

# FRONT STREET WASTEWATER PUMPING STATION WASTEWATER DIVERSION SCHEDULE 'B' CLASS ENVIRONMENTAL ASSESSMENT EXECUTIVE SUMMARY

REGION OF PEEL

PROJECT NO.: 161-13700-00  
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# Revision History

First Issue

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Project File v 1.1: Front Street Wastewater Pumping Station Wastewater Diversion, Schedule 'B' Class Environmental Assessment (Revision 1)

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# 1 Executive Summary

The Region of Peel's Water and Wastewater Master Plan provides a planning framework for the development of water and wastewater servicing infrastructure growth to 2031 planning horizon. The Master Plan was last updated in 2013 and was carried out in accordance with the Master Plan process of the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (EA) document (October 2000, as amended in 2007, 2011, and 2015). The Master Plan identifies a number of strategically phased water and wastewater projects based on the Region's 2031 growth target of 1.64 million people. The Master Plan also considers the impact of potential intensification and greenfield growth post 2031.

Through the 2013 Water and Wastewater Master Plan, the Region has identified a need to divert wastewater from the G.E. Booth Wastewater Treatment Plant (WWTP). The G.E. Booth WWTP has limited capacity to support the planned growth of its current catchment area. The 2013 Master Plan identified a need to divert wastewater away from G.E. Booth WWTP to the Clarkson WWTP, as the Clarkson WWTP has available capacity.

The project is being carried out as a Schedule 'B' Municipal Class Environmental Assessment to address the following problem statement:

*As Mississauga and Port Credit grow, Peel Region is faced with three challenges. The Region has a long-term master plan which recommends that wastewater be balanced between the G.E. Booth (located on the east side) and Clarkson (located on the west side) wastewater treatment plants as the Region grows over the coming decades. The equipment at the Front Street Wastewater Pumping Station is in need of replacement. The Richard's Memorial Wastewater Pumping Station has limited capacity and needs to be expanded.*

This Project File has been prepared to document the findings of the evaluation and selection of the preferred solution. Agency and public community involvement have been engaged through the project.

A long list of five alternative solutions were identified and short list of alternative solution created. The short list of alternative solutions was then evaluated based on technical feasibility, natural environmental impacts, social and cultural impacts as well as economic/financial impacts all supported by on site investigations and reports. The final preferred solution identified includes constructing a new gravity sewer along Lakeshore Road (from Front St to Richard's Memorial WWPS and from Richard's Memorial WWPS to Jack Darling WWPS) and Pine Ave S (from Lakeshore Road W to Ben Machree WWPS) and also constructing a new wastewater pumping station in Richard's Memorial Park, decommissioning of the current Front Street WWPS located in the Port Credit Lighthouse and decommissioning of Ben Machree WWPS. Decommissioning of the pumping station assets includes decommissioning of the forcemains at each location however, hydraulic relief points to remain in operation.

In support of the preferred solution conceptual drawings have been completed, implementation considerations were identified, and mitigation measures developed.

## 2 Introduction

### 2.1 Study Purpose and Objectives

The purpose of this Municipal Class EA study is to provide a comprehensive and environmentally sound planning process, which is open to public participation, to select the preferred solution to address the current Front Street WWPS catchment area wastewater flows taking into consideration the condition of the Front Street WWPS, the site constraints for expansion of the station to accommodate future growth and the environmental risks.

By completing the Class EA planning process, the preferred solution should address environmental, social and technical concerns and be acceptable to the majority of residents, stakeholders and review agencies.

### 2.2 Description of Study Area

The project Study Area is located at the south end of the Region of Peel on the shore of Lake Ontario. It is within the City of Mississauga and bound by Dundas Street W to the north, the shore to the south, Dixie Road to the east and Winston Churchill Boulevard to the west. The Study Area includes the Infrastructure Planning Area. The infrastructure area is bound by Indian Road to the north, the shore to the south, the Credit River to the east and Lorne Park Road to the west.

The eastern portion of the Infrastructure Planning Area includes the Port Credit West Village Heritage Conservation District (HCD). This area is urbanized and will be fully developed with a mix of commercial, medium density residential, and parkland. The Port Credit river confines the eastern boundary of the Infrastructure Planning Area. A recreational trail runs along the waterfront in the south-eastern portion of the Infrastructure Planning Area. The western portion of the Infrastructure Planning Area contains mostly low-density residential housing. Two parks, Richard's Memorial Park and Jack Darling Park, are located in the south-western portion of the Infrastructure Planning Area. A Regional right-of-way, being Lakeshore Road W and Lakeshore Road E, traverses the Study Area in an east-west alignment.

### 2.3 Background

The Region of Peel's Water and Wastewater Master Plan provides a planning framework for the development of water and wastewater servicing infrastructure growth to 2031 planning horizon. The Master Plan was last updated in 2013 and was carried out in accordance with the Master Plan process of the MEA Municipal Class EA document (October 2000, as amended in 2007, 2011, and 2015). The 2013 Master Plan brings the previous 2007 Master Plan in to conformity with the residential and employment growth targets established by the Province and area municipalities.

The Master Plan identifies a number of strategically phased water and wastewater projects based on the Region's 2031 growth target of 1.64 million people. The Master Plan also considers the impact of potential intensification and greenfield growth post 2031. The Region of Peel's lake-based wastewater collection system services the City of Mississauga, much of the City of Brampton and parts of the Town of Caledon.

The system consists of two largely separate gravity trunk sewer systems – the east trunk and west trunk – that terminate near Lake Ontario at the G. E. Booth WWTP and the Clarkson WWTP. The divide between the east and west trunk systems is approximated by the watershed boundary between the Etobicoke Creek and the Credit River.

The two trunk systems are currently connected through the West-East Sanitary Trunk Sewer, which diverts some wastewater flows by gravity from the west to the east trunk system near Highway 407. The system consists of 33 active municipal sanitary pumping stations. Many of these sewage pumping stations service small tributary areas and pump flows to the sanitary trunk sewers.

Through the 2013 Water and Wastewater Master Plan, the Region has identified a need to divert wastewater from the G.E. Booth Wastewater Treatment Plant (WWTP). The G.E. Booth WWTP has limited capacity to support the planned growth of its current catchment area. This includes the area subject to this Schedule B Municipal Class Environmental Assessment as described in Section 2.2. The 2013 Master Plan identified a need to divert wastewater away from G.E. Booth WWTP to the Clarkson WWTP, as the Clarkson facility has available capacity.

The following additional existing constraints inform the study and problem statement:

- Limited capacity at the G.E. Booth WWTP;
- Available capacity at the Clarkson WWTP;
- Long-term sustainable Master Plan strategy to divert flows from G.E. Booth WWTP to Clarkson WWTP;
- Future growth in the Front Street WWPS and Richard’s Memorial WWPS catchment areas;
- Limited space available for expansion of Front Street WWPS on Lakeshore Road near the Credit River;
- Constructability issues with the Front Street WWPS forcemain crossing the Credit River;
- Upgrades required at Richard’s Memorial WWPS and opportunity to redirect flows from Front Street WWPS to Richard’s Memorial WWPS;
- Opportunity to decommission the Front Street WWPS; and,
- Opportunity to decommission the Ben Machree WWPS.

## 2.4 Problem Statement

The problem statement for the Front Street Wastewater Pumping Station Wastewater Diversion Class EA is as follows:

**As Mississauga and Port Credit grow, Peel Region is faced with three challenges. The Region has a long-term master plan which recommends that wastewater be balanced between the G.E. Booth (located on the east side) and Clarkson (located on the west side) wastewater treatment plants as the Region grows over the coming decades. The equipment at the Front Street Wastewater Pumping Station is in need of replacement. The Richard’s Memorial Wastewater Pumping Station has limited capacity and needs to be expanded.**

To address the Problem/Opportunity Statement, the Region has initiated this Municipal Class EA planning process which evaluates alternative solutions to solve the problem identified above. This Project File has been prepared to document the findings of the evaluation and the selection of the preferred solution.

## 2.5 Organization

This report was prepared to meet the requirements of the Ontario Municipal Engineers Association (MEA) Municipal Class EA planning process.

## 2.6 Public Review and Next Steps

This Project File meets the requirements of a Schedule 'B' Municipal Class EA study. Filing of this Project File initiates the 30-day public review period starting June 13, 2019 and ending July 12, 2019. To facilitate public review of this document, hard copies of the Project File are available at the following locations:

- Region of Peel, 10 Peel Centre Drive, 5<sup>th</sup> Floor, Suite A, Brampton ON  
Phone: 905-791-7800
- Port Credit Library, 20 Lakeshore Road E, Mississauga, ON  
Phone: 905-615-4835
- City of Mississauga, 300 City Centre Drive, Mississauga, ON  
Phone: 905-615-3200

A copy of this document is also available online at <http://www.peelregion.ca/pw/water/> and click on Environmental Assessments, Mississauga.

If you have any questions or concerns about the report, please take the following steps:

- 1 Contact the Region's Project Manager to discuss your questions or concerns:  
Kolsoom Motamedi, M.Eng., P.Eng., PMP  
Project Manager, Region of Peel  
10 Peel Centre Drive, Suite A 4<sup>th</sup> Floor, Brampton, ON L6T 4B9  
P: 905-791-7800 ext. 4196 | F: 905-791-0728 | E: [kolsoom.motamedi@peelregion.ca](mailto:kolsoom.motamedi@peelregion.ca)
- 2 Arrange a meeting with the Region's Project Manager.
- 3 If you have significant concerns, the Region will attempt to negotiate a resolution of the issue(s). A mutually acceptable time period for this negotiation will be set. If the issue remains unresolved, you may request the Minister of the Environment and Climate Change to require the Region to comply with Part II of the *Environmental Assessment Act (EAA)* before proceeding with the project. This is called a Part II Order or "bump up request". After reviewing the Part II Order request and the project documents in detail, the Minister may make one of the following decisions:
  - a Deny the request, with or without conditions;
  - b Refer the matter to mediation; or,
  - c Require that the Region comply with Part II of the *EAA* by undertaking one of the following:

- i Set out directions with respect to the Terms of Reference and preparing an Individual EA for the undertaking;
- ii Declare that the Region has satisfied requirements for the preparation of the Class EA Study, as are specified in the order; or,
- iii Impose additional conditions, in addition to those set out in the Class EA Study.

Requests must be submitted in writing to the Minister of the Environment, Conservation and Parks within the 30-day review period. A copy of the form should also be submitted to the Director of Environmental Assessment and Permission Branch:

**Minister**

**Ministry of the Environment, Conservation and Parks**

11<sup>th</sup> Floor

77 Wellesley Street West

Toronto, ON M7A 2T5

minister.mecp@ontario.ca

**Director, Environmental Assessment and Permissions Branch**

**Ministry of the Environment, Conservation and Parks**

1<sup>st</sup> Floor

135 Street Clair Avenue West

Toronto, ON M4V 1P5

enviopermissions@ontario.ca

A copy of the request must also be forwarded to the attention of the Region's Project Manager at the address provided above.

If no Part II Order requests are received, the Region will proceed with detailed design and construction of the proposed works as presented in this Project File.

With the exception of personal information, all received comments collected will become part of the public record of the study, in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*.

# 3 Municipal Class Environmental Assessment Planning Process

## 3.1 Environmental Assessment Act (1990)

Ontario's *Environmental Assessment Act*, R.S.O. 1990 (henceforth referred to as "the Act") was passed in 1975 and proclaimed in 1976. Class Environmental Assessments 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; 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, and 2015), outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater and road projects (MEA, 2015). Since projects undertaken by municipalities can vary in their complexity and potential environmental impacts, projects are classified in "Schedules"

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. The Class EA process also provides an appeal mechanism to change the project status. Under the provisions of Subsection 16 of the amended EA Act, there is an opportunity under the Class EA planning process for the Minister to review the status of a project. Members of the public, interest groups and review agencies may request the Minister to require a Proponent to comply with Part II of the EA Act before proceeding with a proposed undertaking.

## 3.2 Principles of Environmental Planning

The 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; Consideration of a reasonable range of alternatives; Identification and consideration of the effects of each alternative on all aspects of the environment; Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects; Provision of clean and complete documentation of the planning process followed.

## 3.3 Confirmation of MCEA Schedule

The Front Street Station Wastewater Diversion project is proceeding in accordance with the Class EA process in the MEA document (MEA, 2015). This Class EA is being completed as a Schedule 'B' project. This project generally fits the description listed under Item 1 for Schedule 'B' Wastewater Projects in Appendix 1 of the MEA Class EA document:

- 1 Construct new pumping station or increase pumping station capacity by adding or replacing equipment and appurtenances, where new equipment is located in a new building or structure.

### **3.3.1 Communication and Community Engagement Plan**

A Communications and Community Engagement Plan was developed upon commencement of the study to provide a comprehensive approach and guidebook to the manner in which Region staff, agencies, stakeholders, and members of the community are engaged during the Class EA study. It also identified the format, methods, and tools to be used to engage stakeholders and the community in a manner that is interactive, visually appealing and meaningful.

### **3.3.2 Communication and Consultation Summary**

The following public and agency consultation activities were undertaken as part of the various stages of this Class EA process, including study commencement, three Public Information Centres, and Notice of Study Completion.

#### Contact List

A Study Contact List was compiled of relevant and interested parties. The list was used for mail and e-mail correspondence, as applicable. Agency stakeholders included: Indigenous Communities; Conservation Authorities; Emergency and Health Services; Federal Agencies; Municipal Representatives; Provincial Agencies; Rail / Transit; Residents Associations; School Boards; Utilities.

#### Study Commencement

The formal Notice of Commencement was distributed to stakeholders included in the Study Contact List on January 19, 2017 and advertised in the Mississauga News on January 20, 2017. The Notice of Commencement was also posted on the Region of Peel's project website.

#### Public Information Centre No. 1

The first Public Information Centre (PIC) was held within the Infrastructure Study Area at the Port Credit Arena (40 Stavebank Road) on March 28, 2017, from 4:00 p.m. to 7:00 p.m. Representatives from the Region of Peel and its Consultant, WSP, were present at the PIC to provide information and answer questions. A total of 20 people signed-in including a Councillor and staff from the City of Mississauga.

PIC No. 1 presented a total of 10 panels that introduced the study, described the Class EA process, identified problems and opportunities, and outlined the study process. In addition to the general process, the list of servicing approaches, strategies, and long list of possible site locations and linear infrastructure routes were presented. Two additional panels were used to facilitate two exercises for attendees to participate in: "What I Love about Port Credit" and "Place Based Comments". The "What I Love about Port Credit" panel listed several features that the attendees could mark as important to them with one of five green dots provided to them upon entering the PIC. Comment sheets were also provided to attendees to allow them to submit comments regarding the project and materials presented at PIC No. 1.

#### Online Survey and Project Video

An online survey was developed similar to the "What I Love about Port Credit" exercise board presented in PIC No. 1. The online survey was used as an additional medium for stakeholders to voice which elements of Port Credit are important to the public. The survey became available to the public on June 5, 2017. In addition to the survey being available through the Region's project webpage, an e-mail was sent to all stakeholders on the

stakeholder list with a valid e-mail address. The community pop-up event was also used to raise awareness of the online survey. A total of 33 responses were received via the online survey. Responses were compiled, reviewed, and presented in PIC No. 2.

A project video was also developed to visually describe the project and the strategies being considered. The project video was shown at PIC No. 1, PIC No. 2, PIC No. 3, posted on YouTube, and shown at the end of the online survey.

### Community Pop-Up Event Booth

A community pop-up event booth was made available during Art Fest in Port Credit on May 26, 2017. Information about the project was made available, as was a post card that contained a link to the online survey and video. The interactive activity that was used during PIC No. 1 was also made available, and staff asked passersby what they love about Port Credit and to provide their place-based comments. The input provided by participants during Art Fest was aggregated with that received during PIC No. 1 and the online survey.

### Public Information Centre No. 2

The second PIC was held within the Infrastructure Study Area at the Port Credit Arena (40 Stavebank Road) on March 1, 2018, from 5:00 p.m. to 8:00 p.m. Representatives from the Region of Peel and its Consultant, WSP, were present at the PIC to provide information and answer questions. A total of 12 people signed-in, including representatives from the Credit Valley Conservation and the City of Mississauga.

PIC No. 2 presented a total of 21 panels that re-introduced the information presented at PIC No. 1 including the Class EA process, the list of servicing approaches, strategies, and long list of possible site locations and linear infrastructure routes. In addition to the previously presented information, the results of the completed technical investigations, responses from PIC No. 1, the Online Survey, and the Community Pop-Up Event Booth, the alternative evaluation table, the preferred alternatives, and the preliminary construction alternatives were presented.

### Public Information Centre No. 3

The third PIC was held within the Infrastructure Study Area at the Port Credit Arena (40 Stavebank Road) on November 29, 2019, from 5:30 p.m. to 8:00 p.m. Representatives from the Region of Peel and its Consultant, WSP, were present at the PIC to provide information and answer questions.

A total of 26 people signed-in, including representatives from the City of Mississauga and the City Councillor for Mississauga Ward 1.

PIC No. 3 presented a total of 17 panels that re-introduced the information presented at PIC No. 1 and 2 including the Class EA process, strategies, and alternative evaluation and preferred alternatives. In addition to the previously presented information, the Ben Machree Wastewater Pumping Station alternative evaluation table, the preferred alternatives and the preliminary construction alternatives were presented.

### Study Completion

The Notice of Study Completion was published and distributed on June 13, 2019. The notices were made public by mail-out of letters to stakeholders included on the stakeholder contact list, advertised in the Mississauga News, and posted on the Region of Peel's project website.

## 3.4 Indigenous Consultation

Indigenous communities for EA consultation were identified using the Government of Canada's web-based, geographic information system called the Aboriginal and Treaty Rights Information System (ATRIS). A copy of the Notice of Study Commencement was sent to the 26 Indigenous groups identified through ATRIS as well as Indigenous and Northern Affairs Canada (INAC) on January 19, 2017. Notices of PIC 1, PIC 2 and PIC 3 were sent on March 17, 2017, February 15, 2018, November 15, 2018 respectively.

## 3.5 Agency Consultation

### 3.5.1 Credit Valley Conservation Consultation

As a portion of the project area is located within the Credit Valley Conservation's (CVC) regulated area. The project team reached out to the CVC starting in October 2016, prior to the formal commencement of the study in January 2017.

#### **Preconsultation Meeting** - November 21, 2016

- WSP presented an overview of the scope of the project and the expected corresponding works.
- Floodplain limits within the Richard's Memorial Park were discussed and provided.
- Existing natural designation and natural heritage features in the Richard's Memorial Park were discussed.
- Potential required permits from the CVC for the works associated with the project were discussed.

#### **Design Review Meeting** - September 28, 2017

- WSP presented their preliminary design concept for the project.
- CVC's natural environment investigation and tree inventory was discussed and shared with WSP.
- WSP presented their potential pumping station site options within the Richard's Memorial Park to obtain feedback and determine the CVC's preferred site location.

### 3.5.2 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 October 2016, prior to the formal commencement of the study in January 2017.

#### **Preconsultation Meeting** - November 7, 2016

- WSP presented an overview of the scope of the project and the expected corresponding works.
- Potential stakeholders to be added to the stakeholder contact list were discussed.
- The City indicated they are redeveloping the Marina Park area. The redevelopment plan was indicated to be completed in 2017.
- The City indicated there is archaeological potential in Port Credit.

- Potential required permits from the City for the works associated with the project were discussed.

**Design Review Meeting – October 16, 2017**

- WSP presented their preliminary design concept for the proposed pumping station within the Richard's Memorial Park.
- WSP presented their potential pumping station site options within the Richard's Memorial Park to obtain feedback and determine the City's preferred site location.

**Property Impact Meeting – July 13, 2018**

- WSP presented the potential impact to City owned properties due to the expected construction of the proposed pumping station and sewers.
- The expected construction timeline and sequencing for the sewers and pumping station was discussed.

# 4 Baseline Features and Servicing Conditions

The information described in this section was considered when reviewing potential effects of the alternative solutions.

## 4.1 Regulatory Planning Context

### 4.1.1 Provincial Policy Statement (2014)

The 2014 Provincial Policy Statement (the “PPS”) provides policy direction on matters related to land use planning and the responsible management of resources, including the requirement for coordinated, efficient, and cost-effective manner that considers impacts from climate change while accommodating projected needs (Policy 1.6.1).

### 4.1.2 Growth Plan for the Greater Golden Horseshoe (2017)

The Growth Plan for the Greater Golden Horseshoe, 2017 (the “Growth Plan”) builds on the PPS and establishes a comprehensive growth management strategy for the Province of Ontario over the 2041 planning horizon. Section 3(5)(b) of the Planning Act requires that all decisions that affect a planning matter must conform with the Plan.

## 4.2 Planning and Servicing Considerations

### 4.2.1 Region of Peel Official Plan (2014)

The Region of Peel Official Plan (“ROP”) is a long-term plan used to assist the Region in managing growth and development. The objective of the ROP with regards to wastewater services is to provide services in an adequate, efficient, planned and cost-effective manner consistent with public needs and financial realities.

### 4.2.2 City of Mississauga Official Plan (2015)

The City of Mississauga Official Plan establishes policies to manage change and growth within the City through the planning horizon. The Plan contains several Local Area Plans, including the Port Credit Local Area Plan, which establishes policies within the Study Area that reflect heritage, character, environmental, or socio-economic features.

### 4.2.3 City of Mississauga Zoning By-law 0225 (2007)

The City of Mississauga Zoning By-law regulates the use of land, building and structures. As per Part 2: General Provisions, Section 2.1.1.3 of the Zoning By-law, a structure required for the purpose of providing wastewater management facilities or piped services is a permitted use in all zones.

#### **4.2.4 Old Port Credit Village Heritage Conservation District Plan**

The City of Mississauga enacted the Old Port Credit Village Heritage Conservation District Plan in 2004 to guide the physical changes to the area over time to ensure that modifications contribute to the area's character. The existing Front Street WWPS resides within the area defined in the plan.

### **4.3 Existing Linear Facilities**

This section presents a summary of the policies affecting land use planning and servicing requirements in the Infrastructure Planning Area.

#### **4.3.1 Wastewater Servicing**

The proposed trunk sewer is designed to receive flows from the local sanitary systems and therefore is located at an elevation below the existing local sewers. However, confirmation of the location of the sanitary sewers is recommended during the detailed design phase to ensure there are no conflicts with the proposed construction shaft locations.

#### **4.3.2 Watermains**

Various watermains are located within the Study Area, and the proposed works include a number of crossings of watermains and water services. The watermain information contained in the design drawings is based on the Region's GIS based database and should not be relied upon for construction purposes. In general, watermains will be located at higher elevations than the proposed trunk sewer, however, the locations and elevations of the watermains should be verified during the detailed design phase.

#### **4.3.3 Storm**

A detailed storm sewer investigation should be completed during the detailed design phase to confirm storm sewer locations and elevations. It should be noted that a potential conflict has been identified with an existing 1650mm dia. storm sewer in Jack Darling Memorial Park, just upstream of the terminus of the proposed trunk sewer. Additional investigation will be required to confirm the elevation of the storm sewer at this location. Additionally, a potential conflict with the proposed location of temporary construction shaft for Maintenance Hole 2 has been identified that may require relocation of a short section of the existing storm sewer in the area.

#### **4.3.4 Gas**

Natural gas pipelines are known to be present along the alignment of the proposed trunk sewer. A full investigation should be completed during the detailed design phase.

### **4.3.5 Hydro**

Hydro lines are primarily buried underground between Front Street and Godfrey's Lane. West of Godfrey's Lane hydro poles were observed along the north side of Lakeshore Road. A detailed investigation will be required during the detailed design phase to ensure there are no conflicts with the construction of the proposed trunk sewer, especially with respect to the location of the proposed shafts and construction compounds.

### **4.3.6 Communications**

Communications utilities do not typically pose a concern for the design and construction of deep trunk sewers constructed in tunnel. However, a detailed investigation is recommended during the detailed design phase to ensure there are no conflicts with the proposed construction shaft locations

## **4.4 Physical Environment**

### **4.4.1 Subwatersheds**

The Infrastructure Planning Area is within the jurisdiction of the Credit Valley Conservation Authority (CVC). The CVC has jurisdiction over the following subwatersheds: Norval to Port Credit (Subwatershed #9); Lake Ontario Shoreline West Tributaries (Subwatershed #21).

### **4.4.2 Topography, Physiography, and Geology**

The topography of the infrastructure Planning Area provides fairly low relief. The ground surface generally slopes south towards Lake Ontario, with some gentle sloping towards watercourses that cross Lakeshore Road. The general topography of the Peel Plain region consists of level to gently rolling terrain, sloping gradually southward towards Lake Ontario. The Peel Plain is cut by several river valleys including the Credit River Valley. The Credit River valley cuts into the Till and often into the underlying shale.

### **4.4.3 Groundwater Conditions**

Based on the review of the database of the Ontario Ministry Northern Development and Mines, water levels were reportedly varying from 0.5 m to 5.0 m below ground surface (Ontario Ministry of Northern Development and Mines). The approximate locations of these water wells near the proposed wastewater main or forcemain alignment are shown in drawings within the Desktop Geotechnical Report.

### **4.4.4 Areas of Potential Environmental Concern (APEC)**

Based on the findings of the Potential for Contamination Technical Memorandum, APECs have been identified within the Infrastructure Planning Area. The APECs with high, moderate, and low potential for contamination are summarized in in the Background Hydrogeological Technical Memorandum. Twenty (20) areas that are considered high potential for contamination were identified in the Infrastructure Planning Area.

## 4.5 Hydrogeological Analysis

### 4.5.1 Desktop Study

A desktop hydrogeological analysis determined Regional groundwater flow is generally anticipated to be in a southerly direction towards Lake Ontario and towards the Credit River based on the regional water table mapping in the area, which tends to mimic the topography. The overburden and weathered bedrock aquifers may facilitate some groundwater flow and discharge to the Credit River and possibly to the tributaries that cross the proposed alignment along Lakeshore Road.

Near Front Street WWPS, dewatering volumes may be significant depending on the depth of the overburden and connectivity of the surficial aquifer with the Credit River. In the vicinity of Richard's Memorial WWPS, where the wet well excavation may be up to 15 m bgs, some seepage from the thin overburden and the interface with the weathered shale could occur. Deeper sound bedrock is not expected to require significant dewatering. Dewatering requirements may also be greater near Jack Darling WWPS, where the coarse-grained overburden units are thicker.

Access shaft and tunneling are anticipated to intersect the water table and deeper bedrock groundwater and depending on construction methods and mitigations techniques used may require construction dewatering.

### 4.5.2 Hydrogeological Data Report

A Hydrogeological Data Report (HDR) was undertaken by Golder Associates to summarize the factual hydrogeological data (i.e., fieldwork investigation procedures, groundwater conditions, in situ hydraulic testing) collected in the boreholes advanced along the route of the proposed sanitary sewer trunk and associated shaft locations pertaining to groundwater control. The HDR is currently draft and further investigations will be conducted during detailed design.

## 4.6 Geotechnical Analysis

### 4.6.1 Desktop Study

A desktop geotechnical analysis determined that the alignment is underlain by gravelly sand to silty sand over silty clay to clayey silt, which is underlain by the bedrock of Georgian Bay Formation of the Upper Ordovician period which is a grey shale with light grey siltstone and/or limestone interbeds. In some areas, bedrock is expected to lie at 8 to greater than 15m below the ground surface.

Potential construction excavation water takings are anticipated to be high due to permeability of the soil in some areas. For preliminary design, a microtunnel boring machine or similar can be considered. Secant pile (caisson) walls or cast-in-place concrete shafts should be considered to cut off the ground water seepage within saturated cohesionless soils.

### 4.6.2 Geotechnical Data Report

A geotechnical analysis was undertaken by Golder Associates. In general, the subsurface conditions below the surficial layers of asphalt/topsoil and/or fill were found to be underlain by a non-cohesive deposit of variable thickness comprised of silt to silty sand in places

interlayered with or underlain by a deposit of silty clay. The non-cohesive deposit and cohesive deposit in places is typically underlain by a deposit of glacial till grading from silty clay to clayey sand to clayey gravel. The till deposit overlies shale bedrock of the Georgian Bay Formation along the proposed trunk sewer alignment.

#### **4.6.3 Phase 1 ESA**

Phase I Environmental Site Assessments (ESA) were undertaken for each of the preliminary preferred tunnel shaft sites. Potential sources of contamination were identified at some of the compound site and accordingly a Phase Two ESA investigation is required to support the submission of a Record of Site Condition (RSC) at these locations.

### **4.7 Natural Environment / Ecology**

This section summarizes the findings of the Natural Environment Study completed by WSP Canada Inc. Site visits were conducted between January and November 2017.

#### **4.7.1 Water Courses**

There is one prominent water course within the Infrastructure Planning Area, the Credit River. The Credit River is approximately 90 km long, spans a drainage area of 860 km<sup>2</sup>, and drains into Lake Ontario. There are two main sources for the river and they begin at Orangeville and Alton. It is a meeting point for the Niagara Escarpment and the Oak Ridges Moraine.

#### **4.7.2 Areas of Natural Scientific Interest**

Areas of Natural and Scientific Interest (ANSI) were not identified within 120 m of the Study Area.

#### **4.7.3 Significant Habitat of Endangered or Threatened Species**

As part of a desktop review, a search of the OMNRF Natural Heritage Information Centre (NHIC) database was conducted to determine the existence and approximate location of recorded occurrences of Endangered or Threatened Species and Species of Conservation Concern in the general area. The 6 Endangered or Threatened Species and Species of Conservation Concern that were found to have habitat potential within the Infrastructure Planning Area are the following: arthropods; birds; fish; mammals; reptiles; vascular plants.

#### **4.7.4 Aquatic Features and Fish Habitat**

Four watercourses with potential for fish habitat traverse the Infrastructure Planning Area. As a part of the field surveys, a detailed aquatic habitat mapping of the four watercourses was completed and can be found in the Natural Environment Study. No fish were observed at the time of the survey at Birchwood Creek or Moore Creek, however, there is potential for direct fish use in these watercourses due to its direct connection to Lake Ontario when suitable flows are present. Young-of-the-Year (YOY) and an unknown species were identified on site in the Lornewood Creek and the Tecumseh Creek. As such, these watercourses are considered to be direct fish habitats.

#### **4.7.5 Significant Wetlands**

A review of the Natural Heritage mapping did not identify wetlands, whether unevaluated or provincially significant within the Infrastructure Planning Area. No wetlands were identified during the field survey.

#### **4.7.6 Significant Wildlife Habitat**

Three Significant Wildlife Habitats were identified in the area of Richard's Memorial Park:

- A Tall Prairie Grass habitat was identified during the field survey, in open areas in the northeast corner of the park.
- The size of the contiguous woodland (> 32 ha) and its proximity to the Lake Ontario shoreline make it candidate habitat for Landbird Stopover Migratory Habitat.
- The size of the contiguous woodland (>32 ha) and the ELC forest community (FODM7-3) present suggests potential for Candidate Bat Maternity Colony Significant Wildlife Habitat.

#### **4.7.7 Significant Woodlands**

Although Richard's Memorial Park is not identified as part of the Natural Heritage System, and woodlands within the park are not mapped as part of the Residential Woodlands, wooded areas within the park are contiguous with the residential woodland block and are therefore considered significant as per policy 6.3.12(f) of the Official Plan. An Arborist Report was completed.

#### **4.7.8 Significant Valleylands**

The valleylands associated are not significant. The Credit River is located north and east of the Infrastructure Planning Area and fits the criteria to be considered a significant valleyland. Impacts to the Credit River or its riparian corridor are not anticipated.

### **4.8 Archaeological Assessments**

#### **4.8.1 Stage 1 Archaeological Assessment**

A Stage 1 Archaeological Assessment was completed along the Lakeshore Road W alignment. The assessment determined that all greenspace areas located within the Stage 1 assessment area have Stage 2 archaeological potential. As such, a Stage 2 Archaeological Assessment was conducted for these areas in mid-2018.

A Stage 1 Archaeological Assessment was completed on along the Pine Avenue S alignment. The assessment determined that all sewer alignments within the right-of-way were as disturbed or previously assessed and as such a Stage 2 assessment is not required. Should the proposed impacts extend beyond the road platform and associated ditching, a Stage 2 assessment may be required along some sewer routes.

#### **4.8.2 Stage 2 Archaeological Assessment**

A Stage 2 Archaeological Assessment was completed for alignment along Lakeshore Road, from the Credit River to Jack Darling Memorial Park. The assessment also included Jack Darling Park, Richard's Memorial Park, and Port Credit Park. The assessment determined that no further studies would be required in any of the areas.

## 4.9 Built/Cultural Heritage Assessment

The Built/Cultural Heritage Assessment was completed. The assessment determined a total of sixteen built heritage resources (BHR) and seven cultural heritage landscapes (CHL). Further, it recommended that should the proposed work affect the Jack Darlington Memorial Park or the Ben Machree Park, further evaluation of these resources be conducted through a Cultural Heritage Evaluation Report (CHER) to identify cultural heritage value or attribute at the earliest stage of detailed design for the project. If found to have cultural heritage value, the impacts of proposed works are to be assessed through a Heritage Impact Assessment, as applicable.

## 4.10 Traffic Impact Assessment

WSP completed a Traffic Impact Analysis considering the preferred alignment along Lakeshore Road, Pine Avenue S and potential preliminary shaft locations. The analysis determined that the proposed staging plan was generally adequate, and no significant impact is expected on traffic operations during construction, though monitoring of traffic conditions is recommended.

## 4.11 Pre-demolition Designated Substance Survey

A Designated Substances and Hazardous Materials Survey (DSS) was carried out within the existing Richard's Memorial Pumping Station located at 870 Lakeshore Road W. The existing building is single-storey with four (4) wet wells. The survey was conducted to determine the presence/absence of Designated Substances within the building and provide information for correct removal or handling of materials prior to decommissioning or demolition.

# 5 Phase 2: Alternative Solutions to the Problem

This section describes the process undertaken to identify, develop and evaluate alternative solutions to address the problem/opportunity statement identified.

## 5.1 Identification and Screening of Alternative Options

Various high-level options (“Alternative Options”) to address the problem were identified. These include the “Do Nothing” and “Limit Growth” options that are typically used as a baseline for comparison in Class EAs. The alternative options are described below. A detailed review of the alternative options was provided in Technical Memorandum – List of Alternatives.

**Option 1: Do Nothing** - Does not address current condition issues and concerns at the three pumping stations, capacity concerns at G.E. Booth, and does not allow further development in the area.

**Option 2: Limit Growth** - Does not address the problem statement and is not feasible as it does not address provincial policy.

**Option 3 - Expand Front Street WWPS and Richard’s Memorial WWPS** - Does address the condition and capacity issues at the two stations but does not address the need to divert flows away from G. E. Booth.

**Option 4: Redirect flows from Front Street WWPS to the west** - Fully addresses the concerns related to the condition and capacity of the stations, addresses the need to redirect flow away from the G.E. Booth WWTP, and allows for growth.

### 5.1.1 Screening of Alternative Options

A cursory review of the alternative options described in the sections above relative to the Problem Statement allows to easily screen out alternatives that do not “solve the problem.” Based on the screening, only Option 4 sufficiently satisfies the Problem Statement and is therefore carried forward for further evaluation.

## 5.2 Identification of Long List of Alternative Solutions

Option 4 described above can be further broken down into a long list of alternative solutions that address the problem statement. The long list alternative solutions are described in the sections below. A detailed review of the long list alternative solutions was provided in Technical Memorandum – Evaluation Approach.

### 5.2.1 Alternative 1 – Expand Front Street WWPS and Pump to Richard’s Memorial WWPS

Expansion of the Front Street WWPS to address the existing deficiencies and to allow for the WWPS to pump west directly via a new forcemain to a new Richard’s Memorial WWPS. The new Richard’s Memorial WWPS would lift the wastewater and discharge to a nearby maintenance hole on Lakeshore Road, north on the Richard’s Memorial Park. New gravity sewer would be constructed from the Richard’s Memorial WWPS discharge maintenance hole west towards the existing Jack Darling WWPS.

### **5.2.2 Alternative 2 – Expand Front Street WWPS and Pump to Jack Darling WWPS**

Expansion of the Front Street WWPS to address the existing deficiencies and to allow for the WWPS to pump west directly via a new forcemain to the existing Jack Darling WWPS, bypassing Richard's Memorial Park. A new Richard's Memorial WWPS would be constructed and would lift the wastewater and discharge to a nearby maintenance hole on Lakeshore Road W, north on the Richard's Memorial Park. A new gravity sewer would be constructed from the Richard's Memorial WWPS discharge maintenance hole west towards the existing Jack Darling WWPS.

### **5.2.3 Alternative 3 – Expand Front Street WWPS to Pump to New Rhododendron Gardens WWPS**

Expansion of the Front Street WWPS to address the existing deficiencies and to allow for the WWPS to pump west directly via a new forcemain to a new WWPS in the Rhododendron Gardens. A new gravity sewer would be constructed, conveying flows from the new Rhododendron WWPS to the existing Jack Darling WWPS. A new Richard's Memorial WWPS would be constructed and would lift the wastewater and discharge to a nearby maintenance hole on Lakeshore Road W, north on the Richard's Memorial Park. A new gravity sewer would be constructed from the Richard's Memorial WWPS discharge maintenance hole west towards the existing Jack Darling WWPS.

### **5.2.4 Alternative 4 – Decommission Front Street WWPS and New Rhododendron Gardens WWPS**

Decommissioning of the Front Street WWPS. A new gravity sewer would be constructed, conveying the wastewater flows from the decommissioned Front Street WWPS to a new WWPS in the Rhododendron Gardens. A new gravity sewer would be constructed, conveying flows from the new Rhododendron WWPS to the existing Jack Darling WWPS. A new Richard's Memorial WWPS would be constructed and would lift the wastewater and discharge to a nearby maintenance hole on Lakeshore Road W, north on the Richard's Memorial Park. A new gravity sewer would be constructed from the Richard's Memorial WWPS discharge maintenance hole west towards the existing Jack Darling WWPS.

### **5.2.5 Alternative 5 – Decommission Front Street WWPS and New Richard's Memorial WWPS**

Decommissioning of the Front Street WWPS. A new gravity sewer would be constructed, conveying the wastewater flows from the decommissioned Front Street WWPS to a new Richard's Memorial WWPS. The new Richard's Memorial WWPS would lift the wastewater and discharge to a nearby maintenance hole on Lakeshore Road W, north on the Richard's Memorial Park. A new gravity sewer would be constructed from the Richard's Memorial WWPS discharge maintenance hole west towards the existing Jack Darling WWPS. Review the opportunity to maintain Ben Machree Wastewater Pumping Station to that of decommissioning and connecting flows by gravity sewer pipe to the new gravity sewer along Lakeshore Road W.

## 5.3 Screening of Alternative Solutions

Long list alternatives 1, 2, and 3 are not deemed feasible as they require pumping over long distances, thus increasing the cost of operation of the Front Street WWPS. Long list alternatives 3 and 4 are deemed not feasible as the proposed new WWPS would be located within the Rhododendron Gardens, thus requiring a large amount of plants and trees to be removed from the community. Therefore, only long list alternative 5 was carried forward to the short list of alternatives for further evaluation.

## 5.4 Identification of Short List of Alternatives

Alternative Solution 5 described above can be further broken down into three sets of solutions: potential new WWPS site locations, potential linear infrastructure routes, rationalizing flow from Ben Machree WWPS and potential alternative gravity sewer routes. The short list of alternatives is described in the sections below.

### 5.4.1 Potential New Wastewater Pumping Station Site Locations

Seven potential site locations were identified within the Richard's Memorial Park.

- **Site 1** – Located just east of the existing parking lot within the Richard's Memorial Park. Access to the WWPS would be from the driveway to the park.
- **Site 2** – Located in the southern portion of the Richard's Memorial Park where the existing Park washroom is located. Access to the WWPS would be from the existing Richard's Memorial Parking lot.
- **Site 3** – Located in the north-eastern portion of the Richard's Memorial Park where the Park's existing rock garden is currently located. Access to the WWPS would be from either Lakeshore Road W or Dack Boulevard.
- **Site 4** – Located just north of the existing Richard's Memorial Park parking lot and just west of the existing drive way. Access to the WWPS would be from Lakeshore Road W.
- **Site 5** – Located just east of the Richard's Memorial Park's existing driveway. Access to the WWPS would be from Lakeshore Road W.
- **Site 6** – Located north of the Richard's Memorial Park's existing parking lot where the existing Richard's Memorial WWPS is located. Access to the WWPS would be from either Lakeshore Road W or the existing parking lot.
- **Site 7** – Located in the north-western portion of the Richard's Memorial Park. Access would be from Lakeshore Road W.

### 5.4.2 Potential New Linear Infrastructure Routes

Five potential linear infrastructure routes from Front Street WWPS to Jack Darling WWPS were identified.

- **Route 1** – travels underneath of Lakeshore Road W from Front Street WWPS into a new Richard's Memorial WWPS. The new Richard's Memorial WWPS then "lifts" the wastewater and discharges to a maintenance hole located north of the Richard's Memorial Park on Lakeshore Road W. Route 1 then travels underneath Lakeshore Road W from Richard's Memorial WWPS to the existing Jack Darling WWPS.

- **Route 2** – travels underneath Front Street N and Queen Street W from Front Street WWPS to a new Richard’s Memorial WWPS. The new Richard’s Memorial WWPS then “lifts” the wastewater and discharges to a manhole located north of the Richard’s Memorial Park on Lakeshore Road W. Route 2 then travels underneath Lakeshore Road W from Richard’s Memorial WWPS to the existing Jack Darling WWPS.
- **Route 3** – travels underneath Front Street S, the Waterfront Trail, Ben Machree Dr., and Godfrey’s Lane from Front Street WWPS to a new Richard’s Memorial WWPS. The new Richard’s Memorial WWPS then “lifts” the wastewater and discharges to a manhole located north of the Richard’s Memorial Park on Lakeshore Road W. Route 3 then travels underneath Lakeshore Road W from Richard’s Memorial WWPS to the existing Jack Darling WWPS.
- **Route 4** – variation of Route 3, travelling underneath Front Street S, Port Street W, Mississauga Road, west through the 70 Mississauga Road lands, and then south to the Waterfront Trail. Route 4 then continues to a new Richard’s Memorial WWPS as previously described in Route 3. The new Richard’s Memorial WWPS then “lifts” the wastewater and discharges to a manhole located north of the Richard’s Memorial Park on Lakeshore Road W. Route 4 then travels underneath Lakeshore Road W from Richard’s Memorial WWPS to the existing Jack Darling WWPS.
- **Route 5** – variation of Route 3 and Route 4, travelling underneath Front Street S and Bay Street Route 5 then continues to a new Richard’s Memorial WWPS as previously described in Route 4. The new Richard’s Memorial WWPS then “lifts” the wastewater and discharges to a manhole located north of the Richard’s Memorial Park on Lakeshore Road W. Route 5 then travels underneath Lakeshore Road W from Richard’s Memorial WWPS to the existing Jack Darling WWPS.

#### 5.4.3 Potential Ben Machree Wastewater Pumping Station Alternatives

The new gravity sewer along Lakeshore Road W, conveying the wastewater flows from the decommissioned Front Street WWPS to a new Richard’s Memorial WWPS, enables the decommissioning of Ben Machree Wastewater Pumping Station by a gravity sewer. Five alternatives were identified. A detailed review of the alternatives was provided in Technical Memorandum – Ben Machree Alignment.

- **Alternative 1** – maintain the existing Ben Machree WWPS and upgrade the facility to comply with latest regulation requirements. This requires land acquisition, increasing the overflow storage capacity and a new forcemain.
- **Alternative 2** – decommission Ben Machree WWPS and replace with a gravity sewer. The potential gravity sewer route is aligned along Ben Machree Drive and directly connects the Ben Machree WWPS to the Lakeshore Road W.
- **Alternative 3** – decommission Ben Machree WWPS and replacing with a gravity sewer. The potential gravity sewer route runs from the Ben Machree WWPS west along Ben Machree Drive, north along Maple Avenue S, and directly connects the Ben Machree WWPS to the Lakeshore Road W.

- **Alternative 4** – decommission Ben Machree WWPS and replacing with a gravity sewer. The potential gravity sewer route runs from the Ben Machree WWPS west along Ben Machree Drive, north along Maple Avenue S, north along Pine Avenue S and directly connects the Ben Machree WWPS to the Lakeshore Road W.
- **Alternative 5** – decommission of the Ben Machree WWPS and replacing with a gravity sewer. The potential gravity sewer route runs from the Ben Machree WWPS east along Ben Machree Drive, north along Godfrey’s Lane and directly connects the Ben Machree WWPS to the Lakeshore Road W.

## 5.5 Comparative Evaluation of Alternative Solutions

The following sub-sections describe the evaluation process that was used to gather and review all of the information to select the preferred alternative.

### 5.5.1 Approach to Evaluation of Alternative Solutions

The following four evaluation criteria were used to evaluate the alternative solutions:

- **Technical** - Component that considers the technical suitability and other engineering aspects of the wastewater system in regard to constructability, impact on existing utilities, compliance with applicable planning and environmental policies and property requirement impacts.
- **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. This includes impact on water features, geology and hydrogeology, impact on trees, impact to species at risk, land contamination considerations.
- **Social/Cultural** - Component that evaluates potential effects on residents, neighbourhoods, businesses, community character, social cohesion, community features and historical/archaeological and heritage components. This includes impact on existing residences, businesses and/or community, impact to recreational uses enjoyment of park or community assets; visual impact from streetscape; archaeological considerations; impact on parking in park.
- **Economical/ Financial** - Component that compares the potential financial costs, specifically initial capital costs.

The solution with the lowest possible adverse effects was then identified as the preferred solution. The evaluation matrix created for both the potential pumping station sites and the potential linear infrastructure routes can be seen in Table 5-1, Table 5-2 and Table 5-3 respectively.

**Table 5-1 Evaluation Matrix for Potential New Richard’s Memorial SPS Site Locations**

	<b>Criteria</b>	<b>Site #1 (East of Existing Richard's Memorial Park Parking Lot)</b>	<b>Site #2 (South of Existing Richard's Memorial Park Parking Lot)</b>	<b>Site #3 (East of Existing Richard's Memorial Park Parking Lot, between CVC Boundary and Property Line)</b>	<b>Site #4 (North of the Existing Richard's Memorial Park Parking Lot)</b>	<b>Site #5 (East of the Entrance Driveway to the Existing Richard's Memorial Park Parking Lot)</b>	<b>Site #6 (Within the Existing Richard's Memorial Wastewater Pumping Station Site)</b>	<b>Site #7 (North-West of the Existing Richard's Memorial Pumping Station Parking Lot)</b>	
<b>Technical</b>	<b>Constructability</b>	Distance from Lakeshore Road means further tunneling through the Park for the incoming gravity sewer. Deeper inlet sewer and wet well due to the longer gravity sewer.	Farthest from Lakeshore Road Therefore, tunneling through the Richard's Memorial Park for the incoming gravity sewer is required. Deeper inlet sewer and wet well due to longer gravity sewer.	Close proximity to Lakeshore Road means less tunneling through the park and a shallower inlet sewer. Construction impact area would be reduced since the pumping station would be located near the sewer shaft area.	Close proximity to Lakeshore Road means less tunneling through the park and a shallower inlet sewer. Construction impact area would be reduced since the pumping station would be located near the sewer shaft area.	Close proximity to Lakeshore Road means less tunneling through the park and a shallower inlet sewer. Construction impact area would be reduced since the pumping station would be located near the sewer shaft area.	Close proximity to Lakeshore Road means less tunneling through the park and a shallower inlet sewer. As this site is located on top of the existing pumping station, major demolition and site preparation will be required.	Close proximity to Lakeshore Road means less tunneling through the park and a shallower inlet sewer. Construction impact area would be reduced since the pumping station would be located near the sewer shaft area.	
	<b>Impact on existing utilities</b>	Sewers discharging to the existing Richard's Memorial WWPS would be redirected towards a new manhole upstream of the new WWPS inlet.	Conflicts with the existing Lornewood Creek culvert. Sewers discharging to the existing Richard's Memorial WWPS would be redirected towards a new manhole upstream of the new WWPS inlet.	Sewers discharging to the existing Richard's Memorial WWPS would be redirected towards a new manhole upstream of the new WWPS inlet.	Conflicts with the existing Lornewood Creek culvert. Sewers discharging to the existing Richard's Memorial WWPS would be redirected towards a new manhole upstream of the new WWPS inlet.	Sewers discharging to the existing Richard's Memorial WWPS would be redirected towards a new manhole upstream of the new WWPS inlet.	Sewers discharging to the existing Richard's Memorial WWPS would be redirected towards a new manhole upstream of the new WWPS inlet.	Sewers discharging to the existing Richard's Memorial WWPS would be redirected towards a new manhole upstream of the new WWPS inlet.	
	<b>Compliance with applicable planning and environmental policies</b>	Within the CVC floodplains area.	Within the CVC floodplains area.	No identified non-compliances.	Within the CVC floodplains area.	Within the CVC floodplains area.	Within the CVC floodplains area.	Within the CVC floodplains area.	No identified non-compliances.
	<b>Property Requirements Impacts</b>	Requires a large amount of property acquisition due to the long sewer length. Property acquisition would be required for any alignment through the Park.	Requires a large amount of property acquisition due to the long sewer length. Property acquisition would be required for any alignment through the Park.	Requires a moderate amount of property acquisition due to the sewer length. Property acquisition would be required for any alignment through the Park.	Requires a moderate amount of property acquisition due to the sewer length. Property acquisition would be required for any alignment through the Park.	Requires a moderate amount of property acquisition due to the sewer length. Property acquisition would be required for any alignment through the Park.	Requires a moderate amount of property acquisition due to the sewer length. Property acquisition would be required for any alignment through the Park.	Requires a minimal amount of property acquisition due to the short sewer length. Property acquisition would be required for any alignment through the Park.	Requires a minimal amount of property acquisition due to the short sewer length. Property acquisition would be required for any alignment through the Park.

Criteria	Site #1 (East of Existing Richard's Memorial Park Parking Lot)	Site #2 (South of Existing Richard's Memorial Park Parking Lot)	Site #3 (East of Existing Richard's Memorial Park Parking Lot, between CVC Boundary and Property Line)	Site #4 (North of the Existing Richard's Memorial Park Parking Lot)	Site #5 (East of the Entrance Driveway to the Existing Richard's Memorial Park Parking Lot)	Site #6 (Within the Existing Richard's Memorial Wastewater Pumping Station Site)	Site #7 (North-West of the Existing Richard's Memorial Pumping Station Parking Lot)	
<b>Environmental</b>	<b>Impact on water features/resources</b>	No noted potential effects on water features/resources.	No noted potential effects on water features/resources.	No noted potential effects on water features/resources.	No noted potential effects on water features/resources.	No noted potential effects on water features/resources.	No noted potential effects on water features/resources.	
	<b>Geology and hydrogeology considerations</b>	Borehole drilling to determine the bedrock surface and rock coring for testing is required. No geology or hydrogeology concerns.	Borehole drilling to determine the bedrock surface and rock coring for testing is required. No geology or hydrogeology concerns.	Borehole drilling to determine the bedrock surface and rock coring for testing is required. No geology or hydrogeology concerns.	Borehole drilling to determine the bedrock surface and rock coring for testing is required. No geology or hydrogeology concerns.	Borehole drilling to determine the bedrock surface and rock coring for testing is required. No geology or hydrogeology concerns.	Borehole drilling to determine the bedrock surface and rock coring for testing is required. No geology or hydrogeology concerns.	
	<b>Impact on trees and Significant Woodland Features</b>	Mature tree removal is required.	Mature tree removal is required.	Mature tree removal is required.	Mature tree removal is required.	Mature tree removal is required.	Mature tree removal is required.	Mature tree removal is required. Removal of 0.003% of significant woodland).
	<b>Impact to Species at Risk (SAR) or Their Habitats</b>	Removal of 15 potential bat maternity roosting habitat trees	Removal of 19 potential bat maternity roosting habitat trees	Removal of 8 potential bat maternity roosting habitat trees	Removal of 8 potential bat maternity roosting habitat trees	Removal of 13 potential bat maternity roosting habitat trees	No impact to identified SAR	Removal of 6 potential bat maternity roosting habitat trees
	<b>Land contamination considerations</b>	No potential for contamination areas identified	No potential for contamination areas identified	No potential for contamination areas identified	No potential for contamination areas identified	No potential for contamination areas identified	No potential for contamination areas identified	No potential for contamination areas identified
<b>Social</b>	<b>Impact on existing residences, businesses, and/or community</b>	Not located near any residences or businesses. Minor traffic impact on major community road.	Not located near any residences or businesses. Minor traffic impact on major community road.	Located close to the property line of homes on Dack Boulevard. Vehicle and construction machinery noise during construction. Traffic impact on residential road during construction. Minor traffic impact on road during operation.	Not located near any residences or businesses. Minor traffic impact on major community road.	Not located near any residences or businesses. Minor traffic impact on major community road.	Not located near any residences or businesses. Minor traffic impact on major community road.	Located close to the property line of a home on Lakeshore Road. Vehicle and construction machinery noise during construction. Minor traffic impact on major community road.

Criteria	Site #1 (East of Existing Richard's Memorial Park Parking Lot)	Site #2 (South of Existing Richard's Memorial Park Parking Lot)	Site #3 (East of Existing Richard's Memorial Park Parking Lot, between CVC Boundary and Property Line)	Site #4 (North of the Existing Richard's Memorial Park Parking Lot)	Site #5 (East of the Entrance Driveway to the Existing Richard's Memorial Park Parking Lot)	Site #6 (Within the Existing Richard's Memorial Wastewater Pumping Station Site)	Site #7 (North-West of the Existing Richard's Memorial Pumping Station Parking Lot)
<b>Impact to recreational uses, enjoyment of the Park or community assets</b>	Significant impact to park access during construction. Significant impact to Park areas during construction due to location being in the middle of the Park.	The existing gazebo and picnic area would need to be relocated. Significant impact to park access during construction.	Existing Rock Garden would need to be relocated.	Significant impact to park access during construction. Minor impact to Park areas during construction.	Significant impact to park access during construction. Minor impact to Park areas during construction.	Significant impact to park access during construction. Significant impact to Park areas during construction due to major demolition and site grading required to remove the existing pumping station.	Significant impact to park access during construction. Minor impact to Park areas during construction.
<b>Visual impact from streetscape</b>	Moderate impact, near Lakeshore Road	Low impact, far from Lakeshore Road	High impact, close to Lakeshore Road However, architectural design will allow blending in with surroundings and landscaping to provide screening.	High impact, close to Lakeshore Road However, architectural design will allow blending in with surroundings and landscaping to provide screening.	High impact, close to Lakeshore Road However, architectural design will allow blending in with surroundings and landscaping to provide screening.	High impact, close to Lakeshore Road However, architectural design will allow blending in with surroundings and landscaping to provide screening.	High impact, close to Lakeshore Road However, architectural design will allow blending in with surroundings and landscaping to provide screening.
<b>Archaeological considerations</b>	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.
<b>Impact on parking in the Park</b>	Site location does not impact parking. However, would impact access to parking by the public during construction. Access during flood conditions would be limited since the site is located within the floodplain.	Site location does not impact parking. However, would impact access to parking by the public during construction. Access during flood conditions would be limited since the site is located within the floodplain.	Site location does not impact parking. However, some of the parking spots in the park to be used by construction workers for the duration of the project.	Site location does not impact parking. However, would impact access to parking by the public during construction. Access during flood conditions would be limited since the site is located within the floodplain.	Site location does not impact parking. However, would impact access to parking by the public during construction. Access during flood conditions would be limited since the site is located within the floodplain.	Site location does not impact parking. However, would impact access to parking by the public during construction. Access during flood conditions would be limited since the site is located within the floodplain.	Site location does not impact parking. However, some of the parking spots in the park to be used by construction workers for the duration of the project.
<b>Financial</b>	<b>Capital Costs</b>	\$21,120,000	\$21,120,000	\$21,120,000	\$21,120,000	\$21,120,000	\$21,120,000
<b>Rank</b>	<b>Total rank of site alternative</b>	Less preferred	Least preferred	Less preferred	Less preferred	Less preferred	Most preferred

**Table 5-2 Evaluation Matrix for Potential Linear Infrastructure Routes**

		Sewer 1 (S1)	Sewer 2 (S2)	Sewer 3 (S3)	Sewer 4 (S4)	Sewer 5 (S5)
	<b>Screening Criteria</b>	<b>Sewer along Lakeshore Road W.</b>	<b>Sewer along Front Street N., Queen Street W., and Ibar Way to Richard's Memorial Park</b>	<b>Sewer along Front Street S, Waterfront Trail, Ben Machree Drive, Godfrey's Lane, and Waterfront Trail to Richard's Memorial Park</b>	<b>Variation of S3 with sewer along Port Street W, Mississauga Road, 70 Mississauga Road S and south to Waterfront Trail</b>	<b>Variation of S3 and S4 with sewer along Bay Street</b>
<b>Technical</b>	<b>Constructability</b>	As S1 runs along a straight line, no constructability issues during tunnelling identified.	An indirect route through several small local roads and residential areas may cause constructability issues during tunnelling. Would require multiple shafts to accommodate turns.	An indirect route along the shore of Lake Ontario may cause constructability (dewatering) issues during tunnelling. Would require multiple shafts to accommodate turns.	An indirect route along the shore of Lake Ontario may cause constructability (dewatering) issues during tunnelling. Would require multiple shafts to accommodate turns.	An indirect route through several small local roads and residential areas may cause constructability issues during tunnelling. Would require multiple shafts to accommodate turns.
	<b>Ease of site access during construction</b>	Along a wide, major community road. No site access restrictions noted. Would potentially require temporary access/curb cut on Lakeshore Road to facilitate access to launch shaft.	Private residential areas restrict access along the route.	Lake Ontario and Waterfront Trail restricts access along the route.	Private residential areas, Lake Ontario, and Waterfront Trail restrict access along the route.	Private residential areas, Lake Ontario, and Waterfront Trail restrict access along the route.
	<b>Compliance with applicable planning and environmental policies</b>	No noted compliance deviations	No noted compliance deviations	No noted compliance deviations	No noted compliance deviations	No noted compliance deviations
	<b>Property requirements impacts</b>	Along the Region right-of-way, minimal acquisition required	Along the Region right-of-way, minimal acquisition required	Easement acquisition along the Waterfront Trail	Easement acquisition through the former Texaco lands and along the Waterfront Trail	Easement acquisition along the Waterfront Trail
	<b>Impact on existing utilities</b>	No known impact on existing utilities.	Runs near the Metrolinx railway where they are completing the electrification of the lines	No known impact on existing utilities.	No known impact on existing utilities.	No known impact on existing utilities.
<b>Environmental</b>	<b>Impact on water features/resources and hydrogeology</b>	No known impact on existing water features/resources.	No known impact on existing water features/resources.	Routed along the shore of Lake Ontario and may allow for contaminants. High ground water table being located near the Lake may require significant dewatering.	Routed along the shore of Lake Ontario and may allow for contaminants. High ground water table being located near the Lake may require significant dewatering.	Routed along the shore of Lake Ontario and may allow for contaminants. High ground water table being located near the Lake may require significant dewatering.
	<b>Impact on trees</b>	Mature tree removal required.	Mature tree removal required.	Mature tree removal required.	Mature tree removal required.	Mature tree removal required.
	<b>Impact to Species at Risk (SAR)</b>	No impact to identified SAR	No impact to identified SAR	No impact to identified SAR	No impact to identified SAR	No impact to identified SAR
	<b>Contamination considerations</b>	No land contamination concerns identified.	No land contamination concerns identified.	Route passes through the Texaco Lands which contain contaminated soils.	Route passes through the Texaco Lands which contain contaminated soils.	Route passes through the Texaco Lands which contain contaminated soils.

		Sewer 1 (S1)	Sewer 2 (S2)	Sewer 3 (S3)	Sewer 4 (S4)	Sewer 5 (S5)
	Screening Criteria	Sewer along Lakeshore Road W.	Sewer along Front Street N., Queen Street W., and Ibar Way to Richard's Memorial Park	Sewer along Front Street S, Waterfront Trail, Ben Machree Drive, Godfrey's Lane, and Waterfront Trail to Richard's Memorial Park	Variation of S3 with sewer along Port Street W, Mississauga Road, 70 Mississauga Road S and south to Waterfront Trail	Variation of S3 and S4 with sewer along Bay Street
Social	Impact of construction traffic on existing residences, businesses, and/or community	Moderate impact to traffic during construction due to being along a major community road.	Large impact to traffic during construction due to being along narrow residential roads	Large impact to traffic during construction due to being along narrow residential roads	Large impact to traffic during construction due to being along narrow residential roads	Large impact to traffic during construction due to being along narrow residential roads
	Impact to community assets	No known impact to community assets	No known impact to community assets	Route runs along the shore of Lake Ontario. May disrupt shoreline beaches and Waterfront Trail.	Route runs along the shore of Lake Ontario. May disrupt shoreline beaches and Waterfront Trail.	Route runs along the shore of Lake Ontario. May disrupt shoreline beaches and Waterfront Trail.
	Alignment with local plans	No known conflict with local plans	No known conflict with local plans	No known conflict with local plans	No known conflict with local plans	No known conflict with local plans
	Archaeological considerations	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.	Stage I and II Assessment completed. No further assessment is required.
Financial	Initial Capital Costs	\$ 57,030,000	Not Determined**	Not Determined*	Not Determined*	Not Determined*
Rank	Total rank of site alternative	Most preferred	Less preferred	Less preferred	Least preferred	Least preferred

\*Note: Costs not determined as approach found to be technically infeasible.

**Table 5-3 Potential Alternatives for Ben Machree WWPS**

		<b>Approach 1 (A1)</b>	<b>Approach 2 (A2)</b>	<b>Approach 3 (A3)</b>	<b>Approach 4 (A4)</b>	<b>Approach 5 (A5)</b>
	<b>Screening Criteria</b>	Upgrade existing Ben Machree WWPS and maintain existing forcemain system	Decommission Ben Machree WWPS. Sewer along Ben Machree Drive from Ben Machree WWPS to Lakeshore Road W	Decommission Ben Machree WWPS. Sewer along Maple Avenue S from Ben Machree WWPS to Lakeshore Road W	Decommission Ben Machree WWPS. Sewer along Pine Avenue S from Ben Machree WWPS to Lakeshore Road W	Decommission Ben Machree WWPS. Sewer along Godfrey's Lane from Ben Machree WWPS to Lakeshore Road W
<b>Technical</b>	<b>Constructability</b>	The pumping station upgrades required are within the station as well as along the forcemain, located within the right-of-way. No notable constructability issues identified.	Requires multiple tunneling shafts to accommodate curved road segments. Depth of sewer does not accommodate for open cut excavation.	Requires closure of a signalized intersection. Combination of tunneling and open cut construction is feasible.	Combination of tunneling and open cut construction is feasible. No notable constructability issues identified.	Combination of tunneling and open cut construction is feasible. Restricted access and construction laydown area along narrow laneway.
	<b>Ease of site access during construction</b>	In a public park and along a residential street. No site access restrictions noted.	No site access restrictions noted.	No site access restrictions noted.	No site access restrictions noted.	No site access restrictions noted.
	<b>Compliance with applicable planning and environmental policies</b>	No noted compliance deviations	No noted compliance deviations	No noted compliance deviations	No noted compliance deviations	No noted compliance deviations
	<b>Property requirements impacts</b>	Region right-of-way, minimal acquisition required.	Along the Region right-of-way, minimal acquisition required	Along the Region right-of-way, minimal acquisition required	Along the Region right-of-way, minimal acquisition required	Along the Region right-of-way, minimal acquisition required
	<b>Impact on existing utilities</b>	No known impact on existing utilities.	No known impact on existing utilities.	No known impact on existing utilities.	No known impact on existing utilities.	No known impact on existing utilities.
<b>Environmental</b>	<b>Impact on water features/resources and hydrogeology</b>	No known impact on existing water features/resources.	No known impact on existing water features/resources.	No known impact on existing water features/resources.	No known impact on existing water features/resources.	No known impact on existing water features/resources.
	<b>Impact on trees</b>	No known impact.	No impact on trees	No impact on trees.	No impact on trees	Mature tree removal may be required.
	<b>Impact to Species at Risk (SAR)</b>	No impact to identified SAR	No impact to identified SAR	No impact to identified SAR	No impact to identified SAR	No impact to identified SAR

		<b>Approach 1 (A1)</b>	<b>Approach 2 (A2)</b>	<b>Approach 3 (A3)</b>	<b>Approach 4 (A4)</b>	<b>Approach 5 (A5)</b>
	<b>Screening Criteria</b>	Upgrade existing Ben Machree WWPS and maintain existing forcemain system	Decommission Ben Machree WWPS. Sewer along Ben Machree Drive from Ben Machree WWPS to Lakeshore Road W	Decommission Ben Machree WWPS. Sewer along Maple Avenue S from Ben Machree WWPS to Lakeshore Road W	Decommission Ben Machree WWPS. Sewer along Pine Avenue S from Ben Machree WWPS to Lakeshore Road W	Decommission Ben Machree WWPS. Sewer along Godfrey's Lane from Ben Machree WWPS to Lakeshore Road W
	<b>Contamination considerations</b>	No land contamination concerns identified.	No land contamination concerns identified.	No land contamination concerns identified.	No land contamination concerns identified.	No land contamination concerns identified.
<b>Social</b>	<b>Impact of construction traffic on existing residences, businesses, and/or community</b>	Moderate impact to traffic during construction due to being along a residential road.	Large impact to residents' traffic during construction due to number of tunneling shafts required and location along residential roads	Large impact to traffic during construction due to launch shaft location at signalized traffic intersection of major route and residential road	Moderate impact to local business and minor impact to residents due to restricted access to major road. Detour route implementation required.	Moderate impact to residents due to restricted access to local park; potential disruption to park area and heavy equipment traffic along narrow laneway
	<b>Impact to community assets</b>	No known impact to community assets	No known impact to community assets	No known impact to community assets	No known impact to community assets	Route runs adjacent to the Brueckner Rhododendron Gardens. May disrupt park land and restrict access to Waterfront Trail.
	<b>Alignment with local plans</b>	No known conflict with local plans	No known conflict with local plans	No known conflict with local plans	No known conflict with local plans	No known conflict with local plans
	<b>Archaeological considerations</b>	Stage I Assessment completed. No further assessment is required unless construction work area exceeds right-of-way property limits.	Stage I Assessment completed. No further assessment is required unless construction work area exceeds right-of-way property limits.	Stage I Assessment completed. No further assessment is required unless construction work area exceeds right-of-way property limits.	Stage I Assessment completed. No further assessment is required unless construction work area exceeds right-of-way property limits.	Stage I Assessment completed. No further assessment is required unless construction work area exceeds right-of-way property limits.
<b>Financial</b>	<b>Initial Capital Costs</b>	\$125,000	Not Determined*	Approx. \$6,017,500	\$4,870,000	\$5,090,000
<b>Rank</b>	<b>Total rank of site alternative</b>	Least preferred	Least preferred	Least preferred	Most preferred	Less preferred

\*Note: Costs not determined as approach found to be technically infeasible.

# 6 Evaluation Summary and Description of the Preferred Solution

## 6.1 Preferred Solution

The preferred solution includes constructing a new gravity sewer along Lakeshore Road W and Pine Ave S, constructing a new WWPS in Richard's Memorial Park, decommissioning of the current Front Street WWPS located in the Port Credit Lighthouse, decommissioning the existing Richard's Memorial WWPS and decommissioning of Ben Machree WWPS.

Decommissioning of the pumping station assets includes decommissioning of the forcemains at each location however, hydraulic relief points to remain in operation.

## 6.2 Proposed WWPS Site Location in Richard's Memorial Park

### 6.2.1 Preferred Site Location

As evaluated in Table 5-1, the preferred site location for the new Richard's Memorial WWPS was determined to be Site #7, located at the north-west corner of the Richard's Memorial Park, from Lakeshore Road W. Overall, Site #7 best addresses the Problem Statement while determined to have the least potential for overall environmental impact.

### 6.2.2 Implementation Considerations

Design implementation considerations are highlighted below:

- **Property Requirements** - New site location is proposed within the City of Mississauga Richard's Park Memorial and land acquisition to be coordinated accordingly.
- **Noise and Vibration Considerations** - Noise and vibration considerations need to be implemented to minimize effect on resident and enjoyment of park to visitors.
- **Hydrogeological and Geotechnical Considerations** - The Regional floodline is in close proximity to the new pumping station and the City of Mississauga is proposing to daylight a nearby creek. Hydrogeological and geotechnical preliminary investigations have been conducted and confirm an anticipated high-water table.
- **Natural Environment** - A Butternut Health Assessment is required as part of the Detailed Design phase, to determine the tree's health.
- **Natural Environment** - 6 trees identified for removal may have habitat potential Maternity Roosting Habitat. A minor removal of this nature is unlikely to impact the overall ecological function, provided that mitigation measures are employed. Opportunities to reconfigure the pumping station so that it does not impact or reduces the impact to the forested community are to be explored during detailed design.
- **Hydraulic Considerations** - Design peak flow is estimated at 596 L/s. Design average day flow to the station to be 120 L/s.
- **Implementation Schedule** - Subject to the completion of the Class EA, it is anticipated that design award will be issued in 2019 and construction start will begin in 2020. A period of approximately 24 months is assumed for construction.

- Co-ordination with other Approved Projects - Project requirements to be coordinated with the proposed infrastructure route along Lakeshore Road W as the inlet tie-ins will be connected. Existing floodplain delineation to be coordinated with Credit Valley Conservation as may alter due to future plans for Lornewood Creek daylighting.

### 6.2.3 Construction Method

Construction of the new Richard's Memorial Sewage Pumping Station will require extension to below the groundwater table and will require buried exterior walls with backfill material. Based on the geotechnical and hydrogeological studies conducted, potential construction excavation water takings are anticipated to be high with a bedrock surface approximately 3.0 to 6.0 m below the existing ground surface. Secant pile (caisson) walls or similar should be considered to cut off the groundwater seepage within the area. Review of the most appropriate method of construction should be taken during detailed design.

## 6.3 Proposed Linear Infrastructure Route

### 6.3.1 Preferred Linear Infrastructure Route

As evaluated in Table 5-2, the preferred linear infrastructure route for the proposed wastewater diversion sewer was determined to be Route #1. Route #1 travels underneath Lakeshore Road W from the decommissioned Front Street WWPS to the new Site #7 location described in Section 6.1 above. The new Richard's Memorial WWPS then "lifts" the wastewater to a discharge maintenance hole on Lakeshore Road W in front of the WWPS. The wastewater diversion sewer will then continue from the new Richard's Memorial WWPS's discharge maintenance hole west towards the existing Jack Darling WWPS.

### 6.3.2 Implementation Considerations

Preliminary plan and profile drawings were developed for the preferred linear infrastructure route indicating potential shaft locations. The size of the sewer was determined considering the projected flows through the sewer. Design implementation considerations are highlighted below:

- **Property Requirements** - The new sewer alignment is proposed within the right-of-way and land acquisition is not expected. Exact property requirements will be confirmed during detailed design.
- **Transportation Considerations** - Construction of the new sewer is within a major arterial roadway. Appropriate traffic measures will need to be implemented to ensure the safety of road motorists, cyclists, and pedestrians is maintained and minimal disruption occurs.
- **Noise and Vibration Considerations** - Noise and vibration considerations need to be implemented to minimize effect on resident and businesses in the area.
- **Hydrogeological and Geotechnical Considerations** - Hydrogeological and geotechnical preliminary investigations have been conducted and confirm an anticipated high-water table. Appropriate design measures are to be implemented during detailed design to ensure an effective construction methodology is implemented.
- **Hydraulic Considerations** - Estimation of flows from the Front St WWPS drainage area and flows to be conveyed to the Richard's Memorial WWPS using flow monitoring data, hydraulic modelling and population and unit flow design criteria. Projected beyond 2041

flow is estimated at 596 L/s to be used to size the sewer that diverts flows from the current Front St SPS to future Richard's Memorial WWPS.

- **Natural Environment** - Compound limits at MH1 and MH2 will impact riparian vegetation along the banks of the Credit River. To minimize impacts to the stability of the banks removal of the tree cluster labeled CL-7 is to be minimized. The compound limits should ensure vegetation along creek banks is not impacted.
- **Natural Environment** - The gravity sewer crosses four identified watercourses (Birchwood Creek, Moore Creek, Tecumseh Creek, and Lornewood Creek). A minimum depth of 2m from the invert of the creek (crossing) to the obvert of the tunnel is acceptable to the CVC. If 2m depth is not achievable geomorphic assessment is required.
- **Implementation Schedule** - Subject to the completion of the Class EA, it is anticipated that design award will be issued in 2019. A period of approximately 24 months is assumed for construction.
- **Co-ordination with other Approved Projects** - Project requirements to be coordinated with the proposed new infrastructure route along Pine Avenue S and the new Richard's Memorial WWPS as the inlet tie-ins will be connected.

### 6.3.3 Construction Method

The preferred alignment along Lakeshore Road is located in a heavily developed urban neighbourhood. Lakeshore Road is a very busy urban arterial road with commercial, institutional and residential properties on both sides of the roadway. These factors combined with the required depth of installation for the gravity sewer require the sewer to be constructed by trenchless technologies rather than open cut construction.

The proposed diameter of the sewer (minimum 1800mm) and the distances between potential MH/shaft locations, based on available working space, require that the sewer be constructed by tunneling. Tunneling is completed by excavating shafts and using tunnel boring equipment to tunnel underground between the shafts. The only surface works involved with the tunnel construction are the temporary construction compounds at each shaft location at the beginning and end of each tunnel drive. In this scenario tunnel drive lengths vary between approximately 0.5 and 1.0 kilometers apart. After completion of construction, maintenance holes will be installed at the shaft locations to provide access to the gravity sewer for inspection and maintenance purposes.

The temporary construction compounds at each shaft will provide a staging area where construction equipment and materials can be stored, and excavated material (spoil) can be brought to the surface and hauled from the site in trucks. Staging areas around shafts will measure approximately 70 m x 50 m and will be fenced off. Once tunneling is completed, the staging area will be restored to its original condition or enhanced. All potential shaft locations will be further refined upon consultation with property owners and stakeholders along Lakeshore Road W.

Tunnelling methodologies to be considered during the detailed design phase include conventional Tunnel Boring Machine (TBM), Earth Pressure Balance TBM (EPB TBM), and Microtunnel Boring Machine (MTBM). Preliminary geotechnical data indicate the tunnel will be constructed through mixed ground conditions varying from soft ground/overburden to shale bedrock. Combined with the Region's initiative to eliminate inflow and infiltration into the sanitary sewer system, the preferred tunnelling methodology at this point is Microtunneling.

A more detailed assessment of the preferred tunneling methodology should be completed during the detail design phase once additional information is available and once the detailed geotechnical investigation has been completed.

## 6.4 Proposed Ben Machree Wastewater Pumping Station Alternative

### 6.4.1 Preferred Alternative for Ben Machree WWPS

As evaluated in Table 5-3, the preferred alternative for the Ben Machree WWPS was determined to be Alternative # 4. Alternative #4 includes decommissioning the existing Ben Machree wastewater pumping station and installing a gravity sewer which would run east along Ben Machree Drive, north along Maple Avenue S and north along Pine Avenue S to connect to the new gravity sewer along Lakeshore Road W. as per the preferred alignment identified in Section 6.3 above.

### 6.4.2 Implementation Considerations

Preliminary plan and profile drawings were developed for the preferred alternative indicating potential shaft locations. The size of the sewer was determined considering the projected flows through the sewer and microtunnelling construction restrictions.

**Property Requirements** - The new sewer alignment is proposed within the right-of-way and land acquisition is not expected. Exact property requirements will be confirmed during detailed design.

**Transportation Considerations** - Construction of the new sewer is within a residential street and adjacent to some businesses. Appropriate traffic measures will need to be implemented to ensure the safety of motorists, cyclists, and pedestrians is maintained and minimal disruption occurs. Coordination of vehicular access to the car dealership located at Pine Ave S and Lakeshore Road W will need to be considered.

**Noise and Vibration Considerations** - Noise and vibration considerations need to be implemented to minimize effect on resident and businesses in the area.

**Hydrogeological and Geotechnical Considerations** - Hydrogeological and geotechnical preliminary investigations have been conducted and confirm an anticipated high-water table. Appropriate design measures are to be implemented during detailed design to ensure an effective construction methodology is implemented.

**Implementation Schedule** - Subject to the completion of the Class EA, it is anticipated that design award will be issued in 2019. A period of approximately 18 months is assumed for construction, in conjunction with the Lakeshore Road W sewer.

**Co-ordination with other Approved Projects** - Project requirements to be coordinated with the proposed new infrastructure route along Lakeshore Road W as the inlet tie-ins will be connected.

### 6.4.3 Construction Method

The gravity sewer proposed along Ben Machree Drive from the existing pumping station to Pine Ave. may be completed by open cut construction as the sewer is relatively shallow (4-6m below ground surface) and is relatively short in length and therefore will not cause significant disruption to the area. Open cut construction involves excavating a trench and laying the sewer pipe in the trench, and subsequently backfilling the trench.

However, the depth of the proposed sewer along Pine Avenue, and the urban residential nature of the neighbourhood require the sewer to be constructed in tunnel from Ben Machree Drive to Lakeshore Road. The length of the sewer along Pine Avenue is approximately 465m. To complete this drive without constructing intermediate shafts will require the use of a 1200mm dia. microtunnel boring machine. It is proposed that the Maintenance hole 3 shaft serve as the launch shaft for the construction of the Pine Avenue sewer as more space is available for staging tunneling equipment and materials. The shaft at Ben Machree Drive will serve as the exit shaft. After completion of construction, maintenance holes will be installed at the shaft locations to provide access to the gravity sewer for inspection and maintenance purposes.

## 6.5 Construction Cost Estimate

For the preferred linear route option, the cost estimate reflects the scope of work associated with decommissioning the Front St WWPS, Ben Machree WWPS and Richard's Memorial WWPS and constructing a new sewer along Lakeshore Road W and Pine Ave S via tunneling and open cut construction methodology. The capital cost of constructing the Lakeshore Road W sewer was only conducted for the preferred option as it was the only technically viable route. The construction cost estimate is \$60,760,000 including 10% Engineering, 30% Contingency and includes the capital cost of constructing the preferred route option for the Ben Machree WWPS alternative.

The Ben Machree WWPS alternative was not deemed to be critical path, and as such a lifecycle cost analysis was conducted on all of the route options to verify whether this work would be cost effective to include as part of the Lakeshore Road W linear infrastructure or to pursue at a later date. The findings of the lifecycle cost analysis indicated that inclusion in conjunction with Lakeshore Road W would be the most cost-effective solution. The detail of the lifecycle cost analysis is provided in Technical Memorandum – Ben Machree Alignment.

For the preferred new Richard's Memorial WWPS, the cost estimate reflects the scope of work associated with constructing the new pumping station using caisson shoring systems. The construction cost estimate totals \$27,120,000 including 10% for Engineering and 30% Contingency.

# 7 Impact Mitigation Measures

The potential impacts and mitigation measures to be carried forward into detailed design and construction to eliminate or lessen the potential impacts is listed below.

- **Emissions and Noise from Pumping Station Operations** – To be included in the design to meet Ministry requirements with respect to emission and noise.
- **Odorous Gases/ Adverse Air Quality Impacts** - Point source odour control measures will be incorporated into the design to reduce the potential for odour issues impacting the surrounding area.
- **Aesthetic Impacts** - Landscaping, vegetation and architectural features will be included in the design to suit the park landscape of its location.
- **Use of Privately or Publicly Owned Land** - Land transfer from the City of Mississauga is required for the work of this project.
- **Tree Removal and Excavation Adjacent to Retained Trees** - Any tree removals will require appropriate permits prior to removal. Protected trees will be identified and protected per City requirements throughout the duration of construction. All tree/vegetation removals are to be completed outside of the sensitive period for breeding migratory birds (April 1 – August 31) to comply with the Migratory Bird Convention Act (MBCA). Opportunities to reconfigure the pumping station so that it does not impact or reduces the impact to the forested community are to be explored during detailed design.
- **Contaminated Soil Disposal and Spills Prevention** - Re-fueling of equipment and fuel storage should be conducted in designated areas (potentially off-site) with spill protection.
- **Traffic Management** - A Traffic Management Plan should be developed to minimize interference with the flow of traffic due to construction activities.
- **Dust, Noise and Vibration** - Temporary nuisance of noise during construction and other activities to be considered including hours of operation in accordance with City By-laws. Dust control measures may include wetting surfaces using a non-chloride based compound to protect water quality.
- **Erosion and/or Sedimentation Impacts** - Erosion control measures shall be installed to protect exposed surfaces, control run-off and minimize the deposition of silt or suspended sediments. Any pumped water from dewatering activities should be discharged to settling areas or through filter media before entering surface water bodies. All disturbed areas should be re-vegetated as soon as possible following disturbance to stabilize the area and minimize erosion potential.
- **Property Access** - Access is within the public right-of-way.
- **Utility Relocations** - Consideration will be given to the protection and support of existing underground utilities that may be impacted. Should utility relocations be required during construction of the gravity sewers, it shall be coordinated with appropriate utility companies during detailed design.

# 8 Public and Agency Input

## 8.1 Agency Input on Initial Findings

The following summarizes input received from agencies during project initiation.

- 1 Meeting Notes, City of Mississauga, November 7, 2016
  - Traffic impact on Lakeshore Road W should be minimized
  - Short-term Park Access Permit required for short-term activities such as drilling/geotechnical investigation
  - Consent to Entry Permit required for non-intrusive activities
  - Road Occupancy Permit required for short-term activities
  - Noise By-Law Exemption Permit required if after hours work is needed
  - Tree Inventory and Landscaping plan should be developed as part of Site Plan Approval
- 2 Meeting Notes, Councillor Jim Tovey, November 24, 2016
  - Probable important stakeholder locations
  - Inspiration of Port Credit Lands
  - Future possible LRT/Subway line along Lakeshore (Metrolinx)
  - Provide office with updates and distribute contact information to public
- 3 Meeting Notes, Pre-consultation Meeting with CVC November 21, 2016
  - Floodline is not the same as regulation line
  - Information on existing natural designation features to be provided
  - Daylighting of adjacent creek in Richard's Memorial Park to be considered
- 4 Meeting Notes, Councillor Karen Ras, January 9, 2017
  - Probable important stakeholder locations
  - Inspiration Port Credit Lands
  - Provide office with updates and distribute contact information to public
- 5 Letter – Ministry of Tourism, Culture and Sport, June 20, 2017
  - Proponent is required to determine a project's potential impact on cultural heritage resources and built heritage
  - Screen the project for archaeological assessment requirements
- 6 Letter – Credit Valley Conservation, January 30, 2017
  - Permit may be required for any grading or construction work within this area
  - Area traversed by tributaries of Lake Ontario, any alterations or crossings of watercourses require permit
  - Area partially within Regulatory Storm Flood Plain, construction permit may be required

- Area traversed by valley slopes, CVC does not support construction on a valley slope and requires set backs
- Area within Credit River Watershed Natural Heritage System
- Area within Fudger’s Marsh (Clarkson Ravine) ESA
- Area within Rattary Marsh Provincially Significant Wetland Complex, CVC does not support new development in these areas and an Environmental Impact Study Report may be required
- Area within Lorne Park Prairie Life Science Area of Natural and Scientific Interest (ANSI), CVC does not support incompatible development
- Area within Core Greenlands
- Area may contain or provide habitat for a known Species-at-Risk, consultation with MNRF is advised, permit may be required
- Subject to Lake Ontario Shoreline flooding and erosion hazard
- Area within Mississauga Natural Heritage System and Natural Areas Survey, technical support provided by CVC
- May be subject to Approved Source Protection Plan

## 8.2 Public Consultation Comments and Responses

The following summarizes input received from the public during community outreach events.

### 8.2.1 Summary of Comments from PIC 1

#### **Rhododendron Gardens - comments received:**

- Several plants in Rhododendron Gardens were donated and planted
- A pump station in this location would not be supported by the community
- Maintain existing open space in Rhododendron Park
- Opposition to Rhododendron Park being a candidate for a pumping station
- Rhododendron gardens has recently been improved so additional disturbance is not ideal
- Rhododendron Gardens is the only botanical garden in Mississauga

Response: These comments will be considered in the evaluation of pumping station alternatives.

#### **Richard’s Memorial Park - comments received:**

- The Richard’s Memorial Pumping Station is near Lakeshore and does not interfere with the use of the park
- Thousands of people use Richard’s Memorial Park
- Any changes to Richard’s Memorial should not negatively impact the use or the beauty of the park

Response: These comments will be considered in the evaluation of pumping station alternatives.

**Front Street Pumping Station – comments received:**

- Coordinate closure with park redevelopment
- After decommissioning, suggestion to make better use of the park space

Response: These comments will be considered in the evaluation of pumping station alternatives.

**Lakeshore Road – comments received:**

- Several respondents expressed support for tunnelling across Lakeshore Rd

Response: Noted.

**Texaco/Imperial Oil Lands – comments received:**

- How does this new development impact current conditions or align with the EA project?

Response: The Project Team will account for additional flows from this development in the evaluation of alternatives.

**Other comments received:**

- Concern that if everything is diverted to the west, then the west will be overloaded and there could be problems
- Significant growth already underway in Clarkson

Response: The Region has accounted for growth on the west side of Mississauga.

- The Queen St W route is not preferred, given the street's uses (i.e. Residential, parks, and schools). The disruptions, noise, dust would be problematic for these residents
- The Front St W/ Queen St W/ Ibar Way option is unnecessarily long and affects residential streets and neighbourhoods
- One of the alternative routes include following the waterfront trail. This is not preferred because it would involve excavating contaminated soils and disturbing soil at 70 Mississauga Road (Former Imperial Oil lands)

Response: These comments will be considered in the evaluation of linear infrastructure alternatives.

- Suggestion to hold a PIC at night (i.e. Beyond 7:00pm) to accommodate those commuting for work in downtown Toronto
- Suggestion to hose a PIC on the east side of Credit River for Lorne Park Residents

Response: The Project Team will review internally and discuss with the local Councillor.

- Ensure that the Port Credit BIA and Ratepayers groups are included on the project contact list and notified about future events.

Response: The Project Team will review the contact list and update accordingly.

- The Texaco Lands is entering the first phase of development and they may connect to the sewers leading to Front Street Station

Response: The Project Team will account for additional flows from this development in the evaluation of alternatives.

## 8.2.2 Summary of Comments from PIC 2

### Comments received:

- Concern that efforts in restoring buried creek will be ineffective if entire Lornewood Creek flow is not strictly enforced. Specifically, upstream water flow issues will negatively affect restoration.

Response: This comment will be considered in detailed design phase in discussions with the Region.

- Concern of traffic flow along Lakeshore Road from QEW traffic and few alternative routes over the Credit River

Response: Recommendation to conduct traffic impact study and review during detailed design.

## 8.2.3 Summary of Comments from PIC 3

### Comments received:

- Suggestion to coordinate works with proposed surface improvements on Lakeshore Rd.
- Concern for traffic impacts on the community during the construction phase due to road lane restrictions, in particular along Lakeshore Rd.
- Attention should be given to traffic management initiatives long term with respect to synchronized traffic signals along the Port Credit business corridor between Maple and Hurontario

Response: This comment will be considered in detailed design phase in discussions with the Region.

- Concern for the future of Ben Machree building

Response: Discussions have been initiated with the City of Mississauga. This will be reviewed during detailed design phase of the project.

- Suggestion to coordinate proposed works in Machree Park, Port Credit Memorial Park, and the City's redevelopment of those parks is required. Request for further discussions regarding the proposed site plan for the new pumping station at Richard's Memorial Park

Response: Comment received from City of Mississauga. A follow up meeting between the Region and City to discuss concerns is recommended.

- Request to receive benefit/cost ration analysis justifying removal of the pumping station

Response: Comment received from local resident. Recommended that a copy of the Ben Machree decommissioning rationale report be provided and that the resident is engaged directly to ensure individual concerns are addressed.

# 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 Ministry of the Environment, Conservation and Parks (MECP), Credit Valley Conservation Authority (CVC), and the City of Mississauga.

## 9.1 Review Agency Approvals

- **Ministry of Environment, Conservation and Parks**
- **Ministry of Environment, Conservation and Parks (MECP)**
- **City of Mississauga**
- **Credit Valley Conservation**

## 9.2 Site Specific Permits and Approval

A review of site-specific permits and approvals will be dependant on the final design of the project works and should be reviewed during detailed design. List of probable permits and approvals to be considered includes the following:

- 1 **Ministry of the Environment, Conservation and Parks (MECP):** Sewage ECA; Air/ Noise ECA; Permit to Take Water; Sanitary Sewer ECA; EASR; Endangered Species Act (ESA) Review; Species at Risk (SAR) Review
- 2 **City of Mississauga – Planning and Building Department:** Minor Variance; Site Plan Approval; Building Permit; Noise By-law Exception
- 3 **City of Mississauga – Parks and Forestry:** Consent to Entry; Parks Access Permit; Tree Removal/ Protection
- 4 **City of Mississauga – Transportation and Works Department:** Curb Cut Permit; Road Occupancy Permit
- 5 **Credit Valley Conservation:** Notification of Project Start; CVC Permit; Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Permit
- 6 **Electrical Safety Authority (ESA)**
- 7 **Occupational Health and Safety Act – Pre-Start Health and Safety Review (PSR)**

## 9.3 Property Requirements

The preferred trunk sewer alignment and the potential construction compounds and shaft locations have been identified and are located either within the right-of-way, or within City of Mississauga lands, thus eliminating the need for acquisition of easements on private property. This will facilitate the detailed design phase and reduce the risk of delays to the detailed design and construction schedules. The easements required from the City of Mississauga are primarily located in open space and park land.

# 10 Conclusions

This Municipal Class EA Project File has been prepared to confirm that the proposed Front Street WWPS Wastewater Diversion project meets the requirements of the Environmental Assessment Act.

The preferred solution recommends decommissioning of the Front Street WWPS, currently pumping east crossing the Credit River. Instead, a gravity sewer would be constructed conveying flows from the decommissioned Front Street WWPS west towards Richard's Memorial Park. The existing WWPS within the Park will be decommissioned and demolish. A new Richard's Memorial WWPS will be constructed in the north-west corner of the Park, sized for the flows coming from the Front Street WWPS. The new Richard's Memorial WWPS will pump a short distance to a discharge maintenance hole on Lakeshore Road W in front of the Park. The gravity sewer will then continue west from the discharge maintenance hole towards the existing Jack Darling WWPS. The existing Ben Machree WWPS will be decommissioned and a new gravity sewer will be constructed from the station to Lakeshore Road W along Pine Avenue S. Decommissioning of the pumping station assets includes decommissioning of the forcemains at each location however, hydraulic relief points to remain in operation.