 to B-2-5** in **Appendix B-2**. The comparison of the results between the existing and ultimate networks is summarized in **Table 3-5**.

Table 3-4 Operating Scenario 1 - Ultimate Network – Wet Weather Flow Model Results

PARAMETER	5-YEAR	25-YEAR	100-YEAR	2013-07-08
% of nodes with HGL freeboard of less than 1.8 m	2%	4%	43%	19%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	5:40	5:30	5:20	16:40
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	N/A	6:00	6:00	17:10
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	0	0	365	0

Table 3-5 Operating Scenario 1 - Ultimate Network – Comparison Against Existing Network Results

PARAMETER (COMPARISON IS ULTIMATE-EXISTING)	DWF	5-YEAR	25-YEAR	100-YEAR	2013-07-08	AVERAGE ACROSS DWF AND WWF
Increase in % of nodes with HGL freeboard of less than 1.8 m	-11%	-23%	-39%	-19%	-33%	-25%
Increase in time of spill of 900 mm pipe at SMH-6569719 (h:mm)	3:15	2:55	2:50	2:45	0:35	2:28
Increase in time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	N/A	N/A	0:05	0:05	0:15	0:08
Increase in overflow volume from Beach Street SPS to Lake within simulation period (m^3)	0	0	0	-281	0	-
Percent increase in overflow volume from Beach Street SPS to Lake within simulation period (%)	0%	0%	0%	-43%	0%	-

In scenario 1, the flow path of the backflows from Beechwood and Beach Street PS are illustrated in **Figure B-2-6**. The flow propagates southwards (upstream) in the 1200 mm existing sewer along Beechwood Ave, eastwards along Richey Cres, through the siphon under Cooksville Creek, and continues eastwards towards Beach Street SPS. The flow within Beechwood Avenue and Aviation Road sewers are initially hydraulically disconnected but are then connected after the HGL elevation rises above invert of the 900 mm pipe at SMH-6569719 and flows are conveyed eastwards through the siphons under Cooksville Creek.

4 OPERATING SCENARIO 2 ANALYSIS

Operating scenario 2 was simulated using the updated model for both the existing and ultimate network scenarios as described in Section 2.7. In this scenario, both Beechwood SPS and Beach Street SPS have no power and as such its pumps are not functional in operating scenario 2. Flows conveyed to the pumping stations are expected to fill up the wet well and then generate backwater effects in the upstream sewers.

Capacity of the sanitary system is investigated under the 2041 population scenario for both existing and ultimate network scenarios. This section discusses the results of the HGL analysis for the two networks discussed in Section 2.6.2.

4.1 EXISTING NETWORK RESULTS

The simulation for the existing (2022) sanitary sewer network is discussed in this section. This simulation determines the baseline state for the sanitary sewer network to compare against the impacts of the proposed sewer infrastructure upgrades on the hydraulic grade line. Complete modeling results, including capacity analysis results as well as hydraulic grade lines (HGLs), are shown in **Appendix C-1**.

4.1.1 DRY WEATHER FLOW (DWF) CONDITION

Simulation results under DWF conditions show that the sanitary system is surcharging upstream of the Beach Street SPS and Beechwood SPS. This accounts for the majority of the limit of analysis. Results also show that the existing sanitary sewer system does not operate within the acceptable level of service under DWF conditions. Note that the dry weather simulation has a 2-day run time.

Dry weather flow modelling results for the existing network in operating scenario 2 is summarized in **Table 4-1** and displayed in **Figure C-1-1** in **Appendix C-1**.

Table 4-1 Operating Scenario 2 - Existing Network – Dry Weather Flow Model Results

PARAMETER	VALUE
% of nodes with HGL freeboard of less than 1.8 m	41%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	2:50
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	2:55
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	60,539

41% of the manholes within the limit of analysis did not meet the HGL freeboard criteria of 1.8 m.

4.1.2 WET WEATHER FLOW (WWF) CONDITION

The performance of the sanitary sewer system under wet weather flow (WWF) conditions is modelled using four rainfall events described in Section 2.8.

Simulation results show that the sanitary system is surcharging due to backwater effects for the majority of the pipes within the limit of analysis due to failure at both pumping stations. Sanitary sewers immediately upstream of the Beechwood SPS and Beach Street SPS are surcharged due to capacity constraints. Results also show that the majority of the existing sanitary sewer system does not operate within the acceptable level of service under the 5-year and 25-year WWF conditions.

Wet weather flow modelling results for the existing (2022) network analysis in operating scenario 2 are summarized in **Table 4-2** and displayed in **Figure C-1-2 to C-1-5** in **Appendix C-1**.

Table 4-2 Operating Scenario 2 - Existing Network – Wet Weather Flow Model Results

PARAMETER	5-YEAR	25-YEAR	100-YEAR	2013-07-08
% of nodes with HGL freeboard of less than 1.8 m	60%	76%	78%	75%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	2:40	2:35	2:30	16:00
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	2:45	2:40	2:35	15:55
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	29,314	35,411	41,771	27,564

Across the four rainfall events, 60% to 78% of the manholes within the limit of analysis did not meet the HGL freeboard criteria of 1.8 m. The time to first basement flooding decreased as the return period of the storms increased. Overflow volume from Beach Street SPS to the Lake increased as the return period of the storms increased.

4.2 ULTIMATE NETWORK RESULTS

The simulation for the ultimate sanitary sewer network is discussed in this section. This simulation determines the ultimate state for the sanitary sewer network used to determine the impacts of the proposed sewer infrastructure upgrades on the hydraulic grade line. Complete modeling results, including capacity analysis results as well as hydraulic grade lines (HGLs), are shown in **Appendix C-2**.

4.2.1 DRY WEATHER FLOW (DWF) CONDITION

Simulation results under DWF conditions show that the sanitary system is surcharging upstream of the Beach Street SPS and Beechwood SPS. This accounts for the majority of the limit of analysis. Results also show that the ultimate sanitary sewer system does not operate within the acceptable level of service under DWF conditions. Note that the dry weather simulation has a 2-day run time.

Dry weather flow modelling results for the ultimate network and the net improvement over the existing network are summarized in **Table 4-3** and displayed in **Figure C-2-1** in **Appendix C-2**.

Table 4-3 Operating Scenario 2 - Ultimate Network – Dry Weather Flow Model Results

PARAMETER	VALUE	INCREASE COMPARED TO EXISTING NETWORK
% of nodes with HGL freeboard of less than 1.8 m	22%	-19%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	4:55	2:05
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	5:05	2:10
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	52,266	-8,273

Compared with the existing network condition, the proposed sewer system upgrades provided a 19% reduction in manholes that have HGL freeboard of less than 1.8 m, provides an additional 2 hours and 10 minutes before the first manhole violates this criteria, and reduction in the peak overflow to Lake Ontario. Moreover, the surcharging due to capacity constraints upstream of Beach Street pumping station in the existing network scenario is changed to surcharging due to backwater in the ultimate network scenario. This is due to the additional capacity provided by the proposed sewer upgrades.

4.2.2 WET WEATHER FLOW (WWF) CONDITION

The performance of the ultimate sanitary sewer system in operating scenario 2 under wet weather flow (WWF) conditions is modelled using four rainfall events described in Section 2.8.

Simulation results show that the sanitary system is surcharging due to backwater effects or due to capacity constraints due to failure at both Beechwood and Beach Street SPSs. Results also show that the majority of sewers within the limit of analysis do not operate within the acceptable level of service under the 5-year design storm (sewer pipes less than 85% full). However, some sewers operate within the acceptable level of service under the 25-year storm (HGL freeboard of greater than 1.8 m at manholes).

Compared with the existing network scenario, the proposed sewer system upgrades provided, on average, a 19% reduction in manholes that have HGL freeboard of less than 1.8 m, most of which are located in the sanitary network upstream of the Beach Street SPS. The proposed upgrades also provided an average of 1 hour and 38 minutes of additional time before the first manhole violates this same criteria and reduction in the peak overflow to Lake Ontario in the 5-year and 25-year storms only.

Moreover, the surcharging due to capacity constraints upstream of Beach Street pumping station in the existing network scenario is changed to surcharging due to backwater in the ultimate network scenario. This is due to the additional capacity provided by the proposed sewer upgrades.

Wet weather flow modelling results for the ultimate network analysis are summarized in **Table 4-4** and displayed in **Figure C-2-2 to C-2-5** in **Appendix C-2**. The comparison of the results between the existing and ultimate networks is summarized in **Table 4-5.**

Table 4-4 Operating Scenario 2 - Ultimate Network – Wet Weather Flow Model Results

PARAMETER	5-YEAR	25-YEAR	100-YEAR	2013-07-08
% of nodes with HGL freeboard of less than 1.8 m	42%	52%	64%	57%
Time of spill of 900 mm pipe at SMH-6569719 (h:mm)	4:25	4:15	4:05	16:35
Time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	4:35	4:25	4:15	16:40
Overflow volume from Beach Street SPS to Lake within simulation period (m^3)	24,362	29,764	35,968	23,278

Table 4-5 Operating Scenario 2 - Ultimate Network – Comparison Against Existing Network Results

PARAMETER (COMPARISON IS ULTIMATE-EXISTING)	DWF	5-YEAR	25-YEAR	100-YEAR	2013-07-08	AVERAGE
Increase in % of nodes with HGL freeboard of less than 1.8 m	-19%	-18%	-24%	-14%	-18%	-19%
Increase in time of spill of 900 mm pipe at SMH-6569719 (h:mm)	2:05	1:45	1:40	1:35	0:35	1:32
Increase in time of first node not meeting HGL Freeboard of 1.8 m (basement flooding) (h:mm)	2:10	1:50	1:45	1:40	0:45	1:38
Increase in overflow volume from Beach Street SPS to Lake within simulation period (m^3)	-8273	-4952	-5647	-5803	-4286	-5792
Percent increase in overflow volume from Beach Street SPS to Lake within simulation period (%)	-14%	-17%	-16%	-14%	-16%	-15%

In operating scenario 2, the flow path of the backflows from Beechwood and Beach Street SPSs are illustrated in **Figure C-2-6.** The flow propagates upstream first in the proposed 1200 mm sewer along Lakeshore Road East and southwards along the sewer on Aviation Road, westwards along Lakeside Avenue, through the siphon below Cooksville Creek, eastwards along Richey Crescent, and northwards along Beechwood Avenue. The flow within Beechwood Avenue and Aviation Road sewers are initially hydraulically disconnected but are then connected after the HGL elevation rises above invert of the 900 mm pipe at SMH-6569719 and flows are conveyed westwards through the siphons under Cooksville Creek. In contrast, in operating scenario 1, flows move in the opposite direction (eastwards) through the siphons.

5 CONCLUSION

The existing (2022) sanitary network does not have sufficient capacity to convey the flow while maintaining the acceptable level of service under the DWF, 5-year, and 25-year 12-hour SCS storms in the 2041 population scenario in both of the following scenarios:

- Operating scenario 1: No power at Beechwood SPS and power at Beach Street SPS.
- Operating scenario 2: No power at Beechwood SPS and no power at Beach Street SPS.

Therefore, the existing network needs to be upgraded to meet the Region's criteria.

The ultimate (2041) network examined included the proposed upgrades designed by WSP and others planned by the Region that provide additional capacity within the system to protect against basement flooding that convey flows from Beach Street SPS to Beechwood SPS as well as service three planned developments within the sewershed.

The InfoWorks model was updated to include the proposed sewer upgrades in the system for the 2041 time-horizon. The simulation results show that the proposed sewers provided approximately 20% reduction in basement flooding in both operating scenarios 1 and 2, quantified by manhole locations where HGL freeboard was less 1.8 m.

In operating scenario 1, the upgrades eliminate most to all basement flooding in the DWF, 5-year, and 25-year design storms. In Scenario 1, the majority of the ultimate network will have acceptable capacity (less than 85% full) under 5-year SCS design storm and HGL freeboard of more than 1.8 m during a 25-year SCS design storm. However, the additional time provided before the first basement floods and reduction in overflow to Lake Ontario is minimal compared with the existing network.

The proposed sewer upgrades provide an additional 2 hours of response time in operating scenario 2 where both Beechwood SPS and Beach Street SPS have no power. This additional time would allow Region operational crew to mobilize and provide a temporary solution, such as the use of backup generators, to this major failure scenario. Moreover, a reduction in overflow to Lake Ontario was observed in the DWF, 5-year, and 25-year storm conditions.

Across the operating scenarios and network conditions, SMH-1783101 at Richey Cres, SMH-1783108 at Lakeside Avenue and Hampton Crescent, and SMH-1781961 at Private Rd were identified as the first nodes to violate the HGL freeboard criteria.

The model results show that the proposed sewers and those planned as part of the ultimate network detailed in Section 2.6.2 increase the capacity of the sanitary system such that basement flooding within the sewershed is reduced, sewage overflow to Lake Ontario is reduced, and the level of service criteria is met in the 5-year and 25-year design storms. Moreover, these proposed sewers can provide additional capacity to service additional future developments planned within the area and convey the flows to Beechwood SPS. The proposed upgrades to the sewer system provides additional protection, particularly under operating scenario 2 (a full area wide power outage), such that operational teams would have a much more reasonable response time to react.

6 BIBLIOGRAPHY

— Region of Peel. (July 2009; Modified March 2017). Public Works Design, Specifications & Procedures Manual, Sanitary Design Criteria.

STANDARD LIMITATIONS

This report was prepared by WSP Canada Inc. (WSP) for the client, Region of Peel, in accordance with the professional services agreement between WSP and the client. This report is based on information provided to WSP which has not been independently verified.

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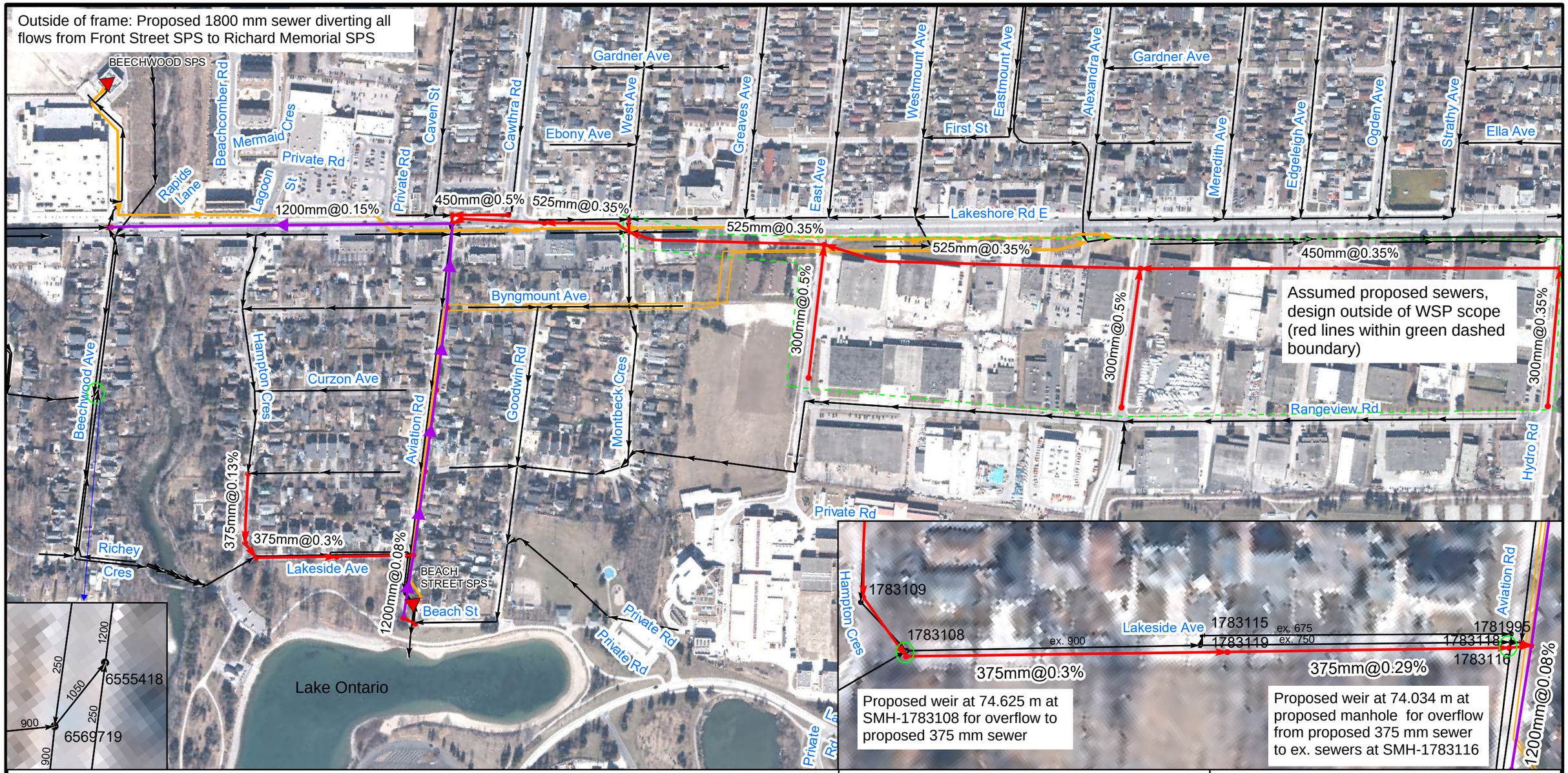
A FIGURES



Legend

- Sewage Pumping Stations
- Proposed Manholes

Proposed or Upgraded Sewers

- Proposed or Upgraded circular sewers
- Proposed 1200 mm sewer with low flow channel by tunnel

Existing Sanitary Infrastructure

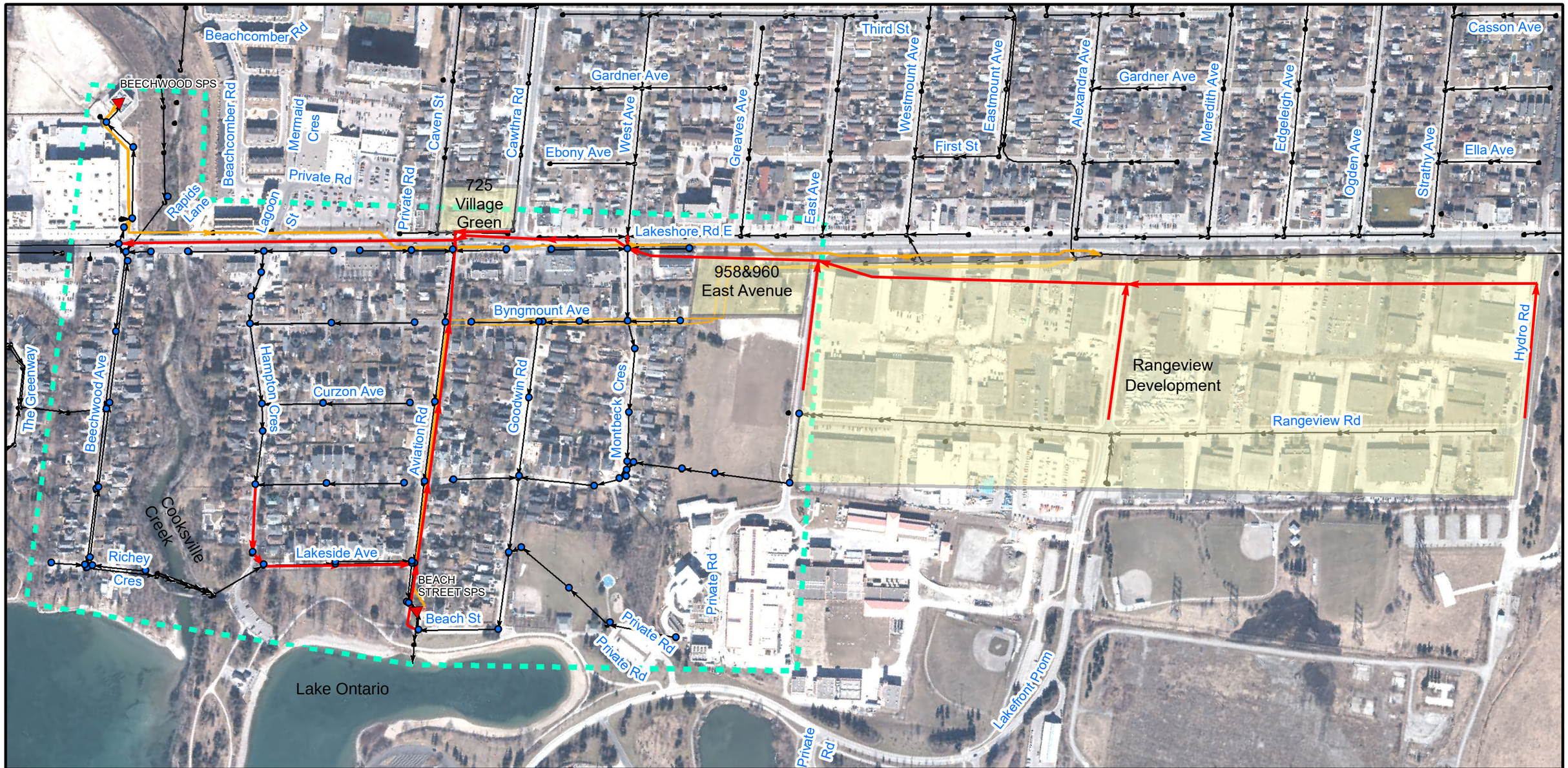
- Existing Forcemain
- Existing Sewer

N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Proposed Design Sewers incorporated in Ultimate Network for Analysis

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: 2-2



Legend

- Sewage Pumping Stations
- Existing Manholes Analyzed within Limit of Analysis
- Existing Manholes outside Limit of Analysis
- Proposed or Upgraded Sewers

Existing Sanitary Infrastructure

- Existing Forcemain
- Existing Sewer
- Limit of Analysis
- Proposed Developments

N

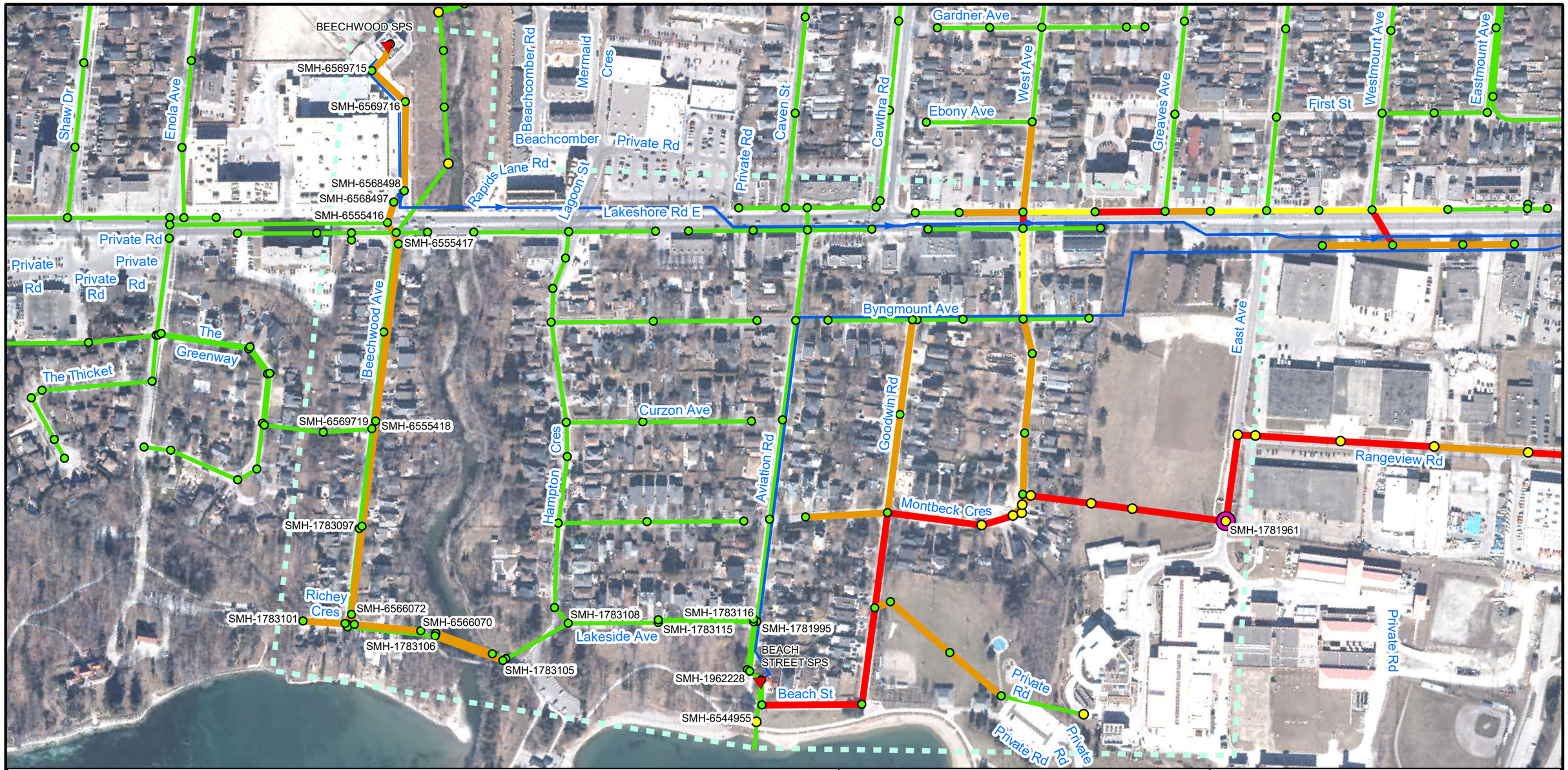
Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Limit of Analysis

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: 2-3

B OPERATING SCENARIO 1 RESULTS

B-1 OPERATING SCENARIO 1 EXISTING NETWORK RESULTS



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Nodes to Violate HGL Freeboard Criteria

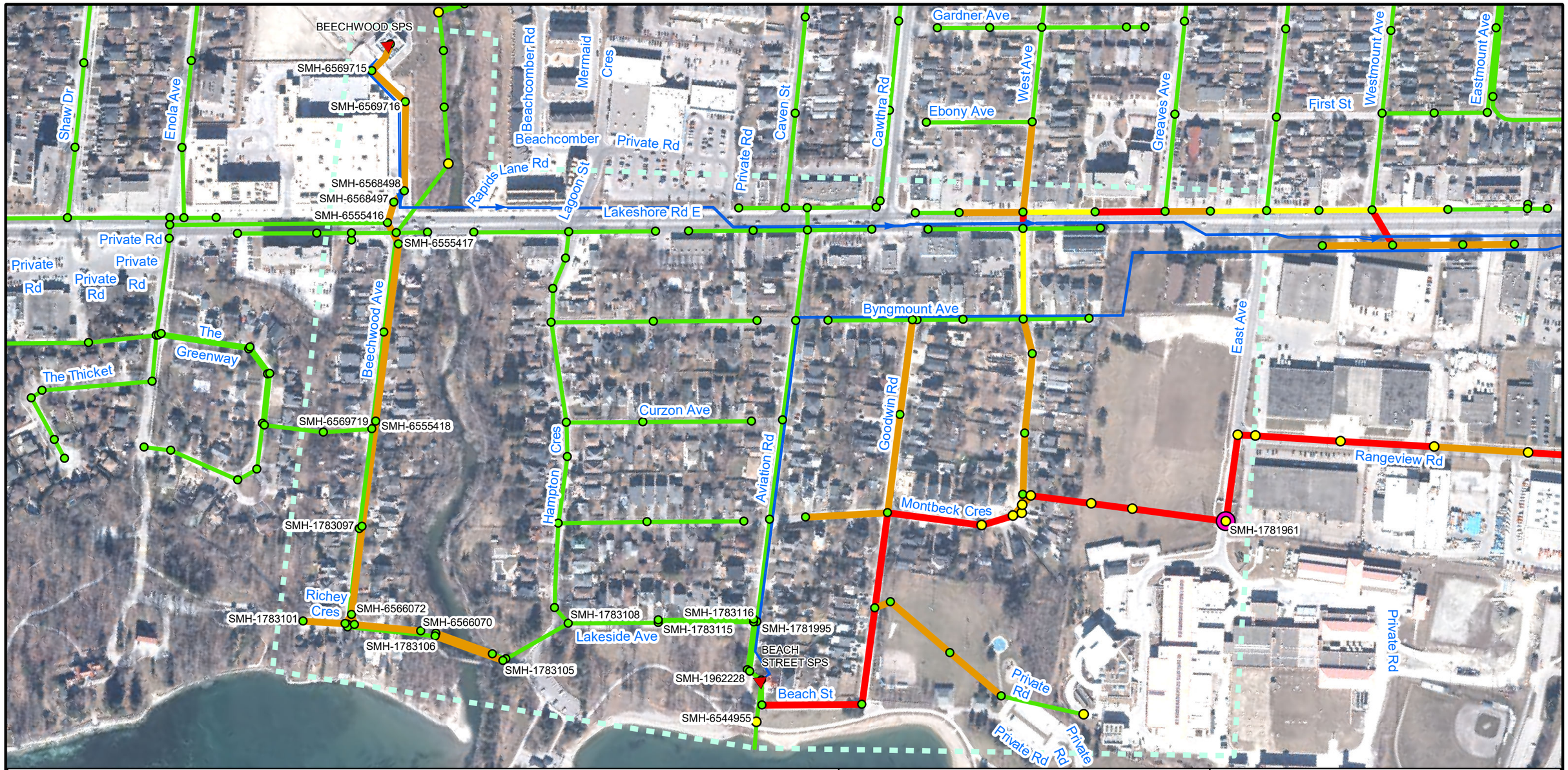
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Existing Network
Dry Weather Flow
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-1-1



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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Sanitary Sewers Surchage State

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- 85% < Surcharge State < 100%
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- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

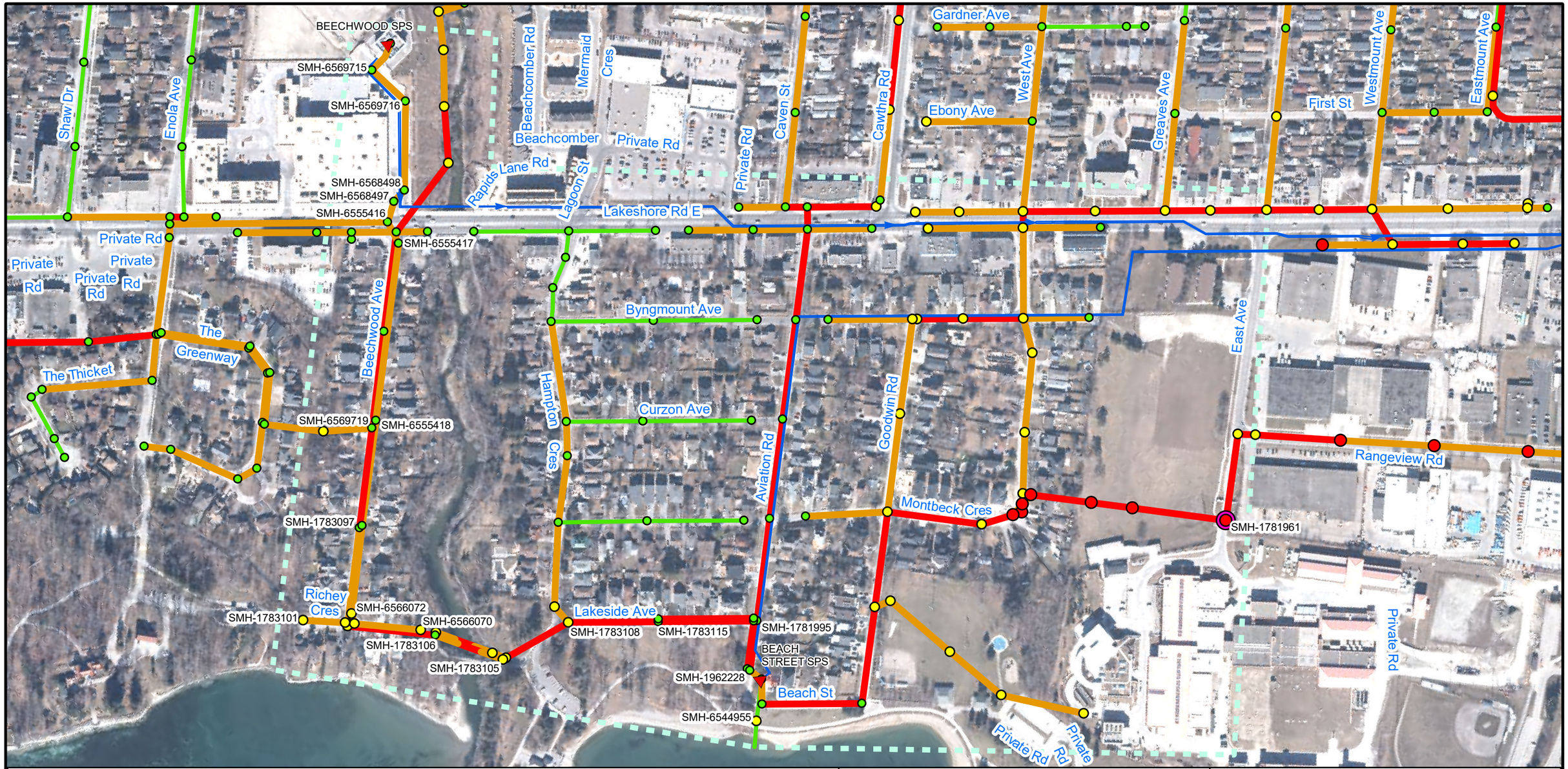
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Existing Network
5-year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-1-2



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
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- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Nodes to Violate HGL Freeboard Criteria

N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Existing Network
25-Year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-1-3

Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

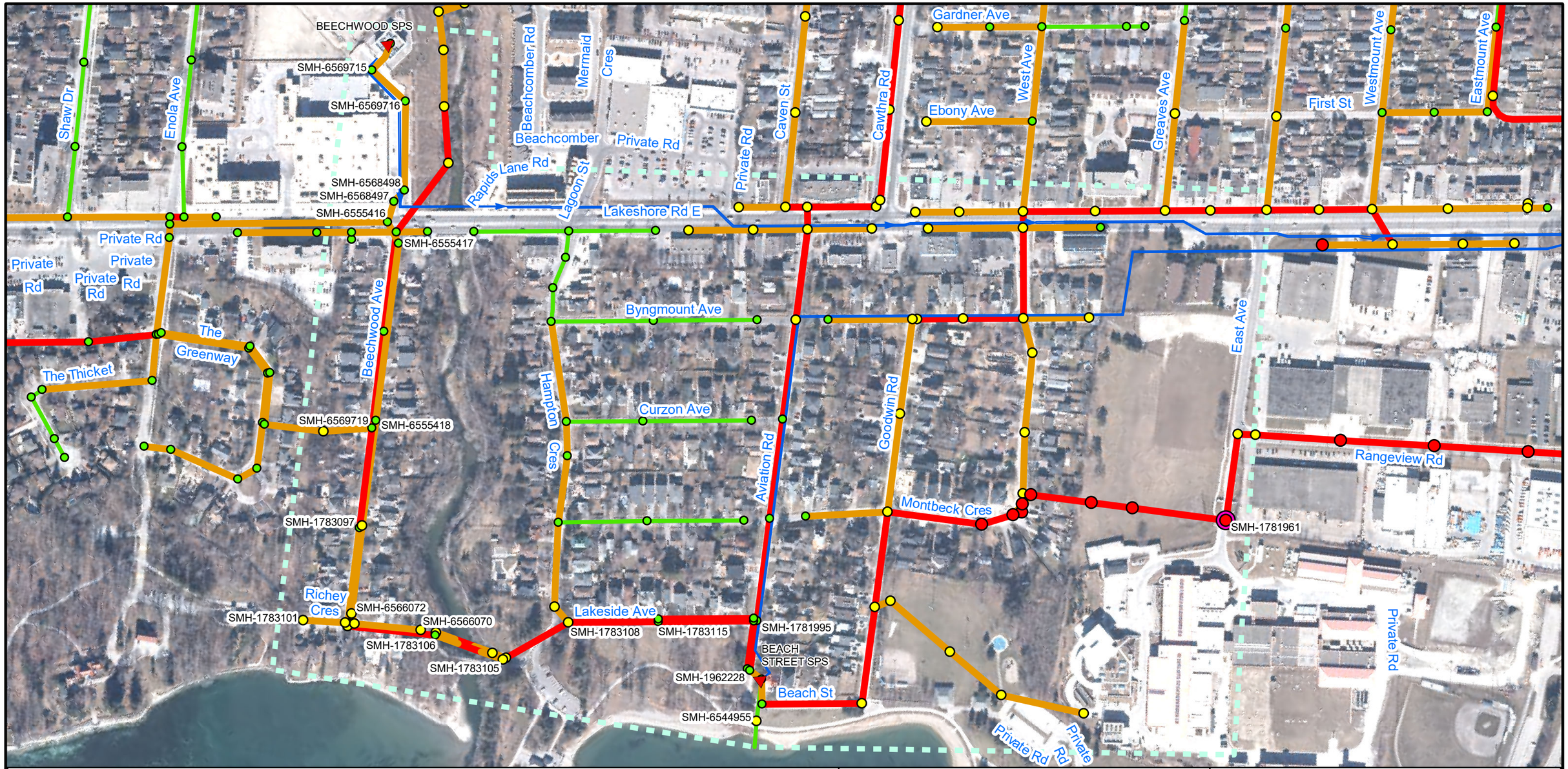
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Existing Network
100-Year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-1-4



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
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- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

N

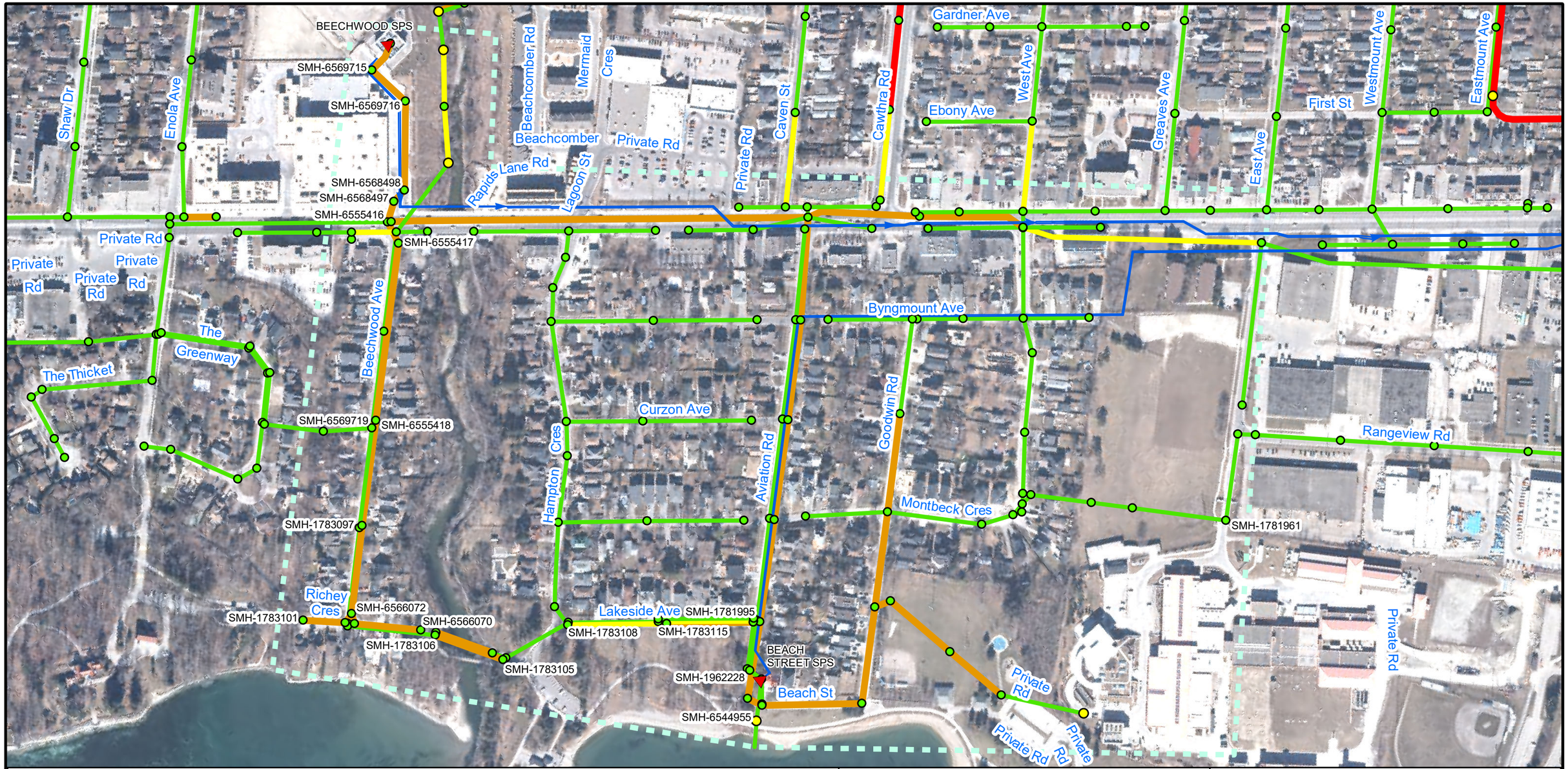
Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Existing Network
July 8, 2013 Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-1-5

B-2 OPERATING SCENARIO 1 ULTIMATE NETWORK RESULTS



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints

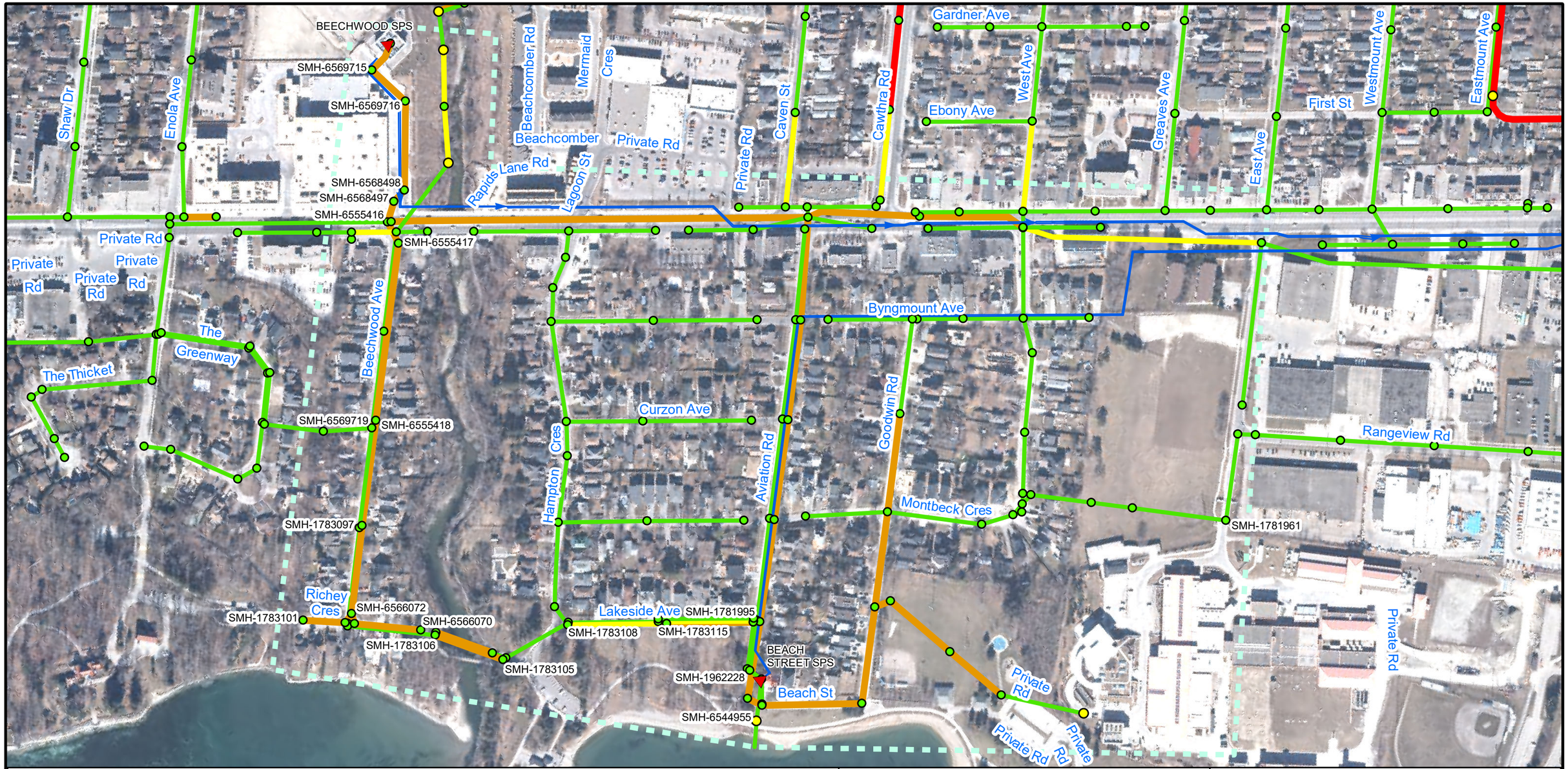
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Ultimate Network
Dry Weather Flow
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-2-1



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
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Sanitary Sewers Surchage State

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- Surcharged due to Capacity Constraints

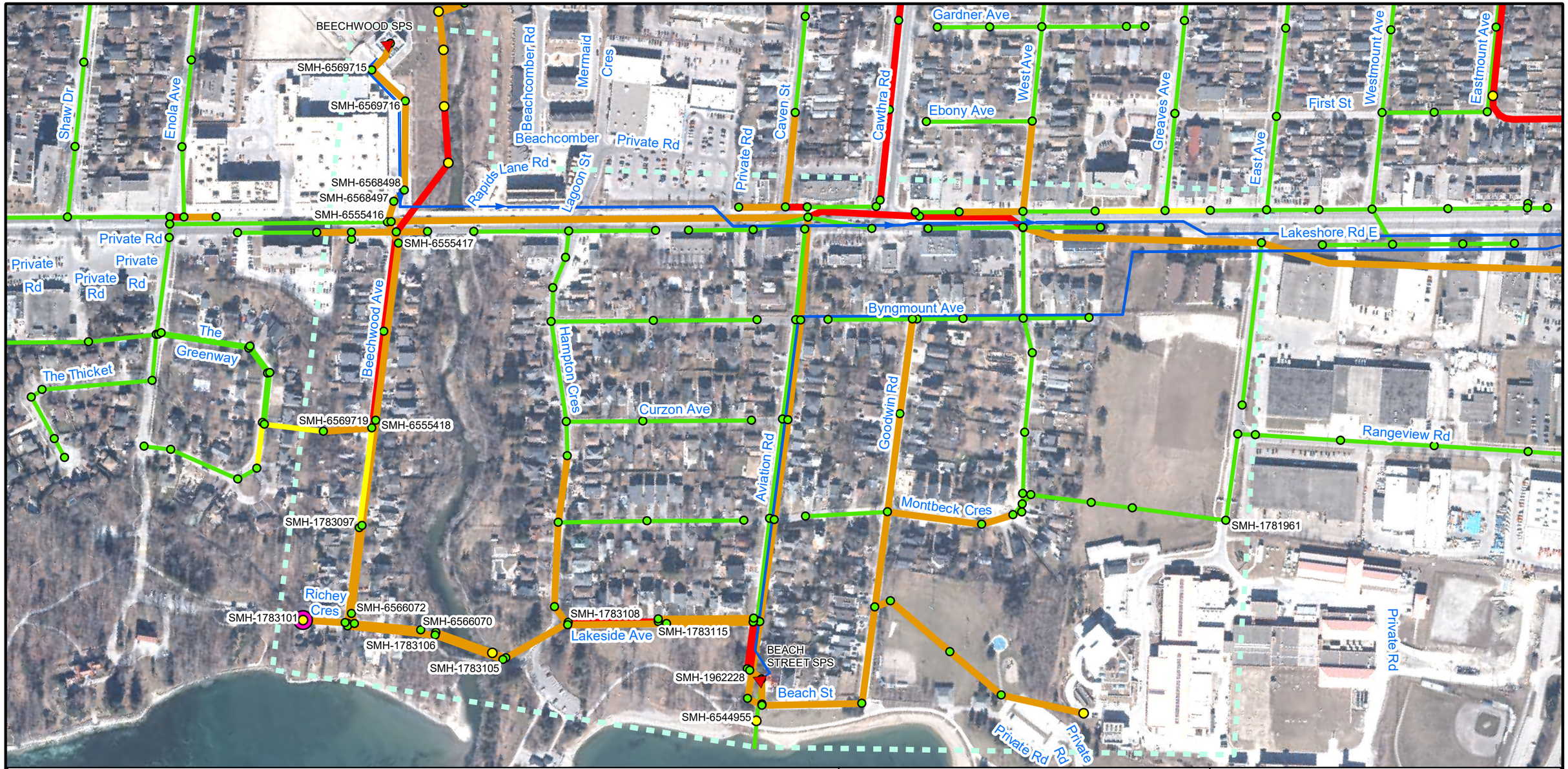
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Ultimate Network
5-Year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-2-2



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Nodes to Violate HGL Freeboard Criteria

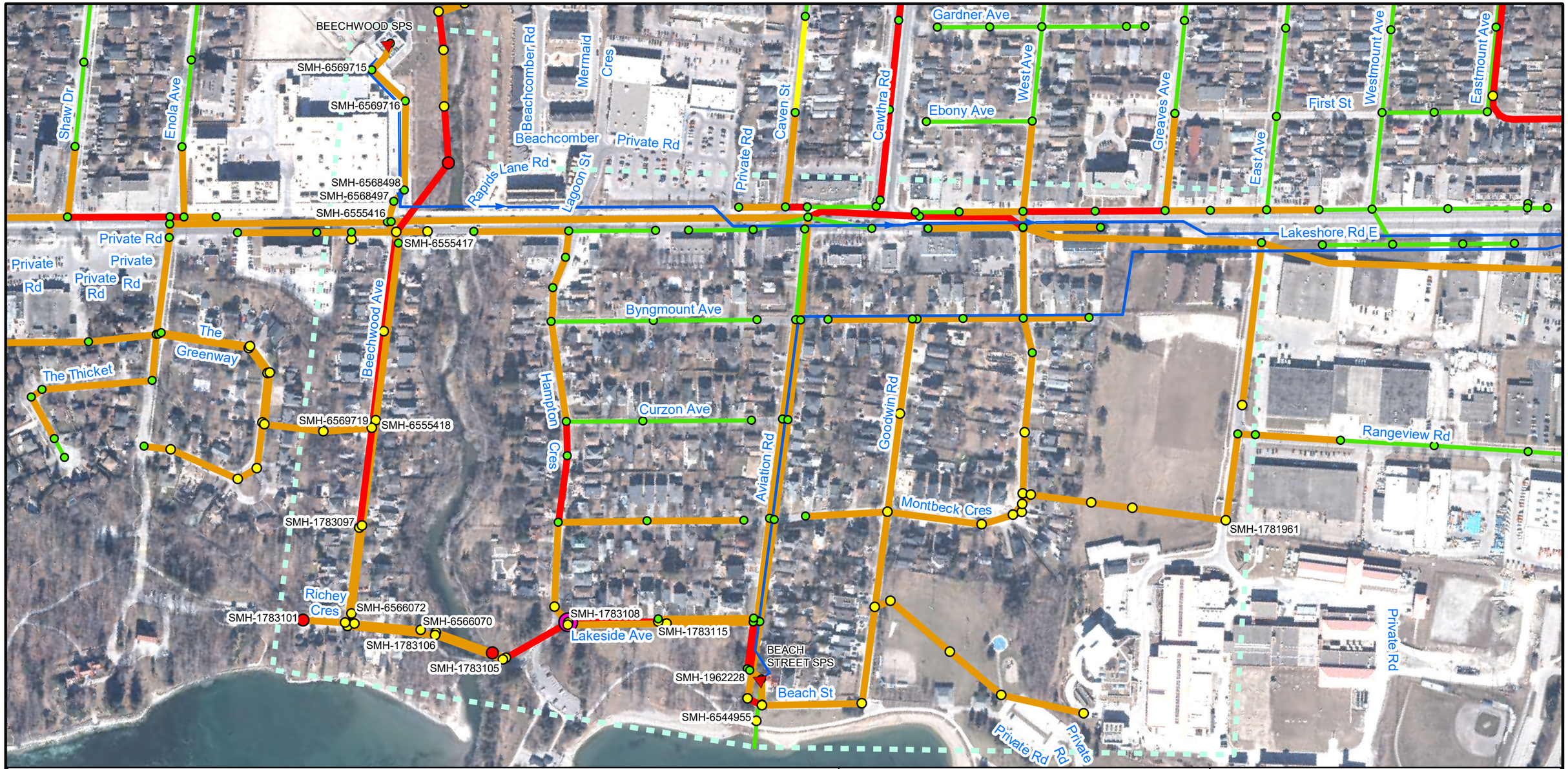
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Ultimate Network
25-Year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-2-3



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Ultimate Network
100-Year Storm
Model Results

wsp

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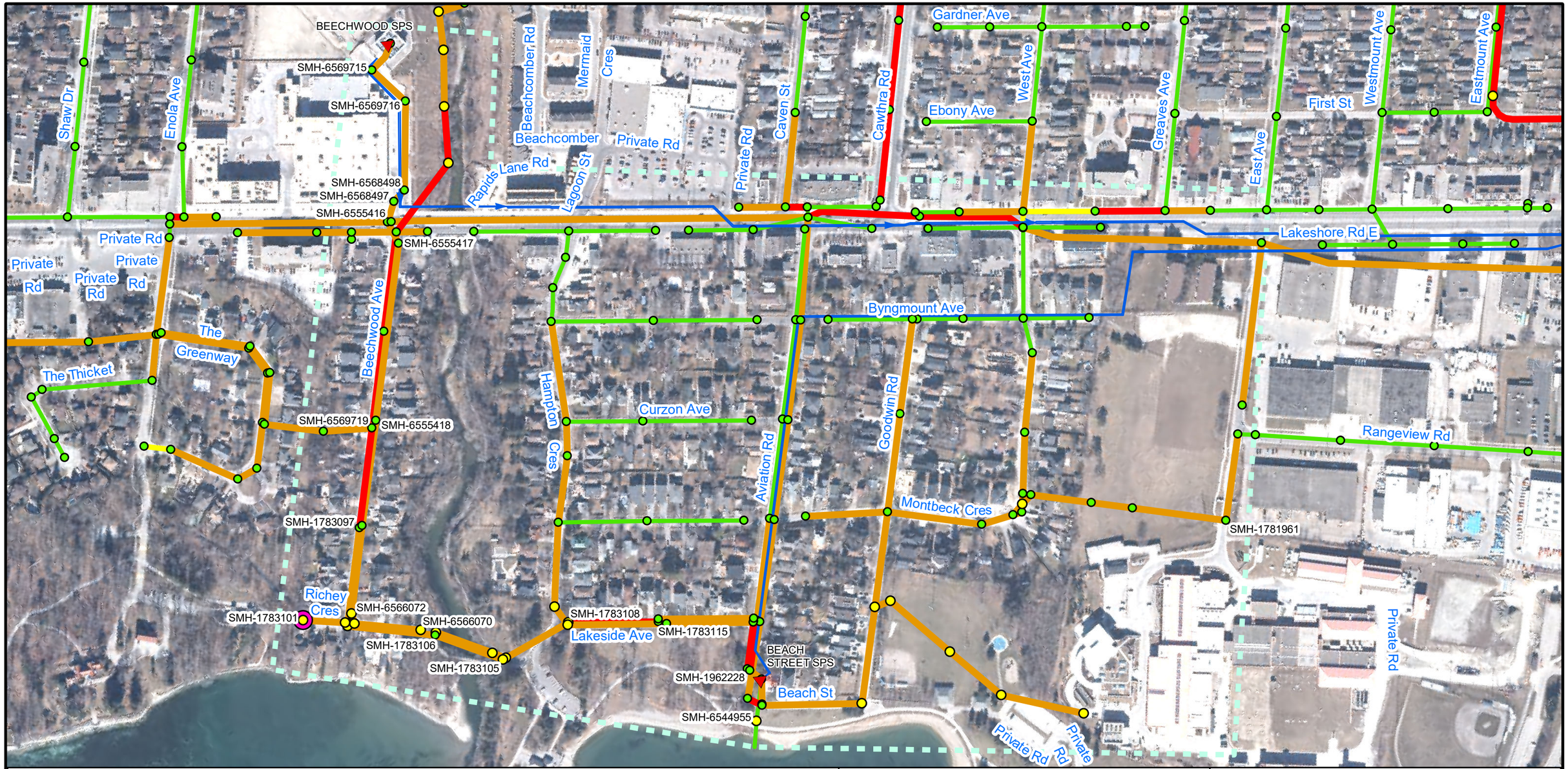
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-2-4



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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Sanitary Sewers Surchage State

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- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Nodes to Violate HGL Freeboard Criteria

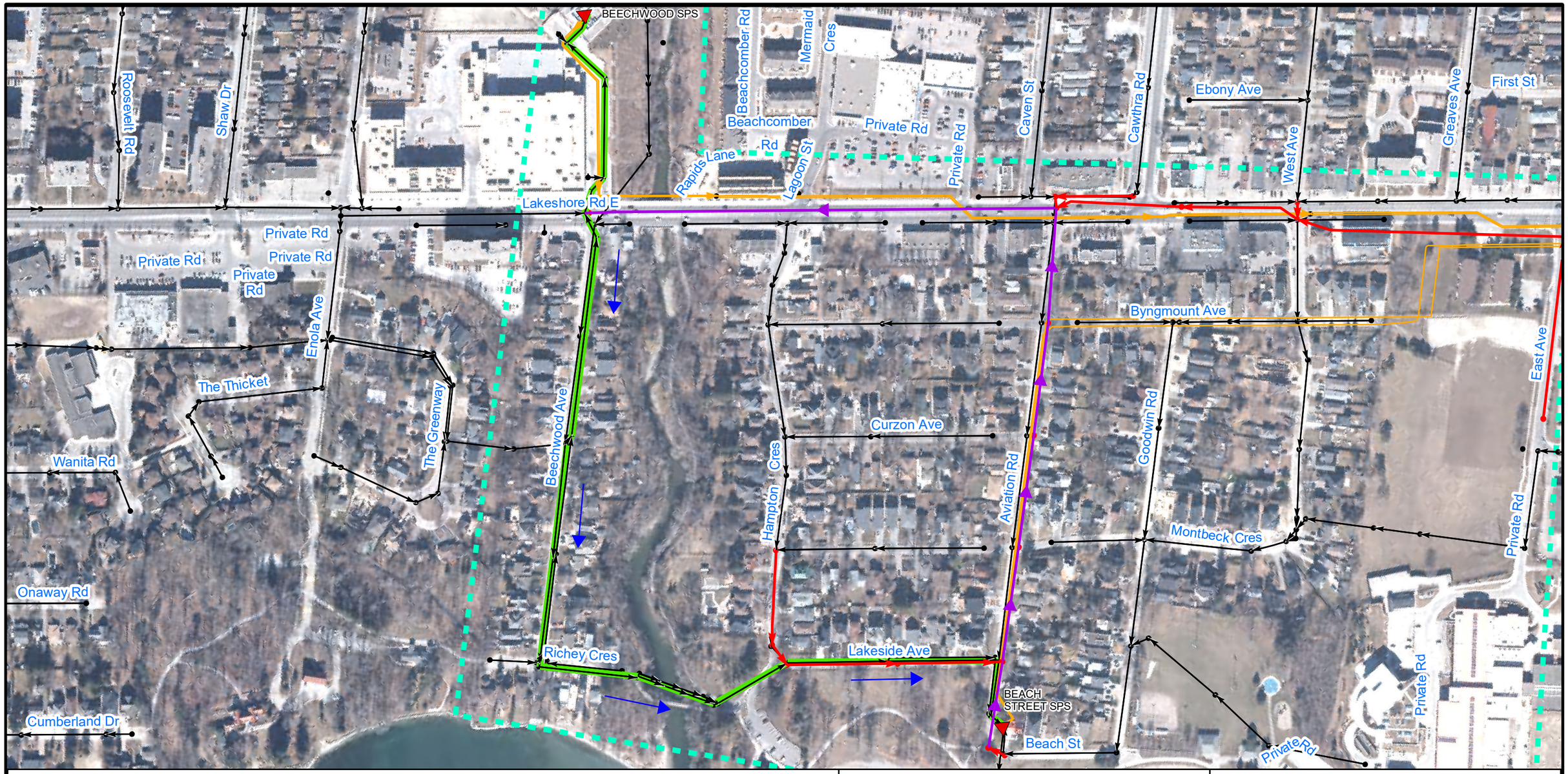
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 1
Ultimate Network
July 8, 2013 Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-2-5



Legend

- Sewage Pumping Stations

Proposed or Upgraded Sewers

- Proposed or Upgraded circular sewers
- Proposed 1200 mm Low Flow Pipe by Tunnel

Existing Sanitary Infrastructure

- Existing Forcemain
- Existing Sewer
- Spill Path of Backflow from Beechwood SPS
- Limit of Analysis
- Existing Manholes
- Proposed Manholes

N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

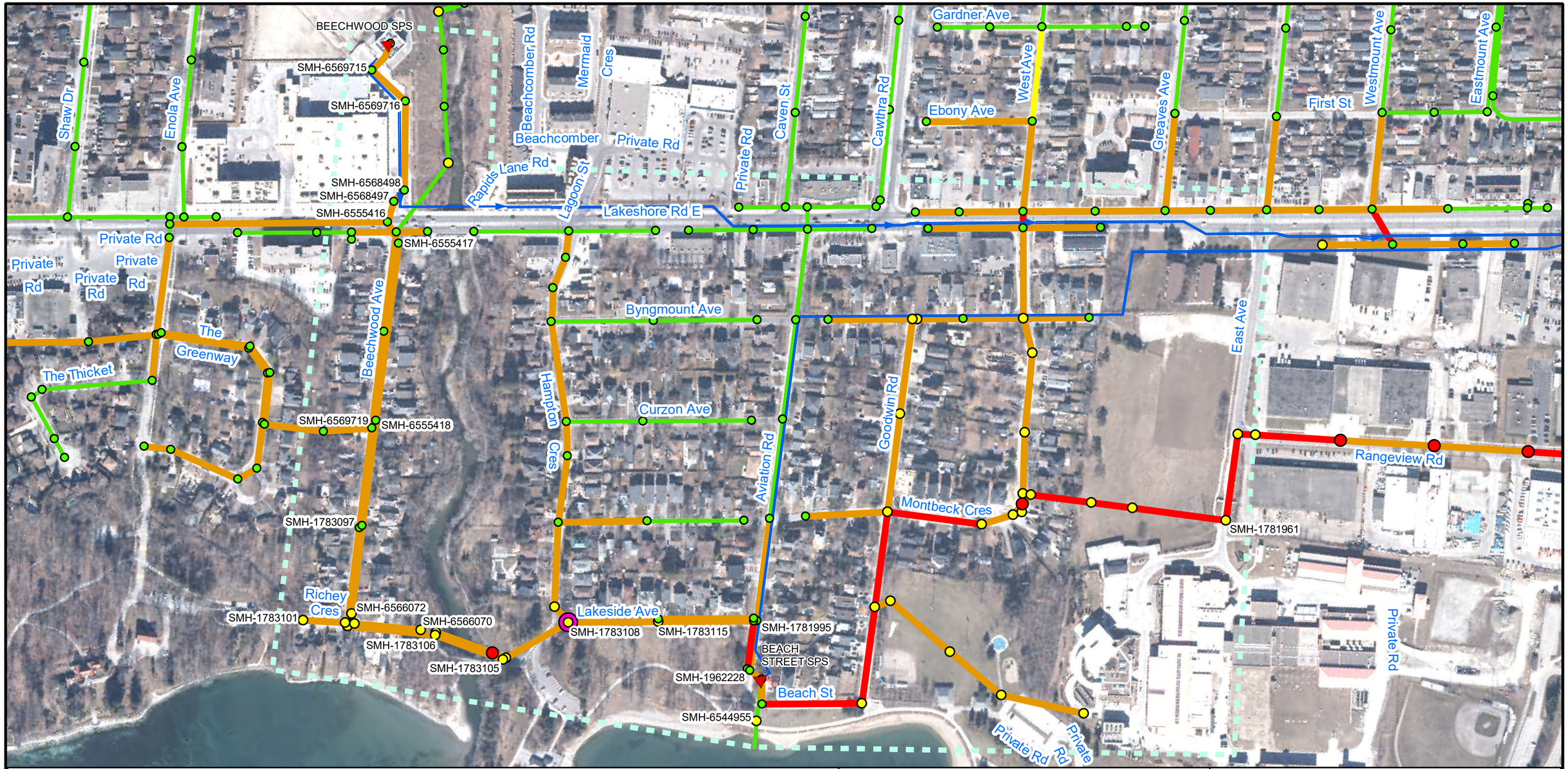
Operating Scenario 1
Ultimate Network
Flow Path of Backflow from Beechwood SPS

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: B-2-6

C OPERATING SCENARIO 2 RESULTS

C-1 OPERATING SCENARIO 2 EXISTING NETWORK RESULTS



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Nodes to Violate HGL Freeboard Criteria

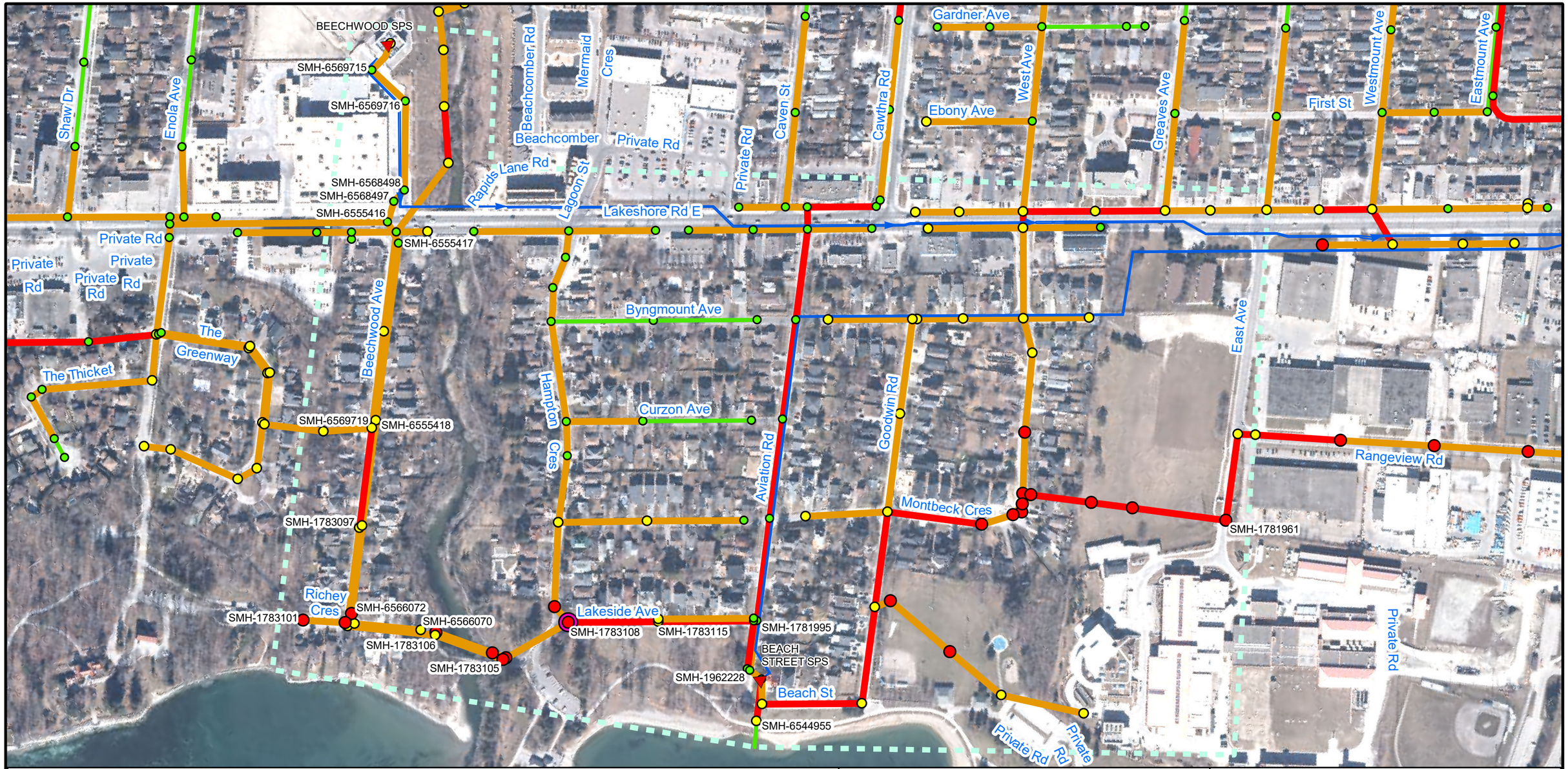
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Existing Network
Dry Weather Flow
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-1-1



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

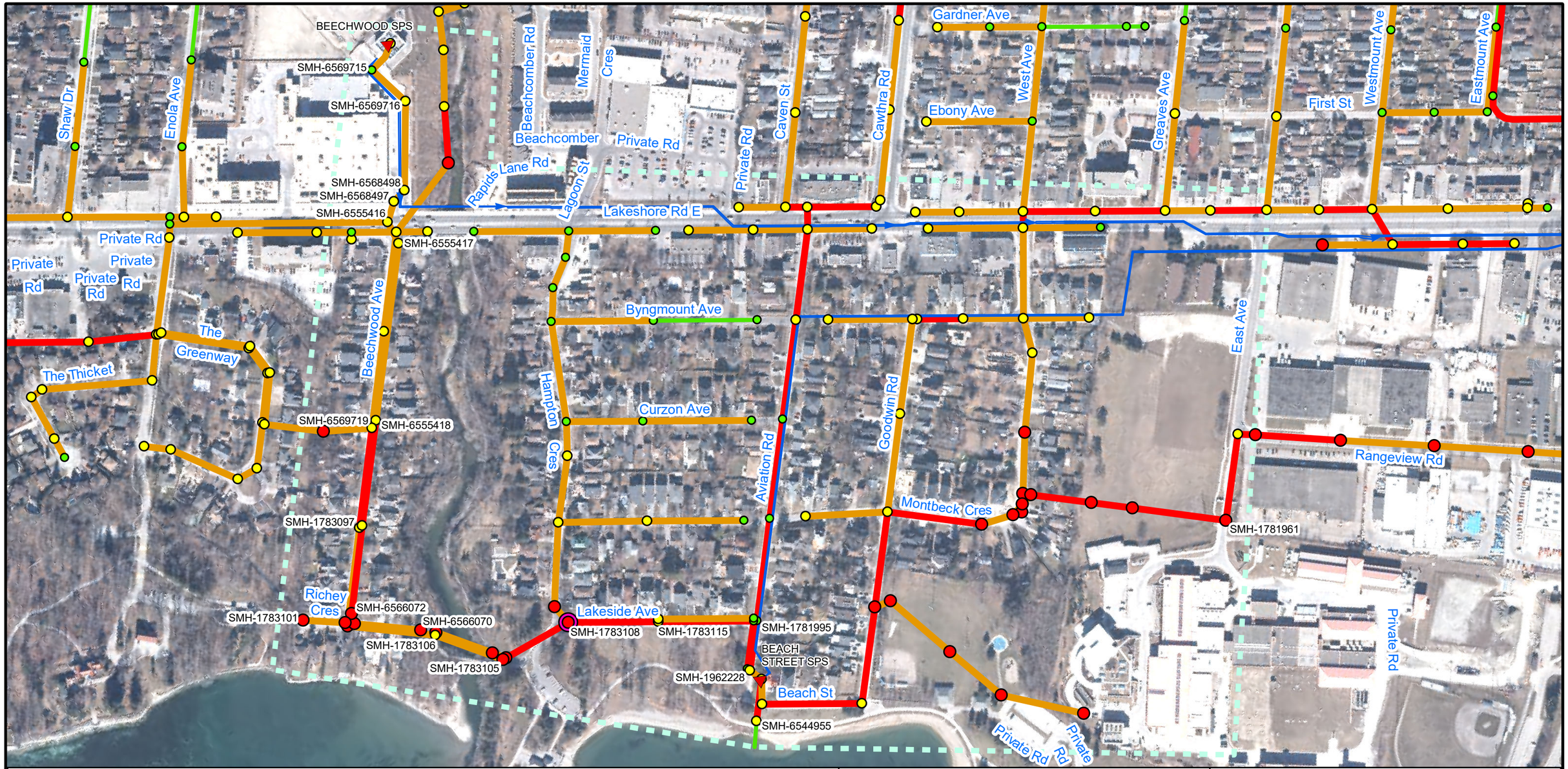
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Existing Network
5-year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-1-2



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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Sanitary Sewers Surchage State

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- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

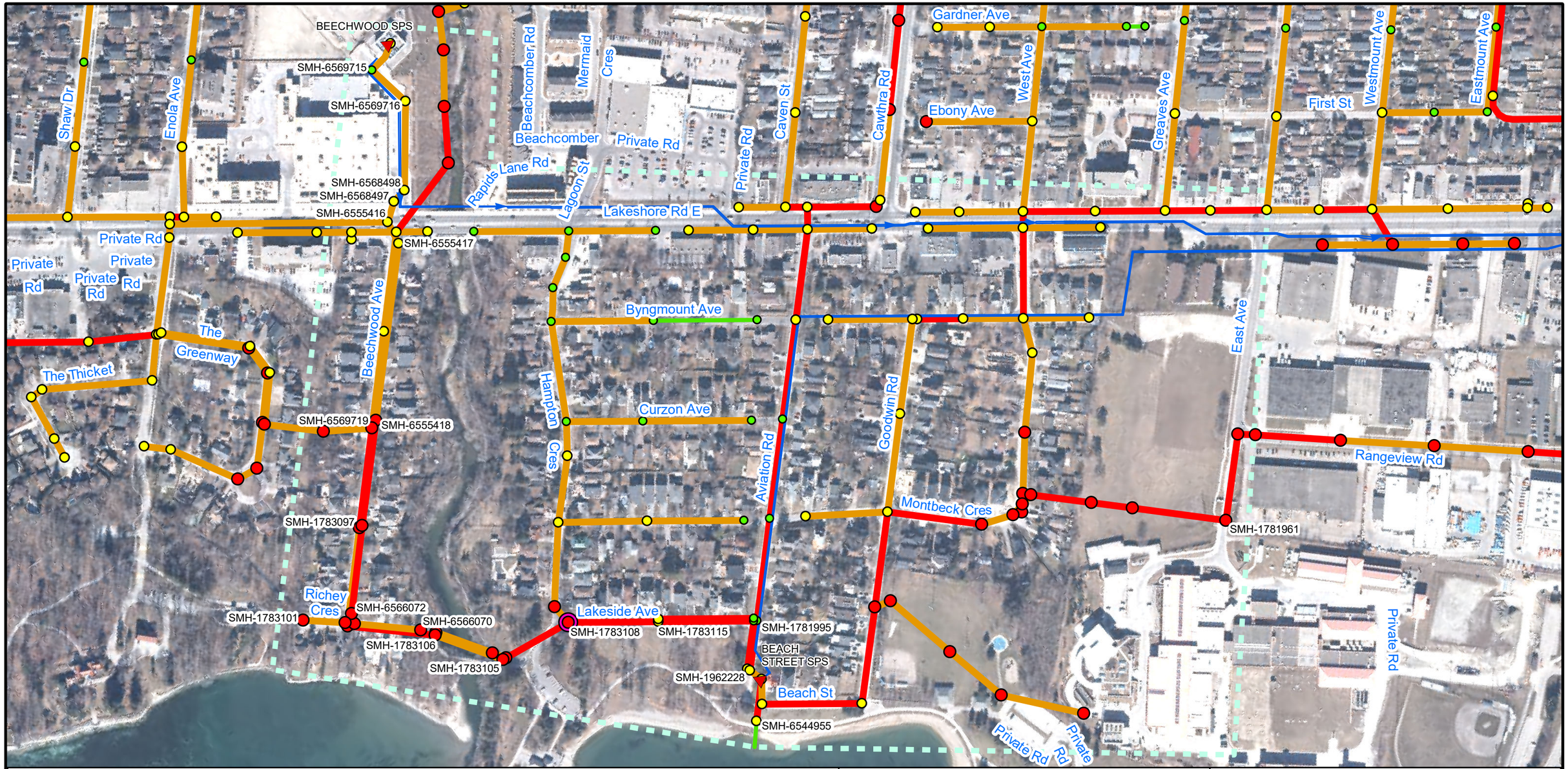
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Existing Network
25-year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-1-3



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

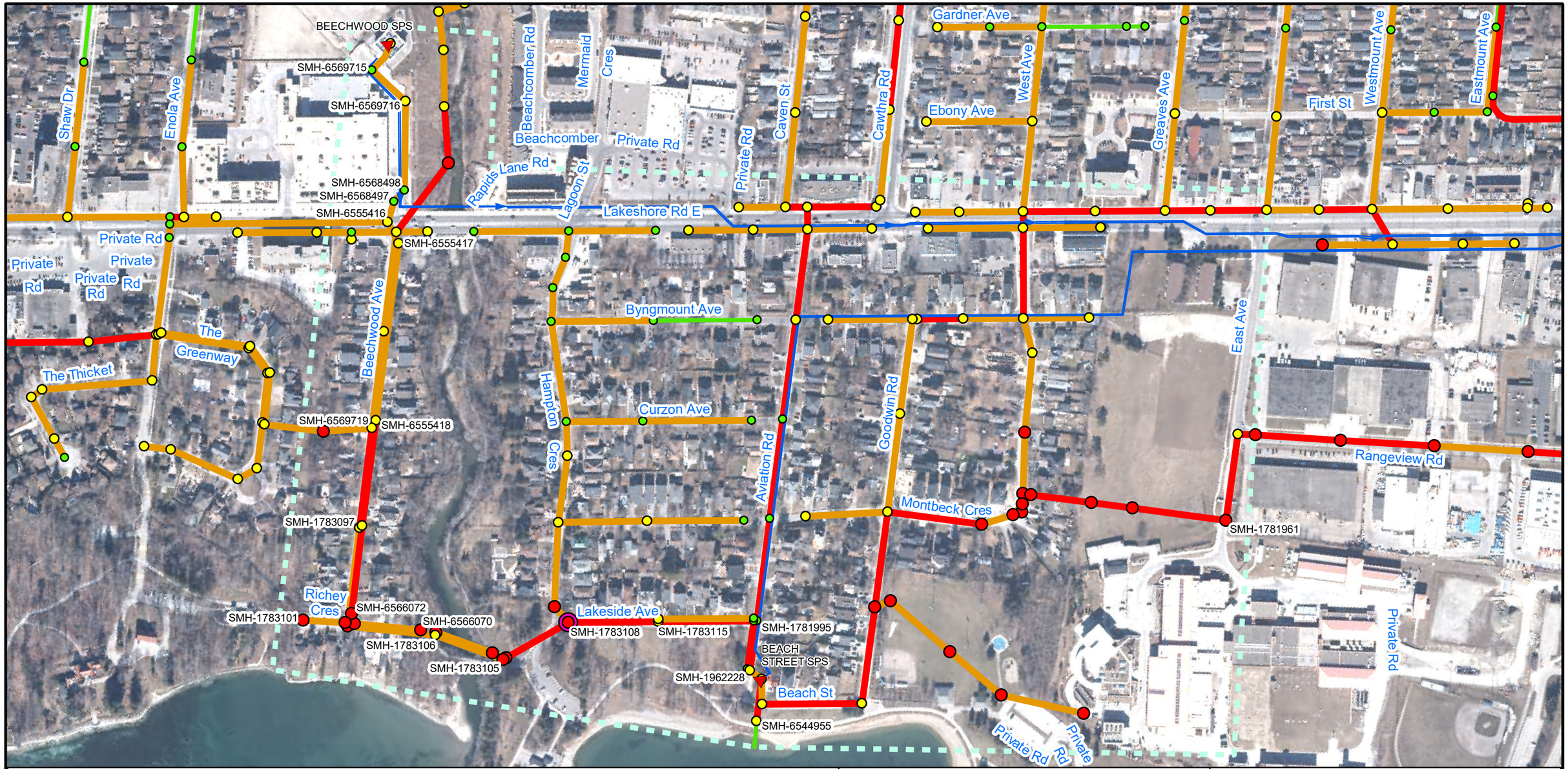
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Existing Network
100-year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-1-4



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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Sanitary Sewers Surchage State

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- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

N

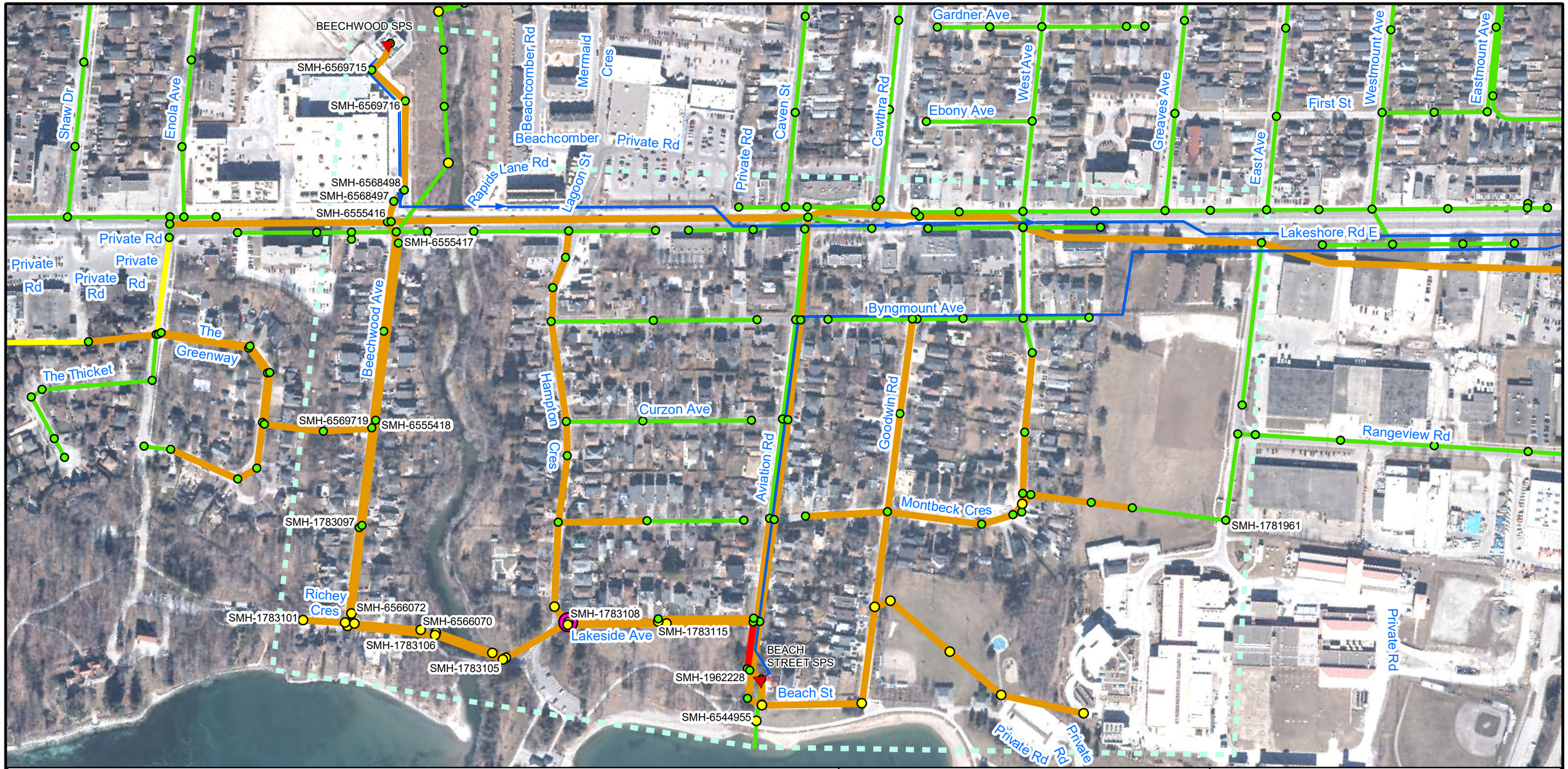
Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Existing Network
July 8, 2013 Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-1-5

C-2 OPERATING SCENARIO 2 ULTIMATE NETWORK RESULTS



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

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Sanitary Sewers Surchage State

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- 85% < Surcharge State < 100%
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- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

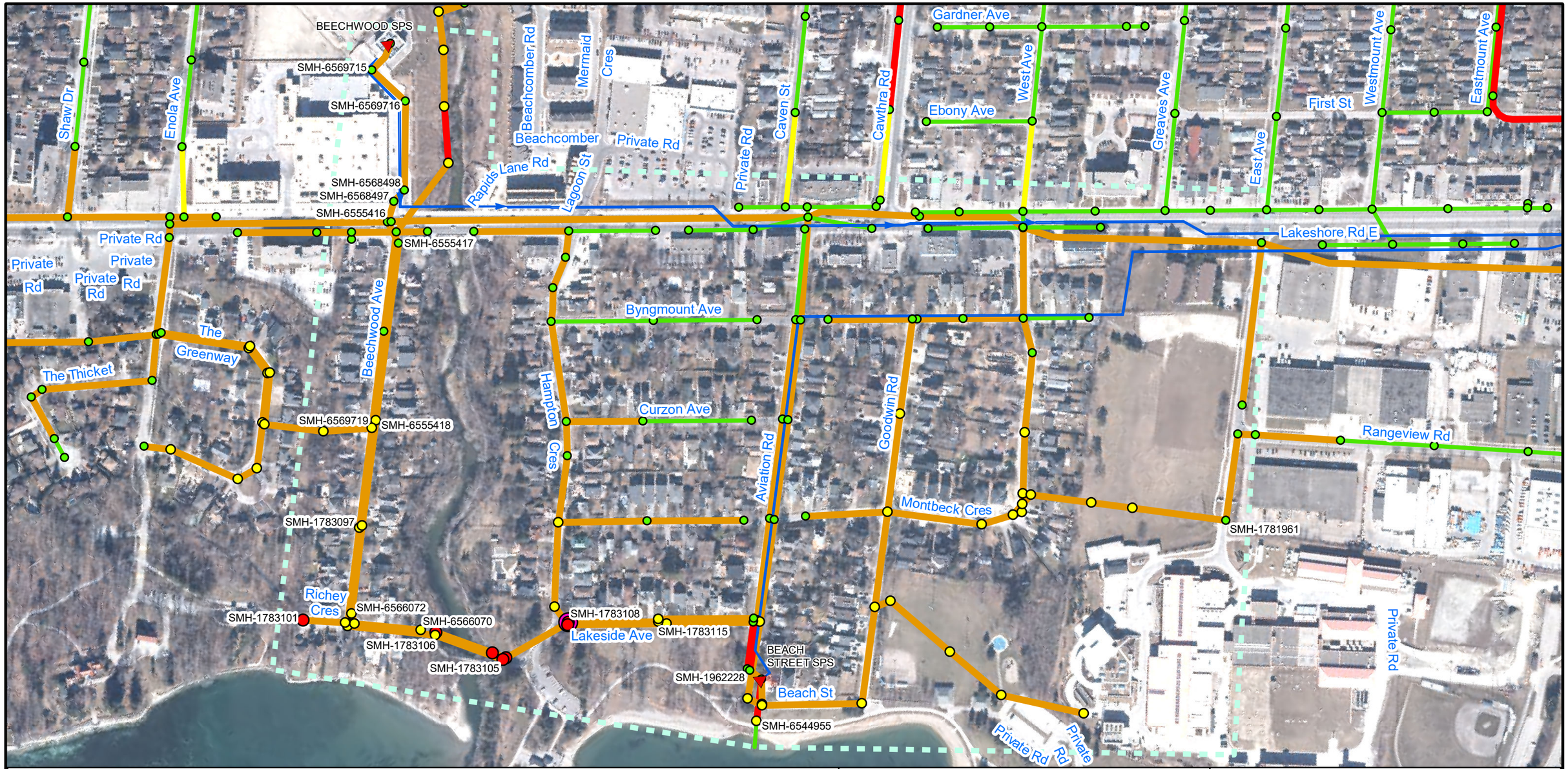
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Ultimate Network
Dry Weather Flow
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-2-1



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

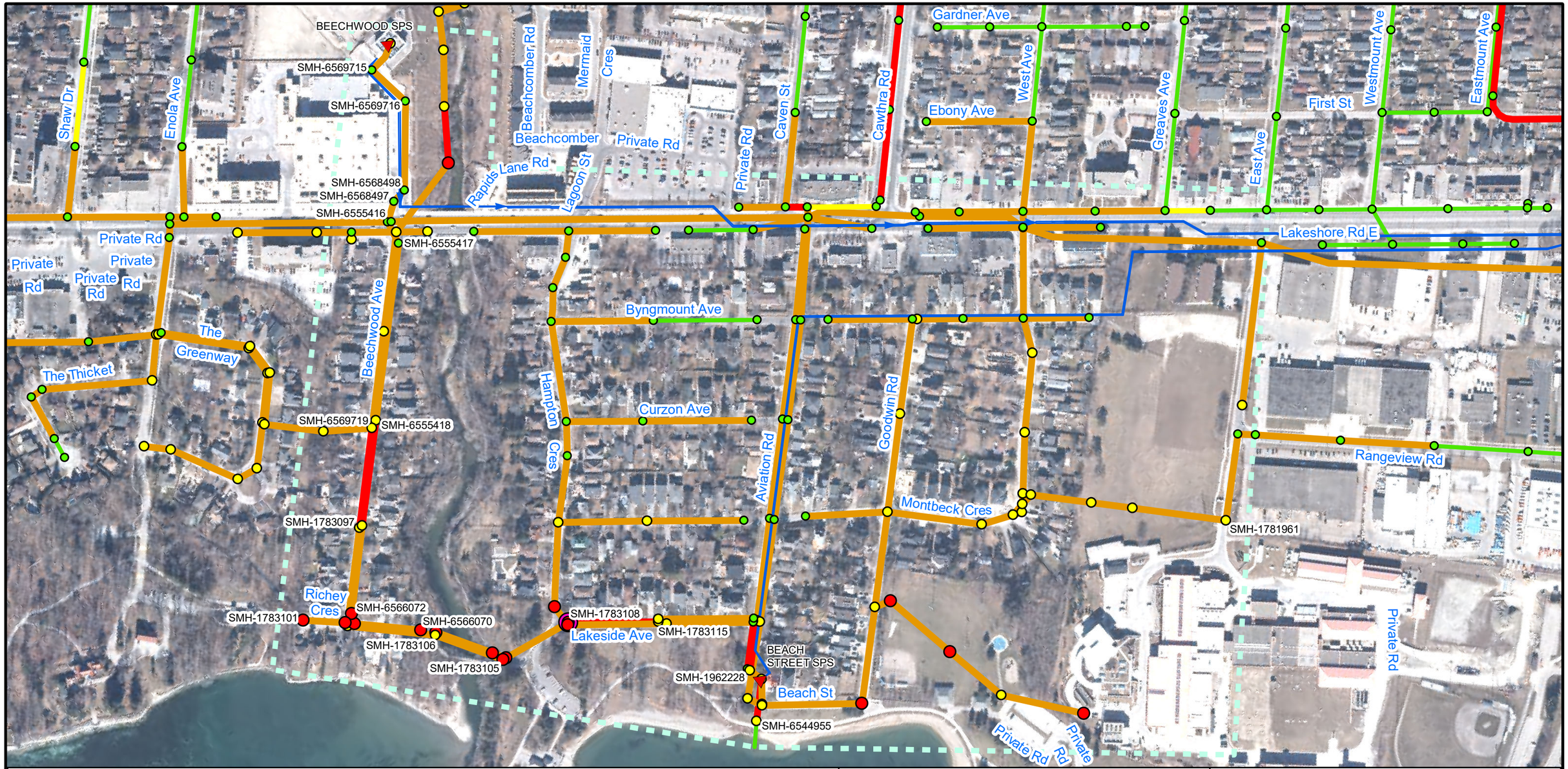
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Ultimate Network
5-Year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-2-2



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

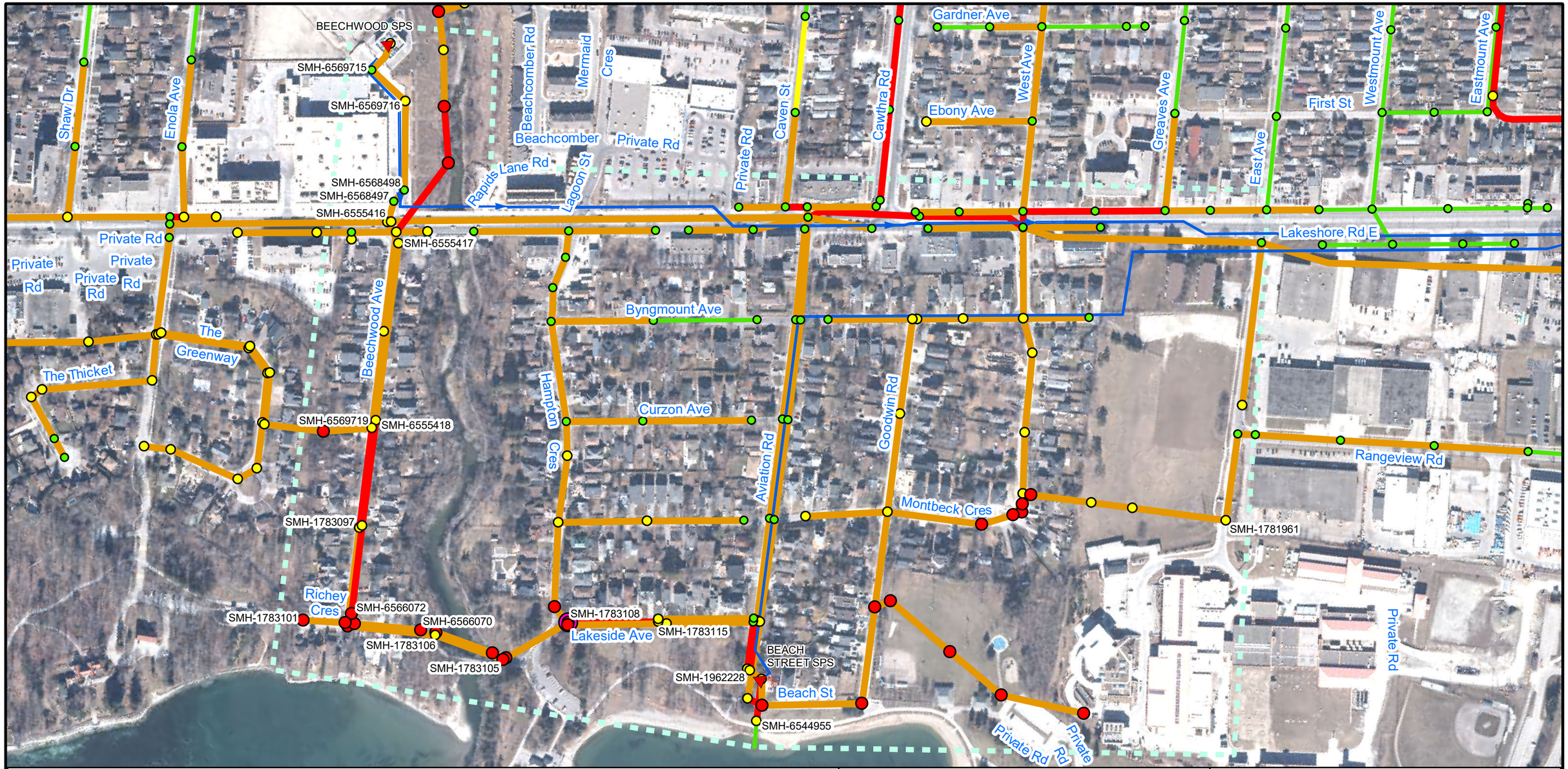
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Ultimate Network
25-Year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-2-3



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

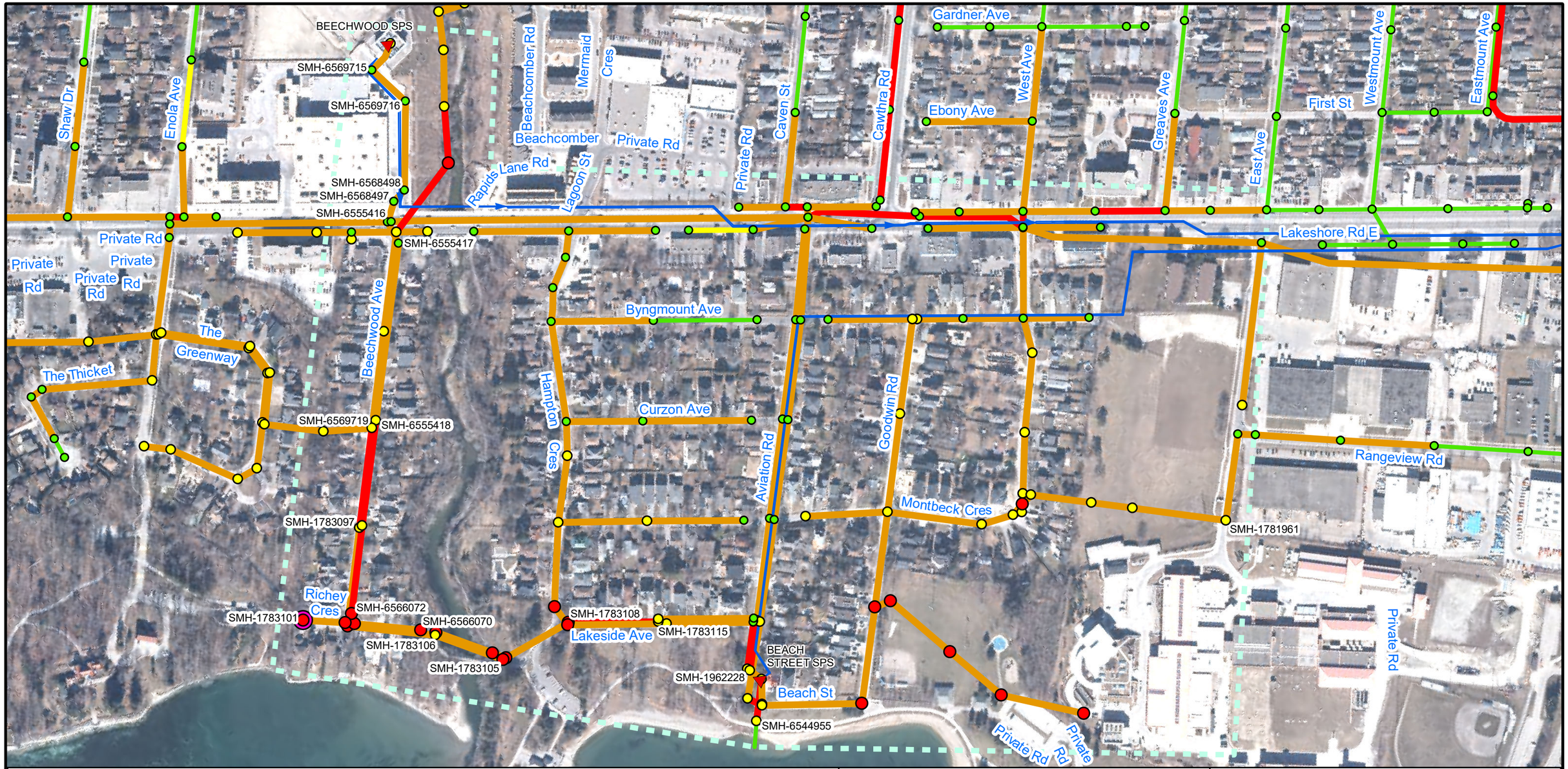
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Ultimate Network
100-Year Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-2-4



Legend

- Sewage Pumping Stations
- Forcemains
- Limit of Analysis

Sanitary Manhole Freeboard (m)

- Freeboard < 0 m (HGL above ground)
- 0 < Freeboard <1.8 m
- Freeboard => 1.8 m

Sanitary Sewers Surchage State

- Surcharge State < 85%
- 85% < Surcharge State < 100%
- Surcharged due to Backwater Effects
- Surcharged due to Capacity Constraints
- First Node to Violate HGL Freeboard Criteria

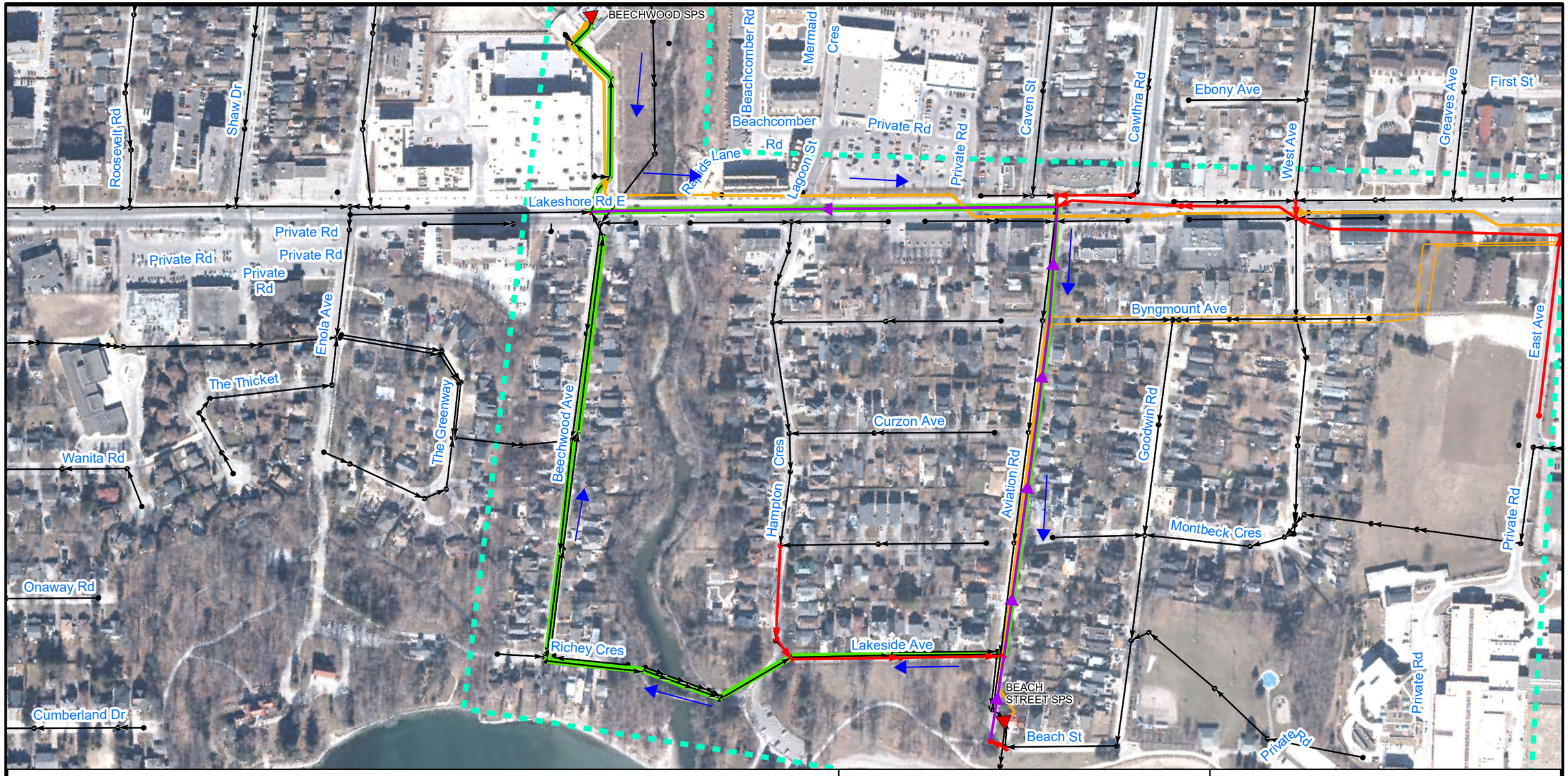
N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Ultimate Network
July 8, 2013 Storm
Model Results

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-2-5



Legend

- Sewage Pumping Stations
- **Proposed or Upgraded Sewers**
  - Proposed or Upgraded circular sewers
  - Proposed 1200 mm Low Flow Pipe by Tunnel
- **Existing Sanitary Infrastructure**
  - Existing Forcemain
  - Existing Sewer
- Spill Path of Backflow from Pumping Stations
- Limit of Analysis
- Existing Manholes
- Proposed Manholes

N

Region of Peel Wastewater Modelling Roster
Beechwood SPS and Beach St SPS
Operational Scenarios Analysis

Operating Scenario 2
Ultimate Network
Flow Path of Backflow from both
Pumping Stations

wsp

Checked: HA	Drawn: SC
Date: October 2022	Project No.: 181-13778-00
Scale: NTS	Figure No.: C-2-6

APPENDIX

B-2 Beach Street SPS Operational Considerations Memorandum

2022-05-12

Troy Leyburne
Project Manager
Regional Municipality of Peel
10 Peel Centre Drive
Suite B, 4th Floor
Brampton, Ontario L6T 4B9

Subject: Beach Street Sewage Pumping Station Diversion Project Operational Considerations

The purpose of this memo is to summarize the required operational procedures to maintain the existing 450 mm and 500 mm forcemains connecting the Beach Street Sewage Pumping Station (SPS) to G.E Booth Wastwater Treatment Plant via Aviation Road, Byngmount Ave, and Lakeshore Road East.

Two options are being considered for implementation: (1) a 600mm micro tunneled pipe between Beach Street SPS and Beechwood SPS via Aviation Ave. and Lakeshore Road East, and (2) replacing the existing 375mm and 350 mm sewers along Goodwin Ave./Montbeck Cres., and Lakeside Dr., respectively.

The option to install a new gravity tunnel on Aviation Road from Beach Street SPS to Beechwood SPS will also incur new requirements for operations and maintenance. The scope of the operational requirements is summarized in this memo. Operational requirements associated with Option 2 ("No Tunnel" option) would most likely remain identical to how Beach Street SPS currently operates and are not considered here.

OPERATIONAL CONSIDERATIONS

In Option A, the "Aviation Tunnel", the existing forcemains will be used only during events when Beechwood SPS is overflowing to Beach Street SPS or during staff training events. Normal flows will drain by gravity back to the Beechwood SPS to be pumped off to the G.E Booth Wastewater Treatment Plant.

In general, the procedure following overflow and training events would be:

1. Flushing the 450mm and 500mm forcemains with 2 volumes of sewage/water equivalent to the total capacity of each forcemain
2. Allow the forcemains to drain via gravity back into the wet well

100 Commerce Valley Drive West
Thornhill, ON
Canada L3T 0A1

T: +1 905 882-1100
F: +1 905 882-0055
wsp.com

3. Pump out wet well via new smaller forcemain connecting to the gravity “Aviation Tunnel”
4. Wash down the wet well with potable water and pump into gravity “Aviation tunnel”

We anticipate that this work would require a staff member from the Region of Peel to visit the site once to divert normal flows from Beechwood SPS to the forcemains. At an average daily dry weather flow of 36.2 L/s, it would take roughly 2.6 hours to fill the wet well with enough volume to flush each forcemain twice. After each forcemain is flushed, any remaining wastewater in each forcemain would back fill into the wet well and pumped out via a smaller forcemain into the connecting gravity main along Aviation to the Beechwood PS. Finally, once the wet well is empty, a Region of Peel staff member would be required to wash down the wet well with potable water and pump any residual effluent into the gravity main. WSP estimates that the procedure will take approximately 16 hours spaced across 3 days:

- Day 1 – Operator diverts flows to the Beach Street to flush each forcemain
- Day 2 – The residual effluent in the forcemains and wet well are drained via a smaller forcemain into the gravity Aviation Sewer Tunnel
- Day 3 – Two (2) operators and confined space rescue crew clean out wet well

In total WSP estimates that the O&M cost associated for each overflow and training event under Option A is approximately $6,600. An estimated cost breakdown of these operational activities is provided in Appendix A.

Sincerely,

Kelsey Hinsperger

WSP ref.: 19M-00593-00

Beach Street Tunnel Operations Estimate

Date: May 2022

By: Justin Lee

Option	Description	Line Item	Quantity	Unit	Unit Cost	Subtotal	Total Cost
1	Aviation Tunnel	Flushing Forcemains	4	hr	$200	$800	$6,600
		Draining residual effluent in forcemains and wet well	4	hr	$200	$800	
		Wet Well Cleaning	20	hr	$200	$4,000	
		Confined Space Rescue Crew	-	-	$1,000	$1,000	
						Annual Operating Cost (12xTotal Cost)	$79,200

Notes:

1. Estimates are conceptual and carry an uncertainty range of +-30%.
2. Estimates carry a 10% design contingency and a 10% market contingency.
3. An hourly O&M cost of 200$/hr was assumed
4. Wet well cleaning will require 2 people for 10 hours each
5. This operational event is assumed to be needed monthly

	Size (mm)	Material	Pipe Length (m)	Total Volume (m3)
Forcemain 1	500	AC	468.5	92
Forcemain 2	450	AC	468.5	75

APPENDIX

B-3 Technical Memorandum 2 – Analysis of Alternative Options for the Beach Street Pumping Station Diversion EA

To: Troy Leyburne (Region of Peel)

From: WSP

Subject: Technical Memorandum 2 – Analysis of Alternative Options for the Beach Street Pumping Station Diversion EA

Date: December 1, 2023

		Option 1 - Aviation Tunnel	**Option 2 - No Tunnel**
		830 m of 1200 mm microtunnel between Beach Street SPS and Beechwood SPS via **Aviation Avenue and Lakeshore Road East** -346.20m of 1200 mm microtunnel on **Lakeshore Road East from Aviation to Greaves Ave** -91.25m of 900 mm microtunnel on **Lakeshore Road East from Greaves Ave to East Ave** -Replacement of 300 m of existing 250 mm sewer on **Lakeside Drive & Hampton Cres.** - **Necessary Beach St SPS station upgrades (refer to PFR).**	–Replacement of existing gravity sewers including pipe upgrades on Goodwin Avenue and Montbeck Crescent via open cut methods, to 450mm PVC pipes –Installation of 300 m of 375mm sewer on Hampton Cres and Lakeside Ave. –Installation of 441m of 525mm sewer on Lakeshore Rd E from East Ave to Aviation Rd to address existing sewer surchargeing risks, and to provide additional capacity for servicing future developments. –Installation of 65m of 450mm sewer on Lakeshore Rd E from Cawthra to Caven –Upsizing of existing sewer on Aviation Avenue to 525 mm sewer from a 300 mm sewer – **Necessary Beach St SPS station upgrades (refer to PFR).**
Hydraulic Performance	**<u>Power failure at Beechwood SPS</u>:** -**1500[a] L/s** flow at Beechwood SPS -**No power** at Beechwood SPS -**Power** at Beach St. SPS	-In **35 minutes,** sewers back up to Beach Street SPS wet well, Beach Street SPS pumps some flow and some flow overflows to Lake Ontario -**756 L/s** is pumped by Beach Street SPS to G.E. Booth (Catastrophic scenario can be further reviewed, would result in a 3 duty/ 0 standby scenario. If one of the pumps were to fail under "catastrophic scenario" then the same result will be achieved of only 756 L/s pumped to G.E. Booth WWTP and the rest as overflow to the Lake) -**700 L/s** overflows through the outfall (if pipes were upsized, more overflow into the lake can be achieved, although this would be considered as spill by MECP) -Basements could flood if flows remain at 1500 L/s past 35 minutes (map of overflowing manholes to be provided). -Mobile generator on-call contract is in place to produce a generator on site within 30 minutes. Standby diesel generator can be provided fior Beach St. SPS, will increase capital cost spending.	-In **33** minutes, sewers back up to Beach Street SPS wet well and overflow to Lake Ontario -**756 L/s** is pumped by Beach Street SPS to G.E. Booth -**700 L/s** overflows through the outfall -Basements could flood if flows remain at 1500 L/s past 33 minutes -Mobile generator on-call contract is in place to produce a generator on site within 30 minutes
	<u>Power failure at Beechwood SPS and Beach St. SPS</u>: -**1500[a] L/s** flow at Beechwood SPS -**No power** at Beechwood SPS -**No power** at Beach St. SPS -Scenario is highly unlikely	-In **35 minutes**, sewers back up to Beach Street SPS wet well and overflow to Lake Ontario -700 L/s overflows through the Beach Street SPS outfall -Basements would flood if flows remain at 1500 L/s past 35 minutes -Mobile generator on-call contract is in place to produce a generator on site within 30 minutes	-In **33** minutes, sewers back up to Beach Street SPS wet well and overflow to Lake Ontario -**700 L/s** overflows through the Beach Street SPS outfall -Basements would flood if flows remain at 1500 L/s past 33 minutes -Mobile generator on-call contract is in place to produce a generator on site within 30 minutes
Costs	Capital	**$19,922,454**	**$9,327,600**
	Operational	As per Operations Analysis memo, $6,600/month is estimated for monthly wet well cleaning & general FM maintenance. Testing the SPS every month or every 2 months should not result in significant costs, aside from electricity usage. It is more expensive to completely replace equipment if they have not been properly maintained rather than to test and maintain it. (Refer to Operations Analysis Memo in Appendix C for detailed info.)	A high-level cost was determined based on current operating and maintenance requirements for Beach St. SPS, which includes electrical usage, maintenance costs, and labour efforts. On average, the total monthly cost to operate and maintain the critical process and electrical equipment is approximately $16,000.
Operations	Normal Flow	-Normal flows drain by gravity from Beach Street SPS to Beechwood SPS	-Normal flows will be pumped from Beach Street SPS to G.E. Booth
	Overflows	-Overflows and training flows will be pumped from Beach Street SPS to G.E. Booth	-Overflows and training flows will be pumped from Beach Street SPS to G.E. Booth
	Key operational considerations	-Since pumps would only be used intermittently and rarely, an SOP would be needed for draining forcemains back to Beach St. SPS wet well, pumping to gravity line, and cleaning out wet well to avoid odours and solids build-up (Washdown lines for wet well can be provided, given water service to Beach St. SPS. Costs for washdown line within station are included within capital cost estimate. Any costs to provide water service to the SPS are beyond the scope of the SPS works.) -Forcemain and wet well cleaning operation would result in approximately 20 additional man-hours per month - Tunnel and local sewers may require periodic flushing due to low flow velocities (Design flows on Lakeshore 65 L/s)	-Beach Street SPS would continue to operate as currently operating. No changes to SOPs or maintenance frequency would be needed.
Constructability		-2 tunnelling shaft location is located within Lakeshore Road East which will result in major traffic disruptions for extended durations during construction (Beechwood and Lakeshore, West Ave) -There is limited clearance between the bridge footings and pipe alignment (only 1.1 - 1.3m cover) -Tunnel slope and velocity is less than Region standards -Local sewers on Hampton and Lakeside have slopes and velocities below Region standards -Hampton sewer was replaced only 8 years ago -6.0m deep open cut excavation on Lakeshore, which was recently paved	

<u>Notes:</u>

a. 1500 L/s is the firm capacity flow from Beechwood SPS and was used as a maximum estimated flow in an overflow scenario.

Option 1 - Aviation Tunnel Storage Time Calculator for Overflow Events at Beechwood SPS and Beach Street SPS

User Inputs

Inlet Flow Rate at Beechwood SPS	1500	L/s
Wet Well Level Prior to Generator Failure @ Beechwood SPS	1	m
Wet Well Level Prior to Generator Failure @ Beach St. SPS	1	m
Tunnel connecting SPSs	Yes	

Beechwood SPS

- (•) None
- ( ) Hydro
- ( ) Nat Gas
- ( ) Diesel

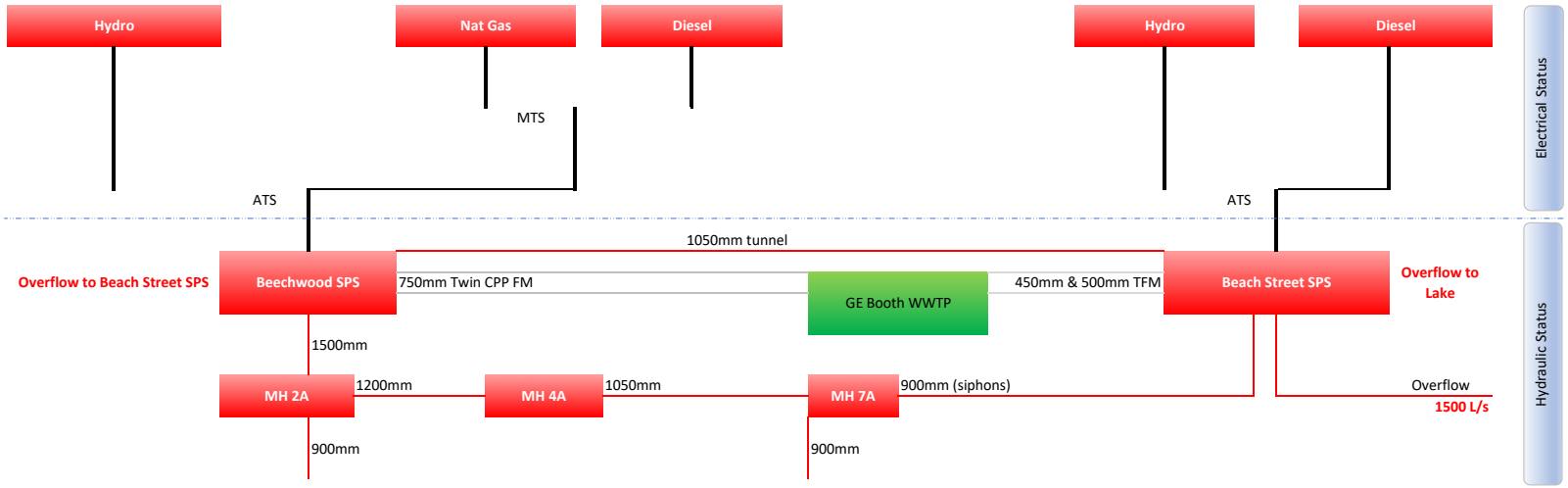
Required Number of Pumps	3	
Pumps	750	KVA
Other facility needs	205	KVA
MTS Diesel Generator Needs	955	KVA

Beach Street SPS

- (•) None
- ( ) Hydro
- ( ) Diesel

System Status

Beechwood SPS and Beach Street SPS are Offline - System Overflow to the Lake



Storage Time Calculations

	Per Stage	Cumulative Totals
Beechwood SPS Wet Wells Filling until **Overflow to Sewers**	0 h 11 m	0 h 11 m
Overfill of Beechwood SPS Wet Wells	0 h 10 m	0 h 21 m
Sewers Filling until **Overflow to Beach St. SPS**	0 h 7 m	0 h 28 m
Tunnel Connecting SPSs	0 h 2 m	0 h 30 m
Beach St. SPS Inlet Sewer + Wet Wells Filling until **Overflow to Lake Ontario**	0 h 5 m	**0 h 35 m**

Gravity Line
Pressure line

Ver 2.0

Option 2 - No Tunnel Storage Time Calculator for Overflow Events at Beechwood SPS and Beach Street SPS

User Inputs

Inlet Flow Rate at Beechwood SPS	1500	L/s
Wet Well Level Prior to Generator Failure @ Beechwood SPS	1	m
Wet Well Level Prior to Generator Failure @ Beach St. SPS	1	m

Beechwood SPS

- (●) None
- ( ) Hydro
- ( ) Nat Gas
- ( ) Diesel

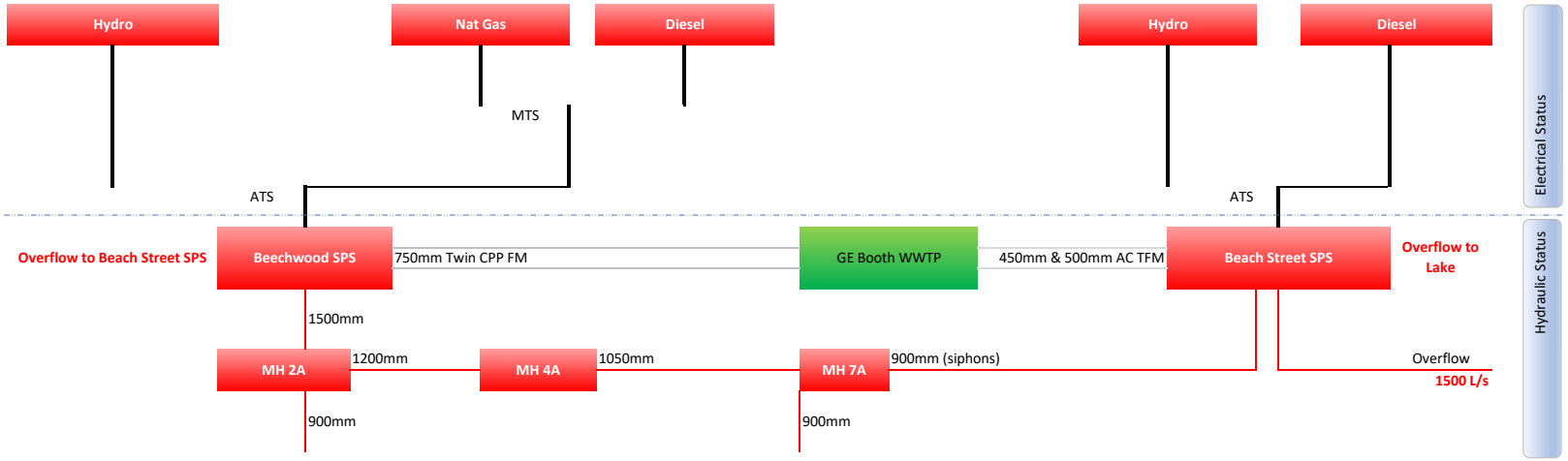
Required Number of Pumps	3	
Pumps	750	KVA
Facility	205	KVA
MTS Diesel Generator Needs	955	KVA

Beach Street SPS

- (●) None
- ( ) Hydro
- ( ) Diesel

System Status

Beechwood SPS and Beach Street SPS are Offline - System Overflow to the Lake



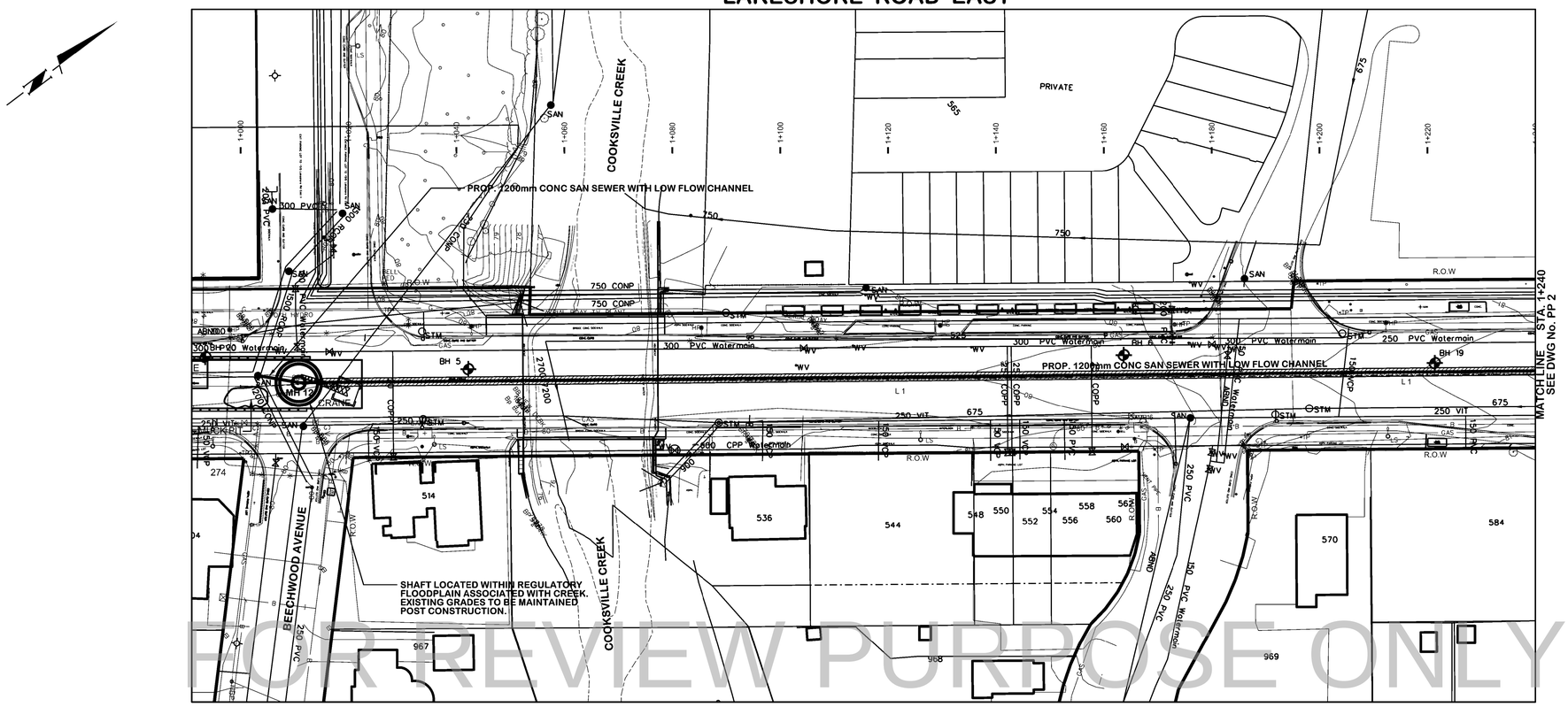
Storage Time Calculations

	Per Stage	Cumulative Totals
Beechwood SPS Wet Wells Filling until **Overflow to Sewers**	0 h 11 m	0 h 11 m
Overfill of Beechwood SPS Wet Wells	0 h 10 m	0 h 21 m
Sewers Filling until **Overflow to Beach St. SPS**	0 h 7 m	0 h 28 m
Beach St. SPS Inlet Sewer + Wet Wells Filling until **Overflow to Lake Ontario**	0 h 5 m	**0 h 33 m**

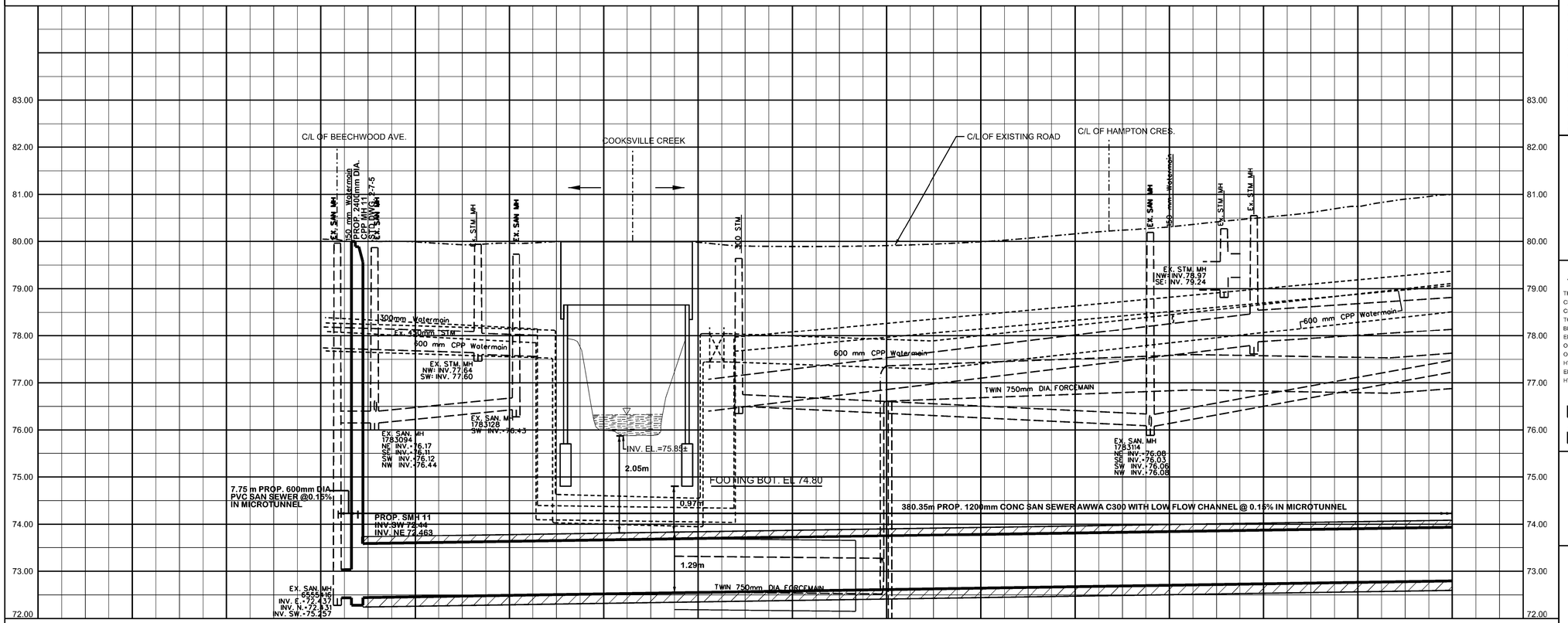
Ver 2.0

C Design Drawings

LAKESHORE ROAD EAST



FOR REVIEW PURPOSE ONLY



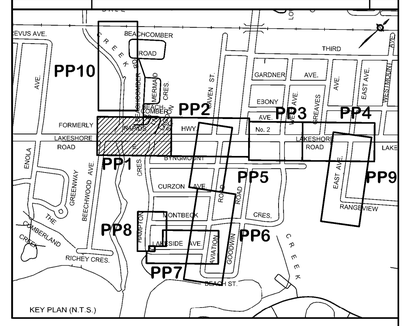
000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	
80.05	79.98	79.96	80.00	79.96	79.87	79.85	80.00	80.16	80.30	80.51	80.75	81.00	81.00	EX. ROAD ELEV.
1+000	1+020	1+040	1+060	1+080	1+100	1+120	1+140	1+160	1+180	1+200	1+220	1+240	1+240	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Horizontal And Vertical Bends Are In Degrees

All Pipes Size In mm

20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. 0011965U550 Elev. 126.740m

Description Location: Limehouse Saint John The Baptist Anglican Church, At Northwest Side Of Dundas Street East (Highway No. 5), 60 M Northeast Of Clawthra Road, Plate In Northeast Face Of Northeast Parapet Wall Of Easterly Steps. Established By Township Of Toronto.

Horizontal: Cordinates are Based on 6 Degree Universal Transverse Mercator (UTM) zone 17, Central Meridian 81 degrees west, North American Datum 1983 adjustment (NAD83).

Elevations: GSC Datum,1978 Southern Ontario Adjustment.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBREOPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

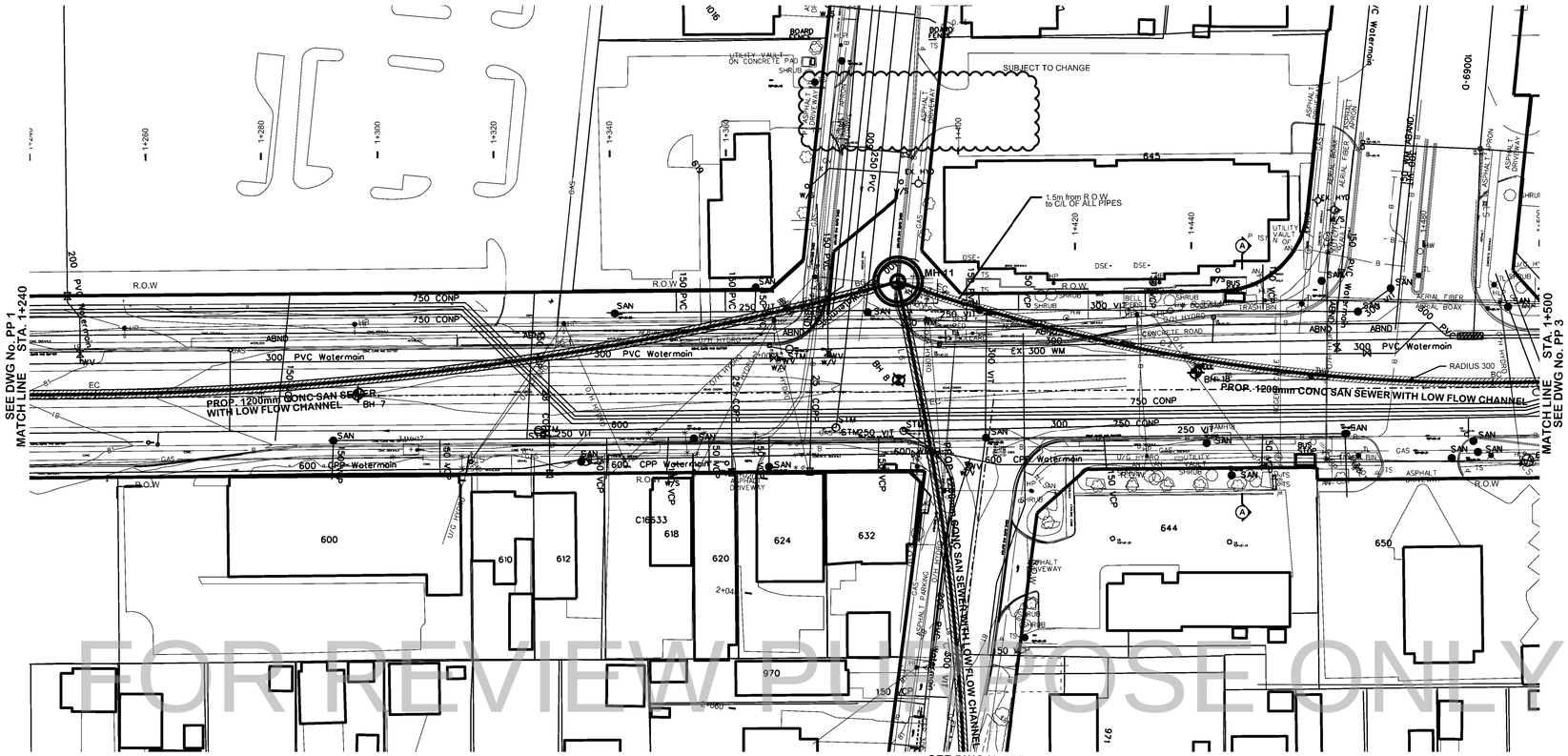
FROM BEECHWOOD AVE. TO HAMPTON CRESCENT

PROP. 1200mm SAN. SEWER

STA. 1+000 TO STA. 1+240

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	J.A.	Drawn by	B.P.		
Date	DECEMBER 2020	Sheet	1 of 10	Plan No.	**PP-1**

LAKESHORE ROAD EAST



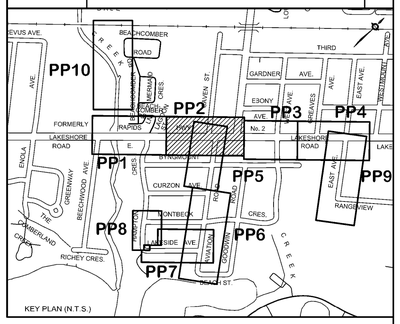
FOR REVIEW PURPOSE ONLY

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



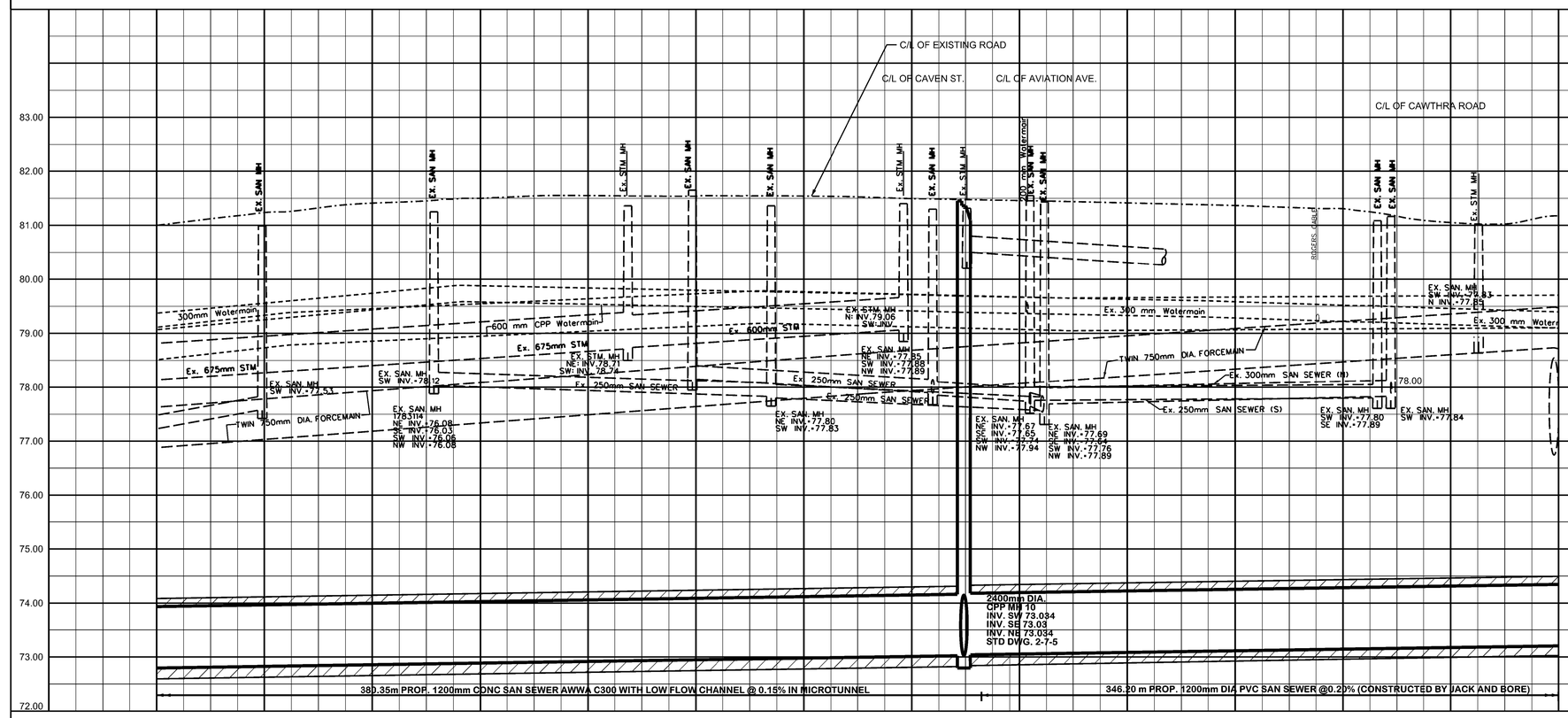
LINE TABLE

NAME	LENGTH	DIRECTION
L1	240.50	N 36°24'8.5" W

CURVE TABLE

NAME	RADIUS	ARC LENGTH	TANGENT LENGTH	CHORD DIRECTION	BC	EC
C1	550	132.90	61.50	N 22°12'54.12" W	E=615703.371 N=4825024.499	E=615638.100 N=4824909.119
C2	300	97.40	48.45	N 36°27'2.26" W	E=615781.723 N=4825102.071	E=615711.833 N=4825034.860

NOTE : ALL UNITS ARE IN METERS UNLESS SPECIFIED OTHERWISE.



000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	
81.00	81.23	81.41	81.50	81.53	81.53	81.54	81.49	81.44	81.40	81.34	81.29	81.01	81.19	81.25	EX. ROAD ELEV.	
1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	3+280	ROAD CHAINAGE	

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Horizontal And Vertical Bends Are In Degrees

All Pipes Size In mm

20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. 001196U550 Elev. 126.740m

Description Location: Limehouse Saint John The Baptist Anglican Church, At Northwest Side Of Dundas Street East (Highway No. 5), 60 M Northeast Of Cawthra Road, Plate In Northeast Face Of Northeast Parapet Wall Of Easterly Steps. Established By Township Of Toronto.

Horizontal: Cordinates are Based on 6 Degree Universal Transverse Mercator (UTM) zone 17, Central Meridian 81 degrees west, North American Datum 1983 adjustment (NAD83).

Elevations: GSC Datum, 1978 Southern Ontario Adjustment.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____

Approved by _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

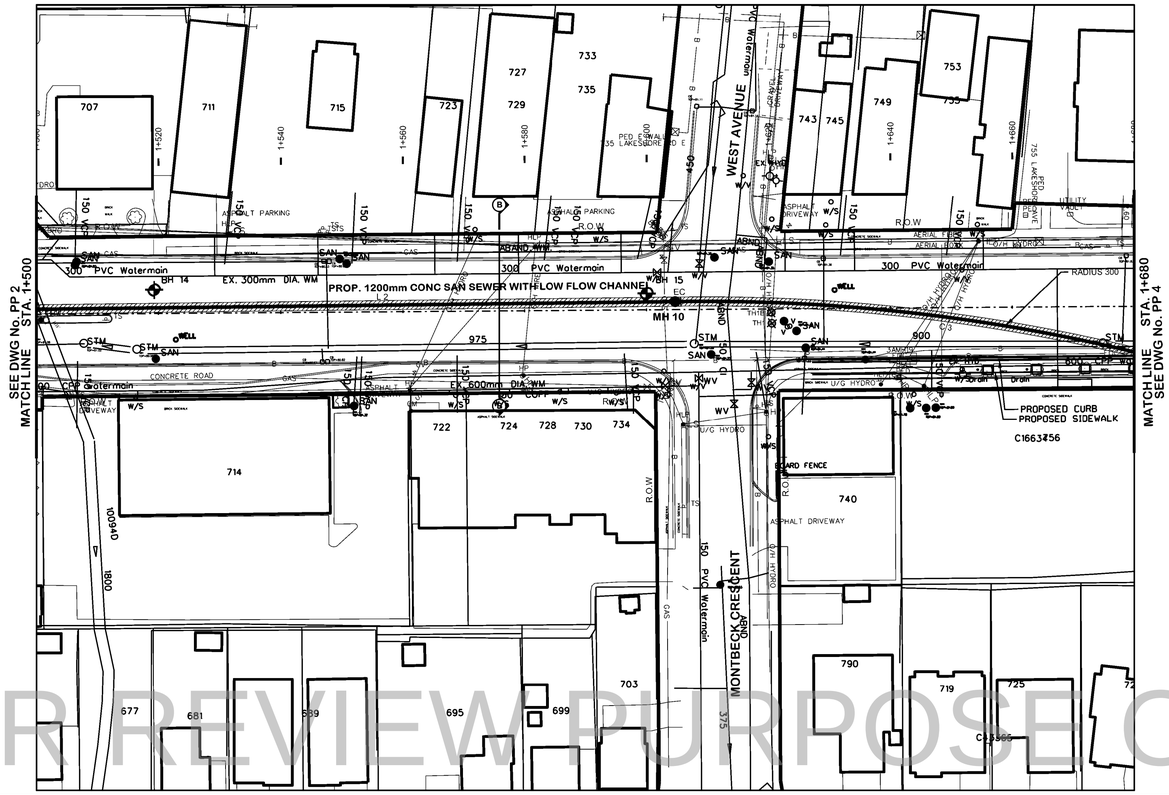
FROM BEECHWOOD AVE. TO HAMPTON CRESCENT

PROP. 1200mm SAN. SEWER

STA. 1+240 TO STA. 1+500

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	J.A.	Drawn by	B.P.		
Date	DECEMBER 2020	Sheet	2 of 10	Plan No.	**PP-2**

LAKESHORE ROAD



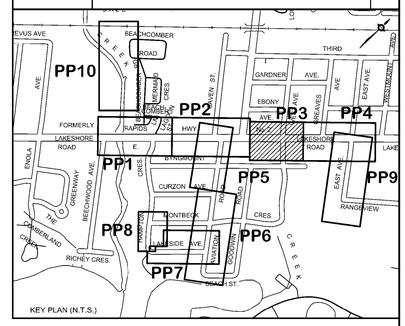
FOR REVIEW PURPOSE ONLY

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



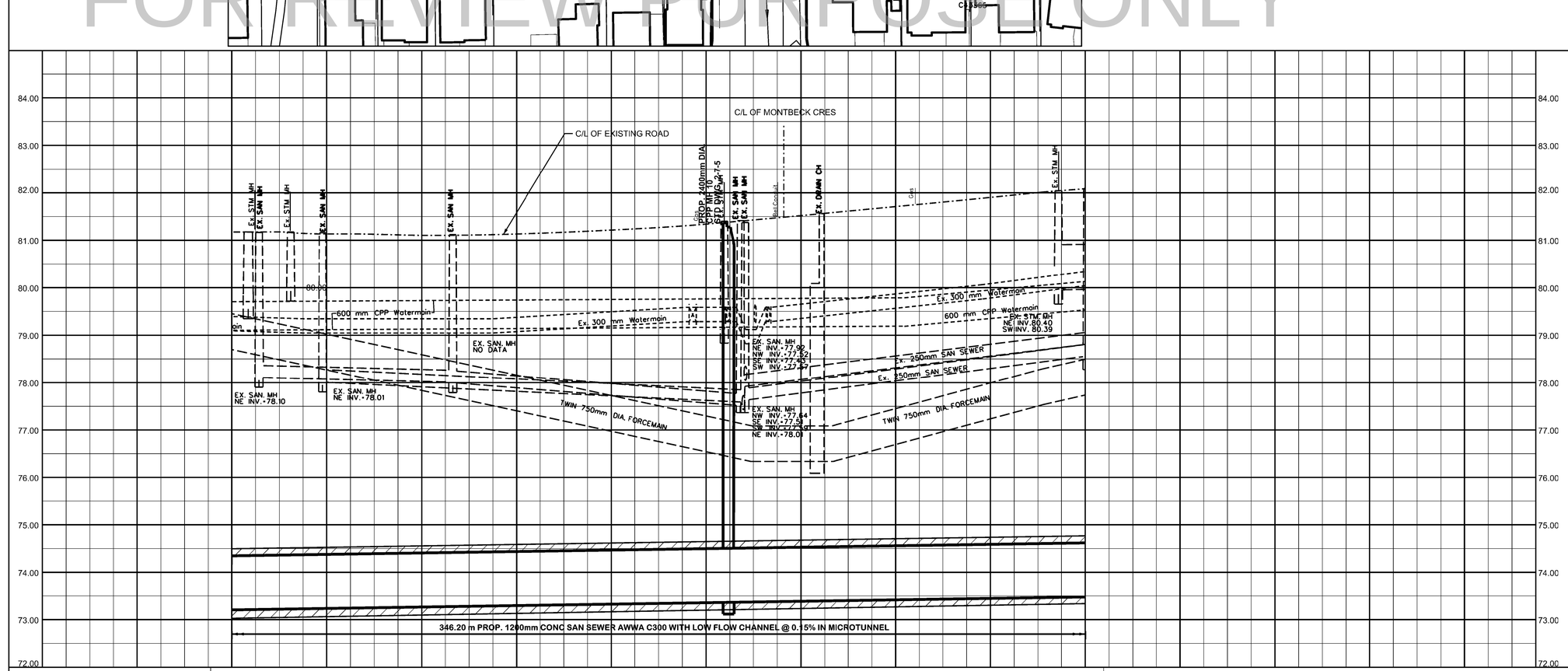
LINE TABLE

NAME	LENGTH	DIRECTION
L2	113.70	N 36°22'45.13" W

CURVE TABLE

NAME	RADIUS	ARC LENGTH	TANGENT LENGTH	CHORD DIRECTION	BC	EC
C3	300	123.40	61.70	N 60°18'59.33" W	E=615940.428 N=4825275.350	E=615849.268 N=4825193.517

NOTE : ALL UNITS ARE IN METERS UNLESS SPECIFIED OTHERWISE.



000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	EX. ROAD ELEV.
81.19	81.15	81.10	81.12	81.20	81.32	81.52	81.70	81.90	82.09	
1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	ROAD CHAINAGE

General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Horizontal And Vertical Bends Are In Degrees

All Pipes Size In mm

20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. 0011965U550 Elev. 126.740m

Description Limehouse Saint John The Baptist Anglican Church, At Northwest Side Of Dundas Street East (Highway No. 5), 50 M Northeast Of Cawthra Road, Plate In Northeast Face Of Northeast Parapet Wall Of Easterly Steps. Established By Townsho Of Toronto.

Location

Horizontal: Cordinates are Based on 6 Degree Universal Transverse Mercator (UTM) zone 17, Central Meridian 81 degrees west, North American Datum 1983 adjustment (NAD83).

Elevations: GSC Datum,1978 Southern Ontario Adjustment.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____

Approved by _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

FROM AVIATION ROAD TO WEST AVE..

PROP. 1200mm SAN SEWER

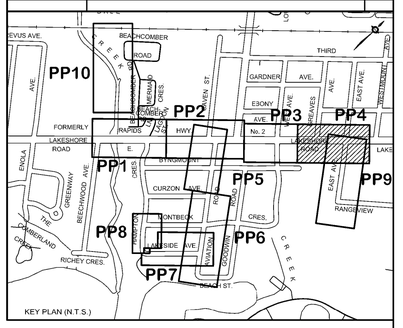
STA. 1+500 TO STA. 1+680

CAD Area	X-XX	Area	X-XX
Checked by	J.A.	Drawn by	B.P.
Date	DECEMBER 2020	Sheet	3 of 10

Project No. 19M-00593

Plan No. **PP-3**

LAKESHORE ROAD



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.

LINE TABLE

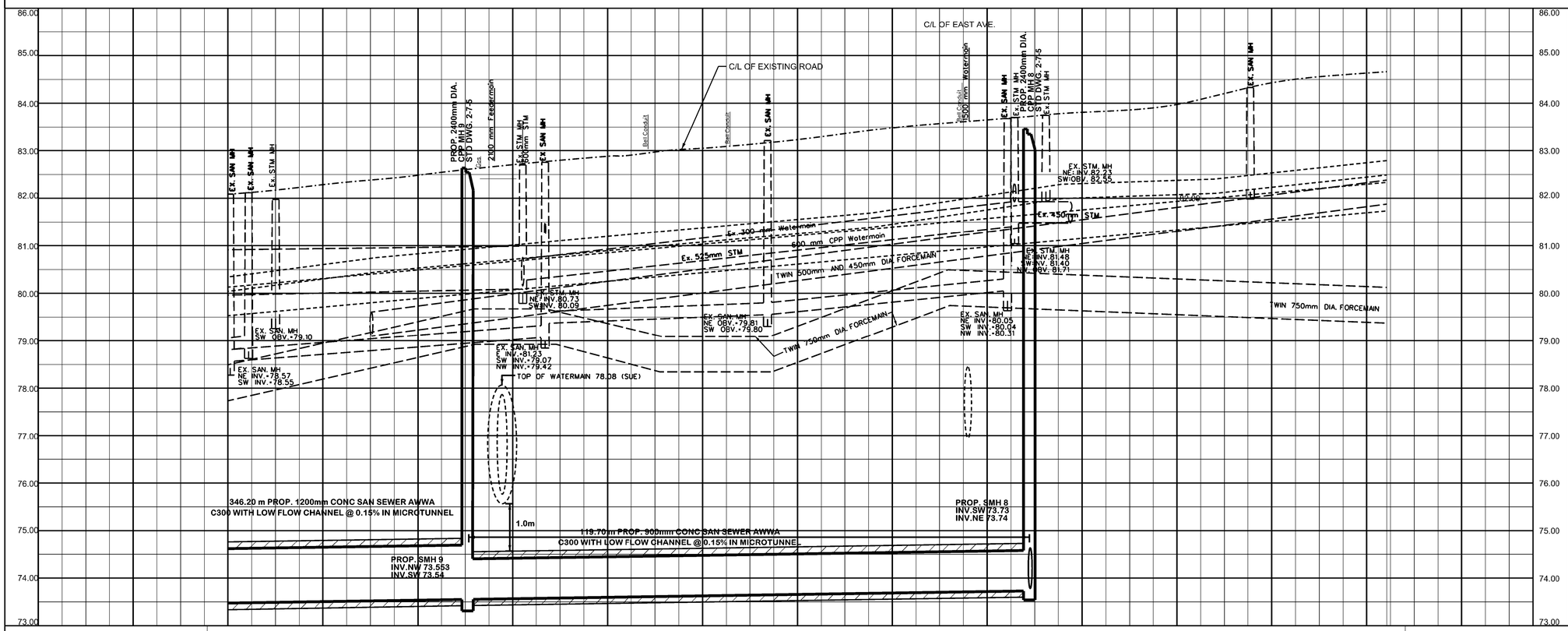
NAME	LENGTH	DIRECTION
L3	119.70	N 146°28'32.29" W

CURVE TABLE

NAME	RADIUS	ARC LENGTH	TANGENT LENGTH	CHORD DIRECTION	BC	EC
C3	300	123.40	61.70	N 60°18'59.33" W	E=615940.428 N=4825275.350	E=615849.268 N=4825193.517

NOTE : ALL UNITS ARE IN METERS UNLESS SPECIFIED OTHERWISE.

FOR REVIEW PURPOSE ONLY



General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Horizontal And Vertical Bends Are In Degrees

All Pipes Size In mm

20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. 001196SU550 Elev. 126.740m

Description Limehouse Saint John The Baptist Anglican Church, At Northwest Side Of Dundas Street East Location (Highway No. 5), 60 M Northeast Of Cawthra Road, Plate In Northeast Face Of Northeast Parapet Wall Of Easterly Steps. Established By Township Of Toronto.

Horizontal: Cordinates are Based on 6 Degree Universal Transverse Mercator (UTM) zone 17, Central Meridian 81 degrees west, North American Datum 1983 adjustment (NAD83).

Elevations: GSC Datum, 1978 Southern Ontario Adjustment.

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Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

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THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESHORE ROAD EAST

FROM AVIATION ROAD TO WEST AVE..

PROP. 1200mm AND 900mm SAN SEWER

STA. 1+680 TO STA. 1+860

	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00
EX. ROAD ELEV.	82.09	82.28	82.46	82.69	82.87	83.04	83.22	83.44	83.63	83.81	83.98	00.00	00.00
ROAD CHAINAGE	1+680	1+700	1+720	1+740	1+760	1+780	1+800	1+820	1+840	1+860	1+880	1+900	1+920

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	J.A.	Drawn by	B.P.		
Date	DECEMBER 2020	Sheet	4 of 10	Plan No.	PP-4

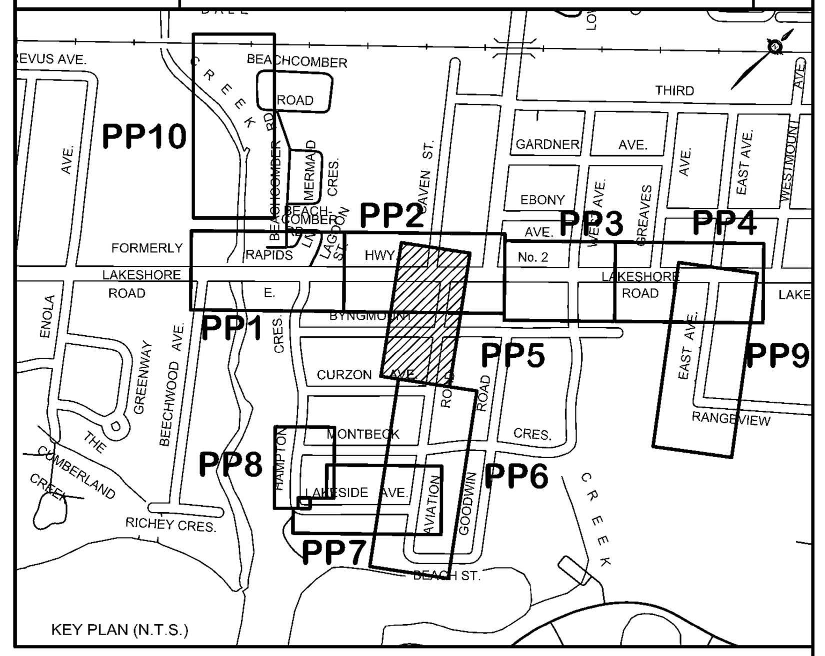
AVIATION ROAD

SEE DWG No. PP 3

SEE DWG No. PP 2

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS		
DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



LINE TABLE

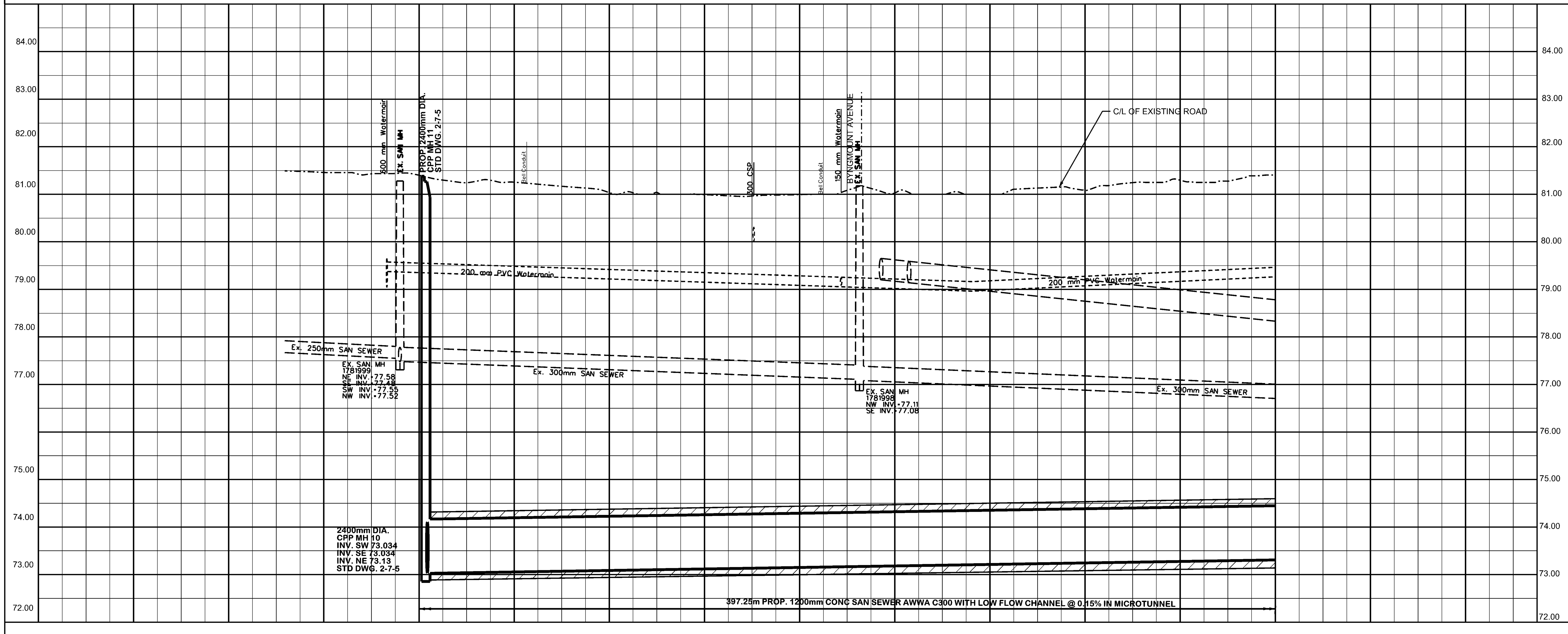
NAME	LENGTH	DIRECTION
L4	299.75	N 45°33'1.05" W
L5	21.55	N 64°7'37" W

CURVE TABLE

NAME	RADIUS	ARC LENGTH	TANGENT LENGTH	CHORD DIRECTION	BC	EC
C4	400	129.14	64.575	N 45°30'46.32" W	E=615830.286 N=4824947.141	E=615725.409 N=4825021.528

NOTE : ALL UNITS ARE IN METERS UNLESS SPECIFIED OTHERWISE.

FOR REVIEW PURPOSE ONLY



	2+000	2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	2+180
	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00
EX. ROAD ELEV.	81.44	81.25	81.10	81.00	81.00	81.04	81.03	81.12	81.31	81.41
ROAD CHAINAGE	2+000	2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	2+180

General Notes

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All Pipes Size In mm

20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. 0011965U550 Elev. 126.740m

Description Location: Limehouse Saint John The Baptist Angilcan Church, At Northwest Side Of Dundas Street East (Highway No. 5), 60 M Northeast Of Cawthra Road, Plate In Northeast Face Of Northeast Parapet Wall Of Easterly Steps. Established By Township Of Toronto.

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Designed by ____ Chkd. ____

Approved by ____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

HORIZONTAL SCALE: 10m 0 10 20 30m

VERTICAL SCALE: 1m 0 1 2 3m

Region of Peel
working with you

AVIATION ROAD

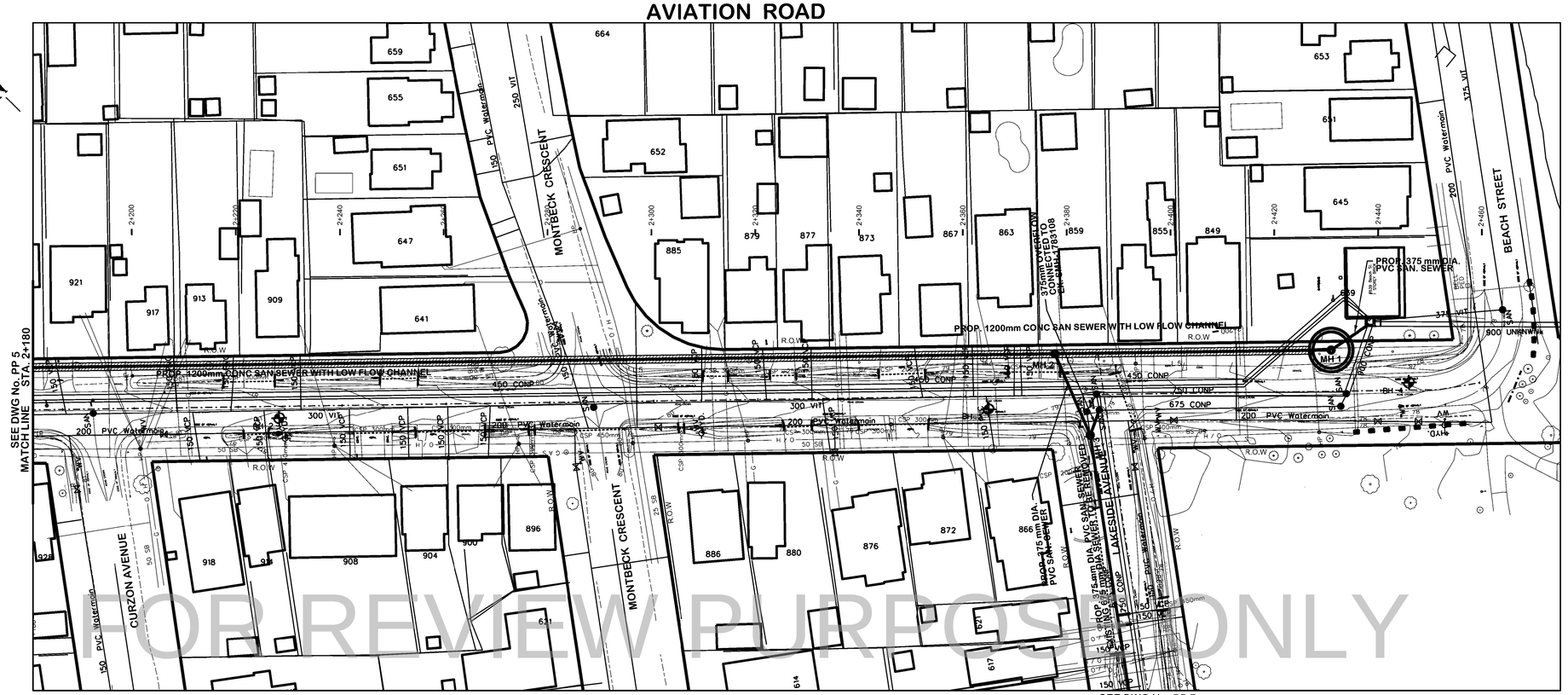
FROM LAKESHORE ROAD E. TO BYNGMOUNT AVE.

PROP. 1200mm SAN SEWER

STA. 2+000 TO STA. 2+180

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	J.A.	Drawn by	B.P.		
Date	DECEMBER 2020	Sheet	5 of 10	Plan No.	PP-5

AVIATION ROAD

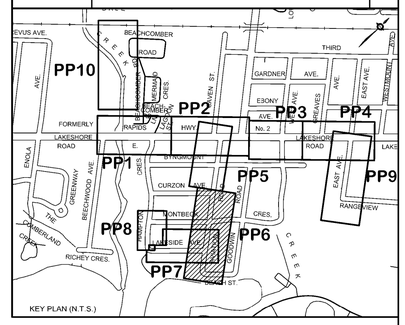


SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



LINE TABLE

NAME	LENGTH	DIRECTION
L 4	299.75	N 45°33'1.05" W

General Notes

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20C Existing Water Service, Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. 001965U550 Elev. 126.740m

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Designed by

Approved by

Chkd.

NOTICE TO CONTRACTOR

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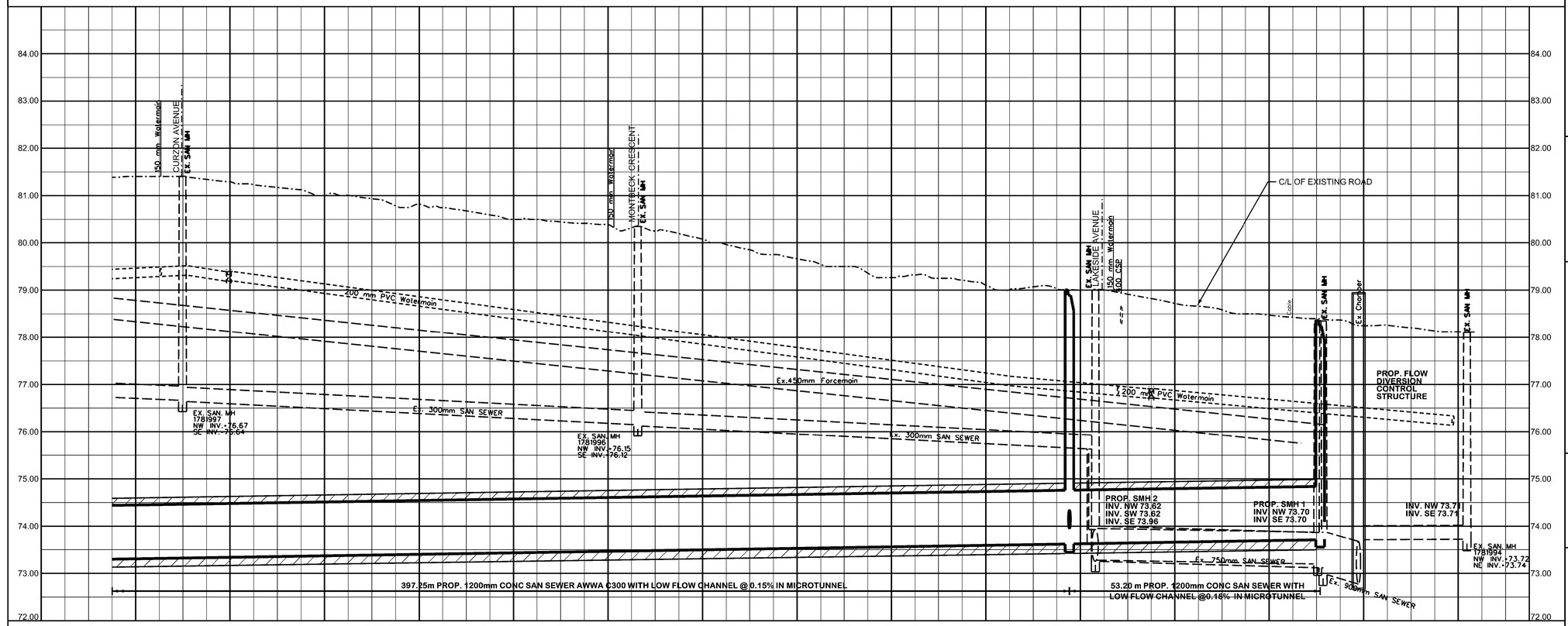
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBREOPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE



000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	
81.41	81.32	81.02	80.76	80.53	80.41	80.13	79.72	79.27	79.19	79.00	78.80	78.51	78.28	78.14	EX. ROAD ELEV.	
2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320	2+340	2+360	2+380	2+400	2+420	2+440	2+460	ROAD CHAINAGE	

Region of Peel
working with you

AVIATION ROAD

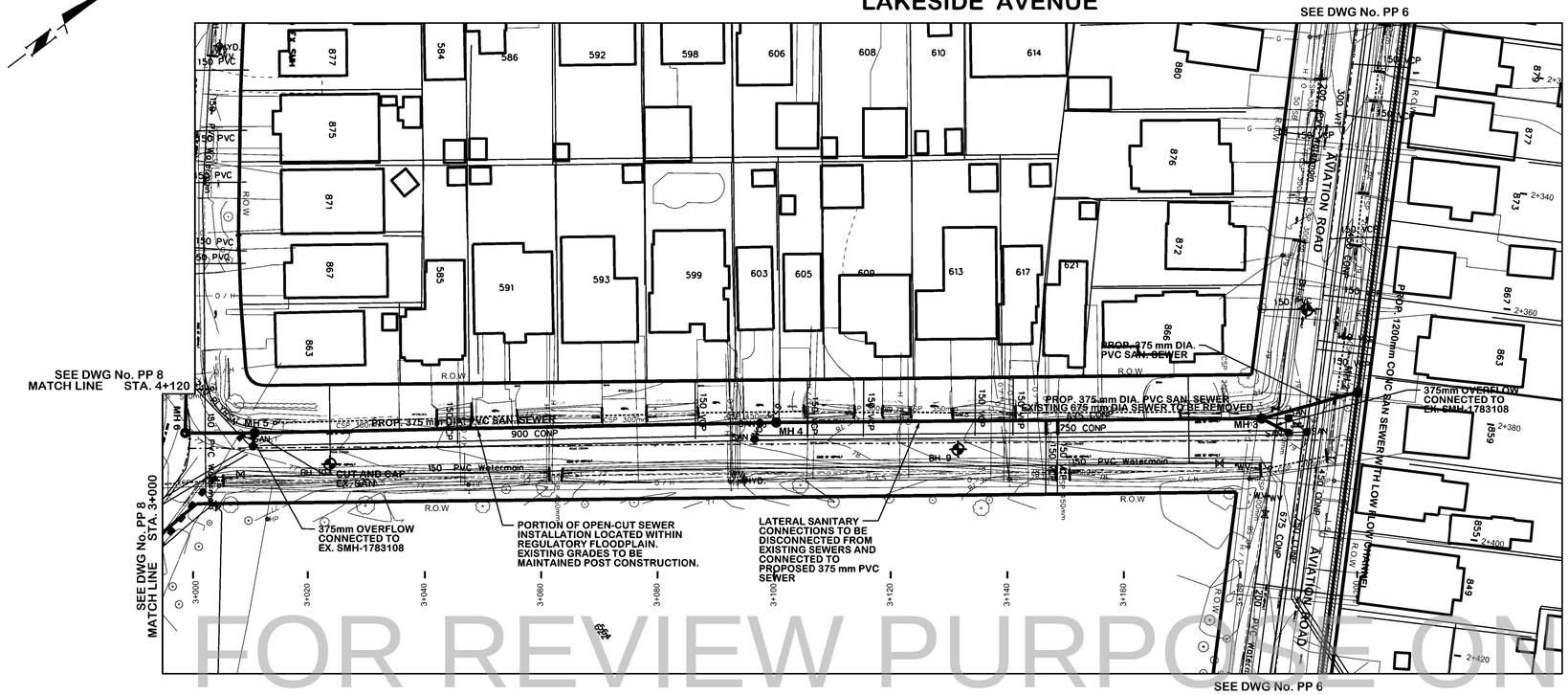
FROM BYNGMOUNT AVE. TO BEACH STREET

PROP. 1200 mm SAN SEWER

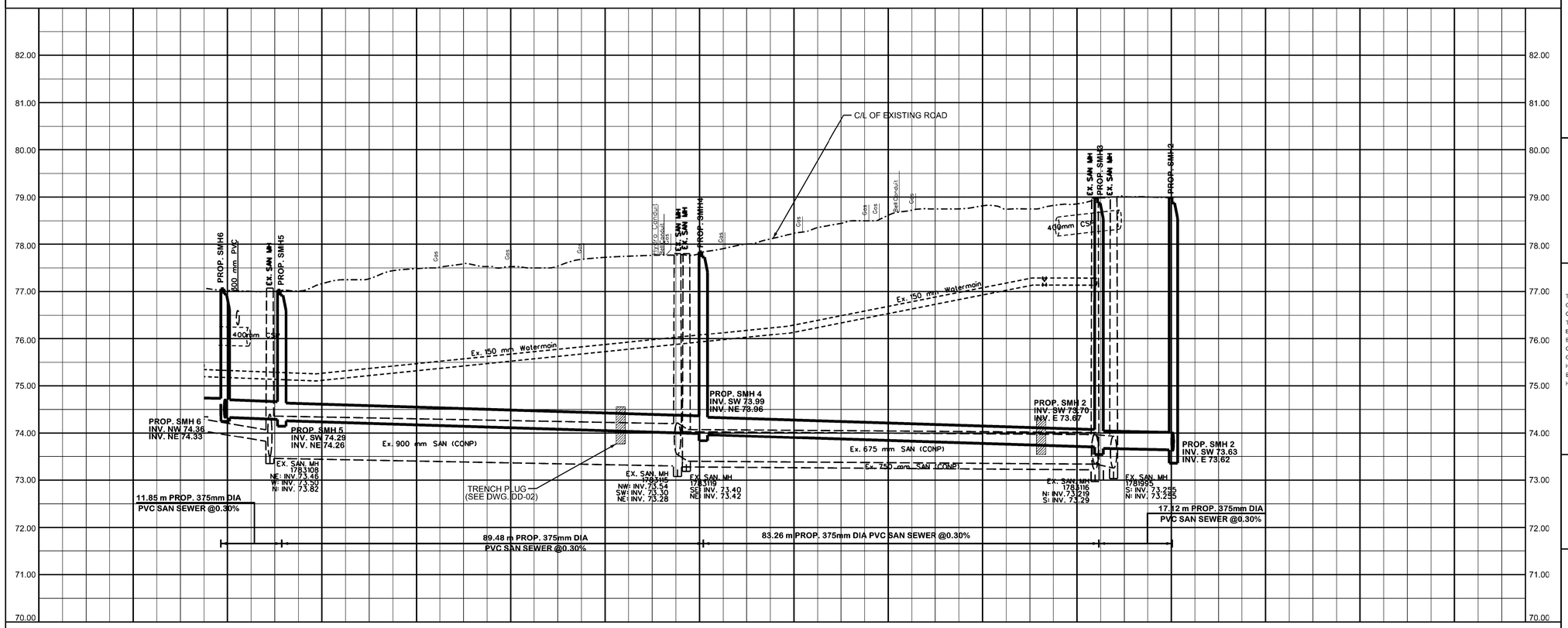
STA. 2+180 TO STA. 2+460

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	J.A.	Drawn by	B.P.		
Date	DECEMBER 2020	Sheet	6 of 10	Plan No.	**PP-6**

LAKESIDE AVENUE



FOR REVIEW PURPOSE ONLY



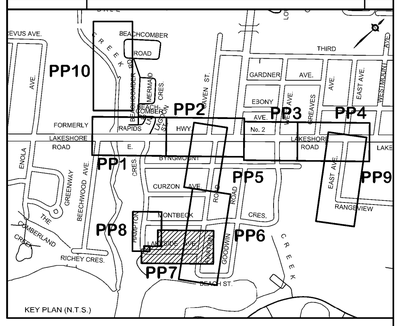
000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	000.00	
76.91	77.10	77.47	77.50	77.52	77.77	78.21	78.53	78.80	78.79	00.00	EX. ROAD ELEV.
3+000	3+020	3+040	3+060	3+080	3+100	3+120	3+140	3+160	3+180	3+200	ROAD CHAINAGE

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



General Notes

All Driveways Are ASPHALT Unless Otherwise Noted

All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field

All Horizontal And Vertical Bends Are In Degrees

All Pipes Size In mm

20C Existing Water Service. Size In mm

WS25 Proposed Water Service, Size In mm

B.M. No. 0011965U550 Elev. 126.740m

Description Location: Limehouse Saint John The Baptist Anglican Church, At Northwest Side Of Dundas Street East (Highway No. 5), 60 M Northeast Of Cawthra Road, Plate In Northeast Face Of Northeast Parapet Wall Of Easterly Steps. Established By Township Of Toronto.

Horizontal: Cordinates are Based on 6 Degree Universal Transverse Mercator (UTM) zone 17, Central Meridian 81 degrees west, North American Datum 1983 adjustment (NAD83).

Elevations: GSC Datum,1978 Southern Ontario Adjustment.

The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____

Approved by _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBREOPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERSOURCE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
ONTARIO MINISTRY OF TRANSPORTATION	PSN (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREWAY (FCI BROADBAND)
HYDRO ONE NETWORKS	
ENERSOURCE, HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
working with you

LAKESIDE AVENUE

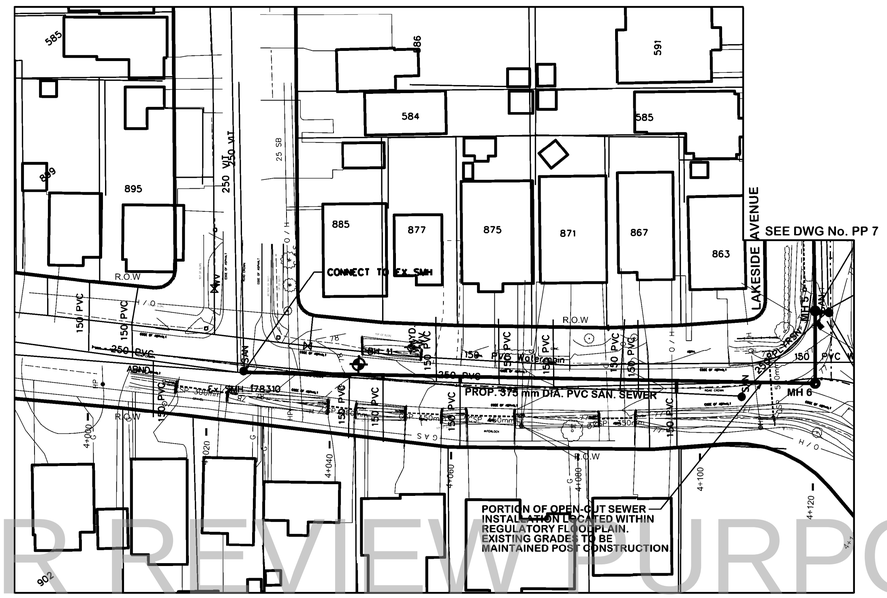
FROM HAMPTON CRESCENT TO AVIATION ROAD

PROP. 375 mm PVC SAN. SEWER

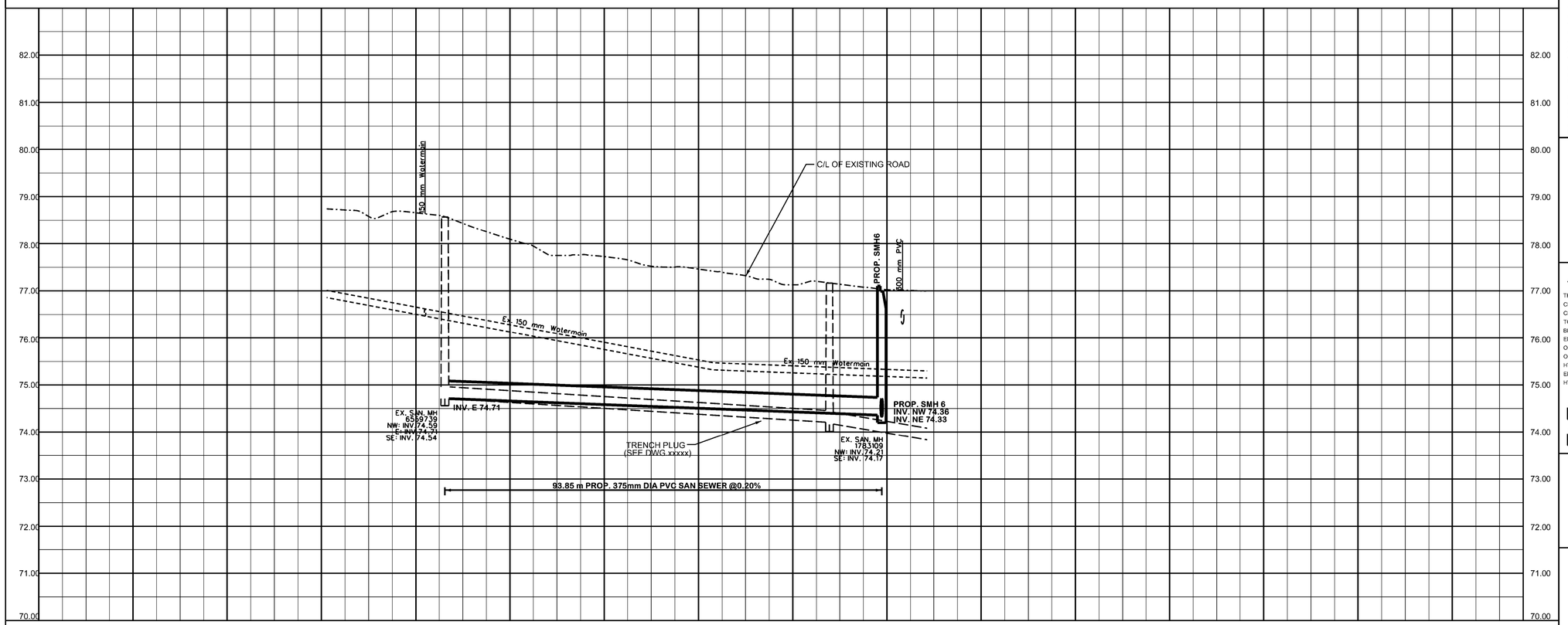
STA. 3+000 TO STA. 3+200

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	J.A.	Drawn by	B.P.		
Date	DECEMBER 2020	Sheet	7 of 10	Plan No.	**PP-7**

HAMPTON CRESCENT



FOR REVIEW PURPOSE ONLY



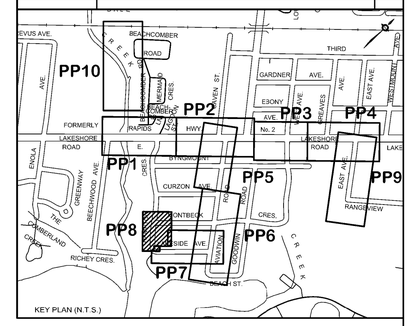
	000.00	000.00	000.00	000.00	000.00	000.00	000.00
EX. ROAD ELEV.	78.65	78.07	77.71	77.45	77.13	77.03	77.16
ROAD CHAINAGE	4+020	4+040	4+060	4+080	4+100	4+120	4+140

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	MAY 00, 2014	X.X.	GAS MAINS	MAY 00, 2014	X.X.
STORM SEWERS	MAY 00, 2014	X.X.	BELL U/G CABLE	MAY 00, 2014	X.X.
WATERMAINS	MAY 00, 2014	X.X.	HYDRO U/G CABLE	MAY 00, 2014	X.X.
TRANSIT	MAY 00, 2014	X.X.	HYDRO ONE	MAY 00, 2014	X.X.
PARKS & REC.	MAY 00, 2014	X.X.	CTV	MAY 00, 2014	X.X.
ONT. CLEAN WATER	MAY 00, 2014	X.X.	COMMUNIC. CABLES	MAY 00, 2014	X.X.

REVISIONS

DATE	DETAILS	INIT.
MAY 2021	30% DETAIL DESIGN	J.A.



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Elevations: GSC Datum,1978 Southern Ontario Adjustment.

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Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m — HORIZONTAL SCALE

1m 0 1 2 3m — VERTICAL SCALE

Region of Peel
working with you

HAMPTON CRESCENT

FROM MONTBECK CRESCENT TO LAKESIDE AVE.

PROP. 375 mm PVC SAN. SEWER

STA.4+000 TO STA. 4+120

CAD Area	X-XX	Area	X-XX	Project No.	19M-00593
Checked by	J.A.	Drawn by	B.P.		
Date	DECEMBER 2020	Sheet	8 of 10	Plan No.	**PP-8**

D Construction Cost Estimates

Project Contract 16-2905 **Beach Street Sewage Pumping Station, City of Mississauga**					Job Ref. **19M-00593-00**
Calculation: Cost Estimate - Beach Street SPS Open Cut - Alternative 2		**Calculated by** Munee Sharma	**Date** December 2023		Status **DD**
		Checked by Jason Ahlberg	**Date** December 2023	**Sheet no.** 1 of 1	Rev. no 0

General Items

Item No.	Item	Quantity	Unit	Unit Cost	Cost
A1	Supply and Maintain Field Office	8	months	$ 10,000.00	$ 80,000.00
A2	Bonds	1.00%	Lump Sum	$ 50,000.00	$ 50,000.00
A3	Insurance	1.00%	Lump Sum	$ 50,000.00	$ 50,000.00
A4	Traffic Control	1	Lump Sum	$ 250,000.00	$ 250,000.00
A5	Dewatering (100 m sections)	16	100 m section	$ 120,000.00	$ 1,920,000.00
A6	Preconstruction Survey	1	Lump Sum	$ 50,000.00	$ 50,000.00
A7	Mobilization and Demobilization	4.00%	Lump Sum	$ 190,000.00	$ 190,000.00
A8	Install and Remove Project Signboards	6	each	$ 500.00	$ 3,000.00
A9	Environmental Measures	1	Lump Sum	$ 50,000.00	$ 50,000.00
				Subtotal - General Items	**$ 2,643,000.00**

Sanitary Sewer Cost

Item No.	Item	Quantity	Unit	Unit Cost	Cost
Manholes					
B1	Pre-cast Manholes (1200mm, Various Depths)	16	each	$ 18,000.00	$ 288,000.00
Pipes					
B2	Supply and install 375mm PVC DR 35 sanitary sewer (5 m depth) (Lakeside & Hampton)	300	m	$ 2,300.00	$ 690,000.00
B3	Supply and install 525mm reinforced concrete pipe, CL 100D (5m deep) (Lakeshore Road E)	441	m	$ 3,000.00	$ 1,323,000.00
B4	Supply and install 450 mm PVC DR 35 sanitary sewer (5m deep) (Lakeshore Road E)	65	m	$ 2,600.00	$ 169,000.00
B5	Remove and replace existing 300mm VC sanitary sewer with 525mm reinforced concrete pipe (Aviation Road)	390	m	$ 4,000.00	$ 1,560,000.00
B5	Remove and replace existing 375mm VC sanitary sewer with 450mm PVC DR 35 sanitary sewer (Goodwin & Montbeck)	400	m	$ 2,750.00	$ 1,100,000.00
				Subtotal - Sanitary Sewer Cost	**$ 5,130,000.00**
				Total	**$ 7,773,000.00**
				Contingency @ 20%	**$ 1,554,600.00**
				Grand Total	**$ 9,327,600.00**

Project Contract 16-2905 Beach Street Sewage Pumping Station, City of Mississauga		WSP			Job Ref. 19M-00593-00
Calculation: Cost Estimate, Microtunnel Sanitary Sewer and Open Cut Sanitary Sewer		**Calculated by** Munee Sharma	**Date** 02-Nov-23		Status **PD**
		Checked by Jason Ahlberg	**Date** 02-Nov-23	**Sheet no.** 1 of 1	Rev. no 0

Sanitary Sewer Cost

General Items

Item No.	Item	Quantity	Unit	Unit Cost	Cost
A1	Supply and Maintain Field Office	18	months	$ 10,000.00	$ 180,000.00
A2	Bonds	1.00%	Lump Sum	$ 150,000.00	$ 1,500.00
A3	Insurance	1.00%	Lump Sum	$ 150,000.00	$ 1,500.00
A4	Traffic Control	1	Lump Sum	$ 120,000.00	$ 120,000.00
A5	CCTV Inspection of Sewers	1700	m	$ 10.00	$ 17,000.00
A6	Preconstruction Survey	1	Lump Sum	$ 50,000.00	$ 50,000.00
A7	Mobilization and Demobilization	4.00%	Lump Sum	$ 570,000.00	$ 22,800.00
A8	Install and Remove Project Signboards	8	each	$ 500.00	$ 4,000.00
A9	Environmental Measures	1	Lump Sum	$ 100,000.00	$ 100,000.00
A10	Coordination of monitoring program	1	Lump Sum	$ 30,000.00	$ 30,000.00
A11	Installation, monitoring and decomissioning of settlement points	1	Lump Sum	$ 50,000.00	$ 50,000.00
A12	Utility relocation allowance	1	Lump Sum	$ 150,000.00	$ 150,000.00
				Subtotal - General Items Cost	**$ 726,800.00**

Tunnelling Items

B1	Shaft excavation and shoring for microtunnel on Aviation Road at Beach Street, including off-site disposal of excavated material, dewatering and backfill, and MH construction (MH 1) (Receiving Pit, 5.5m deep)	1	each	$ 400,000.00	$ 400,000.00
B2	Shaft excavation and shoring for microtunnel on Lakeshore Road East at Caven Road, including off-site disposal of excavated material, dewatering and backfill, and MH construction (MH 10) (Sending Pit, 9m deep)	1	each	$ 500,000.00	$ 500,000.00
B3	Shaft excavation and shoring for microtunnel on Lakeshore Road East at Beechwood Avenue, including off-site disposal of excavated material, dewatering and backfill, and MH construction (MH 11) (Receiving Pit, 8m deep)	1	each	$ 450,000.00	$ 450,000.00
B6	Shaft excavation and shoring for microtunnel east of Greaves Ave, including off-site disposal of excavated material, dewatering and backfill, and MH construction (MH 8) (Launch Shaft, 9m deep)	1	each	$ 500,000.00	$ 500,000.00
B7	Shaft excavation and shoring for microtunnel at East Ave, including off-site disposal of excavated material, dewatering and backfill, and MH construction (MH 7) (Sending Pit, 10m deep)	1	each	$ 500,000.00	$ 500,000.00
B9	Installation of MH 9 at West Ave. for future 450mm connection (including temp. shoring, disposal of excavated material, backfill, and stub for future connection) (9m deep)	1	each	$ 400,000.00	$ 400,000.00
B10	Supply and install 1200mm Conc AWWA C300 sanitary sewer via 1200mm diameter microtunnel from MH 10 to MH 11	380	m	$ 10,000.00	$ 3,803,500.00
B11	Supply and install 1200mm Conc AWWA C300 sanitary sewer via 1200mm diameter microtunnel from MH 1 to MH 10	397	m	$ 10,000.00	$ 3,972,500.00
B12	Supply and install 1200mm Conc AWWA C300 sanitary sewer via 1200mm diameter microtunnel from MH 10 to MH 8	346	m	$ 10,000.00	$ 3,462,000.00
B13	Supply and install 900mm Conc AWWA C300 sanitary sewer via 900mm diameter microtunnel from MH 8 to MH 7	118	m	$ 7,500.00	$ 885,000.00
				Subtotal - Tunnelling Items Cost	**$ 14,873,000.00**

Open Cut & Manholes

C1	Supply and install 375 mm PVC DR 35 sanitary sewer including core break into and connect to maintenance hole Ex MH to MH 6	91	m	$ 2,300.00	$ 210,335.00
C2	Supply and install 375 mm PVC DR 35 sanitary sewer including core break into and connect to maintenance hole MH 6 to MH5	12	m	$ 2,300.00	$ 28,175.00
C3	Supply and install 375 mm PVC DR 35 sanitary sewer including core break into and connect to maintenance hole MH5 to MH4	89	m	$ 2,300.00	$ 204,930.00
C4	Supply and install 375 mm PVC DR 35 sanitary sewer including core break into and connect to maintenance hole MH4 to MH3	89	m	$ 2,300.00	$ 204,930.00
C5	Supply and install 375 mm PVC DR 35 sanitary sewer including core break into and connect to maintenance hole MH3 to MH2	11	m	$ 2,300.00	$ 24,725.00
C8	Remove existing sanitary sewer on Lakeside Ave (675mm dia.)	427	m	$ 450.00	$ 192,150.00
C9	MH2 - 2400mm - PreCast	1	each	$ 40,000.00	$ 40,000.00
C10	MH6, MH5, MH4, MH3 - 1200mm - PreCast (Various depths)	4	each	$ 18,000.00	$ 72,000.00
				Subtotal - Open Cut & Manholes Cost	**$ 977,245.00**

Watermain Construction

D1	Relocate 250mm PVC watermain on Caven St.	25	m	$ 1,000.00	$ 25,000.00
				Subtotal - Watermain Items Cost	**$ 25,000.00**
				Total	**$ 16,602,045.00**
				Contingency @ 20%	**$ 3,320,409.00**
				Grand Total	**$ 19,922,454.00**

E Consultation Material and Comments Received

APPENDIX

E-1 Notice of Commencement

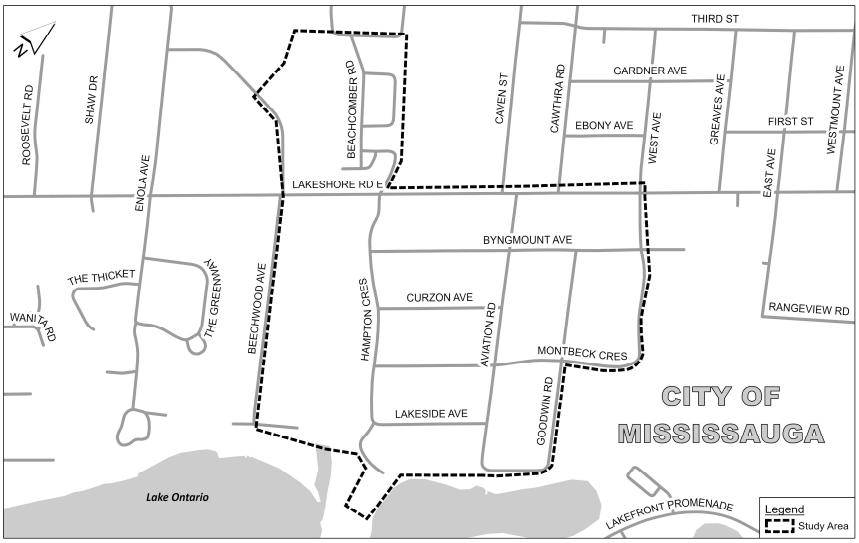
Public Notice

Region of Peel
working with you

Environmental Assessment Study
NOTICE OF COMMENCEMENT - SCHEDULE B
Beach Street Sewage Pumping Station Diversion

The Study:
The Region of Peel has initiated a Schedule B Municipal Class Environmental Assessment (MCEA) study to review existing sanitary sewer infrastructure and evaluate options to divert flow from the Beach Street Sewage Pumping Station (SPS) to the new Beechwood SPS. The map shows the area that may be directly impacted by the proposed construction.

The Study Process will include:
- Public and stakeholder consultations;
- An evaluation of alternative solutions to divert flow to the new pumping station;
- An assessment of proposed alternatives; and,
- Identification of measures to avoid or lessen adverse impacts to the community.



How to Get Involved
Project updates and notices will be posted to www.peelregion.ca/public-works/environmental-assessments. Under the requirements for a Schedule B MCEA study, one Public Open House (POH) will be held to provide an opportunity to review and comment on the alternatives considered, the preferred alternative, potential impacts and proposed mitigation. Notification of the POH will be advertised in advance. If you wish to be added to the study contact list, please reach out to the contacts listed below.
Public consultation is vital to the success of this study. We encourage anyone interested to participate and provide input throughout the study duration.

Contacts
To provide comments or request additional information about this project, please contact:

Kelsey Hinsperger, PMP
Project Manager, EA Lead
WSP Canada
226-220-0590
Kelsey.Hinsperger@wsp.com

Troy Leyburne, BSc. (Env.)
Project Manager, Wastewater
Engineering Services, Public Works
905-791-7800 ext. 4781
Troy.Leyburne@peelregion.ca

This Notice was first issued on **June 16, 2022**

With the exception of personal information, all comments will become part of the public record of the study.
The study is being conducted according to the requirements of the Municipal Class Environmental Assessment, which is a planning process approved under Ontario's *Environmental Assessment Act*.

APPENDIX

E-2 Comments Received

Summary of Comments Received and How They Have Been Addressed
Region of Peel – Beach Street Sewage Pumping Station Diversion Schedule B MCEA

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
Notice of Study Commencement					
1	06/15/2022 / Email	CN Public Works	This contact is on leave of absence; no date of return provided. Alternative email address provided for another contact: ER-Public-Works <ER-Public-Works@cn.ca>	*WSP forwarded the email to provided email address on June 16, 2022.*	No response required.
1a	06/17/2022 / Email	CN Public Works	Please send all EA communication to Proximity@cn.ca. We will not be responding to this from this inbox.	*WSP forwarded the email to provided address on June 17, 2022.*	No response required.
2	06/15/2022 / Email	Malvern Condominium Property Management	We do not manage this corporation anymore.	Thank you for informing me of this. Would you happen to know who the corporation is now managed by?	Response sent via email by WSP on June 15, 2022
2a	06/16/2022 / Email	Malvern Condominium Property Management	Last contact we knew of is this company.	*WSP followed up with the provided contact and another contact via phone and email on June 16, 2022. Determined the new management to be Maple Ridge Community Management.*	No response required.
3	06/16/2022 / Email	Region of Peel – Public Health	Thank you for your email. Your email has been forwarded to the appropriate department. I have asked them to respond directly to your request. For more information, please visit peelregion.ca/health or contact us at (905) 799-7700.	Thanks so much!	Response sent via email by WSP on June 16, 2022
4	06/16/2022 / Email	Ministry of Northern Development, Mines, Natural Resources and Forestry	I no longer work in NDMNRF Aurora District. I have sent your email to the supervisor, District Supervisor, NDMNRF Aurora District for review and assignment to staff. Please add the staff to any future correspondence.	Thank you for passing the message on to the supervisor and providing me with her contact information for future correspondence.	Response sent by WSP via email on June 16, 2022.

Summary of Comments Received and How They Have Been Addressed
Region of Peel – Beach Street Sewage Pumping Station Diversion Schedule B MCEA

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
4a	07/05/2022 / Emailed Letter	Ministry of Natural Resources and Forestry	*Email:* Thank you for the attached notice. MNRF's Land Use Planning and Strategic Issues Section (LUPSI) has received and reviewed the Notice of Study Commencement prepared for the Region of Peel Beach Street Sewage Pumping Station Diversion Project. We provide the attached information and comments for your consideration. Thank you for the opportunity to provide comments. I look forward to hearing from you. *Letter:* The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) received the Notice of Commencement for the Beach Street Sewage Pumping Station Diversion on June 15, 2022. Thank you for circulating this to our office. Please note that we have not competed a screening of natural heritage or other resource values for the project at this time. This response, however, does provide information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation, as well as engaging with the Ministry for advice as needed. Please also note that it is the proponent's responsibility to be aware of, and comply with, all relevant federal or provincial legislation, municipal by-laws or other agency approvals. **Natural Heritage** NDMNRF's natural heritage and natural resources GIS data layers can be obtained through the Ministry's Land Information Ontario (LIO) website. You may also view natural heritage information online (e.g., Provincially Significant Wetlands, ANSI's, woodlands, etc.) using the Make a Map: Natural Heritage Areas tool. We recommend that you use the above-noted sources of information during the review of your project proposal. **Natural Hazards**	--	No response required.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			A series of natural hazard technical guides developed by NDMNRF are available to support municipalities and conservation authorities implement the natural hazard policies in the Provincial Policy Statement (PPS). For example, standards to address flood risks and the potential impacts and costs from riverine flooding are addressed in the Technical Guide River and Stream Systems: Flooding Hazard Limit (2002). We recommend that you consider these technical guides as you assess specific improvement projects that can be undertaken to reduce the risk of flooding. **Petroleum Wells & Oil, Gas and Salt Resources Act** There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website (www.ogsrlibrary.com) for the best-known data on any wells recorded by NDMNRF. Please reference the 'Definitions and Terminology Guide' listed in the publications on the library website to better understand the well information available. Any oil and gas wells in your project area are regulated by the Oil, Has and Salt Resource Act, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the petroleum Operations Section at POSRecords@ontario.ca or 519-873-4634. **Fish and Wildlife Conservation Act** Please note, that should the project require: • The relocation of fish outside of the work area, a Licence to Collect Fish for Scientific Purposes under the Fish and Wildlife Conservation Act will be required. • The relocation of wildlife outside of the work area (including amphibians, reptiles, and small mammals), a Wildlife Collector's Authorization under the Fish and Wildlife Conservation Act will be required. **Public Lands Act & Lakes and Rivers Improvement Act**		

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			Some Project may be subject to the provisions of the Public Lands Act or Lakes and River Improvement Act. Please review the information on NDMNRF's web pages provided below regarding when an approval is, or is not, required. Please note that many of the authorizations under the Lakes and Rivers Improvement Act are administered by the local Conservation Authority. • For more information about the *Public Lands Act*: https://www.ontario.ca/page/crown-land-work-permits • For more information about the *Lakes and Rivers Improvement Act*: https://www.ontario.ca/page/lakes-and-rivers-improvement-act-administrative-guide After reviewing the information provided, if you have not identified any of NDMNRF's interests stated above, there is no need to circulate any subsequent notices to our office. If you have identified any of NDMNRF's interests and/or may require permit(s) or further technical advice, please direct your specific questions to the undersigned. If you have any questions or concerns, please feel free to contact me.		
5	06/16/2022 / Email	Fire & Emergency Services Division – City of Mississauga	Confirmed receipt of email.	--	No response required.
6	06/17/2022 / Email	Secondary Land Use / Hydro One Networks Inc.	Thank you for sending us notification regarding (Beach Street Sewage Pumping Station Diversion). In our preliminary assessment, we confirm there are no existing Hydro One Transmission assets in the subject area. Please be advised that this is only a preliminary assessment based on current information. If plans for the undertaking change or the study area expands beyond that shown, please contact Hydro One to assess impacts of existing or future planned electricity infrastructure. Any future communications are sent to Secondarylanduse@hydroone.com.	--	No response required.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			Be advised that any changes to lot grading and/or drainage within proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor.		
7	06/21/2022 / Email	Planner Credit Valley Conservation Authority	Thank you for providing the NOC information. On May 24th, we had attended a meeting with Kelsey and Troy to discuss our potential concerns and requirements for the proposed works and also reviewed and provided our feedback on the minutes of the meeting. As such, we have no additional comments on the NOC at this stage.	--	No response required.
7a	12/06/2022 / Email	Planner Credit Valley Conservation Authority	CVC staff have now had the opportunity to review the draft Natural Environment Report dated November 3, 2022 and provide these comments for your consideration. CVC Comments 1. It is noted on page 14 of the report that "works will be done using existing infrastructure" for Alternative 2 while the bullet points following this statement indicate replacement of the existing infrastructure. Please clarify and provide details including if the existing infrastructure will be removed or abandoned in its place, and how the new infrastructure will be installed including the type of methodology (will it be open cut?). 2. It is noted on page 15 of the report that the proposed shafts for Alternative 1 (including Cooksville Creek crossing) can be located beyond the limits of the fresh-moist willow lowland deciduous forest but their locations are not shown on any figure. Please identify general location of the proposed shafts on a figure. 3. Please comment if the installation of the proposed shafts for Alternative 1 will require any dewatering or groundwater management. Kelsey/Troy – We will review the alternatives evaluation criteria/matrix and technical studies (including scour	The purpose of this message is to inform you that a Virtual Engagement Opportunity (VEO) will be held for the Region of Peel's Beach Street Sewage Pumping Station Diversion Environmental Assessment Study. The VEO will take place on the Region's website at www.peelregion.ca/public-works/environmental-assessments. VEO materials will be posted on **April 17, 2023.** Please find attached a letter from the Region's Project Manager which provides a general overview of the project, details of the study process and VEO, and how to submit any questions or comments that you may have. Please note that we will provide a separate response to your comments received on the Natural Environment Report for this study shortly.	Response sent by WSP via email on April 13, 2023.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			assessment) as and when completed/submitted and provide any comments on the studies at that stage.		
7b	04/18/2023 / Email	Planner Credit Valley Conservation Authority	Thank you for your email. We will review the responses to our comments on the Natural Environment Report and also review the draft technical studies and evaluation criteria/matrix and provide any comments at that stage. Please provide that information when available.	On behalf of the Region of Peel, thank you for your comments on the Natural Environment Report prepared for the Beach Street Sewage Pumping Station Diversion. We apologize for the delay in responding to your comments. Please find the draft final Project File Report (PFR) for your review at the following link, as well as the finalized Natural Environment Report included in Appendix A-1 of the PFR: Draft Final PFR - January 29, 2024. Please also see responses to your questions below. 1. **It is noted on page 14 of the report that "works will be done using existing infrastructure" for Alternative 2 while the bullet points following this statement indicate replacement of the existing infrastructure. Please clarify and provide details including if the existing infrastructure will be removed or abandoned in its place, and how the new infrastructure will be installed including the type of methodology (will it be open cut?).** **Response**: The description of Alternative 2 has been revised as follows: Alternative 2 will include the replacement of existing sewer infrastructure via open cut methods. All existing sewers will be removed. No tunneling or crossing of Cooksville Creek is required. These works will include: • Replacement of existing gravity sewers including pipe upgrades on Goodwin Avenue and Montbeck Crescent via open cut methods, to 450mm PVC pipes. • Installation of 300 m of 375mm sewer on Hampton Cres and Lakeside Ave. • Installation of 441m of 525mm sewer on Lakeshore Rd E from East Ave to Aviation Rd to address existing sewer surchargeing risks, and to provide additional capacity for servicing future developments. • Replacement of ex. 300mm sanitary sewer to 450mm sewer on Lakeshore Rd E from Cawthra to Caven. • Upsizing of existing sewer on Aviation Road to 525 mm sewer from a 300 mm sewer.	Response sent by WSP via email on January 29, 2024

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				• Installation of a new gravity sewer on Lakeshore Road East from Aviation Road to East Avenue via open cut methods. • Upgrades to Beach Street SPS. 2. **It is noted on page 15 of the report that the proposed shafts for Alternative 1 (including Cooksville Creek crossing) can be located beyond the limits of the fresh-moist willow lowland deciduous forest but their locations are not shown on any figure. Please identify general location of the proposed shafts on a figure.** **Response:** The exact location of the tunnel will be determined as part of the detail design process. An approximate location of the tunnel shaft has been included in Figure A of the Final Natural Environment Report. 3. **Please comment if the installation of the proposed shafts for Alternative 1 will require any dewatering or groundwater management.** **Response**: The shafts for microtunneling will be designed to be watertight eliminating the need for dewatering for the microtunneling operation. **We will review the alternatives evaluation criteria/matrix and technical studies (including scour assessment) as and when completed/submitted and provide any comments on the studies at that stage.** **Response**: The criteria for evaluating alternative solutions and the evaluation matrix can be found in Section 5.2 of the draft PFR. A Scour Assessment and Geomorphic Assessment have previously been completed within the study area as part of the Port Credit Sewage Forcemain Crossing at Lakeshore Road Project (2009) and Cooksville Creek Study for Sanitary Sewer Works (2015), respectively. The results of the Scour Assessment and Geomorphic Assessment recommended that the depth of the forcemain should be placed at a minimum of 2.0 m below the channel inlet. No further Scour Assessment or Geomorphic Assessment are proposed to be completed as part of the project.	

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				You may find a summary of the key findings and recommendations of the 2015 assessment in the PFR, as well as the full assessment in Appendix A-4. We appreciate CVC's interest in this study. We look forward to receiving any comments by **February 29, 2024**, in advance of the 30-day public review period.	
8	06/22/2022 / Email	Alectra Utilities	Thank you for your e-mail/online form. Please refer to reference number provided for any further correspondence related to this issue. An Alectra representative will reply within ten (10) business days. Reference # 6222-0224-1446-603	--	No response required.
9	07/12/2022 / Email	Peel Public Health	Thank you for informing us about this EA study. Where are the Beach Street sewage pumping station and the Beechwood SPS located exactly on the map? Also are there different options for the diversion being considered at this time?	Thank you for your email. I've attached a more detailed figure that includes the Beach Street and Beechwood Pumping Stations. This figure also includes the two alternatives that we are considering in this EA. We are still doing some work on the feasible alternatives, so these are certainly still subject to change as the EA progresses, but the two alignments on the attached figure (shown in purple and red) are our preliminary alternatives. Please let me know if you have any other questions. Thank you!	Response sent by WSP via email on July 13, 2022.

Summary of Comments Received and How They Have Been Addressed
Region of Peel – Beach Street Sewage Pumping Station Diversion Schedule B MCEA

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
9a	07/13/2022 / Email	Peel Public Health	Thanks Kelsey for providing additional information. Our only questions are: • What is the risk of sewage being spilled during the sewage diversion process? • What is the risk of contaminating potable water lines?	Here are responses to your questions: 1) The proposed works would entail a permanent diversion (gravity sewer) using the Region of Peel's 50 psi trunk sanitary sewer design requirements (some of the most stringent standards in North America). During some construction projects temporary bypass systems (diversions) are conducted. We have not completed our design for this project yet, but should a temporary bypass system be required, it will be constructed to the required specifications, and signed off by an engineer. No system is ever perfect, but it will be designed and built to very rigorous requirements to provide optimal protection of the environment. Further to that, a bypass pumping plan will be reviewed and signed off by both the GC, the consultant, and the Region of Peel's ORO of the Wastewater Collection System. The bypass pumping system would also have spill contingency measures in place. 2) There is an extremely low risk of contaminating the potable water lines in the area. The majority of the planned infrastructure is to be installed by microtunneling, and will be several meters below the potable water network. This trenchless methodology significantly reduces the risk of accidental pipe strikes compared to open cut methods. Additionally, all of the sanitary systems being worked on are gravity based sewers, as such the only way for sewage to get into the potable water lines would be if there was a zero pressure (or vacuum) incident in the watermain, that pipe section having a leak or a failed joint, and the sewage surcharging to invert of the offline watermain. This area is protected better than most as the system runs at approximately 100 psi, as it is at the bottom of the Zone 1 pressure zone. Although this is not impossible, it would be extremely unlikely.	Response sent by Peel Region via email on July 13, 2022.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
9b	07/15/2022 / Email	Peel Public Health	Thanks for responding to our questions. Just to get a better understanding, can you elaborate on what you mean in the highlighted statements below? … 2. There is an extremely low risk of contaminating the potable water lines in the area. The majority of the planned infrastructure is to be installed by microtunneling, and will be several meters below the potable water network. This trenchless methodology significantly reduces the risk of accidental pipe strikes compared to open cut methods. Additionally, all of the sanitary systems being worked on are gravity based sewers, as such the only way for sewage to get into the potable water lines would be if there was a zero pressure (or vacuum) incident in the watermain, that pipe section having a leak or a failed joint, and the sewage surcharging to invert of the offline watermain. This area is protected better than most as the system runs at approximately 100 psi, as it is at the bottom of the Zone 1 pressure zone. Although this is not impossible, it would be extremely unlikely.	I'm happy to discuss further if you'd like to chat.	Response sent by Peel Region via email on July 15, 2022.
10	07/13/2022 / Email	Resident	Would you be able to flesh out the details of the proposal for a Beechwood Sewage Pumping Station? Specifically environmental impact, exact location, impact on the ajacent creek and wetlands on the Adamson Estate and the potential for smell created by the implementation of a Sewage plant in our neighborhood? The continued push for tall building along the Lakeshore corridor and properties at the Texaco refiner lands, Lakeview power generating lands and Port St. to name a few continues the stress on existing infrastructure water, sewer, police services, fire, EMS. who is financially responsible? Who is responsible in the event of a catastrophic disaster like the train derailment or fire in Port Credit? Look forward to hearing from you.	Thank you for your comments. We'll restate the questions and respond to them individually. Q1) Would you be able to flesh out the details of the proposal for a Beechwood Sewage Pumping Station? A1) We have attached a map that depicts the locations of the two Sewage Pumping Stations (SPSs). Both of these SPSs are existing assets, with Beechwood being newer and in service for approximately 4 years, whereas the Beach St SPS was originally built in 1961 and has seen various upgrades throughout the years. One of the options being proposed is to construct a gravity sewer, installed primarily by tunnelling, from the Beach St SPS to the Beechwood SPS. Q2) Specifically environmental impact, exact location, impact on the adjacent creek and wetlands on the Adamson Estate and the potential for smell created by the implementation of a Sewage plant in our neighborhood?	Response sent by Peel Region via email on July 14, 2022.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				A2) As noted above, the location of the existing SPSs will remain. The proposed works would entail the use of microtunneling beneath the Cooksville Creek, which is a lower risk construction methodology than traditional methods. These systems are capable of extremely precise tolerances, and can adjust its operation in changing overburden (soil) conditions as required. These SPSs both have existing odour control systems that mitigate odours that may be caused by the sewage flowing into the pumping station, or while being pumped out via their respective forcemains. These systems perform a somewhat different function than Wastewater (Sewage) Treatment Plants. Given the proximity from the Adamson Estate, we do not foresee any impact to it or the existing waterways, or the Waterfront Trail. Q3) The continued push for tall building along the Lakeshore corridor and properties at the Texaco refiner lands, Lakeview power generating lands and Port St. to name a few continues the stress on existing infrastructure water, sewer, police services, fire, EMS. who is financially responsible? A3) The proposed infrastructure will not service the Texaco Refinery Lands (Port Credit West Village Partners Inc.), or other developments west of the Credit River. These proposed works will service the existing sanitary sewer catchment area east of the Cooksville Creek, excluding the Lakeview Power Generating lands (Lakeview Village), which will have its own independent sanitary infrastructure. Development works for water and wastewater are funded through Development Charges. We're not really in a position to comment on resource levels for Police, Fire or EMS for the work that we do. Q4) Who is responsible in the event of a catastrophic disaster like the train derailment or fire in Port Credit? A4) The Region of Peel is responsible for any catastrophic events that occur to our water or wastewater infrastructure. We have certified staff on-call 24/7 to meet the needs of these two systems. We are keenly aware of the evolving requirements of our infrastructure as it relates to wet weather events. The proposed infrastructure would be designed and built to our latest standards which consider our changing environment. Additional resources related to disaster planning or Emergency Management can be found here: • Emergency management – City of Mississauga	

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				• Emergency Preparedness: Emergency Management - Region of Peel (peelregion.ca) • Emergency management | ontario.ca	
10a	07/13/2022 / Email	Resident	Hi all. I wonder if reference to the sewage pumping station on Beechwood is in fact perhaps an upgrade / expansion of the existing station on Beach Street which is at the south end of Aviation? Just a thought.	Thank you for your comments. Q1) I wonder if reference to the sewage pumping station on Beechwood is in fact perhaps an upgrade / expansion of the existing station on Beach Street which is at the south end of Aviation? A1) When the Beechwood SPS was commissioned, it relieved some of the flows that were previously conveyed to the Beach St SPS. One of the proposed options is to divert existing flows from the Beach Street SPS to the Beechwood SPS via gravity sewers under normal operating conditions. There are no plans at this time for any (hydraulic) expansions to either of the SPSs. There are ongoing works at both facilities for preventative and major maintenance, and capital replacements as required.	Response sent by Peel Region via email on July 14, 2022.

11	07/14/2022 / Email	Resident	I just received the attached notice of an environmental study. Could you explain in layman terms the following:
			(a) why it is necessary to create a new Beechwood Pumping station ?
			(b) how is Enola Ave. south affected by a new station?
			(c) does this construction project affect traffic on the Lakeshore?
			Thanks for the information.
				Thank you for your comments. We'll restate the questions and respond to them individually.
				
				• Why it is necessary to create a new Beechwood Pumping station ?
				  • This project will not be creating a new Beechwood Sewage Pumping Station (SPS). The Beechwood Pumping Station is an existing pumping station which was built approximately 4 years ago (see attached). One of the options being proposed for this project is to construct a new sewer pipe to flow by gravity from the Beach St SPS to the Beechwood SPS.
				• How is Enola Ave. south affected by a new station?
				  • The current options under consideration include construction on Lakeshore Road East only as far west as Beechwood Avenue. The project would only affect Enola Avenue in terms of traffic impacts for the proposed construction at Lakeshore Road East and Beechwood Avenue.
				• Does this construction project affect traffic on the Lakeshore?
				  • We are evaluating alternatives that would include significant construction work and Traffic Management Plans on Lakeshore Road East. One of the options
					Response sent by WSP via email on July 14, 2022.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				would include construction at the intersection of Beechwood and Lakeshore, and directly west of the Cawthra Road/Lakeshore intersection at Aviation Road. We are working with traffic engineers and modellers to understand the impacts of various construction methods and staging options, and will take these traffic impacts into account when selecting an option to move forward with. We are planning to hold a virtual public meeting regarding this project in the next month or so and will add your email to our project contact list for any new notifications. Please feel free to contact me with any additional questions; thank you!	
12	07/14/2022 / Email	Resident	Please add my name to the POH for the Beach Street pumping station diversion to Beechwood.	We will do so.	Response sent by Peel Region via email on July 14, 2022.

13	07/14/2022 / Email	Resident	• Resident explained that he lives on Beach Street and received the notice of commencement from a neighbor who lives on Aviation. He said that he never received a notice on Beach Street.
			• He asked about project options and area, and access to Beach Street and traffic impacts on Lakeshore
			• Resident suggested that the team look at using the trail east of Hampton Court adjacent to Cooksville Creek; the trail is in disrepair and he believes it could be a dual purpose project (trail restoration and pipe install)
			• Resident asked about the construction impacts, duration, and schedule
			• Resident asked to be added to the project email list
				• WSP Project Manager (PM) summarized the project: Peel Region and WSP are undertaking an EA to evaluate options for a gravity line between Beach Street SPS and Beechwood SPS for both future development and system resiliency
				• Re: project options and area
				  ○ PM explained that current options are a tunneled option up Aviation, west on Lakeshore, and with a small section extending east on Lakeshore to West Avenue
				  ○ One other, less impactful option is to upgrade local sewers on Goodwin, Montbeck, Lakeside, and Aviation but would stay off of Lakeshore. This option however provides less operational value because it only meets the project requirement of upgrading the system for increased flows, and does not provide the redundancy that the Region wants.
				• Re: access to Beach Street and traffic impacts on Lakeshore
				  ○ PM explained that the EA process will evaluate traffic impacts of the options and that the team is looking at various staging options to minimize the impacts on Lakeshore
					Phone call between resident and WSP Project Manager held on July 14, 2022.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				○ PM also explained that the project team understands that the work in this area will be very impactful on Lakeshore • Re: Trail east of Hampton Court adjacent to Cooksville Creek ○ PM discussed that it may be too close to the creek, but that team will certainly look at it • Re: construction impacts, duration, and schedule ○ PM discussed that typical construction impacts are increased truck traffic, intermittent noise, and vibration/settlement monitoring ○ PM discussed that the team is targeting to start construction early in 2023 and the work would likely take between 9-12 months • PM confirmed that he would be added and notified of any open houses/virtual events related to the EA	
14	07/18/2022 / Email	Resident	I would like to be added to the study contact list.	Thanks for your email, we will add you to the distribution list.	A response was provided by Peel Region Project Manager on July 19, 2022
14a	12/3/2022 / Email	Resident	I was wondering if you could answer a question for me. Our property address is this address. We have an easement on the north side of the property, running east from Montbeck through the old Byngmount school property to East ave. This, I believe is a sewer line. Are you aware if it is currently in use or to be used in the realignment of the new water treatment facility. What would it take to have this easement removed if there is no current use or future planned use for this sewer line?	At present the sewer in the easement beside your home is in use. We are reviewing the long term serviceability of this sewer as a part of the review of the collection system in the Beach St SPS catchment (project) area. Staff working with my group are in close discussions with staff working on the upgrades at the APK Water Treatment Plant to ensure that the plant's long term wastewater servicing needs are considered between these two projects.	A response was provided by Peel Region Project Manager on December 12, 2022

Summary of Comments Received and How They Have Been Addressed
Region of Peel – Beach Street Sewage Pumping Station Diversion Schedule B MCEA

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
15	07/19/2022 / Emailed Letter	Ministry of the Environment, Conservation and Parks	*Email:* Please find attached a letter from the Ministry of the Environment, Conservation and Parks, Environmental Approvals Branch, regarding the above mentioned project. Feel free to contact me directly with any questions or concerns you may have. *Letter:* This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the project is following the approved environmental planning process for a Schedule B project under the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA). The attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please identify the areas of interest which are applicable to the project and ensure they are addressed. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule. The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process. The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's Constitution Act 1982. Where the Crown's duty to consult is triggered in relation to the proposed project, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter. The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.		No response required – Project File Report to be sent to MECP for review

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided

			Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:
			
			• Mississaugas of the Credit First Nation; and
			• Six Nations of the Grand River
			  ○ Six Nations Elected Council; and
			  ○ Haudenosaunee Confederacy Chiefs Council and the Haudenosaunee Development Institute.
			
			Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the “Code of Practice for Consultation in Ontario’s Environmental Assessment Process”.
			
			Additional information related to Ontario’s Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments
			
			Please also refer to the attached document “A Proponent’s Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities” for further information.
			
			The proponent must contact the Director of Environmental Assessment Branch under the following circumstances after initial discussions with the communities identified by MECP:
			
			• Aboriginal or treaty rights impacts are identified to you by the communities;
			• You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right;
			• Consultation with Indigenous communities or other stakeholders has reached an impasse; or
			• A Section 16 Order request is expected based on impacts to Aboriginal or treaty rights.
			
			The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will		

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			be asked to play should additional steps and activities be required. Once the report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the Proponent. Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Section 16 Order requests on those matters should be addressed in writing to: Ministry of Environment, Conservation and Parks 777 Bay Street, 5th Floor Toronto ON M7A 2J3 minister.mecp@ontario.ca and Director, Environmental Assessment Branch Ministry of Environment, Conservation and Parks 135 St. Clair Ave. W, 1st Floor Toronto ON, M4V 1P5 EABDirector@ontario.ca Please note the project cannot proceed until at least 30 days after the end of the public review period provided for in the Notice of Completion. Further, the project may not proceed after this time if: • a Section 16 Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights; or • the Director has issued a Notice of Proposed Order regarding the project. The public can request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In		

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. Once the requested information has been received, the Minister will have 30 days to make a decision or impose conditions on your project. A draft copy of the report should be sent to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments. Please also ensure a copy of the final notice is sent to the ministry's Central Region EA notification email account (eanotification.cregion@ontario.ca) after the report is finalized. Should you or your project team members have any questions regarding the material above, please contact me at trevor.bell@ontario.ca. (See Attachments: Areas of Interest; A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities)		
16	07/19/2022 / Emailed Letter	Ministry of Citizenship and Multiculturalism (MCM) (formerly Ministry of Tourism, Culture and Sport)	*Attached letter:* Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Commencement for the above-referenced project. MTCS's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes: • archaeological resources, including land and marine; • built heritage resources, including bridges and monuments; and • cultural heritage landscapes. Under the EA process, the proponent is required to determine a project's potential impact on known (previously recognized) and potential cultural heritage resources.	*The Stage 1 Archaeological Assessment report was accepted into the Ontario Heritage Register on November 4, 2022.*	No response required.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			Project Summary The purpose of this study is to review existing sanitary sewer infrastructure and evaluate options to divert flow from the Beach Street Wastewater Pumping Station to the new Beechwood Sewage Pumping Station. **Identifying Cultural Heritage Resources** While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. **Archaeological Resources** The MTCS Criteria for Evaluating Archaeological Potential is normally used to determine whether an archaeological assessment is needed. For this study, our records indicate that a Stage 1 Archaeological Assessment has been initiated under PIF # P1006-0067-2022. Please apply the Criteria for Evaluating Marine Archaeological Potential if the project is to involve in-water works. MTCS archaeological sites data are available at archaeology@ontario.ca. Archaeological assessments are undertaken by an archaeologist licenced under the Ontario Heritage Act (OHA), who is responsible for submitting the report directly to MTCS for review. **Built Heritage Resources and Cultural Heritage Landscapes** The MTCS Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes should be completed to help determine whether this EA project may impact built heritage resources and/or cultural heritage landscapes. If there is potential for built heritage resources and/or cultural heritage landscapes on the property or within the project area, a Cultural Heritage Evaluation Report (CHER) should be undertaken by a qualified person to determine the cultural heritage value or interest of the properties. If a property is determined to be of cultural heritage value or interest and alterations or development is proposed, MTCS recommends that a Heritage Impact Assessment (HIA), prepared by a		

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			qualified consultant, be completed to assess potential project impacts. Please send the HIA to MTCS for review and comment and make it available to local organizations or individuals who have expressed interest in review. Community input should be sought to identify locally recognized and potential cultural heritage resources. Sources include, but are not limited to, municipal heritage committees, historical societies and other local heritage organizations. Cultural heritage resources are often of critical importance to Indigenous communities. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to them. **Environmental Assessment Reporting** All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical cultural heritage studies will be completed for this EA project, and provide them to MTCS before issuing a Notice of Completion. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file. Thank you for consulting MTCS on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, please do not hesitate to contact me.		
16a	01/23/2023 / Emailed Letter	Ministry of Citizenship and Multiculturalism (MCM) (formerly Ministry of Tourism, Culture and Sport)	Thank you for providing the Ministry of Citizenship and Multiculturalism (MCM) with the Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment for the above-referenced project dated September 23, 2022, prepared by WSP. Please note that the responsibility for administration of the Ontario Heritage Act and matters related to cultural heritage recently transferred from the Ministry of Tourism, Culture and	Thank you for your comments, we have made the changes. The updated report will be included as an Appendix to the Project File Report to be prepared at the completion of the study.	A response was sent by WSP via email on January 25, 2023.

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			Sport (MTCS) to MCM. Individual staff roles and contact information remain unchanged. Please continue to send any notices, report and/or documentation to both Karla Barboza and the undersigned. **Project Summary** The purpose of this study is to review existing sanitary sewer infrastructure and evaluate options to divert flow from the Beach Street Wastewater Pumping Station to the new Beechwood Sewage Pumping Station. **Cultural Heritage Report Review** We have no concerns with the substance and recommendations of the Cultural Heritage Report. However, since it is important for such reports to be completed by qualified persons, they should include a section briefly summarizing the qualifications of the individuals involved and the role they played in the report's preparation. In light of the ministry change noted above, if the report is being re-edited before study completion, references to MTCS can be replaced with MCM, except where referring to past correspondence or citing earlier documents. Thank you for consulting MCM on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, please do not hesitate to contact me.		
17	07/20/2022 / Phone Call	Resident	Resident had a number of questions about the siting of the two SPSs and general questions about the wastewater collection system in her area. Resident requested to be added to the email distribution list	Peel Region Project Manager explained that there is no planned infrastructure on the Greenway, and that the two SPSs are existing and that the preferred option is to build a gravity sewer from Beach St SPS to Beechwood SPS. The resident was satisfied with the response and had no further questions/concerns.	Phone call between resident and Peel Region Project Manager held on July 20, 2022.

Summary of Comments Received and How They Have Been Addressed
Region of Peel – Beach Street Sewage Pumping Station Diversion Schedule B MCEA

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
18	07/20/2022 Phone Call	Resident	The resident had some general questions about the project, and when he realized it was quite a far distance from his house, he didn't have any concerns.	It was difficult to hear the resident, but Peel Region Project Manager conveyed to him that we were contemplating building a new sewer between the two SPSs. The resident was satisfied with this response and had no further questions/concerns.	Phone call between resident and Peel Region Project Manager held on July 20, 2022.
19	07/26/2022 Phone Call and Follow up Email	Lakeview Ratepayers Association	The Lakeview Ratepayers Association called the Peel Region Project Manager to discuss the project.	Thanks for the call yesterday regarding the Notice of Commencement for the Beach St Sewage Pumping Station (SPS) Diversion Environmental Assessment. This link is for the project in question https://www.peelregion.ca/public-works/environmental-assessments/mississauga/beach-street-sewage-station.asp We appreciate that there are a lot of projects and development in this vicinity. This project is somewhat independent in that it will not service any developments west of the Cooksville, or the large development at Lakeview Village. There will be some new flows serviced by this infrastructure in the immediate vicinity of the Lakeshore and Cawthra area. As discussed, we are proposing to divert flows from the existing Beach St SPS by gravity sewer, to the existing Beechwood SPS. Doing so will increase operational flexibility, as well as assist in mitigating wet weather flows. The work in general will take the existing flows from the east side of the Cooksville Creek, and route them to Beechwood SPS (located on the NW corner of Lakeshore Road East & Cooksville Creek). One of the methodologies being proposed is trenchless technology to reduce the impacts of construction, while allowing us to build with a high degree of precision. We recognize that the storm of 2013 presented challenges for the residents in this area, but did want to bring forward that since	Phone call between resident and Peel Region Project Manager held on July 26, 2022. Follow up email response sent via email from Peel Region Project Manager on July 27, 2022

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				the Beechwood SPS was commissioned approximately four years ago, the flows on the west side of Cooksville Creek are now being routed north up Beechwood Avenue, to the new station. If you have any further questions, please don't hesitate to reach out.	
Notice of Virtual Engagement Opportunity (April 13, 2023)					
20	04/13/2023 / Email	Resident	Thank you. Reference is made about a new Beechwood SPS. Where is this located specifically or intended to be located? Is this the new station located north of Lakeshore?	Yes, it is in reference to the Beechwood SPS located north of Lakeshore Road East, as shown on the attached figure. Please let me know if you have any further comments or questions.	Response was provided by WSP on April 17, 2023
21	04/17/2023 / Email	Resident	I received a 'Notice of Virtual Engagement Opportunity" for the Beach Street Sewage Pumping Station Diversion. I visited the website given (peelrgion.ca/public-works/environmental-assessments) and found only the exact text of the hard copy hand out. What are the alternative solutions? What is a proposed alternative? What was the original solution? Will there be any forthcoming information for what exactly is being planned? I live...in the study area, and am interested to know how disruptive the Diversion from Beach Street to Beechwood might be. For example, will there be major construction? Will roads be dug up? Etc. Thank you for any information you can provide.	Thank you for comments regarding the Beach Street Sewage Pumping Station (SPS) Diversion study. We apologize for the inconvenience, the website has since been updated. Please see the link to the Virtual Engagement Opportunity materials which includes information on the alternative solutions considered and recommended alternative: https://peelregion.ca/public-works/environmental-assessments/mississauga/beach-street-sewage-station.asp The preferred alternative includes the following: • Installation of a new gravity sewer between Beach Street SPS and Beechwood SPS along Aviation Road and Lakeshore Road East via microtunneling. • Installation of a new gravity sewer on Lakeshore Road East from Aviation Road to East Avenue via microtunnelling. • Replacement of existing gravity sewer on Lakeside Avenue via open cut methods. • Upgrades to the Beach Street Sewage Pumping Station (SPS) to current Region standards. As the gravity sewer between the Beach Street SPS and Beechwood SPS will be installed via microtunneling methods, impacts to traffic along Aviation Road will be minimal and will be limited to construction vehicle traffic only. A tunneling shaft will be located adjacent to the Beach Street SPS.	Response was provided by WSP on May 2, 2023

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				We appreciate your interest in this study. Should you have any further questions or comments, please feel free to contact a member of the Project Team. Thank you,	
Agency Review of Draft PFR					
22	02/15/2024	Ministry of the Environment, Conservation and Parks	Thank you for following up with us regarding this project. The ministry has no comments at this time and may not consider reviewing this project if your project team consider no significant concerns identified by the public and stakeholders, or those concerns can be addressed through further detailed design stage and permit and approval process(es). If you have any questions regarding our approach for this project, please feel free to contact us for further discussion.	--	No response required.
23	02/22/2024	Planner Credit Valley Conservation Authority	CVC staff have now had the opportunity to review the draft project file report (PFR) (January 2024), design drawings (December 2023), geomorphic assessment (April 2015), draft geotechnical data report (December 17, 2021), natural environment report (November 3, 2022), arborist report (January 16, 2024), and responses to our last comments in your below email, and provide these comments for your consideration. **General Comments** 1. The detailed Erosion and Sediment Control (ESC) plans will be required at the detailed design stage of the project and these plans should include all relevant ESC control measures, dewatering details (pump locations and discharge points), and construction staging and access areas. 2. Please refer to the Standard Notes for Drawings Submitted for CVC Review (attached) and apply the notes to the ESC drawings, as necessary. 3. The ESC measures should be installed in accordance with the Ontario Provincial Standard Drawings (OPSDs).	Please see below for our responses: **General Comments** 1. The detailed Erosion and Sediment Control (ESC) plans will be required at the detailed design stage of the project and these plans should include all relevant ESC control measures, dewatering details (pump locations and discharge points), and construction staging and access areas. **ESC plans to be completed.** 2. Please refer to the Standard Notes for Drawings Submitted for CVC Review (attached) and apply the notes to the ESC drawings, as necessary. **OK** 3. The ESC measures should be installed in accordance with the Ontario Provincial Standard Drawings (OPSDs). **OK**	Response provided by WSP on March 7, 2024

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			4. All final drawings and technical reports must be signed and stamped by a registered Professional Engineer / qualified professionals prior to the issuance of CVC permit. 5. Prior to the issuance of CVC permit, an email confirmation directly from Region of Peel will be required indicating that the necessary easements and permission to enter agreements with any public and private property owners to facilitate the proposed works are in place. **Engineering Comments** 6. Section 8.1.4 (point 3 under Construction Design) of the draft PFR states that the shafts required for the micro-tunneling should be located outside of the floodplain associated with Cooksville Creek. However, MH11 shown on the drawing (PP-1), is located within the regulatory floodplain associated with the creek. Please clarify if there are options or plans to relocate this shaft. CVC's preference is that the maintenance hole (permanent infrastructure) is located outside of the regulatory floodplain. 7. It appears that a portion of the open-cut sewer installation along Lakeside Ave between MH4 and MH6 is located within the regulatory floodplain associated with Cooksville Creek. All existing grades within the regulatory floodplain must be maintained post-construction. This note should be added to the drawings at the detailed design stage. 8. Please confirm the duration and timing of the open cut works on Lakeside Ave. 9. The drawing (PP-1) shows insufficient clearance (0.97 m) between the proposed infrastructure and channel bed at the Cooksville Creek crossing. The geomorphic assessment carried out by Parish states that a new sanitary sewer should be installed at a depth of 2 m below the channel bed. The scour hazard limit should	4. All final drawings and technical reports must be signed and stamped by a registered Professional Engineer / qualified professionals prior to the issuance of CVC permit. **YES** 5. Prior to the issuance of CVC permit, an email confirmation directly from Region of Peel will be required indicating that the necessary easements and permission to enter agreements with any public and private property owners to facilitate the proposed works are in place. **YES** **Engineering Comments** 6. Section 8.1.4 (point 3 under Construction Design) of the draft PFR states that the shafts required for the micro-tunneling should be located outside of the floodplain associated with Cooksville Creek. However, MH11 shown on the drawing (PP-1), is located within the regulatory floodplain associated with the creek. Please clarify if there are options or plans to relocate this shaft. CVC's preference is that the maintenance hole (permanent infrastructure) is located outside of the regulatory floodplain. **The shaft seems to be just outside the regulation mapping area according to Regulation Mapping - Credit Valley Conservation (cvc.ca). Is there a separate map for the floodplain? Please confirm.** 7. It appears that a portion of the open-cut sewer installation along Lakeside Ave between MH4 and MH6 is located within the regulatory floodplain associated with Cooksville Creek. All existing grades within the regulatory floodplain must be maintained post-construction. This note should be added to the drawings at the detailed design stage. **Note will be added**	

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
			be determined using CVC's scour assessment guidelines (attached). 10. The drawing (PP-9) is missing from the submitted drawing package. Please provide so that any impact to Cooksville Creek upstream of Lakeshore Road East can be assessed. 11. Please indicate the horizontal and vertical datums used on the drawings. 12. Please indicate any relevant benchmarks used in the survey. **Ecology Comments** 13. It is noted that a tree protection and preservation plan will be developed. Please note that tree removals within CVC's regulated areas should be minimized. Any permitted removals will require the use of CVC's Ecosystem Offsetting Guideline (attached) to determine the offsetting requirements for any residual losses. The onsite restoration plans demonstrating the onsite offsetting should be developed using CVC's Plant Selection Guideline (attached), Healthy Soils Guideline (attached), and Buffer Planting Guideline (attached), as appropriate. Any losses that cannot be accommodated on the site should be arranged offsite in a suitable location within the same subwatershed preferably or as a last resort offset through the cash-in-lieu agreement. If you have any questions, please contact me.	8. Please confirm the duration and timing of the open cut works on Lakeside Ave. **Duration of open cut works will be approximately 2 months, late 2025.** 9. The drawing (PP-1) shows insufficient clearance (0.97 m) between the proposed infrastructure and channel bed at the Cooksville Creek crossing. The geomorphic assessment carried out by Parish states that a new sanitary sewer should be installed at a depth of 2 m below the channel bed. The scour hazard limit should be determined using CVC's scour assessment guidelines (attached). **That is the bridge footing. Channel Bed will be added to drawings and clearance will be shown, which just meets the 2 meter clearance requirement.** 10. The drawing (PP-9) is missing from the submitted drawing package. Please provide so that any impact to Cooksville Creek upstream of Lakeshore Road East can be assessed. **This drawing is a part of a separate EA titled: ENVIRONMENTAL ASSESSEMENT: CLAREDALE ROAD TO BEECHWOOD PUMPING STATION. Please refer to it for info on impact to Cooksville Creek upstream of Lakeshore Road East. See link: Claredale EA_Project File Report.pdf** 11. Please indicate the horizontal and vertical datums used on the drawings. **Yes** 12. Please indicate any relevant benchmarks used in the survey. **Yes** **Ecology Comments**	

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
				13. It is noted that a tree protection and preservation plan will be developed. Please note that tree removals within CVC's regulated areas should be minimized. Any permitted removals will require the use of CVC's Ecosystem Offsetting Guideline (attached) to determine the offsetting requirements for any residual losses. The onsite restoration plans demonstrating the onsite offsetting should be developed using CVC's Plant Selection Guideline (attached), Healthy Soils Guideline (attached), and Buffer Planting Guideline (attached), as appropriate. Any losses that cannot be accommodated on the site should be arranged offsite in a suitable location within the same subwatershed preferably or as a last resort offset through the cash-in-lieu agreement. **This will be taken into account while creating Tree protection and preservation plan.** Please let me know if there are further comments or questions. Thank you!	
23a	03/15/2024 / Email	Planner Credit Valley Conservation Authority	Thank you for providing your responses to our last comments in the email below. Please find attached the floodplain mapping of Cooksville Creek for comment 6. The responses to other comments are fine. If you have any questions, please let me know.	Thank you! Due to the restrictions surrounding MH11, we are unable to relocate this shaft. We will add a comment in our drawings at the shaft location noting that it is within the floodplain and will change our report accordingly.	Response sent by WSP via email on March 19, 2024
23b	03/19/2024 / Phone Call	Planner Credit Valley Conservation Authority	WSP asked if shaft 11 falling within the floodplain limits is feasible due to inability of relocating it. CVC stated that they will review the request with the engineering team and get back to WSP.	WSP followed up on request of feasibility of shaft 11 placement: Follow up 1: March 20, 2024 Hope you're doing well! I was wondering if there was any response from CVC on the note I sent below. Is adding this note to our drawing and to the PFR sufficient? Please let me know if you want to have further discussions, I can set up a call if necessary. Thank you! Follow up 2: March 22, 2024 Just wondering if there were any updates on this. Let me know, thank you!	WSP followed up via email to confirm on March 20, 2024, and March 22, 2024

ID #	Date / Comment Type	Agency	Comment Received	How it was Addressed	Response provided
23c	03/22/2024 / Email	Planner Credit Valley Conservation Authority	Thank you for the follow up. We are fine with the location of MH11 as long as the existing grades within the floodplain will be matched post construction to avoid any offsite negative impacts to the floodplain. A note stating this is to be included in the drawings at the detailed design stage. Please also find attached the shape file for the regulatory floodplain, as required. If you have any questions or require any additional information, please let me know.	Appreciate your help on this.	Response sent by WSP via email on March 22, 2024

APPENDIX

E-3 Notice of Virtual Engagement Opportunity

Public Notice

Region of Peel
working with you

Environmental Assessment Study

NOTICE OF VIRTUAL ENGAGEMENT OPPORTUNITY

Beach Street Sewage Pumping Station Diversion

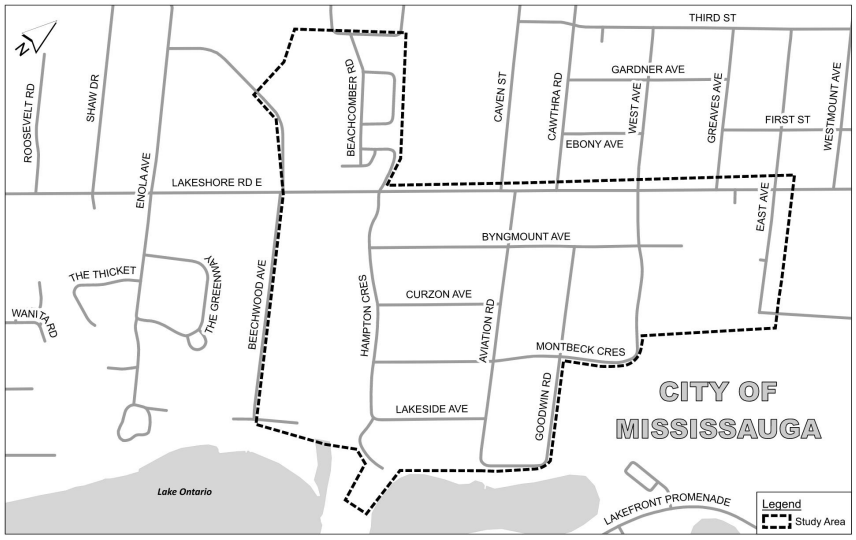
The Study

The Region of Peel is undertaking a Schedule B Municipal Class Environmental Assessment (MCEA) study to review existing sanitary sewer infrastructure and evaluate options to divert flow from the Beach Street Sewage Pumping Station (SPS) to the new Beechwood SPS. The map shows the area that may be directly impacted by the proposed construction.

The Study Process includes:

- Public and stakeholder consultation;
- An evaluation of alternative solutions to divert flow to the new pumping station;
- An assessment of proposed alternatives and identification of preferred alternative; and,
- Identification of measures to avoid or lessen adverse impacts to the community.

Beach Street Sewage Pumping Station Diversion Study Area



Virtual Engagement Opportunity

A virtual Engagement Opportunity (VEO) is being held to allow interested members of the public an opportunity to review and comment on the alternatives developed, the evaluation process followed, the preferred alternative and next steps in the Study process.

VEO materials will be made available to the public on peelregion.ca/public-works/environmental-assessments starting **April 17, 2023.**

Please submit any comments or concerns by **May 19, 2023.** Any input received by that date will be incorporated into the Project File Report, which will be available for public review when the study is completed.

Contact

To provide comments or request additional information about this project, please contact:

Jason Ahlberg, P.Eng.
Project Manager
WSP Canada Inc.
289-982-4391
Jason.Ahlberg@wsp.com

Troy Leyburne, BSc. (Env.)
Project Manager, Wastewater
Engineering Services, Public Works
905-791-7800 ext. 4781
Troy.Leyburne@peelregion.ca

This Notice was first issued on **April 17, 2023**

With the exception of personal information, all comments will become part of the public record of the study. The study is being conducted according to the requirements of the Municipal Class Environmental Assessment, which is a planning process approved under Ontario's *Environmental Assessment Act*.

APPENDIX

E-4 Notice of Completion

Public Notice

Region of Peel
working with you

Environmental Assessment Study

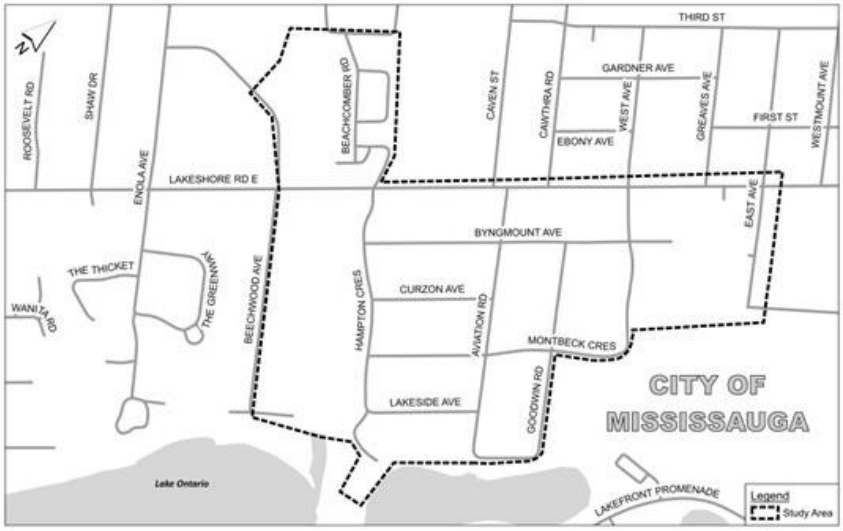
NOTICE OF COMPLETION

Beach Street Sewage Pumping Station Diversion

The Study:

The Region of Peel has completed a Schedule B Municipal Class Environmental Assessment (MCEA) study to review existing sanitary sewer infrastructure and evaluate options to divert flow from the Beach Street Sewage Pumping Station (SPS) to the new Beechwood SPS. The map shows the area that may be directly impacted by the proposed construction.

Area of Focus Map



The Study recommends the following:

- Installation of a new trunk gravity sewer tunnel from the existing Beach Street SPS along Aviation Road and Lakeshore Road East to the Beechwood SPS, and from Aviation Road to East Avenue to provide additional capacity to accommodate development east of East Avenue;
- Open cut replacement of an existing gravity sewer on Hampton Crescent and Lakeside Avenue from Hampton Crescent to Aviation Road to replace aging infrastructure;
- Required upgrades to the Beach Street SPS to meet current Region standards; and,
- Upgrades of the Beach Street SPS will also allow it to be used in contingency operations, including major equipment failure or extreme wet weather events within the sewershed.

Process:

The Study followed the process for Schedule B projects in accordance with the Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011, 2015, and 2023), with the opportunity for public input throughout the project.

The purpose of this Notice is to inform you that a Project File Report (PFR) has been filed and will be available on the project website from **Tuesday, April 9, 2024,** to **Thursday, May 9, 2024,** for a 30-day comment period. The PFR documents the MCEA process followed, including the identification of existing conditions, a summary of consultation activities, the developed alternative solutions and the evaluation process followed, identification of the preferred solution, and potential impacts, proposed mitigation measures and commitments.

The PFR and other project information are available at www.peelregion.ca/public-works/environmental-assessments/mississauga/beach-street-sewage-station.asp

With the exception of personal information, all comments will become part of the public record of the study. The study is being conducted according to the requirements of the Municipal Class Environmental Assessment, which is a planning process approved under Ontario's *Environmental Assessment Act.*

Subject to comments received as a result of this Notice, and the receipt of necessary approvals, the Region of Peel intends to proceed with the design and construction of this project.

Contact:

Please submit any comments or concerns by **Thursday, May 9, 2024.** To provide comments or request additional information about this project, please contact:

Jason Ahlberg, P.Eng., PMP
Consultant Project Manager
WSP Canada Inc.
289-982-4391
Jason.Ahlberg@wsp.com

Troy Leyburne, BSc. (Env.)
Project Manager, Wastewater
Engineering Services, Public Works
905-791-7800 ext. 4781
Troy.Leyburne@peelregion.ca

For concerns that involve the prevention, mitigation or remediation of adverse impacts on constitutionally protected Aboriginal and treaty rights, a Section 16 Order request may be made to the Ministry of the Environment, Conservation and Parks. Section 16 Order requests on other grounds will not be considered.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual environmental assessment), how an order may prevent, mitigate or remedy those potential adverse impacts, and any information in support of the statements in the request. Requests should also include the requester contact information, the project name and the proponent's name. This will ensure that the Ministry is able to efficiently begin reviewing the request.

Requests must be sent by **Thursday, May 9, 2024**.

Requests should be sent in writing or by email to both:

Minister of the Environment, Conservation and Parks
Ministry of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

Director, Environmental Assessment Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

This Notice was first issued on April 9, 2024.

The Region of Peel is committed to ensure that all Regional services, programs and facilities are inclusive and accessible for persons with disabilities. Please contact the Region of Peel Project Manager if you need any disability accommodations to provide comments or feedback for this study.

F

Draft Traffic Analysis Memorandum

MEMO

TO: Region of Peel

FROM: Celine Jacob, Jaspreet Kaur, WSP

SUBJECT: 19M-00593-00 Beach Street Diversion Project - Supplementary Traffic Analysis Memo

DATE: **February 22, 2024**

BACKGROUND INFORMATION

This memo supersedes previously submitted memo dated July 07, 2023, for the traffic staging analysis as part of the tunnel shaft installations at the intersections of Lakeshore Road / Aviation Road or on Caven Street near Lakeshore Road (associated impacts at the intersection Lakeshore Road/Cawthra Road), and at the intersection of Lakeshore Road / Beechwood Avenue. Based on the previous analysis the following staging options were recommended:

For the tunnel shaft installations near the intersection of Lakeshore Road / Caven Street:

- Shaft location on Caven Street is preferred, as this alternative will reduce the traffic impact on Lakeshore Road.
- It was recommended to have **no lane reduction on Lakeshore Road eastbound and westbound directions at Cawthra Road during AM and PM peak hours.** However, it was recommended to provide a truck-only lane in the westbound direction on Lakeshore Road near Cawthra Road / Caven Street to allow construction related truck movements **during the off-peak periods (9:00-15:00 and 19:00-8:00).** This means that during this off-peak periods, there will be a **single lane reduction in the westbound reduction for general traffic. By avoiding the peak periods, the lane reduction** is expected to provide better traffic operation and was considered least impacted and the most preferred option.

For the tunnel shaft installations at the intersections of Lakeshore Road / Beechwood Avenue:

- Reduce Lakeshore Road into single lane each direction with the westbound direction lane drops approximately 90m east of Beechwood Avenue and the eastbound lane drop approximately 90m west of the intersection.
- Remove all left-turn lanes and prohibit left-turning movements at the intersection (Right-In, Right-Out).
- Modified signal timing plans/phases for the traffic signals at the intersection of Beechwood Avenue and Lakeshore Road by providing an extended cycle time of 240 seconds in order to provide a longer green period for the critical east-west direction movements. **(This alternative is not desirable as per the direction received from the city).**

The following changes were made to the staging analysis and modelling using Synchro, based on the comments received from the City of Mississauga on January 12, 2024, and subsequent clarifications updated signal timing plans received on January 17th & 22nd:

- Included the nearby intersection – Lakeshore Road at Lagoon Street / Hampton Crescent in the evaluation of both Beechwood Avenue and Cawthra Road staging.
- Modified the signal control to coordinated actuated control with no recall on side streets at all three intersections on Lakeshore Road – at Beechwood Avenue, at Lagoon Street / Hampton Crescent, and at Cawthra Road based on the updated existing signal plans received from the city. Previous analysis had used slightly different signal controls.
- Used the existing cycle time for the Beechwood Avenue staging analysis since the city has confirmed that extending the cycle length to 240 sec is not desirable. However, with the new signal control with no recall on side streets, would provide more continuous green time for the critical east-west direction as the crossing road activation will only be required for pedestrian crossing.

This memo even though supplements the previous memo as stated above, can be considered as a full staging analysis memo as this includes traffic data information, as well as the Baseline traffic analysis. However, only the relevant staging analysis was included.

The analysis included all of the recommendations from the City:

- Usage of correct signal control plans and splits;
- The inclusion of all three intersections in the Baseline, and;
- The inclusion of all three intersections in each of the Staging Models.

INTRODUCTION

As part of the tunnel shaft installations on Caven Street near Lakeshore Road (where the associated impacts are at Cawthra Road), and at the intersection of Lakeshore Road / Beechwood Avenue, it is anticipated that traffic on Lakeshore Road will be reduced to single lane in one or two directions either during on-peak hours or during off-peak hours. It is expected that the construction will last for approximately 8-10 months. The construction at both locations would be happening at the same time, even though, Beechwood Avenue shaft construction will be shorter duration than Caven Street construction. To determine the traffic operation and queueing impact at the affected intersections during the construction staging, a traffic analysis was conducted using Synchro and SimTraffic software. This memo summarizes the results and recommendations of the traffic analysis of the above staging scenarios. As mentioned previously, this memo supersedes the previous memos.
The study corridor along Lakeshore Road East from Beechwood Avenue to Cawthra Road is shown in Figure 1. Signalised intersections that are going to be affected by the construction are included in the analysis, and the shaft locations are indicated in the Figure 1.

Figure 1: Study Area

TRAFFIC VOLUME DATA

Turning Movement Counts (TMCs) obtained from the City of Mississauga for the intersections within the study corridor range from 2009 to 2018. For the revised analysis, new traffic data were collected for the two main intersections by Traffic Survey Analysis Inc. (TSA). Table 1 below provides the list of all data available.

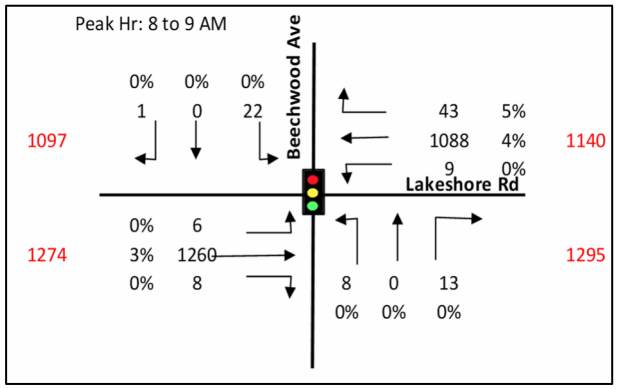
Table 1: Survey Dates and Data Sources for Intersection Turning Movement Counts Data

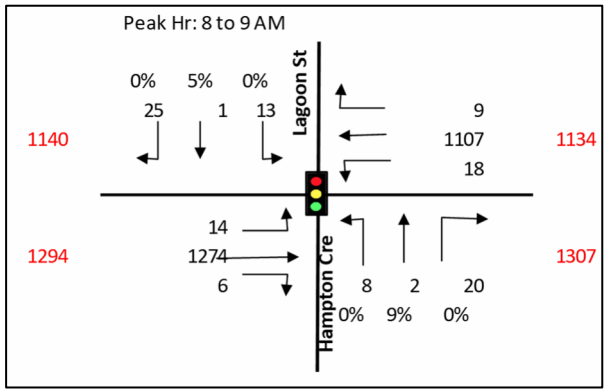
Intersection	Data Collection Date	Data Source
Cawthra Road /Lakeshore Road East	• Tuesday, February 14, 2023 • Thursday February 16, 2023 • Saturday, February 18, 2023 • Thursday, March 1, 2018	• TSA • TSA • TSA • City of Mississauga
Beechwood Avenue / Lakeshore Road East	• Tuesday, February 14, 2023 • Thursday February 16, 2023 • Saturday, February 18, 2023 • Thursday, March 8, 2012	• TSA • TSA • TSA • City of Mississauga
• Hampton Crescent / Lakeshore Road East	Tuesday, March 6, 2012	• City of Mississauga
Caven Street / Lakeshore Road East	Thursday, October 22, 2009	• City of Mississauga

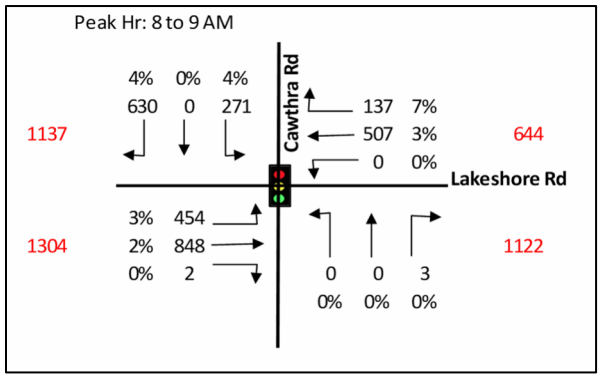
For this analysis, the new data from February 2023 has been utilised. A review of the 8-hour turning movement data from three days (Tuesday, Thursday and Saturday) has indicated that the Saturday peak hour volumes are much lower than the weekday peak hour volumes. Among the two-weekday data, the volumes from Tuesday were marginally greater and the same have been used for the construction staging analysis.

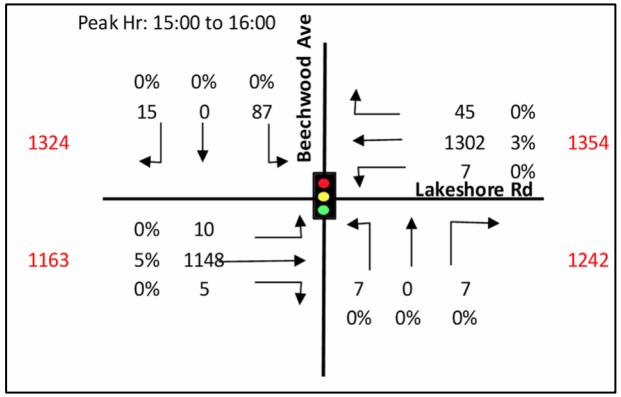
The volume diagrams in Figure 2 show the turning movement volumes for the three intersections for the 2023 weekday AM and PM peak hours and were used for the Baseline analysis. The volumes at the intersection of Hampton Crescent / Lakeshore Road East were adjusted based on the available TMC data as well as based on the volumes from the east and west. The figure indicates that the eastbound direction volumes are higher for the AM peak hour, and westbound volumes are higher for the PM peak hour conditions. The staging scenarios were analyzed for the construction year of 2024 by assuming 1% per year growth rate.

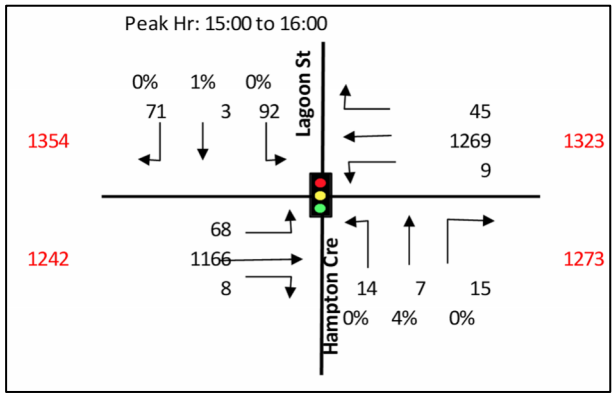
Figure 2: Baseline (2023) Peak Hour Turning Movement Volumes on Lakeshore Road East Intersections

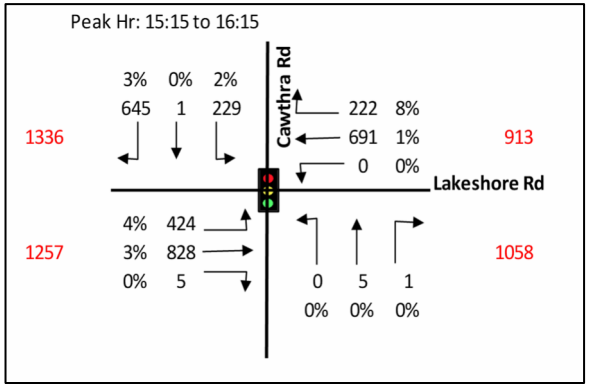












EXISTING SIGNAL PLANS

The City of Mississauga has provided the most recent signal timing plans for the Lakeshore Road East study area intersections. The study area intersections are currently operating with coordinated semi-actuated signal control plans for the eastbound and westbound directions. The signal phase for the crossing roads – Cawthra Road, Lagoon Street / Hampton Crescent, and Beechwood Avenue will be activated only upon vehicle detection. The Lakeshore Road East intersections at Beechwood Avenue and Lagoon Street / Hampton Crescent are coordinated with a cycle length of 140 seconds in the morning peak hour and 120 seconds in the afternoon peak hour. The Cawthra Road intersection is coordinated with the intersections located to the east of it. It operates with a cycle length of 120 seconds during the morning and afternoon peak hours and 100 seconds during the mid-day off-peak hours. The southbound right turn phase at this intersection is provided as an overlap phase with the protected eastbound left turn phase. The intersection evaluations for the Baseline Existing conditions were conducted using the signal timing plans supplied.

BASELINE (2023) INTERSECTION CAPACITY ANALYSIS

The intersection capacity analysis for the study area intersections for both peak hour conditions was conducted using Synchro software (version 11). Synchro is a macroscopic analysis tool and is best suited for evaluating traditional stop-controlled or signal-controlled intersections using Highway Capacity Manual (HCM) methodologies. This software considers the traffic volumes, road network (i.e., posted speed, number of travel lanes, types of traffic control – e.g., traffic signals, 'Stop'/'Yield' signs, etc.) and the signal timing plans, which were provided by the City. The evaluation elements include average delays, Level-of-Service (LOS), Volume-to-Capacity (V/C) ratio, and 95th percentile queue length. The intersection capacity analysis results were summarized using the outputs from the Intersection Reports for signalized intersections.

SimTraffic is a built-in software in Synchro used for the animation and simulation of traffic. It may be considered a microscopic model as each vehicle in the traffic system is simulated and provides a visual representation of vehicles traversing a street network. SimTraffic measures the full effect of queueing and blocking. SimTraffic uses the data inputted in Synchro along with other simulation related input parameters. Typically, number of simulation runs will be conducted with varying simulation seeds and average results are used. Queues in SimTraffic can impact the operations of adjacent intersections, while in Synchro, queues are not modelled on an individual vehicle basis, but on a statistical basis and therefore do not interfere with movements at adjacent approaches / intersections. Conditions with closely spaced intersections and where the lane drop happens between intersections (such as the work zone staging configurations at Caven Street), SimTraffic queue lengths are generally preferred. Therefore, queue lengths from SimTraffic have been used for evaluations along with V/C ratio, and LOS from Synchro.

The performance measures used to evaluate the traffic operation of intersections are summarized in Table 2, and the delay thresholds for LOS are presented in Table 3.

Table 2: Description of Analysis Performance Measures

Performance Measures	Description
V/C (Volume-to-Capacity Ratio)	• Represents the degree to which an intersection turning-movement can accommodate the traffic demand. • This measure was only produced by Synchro
Delay	• Increase in travel time through an intersection as a result of geometry, queuing, or control (stop, yield, or signal). • Geometric delay is negligible for standard stop or signal-controlled intersection
LOS (Level-of-Service)	• Indicator of traffic performance based on total delay for a movement, approach, or intersection overall. Delay thresholds are shown in **Table *3***
95th Percentile Queue	• Queue length which has only a 5% chance of being exceeded within the analysis period (AM or PM peak hour).

Capacity is defined as the maximum number of vehicles that can pass over a road segment or through an intersection within a set time duration. Capacity is combined with LOS to describe the operating characteristics of a road segment or intersection. LOS is a qualitative measure that describes operational conditions within a traffic stream. The HCM defines six levels of service for autos, LOS 'A' through LOS 'F'. LOS 'A' represents lowest average delay and LOS 'F' represents the highest average delay.

Table 3: Intersection Level-of-Service Criteria

LOS	Signalized Intersection Delay Criteria (Seconds per vehicle)	Traffic Operation
A	≤ 10	Acceptable operation
B	> 10.0 and ≤ 20.0	
C	> 20.0 and ≤ 35.0	
D	> 35.0 and ≤ 55.0	
E	> 55.0 and ≤ 80.0	Marginally Acceptable – occasional queuing
F	> 80.0	Unacceptable – persistent queuing

Source: Highway Capacity Manual, 2000

The highest possible rating is LOS 'A', under which the average total delay on a movement, approach or intersection is less than 10 seconds per vehicle. When the average delay exceeds 80 seconds at signalized intersections, the movement is classified as LOS 'F'. Up to LOS 'D' is generally considered as an acceptable LOS for signalized intersections in urban areas. LOS 'E' is the point at which remedial

measures are considered, depending on the nature and extent of the delays. Normal measures include adding through or turning lanes, modifying signal plans and signal phases, optimization of signal controls etc. Since we deal with construction staging involving lane reductions, alternative measures such as traffic diversion away from the intersection, restricting certain movements, adjusting signal plans and phases may have to be used. To be on a conservative approach, traffic diversion has not been considered in the staging evaluation.

The intersection capacity analysis results for the baseline (2023) morning and afternoon peak hour conditions, using the existing signal timing plans, are presented in Tables 4 and 5 respectively for the intersections of Cawthra Road and Lakeshore Road, Lagoon Street / Hampton Crescent and Lakeshore Road, and Beechwood Avenue and Lakeshore Road. The LOS 'E' or 'F' are highlighted as per the legend shown in Table 3. Where the SimTraffic queue length exceeds the available storage length on turning lanes, they are also highlighted. The detailed Synchro/SimTraffic reports for the baseline (2023) conditions are provided in Appendix 1.

Based on the Baseline Conditions for Lakeshore Road East in Tables 4 (2023 AM Peak Hour) and Table 5 (2023 PM Peak Hour), existing conditions evaluations for the intersections on Lakeshore Road indicate good LOS values of 'C' or better for the major east-west direction movements. The V/C ratios (0.81 or below) indicate that all major movements operate below capacity. The 95th percentile SimTraffic queue lengths for the movements in the eastbound / westbound directions are within the available storage length, except for the following:

- Eastbound direction queue at the Cawthra Road intersection: The queue length for the eastbound left turn surpasses the storage length and negatively affects the inside eastbound through lane. Therefore, the queue length for the eastbound direction is the combined effect of eastbound left and through movements. The queue length for the eastbound through movement is 146 m for the AM peak hour, which backs up beyond the upstream intersection at Caven Road **but doesn't reach the upstream signalised intersection at Hampton Crescent.** For the PM peak hour, the eastbound operation is **slightly more critical than AM peak hour**, resulting in a marginally longer queue of 152 m.
- Eastbound left turning queue at the Lagoon Street / Hampton Crescent: During the PM peak hour, queue length for the eastbound left turning queue is 21 m at the Lagoon Street / Hampton Crescent and is close to the available storage length of 20 m. **However, this queue length is not significant and is not expected to interrupt the eastbound through traffic.**

The northbound and southbound left-turn movements from the crossing roads experience higher delay with LOS 'E' which is typically acceptable for left-turning movements. The higher delay for these movements is due to a long cycle length. Also, the V/C ratios (0.81 or less) indicate the volumes are below capacity. The following is noted for the queues of the north-south movements on the side streets:

- Southbound direction movements at the Cawthra Road intersection: The 95th percentile SimTraffic queue lengths for the southbound movements at the Cawthra Road intersection during the peak hours may extend past the upstream stop-controlled intersection of Ebony Avenue. **However, it won't reach the upstream signalised intersection of Third Street which is approximately 300 m north.**

Table 4: Baseline Conditions – Lakeshore Road East Intersections – 2023 AM Peak Hour

Lakeshore Road East Intersections – Baseline 2023 – AM Peak Hour Conditions									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th% Queue (m)**	**95th% Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 120 SB: 26 NB: 20 EBL:32 EB: 74 WB: 42	454	0.77	19	B	#104	44**
	EBT	265*		848	0.38	9	A	74	146***
	EBR	-		2	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	343*		507	0.46	26	C	88	81
	WBR	-		137	-	-	-	-	-
	NBL	-		0	-	-	-	-	-
	NBT	-		0	-	-	-	-	-
	NBR	55		3	0.01	0	A	0	3
	SBL	110		271	0.68	62	E	52	75
	SBT	245*		0	0.68	63	E	53	75
	SBR	245*		630	0.80	20	B	96	94
Lagoon Street/Hampton Crescent	**EBL**	20	Cycle: 140 SB: 35 NB: 35 EB:105 WB:105	14	0.04	1	A	m1	11
	EBT	135*		1274	0.44	1	A	17	35
	EBR	-		6	-	-	-	-	-
	WBL	60		18	0.06	2	A	2	12
	WBT	260*		1106	0.38	2	A	37	50
	WBR	-		9	-	-	-	-	-
	NBL	10		8	0.09	63	E	8	5
	NBT	-		2	0.18	27	C	9	13
	NBR	-		20	-	-	-	-	-
	SBL	15		13	0.14	65	E	10	14
	SBT	-		1	0.20	25	C	9	25
	SBR	-		25	-	-	-	-	-
Beechwood Avenue	**EBL**	20	Cycle:140 SB: 36 NB: 36 EB: 104 WB:104	6	0.02	2	A	1	4
	EBT	286*		1260	0.44	3	A	50	92
	EBR	-		8	-	-	-	-	-
	WBL	20		9	0.03	2	A	m1	8
	WBT	135*		1088	0.40	2	A	24	48
	WBR	-		43	-	-	-	-	-
	NBL	20		8	0.07	62	E	8	7
	NBT	-		0	0.08	1	A	0	10
	NBR	-		13	-	-	-	-	-
	SBL	30		22	0.23	67	E	15	18
	SBR	-		1	0.01	0	A	0	4

**Distance to the upstream signalised intersection*

***SimTraffic queue length shown is limited by the length of the left-turn lane*

****combined queue due to combined EBL & EBT traffic (EBL traffic affects the through lane)*

Table 5: Baseline Conditions – Lakeshore Road East Intersections – 2023 PM Peak Hour

Lakeshore Road East Intersections – Baseline 2023 – PM Peak Hour Conditions									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th% Queue (m)**	**95th% Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 120 SB: 26 NB: 22 EBL:32 EB: 72 WB: 40	424	0.81	30	C	#131	38
	EBT	265*		828	0.36	16	B	106	152
	EBR	-		5	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	343*		691	0.67	31	C	#158	162
	WBR	-		222	-	-	-	-	-
	NBL	-		0	-	-	-	-	-
	NBT	-		5	0.04	48	D	5	37
	NBR	55		1	-	-	-	-	-
	SBL	110		229	0.65	64	E	44	54
	SBT	245*		1	0.69	67	E	45	54
	SBR	245*		645	0.81	21	C	101	128
Lagoon Street/Hampton Crescent	**EBL**	20	Cycle: 120 SB: 35 NB: 35 EB: 85 WB: 85	68	0.31	7	A	17	21
	EBT	135*		1166	0.47	5	A	48	35
	EBR	-		8	-	-	-	-	-
	WBL	60		9	0.03	3	A	m1	3
	WBT	260*		1269	0.53	8	A	148	54
	WBR	-		45	-	-	-	-	-
	NBL	10		14	0.09	46	D	9	10
	NBT	-		7	0.11	25	C	9	7
	NBR	-		15	-	-	-	-	-
	SBL	15		92	0.59	64	E	36	25
	SBT	-		3	0.32	18	B	15	39
	SBR	-		71	-	-	-	-	-
Beechwood Avenue	**EBL**	20	Cycle: 120 SB: 36 NB: 36 EBL:13 EB: 84 WB: 71	10	0.04	3	A	2	3
	EBT	286*		1148	0.47	6	A	65	76
	EBR	-		5	-	-	-	-	-
	WBL	20		7	0.03	5	A	m1	12
	WBT	135*		1302	0.56	4	A	45	54
	WBR	-		45	-	-	-	-	-
	NBL	20		7	0.04	45	D	6	10
	NBT	-		0	0.03	0	A	0	8
	NBR	-		7	-	-	-	-	-
	SBL	30		87	0.58	63	E	34	36
	SBR	-		15	0.07	1	A	0	24

**Distance to the upstream signalised intersections*

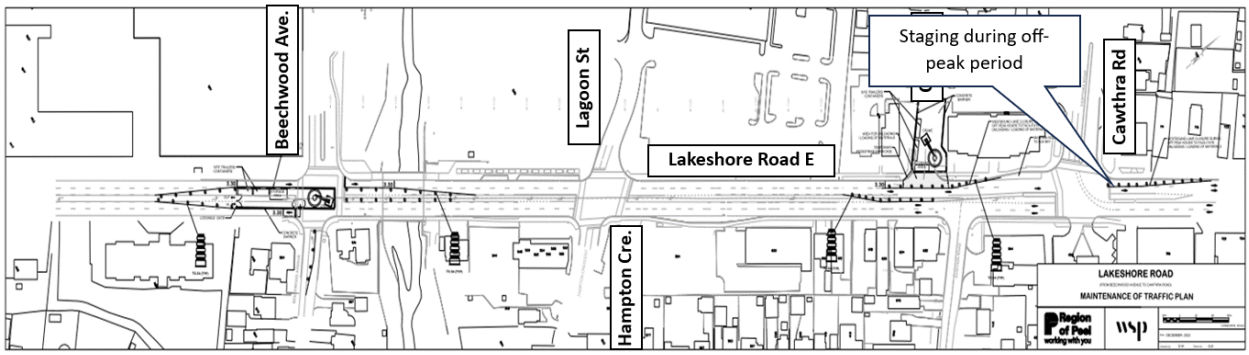
***SimTraffic queue length shown is limited by the length of the left-turn lane*

****combined queue due to combined EBL & EBT traffic (EBL traffic affects the through lane)*

PROPOSED CONSTRUCTION STAGING SCENARIOS

In all the analysis, Synchro results will be used for comparing V/C ratios, delay and LOS. However, the 95th percentile queue length will be compared based on SimTraffic results. Due to the lane closures on Lakeshore Road used for the construction staging, the eastbound and westbound directions would be critical for traffic operations. Wherever required, Signal timing plans / phases were adjusted for the staging scenarios to provide maximum feasible green time for the critical east-west direction movements without affecting the signal coordination. Figure 3 shows the staging configurations on Lakeshore Road at Beechwood Avenue and Cawthra Road.

Figure 3: Lane Configuration on Lakeshore Road East for Beechwood Avenue and Cawthra Road Intersections



- As mentioned earlier, the construction scenarios were evaluated for the anticipated construction year 2024 with a 1% annual growth applied. Note that traffic diversion or detour was not considered for the staging evaluation and the analysis may be considered a conservative approach Any traffic diversion from the construction area would provide improved operation.
-
- General requirement for construction to promote traffic diversion away from construction zones:
- It is expected that the information on the nature, extent, timing, and duration of the proposed lane closures are spread before and during the closure via city website, radio, social media, etc., prompting drivers to think about their travel alternatives and choose the best one for them.
- Advanced warning and signing should be provided well advance of the construction zone to allow travellers to make informed decisions.
- With advanced notification and signing, the following alternative traffic routing are expected to occur for the traffic that use eastbound and westbound Lakeshore Road during construction:
- Diversion to the local detour routes;
- Diversion to other surface streets;

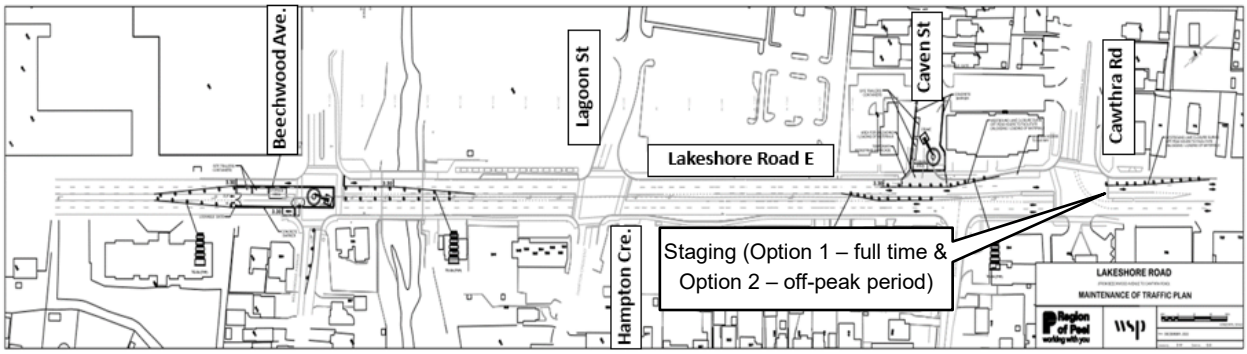
- Diversion to QEW via Cawthra Road, Dixie Road or Hurontario Street – the north-south roads east or west of the lane closure area;
- Time-shifting of trips to avoid the congested period (or not making the trip at all).

CONSTRUCTION STAGING AT THE INTERSECTION OF CAWTHRA ROAD AND LAKESHORE ROAD EAST - SHAFT LOCATION ON CAVEN STREET

For the construction staging evaluation of the shaft location on Caven Street at Lakeshore Road East, Caven Street will be closed for general traffic and options for the provision of a westbound construction related truck-only lane west of Cawthra Road intersection were evaluated. Two options were considered for the intersection at Cawthra Road / Lakeshore Road with Option 1 assuming westbound lane reductions for the entire construction period and Option 2 assuming westbound lane reductions during off-peak times only.

Option 1 (shaft location on Caven Street): Under this Scenario, eastbound lanes will be the same as existing, but the westbound lanes on Lakeshore Road will be reduced to one lane for the through traffic. The second lane is to accommodate a dedicated, full time construction truck lane for loading and unloading. The lane configurations for traffic movements for this scenario are shown in Figure 4. The intersection at Lakeshore Road and Beechwood Avenue will have lane reductions in the eastbound and westbound directions as shown in Figure 4.

Figure 4: Staging Configurations – Cawthra Road and Lakeshore Road – Option 1



The Cawthra Road 2024 Option 1 Construction Staging intersection analysis results are presented in Table 5 (AM Peak Hour) and Table 6 (PM Peak Hour). Due to the westbound lane reductions at the Cawthra Road intersection, the westbound movement during the PM peak hour is expected to operate close to capacity (V/C ratio of 0.93). The 95th percentile SimTraffic queue length for the movement is expected to be approximately 420 m, **which would extend past the upstream signalized intersection of East Avenue.** During AM peak hour, the westbound operation is not as severe with a manageable V/C of 0.80 and queue length equal to 149 m which extends east of the stop-controlled intersection at West Avenue. Therefore, avoiding the westbound direction lane reduction during AM and PM Peak hour conditions would provide manageable traffic conveyance during the Caven Road shaft construction. Construction Staging Option 2 with westbound lane reduction during off-peak period is considered next.

Table 5: Cawthra Road Construction Staging – Option 1 – Lakeshore Road East Intersections – 2024 AM Peak Hour

Lakeshore Road East Intersections - Cawthra Road 2024 Option 1 Construction Staging - AM Peak Hour Conditions									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th% Queue (m)**	**95th% Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 120 SB: 26 NB: 20 EBL:32 EB: 74 WB: 42	448	0.80	36	D	#149	39
	EBT	265*		836	0.37	9	A	73	94
	EBR	-		2	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	332*		508	0.80	46	D	#189	149
	WBR	-		138	0.24	9	A	18	106
	NBL	-		0	-	-	-	-	-
	NBT	-		0	-	-	-	-	-
	NBR	55		3	0.01	0	A	0	9
	SBL	110		274	0.68	63	E	53	63
	SBT	245*		0	0.68	63	E	53	72
	SBR	245*		632	0.72	15	B	97	157
Lagoon Street/Hampton Crescent	**EBL**	20	Cycle: 140 SB: 35 NB: 35 EB:105 WB:105	15	0.04	2	A	m0	9
	EBT	135*		1254	0.43	2	A	15	33
	EBR	-		6	-	-	-	-	-
	WBL	60		19	0.07	2	A	2	14
	WBT	260*		1109	0.38	2	A	37	45
	WBR	-		9	-	-	-	-	-
	NBL	10		8	0.09	63	E	8	7
	NBT	-		1	0.17	26	C	9	12
	NBR	-		20	-	-	-	-	-
	SBL	15		13	0.14	65	E	10	13
	SBT	-		1	0.20	25	C	9	13
	SBR	-		25	-	-	-	-	-
Beechwood Avenue	**EBL**	-	Cycle:140 SB: 36 NB: 36 EB: 104 WB:104	-	-	-	-	-	-
	EBT	286*		1261	0.80	9	A	289	99
	EBR	-		8	-	-	-	-	-
	WBL	-		-	-	-	-	-	-
	WBT	135*		1099	0.73	7	A	119	127
	WBR	-		43	-	-	-	-	-
	NBL	-		-	-	-	-	-	-
	NBT	-		0	0.08	1	A	0	10
	NBR	-		13	-	-	-	-	-
	SBL	-		-	-	-	-	-	-
	SBR	-		1	0.00	0	A	0	3

*Distance to the upstream signalised intersection

**SimTraffic queue length shown is limited by the length of the left-turn lane

***combined queue due to combined EBL & EBT traffic (EBL traffic affects the through lane)

Table 6: Cawthra Road Construction Staging – Option 1 – Lakeshore Road East Intersections – 2024 PM Peak Hour

Lakeshore Road East Intersections – Cawthra Road Construction Staging – Option 1 – 2024 PM Peak Hour Conditions									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th% Queue (m)**	**95th% Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 120 SB: 26 NB: 22 EBL:32 EB: 72 WB: 40	400	0.93	56	E	#135	42
	EBT	265*		780	0.34	12	B	85	122
	EBR	-		5	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	332*		694	0.86	43	D	#290	342
	WBR	-		224	0.33	12	B	39	333
	NBL	-		0	-	-	-	-	-
	NBT	-		5	-	-	-	-	-
	NBR	55		1	0.04	48	D	5	21
	SBL	110		231	0.65	64	E	44	55
	SBT	245*		1	0.69	67	E	45	55
	SBR	245*		648	0.86	25	C	102	130
Lagoon Street/Hampton Crescent	**EBL**	20	Cycle: 120 SB: 35 NB: 35 EB: 85 WB: 85	62	0.32	7	A	m2	20
	EBT	135*		1078	0.47	5	A	16	56
	EBR	-		7	-	-	-	-	-
	WBL	60		9	0.03	3	A	m1	9
	WBT	260*		1275	0.53	7	A	152	47
	WBR	-		45	-	-	-	-	-
	NBL	10		14	0.09	46	D	9	14
	NBT	-		7	0.11	25	C	9	13
	NBR	-		15	-	-	-	-	-
	SBL	15		92	0.59	64	E	36	24
	SBT	-		3	0.32	19	B	16	42
	SBR	-		71	-	-	-	-	-
Beechwood Avenue	**EBL**	-	Cycle: 120 SB: 36 NB: 36 EB: 84 WB: 84	-	-	-	-	-	-
	EBT	286*		1140	0.75	8	A	210	135
	EBR	-		5	-	-	-	-	-
	WBL	-		-	-	-	-	-	-
	WBT	135*		1315	0.88	21	C	#412	121
	WBR	-		45	-	-	-	-	-
	NBL	-		-	-	-	-	-	-
	NBT	-		0	0.04	0	A	0	7
	NBR	-		7	-	-	-	-	-
	SBL	-		-	-	-	-	-	-
	SBR	-		15	0.10	3	A	1	12

**Distance to the upstream signalised intersection*

Option 2 (shaft location on Caven Street): This scenario is based on the assumption that the westbound lane reduction is allowed during **off-peak periods only**. The lane configurations for traffic movements are the same as that for Option 1, but the analysis was done for the highest off-peak period traffic demand which is much lower than the peak period demand used for Option 1. Under this Scenario, eastbound lanes will be the same as existing, but the westbound lanes on Lakeshore Road will be reduced to one lane during off-peak hours to accommodate a dedicated, temporary construction lane on the curb lane for loading and unloading. Based on the available 8-hour TMC data (07:00-09:00, 11:00-14:00, 15:00-18:00), the volumes corresponding to 12:00-13:00 (highest off-peak hour) has been used for the staging evaluation.

The Cawthra Road 2024 Option 2 Construction Staging intersection analysis results are presented in Table 7 for the highest off-peak hour (12:00-13:00) within the daytime off-peak period (09:00-15:00) conditions. With the reduced traffic during the off-peak lane closure scenario, the westbound Cawthra Road queue is expected to be reduced by 70% as compared to that from Option 1. The 95th percentile SimTraffic queue length for the westbound approach is expected to be around 115 m, which is expected to reach to the upstream stop-controlled intersection at West Avenue, but far from the **upstream signalized intersection at East Avenue which is 332 m away**.

Table 7: Cawthra Road Construction Staging – Option 2 – Lakeshore Road East Intersection with Cawthra Road – 2024 Off Peak Hour

Lakeshore Road East and Cawthra Road Intersection – 2024 Construction Staging – Option 2 – Off Peak Hour Conditions									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th% Queue (m)**	**95th% Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 100 SB: 21 NB:17 EBL:19 EB: 62 WB:43	396	0.70	14	B	#74	42
	EBT	265*		473	0.21	7	A	33	198
	EBR	-		2	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	332*		463	0.56	24	C	113	105
	WBR	-		196	0.27	4	A	13	51
	NBL	-		2	-	-	-	-	-
	NBT	-		0	-	-	-	-	-
	NBR	55		2	0.01	0	A	0	12
	SBL	110		196	0.64	58	E	#36	31
	SBT	245*		0	0.64	59	E	#37	39
	SBR	245*		486	0.67	12	B	54	63

**Distance to the upstream signalised intersection*

Under Option 2 Cawthra Road construction staging conditions, the eastbound operations at Cawthra Road are expected to be slightly deteriorated compared to the existing peak hour conditions. The eastbound

queue length would be about 198 m (50 m longer compared to the existing peak hour conditions), due to less green time allocated to the eastbound left turning phase during the off-peak signal timings. The operation during off-peak staging at Cawthra Road can be improved by using the PM peak signal control plan instead of using the off-peak time control plan. The results of the off-peak staging analysis using the PM peak period signal plan is shown in Table 8. Based on this, the eastbound queue length is expected to be 118 m (40% lower than the previous scenario) reaching just west of Caven Street. The westbound queue length at Cawthra Road is expected to be 119 m, just reaching West Avenue. Both of these conditions are better than the queue lengths under the existing peak hour conditions.

Table 8: Cawthra Road Construction Staging – Option 2 – Lakeshore Road East Intersection with Cawthra Road – 2024 Off Peak Hour with PM Signal Timing Plans

Lakeshore Road East and Cawthra Road Intersection – 2024 Construction Staging – Option 2 – Off Peak Hour Conditions with PM Signal Timing Plans									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th% Queue (m)**	**95th% Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 120 SB:26 NB:22 EBL:32 EB:72 WB:40	396	0.64	12	B	72	39
	EBT	265*		473	0.20	7	A	38	118
	EBR	-		2	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	332*		463	0.57	30	C	#171	119
	WBR	-		196	0.27	6	A	21	69
	NBL	-		2	-	-	-	-	-
	NBT	-		0	-	-	-	-	-
	NBR	55		2	0.02	0	A	0	12
	SBL	110		196	0.65	67	E	39	60
	SBT	245*		0	0.65	67	E	39	60
	SBR	245*		486	0.62	9	A	40	65

**Distance to the upstream signalised intersection*

CONSTRUCTION STAGING AT THE INTERSECTION OF BEECHWOOD AVENUE AND LAKESHORE ROAD

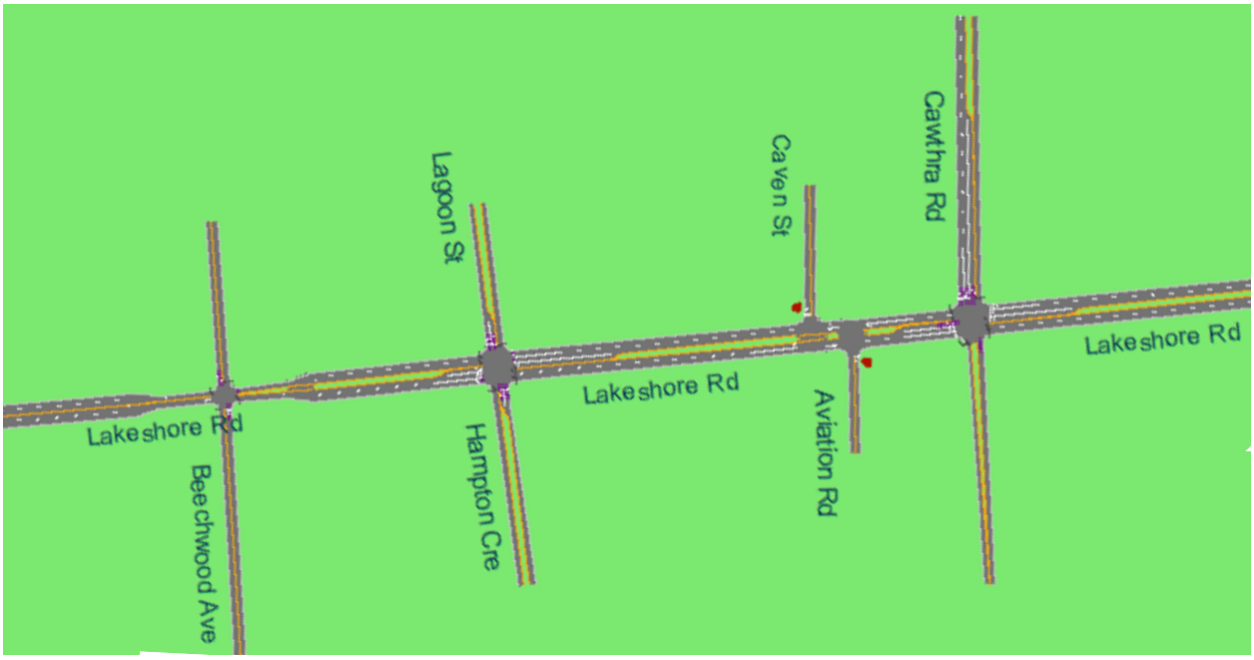
For the construction compound area at the shaft location at the intersection of Lakeshore Road and Beechwood Avenue, the following staging configuration and signal control plans are proposed:

- Reduce Lakeshore Road into a single lane in each direction with the westbound direction lane drops approximately 90 m east of Beechwood Avenue and the eastbound lane drop approximately 90 m west of the intersection.
- Remove all left-turn lanes and prohibit left-turning movements at the intersection.

- Existing signal control type (coordinated semi-actuated) will be used except that the eastbound left-turn (EBL) phase in the PM peak period will be removed (since left-turn is prohibited during staging). For the AM peak period, the existing AM peak period timing plan will be used as there is no EBL phase in the existing AM peak period.
- As discussed under Cawthra Road staging, during the critical AM and PM peak periods, there will not be any lane reductions at Cawthra Road.

It may be noted that the volumes from the crossing road – Beechwood Avenue are very low, and because of the semi-actuated control type, the signal phase for the north-south directions will only be activated when a pedestrian pushes the push button to cross. This will provide almost continuous green time for the east-west direction movement with occasional north-south phase activation and is expected to result in less east-west queueing during construction. Figure 5 shows the lane configurations near the Beechwood Avenue and Lakeshore Road intersection. The analysis included all three signalised intersections in the model – the configurations at Lagoon Street / Hampton Crescent and at Cawthra Road will be the same as existing.

Figure 5: Beechwood Avenue and Lakeshore Road – Staging Configuration



The Beechwood Avenue 2024 Construction Staging intersection analysis results are presented in Table 9 (AM Peak Hour) and Table 10 (PM Peak Hour). The following summarizes the key findings at the Beechwood Avenue intersection:

- The LOS in the Lakeshore Road East intersections would continue to operate similar to the existing conditions – the east / west movements with LOS 'C' or better and the north / south movements with LOS 'E' or better with volumes below capacity (V/C ratios of 0.88 or less).
- The lane reduction in the eastbound direction on the Lakeshore Road East is expected to result in SimTraffic queuing 190 m and 138 m respectively for the AM and PM peak hour conditions.

However, the queue length is not expected to reach the upstream signalized intersection of Shaw Drive.

- The lane reduction in the westbound direction on the Lakeshore Road East is expected to result in queuing close to 124 m and 211 m for the AM and PM peak hours respectively. During PM Peak hour, the westbound queue from Beechwood Avenue intersection would extend past the upstream Hampton Crescent / Lagoon Street intersection. However, the westbound PM queue at Hampton Crescent / Lagoon Street would be limited to around 55 m only and is not expected to reach the Cawthra Road intersection.
- **Overall, the intersections are expected to provide manageable operation for both AM and PM peak hour conditions.**

Table 9: Beachwood Avenue Construction Staging Conditions – Lakeshore Road East Intersections – 2024 AM Peak Hour

Lakeshore Road East Intersections – Beechwood Avenue 2024 Construction Staging – AM Peak Hour Conditions									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th % Queue (m)**	**95th % Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 120 SB: 26 NB: 20 EBL:32 EB:74 WB:42	452	0.77	19	B	#103	41
	EBT	265*		832	0.37	9	A	73	120
	EBR	-		2	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	332*		508	0.46	26	C	88	85
	WBR	-		138	-	-	-	-	-
	NBL	-		0	-	-	-	-	-
	NBT	-		0	-	-	-	-	-
	NBR	55		3	0.01	0	A	0	5
	SBL	110		274	0.68	63	E	53	53
	SBT	245*		0	0.68	63	E	53	60
	SBR	245*		632	0.80	20	B	97	77
Lagoon Street/Hampton Crescent	**EBL**	20	Cycle: 140 SB:35 NB:35 EB:105 WB:105	15	0.04	2	A	m0	10
	EBT	135*		1253	0.43	2	A	15	35
	EBR	-		6	-	-	-	-	-
	WBL	60		19	0.07	2	A	2	14
	WBT	260*		1109	0.38	2	A	37	43
	WBR	-		9	-	-	-	-	-
	NBL	10		8	0.09	63	E	8	8
	NBT	-		1	0.17	26	C	9	11
	NBR	-		20	-	-	-	-	-
	SBL	15		13	0.14	65	E	10	9
	SBT	-		1	0.20	25	C	9	24
	SBR	-		25	-	-	-	-	-
Beechwood Avenue	**EBL**	-	Cycle: 140 SB:36 NB:36 EB:104 WB:104	-	-	-	-	-	-
	EBT	286*		1261	0.80	9	A	289	193
	EBR	-		8	-	-	-	-	-
	WBL	-		-	-	-	-	-	-
	WBT	135*		1099	0.73	7	A	119	124
	WBR	-		43	-	-	-	-	-
	NBL	-		-	-	-	-	-	-
	NBT	-		0	0.08	1	A	0	8
	NBR	-		13	-	-	-	-	-
	SBL	-		-	-	-	-	-	-
	SBR	-		1	0.00	0	A	0	-

**Distance to the upstream signalised intersection*

Table 10: Beachwood Avenue Construction Staging Conditions – Lakeshore Road East Intersections – 2024 PM Peak Hour

Lakeshore Road East Intersections – Beechwood Avenue 2024 Construction Staging – PM Peak Hour Conditions									
Lakeshore Road East Intersection	**Movement**	**Available Storage Length (m)**	**Signal Timing Plan Splits (s)**	**Volume**	**V/C Ratio**	**Delay (s)**	**LOS**	**95th% Queue (m)**	**95th% Queue Sim Traffic (m)**
Cawthra Road	**EBL**	30	Cycle: 120 SB: 26 NB: 22 EBL:32 EB: 72 WB: 40	400	0.80	28	C	#113	44
	EBT	265*		779	0.34	12	B	85	106
	EBR	-		5	-	-	-	-	-
	WBL	50		0	-	-	-	-	-
	WBT	332*		694	0.64	29	C	#159	121
	WBR	-		224	-	-	-	-	-
	NBL	-		0	-	-	-	-	-
	NBT	-		5	-	-	-	-	-
	NBR	55		1	0.04	48	D	5	16
	SBL	110		231	0.65	64	E	44	63
	SBT	245*		1	0.69	67	E	45	63
	SBR	245*		648	0.85	24	C	102	118
Lagoon Street/Hampton Crescent	**EBL**	20	Cycle: 120 SB: 35 NB: 35 EB: 85 WB: 85	63	0.29	5	A	m2	25
	EBT	135*		1076	0.43	4	A	16	56
	EBR	-		7	-	-	-	-	-
	WBL	60		9	0.03	4	A	m1	18
	WBT	260*		1275	0.53	9	A	149	77
	WBR	-		45	-	-	-	-	-
	NBL	10		14	0.09	46	D	9	6
	NBT	-		7	0.11	25	C	9	15
	NBR	-		15	-	-	-	-	-
	SBL	15		92	0.59	64	E	36	25
	SBT	-		3	0.32	19	B	16	49
	SBR	-		71	-	-	-	-	-
Beechwood Avenue	**EBL**	-	Cycle: 120 SB: 36 NB: 36 EB: 84 WB: 84	-	-	-	-	-	-
	EBT	286*		1140	0.75	8	A	210	138
	EBR	-		5	-	-	-	-	-
	WBL	-		-	-	-	-	-	-
	WBT	135*		1315	0.88	21	C	#412	211
	WBR	-		45	-	-	-	-	-
	NBL	-		-	-	-	-	-	-
	NBT	-		0	0.04	0	A	0	0
	NBR	-		7	-	-	-	-	-
	SBL	-		-	-	-	-	-	-
	SBR	-		15	0.10	3	A	1	12

**Distance to the upstream signalised intersection*

CONCLUSION

Synchro and SimTraffic analyses were conducted for the evaluation of intersections affected by the lane reductions required for the tunnel shaft installation on Caven Street near the Lakeshore Road / Cawthra Road intersection, as well as on Lakeshore Road at Beechwood Avenue. Since Lakeshore Road and Lagoon Street / Hampton Crescent intersection is close to the affected intersections, the evaluation included all three signalised intersections. It is required that traffic on Lakeshore Road to be reduced to single lane in one or both directions at the above intersections depending upon the scenarios considered. For the staging for the shaft at Caven Street, even though the shaft location is on Caven Street, the evaluation assessed the feasibility of using the westbound curb lane on Lakeshore Road and Cawthra Road intersection to accommodate a dedicated off-peak time, construction lane for loading and unloading. The following summarizes the results of Baseline (2023) and construction staging scenarios based on the evaluation of the intersections on Lakeshore Road at Cawthra Road, Lagoon Street / Hampton Crescent, and at Beechwood Avenue:

Baseline (2023) Scenario

- Baseline evaluations used existing updated signal timing plans received from the City of Mississauga for all the intersections.
- For all the three intersections, the major east-west direction movements along Lakeshore Road East operates with favourable LOS 'C' or better for both AM and PM peak hour conditions. The V/C ratios (0.81 or below) indicate that all major movements operate below capacity.
- The 95th percentile SimTraffic queue lengths for the movements in the eastbound / westbound directions are within the available storage length, except for the intersection at Cawthra Road with queue length for the eastbound through movement of 146 m and 152 m respectively for the AM and PM peak hour conditions, which backs up past the upstream intersection at Caven Street, but **does not reach the upstream signalized intersection at Lagoon Street / Hampton Crescent.**
- The northbound and southbound left-turn movements from the crossing roads (Beechwood Avenue, Lagoon Street / Hampton Crescent, and Cawthra Road) operate with LOS 'E'. The higher delay for these movements is due to long cycle lengths with the major east-west direction phase being provided with larger split times and green times resulting in longer waiting time or delay for the minor road traffic. It is typically acceptable for left-turning movements with LOS 'E'. Also, the V/C ratios (0.81 or less) indicate the volumes are below capacity.
- Detailed Synchro/SimTraffic reports for the Baseline (2023) conditions are included in Appendix 1.

Construction Staging (2024) Scenarios

- **It is to be noted that the analysis for the staging conditions did not assume any Traffic Detour or Diversion**. At a construction site with congested conditions, traffic diversion from the

construction zones would occur normally. It is typical to assume, a 10-20% reduction of traffic due to congestion at a construction zone. However, actual traffic diversion that will be achieved depends on many factors such as alternate route available, advanced information about closures, the level of congestion, options available for time shifting etc. **Since no diversion was assumed in the analysis, the results may be considered conservative.**

- Existing coordinated semi-actuated signal timing plans were used for the staging scenarios wherever the results show good operation and adjusted for in one of the scenarios – **Staging Option 2 for Cawthra Road during off-peak times.**
- **Staging Scenarios for the intersection of Cawthra Road and Lakeshore Road (shaft location on Caven Street)**: Under this staging scenario, eastbound lanes will be the same as existing, but the westbound lanes on Lakeshore Road will be reduced to one lane for the through traffic to accommodate construction related truck movements on the curb lane. Two options were considered for this staging:
    - **Option 1**: This scenario assumed the westbound lane reduction at Cawthra Road intersection for the through traffic during the entire constriction duration. The evaluation was conducted for the critical weekday AM and PM peak hour conditions. The evaluation results have shown the westbound movement to operate close to capacity with a V/C ratio of 0.93 for the PM peak hour condition. The 95th percentile SimTraffic queue length for the movement is expected to be approximately 420 m, **which would extend past the upstream signalized intersection of East Avenue.** During AM peak hour, the westbound operation is not that severe with a manageable V/C ratio of 0.80 and queue length equal to 149 m, which would reach east of the stop-controlled intersection at West Avenue. **Therefore, avoiding the westbound lane reduction during the peak period is expected to provide manageable operation during Caven Street shaft construction.**
    - **Option 2 (Preferred):** This option considered the westbound lane reduction **only during off-peak periods.** Under this Scenario, eastbound lanes will be the same as existing, but the westbound lanes on Lakeshore Road will be reduced to one lane during off-peak hours to accommodate a dedicated, temporary construction lane for loading and unloading. Based on the available 8-hour TMC data, the volumes corresponding to 12:00-13:00 (highest off-peak hour) has been used for the staging evaluation. With the reduced traffic during the off-peak time lane closure scenario, the 95th percentile SimTraffic queue length for the westbound approach is expected to be around 115 m, which is expected to reach to the upstream stop-controlled intersection at West Avenue. This queue length is however within the upstream signalized intersection at East Avenue, which is 332 m away. The eastbound queue length would be about 198 m (50 m longer compared to the existing peak hour conditions). **The operation during off-peak staging at Cawthra Road can be improved by using the PM peak signal control plan instead of using the off-peak time control plan.** Based on this revised signal plan the eastbound queue length is expected to be 118 m reaching just west of Caven Street and the westbound queue length at Cawthra Road is expected to be 119 m, just reaching West

Avenue. Both of these conditions are better than the queue lengths under existing peak hour conditions.

  - **Based on the evaluation results, it is proposed to provide the westbound lane closure staging only during off-peak periods (9:00-15:00) and with the PM period signal control plan at the intersection of Lakeshore Road and Cawthra Road.**

- **Staging Scenario for the shaft location at the intersection of Beechwood Avenue and Lakeshore Road**: The staging scenario includes the lane reduction on Lakeshore Road eastbound and westbound and restrictions of the left-turn movements at the intersection with right-in and right-out for Beechwood Avenue. Existing Signal control type (coordinated semi-actuated) was used, except that the existing eastbound left-turn (EBL) phase in the PM peak period will be removed. For the AM peak period, the existing signal timing plan will be used as there is no EBL phase in the existing AM peak period. As discussed under Cawthra Road Staging, during the critical AM and PM peak periods, there will not be any lane reductions at Cawthra Road.
- The following summarizes the key findings at the Beechwood Avenue staging:
  - The LOS in the Lakeshore Road East intersections would continue to operate similar to the existing conditions – the east / west movements with LOS 'C' or better and the north / south movements with LOS 'E' or better with volumes below capacity (V/C ratios of 0.88 or less).
  - The lane reductions on eastbound Lakeshore Road East are expected to result in SimTraffic queuing 190 m and 138 m respectively for the AM and PM peak hour conditions. **However, the queue length is not expected to reach the upstream signalized intersection of Shaw Drive.**
  - The lane reductions on westbound Lakeshore Road East are expected to result in queuing close to 124 m and 211 m for the AM and PM peak hours respectively. **During the PM Peak hour, the westbound queue from Beechwood Avenue intersection would extend past the upstream Lagoon Street / Hampton Crescent intersection. However, the westbound PM queue at Lagoon Street / Hampton Crescent would be limited to around 55 m only and is not expected to reach the Cawthra Road intersection.**
  - **Overall, the intersections are expected to provide manageable operation for the Beechwood Avenue Staging for both AM and PM peak hour conditions.**
- Detailed Synchro/SimTraffic reports for the construction staging scenarios (2024) are included in Appendix 2.

RECOMMENDATIONS

For the tunnel shaft installations on Caven Street near the intersections of Lakeshore Road and Cawthra Road:

- Option 2 with westbound lane reductions **during the off-peak period (9:00-15:00)**, along with the PM Period Signal Control Plan would provide better traffic conveyance and is considered the least impactful and the most preferred option.

- Traffic demand data for the 8-hour TMC indicates that **avoiding 08:00-09:00 during the morning peak period, as well as avoiding the entire afternoon peak period (15:00-19:00)** for the westbound lane reductions (to facilitate loading and unloading) is expected to provide manageable traffic conveyance. Therefore, it is recommended to allow the westbound curb lane reduction from 09:00 to 15:00 during the daytime off-peak period only.
- During the staging, the existing signal control used for the PM period will be required at the intersection of Cawthra Road and Lakeshore Road so that maximum feasible green times are available for the critical eastbound and westbound direction movements.

For the tunnel shaft at the intersection of Lakeshore Road East and Beechwood Avenue:

- Reduce Lakeshore Road into a single lane in each direction, where the westbound direction lane drops approximately 90 m east of Beechwood Avenue, and the eastbound lane drops approximately 90 m west of Beechwood Avenue.
- Remove all left-turn lanes and prohibit left-turning movements at the intersection and allow only right-in and right-out for Beechwood Avenue.
- Use signal control type (coordinated semi-actuated) with north / south direction to have only pedestrian signal phase restricting through traffic. Also, the eastbound left-turn (EBL) phase in the PM peak period must be removed.