Region of Peel

McVean Sewage Pumping Station Upgrades

Schedule ‘B’ Class Environmental Assessment

November 28th, 2023

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Schedule ‘B’ Class Environmental Assessment

Region of Peel

Project File Report – Draft: Revision 1

Region of Peel Project No.: 18-2976
WSP Project No.: 211-01228-00
Date: November 28, 2023

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November 28, 2023

Region of Peel
10 Peel Centre Drive, Suite A, 4th Floor
Brampton, ON L6T 4B9

Attention: Troy Leyburne, Project Manager, Major Capital, Wastewater Collection and Conveyance

Dear Mr. Leyburne,

Subject: Project File – Final

WSP Canada Inc. is pleased to provide you with the Project File report for the McVean Sewage Pumping Station Upgrades, Schedule 'B' Class Environmental Assessment. Technical memorandums, reports, and investigations conducted for the project scope are attached in the appendices.

Yours sincerely,

Dean Whittaker, P.Eng.
Director, Water Wastewater
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Revision History

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October 17th, 2023
Date

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October 17th, 2023
Date

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1 Introduction

WSP Canada Inc. (WSP) was retained by the Region of Peel (or the "Region") to complete a Schedule B Municipal Class Environmental Assessment (Class EA) herein referred to as the McVean Sewage Pumping Station (SPS) Upgrades Class EA. The purpose of the McVean SPS Upgrades Class EA is to identify a preferred solution for improving servicing associated with the McVean SPS to accommodate future growth in the Region of Peel, while adhering to the Region's most recent SPS Design Standards.
This Project File Report has been prepared in accordance with the requirements of Phases 1 and 2 of the Class EA process as defined in the Municipal Class EA document (Municipal Engineers Association, 2023).

1.1 Study Purpose and Objectives

The purpose of this Municipal Class Environmental Assessment (EA) study is to select the preferred solution for expanding and upgrading the McVean SPS to accommodate future growth in the Region of Peel, while adhering to the Region's most recent SPS Design Standards. Study objectives include:

- Protection of the environment, as defined in the Environmental Assessment Act (EAA), through the wise management of resources.
- Consultation with a broad range of stakeholders to share ideas and develop alternatives.
- Engage Indigenous Peoples as per the Duty to Consult.
- Selection of a technically viable and cost-effective solution.
- Documentation of the study process as required in the Municipal Class EA planning process.
- Documentation of mitigation and monitoring requirements to minimize impacts to residents, businesses, and the natural environment during the construction phase.

With a comprehensive planning process that is environmentally sound and open to public and agency participation, the preferred solution should address environmental, social, and technical concerns, and be acceptable to most stakeholders.

1.2 Study Area

The project Study Area is located in the northeastern region of Brampton and is bound by McVean Drive to the east, Queen Street East (Regional Road 107) to the south, and watercourses to the north and west. A map of the Study Area is shown in Figure 1-1.

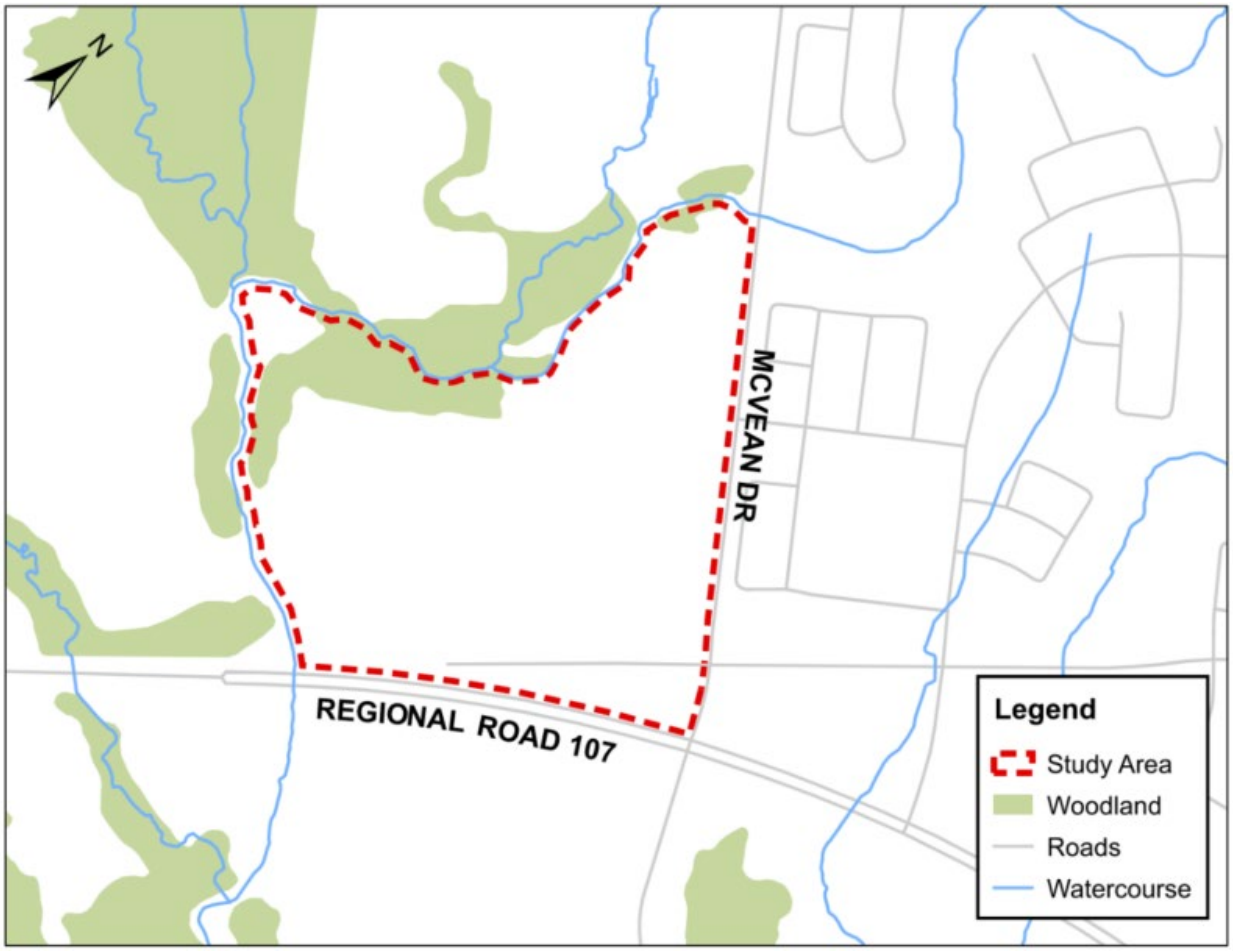

Figure 1-1: McVean Sewage Pumping Station Class EA Study Area

The McVean SPS, which includes a pump station control building and an emergency overflow lagoon, is located in the southern portion of the Study Area at 3900 Ebenezer Road. The Region is directly responsible for the operation and maintenance of the SPS and emergency overflow lagoon. The land where the control building is located is owned by the Region of Peel. The surrounding lands, on which the emergency overflow lagoon is located, lies within the Regional Floodplain, which is owned by the Toronto and Region Conservation Authority (TRCA). The land surrounding the McVean SPS, currently owned by the TRCA, is mainly anthropogenically influenced meadow, with a regional floodplain situated to the west, and archaeologically sensitive areas to the east as identified by the TRCA.

Figure 1-2 shows the existing property limit of the existing McVean SPS. Figure 1-3 shows the wider area exterior to the McVean SPS, including the earthen emergency overflow lagoon and the TRCA regulatory floodplain of the West Humber River.

Figure 1-2: Existing McVean Sewage Pumping Station Property Limit

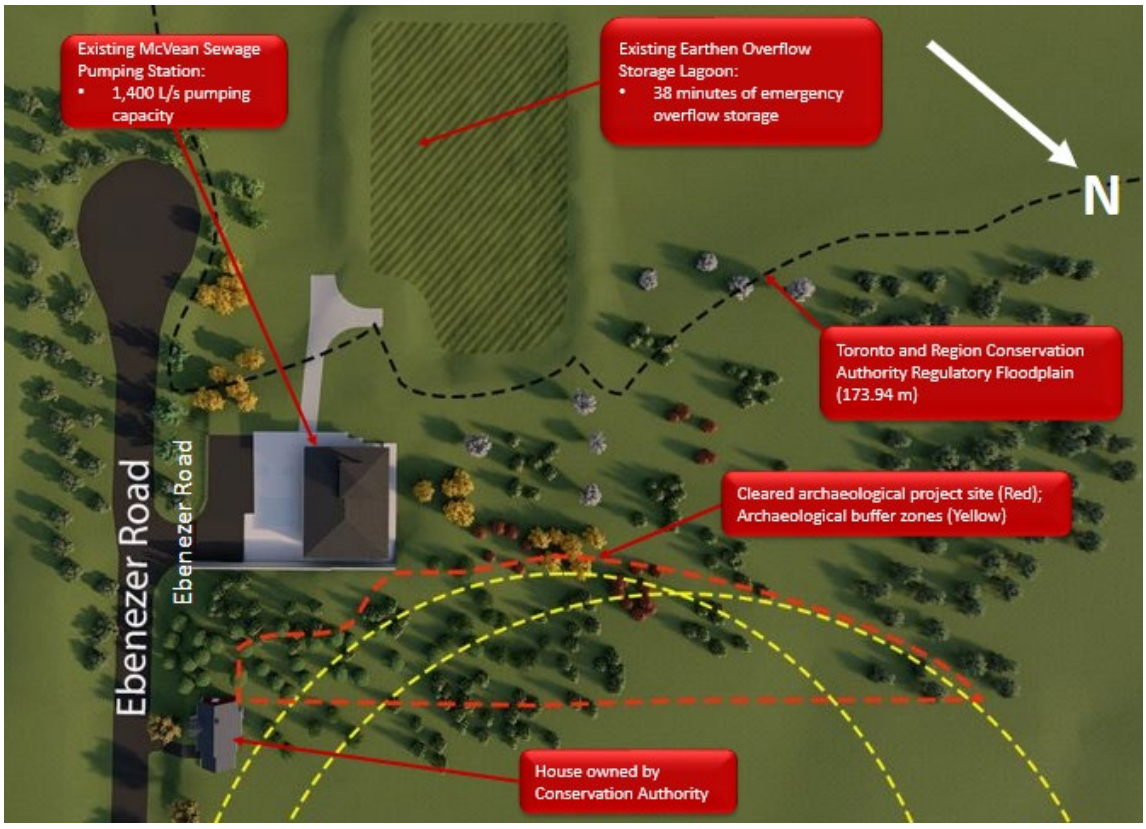

Figure 1-3: McVean Sewage Pumping Station, Emergency Overflow Lagoon and Surrounding Area

1.3 Background

The McVean SPS is owned and operated by the Region of Peel and is located at 3900 Ebenezer Road. Sewage pumping stations are designed to receive and ultimately pump sewage (wastewater) that is supplied via underground gravity pipelines to an underground structure. From the underground structure, these stations convey sewage from one location to another, and ultimately to a treatment facility, to manage the sewage capacity from its users.

Sewage flows are directed to the McVean SPS by a 1500mm and a 750mm gravity sewer running along Ebenezer Road. The current SPS is equipped with two duty pumps and one standby pump, each at a rated capacity of 700 L/s @ 20m TDH. Sewage is discharged to a gravity sewer on Goreway Drive through a 500mm and a 900mm forcemain(s) running west of the SPS. In the event of an emergency overflow, sewage is discharged to an earthen lagoon which has a capacity of 4,830m^3 (amended Certificate of Approval No. 8062-6TMHL2). Once the emergency flow condition has subsided, sewage in the lagoon drains back into the pump station's emergency overflow chamber, where it is pumped back into the wet well by a transfer pump with a rated capacity of 263 L/s.

A 2015 condition assessment report determined that the station does not have enough pumping capacity and emergency storage to meet future demands. The Region of Peel has also experienced operation and maintenance challenges due to grit and Fat, Oil, and Greases (FOGs) build-up. The assessment identified several upgrades for the McVean SPS to accommodate future growth and comply with current Region design standards. The proposed upgrades include:

- Addition of a fourth sewage pump to increase pumping capacity from 1,400 L/s to 2,100 L/s and connection to the new 1200mm forcemain.
- Addition of a new grit management system to minimize grit buildup, equipment deterioration, and odours.
- Addition of a new Fat, Oil, and Greases (FOGs) management system to minimize pumping system blockages and downstream sewer conveyance issues.
- Upgrades to the emergency overflow management strategy to provide approximately two hours of storage at the peak design flowrate of 2,100 L/s.
- Replacement of the existing biofilter odour control system.
- All other required upgrades to the existing infrastructure to accommodate the new rated capacity of 2,100 L/s, including civil, structural, architectural, building mechanical, electrical and instrumentation and control improvements.

To best service these upgrades, WSP and the Region of Peel proposed the construction of a new sewage pumping station complete with headworks equipment, and emergency storage capabilities to meet all the above requirements.

1.4 Problem Statement

The problem statement for the McVean SPS Municipal Class EA is as follows:

The Region of Peel has identified the need to upgrade and expand the capacity of the McVean Sewage Pumping Station (SPS) in order to service planned growth within the Region, as well as to upgrade the SPS to comply with current Region of Peel design standards. These upgrades include pumping capacity increases, odour control improvements, grit, and fats, oils and grease (FOGs) management, emergency storage capacity expansion, and additional site works required to respectively complement the expansion and upgrades. As a result, a Schedule 'B' Class Environmental Assessment (EA) has been initiated to identify a solution for this infrastructure need.

1.5 Public Review of THIS Project File Report

This Project File Report meets the requirements of a Schedule 'B' MCEA study. Filing of this Project File Report initiates the 30-day comment period starting Monday December 4th, 2023 and ending Monday January 8th, 2024. To facilitate public review of this document, an electronic copy of the Project File Report will be made available online at:

https://www.peelregion.ca/pw/water/environ-assess/ebenezer-notice-of-study.asp

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

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

The following section provides clarification on the steps that can be taken under the Environmental Assessment Act by the Miniter of Environment Conservation and Parks or a member of the public. The information provided in this sub-section is intended as an overview of the EA Section 16 process only. For more information and specific instruction, please visit:

https://www.ontario.ca/page/class-environmental-assessments-section-16-order

2 Municipal Class Environmental Assessment Planning Process

2.1 Municipal Class Environmental Assessment

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

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

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

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

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

Exempt Projects

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

Schedule B

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

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

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

Schedule C

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

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

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

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

Eligibility for Exemption

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

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

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

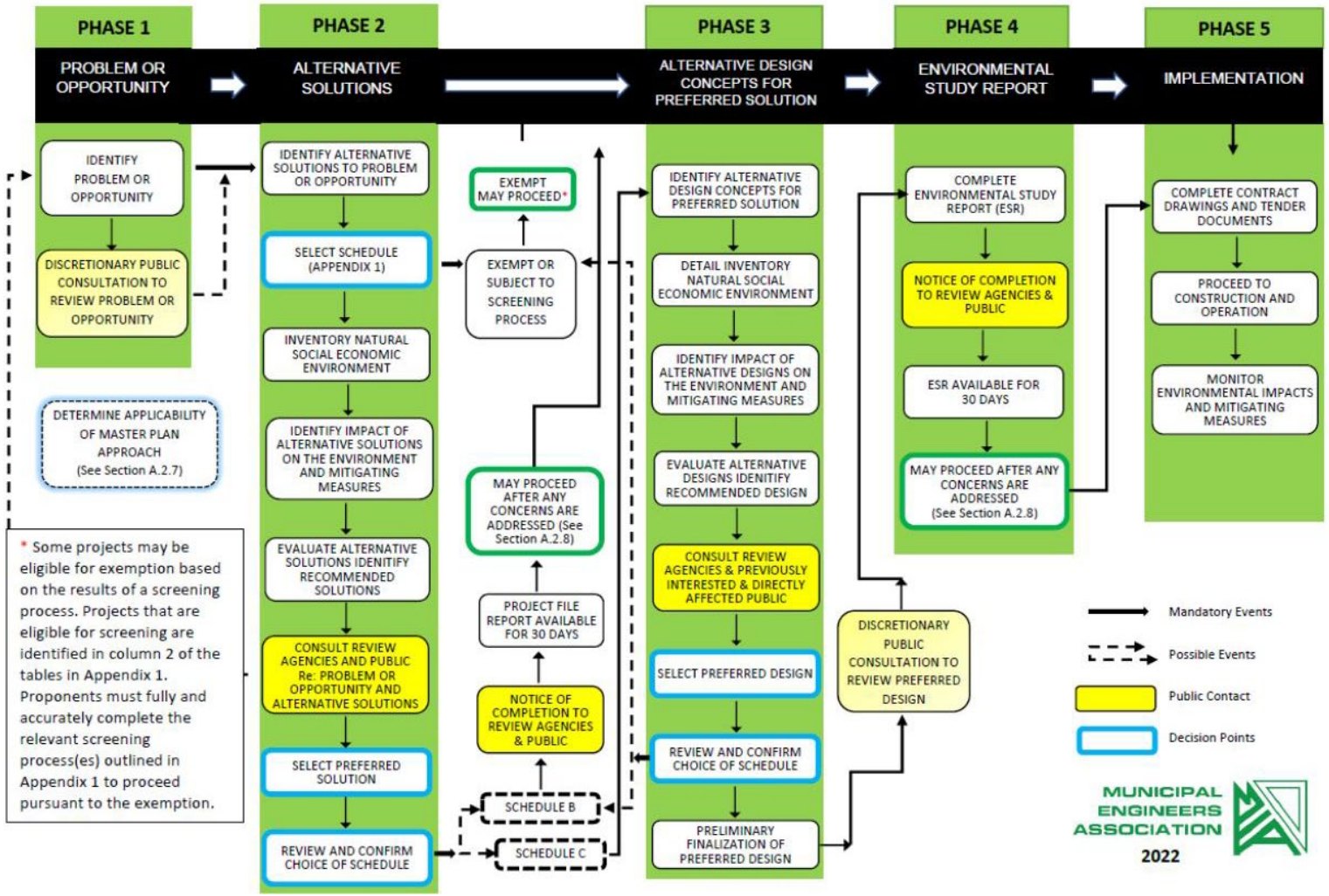


Figure 2-1: Municipal Class Environmental Assessment Process (Municipal Class EA Document, October 2000, as amended in 2015 and 2023)

2.2 Principles of Environmental Planning

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

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

2.3 Confirmation of Class EA Schedule

The McVean SPS Class EA study is proceeding in accordance with the Class EA process in the MEA document (MEA, 2023) as a Schedule B project. This project generally fits the description listed under **Table B** for Schedule B Wastewater Projects, found in in Appendix 1 of the Class EA document and described below. The McVean SPS Class EA aligns with works described in Table B and is not eligible for Exemption from the Class EA process because of the nature of the works proposed and likely impacts. The project works are consistent with a Schedule B Class EA project, as identified in Appendix 1 of the Municipal Class EA document (2023):

"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."
And
"**23c. Increase pumping station capacity where new equipment is located in a new building or structure and the new building or structure would be located outside the existing pumping station site."**

Schedule B projects require the completion of Phases 1 and 2, after which they can proceed to Phase 5 (implementation). As required for Schedule B projects, this Project File Report documents requirements of Phases 1 and 2 of the MCEA Planning and Design Process.

3 Planning Context

This section provides an overview of the planning and policy framework applicable to the Study Area. The planning and policy framework guides infrastructure planning, land use planning, and strategic investment decisions to support provincial, regional and local objectives in growth.
The identification of the study area problems and opportunities considered this policy framework, to ensure that the final recommendations are consistent with provincial, regional and local policies and objectives.

3.1 Provincial Policy Framework

At the time of the completion of this Class EA Project File Report, the Province of Ontario (on April 6, 2023) released legislative proposals for comment of the new 2023 Provincial Planning Statement which will replace the PPS 2020 and the Growth Plan. In an effort to combine the elements of A Place to Grow and the PPS into a new land use policy document, at the time of the McVean SPS EA, the Province of Ontario is seeking public feedback on the proposed legislative changes and are not in effect, thus not having an impact on this study. Worth noting for future Regional infrastructure planning are the proposed policies grouped under five pillars, one of which includes provision of infrastructure to support development.

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

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

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

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

- Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety. Within settlement areas with existing municipal sewage services and municipal water services, intensification and redevelopment shall be promoted wherever feasible to optimize the use of the services.

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

3.2 A Place To Grow – Growth Plan for The Greater Golden Horseshoe (2020)

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

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

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

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

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

Planning for the McVean SPS Class EA study is consistent with the policy direction of the Growth Plan through optimizing and improving efficiency within existing wastewater systems.

3.3 Greenbelt Plan

The Greenbelt, a protected region in Southern Ontario with notable environmental features, is protected through the Greenbelt Plan (2017). This Plan supports the protection of green space, farmland, forests, wetlands, and watersheds located in the region through preventing urbanization in areas with significant agricultural or ecological features.

In the Greenbelt Plan, policies outline that decisions related to planning for water and wastewater infrastructure are informed by applicable watershed planning in accordance with the Growth Plan.

Watershed planning will include a framework to outline goals and direction for the protection and management of water resources. Other relevant policies in the Greenbelt Plan include 4.1.1, cultural heritage resources and landscapes will be conserved to benefit communities.

The Study Area overlaps with the Urban River Valley of the Greenbelt Provincial Greenbelt Plan (OMMAH, 2017) which follows the West Humber River. This watercourse and valley system connect Brampton to lands in the Niagara Escarpment Plan and Oak Ridges Moraine Conservation Plan to Lake Ontario.

The following Greenbelt Plan policies from Section 6.2 apply to the McVean SPS Class EA study:

- Only publicly owned lands are subject to the policies of the Urban River Valley designation. Any privately owned lands within the boundary of the Urban River Valley area are not subject to the policies of the designation. For the purposes of this section, “publicly owned lands” means lands in the ownership of the Province, a municipality or local board, including a conservation authority.
- The lands are governed by the applicable official plan policies provided they have regard to the objectives of the Greenbelt Plan.
- All existing, expanded or new infrastructure which is subject to and approved under the EAA, or which receives a similar approval, is permitted provided it supports the needs of adjacent settlement areas or serves the significant growth and economic development expected in southern Ontario and supports the goals and objectives of the Greenbelt Plan.
- The protected Countryside policies do not apply except for Sections 3.2.6: External Connections and Section 3.3: Parkland, Open Space and Trails, both of which are not pertinent to this project.

3.4 Region of Peel Official Plan (2022)

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

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

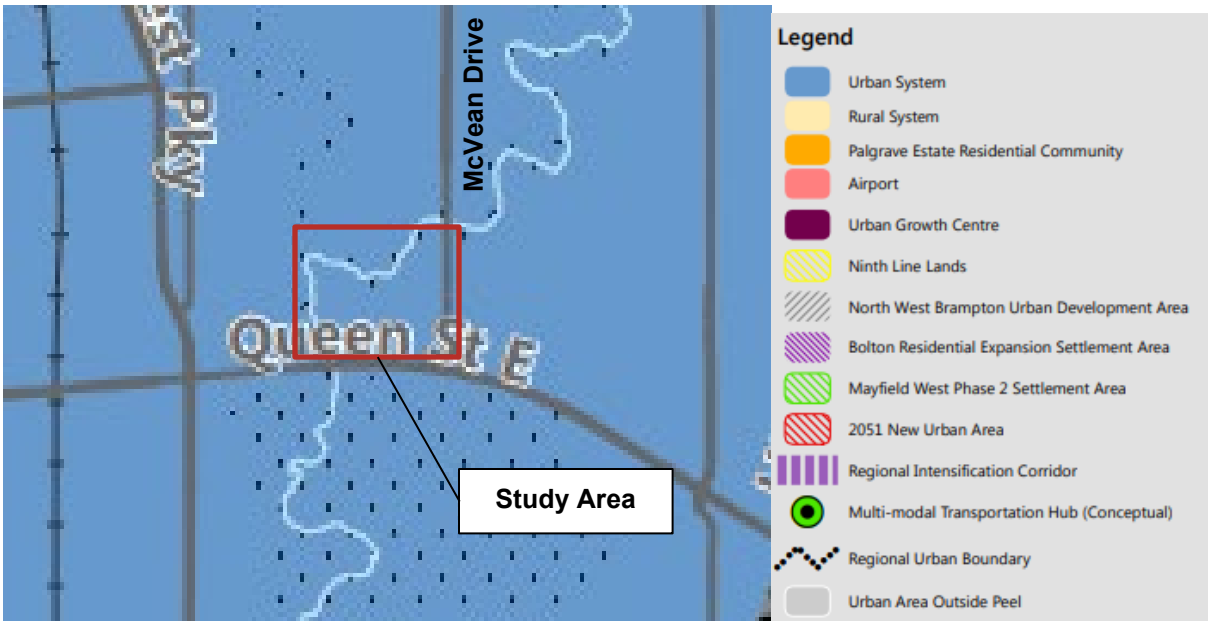


Figure 3-1: Region of Peel Land Use Designation (Region of Peel Official Plan, Schedule E-1)

3.5 Region of Peel Water and Wastewater Master Plan (2020)

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

The Master Plan identified the need to expand the existing McVean SPS to plan for significant growth within the existing McVean catchment area.

3.6 City of Brampton Official Plan (2020)

The City of Brampton Official Plan establishes policies to manage change and growth within the City through the planning horizon. The official consolidation of the Brampton Official Plan has been updated to include approved Official Plan Amendments as of September 2020. The City is working on a new Official Plan, Brampton Plan, that was released for public comment in September 2023 but it not yet in effect at the time of writing this Project File Report.

The Brampton Official Plan (2020) policies specific to sanitary infrastructure were established in Section 4 of the Official Plan to:

- Promote green, sustainable infrastructure and utility development.
- Work with the Region of Peel and all utility providers on the planning and installation of all water, wastewater and utility infrastructure to ensure infrastructure is established and phased as appropriate to accommodate new growth particularly within areas where increased intensity is encouraged.
- Work with the Region of Peel and all utility providers to ensure infrastructure is provided in a timely and efficient manner.

- Provide full municipal sanitary sewer facilities which adequately serve the City of Brampton, except for lands designated Estate Residential in the Official Plan.

Sanitary infrastructure and utilities policies in Section 4 of the Official Plan include the following:

- Policy 4.8.1.1: Brampton expects that the Region of Peel will provide appropriate and timely sanitary sewerage facilities to serve the City's development subject to the following principles:
    i. Appropriate protection, conservation and mitigation of the natural heritage system features, functions and linkages in which sewers are to be installed;
    ii. Operate sewer systems on a gravity flow basis to avoid the need for pumping stations to the extent practicable and feasible; and
    iii. Sanitary sewer collection systems designed on a basis of long-term development patterns as provided for in this Plan or for the total development of the drainage area tributary.
- Policy 4.8.4.7: All utility providers should confirm that servicing requirements can be met as part of the block planning process, including locations for large utility equipment and utility cluster sites.

A portion of the Study Area is designated as Open Space and Deferral as per Schedule A of the Official Plan, as illustrated in Figure 3-2. Open Space represents the structural element which defines the limit for development by prescribing areas to be protected for natural heritage conservation and recreation. The Deferral lands are lands that are deferred to Region of Peel.

As of the writing of this report, the City of Brampton is undertaking an Official Plan review to provide direction to ensure all City planning, projects and development are working together efficiently to achieve the aspirations of the Brampton 2040 Vision.

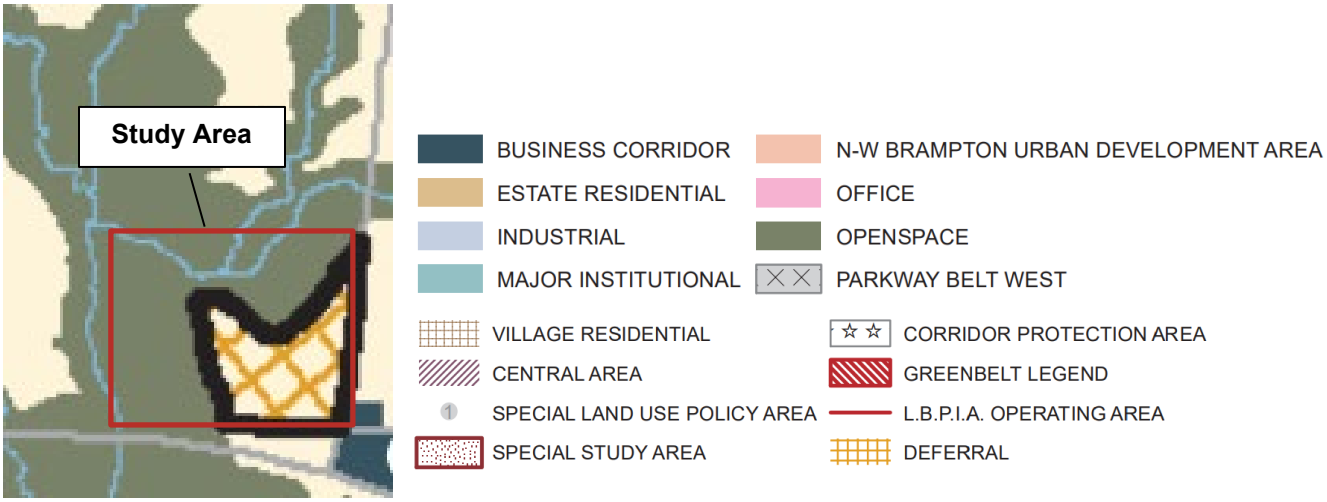


Figure 3-2: City of Brampton Land Use Designation (City of Brampton Official Plan – Schedule A)

3.7 City of Brampton Zoning By-Law 270 – 2004

The purpose of the City of Brampton Zoning By-law is to regulate the use of land, building and structures and to implement the City of Brampton Official Plan. As per Section 6.10 of the Zoning By-law, the provision of wastewater facilities and utilities is permitted in all zones.

3.8 Conservation Authorities Act (1990) and Ontario Regulation 166/06

The Study Area is located within the TRCA regulated area limit under Ontario Regulation 166/06 – Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. The regulated limit is associated with the crest of slope for the West Humber River floodplain at the west and north of the Study Area and the SPS upgrades are likely to fall within the TRCA regulated limit. The proposed works will be subject to Ontario Regulation 166/06 and TRCA permitting will be applicable.

4 Existing Conditions

The following section describes the existing conditions within the study area. The information described in this section was considered when reviewing potential effects of the alternative solutions developed for the study.

4.1 Geotechnical Analysis

In preparation of the geotechnical investigation for this project, WSP reviewed a previous geotechnical report prepared by Terraprobe in 2004. This report investigated and documented the subsurface soil and groundwater conditions at the McVean SPS. A total of eleven boreholes, between 5.0m and 21.4m in depth, were advanced by Terrprobe between February 5 and March 11, 2004. A log of these previous boreholes in contained within **Appendix A** (please note that **Appendix A** details the results of this 2022-2023 geotechnical investigation. Contained within Error! Reference source not found., is a log of the previous 2004 geotechnical boreholes).

4.1.1 Geotechnical investigation

The 2022-2023 geotechnical field investigation for the McVean SPS site, consisted of drilling a total of thirteen (13) exploratory boreholes (BH22-1 through BH22-9 and BH22-12 through BH22-15) to depths ranging from 6.7 to 19.8 m below ground surface. Boreholes BH22-10 and BH22-11 were part of the geotechnical investigation schedule, but the locations of these boreholes conflicted with the existing utilities, therefore were not drilled. The field investigation work of drilling the boreholes were undertaken between December 7 and 14, 2022 by a drilling sub-contractor under the direction and supervision of WSP personnel.

In laboratory testing, the testing program consisted of the measurement of the natural moisture content of all available soil samples, the measurement of the grain size analyses on seventeen (17) selected samples and consistency (Atterberg) limits for eight (8) soil samples.

The subsurface profile consists of topsoil or surficial fill material underlain by a native cohesive and cohesionless (till and non-till) soils. At the monitoring well locations, the groundwater table lies between 5.2 and 9.5 mbgs (between Elev. 167.8 m and 166.0 m). Perched water should be expected in the shallow granular fill and in any granular fill in the existing nearby utility trenches.

Topsoil was encountered, along with asphaltic concrete pavement, subgrade fill overlying glacial till, and strata of silty sand underlying glacial till. The subgrade fill varied in depth and consisted of clayey to sandy silt, silty sand, or sand and gravel. The glacial till contained embedded sand and gravel, cobbles, and potential boulders, and was found to be stiff to very stiff in cohesive zones and compact to dense in cohesionless zones. Fourteen meters of dense silty sand was found underneath the glacial till.

Groundwater was encountered at the SPS site at various elevations between 165.4m to 174.2m and free flowing groundwater was identified 1.2m below the emergency overflow storage lagoon. No free-flowing groundwater was found at the forcemain and influent sewer area, but it is expected that groundwater levels would be 1 to 2 meters below grade when assessing conditions over a longer period.

The Geotechnical Investigation report detailing the investigation procedure and subsurface conditions can be found in **Appendix A.**

4.2 Natural Environment

A Natural Environment Report was prepared for the study to document the existing natural environment conditions within the Study Area and to provide a preliminary impact assessment of the alternatives considered and preferred solution. Preliminary mitigation recommendations are provided as well as recommendations for further study during later design stages.

Field investigations were completed in 2021 to document vegetation communities and wildlife habitat within the study area, including the completion of Ecological Land Classification (ELC) surveys and a general wildlife and wildlife habitat survey. Direct wildlife observations and wildlife signs (including animal browse, tracks/trails, scat, bird nesting activities, tree cavities, burrows, excavated holes and vocalizations) were recorded. Particular attention was also given to assessing the potential for habitat to support Species at Risk (SAR) known to the area generally, or to potentially qualify as Significant Wildlife Habitat (SWH).

The following provides an overview of the existing conditions within the study area, as documented in the Existing Conditions and Impact Assessment (Ecology) Report provided in **Appendix B**.

4.2.1 Vegetation

The study area includes the SPS, adjacent meadows, and the residential property immediately east of the station. Most of the site is cultural meadow (CUM1-1) contained within the floodplain of the West Humber River, as shown in Figure 4-1. A large section of this area included planted young White Spruce (Picea glauca). Additionally, there are small thicket swamps southwest of the sewer pumphouse, and small areas of successional vegetation northwest of the pumphouse and sparsely along some of the fence lines. The lagoon south of the pumphouse is mown turf. The forest to northwest is setback more than 250 m from the existing pumphouse and is not expected to be impacted by the proposed works. Furthermore, through consultation with the Toronto and Region Conservation Authority (TRCA) it was identified that a portion of the site contains restoration plantings. TRCA has undertaken restoration works including reforestation plantings, riparian works and wetland construction and plantings on TRCA lands within the study area limits.

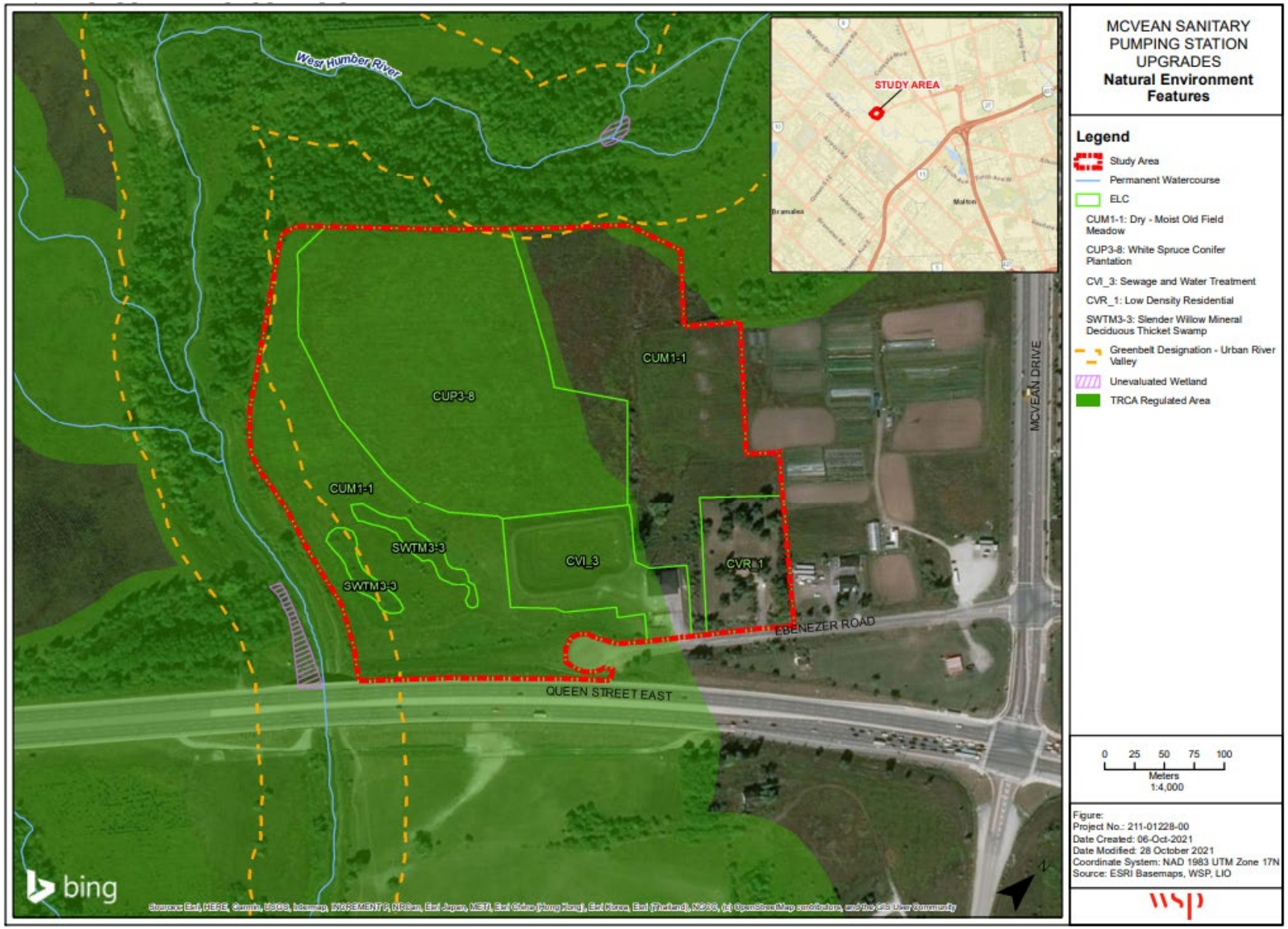


Figure 4-1: Natural Environment Features

Designated Natural areas

No Provincially Significant Wetlands (PSWs), Environmentally Sensitive/Significant Areas, Areas of Natural and Scientific Interest (ANSIs), Provincial Parks, Conservation Reserves, or known wildlife linkage corridors are noted at, or within, 120 m of the study area on the City of Brampton Official Plan (Consolidation Date: September 2020) (Official Plan) Schedule D – Natural Heritage Features and Areas. A portion of the Humber River floodplain adjacent to the project area is designated valleyland/watercourse corridor (Brampton OP – Schedule D).

Woodlands

Significant woodlands were identified north and west of the study area according to the criteria of the Ministry of Natural Resources and Forestry (MNRF). Based on criteria in the MNRF's Natural Heritage Reference Manual (MNRF, 2010), it is likely that these woodlands may be considered significant based on their size (> 2 ha), semi-urban setting and continuous canopy observed using aerial imagery. Following consultation with the Toronto and Region Conservation Authority (TRCA), these areas are considered lowland forest and restoration planting, both of which require ecosystem compensation, should they be impacted either permanently as a result of the proposed infrastructure, or temporarily to facilitate construction of the proposed infrastructure. No mature forested areas will be impacted by the design or construction to the McVean SPS upgrades project.

Valleylands

The western portion of the study area and the forest to the northwest of the study area are valleylands or watercourse corridors. This area is cultural meadow and young Spruce plantation. The area is of low botanical quality and offers limited habitat quality and variety for wildlife. It would be unlikely that this area would be deemed significant.

Regional Floodplain

The existing McVean SPS is located immediately adjacent to the West Humber River. The existing SPS is located outside the TRCA Regulatory Floodplain, the earthen emergency overflow lagoon, which provides the Region with emergency storage capacity in the event of a catastrophic failure associated with the pumping station, is located within the floodplain. This emergency overflow capacity is critical to the Region's infrastructure. The earthen lagoon provides buffering capacity between the SPS and the West Humber River. This buffering capacity allows Regional operations staff critical time to respond to an emergency associated with the SPS, and to avoid a potential sewage spill into the West Humber River. To date, the earthen basin has only been used very rarely, and no sewage spill event(s) into the West Humber River have occurred.

The emergency overflow lagoon has a volume of 4,840 m^3 and is located within the TRCA Regulatory Floodplain This volume is factored into the Regulatory Floodplain elevation of 173.94 m. The existing McVean SPS lagoon is in place as an emergency option and only utilized in the event of an emergency. Through consultation with the Toronto and Region Conservation Authority in September 2023 (discussed in further sections of this report), it was confirmed that all new emergency storage for future servicing is preferred to be located outside of the Regional Floodplain. Any additional emergency overflow storage capacity will aim to be accommodated outside the Regulatory Floodplain. Figure 4-2 presents the location of the existing SPS, earthen emergency overflow lagoon in relation with the TRCA Regulatory Floodplain.

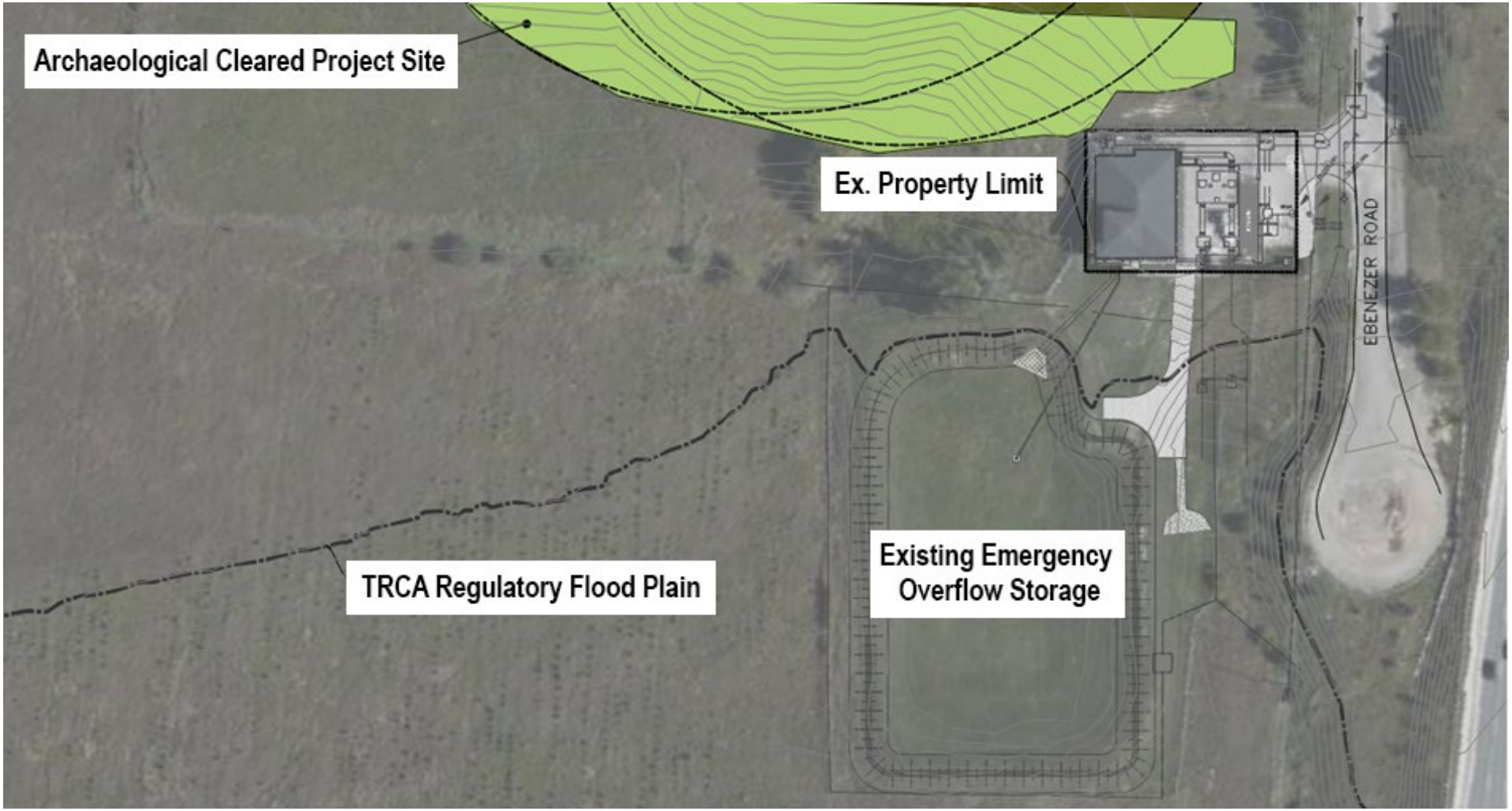


Figure 4-2: Toronto and Region Conservation Authority Floodplain with Respect to McVean SPS Infrastructure

Wetlands

No provincially significant wetlands (PSWs) were found in or adjacent to the study area. Two small wetlands were identified 360m northwest and 270m southwest of the SPS through Natural Heritage mapping, but they are not expected to be impacted due to the distance from construction works. A wetland was also identified 170m southwest of the SPS through TRCA regulation mapping, but the wetland is not considered significant.

Significant Wildlife Habitat

As a small site with no open water and scarce wetland and woodland in an urban matrix, there is low potential for significant wildlife habitat (SWH). Habitat in the study area does not fulfill criteria for Seasonal Concentration Areas of Animals, Rare Vegetation Communities or Specialized Habitat for Wildlife, Habitat for Species of Conservation Concern or Animal Movement Corridors for the ecoregion in which study area lies, which is EcoRegion 7E (MNRF 2015). Although not contributing to determination of SWH using the criteria for Animal Movement Corridors it is noted that the site is adjacent to the Humber River valleyland corridor that would function to some degree for promoting wildlife movement in the valleyland.

Species at Risk Habitat

Five endangered species, five threatened species, and seven species of special concern were identified with online database tools and agency correspondence. Endangered and threatened species and their habitats are required to be protected under federal and provincial legislation. Legal protection does not extend to species of special concern, but preservation is encouraged.**Error! Reference source not found.** Table 4-1 summarizes the species at risk that may be found within the study area.

Table 4-1: Potential Species at Risk Within Study Area

Species	Endangered	Threatened	Special Concern
Arthropods	-	-	Monarch
Birds	-	Bank Swallow Bobolink Chimney Swift Eastern Meadowlark	Barn Swallow Common Nighthawk Eastern Wood-pewee Grasshopper Sparrow Short-eared Owl Wood Thrush
Fish	Redside Dace	-	-
Mammals	Eastern Small-footed Myotis Little Brown Myotis Northern Myotis	-	-
Reptiles	-	-	Snapping Turtle
Vascular Plants	Butternut	-	-

Only two species listed in Table 4-1, Bobolink and Eastern wood-pewee, were observed during field investigations. Ontario Ministry of Conservation and Parks (MECP) and Department of Fisheries and Oceans (DFO) Species at Risk mapping identified Redside Dace to occur within the West Humber River adjacent to the study area. The habitat for this species is defined as the meander belt plus 30 m.

Standard construction erosion and sediment control mitigation is likely sufficient to protect the fish habitat and water quality of the Humber River The Natural Environment Study concluded that no significant impacts to species at risk are expected to occur.

Wildlife Habitat

The study area provides habitat for wildlife that tolerate moderate levels of urban disturbance, primarily meadow habitat. Wildlife potential is enhanced by the close proximity of the West Humber River system, which is approximately 270 m southwest and 360 m northwest of the pumphouse.

The following provides an overview of the wildlife observed during filed investigations.

Avifauna

Meadows

Ten species associated with meadow habitat were recorded including American Goldfinch (*Spinus tristis*), Bobolink (*Dolichonyx oryzivorus*), Clay-colored Sparrow (*Spizella pallida*), Field Sparrow (*Spizella pusilla*), Northern Mockingbird (*Mimus polyglottos*), Savannah Sparrow (*Passerculus sandwichensis*), Song Sparrow (*Melospiza melodia*), Tree Swallow (*Tachycineta bicolor*), Willow Flycatcher (*Empidonax traillii)* and Yellow Warbler (*Setophaga petechia*). All but one of the birds are likely breeding in the study area. Breeding was confirmed for two of them; Song Sparrow was displaying territorial behaviour and Tree Swallow adults were using the bird nesting boxes on study area meadows and a Tree Swallow fledgling was observed.

The meadow species not breeding in the study area was Bobolink, a SAR identified during the first survey based on a single song coming from the CUM1-1 directly northwest of the residential property in the study area.

Clay-coloured Sparrow is a regionally rare species (L3) that was observed and heard during the second survey. It was singing continuously from one of the young, White Spruce trees in CUP3-8 and was likely nesting nearby in a shrub that offered sufficient cover, though breeding was not confirmed. This species was not detected in the ten-kilometre OBBA survey square in the last five years; however, a Clay-coloured Sparrow fledgling was observed in the square during the previous, 2001-2005 OBBA survey period (Birds Canada 2021).

Forests and Forest Edges

Eight species of forest and forest edges were observed including American Robin (*Turdus migratorius*), Blue Jay (*Cyanocitta cristata*), Brown-headed Cowbird (*Molothrus ater*), Common Grackle (*Quiscalus quiscula),* Eastern Kingbird (*Tyrannus tyrannus*), Eastern Wood-pewee (*Contopus virens*), House Wren (*Troglodytes aedon*) and Northern Cardinal (*Cardinalis cardinalis*). All are likely breeding in, or adjacent to, the study area either at the forest edge or on individual trees on the property; however, breeding was not confirmed. Two American Robin nests were found on an external heat duct on the northwest side of the residential building, but no nesting activity was observed.

Eastern Wood-pewee is a SAR that was found singing in mature trees on the residential property in the study area during the first survey but not the second survey. This habitat is too small and disturbed to support the species. It was not breeding in the study area. There were nesting opportunities on the SPS building but no nests were seen.

Wetland

Red-winged Blackbird (*Agelaius phoeniceus*) was likely nesting in marsh vegetation in the ditch west of the pumphouse, though this was not confirmed. Fourteen Canada Goose (*Branta canadensis*), another wetland species, flew over the study area; however, the site provides no breeding or foraging opportunities for this species.

Other Habitat

Killdeer (*Charadrius vociferus*), a species that nests on bare ground or paved ground with gravel, was observed on Ebenezer Road. Breeding evidence was not seen; however, this species may adopt cleared/disturbed lands to use for breeding purposes. European Starling (*Sturnus vulgaris*), observed flying over the study area, may nest in cavities in built structures.

Mammals

Four species were observed. White-tailed Deer (Odocoileus virginianus) were foraging in the CUP3-8 during the first and second surveys. Eastern Cottontail (Sylvilagus floridanus) was seen in the CUM1-1. An Eastern Gray Squirrel (Sciurus carolinensis) and a nest of this species were in trees on the residential property in the study area. A dead Striped Skunk (Mephitis mephitis) was found in the Ebenezer Road ditch and given its location, may have died as a result of a vehicle collision. Opportunities for bat breeding such as mature forest or opportunity to access the SPS building interior were not observed.

Reptiles and Amphibians

No reptiles or amphibians were observed during the wildlife surveys. Should depressions in the southwest portion of the study area contain open water, they may support breeding by anurans that subsequently travel into the study area. Turtles may occur in the West Humber River and travel overland in search of nesting opportunities; however, they are not expected to nest in the study area due to the lack of exposed soil to support nest construction. Snakes may nest or hibernate around the pumphouse foundation or in debris piles next to the residential building and forage in the meadows, but no snakes were seen.

Insects

The CUM1-1 and CUP3-8 supported insects including a dragonfly: Black Saddlebags (Tramea lacerata); a damselfly: bluet (Enallagma sp.) and butterflies: Common Ringlet (Coenonympha tullia), Common Wood-nymph (Cercyonis pegala) and Silvery Blue (Glaucopsyche lygdamus). Occasional breeding host plants (Asclepias sp.) for the SAR butterfly, Monarch (Danaus plexippus), were observed throughout the meadow habitat but this butterfly was not seen.

4.3 Archaeological Assessments

4.3.1 Stage 1 & 2 Archaeological Assessment

A Stage 1-2 archaeological assessment was completed by TRCA in 2021 to determine the presence and extent of archaeological resources within the study area in accordance with the Ministry of Citizenship and Multiculturalism's (MCMs) 2011 Standards and Guidelines. The assessment was triggered by internal TRCA policy as required to be completed prior to the commencement of any construction activity. The Stage 1-2 Archaeological Assessment is provided in **Appendix C.**

The Stage 2 assessment identified two groupings of artifacts within the study area. The first group of artifacts was determined to be the continuation of a previously documented site known as the William Alason homestead (registered as AkGw-438), which is a mid to late 19th century Euro-Canadian site. The second group of artifacts was a newly discovered cluster of Indigenous artifacts and was registered as AkGw-547 site.

Both sites were considered to have further Cultural Heritage Value or Interest (CHVI) and recommended for further Stage 3 archaeological assessment. While these sites will be avoided by the proposed construction activities and remain in situ, a small portion of their 50-metre monitoring zones will be impacted, refer to Figure 4-3 and Figure 4-4. The area of proposed construction that falls within the monitoring zones will be referred to as the "project area". A Stage 3 archaeological assessment for each site was required to determine whether their site limits extend into the project area.

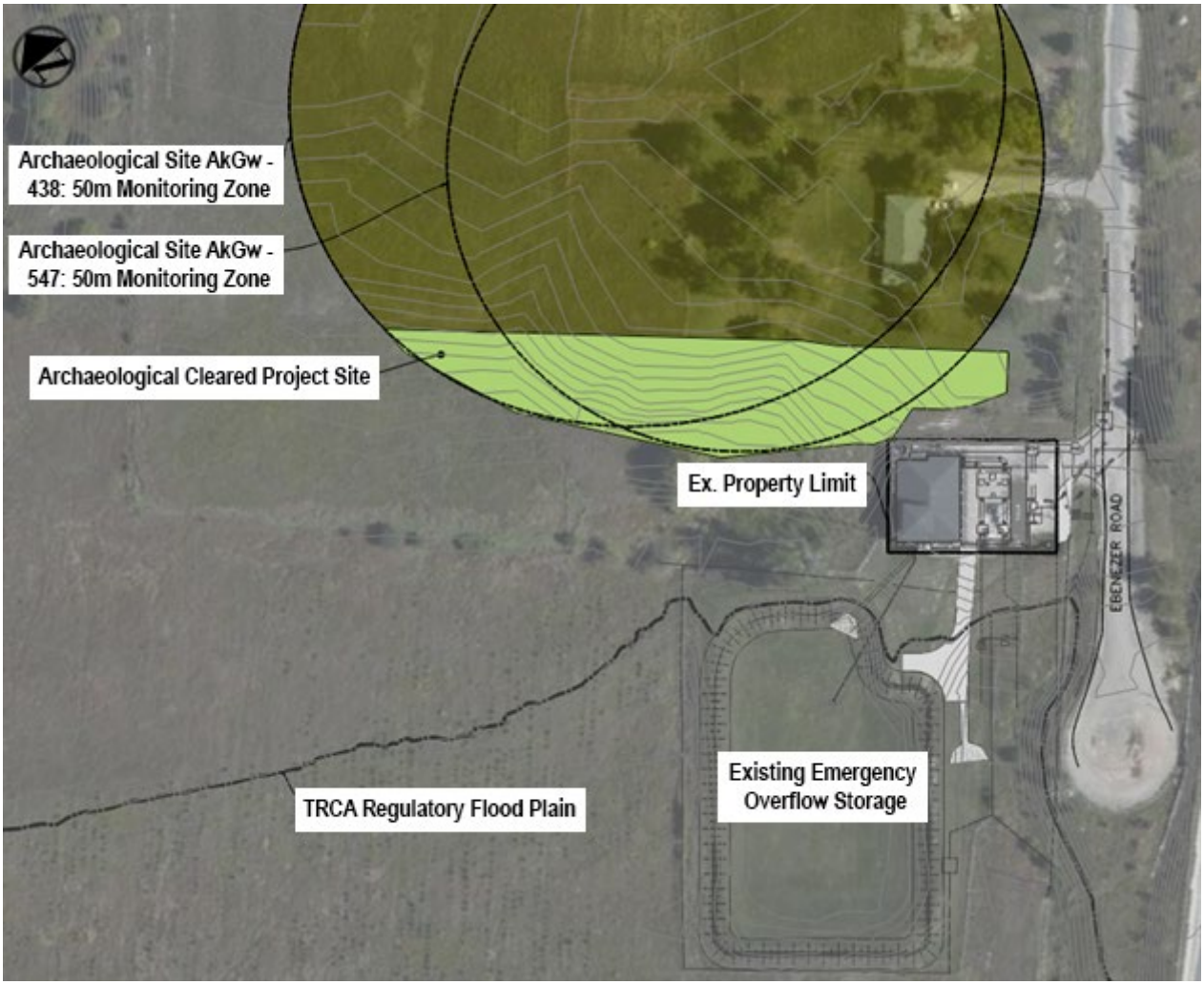


Figure 4-3: McVean SPS- Archaeological Areas Impacting McVean SPS Project

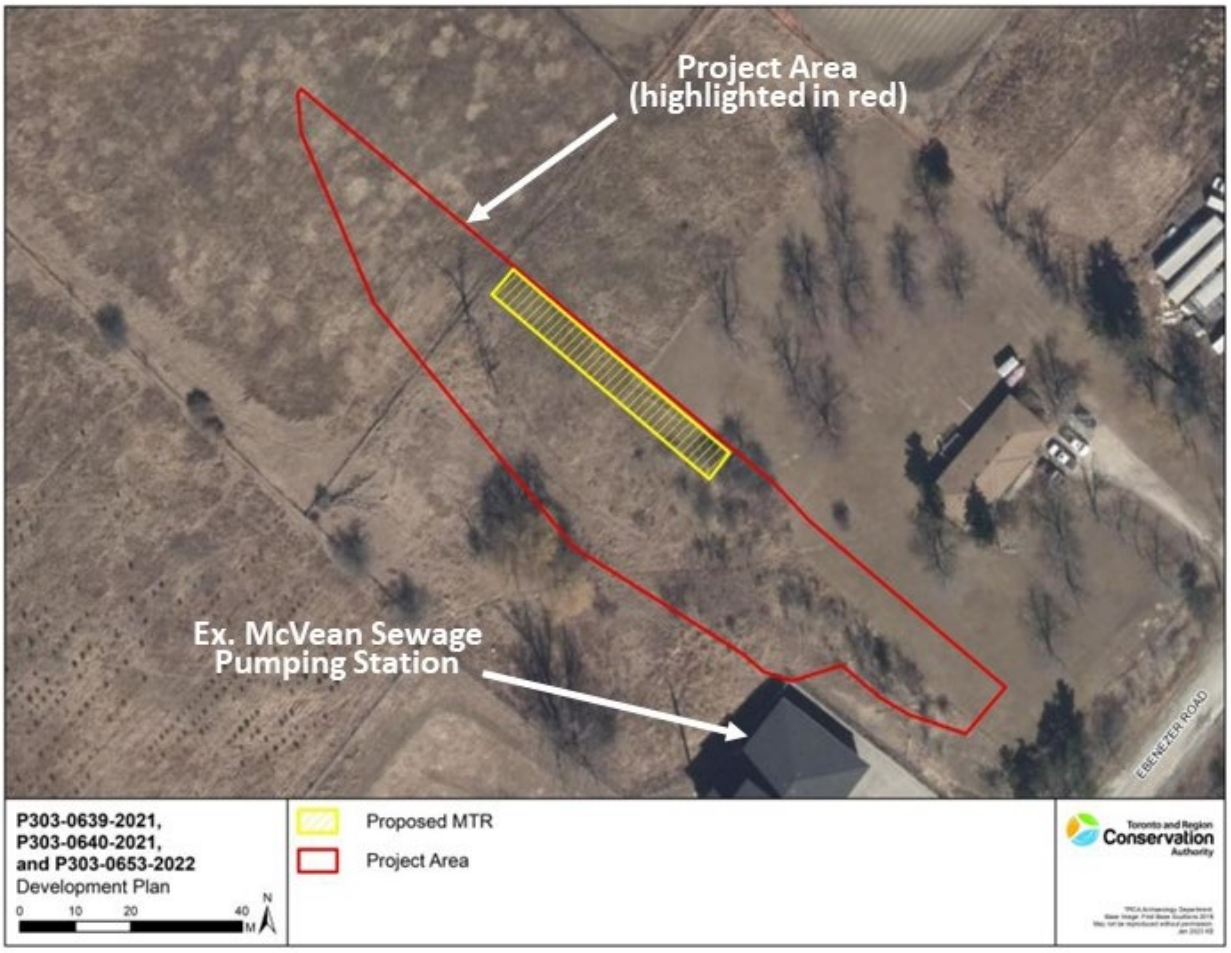


Figure 4-4: McVean SPS- Stage 3 Archaeological Project Site

4.3.2 Stage 3 Archaeological Assessment

The specific objectives of a Stage 3 archaeological assessment are as follows:

- To determine the extent of the archaeological site and the characteristics of the artifacts
- To collect a representative sample of artifacts
- To assess the cultural heritage value or interest of the archaeological site
- To determine the need for mitigation of development impacts and recommend appropriate strategies for mitigation and future conservation.

The Stage 3 archaeological assessment is attached in **Appendix D.**

Fieldwork was conducted on November 16, 18-19, 2021, and May 2-3, 5-6, 9-11, 18, 30-31, June 2, 6, 10 and 13, 2022.

A total of 90 test units were excavated across the project area to confirm the presence or absence of archaeological resources within the 50-metre monitoring zones of the AkGw-438 and AkGw-547 sites. No

archaeological resources relating to the AkGw-438 and AkGw-547 sites were encountered within the project area.

A new site was identified at the southern limit of the 50-metre monitoring zone for the AkGw-547 site and expanded beyond the monitoring zone. The project area and Stage 3 test unit excavation was extended southward to capture the extent of the new finds. The artifacts were registered as a new site under the Borden number AkGw-552. A total of 25 artifacts were recovered and the full extent of the site's limits were established during the Stage 3 test unit excavation. The site has been interpreted as a short-term lithic work area, used briefly for tool reduction and manufacture. Given the lack of diagnostic artifacts, the site can at best be described as a nondiagnostic Pre-Contact lithic site. With no units yielding 10 or more artifacts, no diagnostic artifacts (including Woodland Period ceramics), and no subsurface features identified, the AkGw-552 Site is not considered to have further CHVI and will not require Stage 4 mitigation of development impacts.

The Stage 3 archaeological assessment provided the following recommendations:

- The AkGw-552 site is considered to have no further CHVI and does not require Stage 4 mitigation of development impacts.
- No artifacts were encountered relating to the AkGw-438 and AkGw-547 sites within the project area. However, archaeological concerns remain for both sites beyond the limits of the current project area which will require further Stage 3 archaeological assessment(s), and possibly Stage 4 mitigation of development impacts. In the event of future development impacts within 20 metres of each site, the following Stage 3 archaeological assessment strategies apply:
    - AkGw-438 site: The Stage 3 archaeological assessment shall be conducted in a manner suitable for a post-contact site where it is evident that the level of CHVI will result in a recommendation to proceed to Stage 4 mitigation of development impacts.
    - AkGw-547 site: The Stage 3 archaeological assessment shall be conducted in a manner suitable for a pre-contact site where it is evident that the level of CHVI will result in a recommendation to proceed to Stage 4 mitigation of development impacts. Since the site is located within a manicured lawn, a Stage 3 controlled surface pickup (CSP) cannot be undertaken.

Following the documented Stage 3 assessment activities across the entirety of the project area, the project area is considered free of archaeological concern. Therefore, for the purposes of completion of the Schedule B Class Environmental Assessment, detailed design, tender and construction of the expansion and upgrades associated with the McVean SPS, no archaeological concerns exist. However, it must be noted that since the current Stage 3 archaeological assessments only occurred in the 50-metre monitoring buffers for the AkGw-438 and AkGw-547 sites, it is not possible to evaluate their site limits or artifact distribution completely or accurately in all cardinal directions. Therefore, concerns remain beyond the limits of the current Stage 3 archaeological assessments related to the AkGw-438 and AkGw-547 sites, but only in areas outside this McVean SPS project area. The areas of concern outside this McVean SPS are located to the north and east, within the farmland currently owned by the TRCA.

4.4 Cultural Heritage Assessment

A Cultural Heritage Report was completed as part of the study to identify existing and potential Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) within the study area. The report includes a review of the background history of the project area, an overview of existing conditions within the study area, provides a preliminary impact assessment to conserve BHRs and CHL, identifies mitigation and/or monitoring for potential impacts and provides recommendations for further heritage reporting, if required. The Cultural Heritage Report is provided in **Appendix E**.

A field assessment was conducted on October 5, 2021, to record the existing conditions of the study area and all adjacent properties to confirm or identify existing and/or potential BHRs and CHLs. The field review was preceded by a review of available historical and current aerial photographs and maps. Permission to enter was granted by the Region of Peel, as such, there were no limitations to the field assessment. Where identified, potential resources were photographed and mapped, and physical characteristics visible from the right-of-way or aerial imagery were described.

The results of the assessment concluded that there are two (2) BHRs and four (4) CHLs located within the study area, as illustrated in Figure 4-5. The majority of the study area is located within the Claireville Conservation Area (CHL-4). The conservation area consists of 848 hectares of natural and forested area that straddles Peel Region and Toronto. The natural landscape of the conservation area includes wetlands, valleys, forests, grasslands, as well as the west branch of the Humber River and its tributaries. The Wiley bowstring arch bridge (BHR-1) and the McVean Farm Property are located within the conservation area.

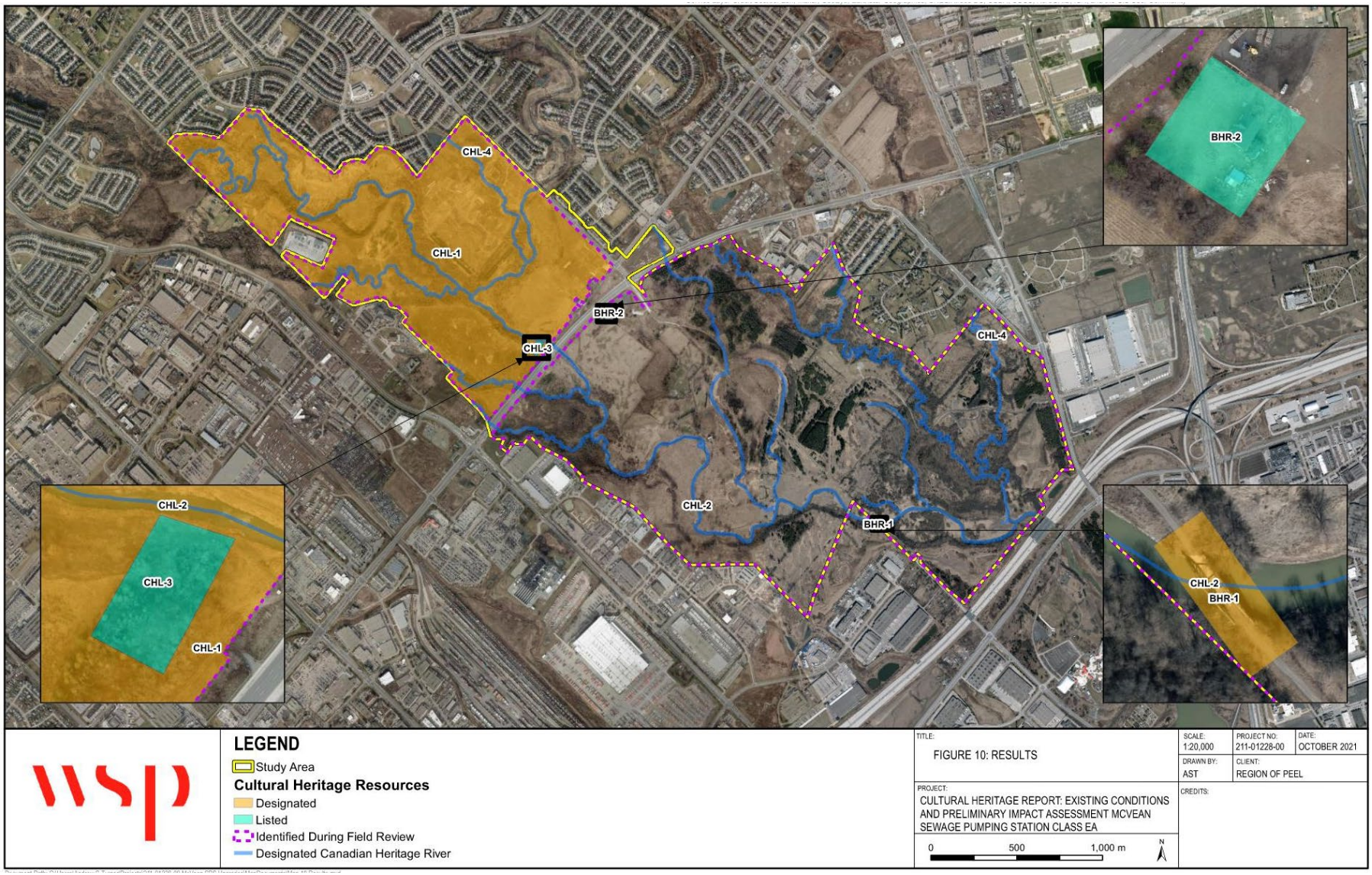


Figure 4-5: Location of Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) Within the Study Area

Identified Cultural Heritage Resources

Background research and a field visit were completed to identify known and potential BHRs and CHLs located within the study area. In addition, a review was conducted to determine previously identified heritage resources documented within the study area, including listed (registered non-designated) and designated properties, heritage conservation districts and known CHLs. This included a review of the City of Brampton's online Heritage Properties Map, a website that provides all BHRs and CHLs that are designated under Part IV or V of the OHA, listed on the heritage register and inventoried. (City of Brampton, 2021).

Potential heritage resources were identified through the high-level application of the criteria identified in the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes. As a result of this review, four CHLs and three BHRs have been identified within the study area. Section 5.4 of the Cultural Heritage Report provides the details of the CHLs and BHRs.

Preliminary Impact Assessment

To establish potential impacts, identified BHRs and CHLs were considered against a range of possible impacts as outlined in the MHSTCI's Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties (2017).

Where any BHRs and CHLs may experience direct or indirect impacts, appropriate mitigation measures will be developed.

Preliminary Impacts on Cultural Heritage Resources

The conservation of BHRs and CHLs in planning is a matter of public interest. Changes to infrastructure have the potential to adversely affect BHRs and CHLs by displacement and/or disruption during and after construction. Heritage resources may experience displacement (i.e., removal) if they are located within the footprint of the undertaking. There may also be potential for disruption or indirect impacts to BHRs and CHLs by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and/or setting.

Methods of minimizing or avoiding a negative impact on a BHR or CHL include, but are not limited to:

- Alternative development approaches.
- Isolating development and site alteration from significant built and natural features and vistas.
- Design guidelines that harmonize mass, setback, setting and materials.
- Limiting height and density.
- Allowing only compatible infill and additions.
- Reversible alterations.
- Buffer zones, site plan control and other planning mechanisms.
- Recommendations for additional studies, including CHERs, HIAs and Strategic Conservation Plans; and,
- Alterations to project design during construction planning and project controls (i.e., vibration reduction, dust suppression or other measures).

Table 4-2 provides the potential impacts of the proposed station improvements on known or potential BHRs and CHLs, including identified mitigation measures, were applicable.

Table 4-2: Potential Impacts and Mitigation Measures of Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL)

BHR Or CHL #	Resource Type	Location	Heritage Recognition	Description of Potential/Anticipated Impact(S)	Mitigation Measures
BHR-1	Bowstring Bridge	0 Gorewood Drive (Crossing the Humber River in the Claireville Conservation Area)	Designated (by-law 328-2013)	There will be no direct or indirect impacts to the property as a result of the proposed undertaking.	None required.
BHR-2	Residence	8940 Claireville Conservation Road	Listed	There will be no direct or indirect impacts to the property as a result of the proposed undertaking.	None required.
CHL-1	Farmstead	0 McVean Drive	Designated (by-law 380-2006)	The alternatives will result in minor some property acquisition along the southern boundary of CHL-1. Based on the current design, the construction of the emergency overflow lagoon expansion and/or the overflow thanks will not result in any impacts to built heritage resources or significant landscape features. Although this intervention will not significantly alter the landscape, it will result in indirect impacts to the property parcel. This is considered to be an indirect impact to the potential heritage attributes of the property since the historical farm components of the property will not be directly impacted.	Where feasible, the preferred alternative should be designed in a manner requiring as little property acquisition as possible. It should be noted that storage and construction staging areas are not available along should be along Ebenezer Road resulting from existing and constructed municipal infrastructure including the 500mm, 900mm and 1,200mm diameter sanitary forcemains. Where construction is anticipated to result in grading impacts and tree removal north of the McVean SPS, post-construction landscaping with native tree species should be employed to mitigate visual impacts and restore the property as close as possible to an as-found condition.

BHR Or CHL #	Resource Type	Location	Heritage Recognition	Description of Potential/Anticipated Impact(S)	Mitigation Measures
CHL-2	Humber River	Extends 100km north from Lake Ontario to	Designated Canadian Heritage River (1999)	There will be no direct or indirect impacts to the property as a result of the proposed undertaking.	None required.
CHL-3	Mill Ruins	Part of Lots 6 and 7, Concession VIII, ND	Listed	There will be no direct or indirect impacts to the property as a result of the proposed undertaking.	None required.
CHL-4	Conservation Area	8180 Highway 50	Identified during field review	The alternatives will result in minor some property acquisition along the southern boundary of CHL-4. Based on the current design, the construction of the emergency overflow lagoon expansion and/or the overflow thanks will not result in any impacts to built heritage resources or significant landscape features. Although this intervention will not significantly alter the landscape, it will result in indirect impacts to the property parcel. This is considered to be an indirect impact to the potential heritage attributes of the property since the historical farm components of the property will not be directly impacted.	Where feasible, the preferred alternative should be designed in a manner requiring as little property acquisition as possible. It should be noted that storage and construction staging areas are not available along should be along Ebenezer Road resulting from existing and constructed municipal infrastructure including the 500mm, 900mm and 1,200mm diameter sanitary forcemains. Where construction is anticipated to result in grading impacts and tree removal north of the McVean SPS, post-construction landscaping with native tree species should be employed to mitigate visual impacts and restore the property as close as possible to an as-found condition.

4.5 Site Contamination

4.4.1 Phase I Environmental Site Assessment

A Phase I Environmental Site Assessment (ESA) was completed for the study area to develop a preliminary determination of the likelihood of contamination in soil or groundwater within the study area and determine the need for additional assessments, includes a Phase II ESA and if necessary, provide the basis for conducting a Phase II ESA or risk assessment. The Phase I ESA is provided in **Appendix F**.

A background review was undertaken as part of the Phase I ESA and determined that the site topography is sloped downwards in elevation towards the southwest, with an elevation range of 172-180 metres above sea level (mASL). Based on the local topography, the inferred shallow ground water flow direction of the Phase I Study Area is to the southwest towards the West Humber River, which is situated approximately 90 m to the southwest of the Site. The ground water flow direction on the Phase I property can only be confirmed through long-term ground water monitoring. WSP and the Region are currently undertaking ongoing hydrogeological investigations to minimize any impact to the groundwater table during construction.
A records review was conducted to obtain and review records that relate to the Phase I property and the surrounding lands within a 250 m radius (i.e., Phase I Study Area) to identify current and past uses and activities that may have contributed to contamination of the soil and groundwater at the Phase I property and a site reconnaissance was undertaken to document current site conditions and determine if Areas of Potential Environmental Concerns (APCEs) are present within the study area. A summary of the results of the investigation are provided below:

- The land use of the property at the time of writing was industrial. A two (2) storey pumping station was present on-site. The Site is in a mixed agriculture, and residential area in the City of Brampton. The Site encompasses an area of approximately 45,580 m^2 (11.3 acres).
- Three (3) APECs were identified on the property related to the importation of fill material of unknown quality, treatment of sewage equal to or greater than ten thousand (10,000) litres per day, and pesticides (including herbicides, fungicides, and anti-fouling agents) large-scale application.
- A Phase II ESA was recommended to investigate the contaminants of potential environmental concern associated with these APECs.

Based on the information obtained as part of the Phase I ESA, it is concluded that Potentially Contaminated Activities (PCAs) on the site and/or within the Phase I Study Area resulted in the identification three APECs on the Phase I property. Based on the APECs identified during this investigation, associated COPCs include metals, metals forming hydrides and ORPs, PHCs, VOCs, PAHs, PCBs, OC Pesticides and THMs.

In order to assess the identified PCAs and APECs to satisfy the conditions of an RSC, a Phase II ESA in accordance with O. Reg. 153/04 has been completed to investigate soil and groundwater quality at the identified APEC prior to filing an RSC.

4.4.2 Phase II Environmental Site Assessment

A Phase II ESA, was completed to investigate the areas of potential environmental concerns (APECs) identified in the Phase One ESA conducted by WSP in May 2022 and subsequently updated in March 2023. The Phase Two ESA is provided in **Appendix G.**

The Phase II ESA was conducted in accordance with Ontario Regulation (O. Reg.) 153/04. The Phase II Property is 45,580 m^2 (11.3 acres) in property area, portion of which is owned by the Region of Peel and is currently utilized by the Region of Peel as an industrial land use sewage pumping station with a one-storey pump house that occupies 470 m^2 (0.116 acres). The rest of the property is currently owned by the TRCA and includes agricultural land and an emergency overflow earthen lagoon for sewage (wastewater) storage, west of the pumping station. As such, the future land use will not change.

The APECs identified during the Phase I ESA were assessed by drilling several boreholes and installing monitoring wells and submitting samples for contaminants of potential concern (COPCs) in the soil and groundwater of the Phase II property, which included: metals and metals forming hydrides (antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium and zinc) and other regulated parameters (ORPs), petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), organochloride pesticides (OCs) and trihalomethane (THMs) parameters.

Based on a review of the information collected in this Phase II ESA, WSP provides the following findings:

- The analytical results from the sampling and analysis program indicates that the reported concentrations of all constituents at the Phase II property meet the applicable Ministry of Environment, Conservation and Parks (MECP) Table 2 site condition standards (industrial use, medium to fine textured soil)[1]. The reported concentrations of all parameters tested in soil and groundwater were below the Table 2 site condition standards. No further assessment as required to be completed.

5 Alternative Solutions

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

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

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

5.1 Identification of Alternative Strategies

Various high-level options ("Alternative Strategies") to address the problem were identified.

The strategies were screened against the following three "must-meet" criteria. As such, if an alternative does not satisfy just one of the screening criteria, then it was not carried forward for detailed evaluation.

Screening Criteria:

1. The Region is required to upgrade capacity from 1,400 L/s to 2,100 L/s.
2. Emergency storage is required for a duration of two hours at the peak design flowrate.
3. Must ensure Grit and (fat oil and grease) FOGs removal and management.

A description of each of the strategies and results of the screening are provided in Table 5-1.

Table 5-1: High Level Options "Alternative Strategies" Screening Evaluation

Strategy	Description	Screening
Do Nothing	Keep existing SPS and lagoon facility with no changes to the facility or surrounding environment.	Do Nothing does not address current condition, capacity, and operational issues and was not carried forward for further consideration.
Limit Growth	The Limit Growth strategy involves the limitation of growth and intensification within communities serviced by the McVean SPS to reduce the need to upgrade the existing infrastructure to accommodate increased demands.	Limiting growth does not address current condition, capacity, and operational issues and was not carried forward for further consideration. Limitting growth also does not align with the planned growth in the Region and City of Brampton Official Plan and does not address the problem statement.

Strategy	Description	Screening
Upgrade Existing McVean SPS	This strategy involves upgrading the existing SPS building.	Upgrading existing infrastructure addresses operational capacity issues; however, does not address emergency storage capacity or grit and FOG removal and management. Upgrading the existing operational SPS from a capacity of 1,400 L/s to 2,100 L/s would be very cumbersome, high risk, and increases the likelihood of additional unforeseen costs associated with bypass pumping as well as contractual delays. This alternative was not carried forward for detailed evaluation because it does not meet the screening criteria and therefore cannot fully address the problem statement.
Construct New McVean SPS	This strategy involves construction of a new sewage pumping station to house the new pumps, grit and FOG handling equipment, while incorporating expansion to the existing emergency overflow storage capacity. The existing SPS building would be decommissioned following construction and commissioning of the new sewage pumping station.	The construction of a new SPS addresses all three criteria; capacity, emergency storage capacity and grit and FOG removal and management. This alternative strategy was carried forward for further evaluation and alternative locations for the infrastructure were evaluated.

Different SPS locations and associated locations for the emergency storage expansion were explored as alternative solutions. Each alternative solution was also differentiated based on the system requirements for management of grit, FOGS, and the ability to accommodate 2 hours of emergency storage (peak design flow rate). Figure 5-1 describes different approaches for the management of grit and FOGs, as well as approaches to accommodate the required increase in emergency storage capacity. Alternative solutions were presented that incorporate a combination of different storage and system requirements and were combined as part of each alternative, in order to address the entirety of the problem statement.

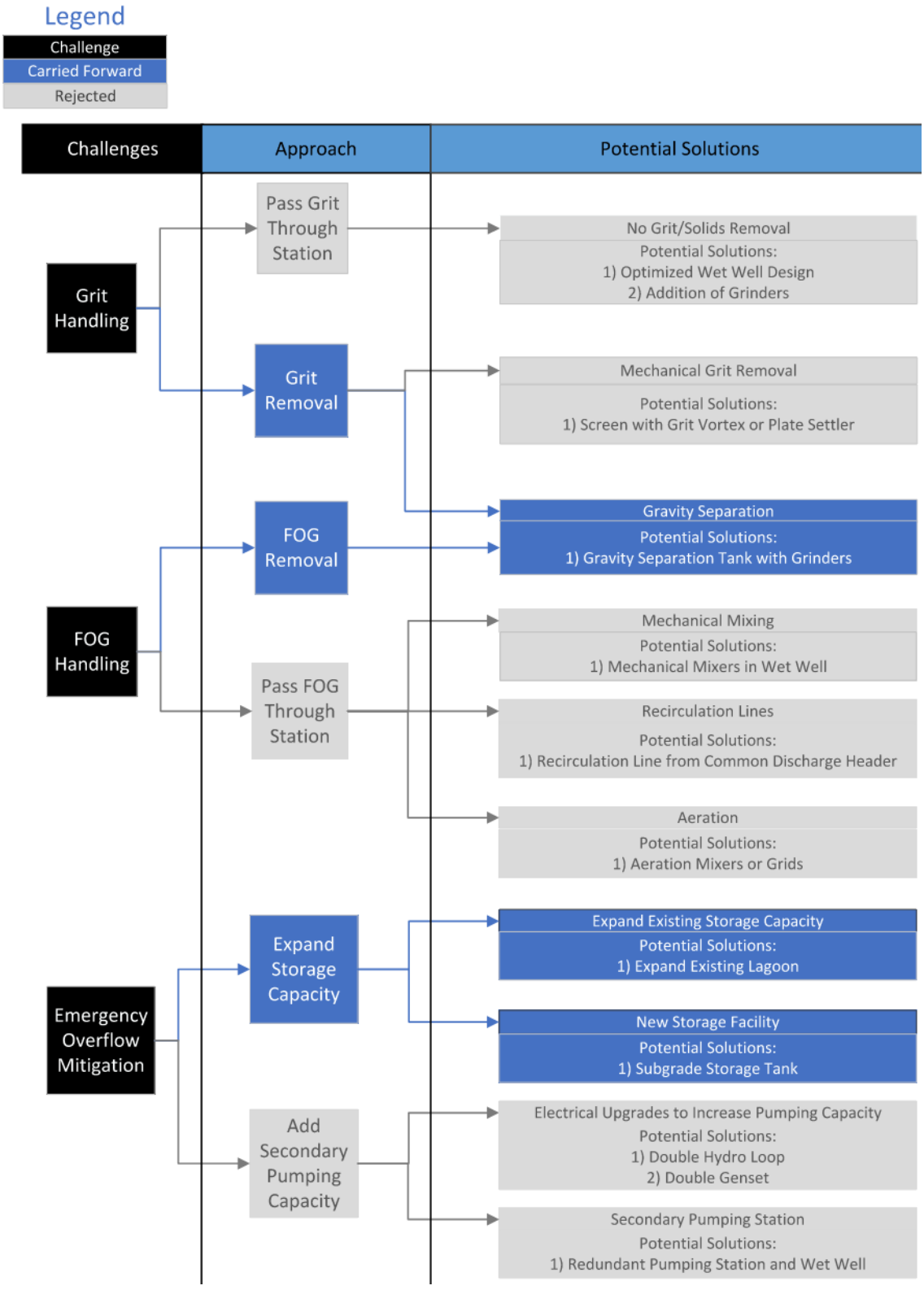


Figure 5-1: Grit, FOG, and Emergency Overflow Mitigation Alternatives

5.1.1 Rock Trap

To protect downstream process equipment (i.e., grinders, pumps, etc.), it is recommended to implement a passive rock trap, to facilaite rock removal (i.e., solids particles greater than 32mm dia.) from entering downstream processes within the SPS. To achieve this, a gravity trap integrated into either the on-site trunk sewer, or inlet channel, should be accommodated into this upgrades project.

5.1.2 Grit Management

To address grit challenges, grit can be passed through the SPS or removed. Grit removal is preferred as it reduces degradation of equipment and sediment accumulation in the wet well and downstream infrastructure. By minimizing grit through removal processes, maintenance costs to keep the equipment and forcemains in good working condition are reduced.

Grit removal can be achieved through mechanical or gravity separation. Mechanical grit removal uses screens to remove large objects and a grit vortex to separate grit by induced vortex flow. Gravity grit removal uses gravity separation tanks where grit from incoming flow settles and accumulates at the bottom due to gravity. The settled grit can then be pumped or collected with a clam shell type bucket.

5.1.3 FOGs Handling

Like grit, FOGs can be passed through the SPS or removed. FOG removal is preferred as it minimizes accumulation of FOGs in the wet well and downstream infrastructure which reduces clogging and maintenance costs. In addition to grit separation, FOG float to the surface of the water in the tank, allowing for FOG collection and disposal. Gravity grit removal may be preferred as it reduces maintenance costs, lowers energy consumption, separates grit and FOG, and can be retrofitted for future expansion when required. Grit management alternatives are incorporated into Alternative Nos. 2, 3 and 4. FOGs removal can be achieved through a skimmer pipe which can be installed within a gravity separation tank, and is incorporated into Alternative Nos. 2, 3 and 4. When required, skimmer pipes can be rotated to collect and deposit FOG into a storage tank that can be pumped or withdrawn via a vactor septage haulage trunk.

5.1.4 Emergency Overflow

To address emergency overflow requirements, storage capacity can be increased. Expanding storage capacity is preferred as it reduces maintenance and operational costs and can be integrated with the design for grit and FOG removal.

The existing earthen emergency overflow lagoon has a storage capacity of 4,830 m^3 (Amended Certificate of Approval 8062-6TMHL2). The Region's current design guidelines required two (2) hours of emergency overflow storage at peak flowrate, as outlined in Section 11 of the Region of Peel's Sewage Pumping Station Design Standards. At the McVean SPS's new rerated capacity of 2,100 L/s, this translates to an existing storage capacity of approximately 38 minutes, a full 82 minutes short of the required 120 minutes (2 hours).

To increase storage capacity, the existing lagoon can either be expanded, or integrated with a new subgrade storage tank. While an expansion of the existing lagoon is more cost-effective, there are the following drawbacks:

- The limited depth associated with the existing lagoon would require a large footprint to facilitate its expansion.
- Its presence within an environmentally sensitive area and location within the regional floodplain of the West Humber River.

Both these drawbacks pose significant challenges to its implementation.

A new sub-grade emergency storage tank solution can be physically connected to the new SPS. This emergency overflow mitigation solution requires a lesser footprint than the expansion of the existing earthen basin, and would be designed and constructed entirely outside of the regulatory floodplain of the West Humber River. The volume of the new two-cell storage tank would be approximately 11,170 m^3, resulting in a total emergency overflow storage time of approximately 82 minutes at the peak flow of 2,100 L/s. In combination with the existing earthen lagoon (38 minute storage time at 2,100 L/s), this total volume would meet the two (2) hour Region of Peel emergency overflow storage design requirement.

Emergency overflow storage capacity was incorporated into Alternative Nos. 2, 3 and 4.

The following measures are required to address the problem statement.

- Pumping capacity upgrades:
    - Upgrade the existing SPS, or construct a new SPS with 4 four (4) dry well – submersible pumps rated at a firm capacity of 2,100 L/s.
    - Connection of a new 1200mm forcemain to the station, where this forcemain is being constructed under a separate contract.
    - Replacement of the existing biofilter odour control system with a new granular activated carbon odour control system.
- Grit and FOG removal:
    - Addition of a new grit management and FOG removal system within the new SPS.
- Emergency overflow mitigation:
    - New subgrade overflow storage tank with a total volume of approximately 11,170 m^3 to achieve approximately 82 minutes of emergency overflow storage inside the station. This combined with the existing earthen emergency overflow lagoon would slightly exceed the Region's design guidelines.

As the footprint is a primary concern for this study, two different site layouts have been proposed for upgrades listed above for the combined alternative.

5.2 Alternative Solutions

Four separate alternative solutions were developed and are described in the following sections. These alternatives have been presented and analyzed in detail as part of Technical Memorandum No. 1 – Preliminary List of Alternatives, and Technical Memorandum No. 2 – Analysis of Alternatives, provided in **Appendix H** and **Appendix I,** respectively.

5.2.1.1 *Alternative 1: Upgrade exisiting McVean Sps (No lagoon upgrade)*

Alternative 1, identified as the baseline alternative, proposes to upgrade the existing SPS, from 1,400 L/s to 2,100 L/s (Figure 5-2 shows an image of the dry well of the existing McVean SPS), and is summarized as follows:

1. All 3 of the existing pumps are required to be replaced and upsized in combination with an upsized fourth pump to realize the new rated capacity of 2,100 L/s (i.e., the existing 2 duty and 1 standby pumps, with the addition of another equivalently sized duty pump will not bring the station's capacity to 2,100 L/s).
2. Brand new and expanded MCC line-up is required to integrate the 4 new larger pumps to the Region's current design standards.
3. Significantly expanded and totally sealed electrical and I&C room is required as a result of ongoing operational issues and spatial requirements.

As a result of the extensive nature of the upgrades to expand the capacity of the existing SPS, either a full bypass, or complex construction staging of the existing station, will be required for an approximate 24-month construction duration, summarized as follows:

1. High cost of a temporary bypass pumping system rated at McVean's firm capacity of 1,400 L/s, including diesel costs (as a base case, hydro-electric costs have also been provided), 24/7 monitoring and alarm, emergency response, and equipment rental.
2. Complex construction staging, leading to more risk and a longer construction duration, associated with upgrading an existing live operational facility critical to the Region. This would also include provisions for separation of the contractor and operations staff in time and space as per Ontario Ministry of Labour (MOL) requirements.

This would result in substantial capital funds going towards temporary infrastructure (i.e., temporary bypass pumping and complex construction staging resulting in a longer project duration), as opposed to permanent.

In addition, this alternative does not easily allow for any future growth or operational flexibility, nor does it address grit and FOGs management. This alternative does not address the Region's design guidelines for 2 hours of emergency storage capacity at the peak design flowrate, as summarized in Table 5-2.

Table 5-2: Existing Storage Volume and Emergency Response Time

Description	Storage Volume	Emergency Storage Time @ 2,100 L/S	Compliance with Regional Design Guidelines for Emergency Overflow Storage
Existing			
Existing Earthen Emergency Overflow Lagoon	4,830 m^3	38 minutes	×

Figure 5-2: Alternative 1- Upgrade the Existing McVean Sewage Pumping Station

5.2.1.2 *Alternative 2: New McVean SPS (East), WITH Emergency Overflow Lagoon (North)*

Overview

Alternative 2 proposes construction of a new SPS, complete with headworks infrastructure, on the east side of the site. The SPS is proposed to consist of a superstructure, with both at-grade and sub-grade levels.

The new SPS will be complete with three (3) duty and one (1) standby dry pit pumps (4 pumps total) to achieve the rated firm capacity of 2,100 L/s. The existing SPS will be decommissioned after construction of the new SPS is complete.

The new SPS is proposed to be accessible from the at-grade driveway from Ebenezer Road. The new SPS will consist of a dry well access area, HVAC area (building mechanical room), wet well access area, washroom and completely sealed electrical and control room. The sub-grade level of the new SPS will consist of an inlet distribution channel complete, two (2) identical gravity separation cells for grit and FOGs management, intermediate flow distribution channels complete with channel grinders, followed by distribution channels to the wet well cells. The sub-grade structure also includes two (2) identical emergency overflow tanks for emergency overflow storage to meet the Region's 2 hour emergency overflow storage in the catastrophic failure of the SPS. The sub-grade structure also includes the dry well, where the major process equipment including the pumps, pipes and valves and located.

It should be indicated that the end of the cul-de-sac of Ebenezer Road was briefly considered as a potential location for the new McVean SPS. This location was quickly dismissed as the following major and operational infrastructure is present within this right-of-way, which is also shown in Figure 5-3 :

1. Existing 500mm diameter forcemain (shown in pink on Figure 5-3).
2. Existing 900mm diameter forcemain (shown in pink on Figure 5-3).
3. New 1,200mm diameter forcemain (shown in pink/ green on Figure 5-3).
4. Existing 600mm diameter storm sewer (shown in green on Figure 5-3).

Figure 5-3: Existing Linear Utilities Surrounding the McVean SPS, Located on Ebenezer Road

Emergency Overflow Storage Implications

This alternative includes two (2) identical emergency overflow tanks, each measuring approximately 10 m wide by 40 m long, will provide approximately 30 minutes of primary storage at 2,100 L/s, within the SPS itself.

This alternative expands the existing earthen emergency storage lagoon's capacity into 2 cells hydraulically connected, from a volume of 4,830 m^3 to approximately 12,000 m^3. This is achieved by raising the existing lagoon berm elevation, combined with a second lagoon cell immediately north of the existing earthen lagoon. This provides a total retention time of approximately 90 minutes of secondary storage (i.e., in the event of a catastrophic failure of the SPS, the overflow tanks integrated with the SPS would be utilized first, followed by a secondary overflow into the earthen emergency storage lagoon cells). The bottom elevation of the new lagoon cell is proposed to be the same as the existing lagoon (±171.00 m), while the top berm of both are proposed to be raised to ±174.10 m, up from ±172.75 m and above the regulatory floodplain at 173.94 m.

The total storage time provided by the new primary overflow tanks and secondary emergency overflow lagoon is approximately 2 hours at 2,100 L/s, as summarized in Table 5-3. The site layout is shown in Figure 5-4.

Table 5-3: Alternative No. 2 Storage Volume and Emergency Response Time

Description	Storage Volume	Emergency Storage Time @ 2,100 L/S	Compliance with Regional Design Guidelines for Emergency Overflow Storage
Existing			
Existing Earthen Emergency Overflow Lagoon	4,830 m^3	38 minutes	×
Proposed – Alternative No. 2			
Primary In-Tank Emergency Overflow Storage	4,000 m^3	32 minutes	-
Secondary Expanded Earthen Emergency Overflow Lagoon	11,120 m^3	88 minutes	-
Total Emergency Storage Achieved	**15,120 m^3**	**120 minutes**	✓

The modification of the existing top berm elevation above the regulatory floodplain, is not preferred, as it impacts the storage volume and direction of flow within the floodplain and may expand the footprint of the regulatory floodplain. This alternative is also not preferred as it significantly impedes on the adjacent TRCA owned property and farmhouse, which is currently farmed and leased. This alternative would require expropriation of TRCA lands as well as the existing farmhouse, which would mean eviction of the existing tenants and ultimately demolition of the farmhouse.

Description of Proposed Permanent Process Flow

Flows will continue to be conveyed to the proposed SPS via an extension of the existing 1,650 mm diameter inlet sewer. From the inlet sewer, flow is discharged into an inlet channel, which distributes flow to the settling tanks for grit and FOGs removal, Following the settling tanks, flow enters a distribution channel where the de-gritted and de-greased sewage passes through a grinder, prior to entering the wet

well. From the wet well, sewage flow is hydraulically conveyed through the pumps in the dry well and out to sanitary collection system via discharge process piping to one of the three forcemains (i.e., primary 1,200mm dia., secondary 900mm dia., or tertiary 500mm dia.).

In the event of a catastrophic failure associated with the SPS, wastewater will flow via gravity into the emergency overflow tanks (within the SPS) first. During a prolonged failure associated with the SPS, sewage will continue to flow via gravity to the expanded emergency overflow lagoon. Once normal operation of the SPS has resumed, sewage stored in the overflow tanks will be conveyed to the wet well, and sewage stored in the earthen storage lagoon will be conveyed to the overflow tanks, then onto the wet well.

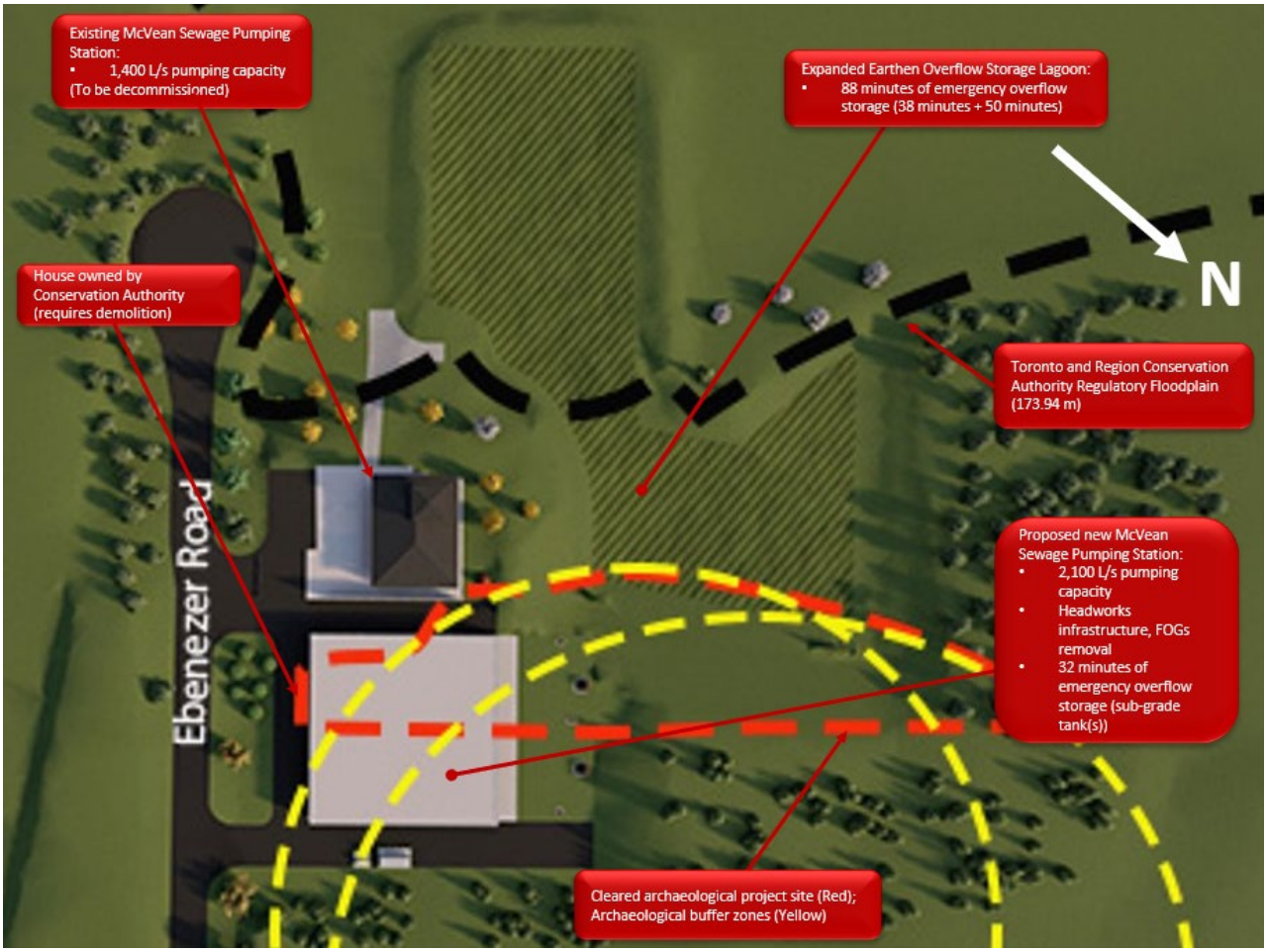


Figure 5-4: Alternative 2 Layout – New SPS and Expansion of Existing Earthen Emergency Overflow Lagoon

5.2.1.3 *Alternative 3: New Mcvean sps (North), Emergency Overflow Lagoon (North-WEST)*

Overview

Alternative 3 proposes construction of a new SPS, complete with headworks infrastructure, north of the existing SPS. The SPS is proposed to consist of a superstructure, with both at-grade and sub-grade levels, similar to Alternative 2.

The new SPS will be designed and constructed in a consistent manner with the station, as described in Alternative 2.

Emergency Overflow Storage Implications

This alternative includes two (2) identical emergency overflow tanks, each measuring approximately 10 m wide by 40 m long, will provide approximately 32 minutes of primary storage at 2,100 L/s, within the SPS itself (i.e., the same as Alternative 2).

This alternative expands the existing earthen emergency storage lagoon's capacity into 2 cells hydraulically connected, from a volume of 4,830 m^3 to approximately 11,120 m^3, the same as Alternative 2. The total storage time provided by the new primary overflow tanks and secondary emergency overflow lagoon is approximately 2 hours at 2,100 L/s, as summarized in Table 5-4.The site layout is shown in Figure 5-5.

Table 5-4: Alternative No. 3 Storage Volume and Emergency Response Time

Description	Storage Volume	Emergency Storage Time @ 2,100 L/S	Compliance With Regional Design Guidelines For Emergency Overflow Storage
Existing			
Existing Earthen Emergency Overflow Lagoon	4,830 m^3	38 minutes	×
Proposed – Alternative No. 3			
Primary In-Tank Emergency Overflow Storage	4,000 m^3	32 minutes	-
Secondary Earthen Emergency Overflow Lagoon Cells	11,120 m^3	88 minutes	-
Total Emergency Storage Achieved	**15,120 m^3**	**120 minutes**	✓

Figure 5-5 shows the expanded lagoon completely inside the existing floodplain. The lagoon expansion in combination with the modification of the existing top berm elevation above the regulatory floodplain is not preferred, as it is located within the regulatory floodplain boundary, currently owned by the TRCA. This alternative, similar to Alternative 2, may also require expansion of the regulatory floodplain boundary. The

main advantage of this alternative over Alternative 2 is that the existing farmhouse does not require expropriation and demolition, nor eviction of the existing tenants.

Description of Proposed Permanent Process Flow

The description of the proposed permanent process flow for Alternative 3, is the same as Alternative 2.

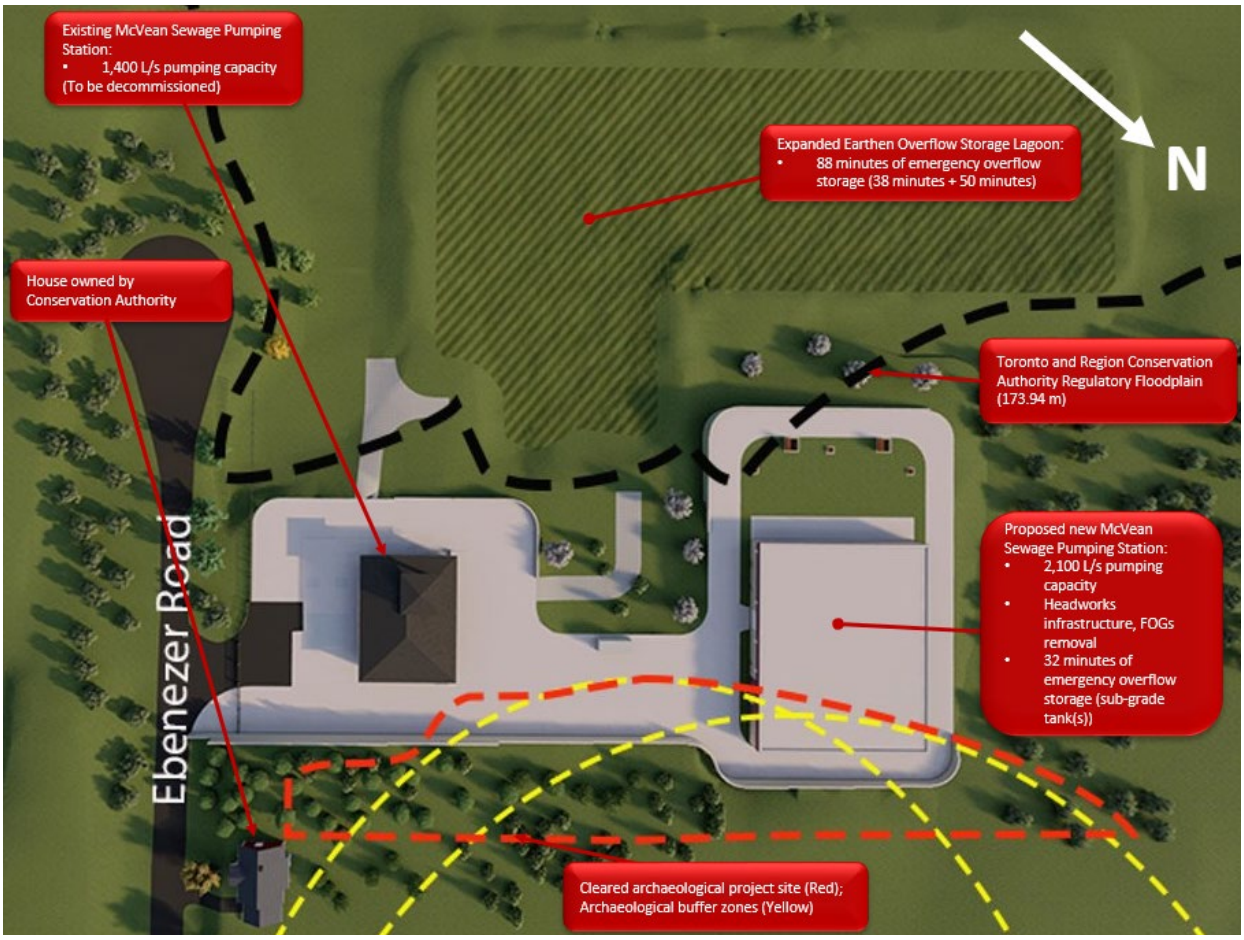


Figure 5-5: Alternative 3 Layout – New SPS and Expansion of Existing Earthen Emergency Overflow Lagoon

5.2.1.4 *Alternative 4: New Mcvean sps, Expanded In-Tank Storage*

Overview

Alternative 4 proposes construction of a new SPS, complete with headworks infrastructure, north of the existing SPS. The SPS is proposed to consist of a superstructure, with both at-grade and sub-grade levels, similar to Alternatives 2 and 3.

Emergency Overflow Storage Implications

This alternative includes two (2) identical emergency overflow tanks (expanded in capacity versus alternatives 2 and 3), each measuring approximately 20 m wide by 52 m long (operational depth – 5m), will provide approximately 82 minutes of primary storage at 2,100 L/s, within the SPS itself.

This alternative maintains the existing earthen emergency storage lagoon's location and capacity of 4,830 m^3. This continues to provide a total retention time of approximately 38 minutes of secondary storage (i.e., in the event of a catastrophic failure of the SPS (or pump clogging or failure of the ATS, etc.), the overflow tanks integrated with the SPS would be utilized first, followed by a secondary overflow into the earthen emergency storage lagoon cells). The bottom and top berm elevation of the existing earthen emergency overflow lagoon cell is to remain at ±171.00 m and ±172.75 m.

The total storage time provided by the new primary overflow tanks and secondary emergency overflow lagoon is approximately 2 hours at 2,100 L/s, as summarized in Table 5-5. The site layout is shown in Figure 5-6.

Table 5-5: Alternative No. 4 Storage Volume and Emergency Response Time

Description	Storage Volume	Emergency Storage Time @ 2,100 L/S	Compliance with Regional Design Guidelines for Emergency Overflow Storage
Existing			
Existing Earthen Emergency Overflow Lagoon	4,830 m^3	38 minutes	×
Proposed – Alternative No. 4			
Primary In-Tank Emergency Overflow Storage	10,290 m^3	82 minutes	-
Existing Earthen Emergency Overflow Lagoon	4,830 m^3	38 minutes	-
Total Emergency Storage Achieved	**15,120 m^3**	**120 minutes**	✓

In this alternative, the existing earthen emergency overflow lagoon remains, while the primary storage is proposed in-tank connected to the new SPS, outside of the regulatory floodplain of the West Humber River. The modified approach to emergency overflow storage represents a net benefit to the project as it significantly mitigates sewage from entering the earthen lagoon during an emergency event. This is because the quantity of primary emergency storage achieved in the sub-grade tanks connected to the SPS has been significantly expanded, while the existing earthen lagoon remains, and can be utilized in an emergency throughout construction of the new SPS.

The additional volume of in-tank emergency storage capacity also offers the Region future/potential opportunities to implement Real Time Control (RTC) within the sanitary collection system. The implementation of RTC offers the Region the following additional benefits:

- Reduction in emergency overflows during extreme wet weather events.
- Opportunities for off-line peak storage. This can be used to either service future growth without the need for future expansions to the SPS, and/or minimize pumping/energy consumption during peak demand times.
- Overall increase in the robustness of the existing sanitary collection system.

Description of Proposed Permanent Process Flow

The description of the proposed permanent process flow for Alternative 4, is the same as Alternatives 2 and 3. The only difference being that with Alternative 4 versus 2 and 3, is that there is significantly less risk associated with sewage flow entering the earthen lagoon (within the TRCA regulatory floodplain), due to the 82 minutes of primary in-tank storage, as opposed to 32 minutes (Alternative 2 and 3).

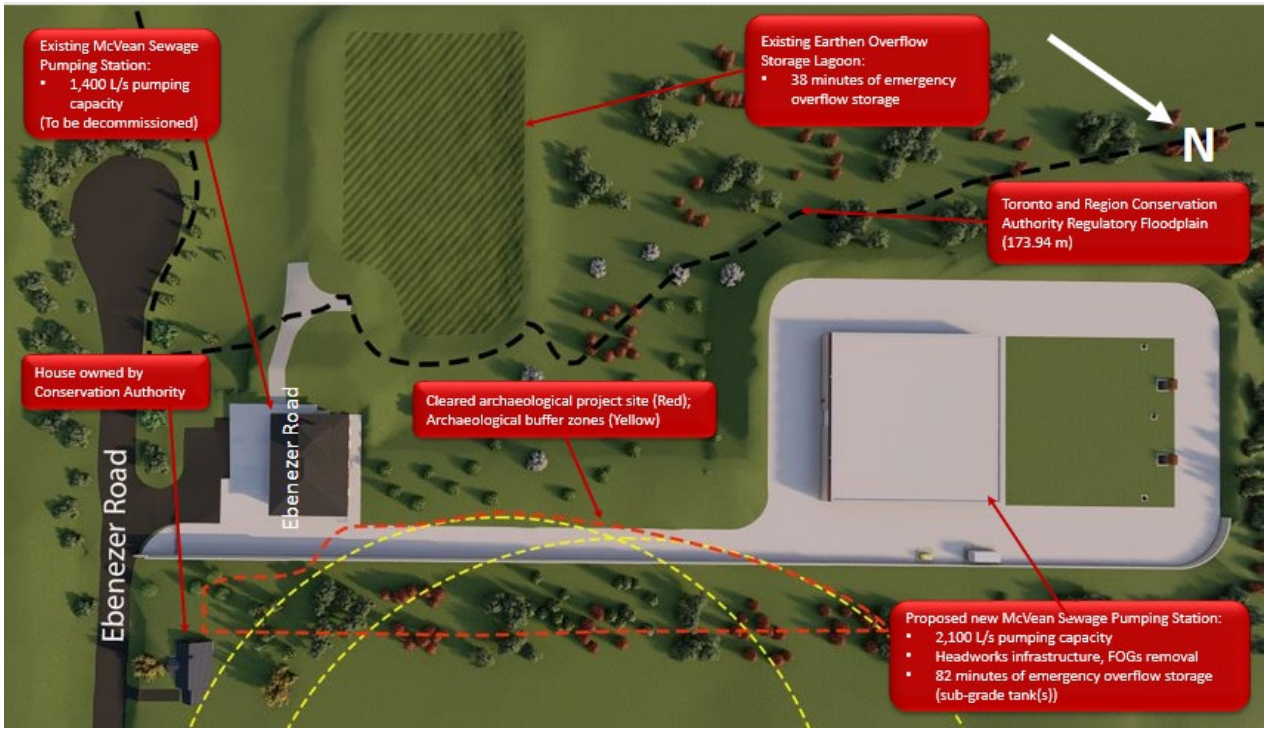


Figure 5-6: Alternative 4 Layout – New SPS, complete with In-Tank Emergency Overflow Storage, Existing Earthen Lagoon (to remain)

5.3 Evaluation of Alternatives

The following sub-sections describe the evaluation process that was used to select the preferred alternative. This section also includes a description of how each alternative solution was evaluated, including a summary of the advantages, disadvantages, or key considerations for each alternative solution.

5.3.1 Approach to Evaluation of Alternative Solutions

The objective of the evaluation process is to identify and recommend a preferred solution. The preferred solution is the alternative that best satisfies the Problem Statement based on the evaluation criteria.

A set of evaluation criteria were identified based on various technical inputs and grouped under four main categories as identified in Table 5-6.

Table 5-6: Evaluation Categories

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

Criteria were developed for each of the evaluation category. Table 5-7 identifies the evaluation criteria used to compare the alternatives.

Table 5-7: Evaluation Criteria

Evaluation Criteria	Description
	Natural Environment Considerations
Proximity to Environmentally Sensitive Areas including Impact to Species at Risk	Means potential for adverse impact(s) to features and areas, which may include significant wetlands, fish habitat, significant woodlands, habitat of endangered species and threatened species, wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social value as a legacy of the natural landscape area (adopted from PPS, 2014). Means potential for adverse impact(s) to features and landforms which include the habitat for species identified as at risk by the Province, in accordance with O. Reg. 230/08.
Impact to Watercourses	Means potential for adverse impact(s) to watercourses and associated tributaries, including ground water and surface water features, to ensure hydrologic functions and linkages are maintained.

Evaluation Criteria	Description
Impact to Vegetation	Means the potential for disruption or removal of shrubbery and other vegetation to accommodate the proposed works.
Potential for Contamination	Means the potential for contamination for each alternative.
GHG Emissions & Carbon Footprint	Means the potential for greenhouse gas emissions and overall carbon footprint of the work.
Social & Cultural Environment Considerations	
Impact to Cultural Heritage Resources	Means the potential for adverse impacts identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may involve features such as structures, spaces, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association (adapted from PPS, 2014).
Land Use / Zoning Compliance	Means the compliance with Provincial, Regional, Municipal, and other agency policies, plans, and regulations. This framework controls the use of land and directs development to appropriate locations. This criterion will also consider the extent of any required amendments to land use or zoning regulations.
Traffic Impacts During Construction	Means the severity of adverse construction impacts on adjacent land uses, specifically traffic congestion.
Noise Impacts During Construction	Means the severity of adverse construction impacts on adjacent land uses, specifically noise pollution.
Dust Impacts During Construction	Means the severity of adverse construction impacts on adjacent land uses, specifically dust.
Removal of Recreational Space (Private or Public)	Means the amount of private or public recreational space which will be removed for both the pumping station and forced main alignment.
Economic Considerations	
Capital Costs	Means the capital costs required to acquire land, obtain necessary approvals and permits, and construct each option.
Life Cycle (Maintenance) Costs	Means the project life cycle (maintenance) costs of each alternative including operational costs such as electricity usage.
Technical Considerations	
Constructability	Means challenges or risks associated with undertaking construction.
Impact to Existing Utilities	Means the impact of each alternative to existing utilities. An alignment within an existing road right-of-way will have a greater impact on existing utilities.
Permits and Approvals	Means the ability to obtain and number of required permits and approvals for the project.
Land Purchase Requirements	Means the area of land that will require purchasing for each alternative.
Ease of Maintenance and Operations	Means the ability to operate and maintain the site after construction, including site access.

A scoring approach was determined to evaluate the alternatives based on the criteria. Scores between one and three was used, with a score of one as the least preferred and a score of three as the most

preferred. Table 5-8**Error! Reference source not found.** presents the colour-coding which corresponds to the respective assigned score. The evaluation matrix can be found in Table 5-9 on the following page.

Table 5-8: Scoring Legend

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

Table 5-9: Evaluation Matrix- Alternative Design Solutions

	Alternative 1			Alternative 2		Alternative 3		Alternative 4	
	Rationale	Score	Weighted Score	Rationale	Score	Rationale	Score	Rationale	Score
Natural Environment Considerations									
Proximity to Environmentally Sensitive Areas including Impact to Species at Risk	Alternative 1 was not evaluated as it did not comply with two (2) of the projects overall objectives with respect to grit and FOGs management, as well as emergency overflow capacity.			All 3 alternatives are the same. No significant designated natural areas were identified within the study area. Woodlands and valley lands were identified north and west of the study area, but they are unlikely to be impacted. Records for seventeen species at risk were found for the study area with five endangered species, five threatened species, and seven species of special concern. However, minimal impacts to species at risk are expected at the project site.	2	All 3 alternatives are the same.	2	All 3 alternatives are the same.	2
Impact to Watercourses				The proposed upgrades will route incoming sewage flows from Ebenezer Road to the new SPS east of the existing SPS. The proposed lagoon expansion will integrate the existing footprint, with an expansion currently outside the regulatory floodplain. The expanded lagoon's berm's will be raised above the elevation of the regulatory floodplain, impacting the existing storage volume and path of flow of the floodplain, which is not preferred. During construction, the existing lagoon will not be able to be utilized for emergency storage capacity.	1	The proposed upgrades will route incoming sewage flows from Ebenezer Road to the new SPS east of the existing SPS. The proposed lagoon expansion will integrate the existing footprint, with an expansion currently inside the regulatory floodplain. The expanded lagoon's berm's will be raised above the elevation of the regulatory floodplain, impacting the existing storage volume and path of flow of the floodplain, which is not preferred. During construction, the existing lagoon will not be able to be utilized for emergency storage capacity.	1	The proposed upgrades will route incoming sewage flows from Ebenezer Road to the new SPS north of the existing SPS. The existing lagoon will remain as is, while approximately 70% of the emergency overflow storage capacity will be achieved within an in-tank sub-grade structure connected to the new SPS, outside of the regularity floodplain.	3
Impact to Shrubbery and other Vegetation				Some shrubbery and vegetation will be impacted by the construction of the new SPS, east of the existing SPS, as well as by the expansion of the existing lagoon. Restoration works will be required after construction is complete, including a loss of planting within the area of the expanded earthen lagoon.	2	Shrubbery and vegetation will be impacted by the construction of the new SPS, north of the SPS, as well as by the expansion of the existing lagoon within the TRCA regulatory floodplain. Significant restoration works will be required after construction is complete, including a loss of planting within the area of the expanded earthen lagoon.	1	Shrubbery and vegetation will be impacted by the construction of the new SPS, north of the existing SPS. Restoration works will be required after construction is complete, including compensation on recent restoration planting efforts by the TRCA.	2
Potential for Contamination				The risk of contamination during construction may occur during the expansion of the existing earthen lagoon, when it cannot be utilized for emergency overflow purposes. There is minimal risk of contamination during regular operations.	2	The risk of contamination during construction may occur during the expansion of the existing earthen lagoon, when it cannot be utilized for emergency overflow purposes. There is minimal risk of contamination during regular operations.	2	The risk of contamination during construction is minimal, given that the existing earthen lagoon can continue to be utilized for emergency overflow purposes. There is minimal risk of contamination during regular operations.	3
GHG Emissions & Carbon Footprint				All 3 alternatives are the same. Greenhouse gases will be emitted by the operation of heavy construction vehicles throughout the duration of construction. Upgrades are not expected to significantly increase greenhouse gas emissions compared to existing station, especially considering the improved hydraulic and emergency efficiency per kWh the pumps and station operation are being designed for. The emergency generator is sized and selected to accept both diesel fuel and natural gas.	2	All 3 alternatives are the same.	2	All 3 alternatives are the same.	2

Climate Change Mitigation and Prepardness		All alternatives offer similiar energy efficient pump selection, building material construction, as well as implementation of grit and ROGs removal, which increases the robustness of the downstream sewer network. There will also be the implmentation of solar roof-top panels for carbon offsetting. This option locates the emergency overflow outside of the existing floodplain of the TRCA, in an earthen style lagoon. While not further impacting the flow path and Regional floodplain elevation, this option does not offer the Region real-time control capabilities.	2	All alternatives offer similiar energy efficient pump selection, building material construction, as well as implementation of grit and ROGs removal, which increases the robustness of the downstream sewer network. There will also be the implmentation of solar roof-top panels for carbon offsetting. This option locates the emergency overflow all within the existing floodplain of the TRCA, in an earthen style lagoon, thereby potentially impacting the flow path and Regional floodplain elevation.	1	All alternatives offer similiar energy efficient pump selection, building material construction, as well as implementation of grit and ROGs removal, which increases the robustness of the downstream sewer network. This alternative offers the utilization of real-time control of the proposed emergency overflow tank(s). This is the most significant long-term potential for reduction of climate change impacts. Strategies which include off-peak demand pumping can be utilized not only at this SPS, but also throughout the downstream treatment system. Real-time control can help to minimize peak energy demands, smooth out / minimize energy requirements for this station and downstream treatment infrastructure. There will also be the implementation of solar roof-top panels for carbon offsetting.	3
Social & Cultural Environment Considerations							
Impact to Cultural Heritage Resources	Alternative 1 was not evaluated as it did not comply with two (2) of the projects overall objectives with respect to grit and FOGs management, as well as emergency overflow capacity.	All 3 alternatives are the same. The Toronto and Region Conservation Authority (TRCA) has identified archaeologically sensitive areas east of the McVean SPS site. Construction will not encroach on archaeologically sensitive lands. Stage 1, Stage 2 and Stage 3 Archaeological Assessments have been completed for the project site, and has cleared the project site of an archaeological concerns.	3	All 3 alternatives are the same.	3	All 3 alternatives are the same.	3
Land Use / Zoning Compliance		Per Section 6.10 of the City of Brampton Zoning By-law 270-2004, the proposed structures and sewer construction works are generally exempt from the requirements of the By-law.	3	Per Section 6.10 of the City of Brampton Zoning By-law 270-2004, the proposed structures and sewer construction works are generally exempt from the requirements of the By-law.	3	Per Section 6.10 of the City of Brampton Zoning By-law 270-2004, the proposed structures and sewer construction works are generally exempt from the requirements of the By-law.	3
Traffic Impacts during Construction		There will be construction vehicle traffic through Ebenezer Road.	2	There will be construction vehicle traffic through Ebenezer Road.	2	There will be construction vehicle traffic through Ebenezer Road.	2
Noise Impacts during Construction		There will be noise from heavy machinery during construction.	2	There will be noise from heavy machinery during construction.	2	There will be noise from heavy machinery during construction.	2
Dust Impacts during Construction		There will be dust impacts during excavation.	2	There will be dust impacts during excavation.	2	There will be some dust impacts during excavation, however not nearly as much as alternatives 2 and 3 due to a much lesser excavation required as the existing earthen lagoon is to remain.	1
Removal of Recreational Space (Private or Public)		By expropriate and evection of the TRCA's existing tenant in the farmhouse, this resident will no longer have enjoyment of the lands, nor the ability to farm.	1	No removal of recreational space, either private or public, is anticipated.	3	No removal of recreational space, either private or public, is anticipated.	3
Economic Considerations							
Capital Costs	Alternative 1 was not evaluated as it did not comply with two (2) of the projects overall objectives with respect to grit and FOGs management, as well as emergency overflow capacity.	The high-level conceptual construction cost estimate for the proposed works, including permitting and traffic management is approximately $65.9 million. This cost estimate includes monies for expropriation of lands and evection of an existing tenant in the TRCA farmhouse.	1	The high-level conceptual construction cost estimate for the proposed works, including permitting and traffic management is approximately $64.9 million.	2	The high-level conceptual construction cost estimate for the proposed works, including permitting and traffic management is approximately $74.2 million.	1
Life Cycle (Maintenance) Costs		As the design life of a gravity sewer is typically between 80 and 100 years, life cycle (maintenance) costs for a gravity sewer is negligible. Pumping combined with vacuum excavation will be required monthly to remove accumulated grit and grease in the settling tank. The expanded earthen lagoon will require maintenance, depending on the frequency of overflow events.	2	As the design life of a gravity sewer is typically between 80 and 100 years, life cycle (maintenance) costs for a gravity sewer is negligible. Pumping combined with vacuum excavation will be required monthly to remove accumulated grit and grease in the settling tank. The expanded earthen lagoon will require maintenance, depending on the frequency of overflow events.	2	As the design life of a gravity sewer is typically between 80 and 100 years, life cycle (maintenance) costs for a gravity sewer is negligible. Pumping combined with vacuum excavation will be required monthly to remove accumulated grit and grease in the settling tank. While the expanded earthen lagoon will require less maintenance, depending on the frequency of overflow events (as it will not be utilized as much as alternatives 2 and 3), the expanded capacity of the emergency overflow tanks will require more operations and maintenance. However, this alternative offers the most benefit in terms of RTC, which can mitigate future system wide expansion and operability costs in the long term.	3
Technical Considerations							

Constructability	Alternative 1 was not evaluated as it did not comply with two (2) of the projects overall objectives with respect to grit and FOGs management, as well as emergency overflow capacity.	The new SPS will be located on the east side of the existing SPS. This will require construction of a new retaining wall and easement on the adjacent TRCA owned lands. While this alternative will not impact operation of the existing SPS, it does expand the existing earthen lagoon. As a result, the existing earthen lagoon will not be able to be utilized during an emergency overflow event during construction.	2	The new SPS will be located on the north side of the existing SPS. This will require construction of a new retaining wall and easement on the adjacent TRCA owned lands. While this alternative will not impact operation of the existing SPS, it does expand the existing earthen lagoon. As a result, the existing earthen lagoon will not be able to be utilized during an emergency overflow event during construction.	2	The new SPS generally be located on the north side, away from the existing neighbouring residential building, however the construction of the retaining wall and the associated easement will require additional construction effort. This alternative does not expand the existing earthen lagoon either. This alternative does not impact the operation of the existing SPS, nor the existing emergency overflow storage capacity of the existing lagoon.	3
Impact to Existing Utilities		Minimal impact to utilities due to a large portion of construction occurring north of the McVean SPS.	3	Minimal impact to utilities due to a large portion of construction occurring north of the McVean SPS.	3	Minimal impact to utilities due to a large portion of construction occurring north of the McVean SPS.	3
Permits and Approvals		Permits and approvals will be required from the MECP, City of Brampton, and TRCA. City of Brampton building permits will be required. Permitting will be the most difficult as expropriation and evection of an existing tenant will be required as part of this alternative.	1	Permits and approvals will be required from the MECP, City of Brampton, and TRCA. City of Brampton building permits will be required. A permit to construct and modify within the existing regional floodplain complete with mitigation will be required.	2	Permits and approvals will be required from the MECP, City of Brampton, and TRCA. City of Brampton building permits will be required.	3
Land Purchase Requirements		The purchase of land owned by the TRCA will be required. This alternative also requires expropriation and evection of the existing tenant from the farmhouse located on TRCA land.	1	The purchase of land owned by the TRCA will be required.	2	The purchase of land owned by the TRCA will be required.	2
Ease of Maintenance and Operations		A new driveway providing access to the new SPS will be installed. However, access to the north and west side of the existing SPS control building will be more limited due to the location of the lagoon.	2	A new driveway providing access to the new SPS will be installed. However, access to the north and west side of the existing SPS control building will be more limited due to the location of the lagoon.	2	A new driveway providing access to the new SPS will be installed. The new driveway will be integrated into the existing access road to the lagoon. By providing approximately 70% of the emergency storage capacity within an in-tank solution, operation and maintenance of the station, including cleaning following an emergency overflow event limited to the tank(s), becomes much easier. The inclusion of the in-tank emergency storage design permits removal of one of the grit tank / wet well trains to be removed from service while maintaining 82 minutes of emergency storage capacity. This alternative also provides the Region with the most future operational flexibility in terms of RTC.	3
TOTAL OUT OF 54	**N/A**	**36**		**39**		**47**	

Note 1:Appendix J shows a detailed cost breakdown for Alternative 2
Note 2: Appendix K shows a detailed cost breakdown for Alternative 3
Note 3: Appendix L shows a detailed cost breakdown for Alternative 4

6 Detailed design Considerations

Key design considerations for preferred alternative no. 4 are presented within this section.

6.1 Civil

6.1.1 Existing Site Conditions

The McVean SPS plays a vital role in the local wastewater management system. The station receives wastewater flows through gravity sewers with diameters of 1,500 mm and 750 mm, both strategically located along Ebenezer Road.

The emergency overflow earthen storage lagoon, with a volumetric capacity of 4,830 m^3, serves as a temporary containment facility for excessive wastewater flows when the pumping station's capacity is surpassed, or during significant operational issues.

6.1.2 Proposed Site Development

The new McVean SPS, complete with headworks infrastructure and twin emergency overflow tanks, is proposed to be located north of the existing station. The new SPS is proposed to include a wet well / dry well style pumping station, complete with inlet distribution channel with integrated rock trap, dual grit settling and grease removal tanks, intermediate flow distribution channels, each complete with channel grinders prior to discharging the de-gritted and de-greased sewage into the wet well. The dry well is complete with dry pit submersible pumps, process piping and valves. An at-grade superstructure will be erected above the sub-grade structure, housing the equipment removals room, wet well access and odour control room, completely sealed electrical and control room, building mechanical room, and washroom.

The new SPS will be complete with emergency power generation in the form of a bi-fuel generator, where the primary source of fuel will be natural gas. Should natural gas not be available, the generator can run on diesel fuel. The generator will be an exterior type, housed within a weatherproof and sound proof enclosure.

The proposed conveyance strategy involves extending the existing 1,650mm dia. inlet trunk sewer north of the existing SPS, to the inlet works of the new SPS. From the SPS, sewage will be pumped via the three (3) duty, one (1) standby pump into any of the three forcemains (i.e., the existing 500mm dia. and 900mm dia., or the newly constructed 1,200mm dia. [scheduled for completion by Quarter 1 of 2025]).

To facilitate the gravity connection of the emergency overflow infrastructure, drainage and return site sewers will be constructed to and from the new emergency overflow tanks to the existing earthen emergency overflow storage lagoon.

Lastly, the construction of a new paved access road is planned to link the new SPS to Ebenezer Road. This road will trace the facility's perimeter, granting truck access to the grit and grease removal suction lines on the northern and southern sides of the facility, as well as enabling equipment installation and

removal. The main entrance will be from the north-east perimeter of the site, and will require the installation of a retaining wall in order to minimize impact to the adjacent TRCA property and existing house. Refer to Figure 6-1 for the layout of the proposed new McVean SPS.

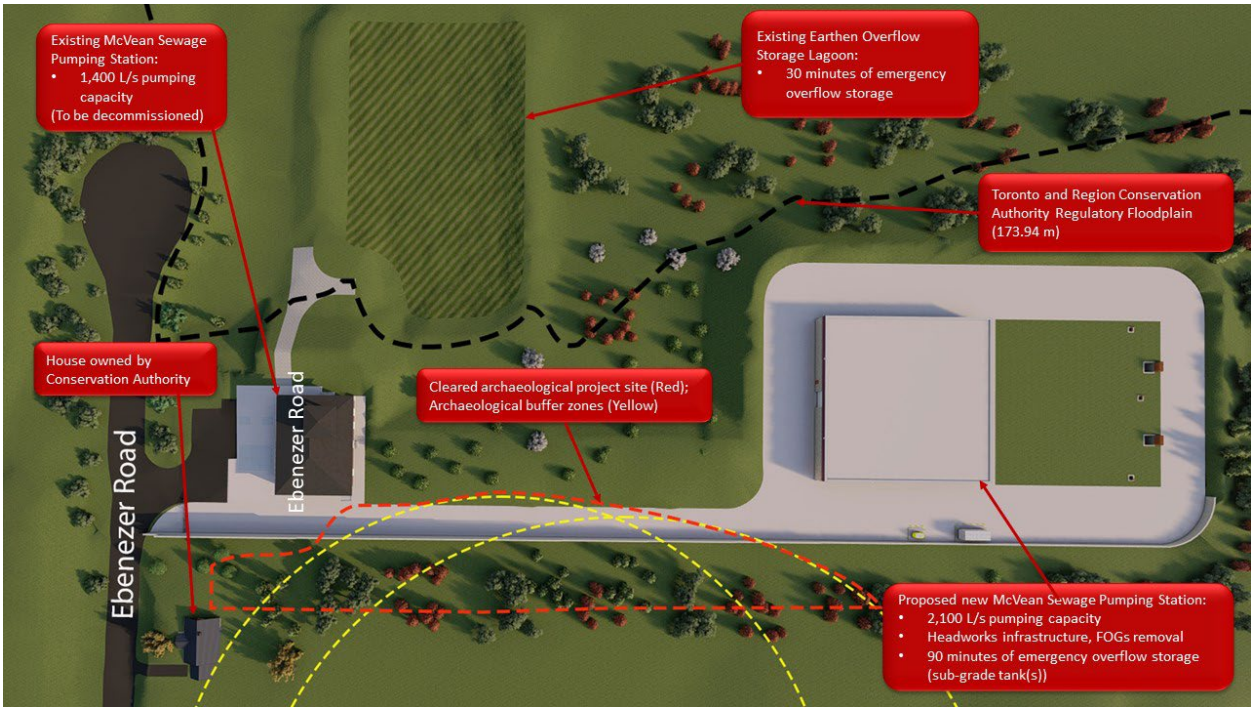


Figure 6-1: Layout Plan of the Preferred Alternative for the McVean SPS Project

6.1.3 Civil Site Serving

To accommodate the increased flow capacity and comply with the Region's sewage pumping station design standards, several modifications to the site piping will be implemented. These modifications aim to enhance the overall functionality and performance of the system. Key site servicing modifications include:

1. Extension of the existing 1,650 mm diameter gravity sewer line to efficiently convey sewage to the new SPS. This new sewer line will be designed in accordance with the Region's Linear Infrastructure – Gravity Sewer Design Criteria.
2. Tie-in of new 1,200 mm station forcemains to the existing 900 mm forcemain and proposed 1200 mm forcemain
3. Integration of an overflow conveyance system that would fill the subgrade overflow tanks first, then if necessary would convey additional flows to the existing overflow lagoon. It would then return flows back to the overflow tanks via gravity once the event has subsided.

6.1.4 Grading and Drainage Design

The grading and drainage design for the site, which is less than 10 hectares, closely adheres to the Region of Peel Public Works Stormwater Design Criteria and Procedural Manual. This comprehensive approach ensures effective management of stormwater runoff, reduced flooding risks, and enhanced

long-term resilience in the face of potential climate change impacts. A systematic methodology will be implemented to ensure compliance with regulatory requirements and address the specific needs of the site and its surroundings.

6.2 Process Mechanical

The new SPS will receive flows via a 1,650 mm diameter gravity sewer from Ebenezer Road. Within the SPS, the flows will enter an inlet channel, complete with integrated gravity rock trap, which splits into two separate parallel trains. Each train directs flow to one of the grit settling and grease removal tanks. De-gritted and de-greased flows then exit each respective tank via an intermediate flow distribution channel equipped with a duty grinders (complete with a bypass channel equipped with a manually raked bar screen in the event of a grinder failure). In the event that flows exceed the capacity of the grinders, excess flows will pass overtop the weir and enter the grinder bypass channel where the bar screen will remove any large debris.

The de-gritted, de-greased and grinded/screened flows will discharge to the two (2) wet well cells. In addition, slide gates are provided immediately upstream of each wet well cell for isolation purposes. A dry well submersible pumping system (3 duty pumps, 1 standby pump) will discharge flows from the wet well via twin 1200 mm diameter station common discharge headers. The discharge headers are connected to each of the 3 forcemains via a sub-grade chamber manifold, which allows for isolation of each forcemain.

6.2.1 Grit and Fogs removal Design

The grit settling system is designed to use two (2) identical gravity tanks. Each cell consists of a settling zone and inlet zone, separated by a baffle. No settling occurs in the inlet zone. The inlet zone has been preliminarily sized to have a surface area approximately twice that of the cross-sectional area of the incoming pipe to prevent backflow.

Grit will be removed from the base of the tank either via fluidized pumping, or by mechanical equipment (e.g., clam shell bucket), and discharged into either a storage bin, or directly to a septage haulage trunk.

A skimmer pipe will be installed in each grit settling tank to remove floating fats, oil and grease (FOG). The skimmer pipe will be designed to have perforations set at the operational level of the grit settling and grease removal cells. FOG will drain off the surface of the wastewater into the skimmer pipe and drains to grease collection cells.

A suction pipe will be installed within each grease collection cell, terminating at the exterior of the building to allow for FOG removal via vacuum truck.

6.2.2 Wet Well

The wet well is a dual-cell rectangular cast-in-place structure sized to accommodate the operating levels at the design capacity of the SPS at 2,100 L/s. The finished floor elevation is proposed to be at an elevation of 165.0 m with interior dimensions measuring approximately 8.5 m x 12 m for each cell. Each wet well cell is accessible via an equipment and access hatch and ladder at grade level.

The proposed pumping station will include four (4) dry well submersible pumps (three (3) duty, one (1) standby), each equipped with inverter duty rated motor to accommodate the proposed variable frequency drive (VFD) motors. As per the MECP criteria and pump manufacturers guidelines, the wet well should be designed with sufficient volume to allow for a ten-minute pump cycle time.

6.2.3 Pumping System

A 4-pump system (3 duty, 1 standby) will be used to achieve the firm capacity of 2,100 L/s. The station will have the capability to discharge to all three (3) forcemains, including the existing 500mm dia. and 900mm dia., and the new 1,200mm dia. The pumping station will operate on a duty rotational basis and will be equipped with primary Milltronics / Radar level control, and secondary (back-up) float level control.

6.2.4 Process Piping and Forcemain

Each of the four (4) dry well submersible pumps will be equipped with an individual 900 mm diameter suction header, which reduces to a 500mm suction inlet to each respective pump. Each pump is equipped with a 400mm diameter discharge spool piece, which increases via a 400mm x 750mm diameter eccentric increaser to a 750mm diameter discharge header. Each suction header is equipped with a motorized bi-directional knife gate valve, and each discharge header is equipped with a check valve and motorized plug valve. Each set of pumps' individual discharge headers meet at a common 750 mm diameter header, equipped with flow meter and motorized plug valve.

The twin headers then expand to twin 1,200 mm diameter headers, connecting via a sub-grade manifold to the existing 500mm and 900 mm diameter and new 1,200 mm diameter forcemains.

6.2.5 Emergency Overflow

The Headworks Facility provides two (2) rectangular emergency overflow storage cells, designed to receive flow from overflow weirs along the intermediate channel immediately upstream of the wet wells.

Each overflow cell has base dimensions of approximately 20m (W) x 52 m (L) x 5m (operational depth). The total capacity of the two (2) overflow tanks are approximately 10.3 m^3, which equates to approximately 82 minutes of emergency storage capacity at the 2,100 L/s peak design flowrate. Secondary gravity storage is present within the existing earthen emergency overflow lagoon in the event of a prolonged SPS failure. The existing emergency storage lagoon will provide 38 minutes of storage at the peak flow rate of 2,100 L/s.

In the event of a catastrophic failure associated with the SPS, sewage overflows in the overflow tank(s). In the event the tanks reach their capacity, secondary emergency overflow storage is present in the existing earthen emergency overflow lagoon. Once the SPS returns to normal operations and flow subside, the existing earthen lagoon will drain via gravity into the emergency overflow tanks, and finally back into the wet well(s).

6.3 Structural

The structural design of proposed McVean SPS will be designed to conform to the current Ontario Building Code (OBC), the National Building Code of Canada (NBCC), the requirements of Occupational Health and Safety Act (OHSA) and local regulations. The codes, standards and regulations that would be considered for the structural design of the plant components are as follows:

- National Building Code of Canada 2015 (NBCC 2015)
- CSA – A23.3-14 – Design of Concrete Structures
- Cement Association of Canada (CAC) Concrete Design Handbook, Fourth Edition
- CAN/CSA – S16-14 Limit States Design of Steel Structures
- Canadian Institute of Steel Construction (CISC) Handbook of Steel Construction, Eleventh Edition
- Ontario Building Code, O. Reg. 332/12
- ACI 350-20: Code Requirements for Environmental Engineering Concrete Structures and Commentary

Foundation Considerations include Foundation Design and Groundwater. Structural Design Criteria includes Ontario Building Code Importance Factor and Structural Design Loading. Loads considered under structural design include Live Load, Snow Loading, Seismic Loading, Wind Loading, Miscellaneous Design Loadings, Deflections, Vibrations, and Corrosion. Underground Structures are an additional important consideration. Construction Considerations include uplift resistance, waterproofing and chemical resistant coating, miscellaneous finishes + fitting and services, concrete, metal.

6.4 Architectural

The proposed SPS will be designed in conformance with the current Ontario Building Code (OBC), NFPA 820: Standard for Fire Protection and Wastewater Treatment and Collection Facilities, the Region of Peel SPS Design Standards, the requirements of Occupational Health and Safety Act (OHSA) and local regulations.

With regards to materials and finishes, durability and longevity are the two driving factors. High quality materials and finishes are specified, minimizing future maintenance.

For aesthetics, the massing and finishes, the proposed SPS will compliment the existing SPS. Similar masonry cladding is specified, both simulated stone and clay brick. A flat roof with reinforced modified bitumen roofing is specified.

Exterior Building Materials and Finishes includes Walls, Roof, Doors, Overhead Coiling Doors, Windows, and Louvers. Interior Building Materials include Doors and Finishes.

6.5 Building Mechanical

6.5.1 Design Codes and Standards

The following Codes and Standards are applicable and will be used as reference in the development of this report and the:

- Ontario Building Code (OBC)
- Ontario Fire Code (OFC)
- National Fire Protection Association (NFPA)
  - NFPA 10 - Standard for Portable Fire Extinguishers
  - NFPA 820 – Standard for Fire Protection in Wastewater Treatment and Collection Facilities
- ASHRAE 62.1 – Ventilation for Acceptable Indoor Air Quality

6.5.2 Odour Control Unit

The existing biofilter odour control unit is to be replaced by a new Granular Activated Carbon (GAC) unit. The demolition of the biofilter will also require the removal of the 2-25 mm water conduits currently servicing the existing system, removal of the drain sump pumps and piping to the septage receiving station and removal of the 600 mm PVC duct.

The proposed odour control unit will provide 6000 CFM for the volume of the wet well. It is proposed that the new SPS will be complete with two (2) – 6000 CFM odour until which will operate on a rotational duty / standby basis.

6.5.3 HVAC Design and Control

The new SPS will be equipped with all necessary Heating, Ventilation and Air Conditioning (HVAC) equipment and control systems to maintain ambient building temperature and humidity levels throughout the year. The HVAC system will be controlled via a centralized programmable controller, with allowances for individual equipment to be run manually as well. The controller will be responsible for the automatic sequencing of all HVAC systems within the station. The controller will also continually monitor the status of all HVAC equipment and will report an error when a piece of equipment is not operating within expected parameters. Depending on the severity of the errors, the station Programmable Logic Controller (PLC) will receive a fault signal to alert the Region's operators that there is an issue.

Communication between the HVAC controller and the station PLC controllers will also be included. Primary ventilation system run / fault status' will be sent to the station PLC, and gas detection alarms will be received by the HVAC controller. With the exception of the Wet Well, upon receipt of a gas detection alarm the appropriate HVAC system will activate to provide ventilation air to the space. The ventilation air will be tempered to ensure that it does not drop the temperature of the room below the desired setpoint value.

The building heating/cooling systems will continue to function regardless of occupancy/ventilation status in order to maintain the previously identified temperature setpoints.

6.6 Electrical

6.6.1 Codes and Standards

The electrical design of the new SPS will conform to the following latest codes and standards:

- Ontario Electrical Safety Code – (2021)
- Ontario Building Code – (2022)
- National Fire Code of Canada
- Applicable CSA Standards
- NFPA 70E for Arc Flash Protection
- NFPA 820 'Standard for Fire Protection in Wastewater Treatment and Collection Facilities
- Electrical Safety Authority - (ESA)
- Applicable Illumination Engineering Society (IES) Standards
- Region of Peel, Sewage Pumping Station Design Standards, Version 1.0, July 30, 2021
- Requirements of local Hydro Utility

Important considerations include Power Supply Strategy, Headworks Design Loads, Utility Service Entrance, Motor Control Centre (MCC), Variable Frequency Drive and Motor Starters, Power and Lighting, Standby Generator, Arc Flash Hazards, and Electrical Area Classification.

6.7 Instrumentation

The existing instrumentation and control system at the new McVean SPS will be composed of an Instrumentation Control Panel (ICP), Float Backup Control Panel, process instrumentation, and gas detection sensors. All the existing system components will be removed and disposed during construction and a new panels and instrumentation will be provided as part of the station upgrades.

The following documentation will be utilized as part of the instrumentation, control, and SCADA design of the McVean SPS:

- Sewage Pumping Station Design Standard, v1.1 – April 16, 2022, by Region of Peel
- Process Automation and Instrumentation Design Standards (PAIDS), v6, by Region of Peel

The instrumentation, control, and SCADA system at McVean SPS will include the following components:

- Control Panels
- Instrumentation for Process and Pumping Station Services

- Communication Equipment

Combustible Gas Detection, I/O Requirements, Alarm System, Communications, Process Control Narrative are additional important design considerations.

7 Climate Change Mitigation and Preparedness

A climate change mitigation approach to the alternatives, and ultimately the preferred alternative, was completed as part of this Class EA process. The approach to climate change mitigation was conducted in a consistent manner with the Ontario Ministry of Environment, Conservation and Park's EA program's Guides and Codes of Practise, with respect to *Considering climate change in the environmental assessment process*, as described below.

As a basis of the approach taken, the 2014 Provincial Policy Statement issued under *the Planning Act* was considered with respect to the following:

- Policies 1.6.2, 1.6.6.7 — Encourage green infrastructure (e.g. permeable surfaces) and strengthen stormwater management requirements.
- Policy 1.8 — Require the consideration of energy conservation and efficiency, reduced greenhouse gas emissions and climate change adaptation (e.g. tree cover for shade and for carbon sequestration).
- Policy 3.1.3 — Requires consideration of the potential impacts of climate change that may increase the risk associated with natural hazards (e.g. flooding due to severe weather).

More specifically, Section 3 of the Guide, was applied on the basis of the 5 following criteria:

1. Atmospheric emissions, including greenhouse gases, and impacts on carbon sequestration.
2. Impacts on climate change in project planning.
3. Alternative methods to implement the project that would reduce any adverse contributions to a changing climate.
4. Climate change impacts on Indigenous people and/or communities.
5. Long term reduction of climate change impacts following project implementation.

7.1 Atmospheric Emissions, Including Greenhouse Gases, and Impacts on Carbon Sequestration.

Atmospheric emissions modelling was completed as part of this Class EA process. Equipment at the proposed SPS was subject to section 20 of Ontario Regulation 419/05. The modelling scenario, for the relevant averaging period, assumed operating conditions for the Facility that result in the highest concentration of each significant contaminant at a Point of Impingement (POI). A POI concentration for each significant contaminant emitted from the SPS, regardless of the alternative, was predicted based on the emission rate estimates and the output from the dispersion model. The predicted POI concentrations in the Emission Summary Table were compared against the applicable section 20 standards and guidelines listed as Benchmark 1 in the Air Contaminants Benchmark (ACB) List, dated April 2023, and they are below their corresponding Ministry POI Limit. The atmospheric modelling report, appended to this Class EA report, demonstrates that the SPS can operate in compliance with section 20 of Ontario Regulation 419/05. It should be indicated that the proposed emergency generator for all alternatives is a bi-fuel generator. The implementation of a bi-fuel generator further mitigates atmospheric emissions of

green house gases, as natural gas will be the primary source of fuel for the generator, with diesel being the secondary source. The Emissions Summary and Dispersion Modelling Report has been included in **Appendix M**.

With respect to carbon sequestration, all alternatives will contain the following recommendations:

- Sodding / seeding on top of the emergency overflow tank.
- Additional tree planting outside the perimeter of the project building.

Both of these initiatives will contribute to the offsetting impacts of carbon sequestration post-development.

7.2 Impacts on Climate Change in Project Planning.

The following considerations were implemented during the evaluation of the alternatives and selection of the preferred alternative, as part of project planning:

- Full compliance with the Ontario Building Code for emergency efficient building envelope design to minimize heating, air conditioning and ventilation (HVAC) requirements. This include full classification of the wet well and dry well areas to minimize, as per the National Fire Protection Association (NFPA) requirements, ventilation requirements, which offers significant energy savings.
- Full compliance with the Toronto and Region Conservation Authority's (TRCA) Guidelines for Determining Ecosystem Compensation. This includes a full plan for additional tree species plantings around the project site.
- Fully compliance with the TRCA's Stormwater Management Criteria, including the implementation of a comprehensive stormwater management plan during construction and post-construction for quantity and quality control. This includes protection of the West Humber river with temporary stormwater runoff controls during construction, and the implementation of stormwater runoff capture, slow release and recharge infrastructure post-construction.

In addition to these codes and guideline, the Region of Peel standard design practises will be implemented which include the following:

  - Pressure pipe for all sewers to mitigate inflow and infiltration into the sanitary system.
  - Wrapping of all inlet maintenance holes with waterproofing membrane to further mitigate inflow and infiltration into the sanitary system.

7.3 Alternative methods to implement the project that would reduce any adverse contributions to a changing climate.

Alternatives 2 and 3, both involve the expansion of the earthen emergency overflow lagoon within the TRCA Regulatory floodplain, while Alternative 4 locates all proposed emergency overflow infrastructure outside of the Regulatory Floodplain, within a fully contained tank structure.

The expansion of the existing earthen emergency overflow lagoon would impact the storage volume and flow path of the West Humber River and its associated Regulatory floodplain. While the top berm elevation of the expanded emergency overflow lagoon, as described in alternatives 2 and 3 would be above the Regulatory floodplain, there is an inherit risk (albeit very low) of overflow into the West Humber River (relative to alternative 4) during an emergency. The in-tank design, presented in alternative 4, enables much more control, safety and automation during an emergency overflow event, thereby significantly mitigating any risk associated with the Regulatory floodplain of the West Humber River.

7.4 Climate Change Impacts on Indigenous People and/or Communities.

The West Humber River and Claireville Conservation Area is a precious natural resource and area, respectively, enjoyed by Indigenous and non-Indigenous peoples alike. Given the location of the project site, strong consideration was given to the mitigation of any risk associated with disturbance of the West Humber River, TRCA Regulatory and Claireville Conservation Area.

Alternative 4 was deemed to have the lowest impact relative to Indigenous people and the local community for the following reasons:

- All proposed infrastructure is located outside of the Regulatory floodplain.
- Additional tree planting outside of the project site will enhance recreational use.
- The in-tank solution of emergency overflow storage significantly mitigates any risk associated with impacts to the West Humber River and Regulatory Floodplain.

7.5 Long Term Reduction of Climate Change Impacts Following Project Implementation.

The long term reduction of the impacts of climate change resulting from the implementation of this project include the followings:

- Increased energy efficiency resulting from the use of variable frequency drives associated with pump operation. It has been estimated through a detailed pump operation energy analysis that these pumps can be flow paced in real time to offer energy savings of approximately 30% by running the pump(s) closer to their optimal speed. Ongoing monitoring efforts of voltage and current draw during long term operation of the new SPS will allow testing and further optimization of pump operation at peak efficiency, refer to **Appendix N**, for the pump energy analysis technical memorandum.
- Utilization of real-time control of the proposed emergency overflow tank(s), as part of alternative 4, is the most significant long-term potential for reduction of climate change. Strategies which include off-peak demand pumping can be utilized not only at this SPS, but also throughout the downstream treatment system. Real-time control can help to minimize peak energy demands, smooth out / minimize energy requirements for this station and downstream treatment infrastructure.

- Energy efficient building envelope design through compliance with the OBC, and room classification in accordance with the NFPA. The energy demand of the SPS can be further reduced through efficient operation of the HVAC system (i.e., as this station is designated as an unoccupied facility, interior building temperature will be kept at an ambient temperature of approximately 12^{o}C (to prevent freezing), while only increases to 22^{o}C upon operator entry.
- Implementation of grit and FOGs management into the design of the SPS presents long term benefits of the downstream trunk sewer in terms of mitigation of clogging, thus increasing the security and reliability of the sanitary collection system.
- Implementation of solar panels on the roof of the new McVean SPS, to provide carbon offsetting opportunities for low power continuous running instrumentation and equipment.

8 Potential Impacts, Mitigation Measures and Commitments to Future Work

Based on the review of existing conditions and the preferred alternative, potential impacts associated with the construction of the new SPS were identified. The potential impacts and mitigation measures to be carried forward into detailed design and construction to eliminate or lessen the potential impacts are provided in the following sections. Construction plans will be developed with consideration for the ecological sensitivities on site, including the features of the Natural Heritage System and candidate SAR habitat. Through application of the following mitigation measures and recommendations, impacts to the environment will be minimized.

8.1 Natural Environment

8.1.1 Vegetation

Potential Impacts

Construction of the new SPS will result in the removal of some area of CUM1-1. This vegetation is culturally derived and not considered significant. If vegetation removal occurs during the breeding bird period, it may harm birds nesting in this vegetation including species protected either under the federal Migratory Birds Convention Act, 1994 (MBCA) or the provincial Fish and Wildlife Conservation Act, 1997 (FWCA). Potential impacts to SAR are expected to be unlikely.

Mitigation Measures

The following mitigation measures are recommended to minimize vegetation disturbance and removal:

- Sediment control fencing will be used to control erosion and sediment runoff and will be used for visual marking to prevent encroachment into vegetation beyond the fencing.
- Ground cover vegetation disturbed by construction will be re-stabilized and re-vegetated as soon as possible using native plant seeding.
- Regular environmental monitoring/inspection will be implemented throughout construction to ensure that environmental protection measures are implemented, maintained, and repaired, and that remedial measures are initiated where warranted.
- Preservation and protection of healthy trees will be done where possible, and impacts will be offset by planting multiple trees for each tree removed.
- One to three trees will be planted for every removal.
- 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 Birds Convention Act (MBCA).

8.1.2 Wildlife and Species at Risk

Potential Impacts

If vegetation removal occurs during the breeding bird period, it may harm birds nesting in this vegetation including species protected either under the federal Migratory Birds Convention Act, 1994 (MBCA) or the provincial Fish and Wildlife Conservation Act, 1997 (FWCA). The nests and nesting activity of most birds breeding in Ontario are protected. Of the 22 species recorded during the surveys, four are not protected including Brown-headed Cowbird, Common Grackle, European Starling and Red-winged Blackbird. Compliance with the MBCA and FWCA is best achieved by scheduling vegetation removal to outside the period in which most birds in the area breed (outside the April 1 to August 31 period).

Removal or disturbance of artificial surfaces may also impact protected nesting birds. The Killdeer found on Ebenezer Road, protected under the MBCA, is a species that nests on bare ground, and gravel and asphalt surfaces; and may nest within the construction zone particularly when surfaces have been cleared in preparation for work and there is a hiatus in work.

Birds and other wildlife such as snakes or bats may nest inside buildings if they find suitable access points. No cavities were observed on the SPS building; however, if they exist and wildlife enter the building, the proposed upgrades may harm this wildlife. Wildlife may also be impacted if they travel into other areas of the construction zone or onto the Ebenezer Road access route. Maintaining awareness of wildlife and avoiding contact will help minimize harm to wildlife such as the Striped Skunk found in the roadside ditch. Sediment or chemical spills released as a result of construction activities may impact vegetation and wildlife or the main branch of the West Humber River Natural Area. The slope between the SPS and the residential property to be excavated for the asphalt driveway poses increased risk of sedimentation. Standard practices for on-site control of sediment/spills and proper maintenance of these practices will provide contaminant mitigation.

Potential impacts to SAR are expected to be unlikely.

Mitigation Measures

The following mitigation measures are recommended to minimize impacts on wildlife and SAR:

- A general awareness of wildlife shall be maintained. Wildlife incidentally encountered during construction shall not knowingly be harmed and shall be allowed to move away from the construction area on their own.
- In the event that wildlife encountered during construction does not move from the construction zone, the Contract Administrator will contact MNRF; the Contractor shall not move the wildlife.
- Vegetation removal shall occur outside the period when most birds in the area breed (i.e., outside April 1 to August 31).

- Should the removal of vegetation to construct the new SPS occur between April 1 and August 31, nest inspections conducted by an experienced, wildlife biologist will be required no more than two days prior to the removal.
- For works between April 1 and August 31, caution shall be taken to watch for evidence of Killdeer nesting on bare ground, asphalt or gravel surfaces.
- If an active bird nest is found within the construction zone, an avian specialist shall determine whether the nest belongs to a protected species and if this is the case, shall establish a suitable buffer around the nest within which work is halted until the young birds are fully fledged.
- The Contractor shall not destroy the active nests (nests with eggs or young birds), or wound or kill birds, of species protected under the MBCA or FWCA.

The following SAR mitigation measures are recommended:

- If a SAR is encountered within or adjacent to the construction site, the Contractor will stop work and contact MECP.
- If construction activities are such that continuing construction in that area would result in a contravention of the ESA, all activities will stop, and the Contract Administrator will contact the MECP SAR Biologist to discuss mitigation options.

Species and Habitat Opportunities

Though it is anticipated that SAR impacts will be minor and not require specific mitigation, opportunities to benefit species and their habitat arise through implementation of the proposed works. As part of habitat compensation measures that may be required consideration can be made for enhancement of habitat for Monarch, by spreading seeds of native breeding host plants (Common Milkweed, Swamp Milkweed) and foraging plants (native wildflowers) in the meadows. Shrubs with dense cover can be planted in the CUP3-8 and CUM1-1 to promote breeding by the regionally rare Clay-coloured Sparrow and benefit this locally significant species and general bird nesting habitat.

8.1.3 Archaeology

Potential Impacts

The project site for the new McVean SPS is clear and free of archaeological concerns, as described in Section 4.3.

Mitigation Measures

- If deeply buried archaeological deposits are discovered in the course of construction, MCM (416-314-1177) should be notified immediately. Should previously undocumented archaeological resources be discovered, they may be new archaeological sites and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out a determination of their nature and significance.

If human remains are encountered during construction, the Cemeteries Regulation Unit of the Ministry of Consumer Service (1-800-889-9768) should be notified. In situations where, human remains are

associated with archaeological resources, MCM should also be contacted to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

8.1.4 Cultural Heritage

Mitigation measures for cultural heritage features have been listed in Table 4-1, and are summarized below:

- Storage and construction staging areas should be appropriately located and/or planned to avoid impacting any of the identified BHRs and CHLs.
- Where construction is anticipated to result in grading impacts and tree removal, post-construction landscaping with native tree species should be employed to mitigate visual impacts to CHL-1 and CHL-4.
- Should future work require expansion of the McVean SPS study area, a qualified heritage consultant should be contacted to confirm the impacts of the proposed work on known or potential BHRs and CHLs.

8.1.5 Noise

Potential Impacts

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

Mitigation Measures

The following mitigation measures are recommended during construction:

- Construction work hours will take place from 7 am to 7 pm.
- Construction work will be located away from Ebenezer Road and residential neighbour/property.
- Truck movements will be scheduled to minimize noise.

8.1.6 Stormwater Management

8.1.6.1 Construction

By following the TRCA Stormwater Management Criteria (2012) for stormwater management design, the project approach will incorporate all relevant mitigation measures to control sediment and erosion.

8.1.6.2 Permanent Infrastructure

Permanent infrastructure will be designed according to the guidelines and standards outlined by the TRCA's Stormwater Management Criteria, and will incorporate design practices and control methods for:

- Stormwater Quality.
- Stormwater Quantity.

8.1.7 Site Contamination and Excess Soil

Potential Impacts

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

Mitigation Measures

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

- If any fill material is imported during construction on the Phase Two Property, the material should be characterized in accordance with current MECP protocols established under O. Reg. 153/04 to ensure compliance with regulatory requirements; and
- The monitoring wells on the Phase Two Property should be decommissioned as per O. Reg. 903 under the Ontario Water Resources Act, when no longer required.
- Excess materials will be managed in accordance with O Reg. 406/19, including completion of an Assessment of Past Uses, Sampling and Analysis Plan and Soil Characterization Report in detailed design.
- Excess earth managed as disposable fill will be managed by the Contractor, taking into account the possibility of salt impacts.
- The Contractor will control the emission of dust and other pollutants and prevent them from leaving the work site.
- All equipment onsite shall be clean and in good working order (no leaks of fuel, grease or oils).
- Vehicle maintenance and refueling shall be confined to designated areas a minimum of 30 m away from any natural features, and all activities shall be controlled to prevent entry of petroleum products or other deleterious substances into the natural environment.
- A Spill Control and Response Plan will be developed and implemented to prevent deleterious substances from entering the natural environment.
- An emergency spill kit will be kept on-site in case of spills during activities or fluid leaks or spills from equipment.
- When spills occur, the Ministry of the Environment Spills Action Centre should be contacted and all reasonable corrective action should be taken to contain and clean the spill immediately.

8.1.8 Ecosystem Compensation

The proposed design and solution will interfere with current natural habitat on site. In reference to the TRCA Guideline for Determining Ecosystem Compensation (2023), the following aspects will be incorporated into the design of the project to ensure the proper and safe restoration of any natural habitat lost during construction:

- Replication of Ecosystem Structure and Land Base.
- Development of and Agreement to Compensation Plan.
- Implementation of Compensation Plan.

8.2 Schedule

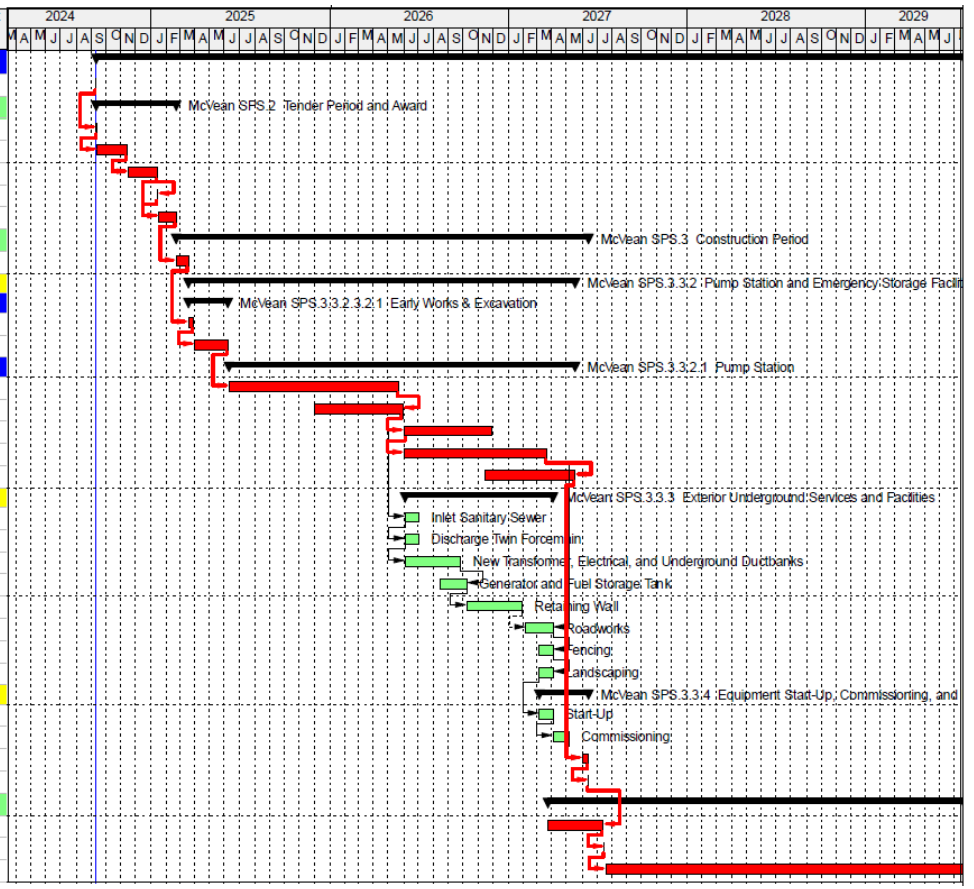
The details of the completion of the Schedule B Class EA is summarized below:

- Posting of the Class EA Amendment highlighting changes made to the preferred alterative – October 2023.
- 30-day review period – November 2023.
- Project File submission to the MECP – December 2023.
- Project File comments, finalization and MECP approval – January 2024.
- 90% detailed design submission – March 2024.
- Region review and comment – April 2024.
- Proceed to 100% tender ready detailed design starting in May 2024 and concluded in September 2024.

Table 8-1 presents a preliminary tender and construction schedule starting in September 2024 when the finalized tender ready detailed design submission is scheduled.

Table 8-1: McVean Sewage Pumping Station Upgrades- Project Implementation Schedule

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
McVean SPS	**McVean Sewage Pump Station Upgrade**	**1267**	**11-Sep-24**	**19-Jul-29**	**0**
MC-1010	100% Tender Design Completion	1	11-Sep-24	11-Sep-24	0
McVean SPS.2	**Tender Period and Award**	**116**	**12-Sep-24**	**20-Feb-25**	**0**
MC-1020	Contract Issued for Tender	1	12-Sep-24	12-Sep-24	0
MC-1030	Contract Tendering	44	13-Sep-24	13-Nov-24	0
MC-1040	Tender Analysis	45	14-Nov-24	15-Jan-25	0
MC-1050	Regional Review	1	15-Jan-25	15-Jan-25	0
MC-1060	Contract Award	26	16-Jan-25	20-Feb-25	0
McVean SPS.3	**Construction Period**	**603**	**21-Feb-25**	**15-Jun-27**	**0**
MC-1070	Construction Mobilization on Site	17	21-Feb-25	17-Mar-25	0
McVean SPS.3.3.2	Pump Station and Emergency Storage Facility	565	18-Mar-25	17-May-27	0
McVean SPS.3.3.2.3.2.1	**Early Works & Excavation**	**59**	**18-Mar-25**	**06-Jun-25**	**0**
MC-1080	Site Mobilization, Laydown, and Preparation	9	18-Mar-25	28-Mar-25	0
MC-1090	Excavation	50	31-Mar-25	06-Jun-25	0
McVean SPS.3.3.2.1	**Pump Station**	**506**	**09-Jun-25**	**17-May-27**	**0**
MC-1100	Pump Station Structural	250	09-Jun-25	22-May-26	0
MC-1110	Emergency Overflow Tank Structural	130	01-Dec-25	29-May-26	0
MC-1120	Building Envelope, Structural, & Architectural	130	01-Jun-26	27-Nov-26	0
MC-1130	Mechanical/Process and Buildings	210	01-Jun-26	19-Mar-27	0
MC-1140	Electrical	131	16-Nov-26	17-May-27	0
McVean SPS.3.3.3	Exterior Underground Services and Facilities	215	05-Jun-26	01-Apr-27	19
MC-1150	Inlet Sanitary Sewer	20	05-Jun-26	02-Jul-26	24
MC-1160	Discharge Twin Forcemain	20	05-Jun-26	02-Jul-26	24
MC-1170	New Transformer, Electrical, and Underground Duc	80	05-Jun-26	24-Sep-26	24
MC-1180	Generator and Fuel Storage Tank	40	14-Aug-26	08-Oct-26	24
MC-1190	Retaining Wall	80	09-Oct-26	28-Jan-27	24
MC-1200	Roadworks	40	05-Feb-27	01-Apr-27	19
MC-1210	Fencing	20	05-Mar-27	01-Apr-27	19
MC-1220	Landscaping	20	05-Mar-27	01-Apr-27	19
McVean SPS.3.3.4	Equipment Start-Up, Commissioning, and Performar	73	05-Mar-27	15-Jun-27	0
MC-1230	Start-Up	20	05-Mar-27	01-Apr-27	19
MC-1240	Commissioning	23	02-Apr-27	04-May-27	19
MC-1250	Performance Testing	10	01-Jun-27	14-Jun-27	0
MC-1260	Substantial Completion	1	15-Jun-27	15-Jun-27	0
McVean SPS.4	**Contract Closeout**	**609**	**22-Mar-27**	**19-Jul-29**	**0**
MC-1270	Defficiency Corrections	84	22-Mar-27	15-Jul-27	0
MC-1280	Total Completion	1	16-Jul-27	16-Jul-27	0
MC-1290	Warranty Period	524	19-Jul-27	19-Jul-29	0



9 Public and Agency Input

9.1 Required Public Consultation

Schedule 'B' Municipal Class EA projects require two mandatory points of contact:

- In Phase 2 of the process, after the Evaluation of the Alternative Solutions and before the Selection of the Preferred Solution.
- The Notice of Completion.

9.2 Summary of Public Consultation Dates

A summary of the public consultation is presented below in Table 9-1.

Table 9-1: Public Consultation Record

PUBLIC CONSULTATION	DATE
Notice of Study Commencement and Notice of Public Open House #1 (1)	February 11, 2021
Public Open House #1 (Virtual) (1)	July 29, 2021
Notice of Public Open House #2 (2)	December 8, 2022
Public Open House #2 (Virtual) (2)	December 8, 2022
Notice of Study Completion (Anticipated)	December 2023 / January 2024
Notes: 1. Provided in **Appendix O** 2. Provided in **Appendix P**	

9.3 Stakeholder and Indigenous Contact List

A stakeholder contact list was prepared during the initial stages of the Study and was updated throughout the Study process. The initial list included addresses within the Study Area, as well as Indigenous communities identified through the Aboriginal Treaty and Rights Information System (ATRIS).

The stakeholder contract list is provided in **Appendix Q**.

9.3.1 Public Information Centre No. 1

Public Information Centre (PIC) 1 was held virtually to allow interested members of the public to review and comment on the preferred alternative, the evaluation process, and next steps of the study. PIC 1

display boards were made available on the Region of Peel website starting July 29, 2021. Comments were received until August 29, 2022.No comments were received during the review period.

More information on the presentation is provided in **Appendix O**.

9.3.2 Public Information Centre No. 2

Public Information Centre (PIC) 2 was held virtually and posted to the Region's website on December 8, 2022. Information provided to the public to review and comment included information on the alternatives, including the preferred alternative, the evaluation process, and next steps. The PIC 2 was available to the public starting December 8, 2022. Comments from the review of the PIC 2 material was received until January 31, 2023. No comments were received during the review period.

More information on the presentation is provided in **Appendix P.**

9.4 Public Consultation Comments and Responses

No public comments were received from either of the PICs.

Following the review period of PIC 2, TRCA was further consulted in August 2023. As the 60% detailed design was advanced, and combined with input from the TRCA, preferred alternative no. 4 was finalized. The updated PIC slides, specifically pertaining to Alternative 4, showing the preferred alternative have subsequently been posted on the Region's website for public review.

9.5 Conservation Authority Consultation

The TRCA was consulted throughout the Class EA process. Most recently, the TRCA provided review comments on the initial DRAFT project file. Those comments, and the responses, have been documented and addressed in **Appendix R.**

9.6 Indigenous Consultation

Indigenous communities with a potential interest or stake in the Study were contacted directly and provided an opportunity to offer their input and to address their comments or concerns. The Project Team initiated contact with the following Indigenous communities:

- Haudenosaunee Confederacy.
- Mississaugas of the New Credit First Nation.
- Six Nations of the Grand River.
- Huronne-Wendat Nation.

A Notice of Study Commencement and notices of PIC 1 and 2 were sent to the communities listed above.

9.7 Notice of Study Completion

Notice of Study Completion is anticipated to be issued in December 2023 / January 2024. The Notice of Completion must be issued and provide a minimum 30-day period during which documentation may be reviewed, with comments and input submitted.

10 Permits and Approvals

The following section identifies 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), the Toronto and Region Conservation Authority, and the City of Brampton.

10.1 Review Agency Approvals

10.1.1 Ministry of the Environment Conservation and Parks

- An Environmental Compliance Approval (ECA) is required for the construction of a new SPS as it is considered a “substantial addition to the existing system” for sewage and a generator (air/noise).

10.1.2 City of Brampton

- Building Permit.
- Site Plan Approval.

10.1.3 Toronto and Region Conservation Authority

- Site Plan Approval and is pertains to Stormwater Management.
- Sediment and Erosion Control Plan – Permission to Construct.
- Environmental Compensation Plan – Permission to Construct.

10.1.4 Electrical Safety Authority (ESA)

- Permission to Expand and Connect.

10.1.5 Technical Standards & Safety Authority

- Permit required for bi-fuel diesel / natural gas driven standby generator.

11 Conclusion

This Municipal Class EA Project File has been prepared to confirm that the proposed McVean SPS project meets the requirements of the Environmental Assessment Act.

The preferred solution recommends a new SPS, complete with headworks infrastructure, located to the north side of the site. This layout places the new building further away from the road and allows for easier transitioning of the piping from the existing facility. The existing SPS will be decommissioned once the new SPS is constructed. Sanitary flows along Ebenezer Road will be redirected to the new SPS. The new SPS will remove grit and FOGs from the sewage prior to pumping to downstream trunk sewer system on Goreway Road via the new and existing forcemains.

The preferred alternative achieves the Region's design guidelines for sewage pumping stations with respect to 2 hours of emergency storage at the peak design flowrate. Approximately 70% of this storage requirement is achieved with an in-tank solution integrated into the new SPS (82 minutes of primary emergency storage), outside of the regulatory floodplain of the West Humber River. The preferred alternative maintains the existing earthen emergency storage lagoon's location and capacity of 4,830 m^3, which continues to provide a total retention time of approximately 38 minutes of secondary storage.

The total storage time provided by the new primary overflow tanks and secondary emergency overflow lagoon is approximately 2 hours at 2,100 L/s, as summarized in Table 11-1. The modified approach to emergency overflow storage represents a net benefit to the project as it significantly mitigates sewage from entering the earthen lagoon during an emergency event. This is because the quantity of primary emergency storage achieved in the sub-grade tanks connected to the SPS has been significantly expanded, as opposed to the earthen lagoon, whose capacity remains the same.

Table 11-1: Preferred Alternative No. 4 Storage Volume and Emergency Response Time

Description	Storage Volume	Emergency Storage Time @ 2,100 L/S	Compliance with Regional Design Guidelines for Emergency Overflow Storage
Existing			
Existing Earthen Emergency Overflow Lagoon	4,830 m^3	38 minutes	×
Proposed – Alternative No. 4			
Primary In-Tank Emergency Overflow Storage	10,290 m^3	82 minutes	-
Existing Earthen Emergency Overflow Lagoon	4,830 m^3	38 minutes	-
Total Emergency Storage Achieved	**15,120 m^3**	**120 minutes**	✓

This alternative is also anticipated to have less environmental, social, and cultural impacts compared to alternative nos. 2 and 3, while providing the Region with increased operational flexibility and maintenance over the life cycle of this infrastructure asset. Figure 11-1 and Figure 11-2 presents the overall process flow schematic and the emergency overflow schematic, respectively, of the preferred alternative.

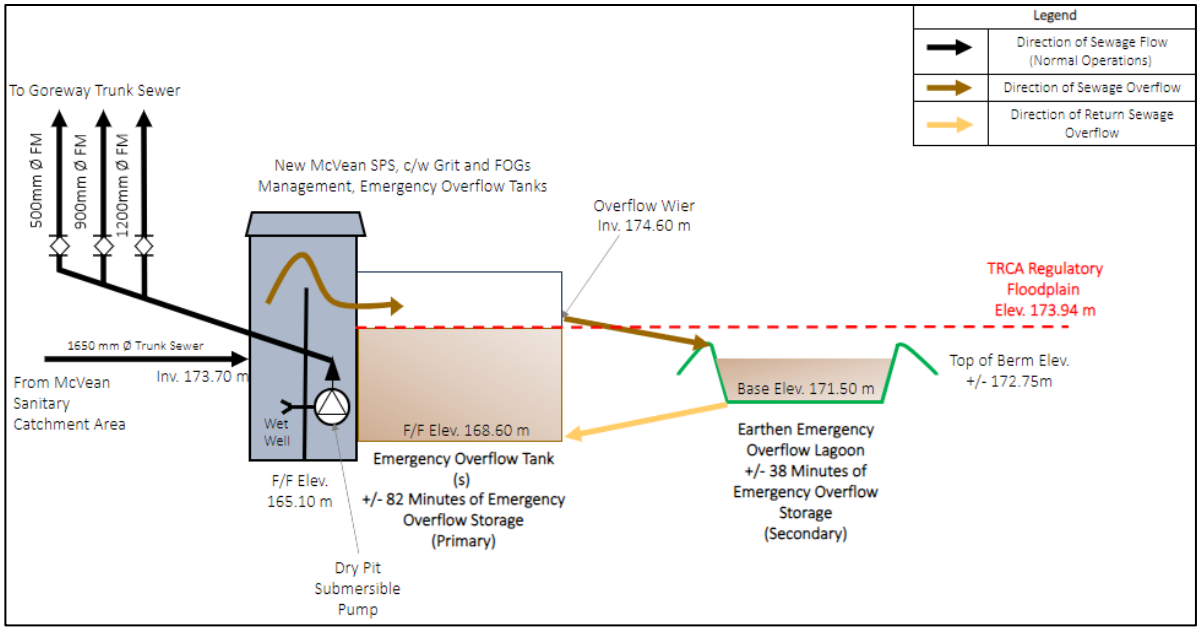


Figure 11-1: Preferred Alternative- Process Schematic for the New McVean Sewage Pumping Station

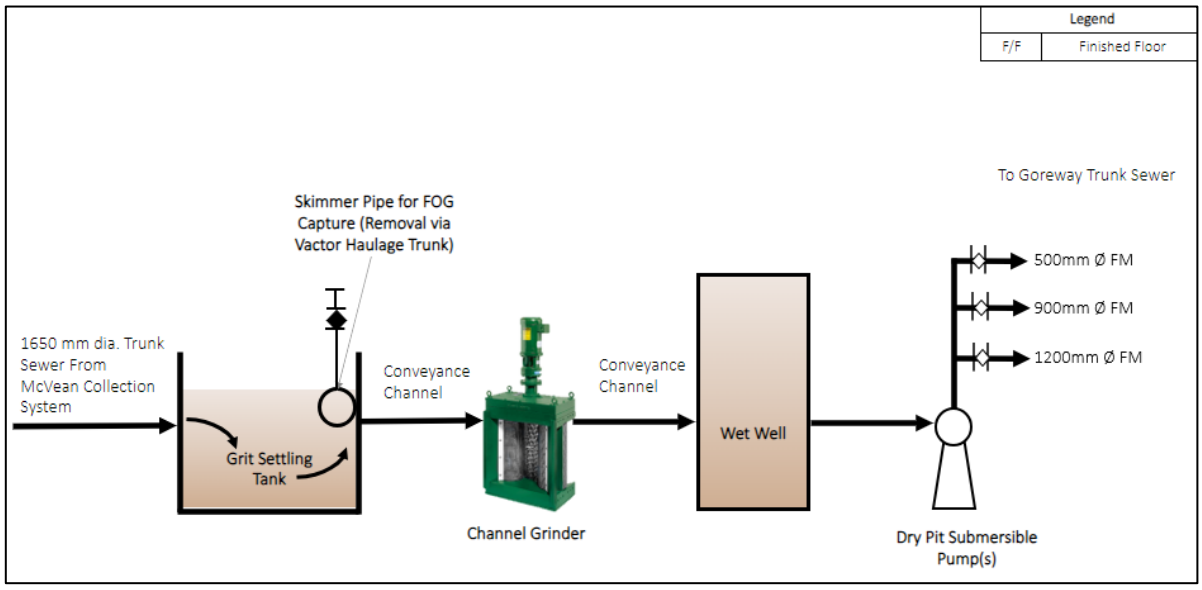


Figure 11-2: Preferred Alternative- Overflow Schematic for the New McVean Sewage Pumping Station

12 Bibliography

Authority, T. a. (2012). *Stormwater Management Criteria.*

Authority, T. a. (2023). *Guideline for Determining Ecosystem Compensation.*

City of Brampton (2020). *Official Plan*.

City of Brampton (2004). *Zoning By-Law 270-2004*.

Conservation Authorities Act (1990) and Ontario Regulation 166/06.

Design Guidelines for Sewage Works. (2023). Retrieved from Government of Ontario.

Engineering, E. (2022). *Process Automation and Instrumentation Design Standard (PAIDS)- Section 2-Design.*

Engineering, E. (2022). *Process Automation and Instrumentation Design Standards (PAIDS)- Section 1-SCADA Standards.*

Engineering, E. (2022). *Process Automation and Instrumentation Design Standards (PAIDS)- Section 3-System Development.*

Engineering, E. (2022). *Process Automation and Instrumentation Design Standards (PAIDS)- Section 4-Hardware Build/Fabrication.*

Engineering, E. (2022). *Process Automation and Instrumentation Design Standards (PAIDS)- Section 5-Installation/Deployment.*

Engineering, E. (2022). *Process Automation and Instrumentation Design Standards (PAIDS)- Section 6-Commissioning/Startup.*

MEA. (2023). *Municipal Class Environmental Assessment.*

Ministry of Environment, C. a. (2008). *Design Guidelines for Sewage Works.*

Municipal Engineers Association. (2023). *Municipal Class Environemental Assessment.*

Peel, R. o. (2012). *Wastewater Pumping Station Design Standards- Version 7.*

Peel, R. o. (2022). *Region of Peel Official Plan.*

Peel, R. o. (2018). *Process Automation and Instrumentation Design Standards: A- Design Reference and Tagging.*

Peel, R. o. (2022). *Sewage Pumping Station Design Standards.*

Peel, R. o. (2020). *Water and Wastewater Master Plan.*

Province of Ontario (2020). *A Place to Grow:* Growth Plan for the Greater Golden Horseshoe.

Province of Ontario (2020). *Provincial Policy Statelment.*

Province of Ontario (2017). The Greenbelt Plan.

Region, P. (n.d.). *Design, standards specifications and procedures*.

Appendices

Appendix A Geotechnical Investigation Report

Appendix B Existing Conditions and Impact Assessment (Ecology) Report

Appendix C Archaeological Stage 1 and 2 Investigation Reports

Appendix D
Archaeological Stage 3 Investigation Report

Appendix E Cultural Heritage Report

Appendix F Phase I Environmental Site Assessment

Appendix G Phase II Environmental Site Assessment

Appendix H Technical Memorandum No. 1 – Identification of Alternatives

Appendix I Technical Memorandum No. 2 – Analysis of Alternatives

Appendix J Construction Cost Estimate – Alternative No. 2

Appendix K Construction Cost Estimate- Alternative No. 3

Appendix L Construction Cost Estimate- Preferred Alternative No. 4

Appendix M The Emissions Summary and Dispersion Modelling Report

Appendix N Energy Analysis Technical Memorandum

Appendix O Public Information Centre No. 1

Appendix P Public Information Centre No. 2

Appendix Q Stakeholder/Contact List

Appendix R Toronto and Region Conservation Authority Comment Log