

1 Port Street East Proposed Marina Environmental Assessment

Final Report



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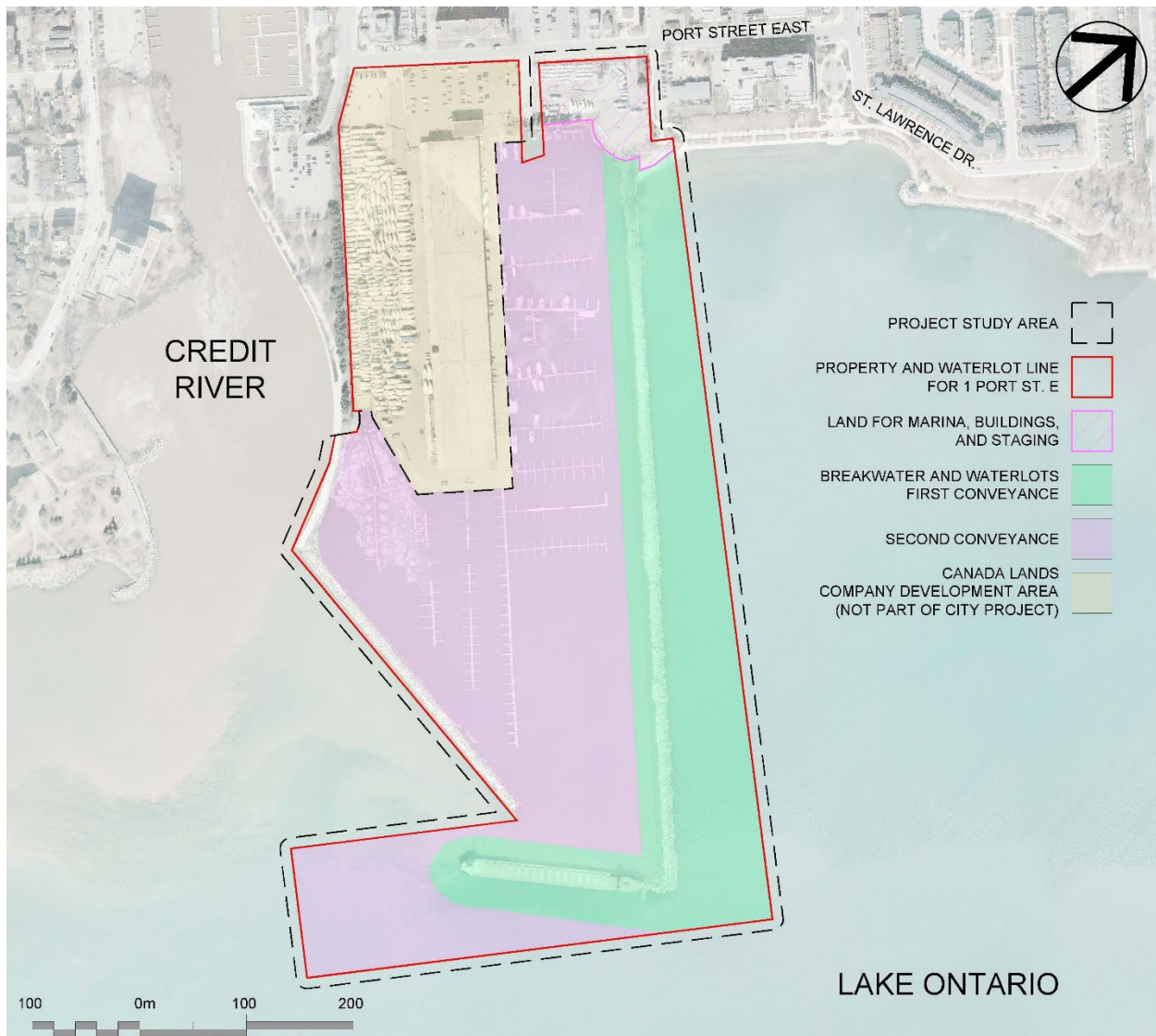
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1. INTRODUCTION

The City of Mississauga (the City) has undertaken an Individual Environmental Assessment (EA) for the 1 Port Street East Proposed Marina Project (1PSEPM Project). An existing private marina, Port Credit Harbour Marina (PCHM), is currently located on the west portion of the site (the wharf) and is privately operated by Centre City Capital Limited. The wharf is owned by Canada Lands Company (Canada Lands or CLC). Centre City Capital Limited leases the space required for PCHM from Canada Lands. Canada Lands and Centre City Capital Limited have reached an agreement to extend the PCHM lease, which was set to expire in 2023. A future mixed-use neighbourhood is proposed to be developed on the wharf which will displace the existing private marina (i.e., the PCHM). The future mixed-use development proposed for the wharf is not a City-led initiative and is not part of this EA. The timing of the development of the wharf is dependent on the landowner (i.e., Canada Lands) and related required approvals.

The City is undertaking the 1PSEPM Project with the objective of expanding the land base around the eastern breakwater to provide continued marina function and services at this site, create public access to the waterfront, new parkland and enhance the site's ecological functions with new terrestrial and aquatic habitat. This part of the Mississauga waterfront has been the subject of many studies. The 1PSEPM Project was identified by the "Inspiration Port Credit" initiative as a key opportunity to "Keep the Port in Port Credit". **Figure 1.1** provides a map showing the lands and water lots at 1 Port Street East and the 1PSEPM Project Study Area.

Figure 1.1: Wharf, Lands and Water Lots and the 1PSEPM Project Study Area



1.1. PROPONENT

The City of Mississauga is the proponent for this Project. The City is planning the 1PSEPM Project to ensure it is consistent with the various planning and guiding documents, including Inspiration Port Credit. Pending EA approval from the Province of Ontario, Council approval of the 1PSEPM Project, including funding from external sources, the City will develop and implement the 1PSEPM Project.

1.2. ENVIRONMENTAL ASSESSMENT TERMS OF REFERENCE REVIEW

The 1PSEPM Project is subject to the requirements of the Ontario *Environmental Assessment Act* (EA Act) as an Individual EA. The 1PSEPM Project cannot be planned under the Municipal Engineer’s Association (MEA) Municipal Class Environmental Assessment because the proposed undertaking is to create a new land base around the eastern breakwater that would allow for the establishment of a new marina and additional parkland rather than for purposes of flood or shoreline protection as contemplated by the Municipal Class EA.

The public, government agencies, Indigenous communities, interest groups, and landowners have been consulted throughout the EA. All activities carried out during the EA are documented in this EA Report.

To meet the requirements of the *Ontario EA Act*, the 1PSEPM Project Individual EA was conducted in two stages. Stage one involved collecting public input and understanding concerns to develop the Terms of Reference (ToR). The submission and approval of the ToR completed stage one. The ToR was approved by the Minister of the Environment, Conservation and Parks (MECP) on September 16th, 2021. Stage two involves the preparation and submission for approval of the Individual EA in accordance with the approved ToR.

The EA has been prepared in accordance with the requirements of the approved ToR and follows the “Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario” (Ministry of Environment, Conservation and Parks, 2014. Revision 2). This EA contains the following:

- a description of the purpose of the undertaking;
- a description of and a statement of the rationale for:
 - the undertaking; and
 - the alternative methods of carrying out the undertaking.
- regarding the undertaking, the alternative methods of carrying out the undertaking a description of:
 - the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly;
 - the effects that will be caused or that might reasonably be expected to be caused to the environment; and
 - the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment.
- an evaluation of the advantages and disadvantages to the environment of the undertaking and the alternative methods of carrying out the undertaking; and
- a description of any consultation about the undertaking by the proponent and the results of the consultation.

In 2019, federal legislation governing environmental assessments, namely the *Impact Assessment Act* (IAA), came into force, repealing its predecessor, the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). A marina Project such as the 1PSEPM Project is not currently described on the Physical Activities Regulations (SOR/2019-285) and does not require a federal EA under the IAA. Moreover, the lands owned by Canada Lands Company (a self-financing Federal Crown corporation, CLC, 2019) are not federal lands and their conveyance to the City does not require the Canada Lands Company to undertake a federal EA under the IAA.

1.2.1. CONCORDANCE WITH TERMS OF REFERENCE

Table 1.1 provides information regarding the comments made in the 1PSEPM Project ToR and commentary regarding where in the EA this commitment has been addressed, and if not, provides a rationale for this deviation from the ToR.

Table 1.1: Concordance of EA with ToR Commitments

ToR Commitment	ToR Reference	EA Chapter or Section Title	EA Reference	Comments
The environmental assessment will be based on three general study areas (i.e., Project Study Area (PSA), Local Study Area (LSA), Regional Study Area (RSA))	Section 1.3, Page 4	Study Areas	Section 2.4	The study areas are confirmed and mapped.
		Description of the Environment Potentially Affected by the Undertaking	Chapter 3	The description of the environment potentially affected by the undertaking is organized in accordance with the three study areas where relevant.
The City will collaborate with the CVC to conserve, enhance and restore the health of the Mississauga shoreline while providing public access to the water's edge and protecting viewing to the lake The City will emphasize resilient solutions for shoreline treatment to protect infrastructure, the natural environment and enhance water quality	Section 2.2, page 16	Description of the Preferred Alternative	Chapter 6	The description of the preferred alternative provides information on how the 1PSEPM Project will serve to conserve, enhance, and restore the health of the Mississauga shoreline while providing public access to the water's edge
		Physical Environment, Effects of Establishment	Section 7.2.2	Assesses the resiliency of proposed lakefill to changing lake levels and coastal processes
		Socio-economic Environment, Effects of Establishment	Section 7.5.2	Assesses impacts of public access to the water's edge and on views to the lake.
		Consultation Record	Section 9.5	Engagement activities with the CVC are described.
The 1PSEPM Project will delineate the boundaries of the land base expansion along the eastern breakwater to permit the relocation of the marina.	Section 2.3, Page 17	Description, Evaluation and Rationale for 'Alternative Methods' of Carrying Out the Undertaking	Figure 5-3	Depicts the boundaries of the land base expansion (i.e., the lakefill).
		Description of the Preferred Alternative	Chapter 6	Describes the size of the land base expansion for the preferred alternative

ToR Commitment	ToR Reference	EA Chapter or Section Title	EA Reference	Comments
The final description of the preferred alternative will be further developed and provided in the EA as required under the <i>Ontario EA Act</i> .	Section 2.4, Page 17	Description of the Preferred Alternative	Chapter 6	Provides information on the preliminary or conceptual design of the preferred alternative.
The final description of the preferred alternative will relate to the ability of the 1PSEPM Project to address the identified problem/opportunity, reflect the advantages and disadvantages of the preferred alternative, and include more details on the purpose and rationale for the undertaking.	Section 2.4, Page 18	Advantages and Disadvantages	Chapter 11	This chapter describes the ability of the preferred alternative to address the identified problem/opportunity, presents the relative advantages and disadvantages of the preferred alternative and includes more details on the purpose and rationale for the undertaking.
The EA will be prepared in accordance with this ToR.	Section 3.1, Page 19	EA Document	All Chapters	The EA was prepared in accordance with this ToR as detailed in this table.
The City of Mississauga will submit the EA for review by the public and government agencies.	Section 3.1, Page 19	Approach to Regulatory Consultation and Community Engagement	Section 1.4 and Chapter 9	Describes the timing and approach to public and government agency review of the Draft EA, including review by MCFN. A comprehensive record of consultation is provided in summary format within the main EA document supported by Appendices.
The EA will contain the following: <ul style="list-style-type: none"> a description of the purpose of the undertaking 	Section 3.1, Page 19	Purpose of the Undertaking	Chapter 2	Provides a description of the purpose of the undertaking.
The EA will contain the following: <ul style="list-style-type: none"> a description of and statement of the rationale for the undertaking and alternative methods of carrying out the undertaken. 	Section 3.1, Page 19	Purpose of the Undertaking	Chapter 2	Provides a description of the rationale for the undertaking within the overall planning context for the 1PSEPM Project.

ToR Commitment	ToR Reference	EA Chapter or Section Title	EA Reference	Comments
<p>The EA will contain the following:</p> <ul style="list-style-type: none"> the alternative methods of carrying out the undertaking an evaluation of the advantages and disadvantages to the environment of the undertaking and the alternative methods of carrying out the undertaking. 	Section 3.1, Page 19	Description, Evaluation and Rationale for 'Alternative Methods' of Carrying Out the Undertaking	Chapter 5	Describes the identification and evaluation of 'alternative methods' and describes the advantages and disadvantages of the preferred alternative.
<p>The EA will contain the following:</p> <ul style="list-style-type: none"> A description of any consultation about the undertaking by the proponent and the results of the consultation 	Section 3.1, Page 20	Public and Agency Review of the Draft EA	Section 1.4 and Chapter 9	Describes the timing and approach to public and government agency review of the Draft EA, including review by MCFN. A comprehensive record of consultation is provided in summary format within the main EA document supported by Appendices.
Additional federal and provincial requirements may be identified during the EA. Municipal approvals may also be required and will be identified as part of the EA	Section 3.3, Page 20	Other Approvals	Section 1.3	Identifies the approval required for the 1PSEPM Project, pending EA review by regulators and the City.
The alternative 1PSEPM Project configurations will be described in sufficient detail to adequately identify potential impacts to the environment, evaluate and compare each alternative based on net effects...and their respective advantages and disadvantage	Section 5.2, Section 5.3, Page 33	Description, Evaluation and Rationale for 'Alternative Methods' of Carrying Out the Undertaking	Chapter 5	Describes the 'alternative methods' in terms of small, medium, and large land bases and their key design elements.
The analysis [of Alternative Methods] by indicator will be presented in an evaluation matrix. For this evaluation, the effects from construction and establishment activities will be considered separately for each alternative	Section 5.3, Page 34	Description, Evaluation and Rationale for 'Alternative Methods' of Carrying Out the Undertaking	Section 5.2	Provides an evaluation of 'alternative methods' within a matrix according to relevant criteria. The evaluation notes the criteria that apply to the construction or establishment phases, or both.

ToR Commitment	ToR Reference	EA Chapter or Section Title	EA Reference	Comments
A summary of environmental effects and mitigation measures and an assessment of 1PSEPM Project advantages and disadvantages will be provided in the EA	Section 5.4, Page 39	Detailed assessment of the Preferred Alternative	Chapter 7	Provides a detailed assessment of the environmental effects of the 1PSEPM Project, recommended mitigation measures and net effects (taking into consideration the implementation of mitigation measures).
		Advantages and Disadvantages	Chapter 11	Provides a summary of 1PSEPM Project's advantages and disadvantages based on the detailed assessment of effects.
Table 7-1 presents the scope of the baseline and effects assessment studies proposed to be completed during the EA Stage.	Chapter 7, Pages 67 and 68	Description of the Environment Potentially Affected by the Undertaking	Chapter 3	Provides a description of the existing environmental conditions in the study areas for the physical, atmospheric, biological, socio-economic, and cultural environmental components.
		Detailed assessment of the Preferred Alternative	Chapter 7	Provides an assessment of the environmental effects of the 1PSEPM Project as defined in Section 6; identifies relevant mitigation measures and residual environmental effects.
1PSEPM Project EA consultation will meet the requirements and best practices for the provincial EA process	Section 8.2, Page 71	Public and Agency Review of the Draft EA	Section 1.4 and Chapter 9	Describes the timing and approach to public and government agency review of the Draft EA, including review by MCFN. A comprehensive record of consultation is provided in summary format within the main EA document supported by Appendices.

ToR Commitment	ToR Reference	EA Chapter or Section Title	EA Reference	Comments
<p>Consultation with agencies, interested parties, stakeholders and public will be ongoing throughout the EA stage of the Project</p> <p>Letters will be sent to regulatory agencies and Indigenous communities to provide notification and request meetings to continue to discuss the 1PSEPM Project and the EA stage</p>	Section 8.2.3, Page 72	Public and Agency Review of the Draft EA	Section 1.4 and Chapter 9	Describes the timing and approach to public and government agency review of the Draft EA, including review by MCFN. A comprehensive record of consultation is provided in summary format within the main EA document supported by Appendices.
		Consultation Record	Chapter 9	Provides details on consultation undertaken by the City.
Three Public Information Centres (PICs) are planned during the EA Stage	Section 8.2.3, Page 72	Consultation Record	Chapter 9	A comprehensive record of consultation is provided in summary format within the main EA document supported by Appendices.
Once the Draft EA is prepared all interested stakeholders, agencies and Indigenous communities will be notified of the opportunity to review and comment. All comments received will be included in the Final EA.	Section 8.2.3, Page 72	Public and Agency Review of the Draft EA	Section 1.4 and Chapter 9	Provides information on the public and agency review of the Draft EA, including the review undertaken by MCFN. A comprehensive record of consultation is provided in summary format within the main EA document supported by Appendices.
An open invitation will be extended to Indigenous communities to meet with the Project Team to discuss the proposal in more detail and discuss issues of interest.	Section 8.2.3, Page 73	Engagement with Indigenous Communities	Section 9.4	Provides details on the City's engagement efforts with Indigenous communities, with substantial detail provided regarding engagement with MCFN and its outcomes.
A monitoring plan will be developed during the 1PSEPM Project EA	Chapter 9, Page 74	Monitoring and Adaptive Management	Chapter 8	Provides a general plan for EA compliance monitoring and environmental performance monitoring
A strategy and schedule for completing a monitoring plan will be developed and included in the EA.	Chapter 9, Page 74	Monitoring and Adaptive Management	Chapter 8	Presents an overall strategy and conceptual schedule for various monitoring activities.

ToR Commitment	ToR Reference	EA Chapter or Section Title	EA Reference	Comments
The EA will include a comprehensive list of commitments made by the City of Mississauga during the ToR process, including where and how they have been dealt with.	Chapter 9, Page 74	Introduction	Section 1.2.1	Provides a table (this table) that lists the commitments made by the City during the ToR process and where in the EA document they have been dealt with.
The EA will include a comprehensive list of commitments made by the City during the preparation of the EA.	Chapter 9, Page 74	EA Commitment Tables	Table 8.1 and Table 9.4	Provides a table of general commitments made by the City during the preparation of the EA and a table of commitments specifically made to MCFN during the preparation of the EA.

1.3. OTHER APPROVALS

Federal and provincial permits under the following legislation are anticipated to be required as part of the 1PSEPM Project. Municipal approvals may also be required.

1.3.1. OTHER FEDERAL APPROVALS

- *The Fisheries Act* is a federal legislation that aims to manage and protect Canada's fisheries resources. In 2019, provisions of the new *Fisheries Act* were implemented by the Department of Fisheries and Oceans (DFO). This included new protections for fish and fish habitat in the form of [standards, codes of practice, and guidelines for Projects near water](#). The Act prohibits the death of fish or the harmful alteration, disruption or destruction of fish habitat (HADD), unless the work, undertaking or activity is authorized by the Minister. In cases where a Project cannot avoid working in or near water or does not meet the conditions of a code of practice, a request for Project review should be submitted to the DFO. If the DFO reviews the Project and determines that the work is not likely to result in a HADD, they will issue a letter of advice and mitigation terms. If the DFO determine that the Project is likely to result in death to fish and/or a HADD, an application for an Authorization will need to be completed. An Authorization must include terms and conditions to avoid, mitigate, offset, and monitor impacts to fish and fish habitat because of the Project.
- *Canadian Navigable Waters Act (CNWA)* applies primarily to works constructed or placed in, on, over, under, through or across navigable waters set out under the Act. The Navigation Protection Program administers the CNWA through the review and authorization of works affecting navigable waters. The creation of land under the *Canadian Navigation Protection Act* requires formal approval under the Act.
- *Migratory Birds Convention Act (MBCA)*. This Act is administrated by Environment and Climate Change Canada and regulates potentially harmful human activities that may affect the conservation of migratory birds – both individuals and populations – and their nests. With some notable exceptions, a permit must be issued for any activities that may affect migratory birds identified under Article I of the MBCA, including waterfowl, cranes, rails, shorebirds, pigeons, migratory insectivorous birds, and other migratory nongame birds. In 2019, the Federal government began a review of the MBCA to provide better protection to migratory bird species and to modernize the Act with respect to enforcement issues and issues related to migratory bird hunting.

- *Species at Risk Act*. The *Species at Risk Act* (SARA) is also administered by Environment and Climate Change Canada. The SARA contains prohibitions against the killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling, or trading of individuals of endangered, threatened, and extirpated species listed in Schedule 1. The SARA also contains a prohibition against the damage or destruction of their residences (e.g., nest or den). The SARA applies to all species on federal lands as well as aquatic species and migratory birds off federal lands. DFO administers the SARA for aquatic species, while Environment and Climate Change Canada administers the SARA for all other federally listed species at risk including migratory birds. Review under the SARA is typically undertaken in conjunction with requirements under the *Fisheries Act*. A permit is required for activities that may affect species listed on Schedule 1 and which contravene the SARA’s general or critical habitat prohibitions.

1.3.2. OTHER PROVINCIAL APPROVALS

- *Lakes and Rivers Improvement Act*. The *Lakes and Rivers Improvement Act* is administered by the Ministry of Natural Resources and Forestry (MNRF) and provides for the use of the water of lakes and rivers and regulates improvements in them. The Act requires MNRF approval for construction in lakes and rivers. The Minister of Natural Resources and Forestry is given discretionary powers relating to the repair, reconstruction and removal of dams, maintenance of water levels, and regulation of use of waters or works. A permit under the Lakes and Rivers Improvement Act may be required.
- Conservation Authorities Act and its regulations:
 - Prohibit, regulate or require the permission of the authority for straightening changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or for changing or interfering in any way with a wetland; and
 - Prohibit, regulate or require the permission of the authority for development, if in the opinion of the authority, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.
 - The proposal to infill portions of Lake Ontario along the shoreline is within the jurisdiction of CVC and is therefore subject to the Regulations above. Permits may be required for development along the shoreline within the 1PSEPM Project Study Area.

On May 2, 2019, the Province introduced Bill 108, entitled the *More Homes, More Choice Act*, as part of its Housing Supply Action Plan. Schedule 2 of this omnibus bill contained proposed revised wording for the amendments to the *Conservation Authorities Act*. On June 6, 2019, Bill 108 passed Third Reading and received Royal Assent. While Bill 108 is now law, its “provisions” (meaning its stipulations) will come into effect at various times. This includes the amendments to the *Conservation Authorities Act*.

The key legislative amendments for conservation authorities can be found in section 21.1 (1) of the amended *Conservation Authorities Act*. They require conservation authorities to provide programs or services that meet the following descriptions and that have been prescribed in regulations:

- Programs and services related to the risk of natural hazards;
- Programs and services related to the conservation and management of lands owned or controlled by the authority, including any interests in land registered on title;
- Programs and services related to the authority's duties, functions and responsibilities as a source protection authority under the Clean Water Act, 2006;
- Programs and services related to the authority's duties, functions and responsibilities under an Act prescribed by the regulations; and
- Enables conservation authorities to provide a program or service other than those listed above, but it must first be prescribed in a provincial regulation.

The changes are primarily focused on clearly defining the core mandatory programs and services provided by conservation authorities, in addition to several other administrative and governance amendments. For example, in February 2023 the CVC informed the City that they can no longer provide comments on certain aspects of Environmental Assessment Projects as per the noted regulation,

- *Clean Water Act*. The *Clean Water Act* (CWA), administered by the MECP, sets the legal framework to ensure that communities can protect their municipal drinking water supplies by developing collaborative, locally driven, science-based protection plans. Both the CWA and *Regulation 287/07* require Source Protection Committees to prepare source protection plans (SPP) with policies to address to drinking water sources within all source protection vulnerable areas. Policy implementing bodies have to conform to or comply with policies addressing significant drinking water threats and have regard for policies addressing moderate and low drinking water threats and have regard for policies addressing moderate and low drinking water threats. On this basis, relevant policies of the SPP should be considered.
- *Endangered Species Act*. The *Endangered Species Act* (ESA), administered by the MECP, protects species identified as being Endangered, Threatened or Extirpated in Ontario. Species status is determined by the Committee on the Status of Species at Risk in Ontario (CASSARO). Under the Act, species are protected (Section 9) as well as their habitats (Section 10). Permits may be required from the MECP for any works within areas identified as habitat of a Species at Risk in Ontario (SARO) and for sampling SARO species. A Section 17 permit for the protection and recovery of a provincial species at risk may be required if SARO species are found in the Project Study Area.

1.4. REVIEW OF THE DRAFT EA

On July 20, 2023, the City provided MCFN with an advanced copy of the Draft EA report and a summary to MCFN for their review and comment. The City offered MCFN capacity funding to assist MCFN in this review. The City received MCFN's comments on September 7, 2023, with a presentation by MCFN to the City regarding MCFN comments on the draft EA and MCFN's priority issues. The City dispositioned each comment and shared this information with MCFN on October 16, 2023. Items that required further discussion were addressed in an in-person meeting held on March 13, 2024, with MCFN, the City and its consultants. The City updated its original Comment Disposition Table and the Draft EA was revised and updated accordingly. On August 8, 2024, a final Comment Disposition Table addressing MCFN comments and a revised EA in tracked changes was sent to the MCFN. The MCFN requested a letter from the City outlining the benefits of the Project to the MCFN. This letter was also provided on August 8, 2024. The final Comment Disposition Table is provided as an Appendix to this EA and is also included in the Record of Consultation Supporting Materials (under separate cover).

The Draft EA was made available for regulatory agency review on September 14, 2023. The review of the Draft EA was coordinated by the MECP. MECP provided memos and comment tables from the Ministry's technical reviewers on October 31, 2023, and November 10, 2023, via email, from the following program areas: Air Quality, Source Protection, Noise, Climate Change, Indigenous Consultation, Species at Risk and Surface Water. The City dispositioned each comment and the Draft EA was revised and updated accordingly. The MECP was provided with the revised EA in tracked changes for a final review. Agency comments on the Draft EA are provided in a Comment Disposition Table in an Appendix to this EA and is also included in the Record of Consultation Supporting Materials (under separate cover).

The Draft EA was made available for public review between September 14, 2023, and October 31, 2023, via the Project website. The City held EA PIC #3 virtually from September 14 to October 31, 2023. Creating a 24/7 community meeting, the public had access to the PIC materials, including the Draft EA document and the Record of Consultation on the Project website. The City also provided a recorded presentation to present the preferred large lakefill alternative and provide an overview of the Draft EA findings. The public provided feedback through an online survey focusing on the results of the EA. The City received 238 completed surveys and over 1,200 views to the online presentation. Public comments on the Draft EA are provided in the EA PIC#3 Summary report in an Appendix to this EA and is also in the Record of Consultation Supporting Materials (under separate cover).

Overall, the City is satisfied that a robust review of the Draft EA was undertaken, and that the final EA has adequately taken into account all comments and feedback provided.

1.5. OVERVIEW OF EA REPORT

This EA report is organized into 11 chapters:

Chapter 1 – Introduction

- Briefly describes the background, goal and objectives of the 1PSEPM Project; introduces the proponent; and provides a summary of the regulatory framework of the EA process and other approvals.

Chapter 2 – Purpose of the Undertaking

- Presents the Problem/Opportunity Assessment and describes the 1PSEPM Project Study Areas and timeline.

Chapter 3 – Description of the Environment Potentially Affected by the Undertaking

- Describes existing environmental and socio-economic conditions in the Regional, Local and Project Study Areas.

Chapter 4 – Evaluation and Rationale for ‘Alternatives To’ the Undertaking

- Describes the process through which functionally different ways of addressing the identified problem/opportunity (‘Alternatives to’) were developed and assessed.

Chapter 5 – Description, Evaluation, and Rationale for ‘Alternatives Methods’ of Carrying Out the Undertaking

- Describes the process through which alternative ways or methods of carrying out the 1PSEPM Project (different sizes of lakefill) were identified and evaluated to choose a preferred alternative.

Chapter 6 – Description of the Preferred Alternative

- Provides a description of the conceptual design for the 1PSEPM Project, including its design, phasing and construction techniques. It also provides a detailed design framework.

Chapter 7 – Detailed Assessment of the Preferred Alternative

- Presents the criteria, indicators and an assessment of potential environmental effects of the 1PSEPM Project during its construction and establishment phases, including recommended mitigation measures and net effects.

Chapter 8 – Monitoring and Adaptive Management

- Outlines the framework and strategy for the EA compliance monitoring, performance monitoring and adaptive management activities that will be developed during the detailed design stage. .

Chapter 9 – Record of Consultation

- Describes the public, agency and Indigenous community consultation activities including input from various interested parties. The City’s responses are provided in an Appendix and in the Record of Consultation Supporting Materials (under separate cover). Details are also provided regarding engagement with MCFN and the specific commitments made by the City to the MCFN during the preparation of the EA.

Chapter 10 – EA Amendment Process

- Provides a framework to deal with modifications to the 1PSEPM Project after the completion of the EA.

Chapter 11 – Advantages and Disadvantages

- Summarizes the advantages and disadvantages of the 1PSEPM Project from an environmental and socio-economic standpoint.

2. PURPOSE OF THE UNDERTAKING

The following sections provide a description of the purpose of the 1PSEPM Project. The description is framed in terms of both the “problem” (expanding the land base on the east side of the breakwater to provide continued marina function on the site) and the “opportunity” (enhancing access to the waterfront and increased parkland) which the 1PSEPM Project presents.

2.1. PLANNING CONTEXT

There is a long history of planning, public engagement, scientific and economic studies with respect to the Port Credit waterfront, specifically the 1 Port Street East site. The following provides a summary of the key background documents and initiatives, and how they support the problem and opportunity assessment in this EA, including:

- Inspiration Port Credit;
- Port Credit Local Area Plan (2016);
- Mississauga Recreational Boating Demand and Capacity Study (2015);
- Mississauga Marina Business Case (2015);
- 1 Port Street East Comprehensive Master Plan (2016);
- 1 Port Street East Official Plan Amendment 65 (2017); and
- Waterfront Parks Strategy 2019 Refresh.

2.1.1. INSPIRATION PORT CREDIT

“Inspiration Port Credit” was a city-building initiative that contributed to the planning framework for transforming Port Credit into an exceptional, high quality, waterfront village. Inspiration Port Credit focused on the 1 Port Street East site, partially owned by Canada Lands, and 70 Mississauga Road South site, formerly owned by Imperial Oil Limited. These properties are two of the City's key waterfront sites in Port Credit. Their revitalization will assist in delivering the City's Strategic Plan action of creating a model sustainable community on the waterfront.

2.1.2. PORT CREDIT LOCAL AREA PLAN

The Port Credit Local Area Plan as adopted by Mississauga City Council on March 11, 2016, in the form of Official Plan Amendment No. 19 expresses a Vision for Port Credit, as an evolving urban waterfront village. Significant elements, which give Port Credit its sense of place, are intended to be preserved and enhanced, such as the main street village character along portions of Lakeshore Road (east and west), heritage buildings and landscapes, community facilities, residential neighbourhoods, open space, parks, and marina functions along the waterfront. The Vision reinforces the importance of retaining and enhancing the built elements that provide residents with a sense of local community and social activity.

The “Vision” is intended to manage change to ensure an appropriate balance is maintained between growth and preservation of what makes Port Credit a place where people want to live, learn, work and play. The Vision is based on six principles:

- Protect and enhance the urban village character recognizing heritage resources, the main street environment, compatibility in scale, design, mixture of uses and creating focal points and landmarks.
- Support Port Credit as a distinct waterfront community with public access to the shoreline, protected views and vistas to Lake Ontario, the Credit River and active waterfront uses.
- Enhance the public realm by promoting and protecting the pedestrian, cyclist, and transit environment, creating well connected parks and open spaces and reinforcing high quality-built form.
- Support the preservation, restoration, and enhancement of the natural environment.
- Balance growth with existing character by directing intensification to the Community Node, along Lakeshore Road (east and west), brownfield sites and supported infill development in the local neighbourhoods. Intensification and development will respect the experience, identity and character of the surrounding context and Vision.
- Promote a healthy and complete community by providing a range of opportunities to access transportation, housing, employment, the environment, recreational, educational, community and cultural infrastructure that can assist in meeting the day-to-day needs of residents.

2.1.3. MISSISSAUGA RECREATIONAL BOATING DEMAND AND CAPACITY STUDY (2015)

In 2015, the City completed a study on boating demand and capacity to determine anticipated demand for recreational boating facilities on Mississauga’s waterfront. The study concluded that the demand for slips exceeds supply and additional slips are needed in Mississauga. The study determined that marinas and boating facilities increase public access to the waterfront; provide more amenities on the waterfront; act as tourism attractions; enhance the physical appearance of the waterfront; raise real estate property values on the waterfront; and, in nearby neighbourhoods, act as a catalyst for new commercial and residential development. In doing so marinas and boating facilities increase the tax base and create improved aquatic habitat.

2.1.4. MARINA BUSINESS CASE (2015)

In 2015, the City completed a Marina Business Case which was a critical study informing the 1 Port Street East Comprehensive Master Plan. The recommendations of the Business Case emphasize the importance of City involvement in protecting future marina use at 1 Port Street East. The Business Case concluded that a future marina at 1 Port Street East is an economic, recreational and cultural heritage imperative and of strategic importance to Port Credit and Mississauga. The Business Case looked at several marina models at this site and defined the most sustainable model as a full-service marina with the majority of uses onsite. It also determined that a marina could work within a mixed-use context.

2.1.5. 1 PORT STREET EAST COMPREHENSIVE MASTER PLAN (2016)

Building upon the principles from the Mississauga Official Plan, the Port Credit Local Area Plan, and community engagement activities undertaken during 2014 and 2015, the City prepared a 1 Port Street East Comprehensive Master Plan (2016). The Master Plan describes the City's vision to ensure that an iconic and vibrant waterfront neighbourhood, and destination with a full-service marina be developed at the 1 Port Street East site. The Master Plan reports on two concepts for a potential new marina comprised of floating slips, a potentially expanded land base, and various marina services. One of the principles of the Master Plan speaks to a new development protecting and enhancing natural and cultural heritage resources, including important views, the marina function and marina heritage.

2.1.6. 1 PORT STREET EAST MISSISSAUGA OFFICIAL PLAN AMENDMENT (OPA 65)

Based on the Inspiration Port Credit Comprehensive Master Plan, Mississauga City Council adopted OPA 65 for 1 Port Street East in 2017 that establishes the appropriate development policies for the site including a future marina use on the eastern portion and mixed-use development for the wharf portion of the site. OPA 65 clarified that the lands will be redeveloped in a manner that recognizes the site's rich marine history and waterfront location. The site will be a city-wide and regional destination that offers recreational and leisure activities with public access and views to the waterfront.

The site's key attractions will include a marina and marina-related facilities. The site will feature high quality design and prioritize pedestrians and cyclists. Innovative sustainable design and green building technologies will be showcased, and the site's natural and cultural heritage resources will be protected and enhanced. The site should achieve the following:

- is woven into the fabric of Port Credit and the city;
- supports the overall vision of Port Credit as an evolving waterfront village;
- celebrates the site's urban waterfront context;
- provides for a mix of uses including, residential, office, retail, indoor and outdoor markets, and makerspaces;
- links the marine and cultural history of the site together; and
- draws people to the water's edge to live, work, make, learn, shop and play.

2.1.7. WATERFRONT PARKS STRATEGY 2019 REFRESH

The City of Mississauga has refreshed its 2008 Waterfront Parks Strategy outlining a 25-year vision for City parks along the waterfront of Lake Ontario. The strategy promotes the protection and enhancement of the City's waterfront while providing public access along the water's edge and opportunities for recreation, tourism and economic development. The proposed infrastructure improvements are intended to maintain and strengthen the City's historical connection to Lake Ontario.

The refresh builds on the 2008 strategy and addresses current planning trends and intensification along Mississauga's waterfront. As well, the strategy supports the Cycling Master Plan by recommending the implementation of north/ south cycling connections with the waterfront trail closer to the Lake Ontario shoreline and the 1PSEPM Project site. The 2019 Refresh recommended that the City continue to explore the opportunity for a full service marina and expansion of the eastern breakwater for public access.

2.1.8. COUNCIL DIRECTION

In October 2017, City Council authorized staff to execute an agreement of purchase and sale with Canada Lands for the eastern portion of the property at 1 Port Street East, including the basin water lot; the eastern breakwater water lot; and 2 acres of land between Elizabeth Street and Helene Street south of Port Street. The initial conveyance was completed on January 24, 2018, transferring the breakwater and a portion of the water lot into City ownership. The second conveyance will take place once the City obtains approvals (including the EA and Council approval), engages a contractor to undertake the marina construction, and issues a "Ready to Commence Construction" notice to Canada Lands. City Council has also authorized staff to pursue external funding opportunities and undertake the Environmental Assessment.

2.2. ENVIRONMENTAL MANAGEMENT CONTEXT

Several studies have been undertaken that describe issues, opportunities, goals and objectives along the Lake Ontario shoreline and nearshore areas for Mississauga, Toronto, and Lake Ontario, and are applicable to the 1PSEPM Project. A summary of the key background documents and how they support the problem and opportunity assessment are detailed below.

2.2.1. CREDIT RIVER ESTUARY: SPECIES AT RISK RESEARCH PROJECT

In 2014, the CVC completed a comprehensive Species at Risk (SAR) research Project focused on the Credit River estuary from the river mouth to the first riffle upstream at the Mississauga Golf and Country Club and its adjacent lands. The Project aimed at:

- identifying all existing SAR and Species of Conservation Concern (SCC)
- developing a short-list of SAR and SCC species that represent a wide variety of guilds/functional groups
- identifying common habitat requirements and threats to the species

- identifying a range of restoration activities
- identifying data gaps and potential future monitoring activities

Although there were no critical habitat for SAR or SCC identified specifically on the eastern breakwater, a variety of species have been observed at nearby parks and at the mouth of Credit River itself. The report encourages plantings for migratory birds at all municipal parks and makes several recommendations for enhancing habitat in the vicinity of the 1PSEPM Project.

2.2.2. FISH COMMUNITY OBJECTIVES FOR LAKE ONTARIO

In 2017, the Lake Ontario Management Unit of the Ontario Ministry of Natural Resources and Forestry (MNRF) and the Great Lakes Fisheries Section of the New York State Department of Environmental Conservation jointly developed a common set of goals and objectives for fish communities in Lake Ontario (Stewart et al., 2017). These goals and objectives aimed to sustain or increase the abundance of desirable fish to provide sustainable benefits to humans using fish for food, recreation, culture, ecological function, and aesthetics. The goals and objectives that were set by the MNRF and are most relevant to the 1PSEPM Project are those for the nearshore zone of the lake, as follows:

Goal:

To protect, restore, and sustain the diversity of the nearshore fish community, with an emphasis on self-sustaining native fishes, such as Walleye, Yellow Perch, Lake Sturgeon, Smallmouth Bass, Largemouth Bass, Sunfish, Northern Pike, Muskellunge, and American Eel.

Objectives:

- Maintain healthy, diverse fisheries—maintain, enhance, and restore self-sustaining local populations of Walleye, Yellow Perch, Smallmouth Bass, Largemouth Bass, sunfish, Muskellunge, and Northern Pike to provide high-quality, diverse, fisheries.
- Restore Lake Sturgeon populations—increase abundance of naturally produced Lake Sturgeon to levels that would support sustainable fisheries.
- Restore American Eel abundance—increase abundance (recruitment and escapement) of naturally produced American Eel to levels that support sustainable fisheries.
- Maintain and restore native fish communities—maintain and restore native nearshore fish communities.

2.2.3. INTEGRATED WATERSHED MONITORING PROGRAM

The CVC prepared an update of its Integrated Watershed Monitoring Program (IWMP) (CVC, 2020). The update report provides a high-level summary of climate, groundwater, stream, forest, and wetland conditions in the Credit River Watershed. The update report also identifies key issues of concern throughout the watershed. Key issue of concern identified by CVC relevant to the 1PSEPM Project is that a changing climate is expected to increase the magnitude and frequency of extreme events, including ice storms, flooding, high winds, and drought (such as the drought in 2016). Intense storms are expected to become more common, resulting in more frequent flooding and more extensive damage to infrastructure. Older infrastructure (including roads, bridges, stormwater management and wastewater treatment facilities) in many parts of the watershed was not designed for changing climate.

2.2.4. LIVING BY THE LAKE: 2019-2039 - AN ACTION PLAN TO RESTORE THE MISSISSAUGA SHORELINE

The CVC began developing an action plan to restore the Mississauga shoreline by conducting the Lake Ontario Integrated Shoreline Strategy (LOISS). LOISS identified opportunities for the protection and restoration of natural ecosystems along the shoreline, inland, and into the lake in the nearshore environment.

LOISS identified the role of existing features in meeting the needs of wildlife, but also to identified priority areas for both restoration and creation of aquatic and terrestrial habitat to enhance existing features and functions. Implementation of the Project has contributed directly to significant improvements in aquatic habitat and functions within the LOISS study area that extends the length of the shoreline within CVC's jurisdiction, from the Harding Waterfront Estate on the west to Marie Curtis Park on the east, including five kilometers up the Credit River and six kilometers into Lake Ontario.

Based on the findings of the LOISS and the Credit River Estuary Species at Risk Research Project, the CVC developed and approved the Living by the Lake Action Plan in 2018 which envisions a "revitalized shoreline that maximizes access for people while maintaining and restoring health, aquatic and terrestrial habitat features and functions." Actions identified in the vicinity of the 1PSEPM Project include:

- Exploring the feasibility of re-creating wetland habitat at mouth of Credit River to support aquatic species;
- Investigate opportunities to enhance open coast habitat for cold water fish species;
- Study fish use of the nearshore at St. Lawrence Park to inform habitat enhancement and/or protection; and
- Explore opportunities to relocate and improve quality of common tern nesting habitat at PCHM.

The City will collaborate with CVC to conserve, enhance and restore the health of the Mississauga shoreline while providing public access to the water's edge and protecting viewing to the lake.

2.2.5. CLIMATE CHANGE ACTION PLAN (2019)

The City developed a Climate Change Action Plan (2019), creating a 10-year road map for tackling climate change. It is the City's first comprehensive climate change action plan. It sets out actions to reduce greenhouse gas (GHG) emissions and help the city adapt to a changing climate over the next ten years. The plan has two goals:

- Reduce GHG emissions 80 per cent by 2050, with a long-term goal of becoming a net-zero community.
- Increase resilience and the capacity of the city to withstand and respond to severe weather events (e.g., extreme heat, flooding).

In recent years, there has been damage to the parks along the shoreline due to severe weather events and the introduction of invasive pests and species. The City will emphasize resilient solutions for shoreline treatment to protect infrastructure and the natural environment and to enhance water quality.

2.3. PROBLEM/OPPORTUNITY ASSESSMENT

The purpose of the 1PSEPM Project is to provide an expanded land base for additional waterfront parkland and marina alternatives at the 1 Port Street East site. The 1PSEPM Project is a key element of Inspiration Port Credit's 1 Port Street East Comprehensive Master Plan (2016).

The 1PSEPM Project is intended to help fulfill the vision:

“to ensure that an iconic and vibrant mixed-use waterfront neighbourhood and destination with a full-service marina is developed at the 1 Port Street East Site”

The wharf at 1 Port Street East was constructed in mid-1950s to facilitate commercial shipping on the Great Lakes. The east breakwater (which is the focus of this EA) was added between 1958 and 1961 in two phases. The “Ridgetown” was added in 1974 and the site converted to a recreational marina in about 1974.

Currently, the PCHM is one of the largest privately-operated full-service marinas on the Greater Toronto Area's (GTA) Lake Ontario shoreline. It is also one of the deepest on the north shore of Lake Ontario. The marina caters to seasonal and transient boaters, charter fishing boats, and cruisers. The PCHM is considered by the City of Mississauga and its residents to be an important asset. Previous studies have documented the community desire to continue the marina operations at this site.

Canada Lands Company (CLC) currently owns a portion of the 1 Port Street East site and water lot where the existing PCHM is located. As documented in the studies discussed in Chapter 2, the wharf will be redeveloped into a mixed-use residential community. These studies have also identified that an expanded land base along the eastern breakwater can help to accommodate the relocation of the marina.

The 1PSEPM Project will delineate the boundaries of the land base expansion along the eastern breakwater to permit the relocation of the marina.

Simultaneously, expansion of the land base also creates an opportunity to:

- Create new waterfront parkland with safe public access:
 - There is no public access associated with the existing privately-owned marina. The public increasingly seeks access to the water's edge through public parkland and along continuous trails and this 1PSEPM Project provides an opportunity to create access where none currently exists.
- Provide opportunities for the creation and restoration of aquatic and terrestrial habitat:
 - The existing breakwater was constructed in the late 1950's when the provision of quality aquatic habitat was not part of Project planning. The 1PSEPM Project provides an opportunity for the creation and restoration of aquatic and terrestrial habitats in the vicinity of the breakwater in a manner that achieves an overall ecological gain that is consistent with the stated objectives of CVC's LOISS.

2.4. STUDY AREAS

The environmental assessment will be based on three general Study Areas.

2.4.1. PROJECT STUDY AREA (PSA)

The Project Study Area (PSA) is shown in **Figure 2.1**. It includes a portion of the 1 Port Street East property, inclusive of the water lot, located in Port Credit, Mississauga, at the mouth of the Credit River. It is bound by Port Street East to the north, Elizabeth Street to the west, Helene Street South to the east and Lake Ontario to the south. The lands and water lot collectively have an area of approximately 21.4 hectares, comprised of:

- The Breakwater & Ridgetown Water Lot (7.9 ha);
- Elizabeth and Helene Street Rights of Way (0.8 ha); and
- The Basin Water Lot (12.7 ha).

2.4.2. LOCAL STUDY AREA (LSA)

The Local Study Area (LSA) is shown in **Figure 2.2**. It is comprised of the areas within the Port Credit Community Node Character Area and the Old Port Credit Village Heritage Conservation District. The area is bounded by the CN tracks to the north, Mississauga Road to the west, Elmwood Avenue to the east and Lake Ontario to the South. This area includes the primary access roads from the QEW to the 1PSEPM Project site.

2.4.3. REGIONAL STUDY AREA (RSA)

The Regional Study Area (RSA) is shown in **Figure 2.3**. The RSA extends beyond the LSA. Depending on the criterion this may include portions of the Credit River watershed up to approximately 5 km upstream, the Lake Ontario shoreline and shoreline neighbourhoods within the boundaries of the city. This Regional Study Area will be used to describe the broader setting for the 1PSEPM Project and used to discuss cumulative effects of the 1PSEPM Project.

Figure 2.1: Project Study Area

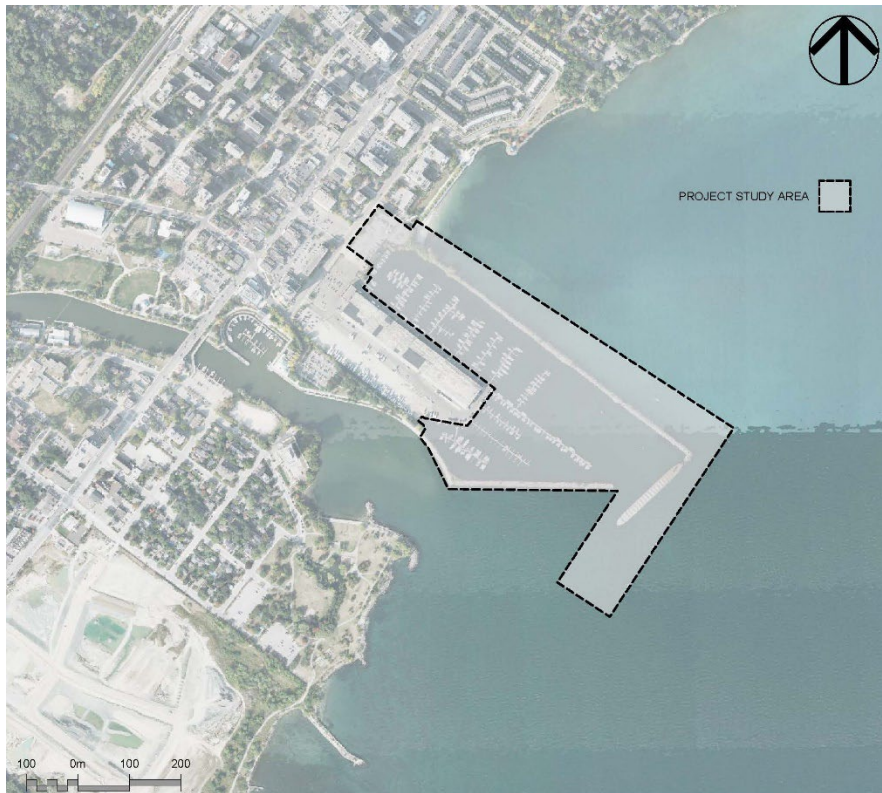


Figure 2.2: Local Study Area



Figure 2.3: Regional Study Area



2.5. ENVIRONMENTAL ASSESSMENT TEMPORAL BOUNDARIES

The temporal boundaries for the 1PSEPM Project EA are as follows:

- **Construction Phase:** The time during which the land base is being constructed, including lakefilling, on-site infrastructure development, habitat creation and site restoration. Construction is subject to EA approval by the Province and City Council Approval of the Project to proceed to detailed design and permitting (e.g., Fisheries Act Authorization by DFO).
- **Establishment Phase:** The time after the parkland and marina is constructed and officially open to the public for use and during which monitoring and adaptive management of the 1PSEPM Project would be undertaken.

3. DESCRIPTION OF THE ENVIRONMENT POTENTIALLY AFFECTED BY THE UNDERTAKING

3.1. PHYSICAL ENVIRONMENT

3.1.1. SHORELINE

REGIONAL STUDY AREA

Much of the shoreline within the 1PSEPM Project Regional Study Area has been protected with either formal or informal shoreline protection structures.

As part of the CVC Lake Ontario Shoreline Hazards study (Shoreplan, 2005) defined a total of 87 shoreline reaches within the CVC watershed. Amongst other attributes, a general shoreline type and shoreline protection type were assigned to each reach. **Table 3.1** and **Table 3.2** were developed from that data. The shoreline length values were determined from digital mapping provided by the City of Mississauga and exclude major structures such as piers and breakwaters but include the shoreline within the Port Credit marinas and Lakefront Promenade Park.

Table 3.1: General Shoreline Statistics

Shoreline Type	Length (m)	% of Total Length
All reaches	20,145	
Artificial shoreline	9,003	45
Cohesive shore with protection structure	7,779	39
Cobble sand	1,454	7
Sand beach	834	4
Cohesive shore with protective beach or rubble	799	4
Unprotected cohesive bank or bluff	276	1

Table 3.2: General Shoreline Protection Statistics

Shoreline Protection Type	Length (m)	% of Total Length
Revetment	6,072	30
Wall	4,332	22
Beach	3,495	18
Wall and revetment	2,924	15
Rubble	1,417	7
Headland-beach (artificial)	904	4
None	858	4
Rip-rap berm	143	< 1

The nearshore bottom within the 1PSEPM Project Regional Study Area is composed mainly of shale bedrock, overlain with erodible cohesive tills varying from low plains to low and moderate height bluffs. Extensive filling has created several reaches that are characterized as artificial shores. Examples of beaches within the 1PSEPM Project Regional Study Area include cobble beaches at Rattray Marsh, the Petro Canada Clarkson Refinery, Lakeside Park, and sand beaches at Richard's Memorial Park, Lorne Park Estates and Jack Darling Park, and adjacent to the mouth of Etobicoke Creek.

LOCAL STUDY AREA

Within the Local Study Area, the shoreline of Lake Ontario is protected with various types of shoreline treatments. Excluding the Project Study Area, which is described below, the shoreline is protected with armour stone seawalls and revetments, rip rap revetments, steel sheet pile walls and other less formal protection structures. The shoreline of Lake Ontario is typically considered to extend up to Lakeshore Road bridge over the Credit River. The protection works are, for the most part, designed to accommodate various specific waterfront functions. Typical examples are rip-rap revetment within the small mooring basin, a launch ramp and low crested structures to accommodate waterfront walkways.

Protection works on the west bank of the Credit River from the Rivergate apartment to the north side of the Mississauga Canoe Club is under reconstruction by City of Mississauga (City). This work is a part of long-term waterfront improvement plans by the City. The shoreline within the Local Study Area, up to the Lakeshore Road bridge can be considered artificial shoreline. Extensive filling along the original shore of the mouth of the Credit River has occurred in the past.

The Credit River bank north of the Lakeshore Road bridge is protected with armour stone, boulders, rip rap and concrete rubble structures. The shoreline protection on the western side of the river was improved in 2022 to include undulating features that provide greater opportunities for in water habitat. More formal structures extend to within approximately seventy metres of the north limit of the railway bridge that forms the limit of the Local Study Area. Informal placement of rubble extends past the railway bridge.

PROJECT STUDY AREA

Within the Project Study Area, 100% of the shoreline is man-made and can be characterized as artificial. The east breakwater consists of large armour stones with a stone core. The west shoreline is formed by a steel sheet pile wharf. The north shore is formed by a conglomerate of structures and informal structures. The land within the Project Study Area is all fill material.

3.1.2. BATHYMETRY

REGIONAL, LOCAL AND PROJECT STUDY AREAS

Figure 3.1 illustrates the bathymetry within the Local and Project Study Areas. Bathymetry reveals both the depth of water and the topography of the lakebed. This information is important in understanding the cost and effects of placement of lakefill and is a key input to the numerical models used to determine the site wave conditions. **Figure 3.2** shows the bathymetry used in the nearshore wave transformation model. The data presented in **Figure 3.2** was synthesized from several Canadian Hydrographic Service survey field sheets.

Figure 3.1: Bathymetry in the Project and Local Study Areas

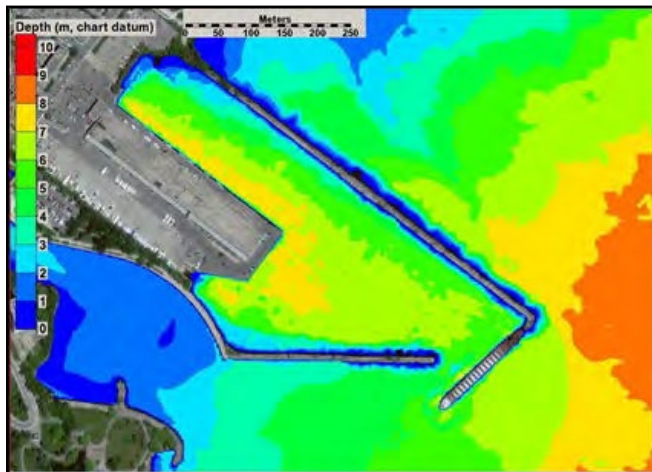
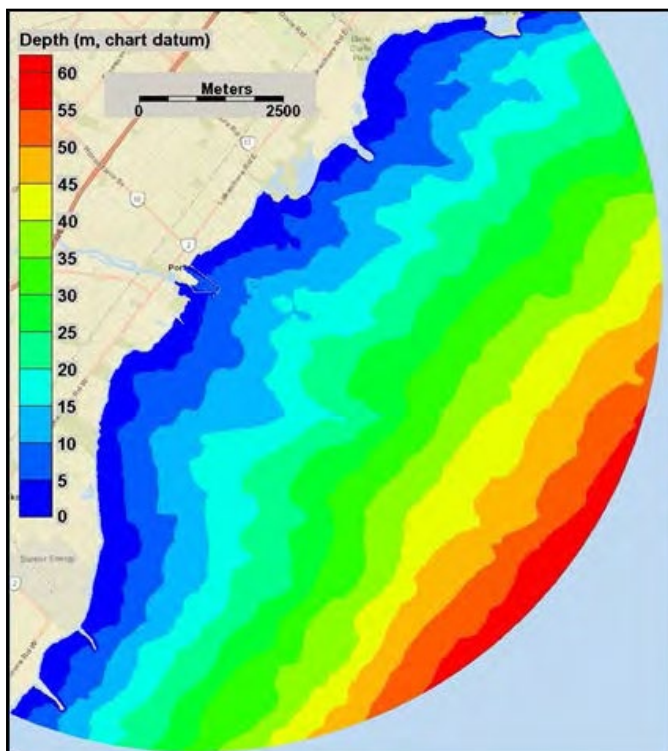


Figure 3.2: Bathymetry in the Regional Study Area



3.1.3. LAKE WATER LEVELS

REGIONAL, LOCAL AND PROJECT STUDY AREAS

Water levels on Lake Ontario fluctuate on short-term, seasonal, and long-term basis. Water levels of the Great Lakes, including Lake Ontario, are referenced to chart datum. Chart datum is generally selected so that the water level seldom falls below it. The referenced chart datum on the Great Lakes is the International Great Lakes Datum (1985). For Lake Ontario the chart datum is 74.2 m IGLD1985. IGLD1985 elevations are 0.098m higher than CGVD28 elevations at Port Credit (Natural Resources Canada Passive Control Network benchmark 63U3470).

Seasonal fluctuations reflect the annual hydrologic cycle which is characterized by higher net basin supplies during the spring and early part of summer with lower supplies during the remainder of the year. Seasonal water levels on Lake Ontario generally peak in the summer (typically in June) with the lowest water levels generally occurring in the winter (typically in December). The average annual water level fluctuation has been approximately 0.6 metres, but this is changing. Although water levels below chart datum are rare, the lowest monthly mean on record was approximately 0.46 metres below chart datum.

Short-term fluctuations last from less than an hour up to several days and are caused by local and regional meteorological conditions. These fluctuations are most noticeable during storm events when barometric pressure differences and surface wind stresses cause temporary imbalances in water levels at different locations on the lake. These storm surges, or wind-setup, are most noticeable at the ends of the Lake, particularly when the wind blows down the length of the Lake.

Long-term water level fluctuations on the Great Lakes are the result of persistently high or low net basin supplies. More than a century of water level records shows that there is no consistent or predictable cycle to the long-term water level fluctuations. Some climate change studies that examined the impact of global warming have suggested that long-term water levels on the Great Lakes will be lower than they are today. Those changes, however, are expected to have a lesser impact on Lake Ontario than on the upper lakes because the Lake Ontario water levels are regulated. For the time being most approving agencies, including CVC, require that the 100-year instantaneous water level (the peak water level that has a 1% probability of occurring during any given year) be used for the design and assessment of shoreline protection structures.

MNR (1989) calculated instantaneous water levels for all Canadian shores on the Great Lakes using a combined probability analysis of monthly mean lake levels and storm surges. A coarse grid circulation model was used to interpolate surge values between stations where measured data was used to calculate the surge height return periods. Toronto and Burlington were the data stations either side of the Mississauga sector. The water levels presented in that report were typically used for designs and assessments, but the 2017 and 2019 high water level have led to a re-assessment of those values. CVC recently adopted 100-year design water level values of 76.0m CGVD28 for development east of the Clarkson Pier and 76.1m CGVD28 for development west of the Clarkson Pier. Those values are used in this EA. The Project Study Area is east of the Clarkson Pier, where the 100-year design water level is 76.0m CGVD28.

3.1.4. CLIMATE CHANGE

Climate change is expected to impact both water levels and storm conditions. A considerable amount of research has been done on climate change and its expected effects on the Great Lakes, but while results vary considerably, there is consensus on several key points. Overall, storm frequency and intensity are both expected to increase, while mean water levels may fall. Climate change impacts on Lake Ontario water levels are expected to be less than on the other Great Lakes because its water levels are regulated.

McDermid et al. (2015) synthesized available science on the observed and predicted impacts of climate change in the Great Lakes basin. They reported a lack of clarity in the understanding of multiple factors influencing water level Projections for the Great Lakes, and a low confidence in the current Projections of future water levels resulting from climate change.

Bonsal et al. (2019) noted that disturbances to the water cycle by humans (dams, diversions, and withdrawals) make it difficult to discern climate-related changes. They also noted that most studies of future levels used models that include phenomena that can have significant effects on water balance, such as lake-effect snow, which transfers large amounts of water from the lake to the land. Projected net basin supplies showed changes to the season cycles for 2041-2070 compared with 1961-2000 producing an increase in water levels during the winter and early spring and a decrease in summer and early fall. Overall estimates were a decrease in net basin supply of 1.7% to 3.9% in Lakes Superior, Michigan, Huron, and Erie, and 0.7% in Lake Ontario. On average, under a range of emission scenarios, most regional climate model studies Project a lowering of future Great Lake levels by 0.2 m for the 30-year time period, centered on the 2050s, as compared to the 1971–2000 mean. However, there is a considerable range (from a 0.1 m increase to a 0.5 m decrease). They also noted a low confidence in the estimate of future water levels because of climate change. All of the studies they reviewed agreed that there will continue to be large year-to-year and multi-year variability in lake levels, possibly even above and below the historically observed extremes.

3.1.5. WAVE CONDITIONS

REGIONAL, LOCAL AND PROJECT STUDY AREAS

Due to a scarcity of locally measured wave conditions, a process known as hindcasting is used to develop a long-term wave database suitable for statistical analysis. Hindcasting uses recorded wind data to model the wave conditions expected to have occurred due to those winds. By hindcasting we can produce wave climates which represent expected conditions over a period of years.

Wave conditions within the Regional, Local and Project Study Areas were determined by first hindcasting waves at an offshore location where wave generation is not affected by water depth, then transferring those waves into the nearshore region accounting for the effects of refraction, diffraction, and wave breaking.

A 48-year wave hindcast was completed by using Toronto Island wind data to produce deep water wave conditions offshore of the site. Wind data recorded from January 1, 1973, to December 31, 2020, was used to produce hourly estimates of the deep-water significant wave height, peak wave period and mean wave direction. Wind data prior to 1973 was not used due to the relatively high occurrence of missing data.

The hindcast was prepared using Shoreplan's parametric hindcast model. Toronto Island wind data was selected as the best wind data source for Lake Ontario hindcasting on the basis of extensive calibration and verification exercises carried out on different Shoreplan Projects including the Etobicoke Motel Strip (Shoreplan, 1995), Port Union Road (Shoreplan, 1998) and Frenchman's Bay (Shoreplan, 2009). During those Projects waves hindcast with Trenton, Toronto Island, Burlington, Hamilton, and St. Catharines wind data were compared to measured wave data from a total of twelve buoys deployed at nine locations (Kingston, Point Petre, Main Duck Island, Prince Edward Point, Port Hope, Cobourg, Toronto, Burlington, and Grimsby). All measured wind and wave data was obtained from Environment Canada.

The general purpose of the hindcast calibration and verification undertaken was to determine which measured wind data set best represents the actual over-water winds that generate waves. This was done by hindcasting to sites where wave data had been measured then comparing the hindcast and measured waves. Typical calibrations involved scaling wind speeds to improve the overall match. It was found that Toronto Island wind data provided the best hindcasts for Central and Western Lake Ontario.

The hindcast model has been used for coastal assessments and coastal structure designs at numerous site along western Lake Ontario including Frenchman's Bay, Port Union Road, the Scarborough Bluffs, Ashbridges Bay, Tommy Thompson Park, Ontario Place, Humber Bay Parks, Mimico Linear Waterfront Park, Lakefront Promenade Park, Port Credit, Oakville Harbour, Shell Park, Burloak Waterfront Park, Burlington Beach, Fifty Point, Grimsby Waterfront Parks and the entrance to the Welland Canal.

The deep-water wave climate offshore of Port Credit has a bi-nodal distribution of the total wave power with predominant easterly and southwesterly peaks. **Figure 3.3** shows the directional distribution of the highest wave heights and the total wave power from the hindcast data. **Figure 3.4** presents wave height and period exceedance curves, which show the percentage of time any given wave height or period is exceeded. **Figure 3.5** shows the results of an extreme value analysis completed to determine a design wave height. For structural design the 100-year return period wave condition is used. At the upper 90% confidence interval the 100-year wave condition has a significant wave height of 5.9 m with a peak wave period of 10.5 seconds. That wave comes from the east.

The 100-year offshore wave was transferred into the 1PSEPM Project Study Area using the SWAN two- dimension spectral wave model developed at Delft University of Technology. The model simulates a steady-state spectral transformation of directional random waves co-existing with ambient currents in the coastal zone. It includes features such as wave generation, wave reflection, wave diffraction, and bottom frictional dissipation. Model bathymetry was developed from Canadian Hydrographic Service field sheets. A flexible grid was used with grid spacing ranging from approximately 5 m in the Project Study Area to 250 m at the offshore boundary.

Figure 3.6 shows the 100-year offshore wave condition transferred inshore at the 100-year instantaneous water level. This represents the upper limit of design conditions usually considered in coastal applications. Extreme values of both offshore wave conditions and water levels are typically considered because both play a major role in determining the nearshore wave condition. **Figure 3.7** shows the same model results within the 1PSEPM Project Study Area.

Figure 3.3: Distribution of Highest Hindcast Wave Heights and Total Wave Power

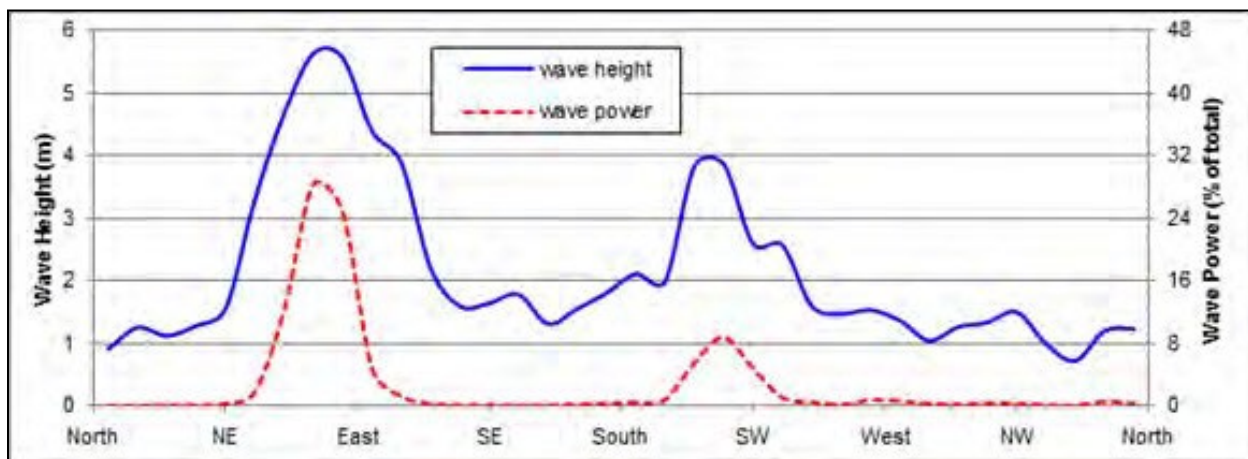


Figure 3.4: Wave Height and Period Exceedance Curves

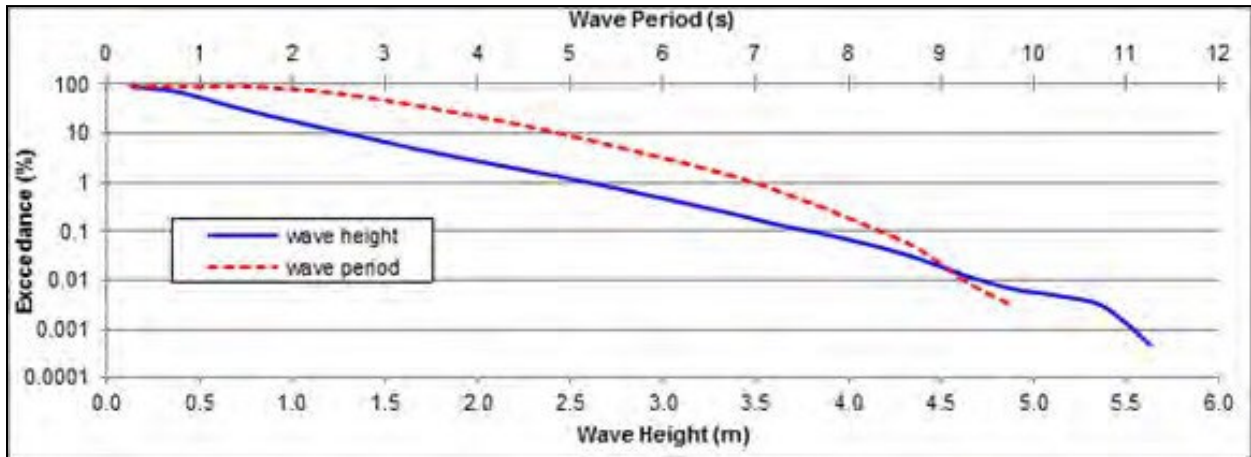


Figure 3.5: Peak-Over-Threshold Extreme Value Analysis (Easterly Storms)

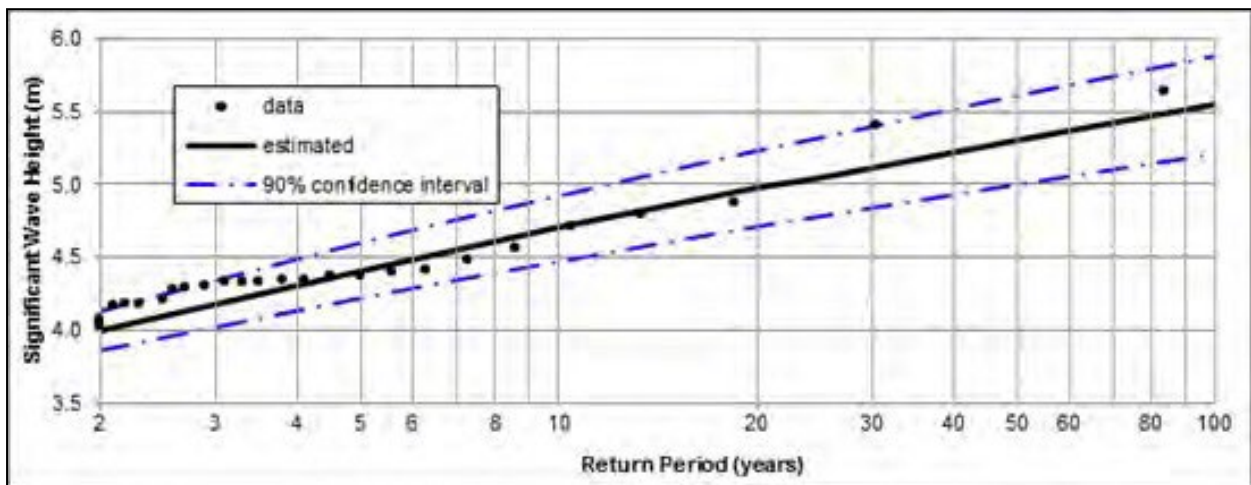


Figure 3.6: Design Wave Transformation (100-yr wave, 100-yr water level)

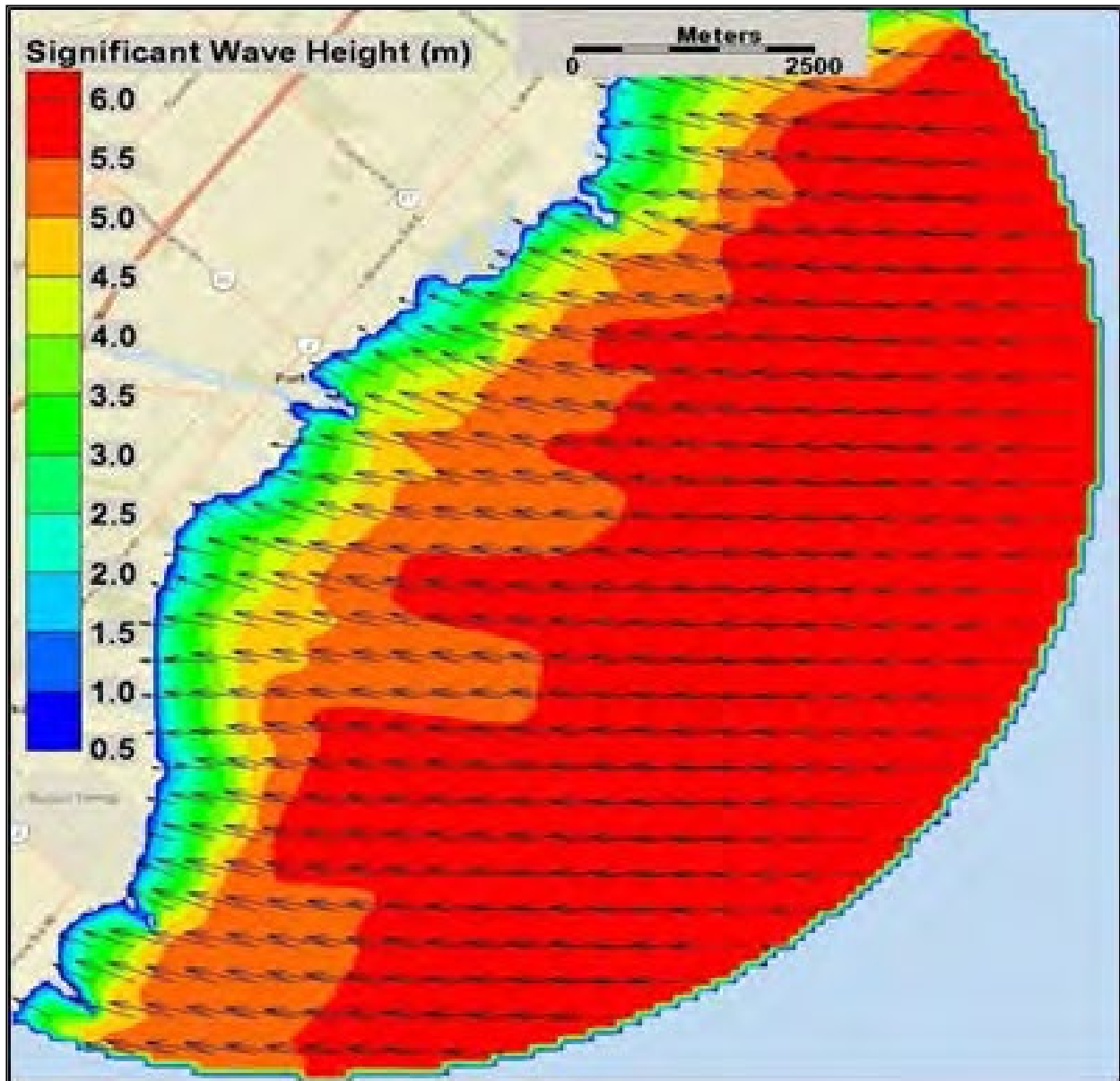
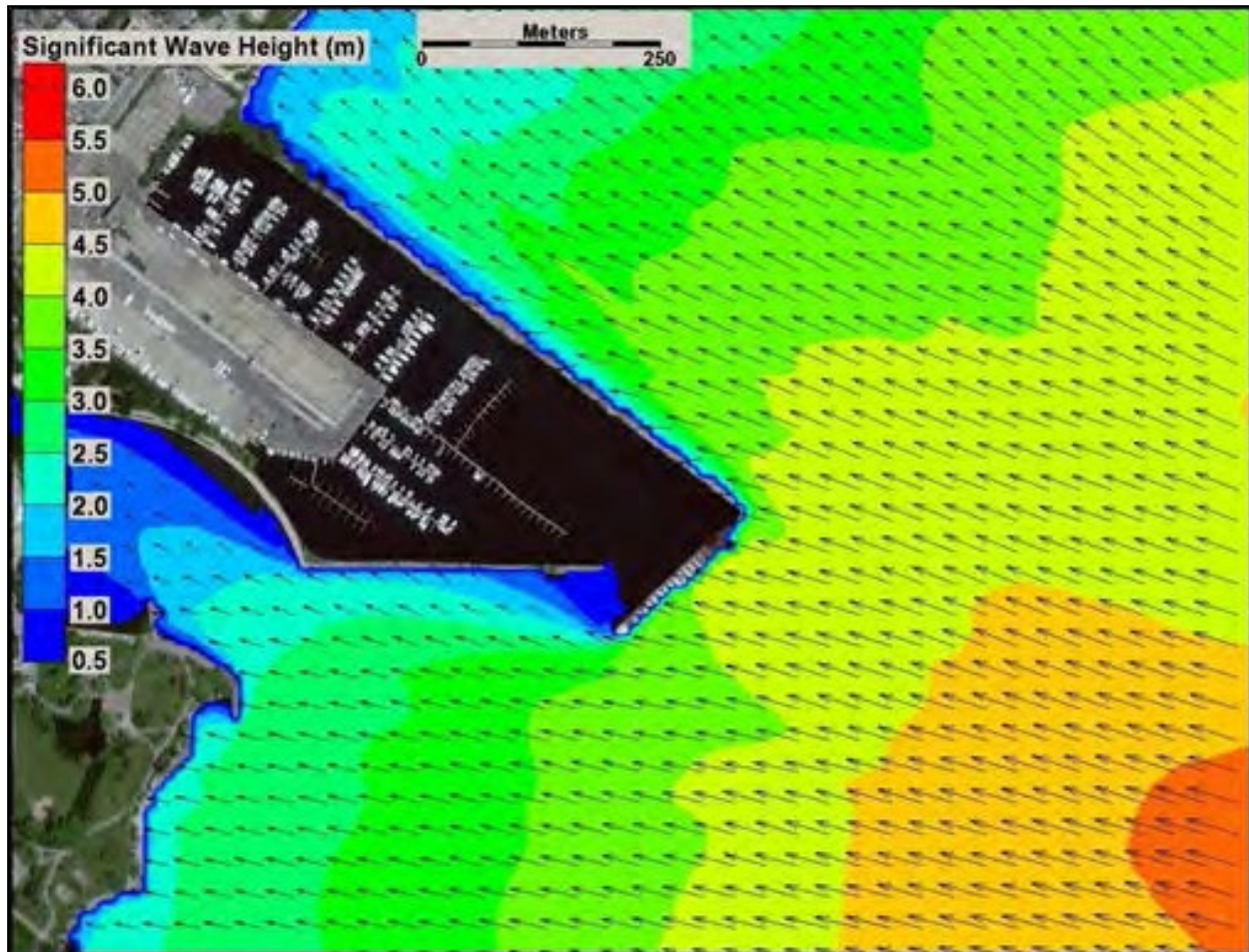


Figure 3.7: Design Wave within the Project Study Area



3.1.6. ICE AND DEBRIS

REGIONAL, LOCAL AND PROJECT STUDY AREAS

Ice cover and winter mean ice cover on Lake Ontario has been declining since the early 1970s, and this is attributed to increasing surface water temperatures. Increases in air temperature are generally coincident with increases in water temperature, with the greatest warming and associated reductions in dissolved oxygen anticipated in the nearshore area. Shore ice, which is ice that forms around the perimeter of the lake, can both protect and damage shorelines, depending upon local conditions (CVC, 2018).

CVC conducted ice monitoring along the shoreline in February 2014 and found that ice accumulation was greatest in protected areas (with complete coverage in the Credit River upstream of Lakeshore Road and in Lakefront Promenade Park embayment and marina) and areas of shallower depth (e.g., Rattray Marsh beach).

Debris from various watercourses and storm sewer systems is typically made up of urban refuse such as plastic bags, water bottles, and take-out containers, as well as woody debris such as sticks and logs which is considered beneficial. Debris is widely scattered across beach shorelines during storm events and tends to collect against structures that extend out into the lake.

3.1.7. LITTORAL SEDIMENT TRANSPORT

REGIONAL, LOCAL AND PROJECT STUDY AREAS

The shoreline from Burlington to Toronto is generally referred to as a non-drift zone due to the lack of littoral (coastal) sediments. On many shores of the Great Lakes, littoral sediment supply originates from erosion of shoreline bluffs and the nearshore lakebed. Within the regional, local and Project Study Areas, most of the shoreline has been hardened, essentially eliminating bluff erosion, and the nearshore lakebed is erosion-resistant bedrock. Some sediment transport does take place because of nearshore bottom deposits, but there is no significant source of new littoral material. Sediment introduced via the watercourses (creeks, rivers, etc.) that discharge into Lake Ontario is typically fine grained and tends to deposit in deeper water offshore of the littoral zone. Littoral Sediment Transport patterns will not be notably altered by any of the alternatives considered.

3.1.8. LAKE AND RIVER WATER QUALITY

REGIONAL AND LOCAL STUDY AREAS

Rainfall and snowmelt run off surfaces rapidly and in unnaturally large amounts in areas of high urban density. This runoff gathers speed and erosional power and takes up contaminants as it travels into receiving waters. Urbanization increases the variety and number of pollutants carried into streams, rivers, and lakes. Storm sewer overflows and rivers are major sources of bacterial, nutrient, and total suspended solids (TSS) loadings along the Regional and Project Study Areas. Additional pollutants from upstream agricultural areas also contribute. These pollutants can harm fish and wildlife populations, kill native vegetation and foul drinking water supplies (Aquafor Beech Limited, 2011).

A LOISS Background Review identified that the largest watercourse within the Regional Study Area, the Credit River has the greatest effect on most water quality parameters. It contributes 86% of the suspended solids, 66% of the nitrates, and 80% of the heavy metals entering Lake Ontario.

PROJECT STUDY AREA

Golder (2016) reported that within the existing marina basin and immediately east of the eastern breakwater, surface water quality generally met Provincial Water Quality Objectives (PWQO) standards, except for total nickel in one shallow surface water sample and copper at two shallow and deep surface water samples.

3.1.9. SEDIMENTATION AND SEDIMENT QUALITY

REGIONAL AND LOCAL STUDY AREAS

The shoreline from Toronto to Burlington is generally referred to as a non-drift zone due to the lack of littoral (coastal) sediments. On many shores of the Great Lakes, littoral sediment supply originates from erosion of shoreline bluffs and the nearshore lakebed. Within the Regional and Local Study Areas, much of the shoreline has been hardened, essentially eliminating bluff erosion, and the nearshore lakebed is erosion-resistant bedrock. Some sediment transport does take place but there is no significant source of new littoral material.

The Credit River yields the greatest amount of sediment supply to Lake Ontario near the Project Study Area, as the overall size of the Credit River basin is almost three times greater than the next largest basin. The Credit River Adaptive Management Study (Credit Valley Conservation, 2014) estimated that the total sediment yield from the Credit River to Lake Ontario is over 174,000 tonnes per year, and primarily composed of fine sands and silt particles.

Sedimentation and bathymetric studies were completed for the Credit Village Marina basin, the Credit River channel and river mouth (Geomorphologic Solutions, 2011). A comparison with data sets from 1989, 1995, 1996, 2010 and 2011 identified areas of sediment loss and gain and revealed that Credit Village Marina basin and the river mouth are experiencing sedimentation.

In 2013, the City of Mississauga completed a dredge Project followed by a maintenance dredge in 2022 aimed at restoring the navigability of the Credit River by removing excess sediment in the Credit Village Marina basin and along portions of the Credit River channel near the mouth of the river. The deposition near the mouth of the Credit River is a natural function of decreasing flow velocity as the river mouth widens. Historically, these conditions supported a coastal wetland in this area. Wave action likely also influences deposition in this area.

PROJECT STUDY AREA

Golder (2016) conducted chemical analyses of sediment samples from 11 locations within the Project Study Area. Results were compared to Ontario Ministry of Environment (Ministry of Environment, 2011(b)) Table 9 Standards. Table 9 describes the sediment quality standards for use under Part XV.1 of the Environmental Protection Act. The analytical results indicate that:

- Table 9 standards are exceeded for one or more metal parameters at most of the sediment sample locations. For example, elevated concentrations were reported for copper, nickel and zinc. Copper, zinc and other metal concentrations are comparable to previous concentrations reported in 2011.
- Concentrations of one or more PHC and/or BTEX parameters marginally exceeded Table 9 standards in samples from 9 locations, both within the marina basin and immediately east of the eastern breakwater. PAH was also present at concentrations exceeding Table 9 standards at 6 sediment sampling locations both within the marina basin and immediately east of the eastern breakwater.
- Notably, no exceedances of the Table 9 standard were reported for any samples analyzed for pesticides or PCBs.

3.1.10. SOILS AND GEOLOGY

LOCAL STUDY AREA

The Local Study Area is underlain by shale bedrock of the Georgian Bay Formation. The Georgian Bay Formation is grey shale that is up to 175 m thick, with fracturing limited to the upper few meters of the formation. A variety of surficial deposits are associated with the Iroquois Plain in the Local Study Area. Coarse-textured glaciolacustrine deposits are primarily sand, gravel minor silt and clay that were foreshore and basin deposits. Areas of bedrock are either exposed or thinly drift-covered Georgian Bay Formation shale. Modern alluvium (river deposits) was laid down by the Credit River within its floodplain, along with Stavebank Creek, Kenolli Creek, Mary Fix Creek and others.

PROJECT STUDY AREA

Based on borehole drilling undertaken by Golder (2016) the onshore portion of the 1PSEPM Project site has a relatively consistent soil and geological profile at depth. This profile consists of:

- Asphalt (up to 0.09 m thick) overlying non-cohesive fill material comprised of varying amounts of silt, sand, clay, and gravel.
- Fill materials were encountered at depths of 1.2 to 3.7 m below ground surface (bgs) This fill material contained occasional debris comprised on cinders, concrete, asphalt, wood and/or glass, particularly in the western portions of the site. 2.4 m of riprap boulders were encountered in one borehole.
- Native soil was encountered at 3 m bgs at the edge of the site along the northern property boundary in only one borehole.
- Peat, approximately 0.3 to 0.6 m in thickness was encountered at three boreholes at depths ranging from 2.9 to 5.5 m bgs and a maximum depth of 7.3 bgs at the southern end of the property, nearest the shoreline.
- Sand, silty sand or gravelly sands underly the peat. Cohesive silty clay was encountered at a depth of 2.1 m bgs at the edge of the site along the northern property boundary in only one borehole.
- Weathered shale was encountered at depths ranging from 9.8 to 10.7 m bgs (Golder, 2016).

Golder (2016) conducted chemical analyses of several soil samples from boreholes in the Project Study Area. Results were compared to Ontario Ministry of Environment (formerly Ministry of Environment, 2011(b)) Table 9 Standards. Table 9 describes the soil and groundwater standards for use within 30 m of a water body in a non-potable groundwater condition. The analytical results indicate that:

- Table 9 standards are exceeded for one or more metal parameters at most of the borehole locations. For example, at one representative borehole near the center of the site, metal/metalloid concentrations exceeded Table 9 standards for antimony, arsenic, barium, cadmium, copper, lead, mercury, molybdenum and zinc.
- Concentrations of four BTEX parameters exceeded Table 9 standards in samples at two boreholes. PHC (F4) and PAH were also present at concentrations exceeding Table 9 standards at one or more borehole locations.

Golder (2016) measured groundwater levels at the Project site. The water table was encountered at depths ranging from 2.0 to 2.6 m bgs. Groundwater flow is inferred to be south and southeast towards Lake Ontario. Apart from one exceedance of Table 9 standards for chloride, no exceedances were reported at the site for groundwater samples collected and analyzed for inorganics, VOCs, PHCs and PAHs.

Overall, the sources of these contaminants are not fully understood but are likely to be from leaks and spills associated with above-ground storage tanks (ASTs) and piping in the southwestern portion of the Project Study Area, boat storage and various marina activities, including winter salt application to paved areas.

3.1.11. SOURCE PROTECTION AREAS

LOCAL AND PROJECT STUDY AREAS

The Clean Water Act (2006) aims to protect existing and future sources of drinking water. To achieve this, vulnerable areas are delineated around surface water intakes and wellheads for every municipal residential drinking water system that is in a source protection area. The Project and Local Study Areas are located within the Credit Valley Source Protection Area, a surface water Intake Protection Zone (IPZ-2) with a vulnerability score of 4.5; a Highly Vulnerable Aquifer (HVA), scoring 6. Parts of these Local and Project Study Areas is located in an Event-based Modelling Area (EBA) for pipeline fuel/oil spills (Ministry of Environment, Conservation and Parks, 2020).

Some of the activities that are undertaken for the 1PSEPM Project may pose a threat to drinking water. As such the Project is likely to be subject to some policies of the approved Credit Valley, Toronto and Region and Central Lake Ontario Source Protection Plan. Section 6.6 provides more details on these policies.

3.2. ATMOSPHERIC ENVIRONMENT

3.2.1. CLIMATE

The climate for the City of Mississauga is like that of the City of Toronto and the broader GTA. Climate data has been recorded at Pearson International Airport in Mississauga since the 1930's. Based on data between 1981 and 2010, records show that Mississauga has an average daily temperature of 27C but has reached as high as 37C. Winters, like much of southern Ontario, are cold with temperatures reaching an average low of -9C and record lows of -31C. Compared to the rest of Canada and Ontario, the amount of snowfall received during the season is relatively low. On average, Mississauga receives 108cm of snow per year. Precipitation in the form of rainfall is on average 681mm per year (Environment Canada). The average wind speed was 15km/h from the west. The winters in Mississauga are the windiest with the average wind speed between 17.6 km/h and 16.9 km/h from the west or the north.

Mississauga experiences the hottest month in July (22 °C avg), the coldest month in January (-5°C avg); the wettest month in April (43.6 mm avg) the windiest month in January (18 km/h) (CustomWeather, 2022).

Although the weather station at Toronto Pearson International Airport covers data for all of Mississauga, Port Credit, having a different topography, has its own micro-climate affected greatly by Lake Ontario. Fog is more common along the lakeshore and along the Credit River valley. The lake, being a heat sink, provides for warmer winter temperatures and cooler summer temperatures. While the wind general comes from the west, in Port Credit, the lake will also provide offshore breezes particularly stronger in the winter.

3.2.2. AIR QUALITY

Air quality in the City of Mississauga is affected by both the emission sources that release pollutants into the air, and by the climate, or atmospheric conditions, such as wind speed, wind direction, and temperature. The climate in the GTA consists of cold and windy winters and typically hot, humid summers.

Air quality in Region of Peel was subject to extensive study along the Hurontario Street corridor from Port Credit to Brampton as part of the Hurontario-Main Light Rail Transit Project (2014). These studies concluded that existing air contaminant levels for the majority of the contaminants are less than their relevant Ambient Air Quality Criteria (AAQC), even when considering the maximum concentrations over multiple stations and multiple years. However, Particulate matter (i.e., PM10, PM2.5), acrolein, benzene, and benzo(a)pyrene do exceed their criteria at least some of the time. PM10 and PM2.5 have maximum concentrations that are above their 24-hour AAQC and CAAQS. These elevated maximums result from high particulate matter events that occur in the GTA from time-to-time. However, for both contaminants, the annual means are well below the thresholds, indicating that on an average day, the ambient concentrations of PM10 and PM2.5 are below the criterion (City of Mississauga, 2014).

The City is committed to improving air quality through a variety of ways. This includes promotion of active transportation solutions (e.g., cycling, walking and e-bikes) through a number of plans and strategies including the Cycling Master Plan and the Pedestrian Master Plan and deep decarbonisation in the transportation and building sectors are all underway by the City. The transformation to electric vehicles and away from gas-fueled cars, the City's move to second generation and electric buses and through energy efficient and net zero buildings all have the benefit of reduced greenhouse gas emissions and other air pollutants, all leading to improvements in air quality. In addition, the City engages with provincial activities in an effort to keep the electricity grid clean and emissions free.

3.2.3. NOISE

REGIONAL AND LOCAL STUDY AREAS

The sources of noise in the Regional and Local Study Areas are both natural (i.e., Lake Ontario) and anthropogenic. Transportation is the major source of noise in Port Credit, including road traffic noise on Lakeshore Road West, Mississauga Road South, and internal roadways within Port Credit, as well as rail traffic on the CN Oakville Subdivision rail line. The Port Credit GO station is located more than 500 m to the northwest of the subject site. Due to distance separation and the presence of existing mid-rise and high-rise residential development between the 1PSEPM Project site and Port Credit GO station, noise from the Port Credit GO station is not expected to influence ambient noise levels at the Project site.

Existing residential, retail and commercial development within Port Credit are not considered significant noise sources and are generally not audible over the ambient road and rail traffic noise (Valcoustics Canada Ltd., 2017).

Overall, the Regional and Local Study Areas can be classified a "Class 1 area", meaning an area with an acoustical environment typical of a major population center, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum" (Ministry of the Environment and Climate Change, 2013).

The closest sensitive receptors (i.e., residences) are located immediately north of the Project site along Port Street and Helene Street. However, there are numerous residences facing the 1PSEPM Project site along Port Street and St. Lawrence Drive to the east of the 1PSEPM Project site.

PROJECT STUDY AREA

The sources of noise in the Project Study Area are both natural (i.e., Lake Ontario) and anthropogenic (i.e., existing marina operations). There are no noise receptors on the Project site.

3.3. BIOLOGICAL ENVIRONMENT

The ecology of natural heritage systems in urban areas are typically composed of fragmented habitats, isolated woodlands and wetlands, lower biodiversity, impacted hydrology with lowered groundwater levels and flashier surface water hydrology, and the presence of invasive species. Urbanization and associated microclimatic changes affect species composition; thus, as habitats simplify, the resources and competitive requirements of many wildlife species are not met (Credit Valley Conservation, 2018).

Historically, the Lake Ontario shoreline in Mississauga was composed of a mix of natural habitats: deciduous and mixed forests, open savannahs and coastal wetlands. Survey records from the early 1800s refer to a 'dense forest' from Burlington to Etobicoke Creek and for 'many miles northward' (Clarkson, 1977).

The area along the Lake Ontario shoreline is highly dynamic by the action of waves and wind. Terrestrial linkages between the Lake Ontario shoreline and the Credit River are weak on both east and west sides of the river. Low density residential subdivisions and armoured banks of the Credit River provide little cover and access for wildlife between J.C. Saddington and J.J. Plaus Parks and upstream to the forested areas of Credit River valley.

Despite urbanization and changing shoreline conditions over time, there remains the potential for SAR habitat and Significant Wildlife Habitat (SWH) to occur in the Regional Study Area.

3.3.1. FISH AND FISH HABITAT

REGIONAL AND LOCAL STUDY AREAS

Aquatic habitats have undergone a substantial change from their historic conditions. Land use change, filling, dredging, and disturbance are the most notable historic and current threats to aquatic habitats along the shore of Lake Ontario. Stone hooking, the removal/mining of rock from the lake bottom, has left a legacy along the Mississauga shoreline that has resulted in wholesale changes in, and destruction of, nearshore aquatic habitat through the removal of structure and shelter for fish including the once extirpated Lake Ontario population of Atlantic Salmon (Martin, 2007). The loss of virtually all cobble substrates and the elimination of Lake Trout spawning reefs are also attributed to stone hooking (Whillans, 1979).

The existing shoreline in the Regional and Local Study Areas consists of erosion protection structures (armour stone, revetments, concrete, rubble, rip rap, etc.) most of the shoreline west of the Project Study Area being artificial.

Night-time water temperatures and daytime air temperatures collected in the summer between 2008 and 2014 averaged 20°C and 21°C, respectively (CVC, 2018).

Flows and sediment from the Credit River are transported to the west, as far away as Tecumseh Creek (CVC 2018). Transport of sediment and particle-bound phosphorus from the watershed exceed PWQO and reduce the water quality in the mouth of the Credit River and nearshore Lake Ontario (CVC 2018). These contributions may provide suitable food resources to harmful algae species, which may feed on the excess nutrients. Additional watershed contributions of chloride in the winter months also pose a risk to existing aquatic habitat.

Port Credit is known for historic and ongoing fisheries research and both recreational and commercial fishing activities. Incidental observations indicate that Burbot (*Lota lota*), Lake Whitefish (*Coregonus clupeaformis*), and Herring (*Clupeidae sp.*) were common occurrences in the past, however, both Burbot and Herring are very uncommon sightings in Port Credit today. It is expected that both wetlands and sheltered embayment's play a critical role in reproduction of these species and the loss of wetland habitat (Faulkner Marsh) may have reduced spawning sites for these species near the mouth of the Credit River (CVC, 2018). Additional spawning areas, such as off-shore shoals, are important spawning sites for Lake Trout (*Salvelinus namaycush*) and while historically documented, are typically difficult to locate in present day.

The Credit River and Lake Ontario are home to at least 65 cold, cool, and warm-water fish species, including forage, coarse, and sport fish, which are further identified in the Fishes of the Credit River Watershed document, produced by CVC (2002). It is further understood that of the 65 potential fish species, 58 native fish species have been recorded in the Port Credit region, of which 23 are considered lake species (CVC, 2018). It is anticipated that most fish species found within the Credit River and ultimately, Lake Ontario, may utilize the nearshore areas within the Study Area to complete all or some of the life cycles. It is also known that nearshore fish species diversity and productivity is higher than those of offshore habitats (CVC, 2018); two thirds of adult fish species and three quarters of young of the year fish species show a high affinity for sand, gravel or silt substrates, which are often associated with vegetation in the nearshore area (Lane et al. 1996 in CVC 2018).

Fish sampling is an ongoing priority for CVC and is conducted using a boat electrofisher, within the Port Credit Coastal Reach (mouth of the Credit River). The results of fish sampling activities between 2008 and 2014 indicate that the Port Credit Coastal Reach has the highest fish species richness (31) and second highest average number of individuals per 1000 seconds (~210), of all assessed locations (CVC 2018). However, when total fish biomass is considered, the PCHM is typically ranked 3rd or 4th of the 7 locations surveyed. It should also be mentioned that when the total fish biomass is corrected to remove Common Carp (*Cyprinus carpio*), a highly invasive species, from the calculation, the PCHM is roughly tied for 1st, with 3 other locations. Additionally, when considering embayment's and river mouth sites, embayment's are often the primary contributor to total biomass values and are known to contribute up to 80% of annual total biomass (CVC 2018). A list of documented fish species with potential presence within the Credit River, at the mouth of the Credit River, or within the vicinity of the Local and Project Study Areas is presented in **Table 3.3**. Not all fish species (or required habitats) will be present within the Regional and Local Study Areas.

Table 3.3: Documented Fish Presence Near Or Within The Regional and Local Study Area and Associated Potential Habitat Usage

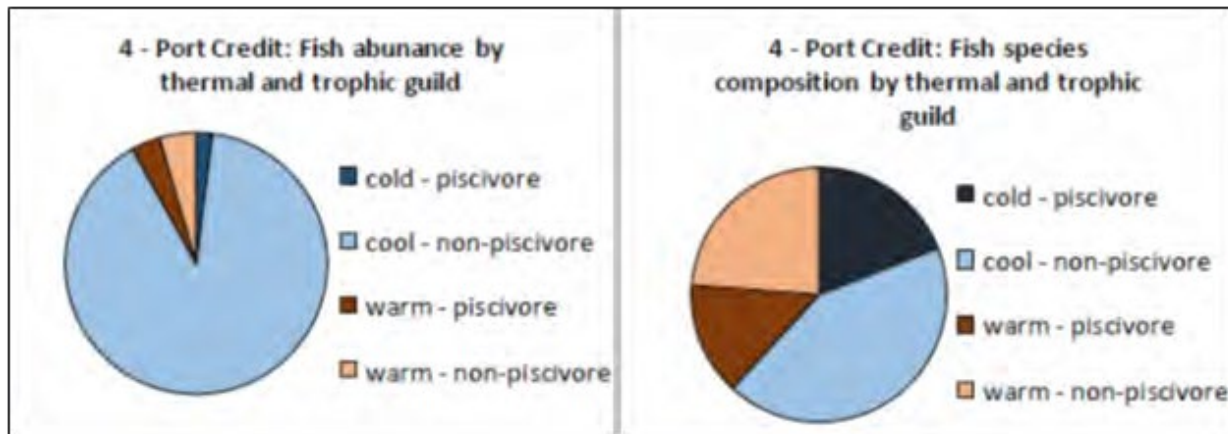
Common Name	Scientific Name	Documented Presence in Credit River (Y/N)	Documented Presence in Port Credit Coastal Reach (Y/N)
Bowfin Family (Family Amiidae)			
Bowfin	<i>Amia calva</i>	Y	N
Catfish Family (Family Ictaluridae)			
Brown Bullhead	<i>Ameiurus nebulosus</i>	Y	Y
Channel Catfish	<i>Ictalurus punctatus</i>	Y	N
Stonecat	<i>Noturus flavus</i>	Y	Y
Drum or Croaker Family (Family Sciaenidae)			
Freshwater Drum	<i>Aplodinotus grunniens</i>	Y	N
Freshwater Eel Family (Family Anguillidae)			
American Eel	<i>Anguilla rostrata</i>	Y	Y
Goby Family (Family Gobiidae)			
Round Goby	<i>Neogobius melanostomus</i>	N	Y
Herring Family (Family Clupeidae)			
Alewife (gaspereau)	<i>Alosa pseudoharengus</i>	Y	Y
Gizzard Shad	<i>Dorosoma cepedianum</i>	Y	Y
Lamprey Family (Family Petromyzontidae)			
American Brook Lamprey	<i>Lethenteron appendix</i>	Y	N
Sea Lamprey	<i>Petromyzon marinus</i>	Y	Y
Minnnow Family (Family Cyprinidae)			
Goldfish	<i>Carassius auratus</i>	Y	N
Redside Dace	<i>Clinostomus elongatus</i>	Y	N
Northern Redbelly Dace	<i>Chrosomus eos</i>	Y	N
Finescale Dace	<i>Chrosomus neogaeus</i>	Y	N
Spotfin Shiner	<i>Cyprinella spiloptera</i>	Y	Y
Common Carp	<i>Cyprinus carpio</i>	Y	Y
Brassy Minnow	<i>Hybognathus hankinsoni</i>	Y	N
Common Shiner	<i>Luxilus cornutus</i>	Y	Y
Redfin Shiner	<i>Lythrurus umbratilis</i>	Y	N
Northern Pearl Dace	<i>Margariscus nachtriebi</i>	Y	N
Hornyhead Chub	<i>Nocomis biguttatus</i>	Y	Y

Common Name	Scientific Name	Documented Presence in Credit River (Y/N)	Documented Presence in Port Credit Coastal Reach (Y/N)
River Chub	<i>Nocomis micropogon</i>	Y	Y
Golden Shiner	<i>Notemigonus crysoleucas</i>	Y	Y
Emerald Shiner	<i>Notropis atherinoides</i>	Y	Y
Blacknose Shiner	<i>Notropis heterolepis</i>	Y	N
Spottail Shiner	<i>Notropis hudsonius</i>	Y	Y
Rosyface Shiner	<i>Notropis rubellus</i>	Y	Y
Sand Shiner	<i>Notropis stramineus</i>	Y	N
Mimic Shiner	<i>Notropis volucellus</i>	Y	N
Bluntnose Minnow	<i>Pimephales notatus</i>	Y	Y
Fathead Minnow	<i>Pimephales promelas</i>	Y	Y
Blacknose Dace	<i>Rhinichthys atratulus</i>	Y	Y
Longnose Dace	<i>Rhinichthys cataractae</i>	Y	Y
Creek Chub	<i>Semotilus atromaculatus</i>	Y	Y
Mudminnow and Pike Family (Family Esocidae)			
Northern Pike	<i>Esox lucius</i>	Y	Y
Central Mudminnow	<i>Umbra limi</i>	Y	N
Perch Family (Family Percidae)			
Rainbow Darter	<i>Etheostoma caeruleum</i>	Y	Y
Iowa Darter	<i>Etheostoma exile</i>	Y	Y
Fantail Darter	<i>Etheostoma flabellare</i>	Y	Y
Johnny Darter	<i>Etheostoma nigrum</i>	Y	Y
Yellow Perch	<i>Perca flavescens</i>	Y	Y
Logperch	<i>Percina caprodes</i>	Y	Y
Walleye	<i>Sander vitreus</i>	Y	Y
Salmon Family (Family Salmonidae)			
Pink Salmon	<i>Oncorhynchus gorbuscha</i>	Y	N
Coho Salmon	<i>Oncorhynchus kisutch</i>	Y	N
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Y	Y
Rainbow Trout	<i>Oncorhynchus mykiss</i>	Y	Y
Atlantic Salmon	<i>Salmo salar</i>	Y	Y
Brown Trout	<i>Salmo trutta</i>	Y	N
Brook Trout	<i>Salvelinus fontinalis</i>	Y	N

Common Name	Scientific Name	Documented Presence in Credit River (Y/N)	Documented Presence in Port Credit Coastal Reach (Y/N)
Sculpin Family (Family Cottidae)			
Mottled Sculpin	<i>Cottus bairdi</i>	Y	N
Slimy Sculpin	<i>Cottus cognatus</i>	Y	N
Smelt Family (Family Osmeridae)			
Rainbow Smelt	<i>Osmerus mordax</i>	Y	N
Stickleback Family (Family Gasterosteidae)			
Brook Stickleback	<i>Culaea inconstans</i>	Y	N
Threespine Stickleback	<i>Gasterosteus aculeatus</i>	Y	N
Sturgeon Family (Family Acipenseridae)			
Lake Sturgeon	<i>Acipenser fulvescens</i>	Y	N
Sucker Family (Family Catostomidae)			
Longnose Sucker	<i>Catostomus catostomus</i>	N	Y
White Sucker	<i>Catostomus commersoni</i>	Y	Y
Northern Hog Sucker	<i>Hypentelium nigricans</i>	Y	Y
Silver Redhorse	<i>Moxostoma anisurum</i>	Y	N
Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>	Y	Y
Greater Redhorse	<i>Moxostoma valenciennesi</i>	N	Y
Sunfish Family (Family Centrarchidae)			
Rock Bass	<i>Ambloplites rupestris</i>	Y	Y
Pumpkinseed	<i>Lepomis gibbosus</i>	Y	Y
Smallmouth Bass	<i>Micropterus dolomieu</i>	Y	Y
Largemouth Bass	<i>Micropterus salmoides</i>	Y	Y
Black Crappie	<i>Pomoxis nigromaculatus</i>	Y	N
Temperate Bass Family (Family Moronidae)			
White Perch	<i>Morone americana</i>	Y	N
White Bass	<i>Morone chrysops</i>	Y	Y
Trout-Perch Family (Family Percopsidae)			
Trout-perch	<i>Percopsis omiscomaycus</i>	Y	N

Figure 3.8 illustrates fish abundance and fish species composition by thermal and trophic guild in the Port Credit area (Credit Valley Conservation, 2018).

Figure 3.8: Port Credit Fish Abundance



(Credit Valley Conservation, 2002)

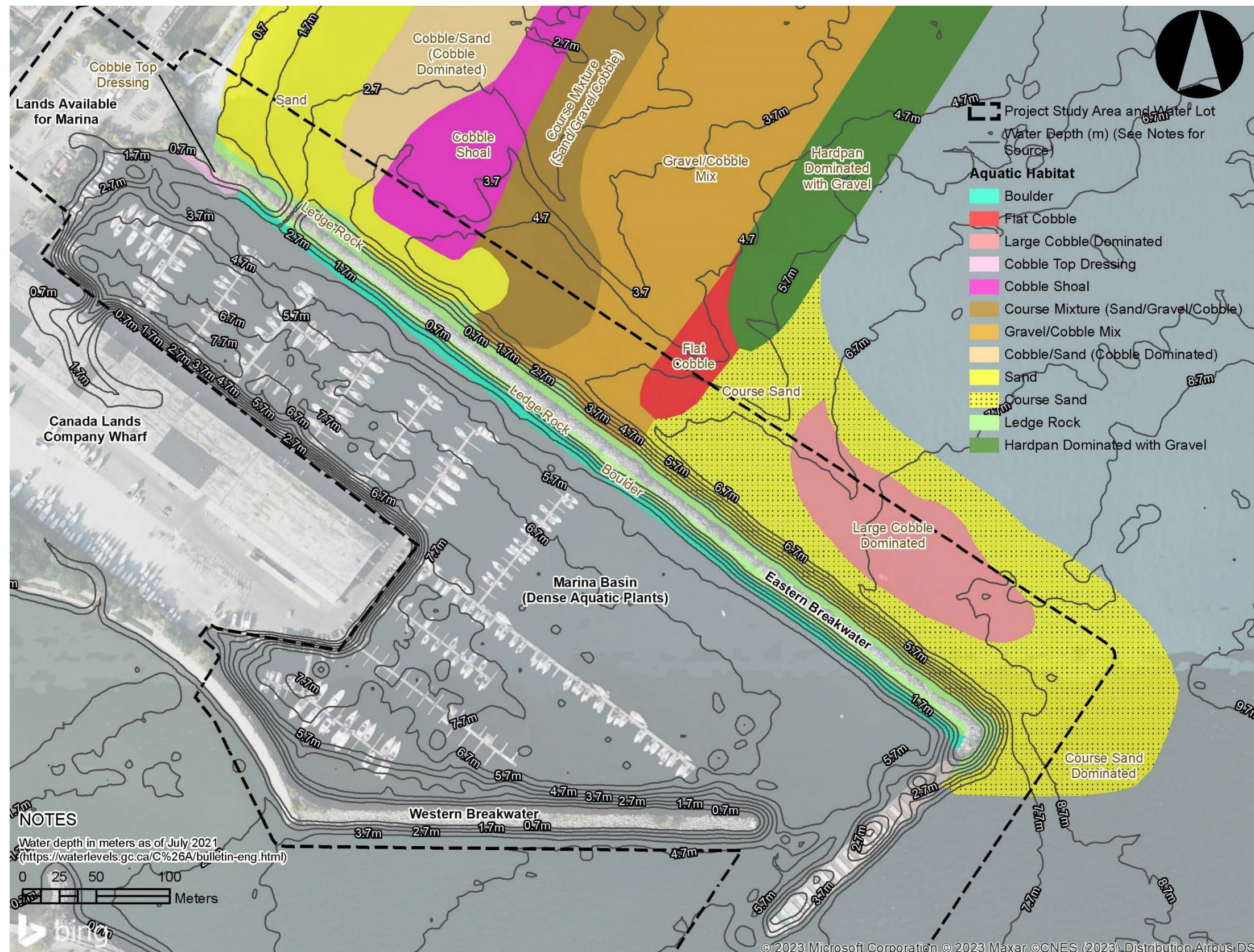
PROJECT STUDY AREA

The Credit River at Lake Ontario can be described as estuary or river mouth habitat. This habitat is a mixing zone where a flowing river mixes with the static water of Lake Ontario. The shoreline of the Port Credit Coastal Reach, which includes the Study Area, is highly engineered, with only 1% left in a natural state as documented by CVC (2018). This engineered shoreline is made up of armour stone, the Ridgetown and other breakwater structures.

Substrates found here are generally finer sands and silts that have been carried as bedload by the river and deposited into the river mouth. Transport of sediment and particle-bound phosphorus from the watershed exceed PWQO and reduce the water quality in the mouth of the Credit River and nearshore Lake Ontario (CVC, 2018). These contributions may provide suitable food resources to harmful algae species, which may feed on excess nutrients. Additional watershed contributions of chloride in the winter months also pose a risk to existing aquatic habitat.

Habitat alteration, periodic dredging and the presence of Common Carp have contributed to the absence of aquatic vegetation beyond very tolerant species that are typically found adjacent to the breakwater (CVC, 2002). Incidental observations indicate that Burbot, Lake Whitefish (*Coregonus clupeaformis*), and Herring were common occurrences in the past, however, both Burbot and Herring are very uncommon sightings in Port Credit today. It is expected that both wetlands and sheltered embayment's play a critical role in reproduction of these species and the loss of wetland habitat (Faulkner Marsh) may have reduced spawning sites for these species near the mouth of the Credit River (CVC, 2018). **Figure 3.9** illustrates the composition and distribution of lakebed substrates as determined from field investigations.

Figure 3.9: Aquatic Habitat Mapping



EAST SIDE OF THE EASTERN BREAKWATER

Directly east of the existing eastern breakwater, large boulders extend into the water lot for several meters, at an estimated 2:1 slope. The boulders provide stability and erosion protection for the marina and nearshore area, while the bank irregularities and lakebed roughness provide instream cover for a variety of documented fish species. Beyond the large boulders, the lakebed substrate is dominated by coarse sand and cobble, with sand becoming more prevalent along the shoreline. An area of hardpan was documented east of the Project Study Area and was dominated with gravel. Multiple cobble dominated shoals were documented along the eastern edge of the Project Study Area and were oriented both parallel and perpendicular to the existing eastern breakwater. Depending on the severity of weather events and wave action, the boulders along the east side of the existing eastern breakwater may have experienced movement since the time of construction.

Based on the placement and organization of the boulders along the west side of the existing eastern breakwater, it is assumed that a barge was utilized from the west side. Beyond the large boulders, the substrate documented along the west side of the existing eastern breakwater is dominated by sand and cobble, with areas of soft detritus.

No macrophyte presence was observed at the time of the aquatic habitat assessment. Algae and Zebra Mussels (*Dreissena polymorpha*) were documented in places along the shoreline, existing eastern breakwater, and hardpan area. The concentration of Zebra Mussels appeared to increase as water depths increased. Water depths greater than 8 m were documented within the Project Study Area east of the existing (eastern) breakwater.

No fish were observed during the aquatic habitat assessment.

Aquatic habitat and substrates documented within the Project Study Area east of the existing eastern breakwater do not appear to be limited to the Project Study Area and extend past the water lot boundary. The only exception to this is the large cobble dominated area located toward the terminus of the breakwater. No areas of critical habitat for potential SAR were documented during the field investigation.

WEST SIDE OF BREAKWATER

Directly west of the existing (eastern) breakwater, large boulders extend into the marina for several meters, at an estimated 2:1 slope. The boulders provide stability and erosion protection for the marina and nearshore area, while the bank irregularities and lakebed roughness provide instream cover for a variety of documented fish species.

Significant algal and macrophyte growth was documented, when compared to the east side of the existing eastern breakwater. This may be due to reduced wave action, flow, and potentially increased residence time of water within the marina. Water depths of greater than 2.5 m were documented within the Project Study Area west of the existing eastern breakwater.

Multiple fish species and individuals were observed within the marina, although only Brown Bullhead and Cyprinids Sp. were identified. It is assumed that many other fish species or families were observed but could not be identified.

Aquatic habitat and substrates documented within the marina basin appear to be consistent throughout the assessed area. It is assumed that the dense macrophyte growth within the marina basin provides suitable nursery and foraging habitat for many species documented in the Project Study Area. No areas of critical habitat for potential SAR were documented during the field investigation.

WITHIN THE MARINA BASIN

Within the marina basin, the substrate is dominated by sand, with fine sediments and other particulate matter resting in isolated pockets.

Moderate to dense algal and macrophyte growth was documented within the marina basin and provides significant cover and surfaces for important life processes (e.g., refuge and spawning) of some fish species with documented presence in the Project Study Area. The density of plant life may be in part due to the sheltered nature of the waters within the marina basin and the potential accumulation of nutrients from overland or other sources.

Multiple fish species (e.g., Brown Bullhead, *Cyprinid Sp.*) were observed within the marina basin and it is expected that multiple life stages are present.

Aquatic habitat and substrates documented within the marina basin do not appear limited and are consistent through the assessed area within the marina basin. No areas of critical habitat for potential SAR were documented during the field investigation. The eastern breakwater appears to be stable on both the east and west side of the assessed area.

SPECIES AT RISK

A desktop review of existing baseline information was undertaken to identify any known or potential SAR, designated under the Species at Risk Act (SARA) Schedule 1 and species listed provincially under the Endangered Species Act, 2007 (ESA, 2007) in the vicinity of the site. This included tools such as the Ministry of Natural Resources online “Make a Map” NHIC Report layer, Element Occurrences (2019) and the DFO distribution Maps for Fish and Mussel Species at Risk (modified 2019-08-23). It is important to note that these databases are not routinely maintained and should be used to provide general guidance for the screening of SAR together with judgement from qualified professionals. The SAR list presented below should be refined to fill data gaps and better define SAR affinities relevant to conditions at the site. SLR has contacted CVC for additional relevant data.

The desktop search results and field level SAR screening were used to support development of a site-specific list of potential SAR based on species range, habitat affinities and professional judgement (**Table 3.4**). A preliminary determination of habitat use within the site by SAR was completed and is presented below. Definitions included in **Table 3.4** were used to apply a likelihood; High, Medium and Low, of the species to occur within the site.

Table 3.4: Potential Species at Risk List

Common Name	Scientific Name	ESA, 2007 SARO ¹	COSEWIC SARA Schedule 1 ²	Preferred Habitat and Species Distribution	Likelihood of Site Use
American Eel	<i>Anguilla rostrata</i>	END	THR	<ul style="list-style-type: none"> Diverse; utilize substrate (rock, sand and mud), submerged vegetation and interstitial spaces of complex structures Tributaries Spawns in Sargasso Sea Seasonal local migrations to hibernate in mud-like substrates 	Moderate
Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	<i>Acipenser fulvescens pop. 3</i>	END	THR	<ul style="list-style-type: none"> Found in depth of 5 to 20 m of water and prefer muddy to sand bottoms. Spawn in shallow fast flowing water, typically below rapids or dams CVC Biologist (Jon Clayton) indicated that they have no record of Lake Sturgeon in the Credit River 	Low
Shortnose Cisco	<i>Coregonus reighardi</i>	END	END	Last observed in Lake Ontario in 1964	Low
Deepwater Sculpin	<i>Myoxocephalus thompsonii</i>	None Great Lakes – Western St. Lawrence population in listed as SC	None	Historically very sparse in Lake Ontario	Low
<p>1. ESA, 2007 – <i>Endangered Species Act</i>: Ontario Regulation 230/08. Act current to 2017-07-31. (http://www.mnr.gov.on.ca/en) EXT [Extinct] A species that no longer exists; EXP [Extirpated] A species no longer existing in the wild in Canada but occurring elsewhere; END [Endangered] A species facing imminent extirpation or extinction; THR [Threatened] A species likely to become endangered if limiting factors are not reversed; SC [Special Concern] (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats; NAR [Not At Risk] - A species that has been evaluated and found to be not at risk of extinction given the current circumstances; DD [Data Deficient] (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.</p> <p>2. Committee on the Status of Endangered Wildlife in Canada (COSEWIC), SARA – <i>Species at Risk Act</i> (S.C.2002, c. 29). Current to 2018 - 03-16. EXT [Extinct] A species that no longer exists anywhere; EXP [Extirpated] A species that no longer exists in the wild in Ontario but still occurs elsewhere; END [Endangered] A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA); THR [Threatened] A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed; SC [Special Concern] (formerly Vulnerable) - A species with characteristics that make it sensitive to human activities or natural events.</p>					

Table 3.5: Likelihood of Project Area Use Ranking

Likelihood of Site Use	Definition
High	<ul style="list-style-type: none"> Confirmed occurrence through preliminary site investigations completed by SLR Confirmed suitable habitat for various life history strategies present on the site
Medium	<ul style="list-style-type: none"> Potential suitable habitat for various life history strategies present on the site
Low	<ul style="list-style-type: none"> Data deficient Suitable habitat for various life history strategies does not appear present on the site Current species distribution no longer occurs within the Project areas

The determination of habitat use within the site by SAR suggests that potential suitable habitat for American Eel is present at the Project Study Area. The American Eel, a unique species, has been characterized as a habitat generalist, yet only limited research has been undertaken into American Eel habitat relationships, particularly for lakes. Given the complexity related to the existing subpopulation of stocked eels in Lake Ontario, additional uncertainty exists related to nearshore habitat associations and overwintering habits.

American Eel recruitment to Lake Ontario have decreased by 99%. Declines are linked to several factors including habitat fragmentation, turbine mortality, and migration barriers. As a result, several management actions were implemented including closing the commercial and recreational fisheries, trap and transport programs around hydroelectric facilities and translocation (stocking) of eels to Lake Ontario to supplement recruitment (MacGregor et al. 2008; Mathers and Pratt 2011). The American Eel has a complex life history, which has challenged traditional methods of species protection. Eels undertake five transitions during their life cycle before reaching maturation: eggs, larvae, glass eels, elver, yellow and silver eels. Eels in Ontario are part of a singular breeding population; one that spawns in the Sargasso Sea (MNRF 2007). From the Sargasso Sea, eels are carried by ocean currents to freshwater lakes, estuaries or ocean coastal environments, where they reside for 5 to 25 years, then migrate back to the Sargasso Sea where they die after undergoing reproduction.

From 2006 to 2010, approximately four million glass eels and elvers were stocked into Lake Ontario (Bay of Quinte) and the Upper St. Lawrence River. These eels were trapped in Atlantic Canada and transferred to the stocking locations. Ultimately, the program was an effort to increase recruitment to Lake Ontario and eventually the escarpment of spawners to the Sargasso Sea. A significant uncertainty related to the program included how the eels would respond to a direct translocation at age 0 from marine to freshwater environments, when naturally migrating eels wouldn't arrive until 6-8 years old (Threader et al. 2010).

A stocking effectiveness research study undertaken by Lloyst et al. in 2015 characterized nearshore patterns of abundance and size and indicated habitat associations in Lake Ontario. The study suggested that stocked American eels resided in a variety of habitats, but the importance of coarse substrates (gravel, rubble, cobble) appeared to diminish, while the importance of finer substrates (sand, silt) increased as eels grew larger. This is likely due to a combination of physical space requirements, habitat availability and prey preference changing with increasing body size, as eels need to balance their requirements for a suitable refuge, finding prey and dealing with intraspecific interactions.

Given findings published by Lloyst et al. (2015), the diversity of coarse and soft substrates within the Eastern Breakwall may support both small and large sized eels. The soft substrates and dense macrophyte cover present at the Western Breakwall and within the marina are likely suitable for larger sized eels. John Clayton, CVC Biologist reported that American Eel has been recorded in the Credit River. Research has suggested that in streams, smaller eels were associated with fast moving water and larger eels with slow, deeper habitats.

Although the American Eel has been commonly characterized as generalist, it is important to recognize that the above observed size-related shift in habitat associations are ontogenetic shifts. Ontogenetic shifts in habitat occur when fish outgrow resources, such as food, in their current location and move to new habitat where optimal resources are available (Wootton 1998). Eels of all sizes utilize nearshore habitats, and heterogeneous nearshore habitat needs to be protected to accommodate the range of sizes and ages of eels.

It is noteworthy that eels once served as one of Canada's most significant freshwater fish in the commercial fishery and in Indigenous cultures. Furthermore, eels are a top predator species and can aid in population control and ecosystem health by controlling invasive species in Lake Ontario.

3.3.2. VEGETATION

Ecozones are the highest level of ecosystem classification in Ontario. Their boundaries are based on key physical landscape within which human and ecosystem functions are defined and constrained. An ecoregion is a unique area of land and water within an ecozone that is defined by characteristics such as climate variables like temperature, precipitation, and humidity. The Project Study Area is in the ecoregion 7E – Lake Erie - Lake Ontario. The ecoregion covers the northern shorelines along Lake Ontario and Lake Erie and is divided into six ecodistricts. The flora and fauna in Ecoregion 7E are the most diverse in Canada and include several provincially significant plants, animals, and vegetation communities. Sugar maple, American beech, and eastern white pine are widespread. Species with affinities to temperate forests in the United States including tulip tree, sassafras, and Kentucky coffee tree also occur. Plant species associated with alvar and grassland communities are located here (Wester, Henson, Crins, Uhlig, & Gray, 2018).

The ecodistrict covering the Project Study Area is the Toronto ecodistrict, extending from the Rouge River west to Bronte Creek. This region is associated with the Eastern Temperate Deciduous Forest Vegetation and the Niagara Section of the Deciduous Forest Region. Common natural features include upland treed areas, shoreline bluffs, river valley systems, and river/ lakefront marshes. Deciduous forest, primarily consisting of American beech and sugar maple, typically occur along rivers (e.g., Credit, Bronte, Sixteen Mile, and Rouge rivers;) or as remnant forests (Wester, Henson, Crins, Uhlig, & Gray, 2018).

3.3.3. FORESTS

REGIONAL AND LOCAL STUDY AREAS

To the west of the Project Study Area, along the Lake Ontario shoreline of Mississauga, deciduous forests, mixed deciduous-coniferous forests and cultural woodlands are some of the most common (though underrepresented) communities. Most of these remnant natural areas are small in size, fragmented by roads, trails and development and are thus isolated from each other. Larger tracts are found at Rattray Marsh Conservation area (approximately 38 ha). Further inland, forested communities remain at Cawthra Woods (approximately 20 ha) and along the main Credit River valley at Dundas Street.

Trees in the Local Study Area are predominantly those in deciduous forest and cultural woodlands. Of note is the Stavebank Oak Forest and Tallgrass Prairie near the southern end of the Credit River Marshes which includes prairie indicator species such as Black Oak (*Quercus velutina*), Indian Grass (*Sorghastrum nutans*) and Big Bluestem (*Andropogon gerardii*) (CVC 2014).

PROJECT STUDY AREA

The Project Study Area is predominately urbanized and paved. Ornamental deciduous and coniferous trees and shrubs exist along most of the perimeter of the 1PSEPM Project site with only 15 clusters of trees growing on the breakwater near the shoreline. None of these trees were planted, rather they are opportunistic with seeds finding the opportunity to root within the rock breakwater. Trees growing along the breakwater include Willow species (*Salix spp.*), Manitoba Maple (*Acer negundo*), Silver Maple (*Acer saccharinum*), and dead and dying Ash species (*Fraxinus spp.*) with evidence of Emerald Ash Borer (*Agilus planipennis*). As is to be expected for trees growing on an anthropogenic rocky substrate subjected to harsh lake winds, most of the trees were in poor condition with several in decline or recently dead.

It is estimated that there exists approximately 1,700 m² of vegetation in the on-land portion of the Project Study Area. A similar vegetation assemblage exists along the shoreline within the fenced area of the property as on the breakwater, comprised of Silver Maple (*Acer saccharinum*), Ash species (*Fraxinus spp.*) and Red Maple (*Acer rubrum*). In addition, there is vegetation surrounding the property. This is largely comprised ornamental trees and shrubs planted adjacent to and outside of the perimeter fence.

3.3.4. WETLANDS

REGIONAL AND LOCAL STUDY AREAS

Wetlands make up less than 1% of the Regional Study Area. Rattray Marsh located at the mouth of Sheridan Creek, west of the Project Study Area, is the last remaining large bay-mouth bar coastal wetland between Oshawa and Burlington (CVC, 2018).

Shallow depths due to sedimentation upstream of the CN Rail bridge to just upstream of the QEW overpass has provided suitable conditions for the establishment of the Credit River Marshes coastal wetland complex. These wetlands comprise eight wetland units and are designated as provincially significant by MNRF and as a Centre for Biodiversity by CVC. The marshes themselves support a diverse complex of habitat types, their location, access and structure provide unique habitat for turtles, snakes, amphibians and birds (including waterfowl). The Credit River Marshes rival Rattray Marsh in quality and species richness, providing habitat for reptiles and amphibians including Eastern Milksnakes (*Lampropeltis triangulum*), Common Watersnakes (*Nerodia sipedon*), Snapping Turtles (*Chelydra serpentina*) and Map Turtles (*Graptemys geographica*).

PROJECT STUDY AREA

There are no wetlands located within the Project Study Area.

3.3.5. BIRDS

Most resident and migrant bird species require natural spaces to survive within an urban environment. Birds often face many stresses in urban ecosystems, particularly area-sensitive forest birds. Waterfront parks in particular offer some of the only remaining habitat within the larger landscape. In urban areas, high quality habitat supporting abundant food resources for migrant birds is limited.

In Mississauga, waterfront parks have been known to play an important role in sustaining migratory bird populations by providing habitat and resources for birds before and after their arduous flight around/over Lake Ontario. The Local and Project Study Areas are both located within an important migratory zone, which includes portions of both the Atlantic and Mississippi flyways. Given how much of Mississauga's shoreline is developed, there is not a lot of high-quality habitat for migrating birds to choose from, thus they will use what is available. Storms and severe weather also can force migrating birds to take new migration routes or settle down in place (even if it is not ideal habitat).

REGIONAL AND LOCAL STUDY AREAS

All along the lakeshore in Mississauga are remnant natural features and manicured parks which offer potential stopover and breeding habitat for species of migrant and resident birds. Surveys since 2010 are beginning to document the diversity of birds that make use of the shoreline areas within the Regional Study Area. Some natural areas are known 'hotspots' for birds (for example Rattray Marsh Conservation Area); however, some migrant birds may make use of sub-optimal habitat when large natural tracts are limited and when inclement weather conditions impede further migration.

The vegetated ravines and river valley systems along the north shore of Lake Ontario within the Regional Study Area serve an important role in sustaining migratory bird populations by providing green north/south corridors through largely urban areas. The area west of Port Credit to Burlington has been identified as the Western Lake Ontario Important Bird Area and is most notable for its congregations of waterfowl, particularly overwintering waterfowl.

Sheltered embayments, creek mouths and some non-natural structures, such as the pier and breakwater at marina can also provide important habitat for water birds. Aggregations of waterfowl and cormorants are frequently noted in these areas.

The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (2022). The data is presented on 10 km x 10 km squares. The data square that overlaps with the Project Study Area was used to determine the potential bird species list for that area. It should be noted that the Project Study Area is a small component of the overall bird atlas square, and therefore it is unlikely that all bird species are found within the Project Study Area. Habitat type, availability and size are all contributing factors in bird species presence and use (Birds Canada, 2022).

A total of 84 bird species were recorded in the OBBA in the atlas square (17PJ12) that overlaps with the Subject Lands. Of the species reported in the OBBA in the atlas square, four are of Special Concern according to the Ontario Species at Risk list: Peregrine Falcon (*Falco peregrinus*), Common Nighthawk (*Chordeiles minor*), Eastern Wood-Pewee (*Contopus virens*), Bald Eagle (*Haliaeetus leucocephalus*) and Wood Thrush (*Hylocichla mustelina*). Six are Threatened in Ontario: Chimney Swift (*Chaetura pelagica*), Barn Swallow (*Hirundo rustica*), Bank Swallow (*Riparia riparia*), Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*); and Least Bittern (*Ixobrychus exilis*). There are two Endangered species, Red-headed Woodpecker (*Melanerpes erythrocephalus*) and Prothonotary Warbler (*Protonotaria citrea*), that have been identified in the atlas square but only with less than 10% probability of being in the area (Birds Canada, 2022).

PROJECT STUDY AREA

The proximity of the 1PSEPM Project site to the shoreline and key migratory corridors allowed many species of birds to use Project Study Area as a stopover to rest and wait out inclement conditions. This includes the mouth of the Credit River, the wharf and water basin to the east. Some existing buildings and structures at the marina and in Port Credit provide roosting and nesting habitat for some birds.

3.3.6. AMPHIBIANS

Amphibians are key ecological indicators as most spend a portion of their life in both aquatic and terrestrial habitats. Because of this dependency on multiple habitats amphibians are sensitive to ecological stressors and the quality of the ambient environment. Human disturbance, pollution, climate change, and alterations to the hydrologic cycle can have an impact on survival, health, and population size.

REGIONAL AND LOCAL STUDY AREAS

Observations indicate that the natural areas along Lake Ontario shoreline in the Regional Study Area contain seven species of frogs and toads: Green Frog, American Toad, Bullfrog, Wood Frog, Western Chorus Frog, Northern Spring Peeper, and Northern Leopard Frog. Many of these records are historic (greater than 20 years old), and the species are sensitive to urban pressures.

The Ontario Herpetology Atlas contains detailed information on the population and distribution status of Ontario and amphibians (Ontario Nature). The data are presented on 10 km x 10 km squares. The data square that overlaps with the Project Study Area was used to determine the potential for amphibian species list for that area. It should be noted that the Project Study area is a small component of the overall herpetofauna atlas square, and therefore it is unlikely that all herpetofauna species are found within the Project Study Area. Habitat type, availability and size are all contributing factors in amphibian species presence and use.

A total of 14 species were recorded in the Ontario Herpetology Atlas in the atlas square (17PJ12) that overlaps with the Project Study Area. Of the 14 herpetofauna species reported in the Ontario Herpetology Atlas as being previously observed within the atlas square, seven species were observed since 2000. Of those seven species only Jefferson Salamander (*Ambystoma jeffersonianum*) is listed as Endangered in Ontario (Government of Ontario, 2022).

Salamander diversity and abundance within the Regional Study Area is low. The most common salamander species is the Red-backed salamander although records of Yellow-spotted Salamander and Jefferson's Salamander exist for the area. The Red-backed salamander is a completely terrestrial species; all other salamanders in the Regional Study Area require wetland habitat to complete a portion of their lifecycle. The relative paucity of other salamander observations in the Regional Study Area may speak to the lack of suitable habitat (i.e., vernal pools, forested wetlands) across the landscape.

PROJECT STUDY AREA

There is no suitable breeding habitat for forest and wetland breeding in the Project Study Area.

3.3.7. REPTILES

REGIONAL, LOCAL AND PROJECT STUDY AREAS

Reptile populations in the larger Lake Ontario shoreline area have not been studied in-depth. Within the larger coastal wetland communities of Rattray Marsh Conservation Area and the Credit River Marshes, turtle observations are common. Similarly, water snake observations are common at the Credit Village Marina. However, it is unknown the extent to which these populations move along the Lake Ontario shoreline. For example, turtles often fare poorly in urban environments, where habitat is limited and fragmented, and encounters with humans are frequent.

The Ontario Herpetology Atlas contains detailed information on the population and distribution status of Ontario reptiles (Ontario Nature). The data are presented on 10km x 10 km squares. The data square that overlaps with the Project Study Areas was used to determine the potential for reptile species list for that area. It should be noted that the Project Study Area is a small component of the overall herpetofauna atlas square, and therefore it is unlikely that all herpetofauna species are found within the Project Study area. Habitat type, availability and size are all contributing factors in reptile species presence and use.

A total of 12 species were recorded in the Ontario Herpetology Atlas in the atlas square (17PJ12) that overlaps with the Project Study area. Of the 12 herpetofauna species reported in the Ontario Herpetology Atlas as being previously observed within the atlas square, eight species were observed since 2000. Of those eight species, three are listed on Ontario's endangered species act: one is Threatened, Blanding's Turtle (*Emydoidea blandingii*); two are Special Concern, Snapping Turtle (*Chelydra serpentina*) and Northern Map Turtle (*Graptemys geographica*) (Government of Ontario, 2022).

3.3.8. INSECTS

The Ontario Insect Atlas contains detailed information on the population and distribution status of Ontario insects. The data is presented on 10 km x 10 km squares. The data square that overlaps with the Project Study Area was used to determine the potential insect species list for that area. Habitat type, availability and size are all contributing factors in insect species presence and use.

A total of 62 species were recorded in the Ontario Insect Atlas as previously being observed within the atlas square (17PJ12) that overlaps with the Project Study area, 50 of which were last seen since 2000. Of the 50 species, two are considered Species at Risk: Monarch (*Danaus plexippus*), listed as a Special Concern species in Ontario and the Mottled duskwing (*Erynnis martialis*), listed as Endangered (Ontario Nature, 2021).

PROJECT STUDY AREA

Milkweed (*Asclepias syriaca*) is a host breeding plant for Monarch. There is no suitable breeding habitat for Monarchs in the Project Study Area.

3.3.9. MAMMALS

REGIONAL AND THE LOCAL STUDY AREA

There has been no comprehensive study for mammals within the Regional Study Area. Many mammals are secretive and difficult to capture and are thus underreported. Common mammals occur within the Regional Study Area. Some less common species such as Red Squirrel and Eastern Chipmunk indicate that some larger habitat patches supporting area-sensitive species exist. Other mammals such as American Mink, Beaver and Muskrat indicate the importance of the shoreline area to species that make use of both terrestrial and wetland communities. Natural areas along the lakeshore and along the Credit River and Lake Ontario tributary creeks are important for the movement of these species and their ability to find adequate resources for food and shelter.

PROJECT STUDY AREA

Eleven mammal species are known to use the Project Study Area for all or some of their life cycle. These species are typical of urban areas and include the Eastern Gray Squirrel, Eastern Chipmunk, Raccoon, and Muskrat.

A bat tree habitat survey was undertaken in May 2024. The Ontario protocols for such a survey are specific to maternity roosts in treed habitats, which includes forests and treed swamps. Surveys in cultural treed areas such as the cultural hedgerow within the Site are usually only completed at the request of the MNRF/MECP.

Trees growing along the breakwater include Willow species (*Salix spp.*), Manitoba Maple (*Acer negundo*), Silver Maple (*Acer saccharinum*), and dead and dying Ash species (*Fraxinus spp.*) with evidence of Emerald Ash Borer (*Agrilus planipennis*). As is to be expected for trees growing on an anthropogenic rocky substrate subjected to harsh lake winds, most of the trees were in poor condition with several in decline or recently dead. 19 trees in this area had decay Class 2 (declining live tree, part of canopy lost) or decay Class 3 (very recently dead, no canopy, branches intact).

All 19 trees had a diameter at breast height greater than 10 cm, which means that they would all be considered snags under the Ministry of Natural Resources and Forestry (MNRF; 2017) Survey Protocol for Species at Risk Bats in Treed Habitats. Two of the 19 trees contained small cavities in addition to loose bark. The remaining 17 trees contained loose bark but did not contain cavities, cracks, crevices, or hollows. No dead leaf clusters (which may provide roosting habitat for Tri-colored Bat [*Perimyotis subflavus*]) were present on any of the trees. The rocky breakwater may be suitable roosting habitat for Eastern Small-footed Myotis (*Myotis leibii*), which is known to roost in rocky crevices and outcrops.

Overall, the potential for bat maternity roosting habitat within these areas is low due to its exposed location and hedgerow configuration. However, some of these trees may be used as temporary day roosts for any bat species. As such, tree removal in winter (between November 1 and March 31) is recommended to avoid the active season for bats as well as the bird breeding season.

3.4. SOCIO-ECONOMIC ENVIRONMENT

3.4.1. LAND USE

The land use descriptions in this section are based on the Mississauga Official Plan, 2011. Mississauga Official Plan consists of a principal document and a series of local area plans. Official Plan policies for lands within the Port Credit Community Node and Port Credit neighbourhoods are contained in the Port Credit Local Area Plan (the Area Plan). In conjunction with the Mississauga Official Plan, the Area Plan provides policies for lands in south central Mississauga to guide land use development.

3.4.2. EXISTING LAND USE

LOCAL STUDY AREA

Existing land uses within the Local Study Area are residential, commercial, industrial, institutional, and open space/greenbelt (City of Mississauga, 2012). Port Credit is generally a stable area with a distinct community identity, with a focus on the Lake Ontario waterfront, the harbour and its heritage. The community is anchored by established residential areas at the eastern and western parts of the community and is served primarily by a commercial corridor along Lakeshore Road. Port Credit's heritage can be found in the unique buildings in and around the harbour area and the Lakeshore Road commercial areas. Port Credit's location makes the community a focal point of residential, commercial, open space and tourism and recreation activity on the Mississauga waterfront.

In 2021, the population in the City of Mississauga was 793,634; an increase of approximately 9% from 2016 (i.e., 721,599). The Port Credit BIA listed that the population of the main street and trade area of Port Credit was 27,430 people in 2021 (Environics Analytics, 2022).

Residential development consists of a combination of dwelling types and forms. High-density areas are centrally located near the Port Credit GO Station, medium and high-density development along Lakeshore Road, as well as low density areas characterized by tree-lined streets in grid patterns. Lakeshore Road has a “main street” commercial character with on-street parking and sidewalks accommodating active pedestrian use. The street is framed by one- to two-storey buildings with small storefront shops. Small-scale industrial and commercial uses exist south of the Canadian National Railway tracks along Queen Street and Queen Street West. Most of the lands in the area are developed except for the Brightwater lands (formerly Imperial Oil) west of Mississauga Road South, which are being developed for mixed-use. Several commercial areas are located along Queen Street and Queen Street West, south of the CN Railway. Other uses along the Port Credit waterfront include a working harbour, fishing, boating and marine services.

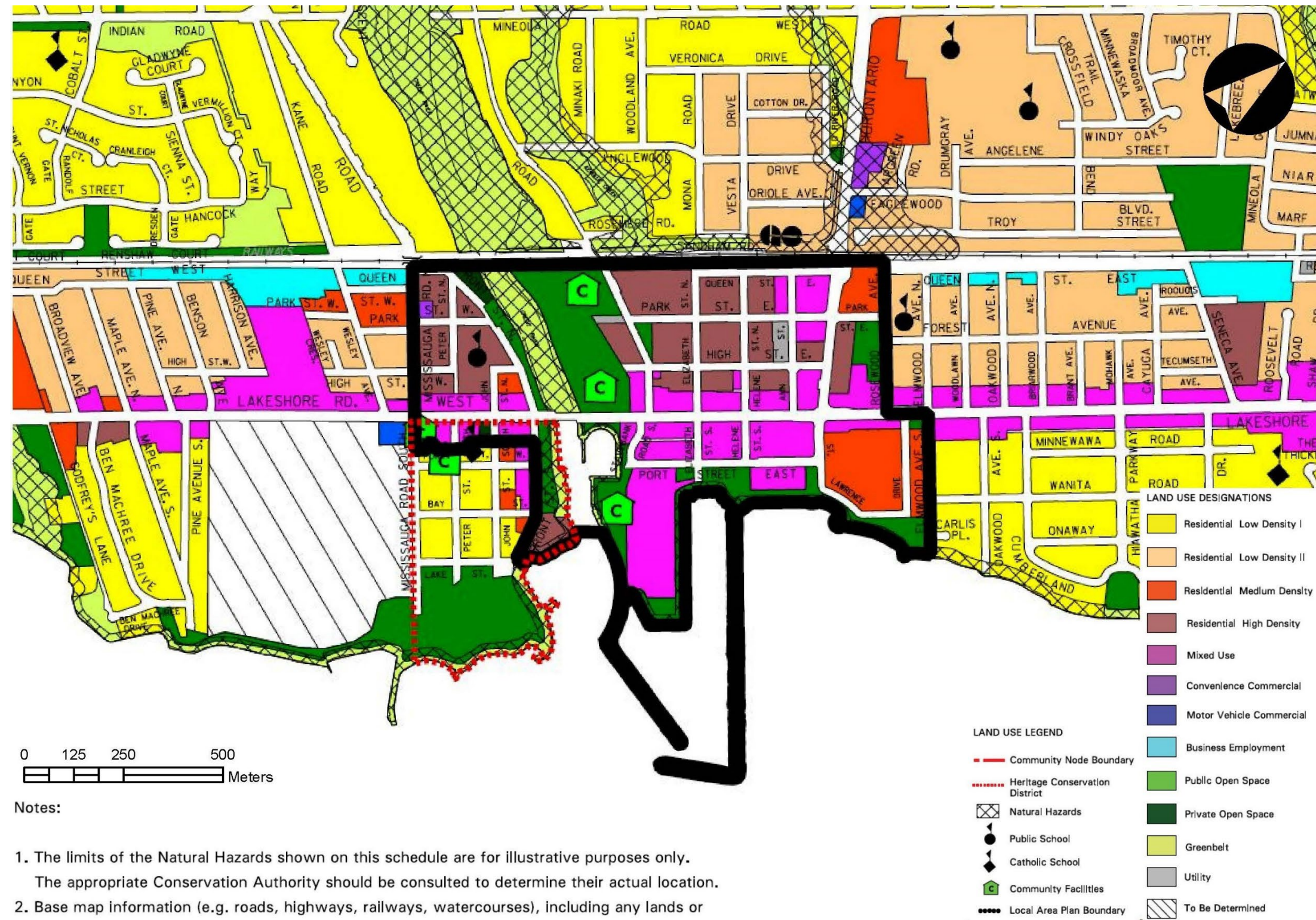
3.4.3. FUTURE LAND USE

LOCAL AND PROJECT STUDY AREAS

The land use designations in Port Credit are shown in **Figure 3.10** as per Mississauga’s Official Plan. This plan describes the future development of Port Credit as an “urban waterfront village”, based on the principles of a mixture of land uses, a variety of densities, pedestrian and cycling friendly infrastructure, transit and supportive urban forms, a significant public realm, and public access to the waterfront.

As part of Inspiration Port Credit, the City worked with the community and stakeholders to create the 1 Port Street East Comprehensive Master Plan. The draft Port Credit Local Area Plan identified the site as having potential as a mixed use, water-related development that takes advantage of the site’s location in downtown Port Credit and on the lake. The master plan detailed a vision for the entire 1 Port Street East site that ultimately set out permitted uses, densities, heights and building forms as detailed in the Official Plan Amendment (City of Mississauga, 2017).

Figure 3.10: Local Area Plan Land Use Designations



- Notes:
1. The limits of the Natural Hazards shown on this schedule are for illustrative purposes only. The appropriate Conservation Authority should be consulted to determine their actual location.
 2. Base map information (e.g. roads, highways, railways, watercourses), including any lands or bodies of water outside the city boundaries, is shown for information purposes only.
 3. Roads shown on this schedule are existing or under construction and are shown for information purposes only. For future roads refer to Schedule 5, Long Term Road Network.

3.4.4. RECREATION

REGIONAL AND LOCAL STUDY AREAS

The nearshore areas of Lake Ontario and the Credit River in the City of Mississauga are prime locations for recreational boating, canoeing and kayaking. Currently there are three marinas along the waterfront in Mississauga – Lakefront Promenade Marina, Credit Village Marina, and the Port Credit Harbour Marina. Marine uses within and in the vicinity of the marinas include motor boating, boat launching, shoreline and boat-based fishing, canoeing, and kayaking.

Centre City Capital Limited operates the PCHM through a lease with Canada Lands, the owner of a portion of the property. Centre City Capital Limited has operated the marina since 1978. Centre City Capital Limited sub-leases space to several businesses complementary to marine use.

PCHM is one of the largest privately-operated full-service marinas on the GTA Lake Ontario shoreline. The depth of water in the marina basin, one of the deepest on the north shore, allows the marina to accommodate boats up to 75 feet in length. The number of slips operated within the existing marina basin has fluctuated over time. The marina caters to seasonal and transient boaters, charter fishing boats, and liveaboards.

Port Credit is also the go-to spot for fishing enthusiasts throughout the GTA and is home to several fishing charter companies. Every summer on the shores of Lake Ontario, the annual Great Ontario Salmon Derby, North America’s largest freshwater fishing derby, takes place for a six-week period in July and August. Over a 50-day period, the derby has had an estimated 21,000 people annually. The event attracts fishermen from all over the world and is an important tourist attraction to the City.

Several waterfront parks are located within the Local Study Area, with the nearest parks to the 1PSEPM Project site:

- St. Lawrence Park is located along St. Lawrence Drive immediately to the east of the 1PSEPM Project site. This is a passive waterfront park with water’s edge seating, views to the lake, gathering areas and the waterfront trail.
- Tall Oaks Park is located east of St. Lawrence Park and the 1PSEPM Project site at the foot of Elmwood Avenue South. As the name suggests, it is heavily wooded with old and large trees.

- Port Credit Memorial Park is located along the Credit River north of Lakeshore Road. It is a place to enjoy river activities and explore the area’s history related to the Credit River. The park includes a water’s edge walkway with seating and views to the river, active recreation opportunities, picnicking, trails and gathering areas. Many of the City’s festivals are hosted at Port Credit Memorial Park. The Port Credit library is located within the park and the Port Credit Memorial Arena is located adjacent to the park. The portion of Port Credit Memorial Park that is located on the west side of the river will be redeveloped to include a river promenade with access to lookout points and fishing areas, small civic space to encourage opportunities to watch rowing and canoeing, enhanced coastal edge, parking, and improved streetscape. Marina Park is located along the Credit River’s west edge south of Lakeshore Road and serves as an important connection to J.C. Saddington Park. Marina Park will be redeveloped to include a river promenade with passive seating and gathering areas, and lookout points, launch ramps for motorized and non-motorized boats, flexible parking and multi-use event space, car and trailer parking, charter boat area, walkway connections, small pockets of open green space and trees, and improved shoreline.
- Vimy Park, located on Stavebank Road north of Lakeshore Road, annually hosts Remembrance Day ceremonies and contains The Port Credit Cenotaph. Park improvements have been proposed that will be in keeping with the site’s heritage significance, increase accessibility and enhance space for local events and commemorative ceremonies. Improvements will include:
 - New walkways and upgrades to existing connections
 - New site furnishings such as benches
 - Pedestrian lighting improvements
 - Enhancements to existing planting
 - Expansion of the existing plaza for events
- J.C. Saddington Park is located on the west shore of the Credit River. It is a destination park and includes the waterfront trail, a park pavilion, parking, picnicking, water’s edge seating and views to the lake.
- J.J. Plaus Park is located on Stavebank Road South, west of the 1PSEPM Project site. This is a small riverfront park with water’s edge seating, the waterfront trail, views to the lake, a restaurant, the public Credit Village Marina and a surface parking area.

The Waterfront Trail runs throughout the Regional and Local Study Areas. The Mississauga section of the Waterfront Trail stretches from the Waterfront Harding Estate in the west to the future Jim Tovey Lakeview Conservation Area in the east. Through Port Credit, the trail is on paved asphalt through parks, with some portions aligned along residential streets. Currently, the 1 Port Street East site is a missing link in the Waterfront Trail network.

The City's Waterfront Parks Strategy Refresh (Dillon Consulting, 2019) identified the following overarching priorities that are relevant to the 1PSEPM Project:

- Establish new waterfront parks concurrent with the Inspiration community redevelopments.
- Strengthen the cohesiveness of the waterfront parks system while acknowledging the unique character of each park.
- Expand water-based recreational activities.
- Expand support facilities (picnic and shade) and amenities (food and rentals) to enhance the visitor experience.
- Improve views and visibility to Lake Ontario.
- Protect, enhance and expand the protection of sensitive and/or natural features while maintaining views and visibility to Lake Ontario and the Credit River.
- Expand parkland securement through acquisition, land conveyance, public private partnerships; land easements and/or protection agreements for shoreline access.
- Ensure high quality designs and maintenance of public spaces, including public recreational marina facilities.

The strategy acknowledges that opportunities for shore fishing are essential along the lake and encourages the provision of safe and accessible locations for angling purposes.

PROJECT STUDY AREA

The Project Study Area includes a portion of the 1 Port Street East property, inclusive of the water lot, located in Port Credit, Mississauga, at the mouth of the Credit River. As such there are no official recreational areas within the Project Study Area. The Waterfront Trail runs along the south side of Port Street adjacent to the 1PSEPM Project site.

3.4.5. VISUAL AND AESTHETICS

The Port Credit Local Area Plan (City of Mississauga, 2021) contains many provisions intended to protect views of Lake Ontario from Port Credit. Providing views towards Lake Ontario respects Port Credit's identity as a waterfront community. Provision of public access to the waterfront and protection of views to Lake Ontario are important components of Port Credit. **Figure 3.11** illustrates areas of Port Credit that currently have views of Lake Ontario and are considered important for preservation by the City (City of Mississauga, 2021)

Figure 3.11: Scenic Routes and Views from Port Credit



The most prominent and direct views of the Project Study Area are from two multilevel hotels, and condominium residences facing the lake along Port Street and St. Lawrence Drive. St. Lawrence Park includes a gazebo that directly faces the existing breakwater and boasts open water views of Lake Ontario. More distant views of Lake Ontario and the Project Study Area are possible from multi-storey residential building north of Lakeshore Road West, at the intersection of Lakeshore Road and Hurontario Street, and west of the Credit River along Front Street South.

Currently, land-based “open lake views” (or vistas) from the Project Study Area to Lake Ontario are partially screening by perimeter vegetation and limited as public access to the Project Study Area is restricted.

Direct and prominent views of the site exist from the east side to the wharf at the PCHM. Direct and prominent views of the 1PSEPM Project site also exist from Lake Ontario.

3.4.6. TRAFFIC AND TRANSPORTATION

LOCAL STUDY AREA

Port Credit is served by four major corridors: Lakeshore Road which runs east-west through Port Credit, Mississauga Road which runs north from Lakeshore Road, the Queen Elizabeth Way (QEW) highway, and Hurontario Street, which runs north from central Port Credit. All roads in the Local Study Area are under the jurisdiction of the City of Mississauga, with the nearest regional arterial road being Cawthra Road to the east of Hurontario Street.

Lakeshore Road is an east-west major arterial roadway that extends through the entirety of the City of Mississauga, providing connections to the QEW at Mississauga Road and Hurontario Street. As Lakeshore Road is the only continuous east-west roadway link south of the QEW, it is important to allow for efficient movement of goods for primary and secondary truck trip generators in the Local and Regional Study Areas.

In Port Credit, Lakeshore Road West becomes Lakeshore Road East at the Credit River, Lakeshore Road operates with four travel lanes with a posted speed limit of 50 km/h, and with lay-by parking on both sides of the street. Lakeshore Road West has signalized intersections with Mississauga Road. Lakeshore Road East has signalized intersections at Stavebank Road, Elizabeth Street, Helene Street and Hurontario Street.

Traffic conditions along the Lakeshore Road corridor can become congested, particularly on left turn movements at signalized intersections, during the weekday peak hours due to the relatively high traffic volumes carried during these periods (BA Consulting Group Ltd., 2017). During the AM peak hour, Lakeshore Road at the Credit River and Hurontario crossings are congested in the eastbound direction. During the PM peak hour, the Credit River crossing is congested in both directions. At the intersection level, there are existing operational issues at Stavebank Road and Mississauga Road (HDR, 2019). Truck volumes are relatively consistent along Lakeshore Road through most of Port Credit, generally ranging between 50 – 175 vehicles during peak hours. Recent construction Projects along Lakeshore Road and the Hurontario LRT line have contributed to growing congestion in the short term with additional trucks utilizing Lakeshore Road for access to construction sites.

In the future (2041 horizon), predicted auto volumes along Lakeshore Road were Projected to reach approximately 2,730 vehicles per hour in the westbound direction (PM peak hour peak direction) across the Credit River on Lakeshore Road. This volume exceeds capacity (approximately 2,000 vehicles per hour per direction). This demand is a result of the expended growth in the Lakeshore Road corridor that is expected to grow by approximately 56,000 people and 16,500 jobs between 2011 and 2041. Much of this growth will be focused in Port Credit (i.e., new developments at 70 Mississauga Road, 1 Port Street, Port Credit GO Station area, and the Lakeview Employment Area) (HDR, 2019).

In general, all parking types (e.g., on-street, off-street and layby) are utilized more during weekdays than on weekends. Public on-street parking is most utilized in Port Credit area between Hurontario Street to Mississauga Road, whereas public off-street parking is also highly utilized in Port Credit. Layby parking is highly utilized in the Port Credit (75% on weekdays); therefore, there is a need to maintain layby parking (HDR, 2019). There are three public parking locations within the areas of Port Credit nearest the Project site: Stavebank Road south with 109 spaces, 26 Lakeshore Road East (Port Credit Library) with 158 spaces and 80 Port Street parking garage with 43 spaces. Additionally, there are private parking lots and street parking available.

The Port Credit Local Area Plan includes a detailed section on how the development of the Port Credit area would support the creation of a “Multi-Modal City”. For development sites, the Plan gives direction that traffic should be directed towards signalized intersections and vehicular turning movements consolidated at other locations.

PROJECT STUDY AREA

Access to the 1PSEPM Project site is via Port Street. This is an east-west minor collector road under the jurisdiction of the City of Mississauga that runs between Stavebank Road and Hurontario Street. Port Street has a two-lane cross-section and a posted speed limit of 40 km/h, with parking permitted on both sides of the street. Helene Street runs perpendicular to Port Street between Lakeshore Road and the Project site. It has a two-lane cross-section and a posted speed limit of 40 km/h, with parking permitted on both sides of the street.

3.4.7. BUSINESS ACTIVITY

LOCAL STUDY AREA

Port Credit is a unique hub for shopping, events, music and activities on the waterfront. It has a wide array of restaurants, retail stores, business offices all within walking distance from the Credit River or from Lake Ontario. Most of these businesses are located along Lakeshore Road. Two hotels are located across from the PCHM on Stavebank Road, the Ports Hotel and the Waterside Inn.

PCHM is one of the largest privately-operated full-service marinas on the GTA’s lakefront and includes marina-related businesses. At present, the PCHM offers the following amenities:

- Approximately 470 slips;
- Seasonal docking, storage, including Indoor storage;
- 35 Ton travel Lift (all year);
- Washroom facilities and laundry;
- Fenced property with restricted access;
- Marine store, canvas & boat top repairs, boat cleaning tenant businesses; and
- New & brokerage boat sales tenant businesses (Port Credit Harbour Marina, 2022).

3.4.8. COMMERCIAL FISHING

REGIONAL AND LOCAL STUDY AREAS

Ontario's commercial fisheries contribute millions of dollars to the province's economy every year. The Ministry of Natural Resources and Forestry (MNRF) sets annual quotas and issues annual licences for the commercial harvest of fish, primarily in the Great Lakes. More than 500 active commercial fishing licences are held in Ontario. Lake Ontario has the smallest commercial fishery of all the Great Lakes. Harvested species include Yellow Perch, Lake Whitefish, Bullhead, and American Eel. Vessels used in Lake Ontario's commercial fishing industry are primarily steel built fish tugs built in the mid-1900s. The modern harvesting techniques used by the commercial fishing industry in Lake Ontario are primarily gill netting, trap netting and trawling. Fish monitoring trawl sites exist offshore from Port Credit (Canadian Seabed Research, 2017).

3.5. INDIGENOUS COMMUNITIES

The Project Study Area is located in the unceded territory of the Mississaugas of the Credit First Nation (MCFN) and is currently under an Aboriginal title claim under active negotiations with the Government of Canada. Lands within the Local Study Area are within the traditional territory of MCFN. There are no current First Nation reserve lands within the Regional, Local or Project Study Areas.

3.5.1. MISSISSAUGAS OF THE CREDIT FIRST NATION

The Project is being developed on the traditional territory of MCFN, who are the Aboriginal and treaty rights holders and host First Nation.

MCFN's territory covers approximately 3.9 million square acres and extends over much of southern Ontario from the Rouge River Valley in the east, across to the headwaters of the Thames River, and down to Long Point on Lake Erie. It encompasses the present-day Greater Toronto Area, Kitchener, Niagara Falls, Hamilton, and the City of Mississauga, as well as the lands and waters between and surrounding same. Importantly, MCFN's territory includes the entire area of the Port Credit River, the Port Credit Marina and the City of Mississauga and the Peel Region.

As an Indigenous community, MCFN holds Aboriginal and treaty rights that are protected under Section 35 of the *Constitution Act, 1982*. Between 1781 and 1820, MCFN entered into a number of treaties with the Crown that reflected the Crown's understanding of MCFN's ownership and title to the lands and resources of MCFN's traditional territory. These treaties established treaty rights (e.g. hunting, fishing, gathering, etc.) for MCFN across their territory, rights which MCFN members continue to hold and exercise today. Notably, with respect to the Port Credit area, MCFN's ancestors entered Treaties 22 and 23 referred to as the "Credit Treaties" in 1820.

MCFN assert that they hold unextinguished Aboriginal rights and title over the waters, beds of water, and lakebeds throughout MCFN’s territory, including the Credit River.¹ Throughout the historic treaty negotiations, MCFN’s ancestors always stressed the importance of the rivers, lakes, and waters to MCFN. Water is vital to MCFN’s survival and all other forms of life. Water is the foundation of MCFN’s interconnectedness to their traditional territory, and as such, MCFN’s ancestors never surrendered Aboriginal title to the water, beds of water, or lakebeds across MCFN’s territory. MCFN continues to hold Aboriginal title to these lands and waters today.

Today, MCFN’s reserve lands include the 2,392.6-hectare parcel of land known as New Credit 40A Indian Reserve and Reserve 40B near Hagersville, Ontario. Although many of their community members live on this reserve, MCFN’s relationship to their entire traditional territory – including to the waters and lands underwater – remains central to their identity as a people.

In 2016, MCFN submitted claims to Canada and Ontario to find a negotiated resolution reconciling their Aboriginal title to these lands and waters with the Crown and the public’s continued use of them. The courts have found that Aboriginal title includes rights such as to participate in decision making about development and uses of the area, benefit from it, continue an ongoing relationship with the area, etc. Negotiations are currently ongoing between MCFN and Crown-Indigenous Relations and Northern Affairs Canada.

MCFN’s treaty rights fundamentally entitle them to sustain themselves through the lands, waters, and resources of their territory, now and into the future. It is these fundamental rights and MCFN’s responsibility to future generations to ensure MCFN’s rights and interests are respected during any proposed developments or strategies planned for their territory.

As outlined above, the 1PSEPM Project Site is an area of historical and cultural significance to MCFN. The 1PSEPM Project Site is located at the mouth of the Credit River, which was once an essential part of MCFN’s settlements, trade, harvesting, and continues to be an important site for MCFN’s way of life and heritage today.

MCFN, as the host Indigenous government, is committed to consulting with the City of Mississauga to investigate innovative ways of mitigating impacts on MCFN’s rights and including and amplifying MCFN’s history, culture, and traditions as part of including Indigenous design and ideas during the development of 1PSEPM Project.

3.5.2. HURON WENDAT NATION

The term “Wendake Sud”, represents the ancestral territory of the Huron-Wendat Nation in Ontario. The Huron-Wendat Nation stretches from Lake Nipissing in the north to Lake Ontario in the south and Île Perrot in the east to the vicinity of Owen Sound in the west. Formerly occupied by more than 100,000 Huron-Wendat, this territory is today marked by archaeological sites which bear witness to this strong occupation of the territory (Huron-Wendat Nation, 2022).

¹ MCFN also holds Aboriginal title to the Rouge River Valley. MCFN submitted a request to find a negotiation resolution to this Aboriginal title claim with the Crown in 2015. Negotiations are ongoing.

3.5.3. SIX NATIONS OF THE GRAND RIVER

Six Nations of the Grand River, Ontario, is the common name for both a reserve and a Haudenosaunee First Nation. The Six Nations are the Mohawk, Seneca, Oneida, Cayuga, Onondaga and Tuscarora nations. Six Nations is the largest First Nation reserve in Canada by population, and the second largest by size. The Six Nations reserve is bordered by the County of Brant, Norfolk County, and Haldimand County. There are several individual communities within the reserve, the largest of which is Oshweken (Government of Ontario, 2021).

3.5.4. HAUDENOSAUNEE CONFEDERACY CHIEFS' COUNCIL

There are six nations that make up the Haudenosaunee Confederacy. These are the Mohawks, Oneidas, Onondagas, Cayugas, Senecas, and the Tuscororas. Members of individual nations within the confederacy may live off-reserve or in reserve communities in Canada and the United States. Six Nations of the Grand River is a reserve where all six members of the Haudenosaunee are represented. In 1924, the federal government imposed an elected Council structure under the *Indian Act*; however, the traditional Council model continues to function in opposition to this model.

The Haudenosaunee Grand Council of Chiefs continues to meet and direct national Haudenosaunee policies (Haudenosaunee Confederacy, 2022). The Haudenosaunee Confederacy Chiefs Council has legislated the Haudenosaunee Development Institute (HDI) to represent HCCC their interests in the development of lands within areas of Haudenosaunee jurisdiction, including but not limited to the land prescribed by the Haldimand Proclamation and the 1701 Treaty Area. HDI has established and administers a regulatory framework which identifies, registers, and regulates development in compliance with several regulatory obligations including the Haudenosaunee Green Plan (HGP) and the Haudenosaunee Development Protocol (HDP). HDI is also charged with ensuring that the perpetual care and maintenance of the Haudenosaunee is maintained with respect to Haudenosaunee interests.

3.6. CULTURAL ENVIRONMENT

3.6.1. REGIONAL AND LOCAL STUDY AREAS

HUMAN USE AND SETTLEMENT

The Regional and Local Study Areas have a long history of human use and settlement since time immemorial and continuing through to the present-day industrial uses and parkland. Portions of this area would originally have had a very high potential for Indigenous community sites of the pre-contact and post-contact periods, including MCFN's cultural and historic connections to the site. Remnants of these past occupations have been found in abundance along the Credit River, however most of them have been destroyed due to modern-day development and urbanization. Extensive lake filling and dredging activities were the primary disturbances within and adjacent to the Project Study Area.

In 1988, the City of Mississauga defined by by-law Old Port Credit village south of Lakeshore Road West on the west side of the Credit River as an area to be examined for possible future designation as a heritage conservation district. In 2004, the City enacted the Old Port Credit Village Heritage Conservation District (HCD) Plan. This plan guides physical changes to the area over time to ensure that modifications contribute to the area's special character. The area to which the HCD Plan applies was one of the topics examined through a 2017 update process regarding the District. Among the updates made, the HCD Plan was refined such that the eastern boundary of the District encompasses the entire Credit River, as well as the City-owned property located on the northeast side of the harbour.

3.6.2. PROJECT STUDY AREA

SCREENING

The City has completed a screening level assessment regarding Built Heritage Resources (BHR) and Cultural Heritage Resources (CHR) for the Project site. This was done using the checklist for non-specialists and the Ministry of Citizenship and Multiculturalism (formerly the Ministry of Tourism, Culture and Sport) criteria for evaluating potential for build heritage resources and cultural landscapes. **The Project Study Area is or does not:**

- form part of the Old Port Credit Village Heritage Conservation District which is located on the west side of the Credit River;
- identified, designated or otherwise protected under the Ontario Heritage Act as being of cultural heritage value. There are 13 registered archaeological site within a 1 km radius of the Project Study Area. (Scarlet Janusas Archaeology Limited, 2024);
- a National Historic Site;
- designated under the Heritage Railway Stations Protection Act or the Heritage Lighthouse Protection Act. There is no railway station or lighthouse on the Project site;
- identified as a Federal Heritage Building. There are no buildings or structures on the Project site;
- located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage site;
- subject to a municipal, provincial or federal commemorative plaque (Scarlet Janusas Archaeology Limited, 2024);
- adjacent to a known burial site and/or cemetery;
- located in a Canadian Heritage River watershed. The Credit River is not designated as a Canadian Heritage River;
- contain any unique landscape features such as waterfalls, rock faces, caverns or mounds that may have a connection with a particular event, group or belief. The site is flat in topography and contains fill materials; and

- contain an Indigenous sacred sites or trails or a historic road or railway. No such features were identified during consultation with the MCFN.

The Project Study Area does not contain any buildings or structures that are 40 or more years old. In fact, there are no buildings or structures on the Project site. The only feature of community interest from a historical perspective is the Ridgetown. As noted previously, the Ridgetown was a steel-hulled propeller-driven Great Lakes freighter launched in 1905. It is one of the oldest surviving great lakes freighters (or “laker” as they are known). In 1974, the Ridgetown was loaded with stone and cement and sunk to become a permanent breakwater off the Port Credit shoreline and part of the Project Study Area.

While there are no documented Indigenous knowledge studies available for the Project site, portions of this Local and Regional Study Areas would originally have had a very high potential for Indigenous community sites of the pre-contact and post-contact periods, including MCFN’s cultural and historic connections to the site. The on-land portion of the Project Study Area would have exhibited cultural heritage potential based on its proximity to the Credit River and Lake Ontario, however, the deep and extensive disturbance of the soils and in-filling across the entire site obviates any cultural heritage potential for the on-land portion of the Project Study Area. Therefore, there is no possibility of cultural heritage potential and no further archaeological assessment is considered to be required (Scarlet Janusas Archaeology Limited, 2024).

Nevertheless, out of respect for the Indigenous communities with an interest in the study areas, the City proceeded with a marine archaeological assessment and a Stage 1 Archaeological Assessment for the on-land portion of the Project Study Area. The results of these studies are summarized below, and the full studies are provided in Appendix B to this EA Report. These are being shared with Indigenous communities with an interest in the study area from a cultural heritage perspective.

MARINE ARCHEOLOGICAL ASSESSMENT

In the summer of 2019, a marine archaeological assessment and background research were undertaken at the 1PSEPM Project site. This included in-water studies involving side scan sonar and magnetometer equipment to investigate the area. Any targets found using these methodologies were further investigated using forward looking sonar (on a remote operated vehicle) and video. Background research indicated that the Project Study Area had been heavily modified via in-filling, surface development, dredging, redevelopment and additional periodic dredging.

Only one target was found during the marine archaeological survey. This target consisted of at least two very large metal frames with uprights in some places and cut rectangular holes. This target lay immediately adjacent to the Ridgetown. Examination confirmed that the Ridgetown was not lying on any part of the target. Given that the area of the Ridgetown was dredged prior to its being positioned as a breakwater, it is unlikely that the target was in this location at that time. It is possible that the development of this breakwater (Ridgetown) may have had materials associated with the development that were discarded after its completion. This is not any type of structure that could have been transported by any natural means, and only by intentional disposition. No additional cultural targets were located, and the remaining area of the marine archaeological survey is considered clear of cultural/archaeological concerns.

ON-LAND ARCHAEOLOGICAL ASSESSMENT

A Stage 1 archaeological assessment was conducted in March 2024 for the on-land portion of the Project Study Area (i.e., 1 Port Street East, Block A and part of Block B) for an area approximately 1.1 hectare in size. This area is located on the existing marina lot use for storage of boats, trailers and vehicles, and also includes the small beach area along the southeast section of the Project Study Area. Previous use of the property included storage of fuels for marina use (Scarlet Janusas Archaeology Limited, 2024).

Background research indicated the area of the Credit River Valley and area have been represented in the archaeological record by the Iroquois, Algonquin and Ojibwa speaking peoples, and that their archaeological presence has been recorded in the area since the Middle Archaic period (500 BC – 500 AD). The Lake Iroquois (former) shoreline occurs north of the Project Study Area, and as such, would have been inundated during the time of Lake Iroquois (Scarlet Janusas Archaeology Limited, 2024).

4. EVALUATION AND RATIONALE FOR 'ALTERNATIVES TO' THE UNDERTAKING

4.1. DESCRIPTION OF 'ALTERNATIVES TO' THE UNDERTAKING

The Ontario EA Act requires the identification and evaluation of 'Alternatives To' the undertaking, including the consideration of the "Do Nothing" alternative. 'Alternatives To' the undertaking are defined as different ways to solve the identified problem or address the identified opportunity. The 1PSEPM Project is an opportunity to move forward with the implementation of the City-approved 1 Port Street East Comprehensive Master Plan and ensure the continuation of the site's historic marina function, which is key to the cultural identity of Mississauga and the Port Credit community.

Various planning studies undertaken with significant public and stakeholder engagement looked at the long-term vision for this part of Port Credit. It was clear that the community wanted to keep the marina in Port Credit and the deep-water harbour at this location was considered an asset that gave this site a unique advantage over any other. Following extensive study, including a Marina Business Case (2015), 1 Port Street East Comprehensive Master Plan (2016) and Official Plan Amendment (2017), which were approved by City Council, the City identified that a marina was most appropriate on the lands between Elizabeth and Helene Street, an expanded eastern breakwater, and the entire waterlot. The existing harbour basin is a natural location for a marina and the costs associated with creating a harbour basin in other locations would be prohibitive. Based on the previous studies, Canada Lands, the owners of the 1 Port Street East site, executed an agreement for a phased transfer of the breakwater, 2 acres of land, and the deep-water harbour to the City for the purposes of developing a marina on the eastern portion of this site. Therefore, alternative sites for a new marina outside of Port Credit have not been considered and the City's intention has consistently been to explore replacing the marina services and facilities within the existing basin.

A marina at this site supports Port Credit's cultural heritage and character, as this site has historically accommodated marine functions due to the protected harbour basin. For these reasons no additional sites along the Mississauga waterfront were assessed as alternatives and focus has been placed on the expansion of the land base along the breakwater at the 1 Port Street East site to permit relocation of the marina and associated operations. The 'Alternatives To' that are subject to evaluation are defined as:

- **Do nothing.** This alternative will not create additional parkland or preserve a future public marina function at the site. The second conveyance of land and water lot from Canada Lands to the City would not take place, leaving the development of the entire property at the discretion of the Canada Lands.
- **Create a new land base.** This alternative involves creating a new land base around the eastern breakwater that would allow for the establishment of a new marina and additional parkland in accordance with the City's approved 1 Port Street East Comprehensive Master Plan. To a large extent, the location and extent of filling will determine what can be created or constructed on this new land base.

4.2. EVALUATION OF 'ALTERNATIVES TO' THE UNDERTAKING

These 'Alternatives To' are evaluated in a qualitative manner in **Table 4.1** in terms of their environmental effects and their main advantages and disadvantages with respect to their ability to address the 1PSEPM Project 'problem' and 'opportunity'. An overall rationale for the selection of the 'Alternative To' that will be carried forward to the development of 'Alternative Methods' based on net effects, advantages, and disadvantages.

Table 4.1: Evaluation of Alternatives to the Undertaking

Environmental Component	Criteria	Do Nothing	Create a New Land Base
Physical Environment	Resiliency to changing lake levels and coastal processes	The long-term integrity of the existing pier and the eastern breakwater will continue to be at risk from changing lake levels and coastal processes	A new land base can be designed with sufficient flexibility with respect to changing coastal processes and lake levels to ensure its the long-term integrity and wharf protection.
	Effects on water quality in the Local Study Area	There is no potential for changes to water quality	Construction will result in temporary increased turbidity from lakefilling. Mitigation is available to minimize adverse effects.
	Potential for disturbance of contaminated soils	There is no potential for disturbance of contaminated soils	Construction has the potential to disturb contaminated soil. Mitigation is available to minimize adverse effects.
Atmospheric Environment	Change to air quality	There is no potential for changes to air quality	Dust from construction activities, trucks hauling fill and emissions from construction equipment may be sources of nuisance effects. Mitigation is available to minimize adverse effects.
	Changes to ambient noise conditions	There is no potential for change in noise levels	Noise from construction activities and trucks hauling fill may be sources of nuisance effects. Mitigation is available to minimize adverse effects.
Biological Environment	Area and quality of terrestrial habitat	There is no potential for loss or disturbance of terrestrial habitat	Some existing vegetation on the existing property and eastern breakwater would be lost and/or disturbed. Mitigation will be available to minimize adverse effects.
		Any development of the wharf and the water basin to the east of the wharf will be at the discretion of the Canada Lands. No potential for improvement to terrestrial habitat on property owned by the City.	Creating a new land base offers opportunities to improve terrestrial habitat and enhance migratory bird habitat and habitat connectivity through new plantings.
	Area and quality of aquatic habitat	There is no potential for effects on aquatic habitat	Although lakefilling activities may cover some existing low-quality aquatic habitat, this alternative provides the opportunity to create better habitat conditions.

Environmental Component	Criteria	Do Nothing	Create a New Land Base
		There is no compensation required with respect to fish habitat.	Removal of existing aquatic habitat will likely require an Authorization under the <i>Fisheries Act</i> , for the proposed HADD, and habitat compensation (offsetting) will be stipulated under this <i>Authorization</i> in order to meet the Habitat Policy Guiding principle of “No Net Loss”. As a measure and standard to avoid and mitigate the HADD, a new land base can be designed so that it is self-compensating, so that the creation of new aquatic habitat as part of Project design will compensate for the removal of a portion of the existing aquatic habitat.
	Potential to maintain or improve connections for aquatic species	Existing connections for aquatic species are maintained. No opportunities to improve connections for aquatic species.	A new land base with enhanced aquatic habitat may maintain or improve the ability of aquatic species to move within the nearshore areas and upstream in the Credit River.
Socio- economic Environment	Area of open space or park land created	Without the conveyance of additional land and water lot from Canada Lands to the City, no additional land base is created such that it can be made available for public amenities, parks and trails. Any parkland would be limited to the wharf development and not guaranteed.	Creating a new land base offers opportunities to establish parkland that support passive recreational activities for visitors and residents of the City of Mississauga and beyond.
	Potential for changes to use of waterfront for recreation	There is little potential for changes to use of waterfront for recreation. As existing marina operations and site conditions deteriorate over time, the waterfront area near the existing marina will become less attractive for recreation.	Creating a new land base will change how the public use and access the site. Changes in activities should be compatible with activities associated with the marina and marina activities to avoid conflict.
	Potential for change to navigation	Changes to navigation are not likely.	The placement of lakefill may alter navigation patterns in the harbour basin and on the eastern side of the pier during construction. Safe navigation will be maintained during the establishment phase.

Environmental Component	Criteria	Do Nothing	Create a New Land Base
	Disruption to use and enjoyment of property during construction and establishment	There is no potential for disruption to use and enjoyment of residential properties, community facilities and institutions.	Construction activities may produce temporary nuisance effects that can disrupt people’s use and enjoyment of their property, community facilities and institutions. Mitigation is available to minimize adverse effects.
	Changes in community character	The ultimate loss of marina functions along the waterfront will result in irreversible harm to the unique character of Port Credit.	Creating a new land base offers the opportunity to maintain marina functions along the waterfront and the unique character of Port Credit. The presence of new recreational and commercial land uses has the potential to enhance community character.
	Effects on business operations during construction and establishment	<p>The ultimate loss of marina functions at the 1 Port Street East site will result in adverse effects on business operations.</p> <p>No potential for generating positive effects to business operations. Existing businesses might cease operations and jobs could be lost.</p>	<p>Creating a new land base offers the opportunity to maintain marina functions along the waterfront and maintain numerous full-time and part-time marine-related jobs and business operations.</p> <p>Construction and establishment activities will produce temporary nuisance effects that may result in short-term disruption to business operations. Mitigation is available to minimize adverse effects.</p> <p>Construction and establishment activities will generate business opportunities to improve business activity and enhance operations.</p>
Cultural Environment	Potential for disturbance or destruction of marine and land-based archaeological resources; displacement of built heritage resources and/or cultural heritage landscapes by demolition and/or removal and disruption of resources by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the character and setting of the cultural heritage resource.	There is no potential for effects on cultural heritage resources.	Construction has the potential for the disturbance and destruction of marine and land-based cultural heritage resources. A new land base may have the potential to impact built heritage resources or cultural heritage landscapes. A new land base would create a new feature on Port Credit’s shoreline.

Environmental Component	Criteria	Do Nothing	Create a New Land Base
	Potential for effect from construction and operations on traditional uses of lands by Indigenous communities	There is no potential additional or new effects on traditional uses of lands and waters	Once established, a new land base must allow for the continued use of lands and waters by Indigenous communities.
Cost	Capital and Costs	Avoids the capital costs of new construction.	A new land base will require funding for construction.
	Maintenance and Repair Costs	Costs for ongoing maintenance and repairs for the existing breakwater.	A new land base will require funding for maintenance and repairs.

The 'do nothing' alternative does not create a new land base that would allow for the protection and development of a new marina. Therefore, this alternative does not meet the purpose of the 1PSEPM Project. There are no clear advantages to this alternative other than the avoidance of new construction costs and adverse environmental effects on various environmental components during construction. The main disadvantages of the 'do nothing' alternative are:

- Doing nothing would stall the implementation of the City-approved 1 Port Street East Comprehensive Master Plan with respect to the continuation of the site's historic marina function, which is key to the cultural identity of the Port Credit community. The 'Do Nothing' alternative would forego the creation of new waterfront parkland, improved waterfront trail through this area, and improved aquatic and terrestrial habitat.
- The long-term integrity of the existing wharf and the eastern breakwater will continue to be at risk from changing lake levels and coastal processes. City costs for ongoing maintenance and repairs remain and may rise over time.

New land can be created through lakefilling to allow for the establishment of a marina and supporting facilities and infrastructure; provide public access to the waterfront, improvements to the waterfront trail system and new parkland at the 1 Port Street East site. The disadvantages of this alternative relate to its potential for adverse environmental effects on various environmental components during construction. Measures are available (e.g., traffic controls, dust management, noise abatement, spill management) to mitigate these adverse environmental impacts. The main advantages of this alternative are:

- Promotes the implementation of the City-approved 1 Port Street East Comprehensive Master Plan with respect to the continuation of the site's historic marina function;
- Avoids the ultimate loss of marina functions at this site and its adverse effects on recreational boating, business operations and community character of Port Credit;
- A new land base can be designed with sufficient flexibility with respect to changing coastal processes and lake levels to ensure its long-term integrity; and
- Creating a new land base offers opportunities to enhance terrestrial and aquatic habitats and establish parkland that can support passive recreational activities for visitors and residents of Mississauga and beyond.

It is noteworthy that any development of the wharf will be at the discretion of the Canada Lands. The ultimate development of the existing wharf is likely to create nuisance effects like those associated with creating a new land base.

In conclusion, the "create a new land base" alternative has been carried forward to the development of 'Alternative Methods'.

5. DESCRIPTION, EVALUATION AND RATIONALE FOR 'ALTERNATIVE METHODS' OF CARRYING OUT THE UNDERTAKING

The following sections describe the iterative steps that were used in developing alternative 1PSEPM Project configurations ('Alternative Methods'). 'Alternative methods' are different ways of implementing the preferred 'Alternative to'. The alternatives were assessed as to their ability to achieve the purpose of the 1PSEPM Project. Criteria and indicators were used to assess the potential for adverse and positive environmental effects and reflected all components of the environment. For this Project, 'alternative methods' are different configurations of lakefill around the eastern breakwater.

5.1. METHODOLOGY

There is a four-step process that was outlined in the Terms of Reference, which is used to identify and evaluate the Alternative Methods:

- **Step 1** – Determination of Footprint for Alternatives.
- **Step 2** – Identification of Desired Design Elements; parkland, trail, marina elements.
- **Step 3** – Comparative Evaluation of Alternatives
- **Step 4** – Confirm and refine the Undertaking and complete the Detailed Assessment of the Preferred Alternative

5.1.1. STEP 1 – DETERMINATION OF FOOTPRINT FOR ALTERNATIVES

The first step in defining the alternative 1PSEPM Project configurations was to develop a range of footprints up to a maximum spatial extent. This range of footprints was determined through consideration of physical constraints.

The smaller the land base the fewer opportunities to provide a full range of marina services and public amenities. The larger the land base the greater the opportunity to provide a full range of marina services, increased public access, parkland and other amenities. The alternative footprints are defined below:

- Do Nothing
- Alternative 1: Small Lakefill Footprint (**Figure 5.1**)
- Alternative 2: Medium Lakefill Footprint (**Figure 5.2**)
- Alternative 3: Large Lakefill Footprint (**Figure 5.3**)

These alternatives are considered bounding, that is, the final land base and the final 1PSEPM Project configuration is likely to fall between these three distinct footprints in terms of size.

Figure 5.1: Alternative 1: Small Lakefill Footprint

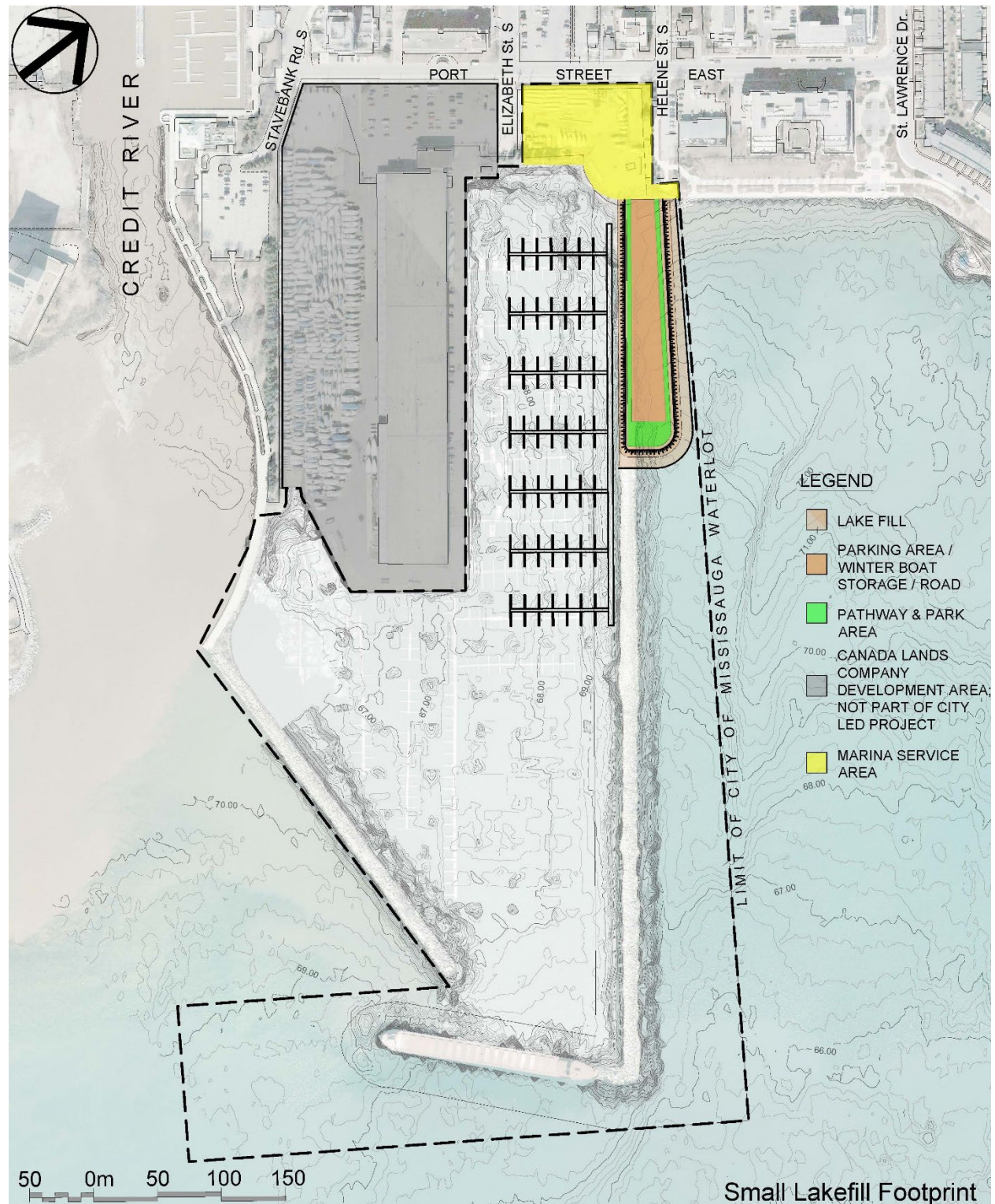


Figure 5.2: Alternative 2: Medium Lakefill Footprint

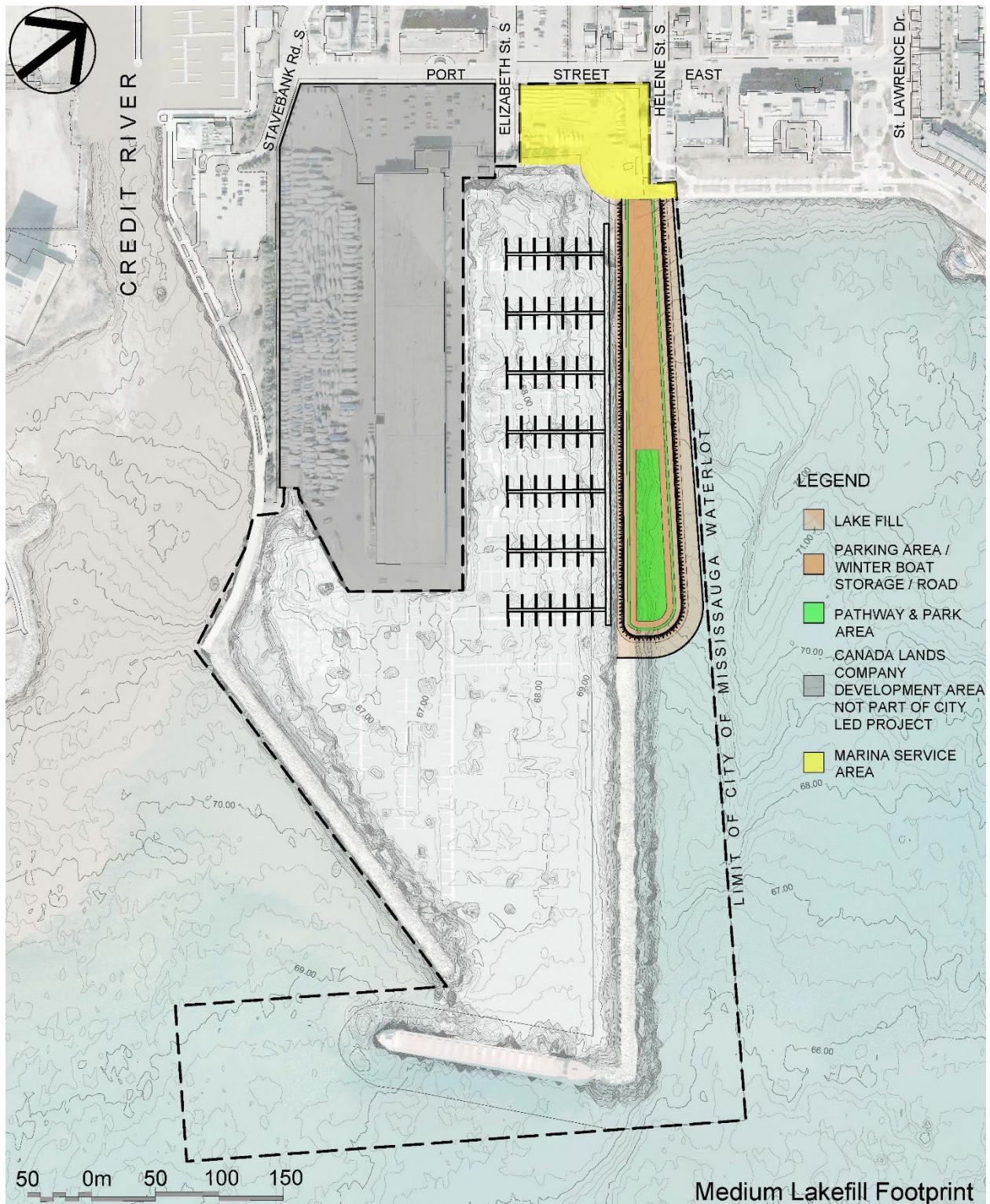
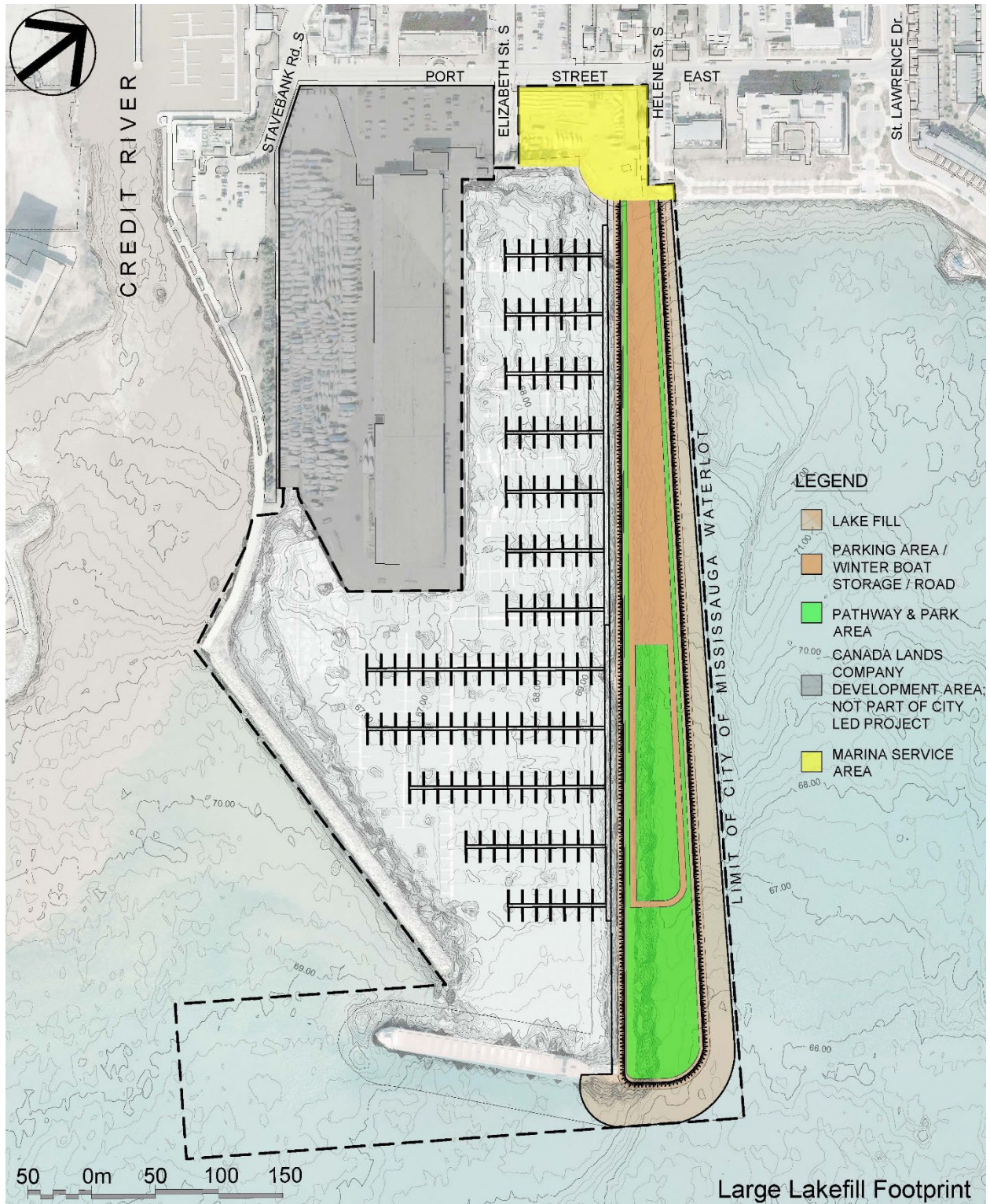


Figure 5.3: Alternative 3: Large Lakefill Footprint



5.1.2. STEP 2 – IDENTIFICATION OF DESIRED DESIGN ELEMENTS

The footprint alternatives determined in Step 1 were further refined to include the key design elements listed below:

- The approximate number, locations and sizes of boating slips;
- Marina services, including public parking, on-site winter boat storage;
- Open space or parkland area, including trail connections and opportunities for recreation; opportunities to provide views of Lake Ontario and back to the City; and
- Aquatic and terrestrial habitat features.

These design elements are conceptual in nature, allowing them to be evaluated, and could be subsequently implemented by the City in a flexible and adaptive manner. Major changes to these design elements following EA approval would be subject to an amendment procedure, review and approval by the MECP and other regulators as required. What might be considered a major change is considered in Chapter 10 of this EA.

5.1.3. STEP 3 – COMPARATIVE EVALUATION OF SHORT LIST OF ALTERNATIVES

The purpose of Step 3 was to evaluate the three alternatives and the “do nothing” alternative to identify a single (1) preferred alternative to be carried forward for more detailed development and assessment. This evaluation of alternatives was accomplished by establishing an order of preference between the three alternatives developed in Steps 1 and 2.

The evaluation method used criteria and indicators to structure information and facilitate the comparison of alternatives against each other. The evaluation criteria and indicators were refined through consultation with a wide range of regulators, stakeholders, and members of the public.

The comparison of alternatives required the explicit consideration of trade-offs thereby keeping the more desirable attributes over those considered to be less desirable. The alternative identified as preferred at the end of Step 3 has the greatest potential to meet the Project need and provide the desired marina facilities and parkland and public access while minimizing effects associated with construction and establishment. The detailed assessment of the preferred alternative is presented in Step 4.

The Comparative evaluation of alternatives involved three tasks as detailed below:

- Refinement of comparative evaluation criteria and indicators originally presented in the ToR;
- Assessment of effects; and
- Comparative evaluation to identify the preferred alternative.

The evaluation criteria and indicators used for the comparative evaluation were developed from the preliminary list of criteria and indicators presented in the approved ToR and refined by the City and consultant team based on information available about each alternative and review comments received from stakeholders including:

- City of Mississauga;
- Credit Valley Conservation;
- Canada Lands Company;
- The public;
- Interest and community groups;
- Indigenous communities; and
- Federal and provincial regulatory agencies.

In general, the data for the effects assessment were collected as part of baseline studies (see Chapter 3). Baseline data was used with the descriptions of the alternatives, and basic Project assumptions to determine how each alternative would potentially affect the environment. Some of these basic assumptions were:

- The construction techniques used to extend the land base are similar regardless of the size of the footprint.
- The duration of the Stage 1 construction period (i.e., lakefilling) will be approximately 3 months for the smallest footprint, 7 months for the medium footprint and 14 months for the largest footprint. The 14-month construction period may be discontinuous to accommodate allowable in-water work windows for fisheries as specified by approving agencies. Timing is also dependent on fill availability and weather conditions. These times are construction times for the lakefill and protection only and assume that protection is being implemented at the same time as the lakefill is proceeding. The assessment of construction related effects assumed that the construction schedule would be optimized to minimize disruption.
- Best Management Practices (BMPs) to mitigate construction effects would be implemented. While the effects assessment indicates that construction related disruption effects are likely to occur, in all cases these effects will be temporary and like the effects associated with infill development, road and infrastructure construction. The assessment of operation related effects recognizes that operational effects from marina services and from those using the marina will be like existing conditions or current operations of the marina.

This assessment resulted in a relative comparison of the alternatives for each criterion and indicator. For some of the criteria and indicators, the effects assessment concluded that there were no differences between any of the alternatives. These criteria and/or indicators were screened from the evaluation as they do not assist in decision-making. Table 5.1 details which criteria and/or indicators were screened from the evaluation.

Table 5.1: Criteria and Indicators for Comparative Evaluation of Alternative Methods

Environmental Component	Criteria	Indicator(s)	Approach to Assessment	Screened/Used in Comparative Evaluation	Rationale for Screening of Criteria
Physical Environment	Resiliency of proposed lakefill to changing lake levels and coastal processes	Ability of proposed alternative to withstand changing lake levels (i.e., flooding hazards) and coastal processes (shoreline erosion) including future changes associated with climate change.	Professional judgement based on coastal process modeling	Screened	Each of the alternatives will be designed to be resilient, considering the potential for severe weather due to climate change and other factors. Each alternative requires repairs to the breakwater outside the fill area to provide additional resiliency. Therefore, same for all alternatives.
	Effects on surface water quality in the Local Study Area	Changes to surface water quality from placement of fill (turbidity, etc.) and spills associated with construction equipment	Professional judgement based on past Project experience	Used in evaluation	The potential for changes to surface water quality is related to the size of the lakefill and location within the lake. Construction durations also vary. Therefore, this criterion helps to differentiate between the alternatives.
	Potential for disturbance of contaminated soils	Area of contaminated soils to be managed/remediated for 1PSEPM Project	Comparison with existing conditions	Screened	Each of the alternatives has the same potential for disturbance of contaminated soils or sediments. Therefore, same for all alternatives.
	Ability to manage contaminated soils and groundwater	Ease of remediation/risk management	Comparison with existing conditions	Screened	Each of the alternatives has the same potential for disturbance of contaminated soils or sediments and will require similar remediation efforts (if required). Therefore, same for all alternatives.
	Risk to existing and future municipal drinking water	Changes in risks to municipal drinking water from Project activities.	Potential for use of groundwater as a source of drinking water. Comparison with proximity of water intakes.	Screened	Water intakes are not in proximity to the Project site and turbidity from fill placement will not likely extend beyond the Local Study Area. Groundwater in the Local or Project Study Areas is not used as a source of drinking water and the site has low vulnerability scores.

Environmental Component	Criteria	Indicator(s)	Approach to Assessment	Screened/Used in Comparative Evaluation	Rationale for Screening of Criteria
					Therefore, same for all alternatives.
Biological Environment	Area and quality of terrestrial habitat	Total area of terrestrial habitat created, enhanced, disrupted, or lost	GIS measurement of areas and qualitative assessment of potential for change to terrestrial habitat	Used in comparative evaluation	Size of lakefill and Project design features will determine opportunities for habitat creation, and potential for disruption or loss. Therefore, this criterion helps to differentiate between the alternatives.
		Potential effects on terrestrial Species at Risk (SAR) and Significant Wildlife Habitat (SWH)	Qualitative assessment based on professional judgement	Screened	SAR habitat creation is not likely in a managed park environment. Therefore, same for all alternatives.
		Potential for creation of habitat for nuisance species	Qualitative assessment based on professional judgement	Screened	Habitat creation for nuisance species is not likely in a managed park environment. Therefore, same for all alternatives
		Qualitative assessment of improvement to terrestrial habitat for enhancement of migratory bird habitat and habitat connectivity.	Qualitative assessment based on professional judgement	Used in comparative evaluation	Size of lakefill and Project design features will determine opportunities for improvements to habitat and connectivity. Therefore, this criterion helps to differentiate between the alternatives.
	Area and quality of aquatic habitat	Total area and types of aquatic habitat disrupted or removed	GIS measurement and assessment based on field work	Used in comparative evaluation	Size of lakefill and Project design features will determine potential for habitat disruption and amount of habitat removed. Therefore, this criterion helps to differentiate between the alternatives.
		Potential effects on aquatic Species at Risk (SAR) and Significant Wildlife Habitat (SWH)	Qualitative assessment based on professional judgement	Screened	Lake Sturgeon has been recovered near mouth of Credit River (last record 2006). American Eel has also been observed along the Lake Ontario shoreline within the study areas.

Environmental Component	Criteria	Indicator(s)	Approach to Assessment	Screened/Used in Comparative Evaluation	Rationale for Screening of Criteria
					Habitat in footprint is not considered critical habitat for any SAR species. There is no SWH within the Project footprint. There is low potential for Lake Sturgeon habitat and moderate potential for American Eel habitat within the Project footprint. Project is not anticipated to effect mouth of Credit River. Therefore, the same for all alternatives. Eel habitat is most likely associated with the existing breakwater, there the same for all alternatives.
		Potential for the creation of habitat for nuisance species	Qualitative assessment based on professional judgement	Screened	Created habitat can be designed to avoid nuisance species. Therefore, same for all alternatives
		Amount of self-compensation with respect to fish habitat (i.e., Opportunity to incorporate fish habitat creation and enhancement opportunities into design)	Qualitative assessment based on professional judgement and field work.	Used in Comparative Evaluation	Lakefill will result in habitat removal and alteration which will require compensation or offsetting pursuant to the Federal Fisheries Act. Therefore, this criterion helps to differentiate between the alternatives.
	Potential to maintain or improve connections for aquatic species	Qualitative assessment of connections for movement of aquatic species within Lake and Credit River	Qualitative assessment based on professional judgement	Screened	Size and location of Project footprint follows existing breakwater thus, will not create a new barrier or facilitate the movement of aquatic species within the lake. Therefore, same for all alternatives
Socio- economic Environment	Area of open space or parkland created	Total area to be made available for recreation including trails and parkland.	GIS measurements	Used in Comparative Evaluation	Size of lakefill will determine opportunities for the provision of parkland and trails for recreation.

Environmental Component	Criteria	Indicator(s)	Approach to Assessment	Screened/Used in Comparative Evaluation	Rationale for Screening of Criteria
					Therefore, this criterion helps to differentiate between the alternatives.
	Potential for changes to use of waterfront for recreation	Potential for use of area for new activities such as fishing, birding etc. Compatibility of recreational activities with boating and marina business activities.	Qualitative assessment based on professional judgement. Comparison with existing conditions.	Screened	All the alternatives provide greater area for recreational uses but do not change the recreational activities undertaken at the waterfront. Recreational activities will remain compatible with boating and marina business activities. Therefore, same for all alternatives.
		Changes to navigable area because of Project implementation.	Qualitative assessment based on professional judgement	Screened	The enlarged breakwater will be a navigational constraint for all alternatives. Therefore, same for all alternatives.
	Disruption to use and enjoyment of property during construction and establishment	Effects of construction (noise, dust, traffic, site visibility) at residential properties, community facilities, institutions and businesses.	Qualitative assessment based on professional judgement	Used in Comparative Evaluation	Size of lakefill will determine duration of construction and therefore duration of construction related nuisance effects. Size of lakefill will determine site visibility. Therefore, this criterion helps to differentiate between the alternatives.
		Effects of lakefill establishment (air quality, noise, dust, traffic, site visibility) at residential properties, community facilities, institutions and businesses.	Qualitative assessment based on professional judgement	Used for comparative evaluation	Each of the alternatives except the “do nothing” require the 2-acre existing lot at 1 Port Street East to be developed which is the only area with potential for development of marina businesses. Size of lakefill, parking and boat slips available for use will determine effects of marina operations.
	Changes in community character	Effects of lakefill establishment on the unique character of Port Credit and its marina	Qualitative assessment based on professional judgement	Used for comparative evaluation	Each of the alternatives will “Keep the Port in Port Credit” and in Mississauga. Each of the alternatives except the “do nothing” require the 2-acre existing lot at 1 Port Street to be developed which is the only area with

Environmental Component	Criteria	Indicator(s)	Approach to Assessment	Screened/Used in Comparative Evaluation	Rationale for Screening of Criteria
		functions along the waterfront.			<p>potential for development of marina businesses.</p> <p>Size of lakefill will determine opportunities for the provision of parking and boat slips, parkland and trails for recreation.</p> <p>Size of lakefill will determine site visibility and effects on community character.</p> <p>Therefore, this criterion helps to differentiate between the alternatives.</p>
	Effects on non-marina business operations during construction and establishment	Adverse effects on non-marina business operations from increased noise, dust, traffic and site visibility) to business operations during construction and establishment	Qualitative assessment based on professional judgement	<p>Evaluated for construction phase.</p> <p>Screened for establishment phase.</p>	<p>Size of lakefill will determine duration of construction and therefore duration of construction related effects.</p> <p>Effects during establishment phase are similar for each alternative.</p>
Cultural Environment	Potential for disturbance or destruction of marine and land-based archaeological resources; displacement of built heritage resources and/or cultural heritage landscapes by demolition and/or removal and disruption of resources by the introduction of physical, visual, audible or	Direct or indirect impacts to built heritage resources and cultural heritage landscapes within the study areas	Presence of known (previously recognized) and potential cultural heritage landscapes within the study areas.	Screened	<p>A screening undertaken using the checklist for non-specialists and the Ministry of Citizenship and Multiculturalism (formerly the Ministry of Tourism, Culture and Sport) criteria for evaluating potential for built heritage resources and cultural landscapes indicated that there are no cultural heritage resources present in the Project footprint nor in close proximity to be affected by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the character of a marina and that of Port Credit. Cultural heritage resources in the Local Study Area are potentially affected the same by all alternatives.</p>

Environmental Component	Criteria	Indicator(s)	Approach to Assessment	Screened/Used in Comparative Evaluation	Rationale for Screening of Criteria
	atmospheric elements that are not in keeping with the character and setting of the cultural heritage resource.				
	Potential disturbance or destruction of marine or land-based archaeological resources	Archaeological resources within the study areas.	Presence of archaeological resources in the Project footprint	Screened	Baseline studies indicated that there are no archaeological resources present in the Project footprint. There is no potential for the disturbance or destruction of marine or land-based archaeological resources in the Local Study Area as no physical works or activities are required beyond the Project site. There are no temporary staging areas proposed. Therefore, same for all alternatives.
	Potential for effect from construction and operations on traditional uses of lands by Indigenous communities.	On-going traditional uses of lands within 1PSEPM Project Study Area	Qualitative assessment based on professional judgement	Screened	With mitigation, 1PSEPM Project construction will create nuisance effects similar for all alternatives. Establishment of the Project might improve the ability of Indigenous communities to access areas that were previously private use only. Therefore, same for all alternatives.
Cost	Potential to phase implementation of land creation and park development	Ease of construction	Professional judgement	Screened	The same construction techniques will be used for all alternatives.
	Capital Cost	Estimated capital cost	General high level cost estimates	Used in Comparative Evaluation	Capital costs will vary depending on the size and complexity of the alternative. Therefore, this criterion helps to differentiate between the alternatives.

Environmental Component	Criteria	Indicator(s)	Approach to Assessment	Screened/Used in Comparative Evaluation	Rationale for Screening of Criteria
	Sustainability of active and informal parkland	Qualitative assessment of maintenance and repair requirements of “park” space	Professional judgement	Used in Comparative Evaluation	Type of maintenance and repair activities would be similar for all alternatives, but costs for maintenance and repairs would depend on size of the lakefill. Therefore, this criterion helps to differentiate between the alternatives.
	Cost of management and soil contamination	Total cost associated with remediation / risk management	Professional Judgement	Screened	The management of contaminated soil would be similar for all alternatives. Therefore, the same for all alternatives.

The 1PSEPM Project is about expanding the land base around the eastern breakwater to provide continued marina function and services at this site, as well as create opportunities for public access to the waterfront, new parkland, and enhancements to the site's ecological functions. The evaluation of 'Alternative Methods' was structured to assess the ability of each alternative to achieve this purpose. The purpose of the effects assessment is to measure the benefits and effects between alternatives.

Once the effects assessment was completed, the alternatives were ranked first, second, third and fourth. In general, this was done by looking at the differences between the alternatives vis-à-vis the confidence level of the assessment methods. If the differences were very small the alternatives were rated the same; only major differences are reflected in the ratings.

5.1.4. STEP 4 – CONFIRM, REFINE THE UNDERTAKING AND COMPLETE THE DETAILED ASSESSMENT OF PREFERRED ALTERNATIVE

Following the comparative evaluation and the selection of the preferred alternative, the final step in the assessment is to confirm and refine the undertaking for the purposes of the detailed assessment. The detailed assessment will examine how the preferred alternative meets the purpose of the undertaking; it describes the net environmental effects; how it minimizes adverse effects and/or maximizes positive effects; and summarizes its advantages and disadvantages, according to the following components of the environment (and Project costs), namely:

- Physical Environment;
- Atmospheric Environment;
- Biological Environment;
- Socio-economic Environment;
- Cultural Environment (including Interests of Indigenous Communities); and
- Cost.

5.2. COMPARATIVE EVALUATION OF LAKEFILL FOOTPRINT ALTERNATIVES

The comparative evaluation combined the information presented by indicator to reflect a preference by criterion and then combined the information presented by criterion to reflect a preference for each environmental component. Finally, the preferences by component were combined to present the preferred alternative, in effect rolling up the detailed information into a decision. Trade-offs between alternatives are identified and discussed in the following sections with the intent of providing the reader with a traceable decision-making process.

Table 5.3 summarizes the evaluation of the alternatives for each environmental component.

Table 5.2: Comparative Evaluation of Alternative Methods (i.e., Lakefill Footprints)

Environmental Component	Criteria	Indicator(s)	Do Nothing Alternative	Smallest Lakefill Footprint	Medium Lakefill Footprint	Largest Lakefill Footprint
Physical Environment	Effects on surface water quality in the Local Study Area	Changes to surface water quality from placement of fill (turbidity, etc.) and spills associated with construction equipment	No change to surface water quality as there are no construction activities	Surface water quality will potentially be affected locally by turbidity from the placement of fill for the shortest duration of construction. Turbidity will tend to disperse less widely in nearshore areas without any mitigation. Mitigative measures will reduce any impacts to surface water quality to negligible levels.	Surface water quality will potentially be affected locally by turbidity from the placement of fill for a moderate duration of construction. Turbidity will tend to disperse less widely in nearshore areas without any mitigation. Mitigative measures will reduce any impacts to surface water quality to negligible levels.	Surface water quality will potentially be affected locally by turbidity from the placement of fill for the longest duration of construction. While construction is occurring near the shore, turbidity will tend to disperse less widely in nearshore areas without any mitigation. When construction is occurring further out into Lake Ontario, turbidity will be dispersed widely in deeper sections of Lake Ontario without any mitigation. Mitigative measures will reduce any impacts to surface water quality to negligible levels.
Physical Environment Summary			First Ranked	Second Ranked	Second Ranked	Second Ranked
Biological Environment	Area and quality of terrestrial habitat	Total area of terrestrial habitat created, enhanced, disrupted or lost	No terrestrial habitat created, enhanced, disrupted or lost.	Smallest area (500 m ²) available for potential habitat creation or enhancement. Potential for expansion of habitat for Common Terns (only Species at Risk in vicinity of Project)	Moderate area (4590 m ²) available for potential habitat creation or enhancement Potential for expansion of habitat for Common Terns (only Species at Risk in vicinity of Project)	Largest area (18,000 m ²) available for potential habitat creation or enhancement. Potential for expansion of habitat for Common Terns (only Species at Risk in vicinity of Project)

Environmental Component	Criteria	Indicator(s)	Do Nothing Alternative	Smallest Lakefill Footprint	Medium Lakefill Footprint	Largest Lakefill Footprint
		Qualitative assessment of improvement to terrestrial habitat for enhancement of migratory bird habitat and habitat connectivity.	No potential for improvements.	Enhancement of habitat connectivity is least due to area and the very nearshore location.	Enhancement of habitat connectivity is moderate due to area.	Enhancement of habitat connectivity is greatest due to largest area and location furthest into Lake Ontario.
	Area and quality of aquatic habitat	Total area and types of aquatic habitat disrupted or removed	No aquatic habitat disrupted or removed.	Smallest area (approx. 6,300 m ²) of habitat removed. Habitat with relatively higher productivity potential removed (shallow - 1-3m -depth sand dominated and cobble habitat).	Moderate area (11,000 m ²) of habitat removed. Habitat with relatively higher productivity potential removed as in Alternative 1 with additional (approx. 4,700 m ²) nearshore habitat (= / > 3 - 5m depth) with similar substrate distribution removed.	Largest area of habitat (29,600 m ²) removed. Habitat with relatively higher productivity potential removed as in Alternatives 1 and 2 with additional (approx. 18,600 m ²) nearshore habitat (5m -8m depth) with similar substrate distribution removed.
		Amount to self-compensation with respect to fish habitat (i.e., Opportunity to incorporate fish habitat creation and enhancement opportunities into design)	None	Smallest perimeter and shallowest depths affected, therefore least opportunity for beneficial habitat to be incorporated into design. However, opportunity for on-site compensation within part of waterlot not used for lakefill.	Moderate perimeter and medium depths affected, therefore medium opportunity for beneficial habitat to be incorporated into design. However, opportunity for on-site compensation within part of waterlot not used for lakefill.	Largest perimeter and deepest depths affected, therefore greatest opportunity for beneficial habitat to be incorporated into design. However, limited opportunity for on-site compensation thus off-site compensation will likely be required.

Environmental Component	Criteria	Indicator(s)	Do Nothing Alternative	Smallest Lakefill Footprint	Medium Lakefill Footprint	Largest Lakefill Footprint
Biological Environment Summary			Fourth Rank No potential to enhance aquatic and terrestrial habitat	Third Rank Highest potential to enhance aquatic habitat on site. Limited potential to enhance terrestrial habitat	Second Rank Potential to enhance aquatic habitat on site. Moderate potential to enhance terrestrial habitat.	First Rank Potential to enhance aquatic habitat however, largest area of aquatic habitat removed and off-site compensation may be required. Greatest potential to enhance terrestrial habitat
Socio- economic Environment	Area of parkland created	Total area to be made available for recreation including trails and parkland.	Existing breakwater has no recreational value. No new area available for recreation.	Smallest new area (1,800 m ²) available for recreation including trails and parkland. Approximately 9% of land created will be available for park use providing limited opportunities to create quality park experiences.	Moderate new area (6,800 m ²) available for recreation including trails and parkland. Approximately 40% of land created will be available for park use providing moderate opportunities to create quality park experiences.	Largest new area (18,000 m ²) available for recreation including trails and greenspace. Approximately 52% of land created will be available for park use providing the greatest opportunity to create quality park experiences.
	Ability to accommodate marine facilities and services	Area available to accommodate marina facilities and services	None	Smallest area available and sufficient area for working marina facilities and ~200 slips. Smallest area with a limited number of slips provides for a low potential for a working marina’s business viability.	Moderate area available and sufficient area for working marina facilities and ~200 slips. Moderate area with a limited number of slips provides for a low potential for a working marina’s business viability.	Largest area available and sufficient area for working marina facilities and ~450 slips. Largest area with the largest number of slips provides for the greatest potential for a working marina’s business viability.

Environmental Component	Criteria	Indicator(s)	Do Nothing Alternative	Smallest Lakefill Footprint	Medium Lakefill Footprint	Largest Lakefill Footprint
	Disruption to use and enjoyment of property during construction and establishment	Effects of construction (noise, dust, traffic, site visibility) at residential properties (including live aboards), community facilities and institutions.	Nuisance effects from construction activities will not occur.	Nuisance effects (noise and dust) from construction activities will occur along roads and areas nearest the construction activities. Nuisance effects are mitigable and will occur for the shortest duration of construction. Visibility of construction activities will be limited within south Port Credit in the Local Study Area.	Nuisance effects (noise and dust) from construction activities will occur along roads and areas nearest the construction activities. Nuisance effects are mitigable and will occur for a moderate duration of construction. Visibility of construction activities will be limited within south Port Credit in the Local Study Area.	Nuisance effects (noise and dust) from construction activities will occur along roads and areas nearest the construction activities. Nuisance effects are mitigable and will occur for the longest duration of construction. Visibility of construction activities will be limited within south Port Credit in the Local Study Area.
		Effects of marina operations (air quality, noise, dust, traffic, site visibility) at residential properties, community facilities and institutions.	Nuisance effects from marina operations will not occur.	Effects from marina operations will be less than existing and limited within south Port Credit. New land base and associated uses will be visible from a small area of south Port Credit in the Local Study Area and along the shoreline.	Effects from marina operations will be less than existing and limited within south Port Credit. New land base and associated uses will be visible from a slightly larger relative area of south Port Credit in the Local Study Area and along the shoreline. Size of viewshed is not substantially different from the smallest lakefill footprint.	Effects from marina operations will be similar to existing and limited within south Port Credit in the Local Study Area. New land base and associated uses will be visible from largest relative area of south Port Credit and along the shoreline.

Environmental Component	Criteria	Indicator(s)	Do Nothing Alternative	Smallest Lakefill Footprint	Medium Lakefill Footprint	Largest Lakefill Footprint
	Changes in community character	Effects of marina operation on the unique character of Port Credit and its marina functions along the waterfront.	The “do nothing” alternative does not keep the port in Port Credit following CLC redevelopment of the wharf. Negative effect on community character as the marina may disappear as a result of changes to land use. Marina is considered part of community character.	The footprint offers the smallest opportunity to maintain marina functions, enhance recreational uses of the waterfront and connect the waterfront with the rest of the Local Study Area.	The footprint offers a moderate opportunity to maintain marina functions, enhance recreational uses of the waterfront and connect the waterfront with rest of the Local Study Area.	The footprint offers the best opportunity to maintain marina functions, enhance recreational uses of the waterfront and connect the waterfront with the rest of the Local Study Area
	Effects on non-marina related business operations during construction and establishment	Adverse effects on non-marina related business operations from increased noise, dust, traffic and site visibility) to business operations during construction and establishment	Nuisance effects from construction activities will not occur.	Nuisance effects will occur but are mitigable. They are most likely to occur along roads and areas nearest the construction activities for the shortest duration of construction.	Nuisance effects will occur but are mitigable. They are most likely to occur along roads and areas nearest the construction activities for a moderate duration of construction.	Nuisance effects will occur but are mitigable. They are most likely to occur along roads and areas nearest the construction activities for the longest duration of construction.

Environmental Component	Criteria	Indicator(s)	Do Nothing Alternative	Smallest Lakefill Footprint	Medium Lakefill Footprint	Largest Lakefill Footprint
Socio-economic Summary			Fourth Ranked No potential to provide marina or parkland	Third Ranked Provides for ~200 slips Least potential to provide parkland (~9 % of lakefill area) Nuisance effects are mitigable and will occur for shortest duration	Second Ranked Provides for ~200 slips Moderate potential to provide parkland (~40% of lakefill area) Nuisance effects are mitigable and will occur for moderate duration	First Ranked Provides for ~450 slips Greatest potential to provide parkland (~52% of lakefill area) Nuisance effects are mitigable and will occur for longest duration
Cost	Capital Cost of lakefill and land creation	Estimated capital cost of lakefill and land creation (i.e., high level cost estimates for only lakefill and creation of new land for park.	No cost	Low capital cost. ~10% of capital costs relate to land for park.	Moderate capital cost. ~40% of capital costs relate to land for park.	High capital cost. ~53% of capital costs relate to land for park.
	Sustainability of active and informal parkland	Qualitative assessment of maintenance and repair requirements of “park” space	Cost of maintenance and repair of safety hazards.	Low maintenance and repair cost due to small size of lakefill and parkland.	Moderate maintenance and repair cost due to moderate size of lakefill and parkland.	High maintenance and repair cost due to largest size of lakefill and parkland.
Cost Summary			First Ranked	Second Ranked	Third Ranked	Fourth Ranked

Table 5.3: Alternative Methods Evaluation Summary

Environmental Component	Do Nothing Alternative	Small Lakefill Footprint	Medium Lakefill Footprint	Large Lakefill Footprint
Physical Environment Summary	First Rank	Second Rank Similar effects for all alternatives	Second Rank Similar effects for all alternatives	Second Rank Similar effects for all alternatives
Biological Environment Summary	Fourth Rank No potential to enhance aquatic and terrestrial habitat	Third Rank Least potential to enhance aquatic habitat on site and minimizing need for off-site fisheries offsets. Limited potential to enhance terrestrial habitat.	Second Rank Moderate potential to enhance aquatic habitat on site and minimizing need for off-site fisheries offsets. Moderate potential to enhance terrestrial habitat	First Rank Greatest potential to enhance aquatic habitat on site, however largest area of aquatic habitat removed and off-site offsets may be required. Greatest potential to enhance terrestrial habitat
Socio-economic Summary	Fourth Rank No potential to provide marina or parkland.	Third Rank Provides for ~ 200 slips. Least potential to provide parkland ~9 % of lakefill area. Nuisance effects are mitigable and will occur for shortest duration.	Second Rank Provides for ~200 slips. Moderate potential to provide parkland ~40 % of lakefill area. Nuisance effects are mitigable and will occur for moderate duration.	First Rank Provides for ~450 slips. Greatest potential to provide parkland ~52% of lakefill area. Nuisance effects are mitigable and will occur for longest duration.
Cost Summary	First Rank No capital cost but no marina or parkland created. Costs for maintenance and repair would be incurred for safety hazards.	Second Rank Low capital costs for land creation with space for a marina and very small parkland ~10% created	Third Rank Moderate capital costs for land creation but similar size marina to the smallest footprint and moderate parkland created	Fourth Rank Highest capital costs for land creation, largest marina, and largest area of parkland created

The overall conclusions of the comparative evaluation of lakefill footprint alternatives, and their advantages and disadvantages are:

- The **Do-Nothing** alternative is most preferred for cost, and effects to the physical environment while least preferred for the biological and socio-economic environment as there is no potential to enhance aquatic and terrestrial ecology and no new marina nor parkland. Overall, the Do-Nothing alternative was the fourth ranked alternative.
- **Alternative 1 - Small Lakefill Footprint** provides the lowest number of slips and smallest area of new parkland. It has few opportunities to create terrestrial or aquatic habitat enhancements. However, construction and the nuisance and other potential effects (e.g., turbidity) from construction activities will be for the shortest duration. Nonetheless, most construction associated effects are mitigable. Overall, the Small Lakefill Footprint alternative was the third ranked alternative.
- **Alternative 2 - Medium Lakefill Footprint** provides the lowest number of slips (equal to the Small Lakefill Footprint alternative) and moderate opportunity for the creation of new parkland. It also provides a moderate opportunity to create terrestrial and aquatic habitat enhancements. Nuisance and other potential effects (e.g., turbidity) from construction activities will be for a moderate duration and are mitigable. Overall, the Medium Lakefill Footprint alternative was the second ranked alternative.
- **Alternative 3 - Large Lakefill Footprint** provides the opportunity to create the largest area of parkland relative to the marina space required for parking, boat storage and marina facilities. It also provides for a similar sized marina to what exists today (greatest number of slips). With a larger footprint, perimeter, and location jetting into deeper waters in Lake Ontario this alternative has the greatest potential to enhance aquatic habitat, however, represents the largest area of existing aquatic habitat removed/altered and off-site compensation may be required. Baseline studies indicate that existing fish habitat that would be lost is not limiting in Lake Ontario, and new habitat created has the potential to be greater quality than what would be lost. With a large land base, this alternative offers the most potential to enhance terrestrial habitat over what exists now. Conversely, as the largest footprint alternative, it also has the highest cost and will take the longest to construct resulting in nuisance and other potential (e.g., turbidity) effects for the longest period. However, the effects from construction are not permanent nor irreversible. Effects from construction are mitigable using standard mitigation and best management practices that have been proven to be effective, while the lakefill area and its benefits will exist for the long-term. Overall, the Large Lakefill Footprint alternative was the **first ranked** alternative, and therefore the preferred alternative.

The large lakefill footprint alternative will now be subject to **Step 4** of the evaluation process. This step involves the confirmation of the preferred alternative (see below) and refining the undertaking for the purposes of the detailed assessment (Chapter 6). The detailed assessment is provided in Chapter 7. It examines how the preferred alternative meets the purpose of the undertaking; it describes the net environmental effects taking into consideration the implementation of mitigation measures; how it minimizes adverse effects and/or maximizes positive effects; and summarizes its advantages and disadvantages, according to the following components of the environment (and Project costs), namely:

- Physical Environment
- Atmospheric Environment
- Biological Environment
- Socio-economic Environment
- Cultural Environment (including Interests of Indigenous communities)
- Cost

5.3. CONFIRMATION WITH PUBLIC AND STAKEHOLDERS

The evaluation of the alternatives and the selection of the Large Footprint as the preferred alternative was presented to the public and stakeholders at two Public Information Centers (PICs) to gain their feedback. Chapter 8 provides a summary of these PICs. In general, respondents to on-line surveys available during the virtual PICs and during an in-person pop-up event confirmed that the evaluation of alternatives and the selection of the Large Lakefill Footprint as the preferred alternative was appropriate. Most respondents expressed satisfaction with the evaluation by indicating that:

- The evaluation did not miss any environmental effects from the construction in assessing the preferred large lakefill footprint alternative (82.3%);
- The evaluation did not miss any environmental effects from establishment (operation once construction is completed) in assessing the preferred large lakefill footprint alternative (83.8%)

When asked if they had any questions for the Project team about this 1PSEPM Project or the preferred large lakefill footprint alternative, only three (3) of the 130 responses could be considered as an expression of opposition to the City's selection. Rather, most of the questions asked of the City were regarding detailed design aspects of the marina and its operation. Most responses were in support of the City's selection of the Large Lakefill Footprint alternative.

The 1PSEPM Project is about expanding the land base around the eastern breakwater to provide continued marina function and services at this site, as well as create opportunities for public access to the waterfront, new parkland, and enhancements to the site's ecological functions. With this understanding, most of the comments received were focused on the marina design and operations rather than on the nature of the land base.

All comments and questions received through the online surveys were reviewed by the 1PSEPM Project team to assist in the refinement and description of the undertaking (i.e., the 1PSEPM Project). Matters related to specific marina operations were provided to the City's Community Services Department for consideration during detailed marina design, park planning, and operation.

6. DESCRIPTION OF THE PREFERRED ALTERNATIVE

This chapter describes the conceptual design of the 1PSEPM Project preferred alternative, construction techniques to build the preferred alternative, and the proposed phasing plan for construction.

6.1. OVERVIEW OF THE CONCEPTUAL DESIGN

The conceptual design for the 1PSEPM Project is a lakefill expansion to the existing breakwater. It includes the following components:

- Shoreline configuration and protection features;
- Naturalization; and
- Conceptual recreational features and amenities.

The various components are described in their built-out state in the following sections. The conceptual design of the 1PSEPM Project is presented on **Figure 6.1**.

6.2. SHORELINE CONFIGURATION AND PROTECTION FEATURES

The 1PSEPM Project preferred alternative requires approximately 240,000 m³ of fill material. The shoreline protection features of the 1PSEPM conceptual design consists of an armour stone revetment. The south end includes an island breakwater structure, also protected with an armour stone revetment, which will shelter an aquatic habitat area. The island breakwater structure will have a lower crest elevation than the main breakwater and has the main function of reducing the effect of open lake waves on the aquatic habitat area. The island breakwater will be separated from the main lakefill structure over the full range of water levels and will not allow for public access.

The following subsections describe the conceptual details of these shoreline protection features based on a preliminary assessment of coastal conditions. **Figure 6.2** shows a site plan overview of the preferred alternative's lakefill configuration. Typical cross sections A and B, which are described below, are shown on **Figure 6.3**.

Figure 6.1: 1PSEPM Project Preferred Alternative



Figure 6.2: 1PSEPM Project Preferred Alternative Lakefill Configuration

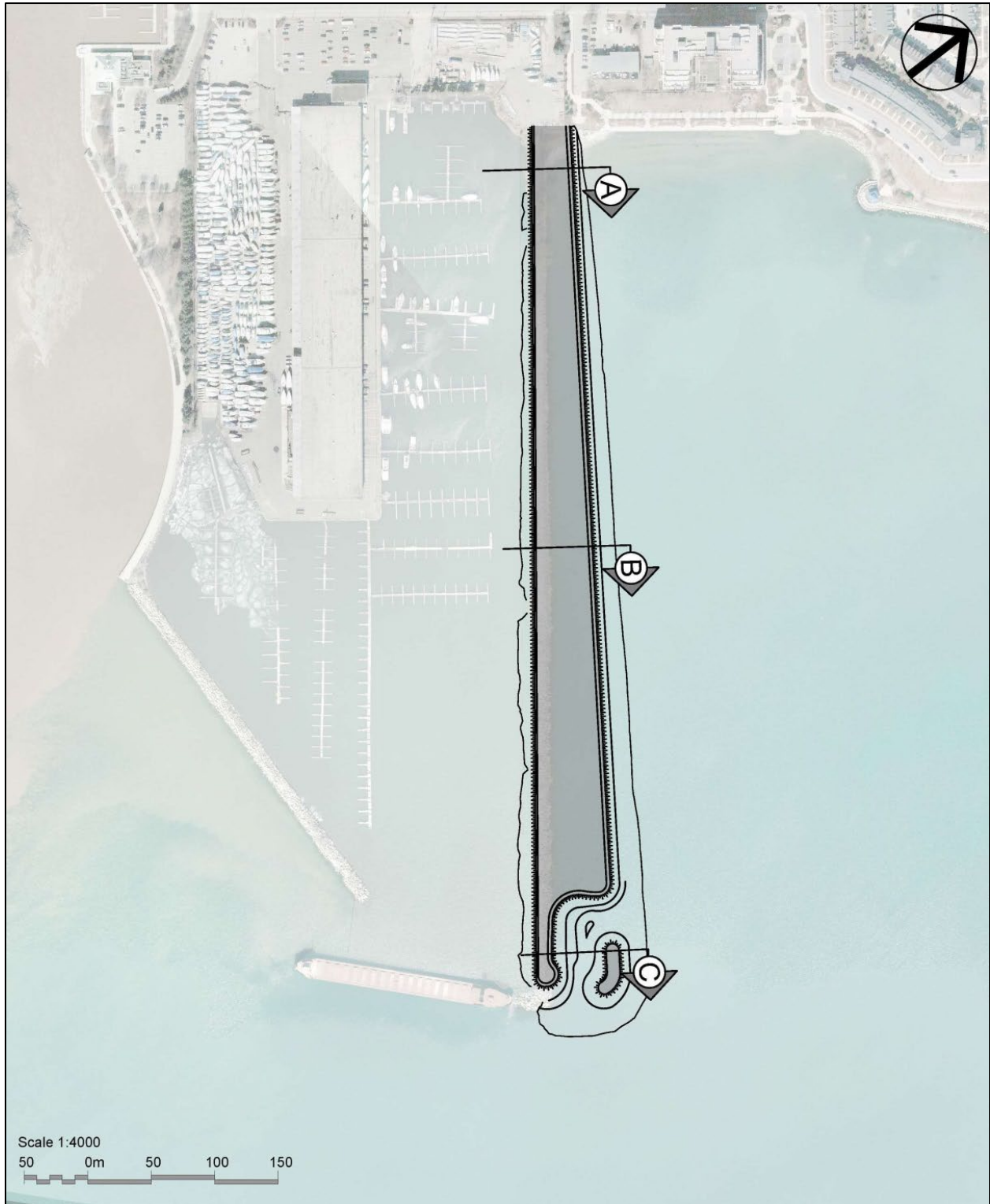
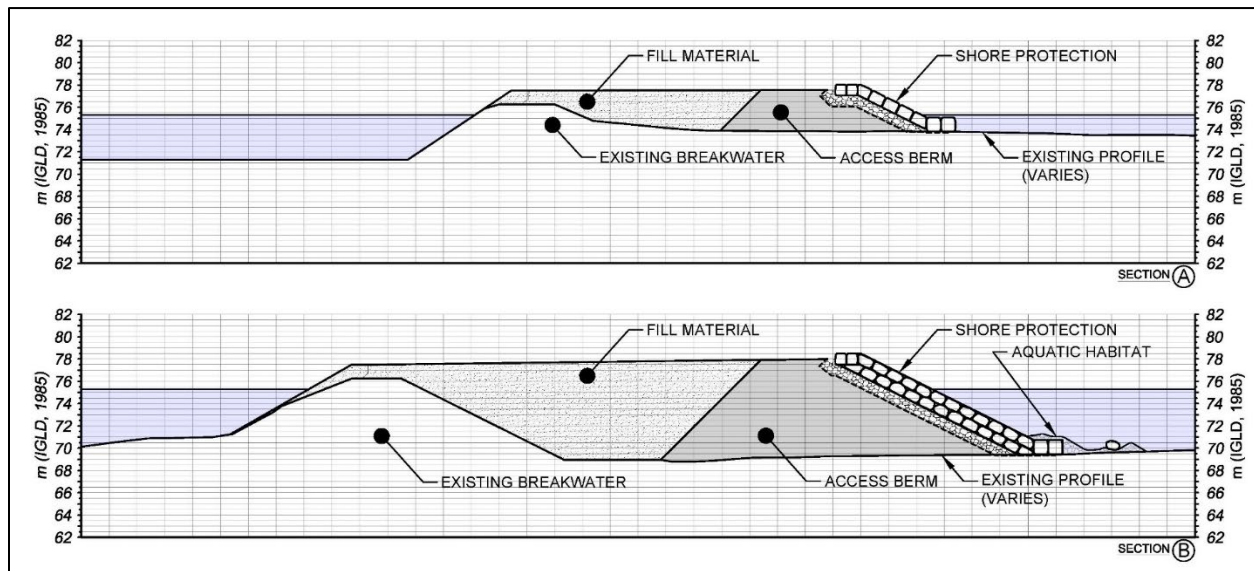


Figure 6.3: Armour Stone Revetment Typical Cross-Sections



6.2.1. ARMOUR STONE REVETMENTS

Armour stone revetments are a common type of shoreline protection structure on the Great Lakes. A revetment is a sloping structure consisting of outer layer(s) of primary armour stone protection and sub-layer(s) of secondary armour stone and/or rip rap. The description provided below is based on a conceptual design appropriate for an Environmental Assessment. Detailed design of the Project will confirm and refine design elements described herein.

The slope of the revetment can vary but 2H:1V is the most common and is the proposed slope for most of the 1PSEPM Project preferred alternative, except for certain areas on the south side of the structure where slopes are reduced to approximately 3H:1V. These slopes generally provide suitable stability for the underlying soil or fill material and can be partially built within the reach of shore-based equipment. Parts of the construction of the lakefill and protection structure and the delivery of material may be undertaken over water with the use of a barge.

The lake bottom elevation around the toe of the structure varies between approximately 75.0 m near the interface with the mainland, and approximately 66.0 m at the lakeward most point of the structure. This means under design high water levels, the depth at the toe of the revetment will vary between approximately 1.0 and 10.0 m. Typical average summer water levels will vary between 75.1 m and 74.8 m.

The crest of the revetment on the breakwater will vary between approximately 78.0 m and 79.0 m. The cap stone crest is set approximately 0.5 m above the top of the fill and core material behind the protection structure. Crest armour stones will be placed horizontally across the top of the slope to widen the structure crest. These stones will be selected and placed such that gaps or crevices between the stones will be minimized. The structure was conceptually designed to minimize wave overtopping, though some overtopping will occur under 1:100-year design conditions, as described in 3.1.5. Significant wave spray will also be generated and carried across the structure. The toe of the revetment will be embedded in the lakebed after being cleared of any loose sediment or soft material. The toe will likely consist of one or two stones placed horizontally on the lakebed in front of the revetment slope. Typical section of the proposed revetment along the east side of the lakefill is presented on Figure 6.3.

The revetment is expected to consist of two typical sections. The first approximately 40 m of revetment, starting at the shore, is expected to be a single layer of specially placed armour stone, backed by a layer of rip rap, and finally a layer of geotextile. Special placement noted here describes armour stone placed tightly in a single layer to produce uniform, smooth and stable surface. The armour layer will be approximately 1.0 m thick, and the rip rap layer will be approximately 0.9 m thick. The primary armour layer stones are expected to be in the order of 3 to 5 tonnes each. Section A on Figure 6.3 shows a typical concept level cross-section through the single armour layer portion of the revetment.

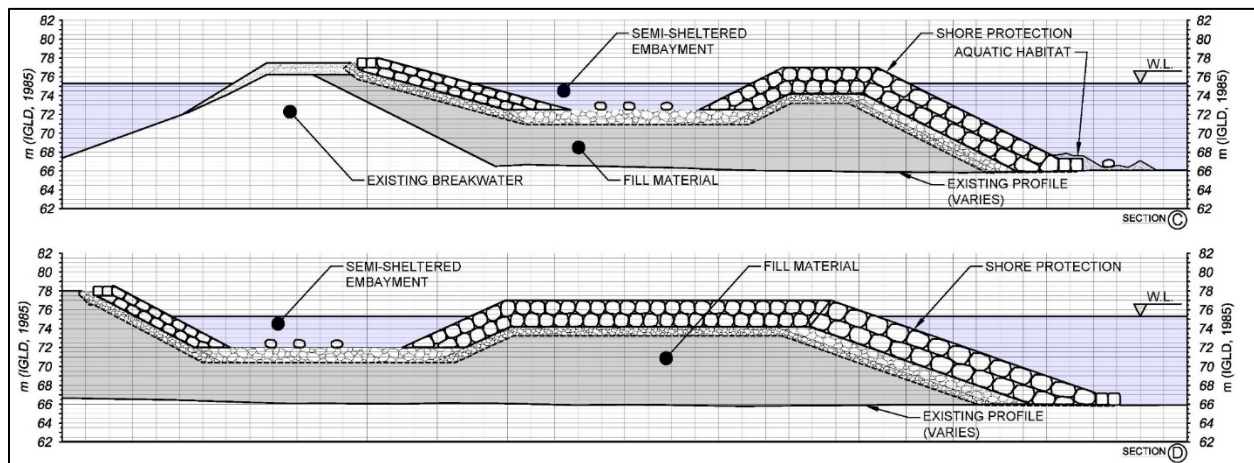
The rest of the revetment slopes will be protected by a double layer of randomly placed primary armour stone, a layer of secondary armour stone, and a layer of rip rap underlain by geotextile. The primary layer of armour stone is expected to vary between 1.8 m to 3.4 m thick, the secondary layer between 0.8 m to 1.2 m thick, and the rip rap between 0.6 m to 0.9 m thick. The primary and secondary armour stones are expected to vary in the order of 2 tonnes to 10 tonnes and 0.4 tonnes to 1.2 tonnes, respectively. The stone sizes will increase with distance from the shore, consistent with the increase in wave design height further offshore. Section B on Figure 6.3 shows a typical concept level cross-section through the double armour layer portion of the revetment.

As noted above, the placement of the stones will consist of “special placement” in the first segment of the breakwater closest to land, then transition to “random” placement moving lakeward. Random placement means each stone is placed individually and keyed in so that it touches adjacent stones on at least three sides, while special placement refers to stones individually placed and keyed very tightly so that they touch adjacent stones on all four sides. Random placement of armour stone can proceed at a faster pace than special placement, thus reducing the cost per tonne placed, though will increase the tonnage of stone placed because randomly placed armour stone generally required two layers of stone whereas special placement consists of one layer. Randomly placed structures are generally less susceptible to sudden failure than a single layer “special placement” revetment. The crevices between randomly placed stones tend to be larger than between special placement stones. This generally reduces wave uprush when compared to a specially placed structure. The details of the structures will be refined in the detailed design phase and the most appropriate design will be implemented.

6.2.2. AQUATIC HABITAT

The 1PSEPM Project preferred alternative will remove some existing aquatic habitat on the lake bottom and will provide enhanced fish habitat areas at the south part of the preferred alternative. The south end of the preferred alternative includes an embayment area protected with an island breakwater to provide improved semi-sheltered aquatic habitat. The exposed side of the island breakwater will be protected with a double layer armour stone breakwater. Smaller stone material will line the sheltered interior of the island breakwater. The base of the channel between the island and the main lakefill will be lined with boulder and cobble sized stones to provide suitable substrate for aquatic habitat by various fish species and their life stages. A conceptual plan of this area is illustrated on **Figure 6.4**. Section C on **Figure 6.4** shows a typical concept level cross-section through the island breakwater, habitat embayment, and revetment. This embayment includes approximately 2,400 sq. meter of greater quality aquatic habitat.

Figure 6.4: Armour Stone Revetment and Aquatic Habitat Typical Cross-Sections



The shore of the main lakefill along the north side of the embayment is proposed to have a crest elevation of approximately 78.0 m with side slopes of approximately 2H:1V or flatter. The slopes will extend down to meet the boulder and cobble substrate at the bottom of the fish habitat area. The bed elevation of the boulder and cobble substrate is proposed to vary in elevation between 72.5 m and 73.0 m at the “entrances”, and down to an elevation of 70.0 m in the center of the fish habitat area. The higher elevations at the entrances will help to reduce the severity of waves that enter the area and the depth variance throughout the area will increase the habitat diversity.

Structural aquatic habitat features may be incorporated along the toe of the revetment. Large cobble or boulder sized material would be needed to resist currents generated during storms. Smaller material is expected to be unstable during major storms. A typical conceptual plan of aquatic habitat along the toe of the revetment is shown on **Figure 6.5**.

Aquatic habitat in Lake Ontario consists of the areas of the lake bottom below the elevation of 75.32 m IGLD85. This elevation was established by the Department of Fisheries and Ocean (DFO, 2004). Aquatic habitat is further subdivided into distinct depth zones based on depth below elevation 75.32 m. The zones are 0 m to 2 m, 2 m to 5 m, 5 m to 10 m, and greater than 10 m. The total area affected by the implementation of the preferred alternative is approximately 13,000 m² of aquatic habitat modified and 29,000 m² of aquatic habitat lost.

Table 6.1 below shows the areas of aquatic habitat modified and lost in the four depth zones affected by the preferred alternative. As noted above the proposed embayment includes approximately 2,400 sq. meter of high-quality aquatic habitat versus the generally lower quality habitat that currently exists.

Table 6.1: Aquatic Habitat Areas Modified and Lost

Aquatic Habitat Depth Zone	Aquatic Habitat Modified	Aquatic Habitat Lost
0 m to 2 m	100 m ²	4,100 m ²
2 m to 5 m	1,000 m ²	8,100 m ²
5 m to 10 m	11,900 m ²	16,900 m ²
greater than 10 m	0 m ²	0 m ²
Total	13,000 m²	29,100 m²

Discussions held with MCFN indicate that while they acknowledge that the habitat to be created on the south edge of the east breakwall (i.e., composed of an embayment refuge area of approximately 2400m²) will provide improved habitat functions for many fish species in the area, the amount of aquatic habitat modified and lost is considered by MCFN to be substantial, regardless of its quality at present. The amount of habitat to be created by the embayment is not sufficient to offset the amount of habitat modified or lost and off-site compensation will be explored.

As indicated in Section 6.6, the City recognizes that as part of the *Fisheries Act* Authorization, the City will need to provide appropriate habitat offsets to counterbalance the aquatic habitat removed due to the Project and that this will entail investments in the creation and/or enhancement of fish habitat off-site. During the detailed design stage and in seeking the *Fisheries Act* Authorization from DFO, the City will consult and work collaboratively with MCFN, DFO and others to address the habitat deficit created by the 1PSEPM Project.

6.2.3. RECREATIONAL SPACES AND MARINA

The conceptual design illustrates the intended parkland and trails that are proposed to be built on top of the expanded breakwater. Approximately 18,000 m² (1.8 ha) of parkland will be created from this intended design. Recreational trails and walkways will be developed with the appropriate resources and practices to preserve water quality. Additionally, design of trails will ensure the safety of park users and the sustainability of the surrounding vegetation. A plan of the recreational spaces and marina is presented on **Figure 6.6**.

Figure 6.5: Aquatic Habitat and Breakwater

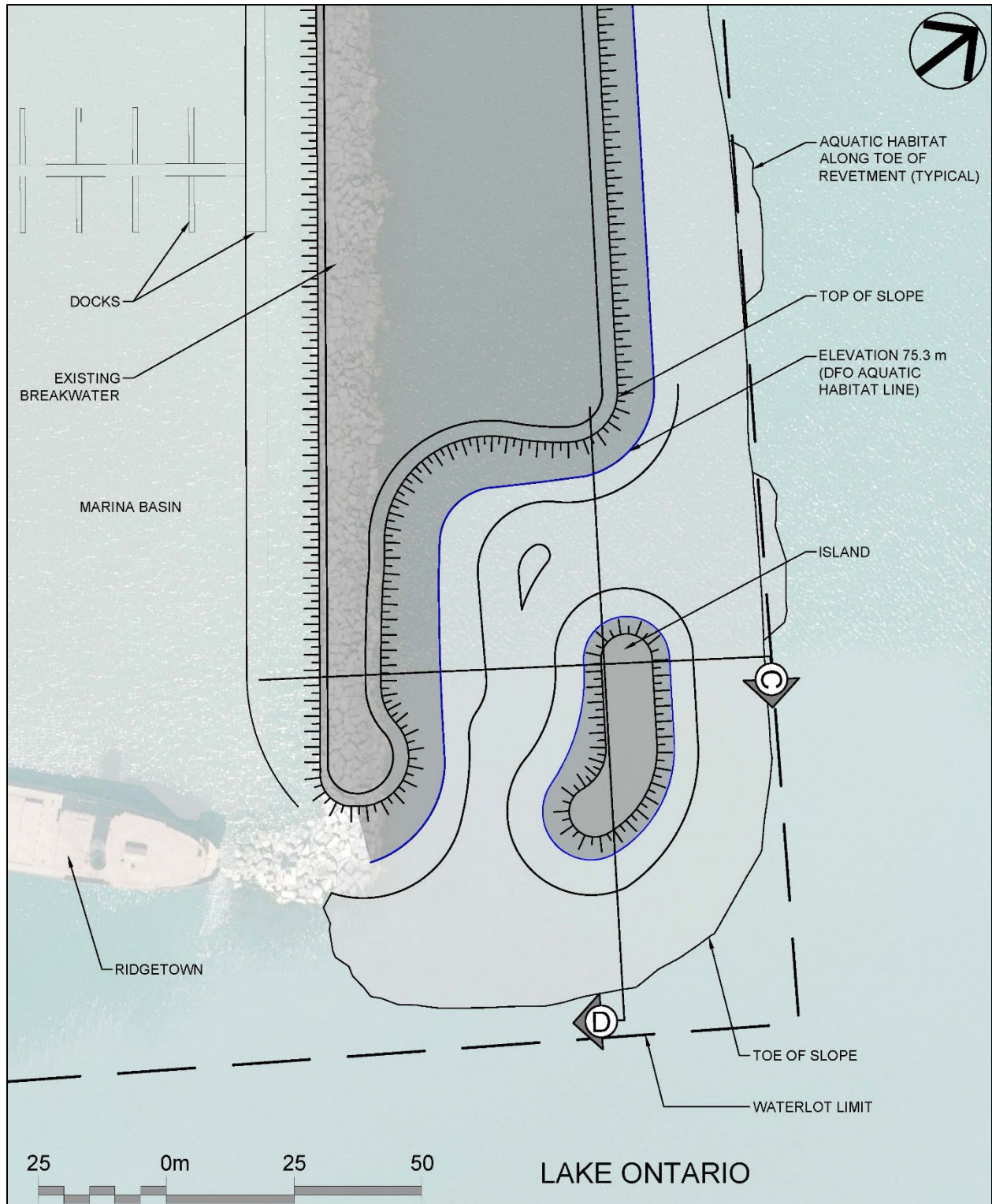


Figure 6.6: Recreational Spaces and Marina



There are primary trail and walkway systems that generally follow the edges of the breakwater and border sections of passive park space. The trail system will meet the appropriate trail standards for the City of Mississauga. The trails and walkways are proposed to connect to the Waterfront Trail in St. Lawrence Park to the east. Trails and walkways will be constructed above Lake Ontario's 100-year flood level to minimize flooding, damage, and maintenance costs.

A walkway on the west side of the breakwater will accommodate boaters using the marina and will also be shared with the general public. A walkway on the east side provides an expanded tree-lined promenade overlooking the lake connecting to the end of the breakwater.

A floating main dock is proposed to be installed on the marina side of the existing breakwater. This dock will run along the length of the breakwater and will have floating docks extending out perpendicular to the main dock which will provide access to approximately 450 proposed boat berthing slips. The main floating dock will be connected to the mainland at the north end but there will also be intermittent access ramps spaced along its length that lead from the main floating dock to the west breakwater pathway. Naturalized plantings will be established along the top of the revetment between the access ramps. The layout of the marina docks will be finalized during detailed design. The layout does not impact the lakefill operations.

Marina services and facilities will be located on the 1 Port Street East existing land base site. This portion of site is approximately 2 acres and currently a parking lot. The City will determine during detailed design the nature and size of the structure to occupy this space. Once these plans are finalized, the City will pursue the necessary approvals for the construction of the building. Any businesses choosing to lease space in the marina building will be responsible for securing any required approvals which are separate from this EA document.

6.2.4. PARKING AREA

The landward half of the expanded breakwater is proposed to be designated as a summer parking area. Visitors would be able to park to access the marina or the nearby parkland at the end of the breakwater. The parking lot is proposed to have approximately 275 parking spaces. During the winter months, when the Marina is not being used and there is less foot traffic in the park area, the parking lot can be used as a boat storage area an important aspect of marina business operations. The use of the parking area for winter storage of boats is illustrated on **Figure 6.7**. A recreational trail is proposed to be installed on the eastern side of the parking lot running behind the crest of the shore protection to provide continuous pedestrian access from the mainland to the end of the breakwater.

Figure 6.7: Parking Area Used for Boat Storage



6.2.5. STORMWATER MANAGEMENT

The site will be graded so that stormwater, as well as wave overtopping water and wave spray, will be directed towards the marina basin via overland flow. A bioswale will be constructed along the edge of the marina basin to remove debris and pollution before the surface runoff enters the basin. The bioswale will accept and infiltrate the runoff from parking areas during the early stages of storm events, which is when deleterious substances, including hydrocarbons and sediments are washed from impervious surfaces. A perforated subdrain below the bioswale will collect the filtered water which will be conveyed to the adjacent marina basin via storm sewers and outfall structures.

6.3. MAINTENANCE ASSOCIATED WITH THE 1PSEPM PROJECT PREFERRED ALTERNATIVE

6.3.1. BREAKWATERS

Maintenance requirements for the expanded breakwater structures will be focused on the rehabilitation and repair of the structures over their design life. Maintenance of any structural protection is a fundamental requirement for long term functionality. Even structures designed to withstand 1:100-year design conditions will not last 100 years if they are not maintained.

For the first two years following construction and warranty period, the revetments require visual inspections by City staff and/or a professional engineer experienced in the assessment of marine structures. One inspection should take place in the fall when the water levels are approaching their annual low. A second inspection should take place in the spring to look for any damage associated with late fall, winter, and early spring storms. Assuming that no repair work is required within the first two-year period, the visual inspections can be subsequently carried out annually by a City staff and/or a professional engineer or technician experienced in the assessment of civil infrastructure. Those inspections should take place in the spring. Any problem areas should be referred to a professional engineer experienced in the assessment of marine structures, for a more detailed review.

Once the structures have a good stability record for at least five years, they may be inspected less frequently. A routine inspection interval of three to five years should be sufficient. A visual inspection should also be carried out following major storm events, irrespective of the routine inspection interval. For the purposes of this discussion, a major event may be defined as a storm that causes noticeable damage along other portions of Mississauga's Lake Ontario shoreline.

For newly constructed structures it is common practice to recommend that 0.5 to 1.0% of the construction budget be accrued annually to establish a maintenance fund for that structure. That fund is typically spent on an as-needed basis rather than at a constant annual rate. If the structure is properly built out of suitable material, there should be no need for routine maintenance work for several years. It is common for new structures to not require routine maintenance for a period of 15 to 20 years, or more. However, there is always a risk that design conditions could be exceeded in any given year, and the structure could be damaged, or armour stones deteriorate at unforeseen rate.

6.3.2. FACILITIES

Maintenance of the marina, park space, trails and parking lot will follow the City's maintenance practices.

6.4. SITE ACCESS ROUTE

Construction access to the site would be achieved by entering the marina area from Port Street East. This will also be the access point once construction is complete.

Construction materials, specifically the stone material required to build out the breakwater and construct the shore protection, will have to be brought in from outside the City of Mississauga. Typically, stone material is acquired from Quarries or pits located North and West of the City of Mississauga. At this point in time, it is assumed that roughly half of the fill and stone material will be delivered over land using trucks and the remainder will be delivered over water via barge.

Typically, trucks accessing the site will use the highways then arterial roads. It is noted that there is construction related traffic concerns in the Port Credit area. Therefore, during detailed design the City may choose to designate truck routes to manage construction traffic. Consideration for disruption of the immediate area around the routes due to heavy vehicular traffic as well as overall efficiency of travelling on city roads versus the highway will also be considered.

6.5. CONSTRUCTION PHASING

The construction of the 1PSEPM Project preferred alternative will occur in two distinct stages. Stage 1 is the land creation and protection by placing the breakwater fill material and armour stone revetment shoreline protection. Followed by Stage 2, which includes the construction of site, the marina and park construction.

6.5.1. STAGE 1 LAND CREATION

Construction of the expanded breakwater and the shoreline protection in Stage 1 is anticipated to occur over a period of approximately 14 months depending on fill availability, approvals, weather and in-water working periods. Upon receipt of all required approvals, construction access to the site will be established. Temporary construction access may include the installation of a mud mat, temporary granular base, perimeter fencing, silt barriers, etc. Clearing of vegetation, such as trees growing out of the existing breakwater, will be completed.

A staging area will be constructed at the site entrance near Elizabeth Street south of Port Street East including a site trailer, materials and equipment storage, as well as appropriate parking for site workers.

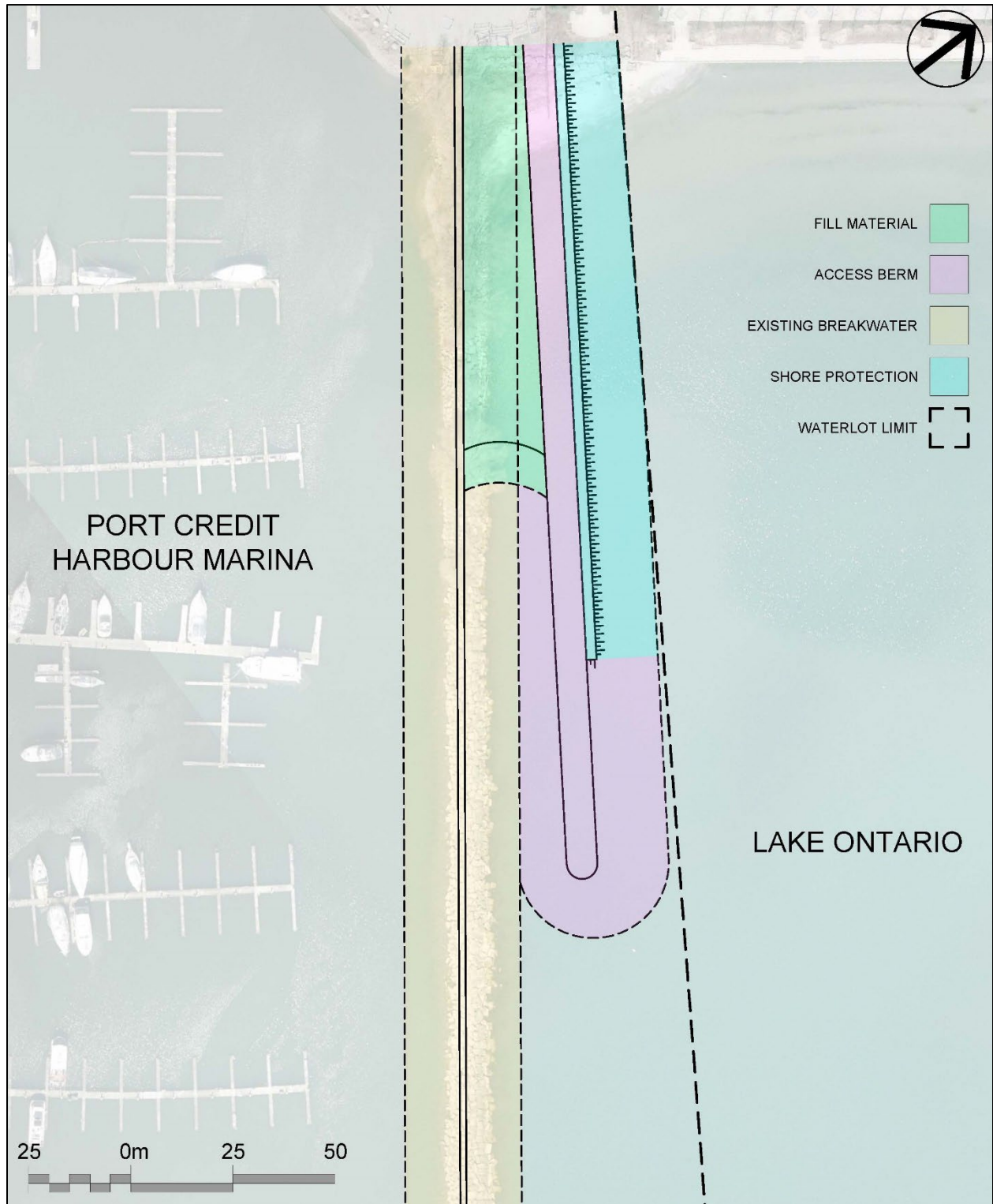
The lakefill process will begin with the construction of an access berm that construction equipment will use to access the rest of the site. Once a sufficient length of the access berm has been created, construction of the shore protection will begin, lagging just behind the construction of the access berm. Material will be delivered to site by water using barges, or over land by trucks. Trucks can drive onto the access berm to deliver stone and clean fill material directly to the area being constructed and are expected to be the primary delivery mode in the early stages. Delivery of clean fill and stone materials by barge will become more significant as the construction proceeds further offshore into deeper water. Armour stone from the existing breakwater will be salvaged to the extent that is economically viable. The salvage operation will lag behind the berm and protection construction so that there is no loss of protection to the existing breakwater. A schematic of the fill placement is illustrated on **Figure 6.8**.

Once a sufficient length of the access berm and shore protection has been constructed to provide adequate shelter, filling of the gap between the existing breakwater and the new structures with clean fill material may begin. The construction schedule for the Phase 1 of the Project was developed based on continuous supply of granular fill material from pits or quarries. It is anticipated that clean fill material may be available from various City of Mississauga and other public agency infrastructure Projects. The use of that fill material, properly tested, can be accommodated. In addition, the use of clean fill material from local private sources can be used at the site. Armour stone and rip rap material will be acquired from Ontario quarries.

All in-water work will be completed during an appropriate in-water work timing window, as set out by Fisheries and Oceans Canada, to comply with fisheries regulations. The in-water work timing window will be established prior to construction during the approvals phase.

Any disturbed areas will be temporarily stabilized as is feasible during on-going construction activities until final site restoration can be completed. Where possible opportunities for progressive rehabilitation will be explored. In addition, all construction debris and mud tracking will be collected, removed, or cleaned up from the site and adjacent roadways on an on-going basis and in a timely fashion.

Figure 6.8: Lake-fill Material Placement



As noted above, the filling program proposed for the construction of the landform assumes that clean fill material will be supplied from commercial quarries or pits. This assumption allows for the development of a schedule and construction methodology. It also reflects experience with similar lakefill sites. It has been assumed that construction will include the use of both trucking and barging to supply the material required for the Stage 1 construction. Supply of clean fill material by marine transport has become possible over the past several years with a number on contractors with suitable equipment operation in the area. Water depth in the outer part of the lakefill also allows for this operation to occur. The supply of fill material by marine transport is considered important due to the narrow width of the lakefill, which hinders truck movement and the location of the site near a developed commercial and residential location where an increase in truck traffic is desired to be minimized.

It is assumed that approximately 2,000 tonnes of clean fill material per day can be supplied by barge. The potential supply rates will vary at the time of construction depending on equipment and fill availability.

It is assumed that trucking will supply material at a rate of six trucks per hour for an eight-hour day. This rate of supply is expected to allow for controlled movement of trucks on the site, dumping and grading of the fill material in a controlled fashion. Each truck will perform two movements, coming onto the site and then exiting the site for a total of 96 truck movements per day.

Together, the trucking and barging will require in the order of 200 days to supply material, which equates to 10 full months at 20 working days per month. Considering potential weather related down time for the barging and construction related delays in the trucking, it is reasonable to assume the Stage 1 construction will take in the order of 14 months of operations to complete. That time may extend over a longer period to accommodate approvals, weather and in-water working periods. Under normal conditions, no work should be undertaken on weekends.

6.5.2. STAGE 2 SITE SERVICING AND LANDSCAPING

This phase of the 1PSEPM Project will include the construction of the parking lot, park features, trails, landscaping, signage, aquatic habitat features, etc. Construction of the new marina buildings and associated structures, as determined during detailed design, will also occur at this stage. The elements of Stage 2 will be subject to further refinement and approvals during detailed design.

Stage 2 construction, inclusive of servicing and landscaping would begin at the completion of the Stage 1 and is anticipated to take approximately 14 months of construction, depending on fill availability, approvals, weather and in-water working periods. Access and staging would remain like that of Stage 1 utilizing the same areas, resources and locations for construction and logistical efficiencies. Erosion and sediment control measures (ESC) established in Stage 1 could either remain or be adjusted to accommodate the initial works of Stage 2 work.

Stage 2 construction will begin at the far (southeast) end of the site and working back to the mainland area. Proposed servicing and utilities can be installed and backfilled, and rough grading and earthworks can be conducted on the whole site as required (and subject to the finished site after Stage 1). Hardscape work can all be done in conjunction with each other (parking lot / landscape paving / stone items and structures etc.) to make construction more efficient and cost effective. Starting from the furthest point out and working back towards the entry to the site would be the most efficient way to implement the hardscape work. Parking lot paving could be left at base coat asphalt to facilitate the remaining construction works and then topcoat can be placed as a final item and line painting.

Once hardscape and paving are completed, attention can move to soft landscape works, all vegetative work (trees / shrubs / aquatics / perennials / grasses etc.) can commence. Vegetation to be planted will be native, non-invasive species resilient to the coastal conditions associated with the north shore of Lake Ontario. Topsoil and fine grading to shape and provide final contouring and shaping to the landscaped areas.

All staging areas would be incorporated into the construction works as required to achieve the full build-out of the Project.

6.6. DETAILED DESIGN FRAMEWORK

The description of the preferred alternative provided in preceding Sections of Chapter 6 is a conceptual design appropriate for an EA. Following EA approval and City Council approval to proceed with the 1PSEPM Project, a detailed design will be developed by the City in consultation with the MECP, MNRF, CVC, DFO, MCFN and other interested parties.

6.6.1. CONFIRMATION AND REFINEMENT OF DESIGN ELEMENTS

Detailed design of the Project will confirm and refine the design elements of the preferred alternative following approval of the EA and City Council approval to proceed with the 1PSEPM Project. These design elements include:

- Armour stone revetments and shoreline protection structures;
- Island breakwater structures;
- Aquatic habitat feature, substrates and aquatic vegetation;
- Marina docks, slip configuration and marina walkways
- Marina buildings, facilities and services;
- Summer and winter parking areas;
- Winter boat storage areas;
- Parkland configuration, trails and other elements;
- Landscaping, habitat creation and vegetation plantings;
- Stormwater management features; and
- Fencing and public safety features (e.g., lighting).

The detailed design stage will also confirm:

- Potential for sourcing fill and construction materials of appropriate quality;
- Armour stone placement strategies to provide more habitat opportunities for aquatic species such as the American Eel through greater interstitial spacing in the armour stone;
- Material delivery and site access;
- Material and construction equipment storage;
- Construction phasing and schedule; and
- Maintenance requirements, focused on the rehabilitation and repair of the structures over their design life.

Additional analysis will need to be undertaken regarding the detailed design to address issues related to climate change, such as the potential impact of severe weather that may result in wave spray/overtopping, changing lake levels and/or excess precipitation on future infrastructure (e.g., stormwater management infrastructure). Additional analysis will also need to be undertaken to better quantify the loss of fish habitat. For example, the Habitat Ecosystem Assessment Tool (HEAT) provides an accounting framework for assessing losses, gains, and modifications to habitat from development, offset, and restoration activities.

6.6.2. CONFORMITY WITH SOURCE PROTECTION POLICIES

The 1PSEPM Project Area intersects with an intake protection zone (IPZ)-2 with a vulnerability score of 4.5, a Highly Vulnerable Aquifer (HVA) with a score of 6, and within an Events-based Area (EBA) for pipeline fuel/oil spill within the Credit Valley Source Protection Area of the larger Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Protection Region. As such, some of the activities of the Project may be subject to the applicable policies of the CTC Source Protection Plan. Detailed design and City operation of the marina will address the following seven policies in the CTC Source Protection Plan, applicable within the EBA and IPZ-2:

- LO-FUEL-1 and LO-FUEL-2: Policies directed at the MECP that address fuel spill prevention and contingency plans and that may have implications for the facility owner (e.g., marina with onsite fuel storage).
- SAL-10: Planning approval authority is encouraged to require a salt management plan for developments with new roads and parking lots.
- SAL-12: Municipality is encouraged to require implementation of a salt management plan and use of trained individuals in the application of road salt.
- SAL-13: Municipality is requested to report annually to the SPA the results of its sodium and chloride monitoring conducted under the Safe Drinking Water Act and any other applicable monitoring programs.
- DNAP-3: Municipality is encouraged to promote BMPs for the handling/storage of DNAPLs for ICI land uses.

- OS-3: Municipality is encouraged to promote BMPs for the handling/storage of organic solvents for ICI land uses.

6.6.3. CONFIRMATION OF FILL MATERIAL QUALITY

The MECP regulates the management of soil and excess soil quality through Ontario Regulation (O.Reg.) 406/19 and MECP's Rules for Soil Management and Excess Soil Quality Standards and "subject waste" through the O.Reg. 347 (General - Waste Management). However, O.Reg 406/19 and associated rules do not apply to the final placement of excess soil on the bed of a surface water body as is proposed by the 1PSEPM Project. Since that regulation does not apply, the City will need to demonstrate that the material being used as lakefill meets the definition of "inert fill" in O.Reg. 347, having regard to relevant MECP lakefilling guidance, including the MECP document entitled "Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario" (2011). The City must demonstrate compliance in accordance with this regulation and MECP guidance, in order for the lakefilling activity to be exempt from Part V of the *Environmental Protection Act* so that no waste approval would be required.

During detailed design, the City shall consult with MECP's Regional Technical Support and the local District Office to review matters related to fill material quality to help ensure all relevant criteria can be met, and to develop an appropriate testing process during construction. The potential for sourcing fill and construction materials of appropriate quality will be further investigated.

6.6.4. COSTS

This capital cost of the conceptual design for the preferred alternative will be refined following the EA. The major capital cost items are:

- Construction of berm and placement of fill material;
- Shore protection;
- Landscaping / plantings; and
- Site servicing.

The cost of contingency, design, approvals and administration will also be part of the capital cost estimate. Additional cost estimates will also be prepared for the marina facilities.

The capital costs for the Project would need to be approved by Council following EA approval by MECP.

6.6.5. CONSULTATION WITH MCFN

During the detailed design stage, the City will consult with MCFN (and other interested parties) to:

- Identify and incorporate accurate, culturally appropriate, and informative educational signage or similar components related to the significance of the Project's location, historically and today, to MCFN and the City. Both the City and MCFN desire to include Indigenous recognition in the 1PSEPM Project.

- Identify and incorporate feasible bioengineering approaches (natural fiber blankets and planting native vegetation buffers for shoreline stabilization). It is acknowledged that the severity of the coastal conditions may not allow for the use of bioengineering options along the shoreline of the lakefill. However, bioengineering can be considered for offsetting measures that may be undertaken away from the 1PSEPM Project.
- Develop landscaping and vegetation plans to support creating a naturalized habitat less used by the public (e.g., to provide quality habitat for species such as migratory birds and habitat preferences of local at-risk wildlife). The MCFN have identified the Monarch Butterfly, Mottled Duskwing, and turtles as species that should be considered in the development of vegetation plans.

The City recognizes that as part of the *Fisheries Act* Authorization, the City will need to provide appropriate habitat offsets to counterbalance the aquatic habitat removed due to the Project and that this will entail investments in the creation and/or enhancement of fish habitat off-site. During the detailed design stage and in seeking the *Fisheries Act* Authorization from DFO, the City will consult with MCFN and others to:

- Investigate the feasibility of the creating and/or enhancing fish habitat along the eastern side of the east breakwater to provide a greater range of habitat function (forage, refuge, spawning, nursery) for fish, without affecting public safety or the function of the Project, including the provision of abundant large interstitial habitat, benthic invertebrate habitat, low and high-energy zones as part of the habitat offsetting plan.
- Investigate feasible opportunities for the incorporation of habitat suitable for American Eel and Lake Sturgeon in the habitat feature at the south end of the Project site. Investigate feasible opportunities for the incorporation of habitat suitable for American Eel and Lake Sturgeon in areas proximal to the Credit River, within the Credit River watershed and/or Lake Ontario.

6.6.6. GREEN BUILDING STANDARDS

While not the subject of this EA, detailed design may also consider the location, size and type of marina service building. It is the City's intention that the design of this building be subject to the Corporate Green Building Standard (December 2019).

7. DETAILED ASSESSMENT OF THE PREFERRED ALTERNATIVE

The detailed assessment examines how the 1PSEPM Project preferred alternative meets the purpose of the undertaking and addresses the problems and opportunities as discussed in Chapter 2. The detailed assessment describes the net environmental effects; and how the preferred alternative minimizes adverse effects and/or maximizes positive effects according to the following components, namely:

- Physical Environment;
- Atmospheric Environment;
- Biological Environment;
- Socio-economic Environment;
- Cultural Environment (including Interests of Indigenous Communities); and
- Costs.

The criteria developed for the Comparative Evaluation of Alternatives (Chapter 5 Table 5.1) was used as a basis for the detailed assessment but scoped and refined to reflect the potential for effects associated with the conceptual design and the detailed assessment framework (Chapter 6). Consideration was also given to comments received from the public during the EA and input received from MCFN. A set of indicators were defined for construction and establishment to structure and, where possible, quantify the effects of the construction and establishment of the 1PSEPM Project preferred alternative on the environment. Table 7.1 lists the criteria and indicators used for the detailed assessment.

Table 7.1: Criteria and Indicators for Detailed Assessment

Environmental Component	Criteria	Indicator(s)	Approach to Assessment
Physical Environment	Resiliency of proposed lakefill to changing lake levels and coastal processes	Ability of proposed alternative to withstand changing lake levels (i.e., flooding hazards) and coastal processes (shoreline erosion) due to severe weather (and other factors) associated with climate change.	Professional judgement based on coastal process modeling
	Effects on surface water quality in the Local Study Area	Changes to surface water quality	Professional judgement based on anticipated performance of the Project design and past Project experience
Atmospheric Environment	Changes to Air Quality in the Local Study Area	Changes to air quality from dust and greenhouse gas emissions	Professional judgement based on past Project experience
	Changes to ambient noise in the Local Study Area	Changes to ambient noise	Professional judgement based on past Project experience
Biological Environment	Area and quality of terrestrial habitat	Total area of terrestrial habitat disrupted or lost	Measurement of areas and qualitative assessment of potential for change to terrestrial habitat
		Potential effects on terrestrial Species at Risk (SAR) and Significant Wildlife Habitat (SWH)	Qualitative assessment based on professional judgement
		Potential for creation of habitat for nuisance species	Qualitative assessment based on professional judgement
		Potential for improvement of terrestrial habitat	Qualitative assessment based on professional judgement
	Area and quality of aquatic habitat	Loss or disruption of aquatic habitat	Measurement and assessment based on field work
		Potential effects on aquatic Species at Risk (SAR) and critical habitat	Qualitative assessment based on professional judgement
		Potential for the creation of habitat for invasive species	Qualitative assessment based on professional judgement

Environmental Component	Criteria	Indicator(s)	Approach to Assessment
		Potential for creation or enhancement of aquatic habitat	Qualitative assessment based on professional judgement and field work.
Socio-economic Environment	Area of open space or parkland created	Total area to be made available for recreation including trails and parkland.	GIS measurements
	Potential for changes to use of waterfront for recreation	Disruption from construction nuisance effects of recreational activities undertaken at waterfront parklands and trails (e.g., cycling), on the lake, and in Port Credit Village.	Qualitative assessment based on professional judgement, comparison with existing conditions.
		Loss of Recreational Amenities	Qualitative assessment based on professional judgement
	Disruption to use and enjoyment of property during construction	Effects of construction (noise, dust, traffic, site visibility) at residential properties, community facilities, institutions and businesses	Qualitative assessment based on professional judgement and conclusions regarding air quality and noise effects.
	Effects on business activity during construction	Effects on business activity	Qualitative assessment based on professional judgement
	Effects on business activity during establishment	Effects on business activity	Qualitative assessment based on professional judgement
	Disruption to use and enjoyment of property during establishment	Effects of park and marina operations (air emissions, noise, dust, and traffic, site visibility) at residential properties, community facilities, institutions and businesses.	Qualitative assessment based on professional judgement
		Effects of visibility of new lakefill area including park activities and marina operations at residential properties, community facilities, institutions and businesses	Qualitative assessment based on professional judgement

Environmental Component	Criteria	Indicator(s)	Approach to Assessment
	Changes in community character	Opportunity to enhance the unique character of Port Credit Village and its marina functions along the waterfront.	Qualitative assessment based on professional judgement
Cultural Environment	Potential effects on built heritage resources and cultural heritage landscapes due to construction	Direct or indirect impacts to built heritage resources and cultural heritage landscapes Presence of absence of built heritage resources and cultural heritage landscapes within the Project footprint	Presence of cultural heritage resources in the Project footprint
	Potential displacement of marine- and land-based archaeological resources	Presence or absence of archaeological resources within the Project footprint	Stage 1 Archaeological Assessments
	Potential for effect from construction and establishment on traditional uses of lands by Indigenous communities.	Extent of traditional uses of lands and waters within the 1PSEPM Project study area	Qualitative assessment based on professional judgement
Cost	Capital and Other Cost	The capital and other cost of the conceptual design for the preferred alternative will be refined following the EA	

7.1. IDENTIFYING NET EFFECTS

For each indicator, the effects to existing conditions (Chapter 3) due to 1PSEPM Project preferred alternative works and activities (Chapter 6) were predicted. In some cases, no effects were predicted due to the application of mitigation or avoidance measures. Where net effects were predicted (i.e., effects remaining after mitigation is applied), they were classified as positive, negative, or negligible. Positive effects (e.g., improved habitat) are generally associated with establishment/post-establishment and were quantified where possible. Effects that were either negative or negligible tended to be associated with construction activities. Negligible effects are generally short-term, localized, do not occur frequently, and can be minimized largely through mitigation; these are often typical of construction Projects. Examples of these include air and noise emissions from construction equipment. Negative effects are those that mitigation could not minimize the effect to the extent that it became negligible, thus, the effect was considered a net negative effect of the 1PSEPM Project.

7.2. PHYSICAL ENVIRONMENT

7.2.1. EFFECTS OF CONSTRUCTION

Criterion:	Effects on surface water quality in the Local Study Area
Indicator:	Changes to surface water quality
Potential Effect:	Reduced water quality from runoff due to onshore earthworks and vehicle movements and the potential use of unsuitable materials within the lakefill.

EFFECTS ASSESSMENT

Land based construction activities for the 1PSEPM Project are expected to be limited to vegetation removal and mobilization of land-based area for construction staging. The Project site is largely paved, has curbs and is serviced by municipal storm sewers along Port Street, so substantial off-site runoff from is not expected. However, on-site construction vehicle movement creates the potential for sedimentation that can affect surface water quality or deposit fine sediment into the existing marina basin and potentially the nearshore area of Lake Ontario. Site runoff is unlikely to change in response to flows generated by localized and short-lasting storms, long lasting precipitations, snowmelt, or rain or melting snow.

The use of unsuitable materials within the lakefill has the potential to leach out of the lakefill over time in the surrounding lake water, potentially reducing nearshore water quality.

MITIGATION MEASURES

Mitigation measures are warranted to minimize adverse effects on surface water quality during construction.

- Construction of the Project should aim to maintain the existing asphalt cover for as long as possible to maintain current drainage patterns and avoid exposing erosion susceptible soils.

- The material being used as lakefill shall meet the definition of “inert fill” in O.Reg. 347, having regard to relevant MECP lakefilling guidance, including the Ministry document entitled “Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario” (2011). The City shall ensure that an appropriate testing process is undertaken during construction.
- Stockpiling of materials shall be undertaken in designated locations. No stockpiling of materials other than those being used for shore protection works, such as armour stone, rip rap, and clean fill will be undertaken within 30 m of the lake, if feasible due to site constraints. Some stockpiling of armour stone near the exposed end of the lakefill will be required for emergency storm protection.
- The City will ensure that an “Erosion and Sediment Control Plan” is developed that will apply for the duration of construction activities. MCFN will be consulted on a draft plan before it is finalized and included as part of the detailed design and/or *Fisheries Act* Authorization.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on surface water quality due to onshore earthworks and vehicle movements is considered ***Negligible***.

Criterion:	Effects on surface water quality in the Local Study Area
Indicator:	Changes to surface water quality
Potential Effect:	Increased turbidity and reduced water quality from disturbance of sediments from the lakebed, from placed material and from vessel movement during construction.

EFFECTS ASSESSMENT

Construction activities for the 1PSEPM Project preferred alternative are expected to involve land creation and protection by placing the armour stone shoreline protection and lakefill materials on the lake bottom.

The placement of armour stone on the lake bottom to create the shore protection structure will result in the disturbance and resuspension of existing sediments from the lake bottom into the water column resulting in increased turbidity and potentially reduced surface water quality. Turbidity is a reduction in water clarity. Water is considered turbid when the presence of suspended particles becomes conspicuous and considered to be impaired or of lower quality.

Sediment re-suspension is unavoidable to some extent and occurs whenever materials are placed onto a lake bottom. However, the degree of sediment re-suspension and turbidity generated from material placement will depend on many site and operation-specific variables, including:

- characteristics of the substrate (e.g., grain size, specific gravity, etc.);
- nature of the material placement operation (e.g., armour stone size, placement rate, and placement method); and,

- site hydrology, hydraulics, hydrodynamics (e.g., current, vessel wakes).

Experience with sediment re-suspension and turbidity under a wide variety of dredging operations (i.e., having a greater impact than material placement on the lake bottom) have shown that in most cases re-suspended sediment concentrations:

- are greater near the bottom (as compared to higher in the water column).
- rapidly decrease with distance from the area of disturbance; and
- resettle close to the area of disturbance within a few hours or less, and only a small fraction takes longer to resettle. Resettling distances are greater when the particle size distribution is smaller (i.e., silt/clays rather than sand/gravels) and when the water currents are not fast enough to mobilize the sediments being disturbed.

In the case of the lakefill area for the 1PSEPM Project preferred alternative, the existing (eastern) breakwater creates a strong barrier to nearshore currents creating a relatively calm embayment to the east where the lakefill is to be constructed. Therefore, because currents in the area are low, wave action and wind direction are likely the key factors in determining whether, and how far, sediments move and are redistributed within the lake. However, lakebed substrate where the lakefill is to be constructed is dominated by coarse sand and cobble, with sand becoming more prevalent along the shoreline. An area of hardpan and multiple cobble dominated shoals along the eastern edge of the placement area also exist. These types of sediment are less likely to be resuspended and will likely resettle quickly near the area of disturbance. For the portion that may be resuspended, sediments are likely to be transported towards the shore and east side of the created landform by wave action.

Apart from turbidity, some chemicals from the contaminated sediment, in the marina basin west of the breakwater, may also be disturbed. This sediment contamination is to be expected in a marina basin used for many years by pleasure watercraft. Contaminated sediments in the area where the lakefill is to be constructed are possible but not likely.

All of the above must be considered with the view that major storms and wave action have the ability to re-suspend fine to coarse sediment within the entire construction area.

Any resuspension of sediment during construction process is short duration and extremely localized in comparison to natural storm occurrences. Moreover, the use of sediment control measures such as turbidity curtains or sheet piling to minimize turbidity or sediment transport on lakefill Projects on the open coast of the lake is not considered practical. Such measures would be quickly damaged during storm events.

Finally, vessels such as barges and supporting watercraft operating in shallower waters may also contribute to the resuspension of lake bottom sediments through propeller action and anchoring.

MITIGATION MEASURES

Mitigation measures are warranted to minimize adverse effects on surface water quality during construction.

- Follow best management practices in “Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario” (Gordon & Fletcher, 2011 (c)).
- Utilize only clean fill for lakefill construction.
- The City will ensure that the contractor(s) develop a construction phase “Surface Water Quality Management Plan” aimed at minimizing turbidity, resuspension of potentially contaminated sediments in the marina basin and Lake Ontario. This management plan shall include “Turbidity Management Protocol” that considers:
 - Operational control modifications (e.g., reduced rate of construction);
 - Weather-related influences or triggers to guide operation control modifications (e.g., restricting operation to days when acceptable thresholds of suspended sediment concentrations can be achieved.
 - Turbidity triggers or thresholds at a specific distance(s) from the lakefilling operation; and
 - Regular in-water monitoring or the use of real time turbidity monitoring technology.
- The protocol shall build on experience gained from other waterfront and lakefill Projects in Mississauga (e.g., Jim Tovey Lakeview Conservation Area). The management plan and turbidity protocol shall be developed with guidance from the MECP and DFO. MCFN will be consulted on a draft plan before it is finalized and included as part of the detailed design and/or Fisheries Act Authorization.
- Should the detailed design require disturbance of bottom sediment within the existing marina basin, appropriate sediment controls such as turbidity curtains will be employed in the sheltered basin.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on surface water quality from disturbance of sediments from the lakebed, from placed material and from vessel movement during construction is considered **Negligible**.

Criterion:	Effects on surface water quality in the Local Study Area
Indicator:	Changes to surface water quality
Potential Effect:	Reduced soil, groundwater, and surface water quality from operation, refueling and routine maintenance of vehicles, vessels, and machinery.

EFFECTS ASSESSMENT

The Project Study Area is not located in groundwater protection zones with highly vulnerable scores. Therefore, activities associated with the 1PSEPM Project do not pose a significant threat to drinking water. Concerns have been raised by the MECP regarding the storage of fuel during construction and at the marina once it is operational. Although this EA only addresses the lakefill component, it is noteworthy that the existing fueling operation at the existing marina at 1 Port Street East may or may not continue into the future as there are City operated fueling opportunities for boaters elsewhere. As such, the 1PSEPM Project does not involve any new marina fueling related activities that may threaten drinking water.

The operation, refueling and routine maintenance of construction equipment and smaller machinery will tend to occur at the work site daily. Vehicle, construction equipment and machinery operation can cause potential soil contamination from drips, leaks and spills released from fueling; and improper storage of petroleum, oils and lubricants (POL) and other hazardous materials on-site. Although vehicles and most machinery are mobile, some equipment cannot practically be relocated for fueling and maintenance. The most common form of potential soil contamination on construction work sites occurs from drips and spills released from fueling nozzles and gas can spouts as they are moved between the fuel tank and the vehicle or equipment. Being a frequent activity, the potential for drips and minor spills is a common and a frequently occurring potential environmental hazard, having the potential to contaminate soil, groundwater, and surface water.

Accidental fuel spills from vehicles, heavy equipment and small machinery during construction activities also have the potential to cause noticeable odors. These emissions are small in scale and very localized to the immediate vicinity of a spill or waste collection site.

Vessel operation in Lake Ontario may result in emissions to water. These include deck run-off and wash water, POL, and potentially discharges of grey or black water from sewage treatment systems. These direct emissions to water will result in reduced surface water quality in the immediate vicinity of the vessel. Because currents in the area are low, wave action and wind direction are likely the key factors in determining whether, and how far, discharges are distributed within the lake.

MITIGATION MEASURES

Mitigation measures are warranted to minimize adverse effects on surface water quality during construction.

- The City will ensure that contractor(s) develop a construction phase “Spills Management Plan”. MCFN will be consulted on a draft plan before it is finalized and included as part of the detailed design and/or Fisheries Act Authorization. This management plans shall:
 - Define Project and site-specific objectives.
 - List the applicable legislative and regulatory requirements.

- Describe the on-site roles and responsibilities with respect to spills prevention and emergency response procedures, including procedures for:
 - reporting a spill
 - stopping the spill if possible
 - containing the spill
 - protecting the area of the spill; and
 - removing the material for storage or disposal.
- Consider the potential for extreme weather events contributing to the cause of spills and their subsequent clean-up.
- Describe monitoring and reporting requirements.
- The City shall ensure that contractor(s) implement the following Best Management Practices:
 - Vehicles, vessels, and machinery must be checked for leakage of lubricants or fuel and must be in good working order.
 - Keep floating oil booms on hand if oily residue sheens or floating debris are detected.
 - Store all POLs and chemicals in secure containers and preferably in a secure storage trailer.
 - All construction waste and debris will be disposed of in accordance with applicable provincial guidelines and regulations.
 - Where possible, refuel equipment on impermeable pads, liners or using drip pans at least 30 m from the lake.
 - Vehicles remaining stationary for more than 30 minutes shall use drip pans. Drip pans shall be emptied into oil absorbing sheets or waste POL containers for disposal. Every vehicle to carry a spill kit to control spills from that vehicle.
 - The construction site shall have a single, prominently marked location for the storage of POL and other hazardous or potentially contaminating materials (e.g. solvents). These storage areas shall not be located within thirty metres of Lake Ontario. An approved spill kit shall be available at all storage locations.
 - Any spill and the response taken should be reported to immediately to the City and the MECP Spills Action Centre.

Although marina operations are not the subject of this EA, the City will continue engaging with the Credit Valley Conservation, a Source Protection Authority, during detailed design to determine whether fuel storage would be a considered a significant drinking water threat. Such engagement may serve to help in detailed design and in the City's decision-making regarding the need for on-site fuel storage and dispensing at the marina during the establishment phase.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on surface water quality from leaks and spills during construction is considered **Negligible**.

7.2.2. EFFECTS OF ESTABLISHMENT

Criterion:	Resiliency of proposed lakefill to changing lake levels and coastal processes
Indicator:	Changing lake levels (i.e., flooding hazards) and coastal processes (shoreline erosion) due to severe weather (and other factors) associated with climate change.
Potential Effect:	The lakefill may result in changes in the water levels and circulation patterns along the Lake Ontario shoreline that may result in local flooding, changes to sediment movement and deposition patterns in Lake Ontario.

EFFECTS ASSESSMENT

In developing the conceptual design, consideration was given to the MECP document entitled “Considering Climate Change in the Environmental Assessment Process” (MECP, 2017). The coastal engineering and associated modelling recognized climate change scenarios and applicable changes for Lake Ontario to design the lakefill such that it will be resilient to climate change impacts. The conceptual design of the lakefill has taken into consideration the ability of lakefill to withstand changing lake levels (i.e., flooding hazards) and coastal processes (wave action, shoreline erosion) including future changes associated with climate change. The modelling concluded that the lakefill design makes the structure resilient to changing lake levels and a wide range of coastal processes. Modelling also shows that the marina basin will be more resilient coast process in the future than it is today.

MITIGATION MEASURES

None.

NET EFFECT

The lakefill will not be affected by and will have **No Net Effect** on water levels and circulation patterns along the Lake Ontario shoreline that may result in local flooding, changes to sediment movement and deposition patterns in Lake Ontario. The existing breakwater has already affected coastal processes along the Lake Ontario shoreline. The new lakefill adjacent to the breakwater will not change existing conditions in any notable way.

Criterion:	Effects on surface water quality in the Local Study Area
Indicator:	Effects on surface water quality
Potential Effect:	Reduced surface water quality from runoff and stormwater discharges

EFFECTS ASSESSMENT

The conceptual design of the preferred alternative (i.e., large lakefill footprint) includes grading to direct storm water to a bioswale along the western edge of the lakefill. The bioswale will accept and infiltrate the runoff from parking areas during the early stages of storm events, which is when deleterious substances, including hydrocarbons and sediments are washed from impervious surfaces. A perforated subdrain below the bio-swale will collect the filtered water which will be conveyed to the adjacent marina basin via storm sewers and outfall structures. The conceptual design includes approximately 10,000 m² of the Project site being allocated to parking. Parking areas are well known to be sources of many types of pollutants such as oil, gas, sediment, heavy metals, nutrients, and trash.

The Project Study Area is not located in groundwater protection zones with highly vulnerable scores. Therefore, activities associated with the 1PSEPM Project such as the handling and storage of road salt or dense non-aqueous phase liquids do not pose a significant threat to drinking water.

Impervious surfaces (i.e., paved parking areas, trails, covered buildings) on the shore or on the lakefill will contribute to stormwater runoff into Lake Ontario during rainfall and snowmelt events. Changes in stormwater discharges to Lake Ontario have the potential to result in reduced water quality in the marina basin and the nearshore area of the Lake through increased contaminant, sediment, and nutrient loadings. Increased temperature from stormwater discharges may also contribute to aquatic habitat alteration.

Overall, it is expected that the proposed design will provide an enhanced level of protection for water quality through the long-term average removal of 80% of Total Suspended Solids (TSS) on an annual loading basis from all runoff leaving the site.

MITIGATION MEASURES

Mitigation measures are warranted to minimize adverse effects on surface water quality from stormwater discharges during establishment.

- The City will address potential impacts to drinking water during detailed design by giving consideration to relevant Source Protection Plan policies as identified in Section 6.6.
- The City will develop a “Stormwater Management Plan” for the established lakefill and the impervious areas on-site (i.e., parking areas, boat storage, marina service building areas). MCFN will be consulted on a draft plan before it is finalized and included as part of the detailed design and/or Fisheries Act Authorization. The plan will be designed to provide an enhanced level of protection for water quality through the long-term average removal of 80% of Total Suspended Solids (TSS) on an annual loading basis from all runoff or stormwater leaving the site. The plan will include a regular inspection and monitoring component.

- In accordance with MECP guidance, a “treatment train” approach shall be taken to achieve the enhanced level of protection for water quality. Whereby consideration shall be given to the use of additional Low Impact Development (LID) practices during detailed design, incorporating (where feasible) permeable paving, bioretention and infiltration areas, oil/grit separators, retention ponds, sand filters, grassed swales, vegetated filter strips. The City will be guided by its Green Development Standards (2012) where relevant.
- The detailed design will designate snow storage areas on-site if required. The City will consider lower impact road salt alternatives for use in winter maintenance operations as per City practices.
 - Although marina operations are not the subject of this EA, the City will continue engaging with the MECP and the Credit Valley Conservation, a Source Protection Authority, during detailed design to ensure that application, handling and storage of road salt and handling of dense non-aqueous phase liquids would not be a significant drinking water threat during all phases of the Project.

NET EFFECT

Taking into consideration the implementation of design and mitigation measures, the net effect of the Project on surface water quality during establishment is considered **Negligible**.

7.3. ATMOSPHERIC ENVIRONMENT

This EA addresses the lakefill component of the Project. The purpose of the 1PSEPM Project is to provide an expanded land base for additional waterfront parkland and marina alternatives at the 1 Port Street East site. The Project involves simply moving some of the existing operations from one side of the marina basin to the other. The fueling operation at the existing location at 1 Port Street East may or may not continue in the future, as there are City-operated fueling opportunities for boaters elsewhere. Moreover, the new marina is anticipated to host approximately the same numbers of boats as the existing marina does. Therefore, for the purposes of this EA, the existing air quality is not expected to measurably change as the emission sources are not expected to change.

7.3.1. EFFECTS OF CONSTRUCTION

Criterion:	Change to air quality in the Local Study Area
Indicator:	Changes to air quality from increased dust and greenhouse gas emissions
Potential Effect:	Increased dust levels from, heavy equipment use/vehicle movement, soil/fill storage and fill placement. Increased greenhouse gas (GHG) emissions for operating vehicles, vessels and equipment.

EFFECTS ASSESSMENT

Construction activities such as vehicle movements and the movement and placement of fill have the potential to generate dust. Dust may be a nuisance to residents, recreational users and businesses adjacent to the site (both on land and in the water) and along access routes. Construction activities near sensitive receptors onshore will occur for a short period of the overall construction time. Most fill operations that might generate dust will occur with increasing distance away from residents and recreational users.

The operation of vehicles and equipment during construction will be a source of GHG emissions from the combustion of fuel. Because only a few vehicles and pieces of heavy equipment on land and one or two vessels in the lake would operate during construction, GHG emissions are considered negligible.

MITIGATION MEASURES

Mitigation measures are warranted to minimize adverse effects on air quality from dust generated by heavy equipment use/vehicle movement, soil/fill storage and fill placement.

The City will ensure that contractor(s) develop a construction phase “Fugitive Dust Management Plan” that would be applied throughout construction. MCFN will be consulted on a draft plan before it is finalized and used by the City or its contractors. This management plan shall be based on Environment and Climate Change Canada’s document entitled “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities” (ChemInfo Services Inc., 2005). This management plans shall:

- Define Project and site-specific objectives.
- List the applicable legislative and regulatory requirements.
- Describe the on-site roles and responsibilities with respect to dust management procedures.
- Describe monitoring and reporting requirements.

The City shall ensure that contractor(s) implement the following Best Management Practices:

- Minimize vehicle movement on/over exposed soils.
- Regularly clean city streets used by trucks or other vehicles entering / exiting the Project site (by sweeping or water application)
- Apply dust suppression measures (water) should dust levels be a concern on-site or due to a public complaint.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on air quality during construction is **Negligible**. Standard mitigation measures and the application of best management practices have proven to be effective.

Criterion:	Changes to ambient noise in the Local Study Area
Indicator:	Changes to ambient noise
Potential Effect:	Increased ambient noise levels nearest construction activities and along haul roads and rock and fill placement. Increased underwater noise levels from vessel operations.

EFFECTS ASSESSMENT

Construction activities such as vehicle movements and the use of construction equipment have the potential to generate noise. The noisiest activities will be the dumping of rocks, placement of rock and fill, and the backup beepers on construction equipment. Trucks hauling rock and fill to the site will also generate noise along haul roads. Noise may be a nuisance to residents, recreational users and businesses adjacent to the site (both on land, in the marina basin and in the lake) and along access routes. Noise may be generated underwater by vessel operation during the placement of fill.

MITIGATION MEASURES

Mitigation measures are warranted to minimize noise emissions generated by heavy equipment use/vehicle operation and rock/fill placement. The following measures shall be implemented:

- Activities that could create noise will be restricted to daylight hours and adhere to the intent of the Mississauga’s Noise Control By-law 0360-1979. In most residential areas (including that nearest the Project site), construction noise is allowed between 7 a.m. and 7 p.m. every day except Sundays and statutory holidays. Given the character of the Port Credit area, no construction will be permitted on weekends (Saturdays or Sundays) or on statutory holidays. Written notice shall be provided to all residences and business by regular mail or delivery in person which includes information regarding the type of construction, the address or general area where the construction will take place, the date(s) and time(s) of construction, the source of construction noise and mitigation measures, that will be taken to reduce the noise or vibration from construction. A Noise Control Officer designated by the Commissioner for the City shall be identified to undertake periodic inspections of construction activities and make recommendations for further noise mitigation.
- Contractors hauling rock and fill materials shall comply with the Ontario Highway Traffic Act and the City’s Noise Control By-law. The By-law also applies to moving motor vehicles, including noise created from mufflers, exhaust or emission control systems.

- The City will ensure that contractor(s) develop a construction phase “Noise Management Plan” that would be applied throughout construction. MCFN will be consulted on a draft plan before it is finalized and used by the City or its contractors. This management plans shall:
 - Define Project and site-specific objectives.
 - List the applicable municipal and provincial legislative and regulatory requirements.
 - Describe the on-site roles and responsibilities with respect to noise management, including that of the City’s Noise Control Office.
 - Describe monitoring and reporting requirements.

The City shall ensure that contractor(s) implement the following Best Management Practices:

- All internal combustion engine-driven equipment will be fitted with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Vehicles, vessels, and equipment are to be in good repair, equipped with noise emission controls as applicable and operated within operating specifications.
- Unnecessary idling of internal combustion engines will be strictly prohibited.
- To the extent possible, vessel engines and propellers will be shut down if anchored to reduce unnecessary underwater noise during their operation.
- Temporary sound barriers can be used, where feasible, to screen mobile and stationary construction equipment. The temporary sound barrier will provide attenuation only if it interrupts the line-of-sight between the source and receiver.
- Standard backup alarms equipment should be avoided if possible. If back alarms are required, a broadband back-up alarm should be used but the preference is to use a radio or personal silent alarm approach for providing alerts for equipment movements. This is to minimize sound levels at the noise-sensitive receptors when operating.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on the noise environment are **Negligible**. Standard mitigation measures and the application of best management practices have proven to be effective.

7.4. BIOLOGICAL ENVIRONMENT

7.4.1. EFFECTS OF CONSTRUCTION

Criterion:	Area and quality of terrestrial habitat
Indicator:	Total area of terrestrial habitat disrupted or lost
Potential Effect:	Terrestrial habitat, particularly mature trees may be removed and/or disturbed by construction activities.

EFFECTS ASSESSMENT

Up to 1,700 m² of terrestrial habitat may need be removed and/or disturbed by construction activities, including site perimeter plantings and clusters of mature trees on the existing breakwater. As discussed in Chapter 3, this habitat is of limited value given it consists of ornamental trees and the vegetation on the breakwater which is often overtopped. It is anticipated that birds will avoid the area under active construction. Most of the bird species currently using this part of the shoreline are urban tolerant and therefore, used to human activities. Existing structures with barn swallow nests and the nests themselves are not located on the 1PSEPM Project site, but rather on nearby properties that are not part of the planned works. The planned works are approximately 50 m away from these structures and are unlikely to disturb nesting barn swallows.

However, during migration seasons some birds moving through the area or utilizing the vegetation on site as a resting spot may be more sensitive to human activities. Migrating birds may avoid the area nearest construction activity or settle down in places that are not ideal habitat.

MITIGATION MEASURES

Mitigation measures are warranted to minimize the removal and/or disturbance during construction. Mitigation measures are:

- Minimize the removal of existing trees to the extent possible, particularly along Port Street and adjacent to St Lawrence Park.
- Apply appropriate tree protection measures for remaining trees. These measures will be determined during detailed design by the City.
- Tree removals will be offset by compensatory planting as part of the proposed park (wildlife friendly native, non-invasive trees and shrubs within the landscaping plan). For example, consideration will be given to creating a naturalized habitat that is less actively used by the public to give migrating birds important habitat during migration.

- Comply with measures of the Migratory Birds Convention Act: vegetation removal will occur outside of breeding bird period (typically April 15-August 31). Major construction, particularly vegetation removal, will be outside of the spring bird migration window (mid-March to early June). If work occurs within the general nesting season, a qualified wildlife biologist will complete a non-intrusive survey for signs of breeding and nesting birds.
- Prohibited-entry setbacks, where major construction activity will not occur will be established around existing barn swallow nests and other protected nests (e.g., active migratory bird nests and any nests of Schedule 1 birds). The setback size will be based on the ‘alert and flush’ distances as determined by a qualified wildlife biologist.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on terrestrial vegetation is considered to be a **Minor Adverse Effect**. There will be a loss of vegetation, including mature trees, to facilitate construction that would not be immediately offset by plantings on the new lakefill area.

Criterion:	Area and quality of terrestrial habitat
Indicator:	Potential effects on terrestrial Species at Risk (SAR) and Significant Wildlife Habitat (SWH)
Potential Effect:	Loss or disruption to SAR habitat or SWH

EFFECTS ASSESSMENT

The MECP noted that they are aware of several provincially protected species in the general area of the Project site. These are Bank Swallow (*Riparia riparia*) and Little Brown Myotis (*Myotis lucifugus*). Field studies indicate that there is no potential habitat for Bank Swallow in the Project Study Area. There is low potential for other SAR habitat and no SWH has been identified within the Project Study Area. The potential for loss or disruption to SAR habitat or SWH is considered to be low.

MITIGATION

Mitigation measures are warranted to minimize the potential for loss or disruption to SAR habitat or SWH. Mitigation measures are:

- Implement the mitigation measures for terrestrial vegetation identified above.
- To avoid potential impacts to bats, tree removal shall be undertaken in winter (between November 1 and March 31).
- The City will seek an *Endangered Species Act* Authorization if required following detailed design, or an exemption if warranted. The City will continue to seek advice and input from the MECP and MCFN regarding the potential for SAR in the Project Study Area, in developing its detailed design and in seeking authorizations or exemptions.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, **No Net Effect** of the Project on SAR habitat or SWH is anticipated.

Criterion:	Area and quality of terrestrial habitat
Indicator:	Potential for creation of habitat for nuisance species
Potential Effect:	Increased potential for the transport of nuisance and invasive plant species to the site via construction equipment

EFFECTS ASSESSMENT

There is an increased potential for the transport of nuisance and invasive plant species to the site via construction equipment. The movement of equipment and personnel could promote the introduction of invasive species to the new landform. Invasive plant species threaten and can alter existing terrestrial habitats and disrupt ecosystem functions. Once established, invasive species can: degrade wildlife habitat and biodiversity, including increasing competition with tree seedlings. Once established, invasive species become costly and difficult to control or eradicate.

The City cannot control where contractors source their construction equipment. It may come from a neighbouring development or from anywhere across the GTA or Ontario. The movement of construction equipment that has not been properly washed has always and continues to be a source of potential invasive species at new construction sites.

MITIGATION

Mitigation measures are warranted to minimize the potential for the transport of nuisance and invasive plant species to the site via construction equipment. Mitigation measures are:

- Implement measures outlined in the City of Mississauga's "Invasive Species Management Plan & Implementation Strategy" (City of Mississauga, 2021).
- Apply best management practices regarding cleaning of vehicles and equipment entering, exiting, and operating on-site. All contractors involved will follow the Ontario Invasive Plant Council's "Clean Equipment Protocol for Industry" (June 2016).

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on the noise environment is **Negligible**. Standard mitigation measures and the application of best management practices have proven to be effective.

Criterion:	Area and quality of aquatic habitat
Indicator:	Loss and disruption of aquatic habitat
Potential Effect:	<p>Aquatic habitat will be lost or disrupted as lakefill construction occurs. This includes the east side of the expanded lakefill and the underwater portion of the aquatic habitat feature at the south end.</p> <p>Construction activities are expected to disturb and resuspend sediment into the water column when new materials are placed on the lake bottom. This could result in increased turbidity and potentially reduce surface water quality.</p>

EFFECTS ASSESSMENT

The Study Area provides a variety of substrates at varying depths that likely afford aquatic habitat opportunities for several fish species and life stages with documented presence in or near the study area. The preferred alternative will result in the largest area of lakebed infill and as a result require the removal of approximately 29,000 m² of fish habitat. This is in addition to the replacement of like for like habitat along the eastern face of the existing breakwater that is replicated in the proposed marina design.

During construction, a total of approximately 29,000 m² of aquatic habitat will be removed as lakefill construction occurs and approximately 13,000 m² will be altered. This includes the east side of the expanded lakefill and the underwater portion of the aquatic habitat feature at the south end. The proposed lakefill will replace the existing bottom strata.

Lakebed substrate where the lakefill is proposed to be constructed is dominated by coarse sand, cobble and gravel, with sand becoming more prevalent along the shoreline. Areas of hardpan and cobble shoals along the easter edge of the placement also exist. These materials are less likely to be resuspended and will likely settle shortly after disturbance.

MITIGATION MEASURES

Mitigation measures are warranted to minimize the loss and disruption of aquatic habitat.

Mitigation measures are:

- The City will create and enhance aquatic habitat at the southern (lakeward) terminus of the proposed lakefill. Here, the proposed shoreline will be sculpted westward to create a lakeward facing embayment that will be protected by an armour stone island to be created further out into the lake adjacent to the headland. The proposed feature will create approximately 2,400 sq. m of semi-sheltered moderately shallow water area where substrate can be selected, and structural habitat provided at varying depths. The east side of the lakefill may permit additional opportunities to flatten the side slope and /or create a shallow underwater terrace along portions of the wall to be sheltered by the island and create littoral areas to provide productive areas for forage fish reproduction and feeding.
- An offset plan shall be developed, in conjunction with DFO, and in consultation with MCFN and other interested parties, as part of the *Fisheries Act* Authorization to provide suitable habitat offsets to counterbalance total aquatic habitat removal. This entails investments in the creation of fish habitat off-site. The offset plan will also detail post construction monitoring techniques to evaluate the effectiveness of the offset strategies.
- The City will continue to seek advice and input from the MECP, the CVC the federal DFO and MCFN in developing its detailed design and offset plan.

Additional mitigation measure are:

- The detailed design will ensure that spawning habitat for the invasive species, such as Common Carp, shall not be promoted.
- In water construction activities will occur within appropriate restriction timing windows for fish, where possible, to protect fish and fish habitat.
- As appropriate, areas will be cleared of fish prior to fill placement. Any fish entrapped in fill areas will be removed to the lake. Integrate requirements for site observations during construction activities that would trigger fish salvage.
- All machinery, equipment, and vessels that will be used during construction shall follow regulations and best practices on clean equipment/vessel protocols to avoid spreading non-native invasive plants and animals (fish, mussels, crabs, etc.) on hauls and ballast tanks.
- Utilize only clean fill for lakefill construction. No contaminated fill shall be placed in the lakefill area or in Lake Ontario.
- Restrict operations to calm water days (i.e., suspend operations during periods of high wave action).

NET EFFECT

Taking into the consideration the implementation of appropriate offsetting of remaining aquatic habitat losses and other mitigation measures, the net effect of the Project on the fish and fish habitat is **Negligible**.

Criterion:	Area and quality of aquatic habitat
Indicator:	Potential effects on aquatic Species at Risk (SAR) and/or habitat
Potential Effect:	Potential loss or disruption to aquatic Species at Risk (SAR) and/or habitat

EFFECTS ASSESSMENT

A desktop review of existing and available baseline information was undertaken to identify any known or potential SAR, designated under the *Species at Risk Act (SARA)* Schedule 1 including species listed provincially under the *Endangered Species Act, 2007 (ESA, 2007)* in the Project areas. It is important to note that these databases are not routinely maintained and should be used to provide general guidance for the screening of SAR in collaboration with the judgement from qualified professionals. The SAR list presented above should be refined to fill data gaps and better refine SAR affinities.

No areas of critical habitat for aquatic SAR were documented during the desktop analysis of available resources or from the field investigation. As such, loss of critical habitat is not anticipated. The desktop analysis did identify the potential for aquatic SAR in the Project areas; Lake Sturgeon, American Eel, Shortnose Cisco and Deepwater Sculpin. The 1PSEPM Project site was determined have only moderate suitable habitat potential for American Eel, and low suitable habitat potential for Lake Sturgeon, American Eel, Shortnose Cisco and Deepwater Sculpin.

MITIGATION MEASURES

Mitigation measures are warranted to minimize potential effects on aquatic Species at Risk (SAR) and/or habitat. Mitigation measures are:

- In Ontario, the MNRF has the responsibility of setting the in-water timing window guidelines. These guidelines are determined according to the species of fish in the water body, whether those fish spawn in the spring or fall, and where the water body is located in Ontario. The restricted in-water activity period to protect spring spawning and incubation extends from April 1st to July 15th. The restricted in-water activity period to protect fall spawning species, whose eggs incubate through winter, extends from September 15th to May 31st. When both the spring and fall restricted activity windows are applied, the least sensitive period for in-water work extends from July 15th (spring restrictions end) until September 15th (fall restrictions commence).
 - It is important to note that American Eel is a catadromous species, they do not spawn in Lake Ontario, once eels mature, they migrate back to the ocean to undertake spawning activities.

- In-water construction activities will occur within appropriate restriction timing windows for fish, where possible, to protect fish and fish habitat. MNRF and CVC will be contacted regarding appropriate in-water timing window for construction works. The agreed upon timing window will be stated as a condition in the *Authorization* from the DFO.
- The City will seek an *Endangered Species Act* Authorization after detailed design if required, or an exemption if warranted. The City will continue to seek the advice and input from the CVC, MCFN and the federal DFO regarding the potential for SAR in the study areas, in developing its detailed design and mitigation plan and in seeking authorizations or exemptions.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on aquatic Species at Risk (SAR) and/or habitat is **Negligible**. Habitat offsets to be developed as part of the *Fisheries Act* Authorization’s offset plan may serve as a benefit to certain SAR species and/or habitat.

7.4.2. EFFECTS OF ESTABLISHMENT

Criterion:	Area and quality of terrestrial habitat
Indicator:	Potential for the creation of habitat for nuisance species.
Potential Effect:	Increased potential for the establishment of nuisance and invasive species at the site.

EFFECTS ASSESSMENT

The establishment of the park area creates the opportunity for the establishment of nuisance and invasive species at the site. These species are often opportunistic with vegetation species arriving on the wind or being transported to the site by animals, birds or humans, and faunal species (such as geese) self transporting to site.

MITIGATION MEASURES

Mitigation measures are warranted to minimize the potential for the establishment of nuisance and invasive species at the site. Mitigation measures include:

- Best management practices regarding parkland design and nuisance species management will be applied. (e.g., consider minimizing Canada Goose foods (turf grass) and maximizing native herbaceous plantings that block turf grass/paths from the water.)
- With respect to Canada Geese, City staff monitor geese populations annually across waterfront areas, including parks and marina facilities. The City’s Goose Management Program has proven to control the population of resident geese within waterfront areas of the city. This program shall be implemented at the 1PSEPM Project site (as required) during the establishment phase.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on terrestrial habitat is **Negligible**. City programs and the application of best management practices have proven to be effective.

Criterion:	Area and quality of terrestrial habitat
Indicator:	Potential for improvement to terrestrial habitat
Potential Effect:	On a portion of the 18,000 m ² of parkland created, native species will be planted to compliment other Lake Ontario shoreline and inland migratory bird habitat and increased habitat connectivity

EFFECTS ASSESSMENT

On a portion of the 18,000 m² of parkland created, native non-invasive species of trees, shrubs and other vegetation will be planted that may be used by urban tolerant wildlife and birds. The newly created area may function as a stopover for migratory birds. This potential terrestrial habitat has the potential to compliment other Lake Ontario shoreline and inland migratory bird habitat and increased habitat connectivity. It is noted that because this is a park setting that includes soft landscape and hard surfaced pathways not all of this area will be planted and support ecological functions. Moreover, it will be heavily used by people making it low quality new habitat.

The City's Natural Heritage and Urban Forest Strategy (2014) promotes the protection, expansion and restoration of the Natural Heritage System, its features, and increasing the City's urban tree canopy cover. The planting of native trees and naturalized (trees/shrubs/herbaceous plants) habitat area/areas support this strategy.

MITIGATION MEASURES

Vegetation to be planted should be wildlife friendly native, non-invasive trees, shrubs and grasses. The City's plantings should be guided by its Green Development Standards (2012) where relevant.

During the detailed design stage, the City will consult with MCFN and other interested parties to develop feasible vegetation plans including how those can support creating a naturalized habitat less used by the public (e.g., to provide quality habitat for species such as migratory birds and habitat preferences of local at-risk wildlife). MCFN have identified the Monarch Butterfly, Mottled Duskwing, and turtles as species that should be considered in the development of vegetation plans. The landscaping plan and specific planting will be guided by the following:

- Minimize the removal of existing trees to the extent possible, particularly along Port Street and adjacent to St Lawrence Park.
- Tree protection measures will be determined during detailed design by the City. Removals will be offset by compensatory planting as part of the proposed park.

- Measures will be taken to ensure that no terrestrial wildlife are in the trees/bushes along the site perimeter prior to and during construction.
- Planting will be wildlife friendly native, non-invasive trees and shrubs.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on terrestrial habitat is a **Minor Adverse Effect**. There will be a loss of habitat, including mature trees, to facilitate construction that would not be immediately offset by plantings on the new lakefill area.

Criterion:	Area and quality of aquatic habitat
Indicator:	Potential for creation or enhancement of aquatic habitat
Potential Effect:	Potential creation of 2,400 m ² of aquatic habitat associated with the lakefill and aquatic habitat features included in the design.

EFFECTS ASSESSMENT

The Project will create 2,400 m² of aquatic habitat primarily associated with the aquatic habitat feature at the south end of the site.

The fish habitat creation component of the 1PSEPM design proposes to create and enhance aquatic habitat at the southern (lakeward) terminus of the proposed lakefill. Here, the proposed shoreline will be sculpted westward to create a lakeward facing embayment that will be protected by an armour stone island to be created further out into the lake adjacent to the headland. The proposed feature will create approximately 2,400 m² of semi-sheltered moderately shallow water area where substrate can be selected, and structural habitat provided at varying depths. The east side of the lakefill may permit additional opportunities to flatten the side slope and /or create a shallow underwater terrace along portions of the wall to be sheltered by the island and create littoral areas to provide productive areas for forage fish reproduction and feeding.

The island breakwater and embayment will provide a variety of substrate for aquatic vegetation and fish habitat. It is anticipated that the lee side of the island will provide quality spawning and foraging habitat for open coast fish species such as Alewife, Lake Trout and juvenile salmonids; sheltered habitat for important Lake Ontario feeder fish species such as Emerald Shiner, Lake Chub and Spottail Shiner as well as nearshore fish species such as White Sucker, Common Carp (non-native invasive species) and Longnose Dace.

MITIGATION MEASURES

The design of the aquatic habitat area and the shore protection structure is still at the conceptual level and details of the substrate and habitat features will need to be further developed as part of the detailed design and the *Fisheries Act* Authorization processes. In seeking the *Fisheries Act* Authorization from DFO, the City will consult with MCFN and others.

NET EFFECT

Taking into the consideration the implementation of a robust detailed design for the island breakwater, embayment and overall lakefill structure, **No Net Effect** of the Project on aquatic habitat is anticipated. Some aquatic species may benefit from improved foraging and sheltering habitat quality within the Project Study Area over existing conditions.

7.5. SOCIO-ECONOMIC ENVIRONMENT

7.5.1. EFFECTS OF CONSTRUCTION

Criterion:	Potential for changes to use of waterfront for recreation
Indicator:	Disruption from construction nuisance effects of recreational activities undertaken at waterfront parklands and trails (e.g., cycling), on the lake, and in Port Credit Village.
Potential Effect:	Recreational users may be disrupted by construction noise, dust and traffic.

EFFECTS ASSESSMENT

Throughout the construction period, recreational users in the vicinity of the 1 Port Street site may experience nuisance effects such as noise and dust which may affect their recreational experience. While the duration of construction is estimated to be approximately 14 months, depending on fill availability, approvals, weather and in-water working periods, nuisance effects will be more pronounced when construction activities are closer to shore. None of these effects will preclude recreational use during construction.

MITIGATION MEASURES

Mitigation measures are warranted to minimize disruption to recreational users of the waterfront from construction noise, dust and traffic. Mitigation measures are:

- Implement mitigation measures for effects on the physical environment (i.e., air quality and noise) as outlined above in Section 7.2 above.
- Adhere to selected haul route for delivery of lakefill materials, if mandated by City.
- Avoid the use of the existing parking lots and loss of street parking.
- Maintain safe public access to waterfront trail along Port Street and provide alternative routes (if necessary)
- The City will coordinate all activities at the marina and vessel activity in the harbour for the duration of construction so as to avoid unnecessary interference with area users.
- Maintain watch for boat traffic and communicate with other vessels to maintain safe operations.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on recreational users of the waterfront is considered to be a **Minor Adverse Effect**. Standard mitigation measures and the application of best management practices have proven to be effective.

Criterion:	Potential for changes to use of waterfront for recreation
Indicator:	Loss of recreational amenities
Potential Effect:	Loss of a small beach to the east of the breakwater along St. Lawrence Park.

EFFECTS ASSESSMENT

A portion of the small beach to the east of the breakwater along St. Lawrence Park will be lost because of construction of the lakefill. This area of the beach is very small, and the public is not encouraged to access this area.

MITIGATION MEASURES

A similar sized beach will be established naturally over time where the northeast edge of the lakefill connects to the existing shoreline.

NET EFFECT

No Net Effect of the Project on recreational amenities is anticipated. The reestablishment of a similar beach over time will likely result in a no net loss of beach area.

Criterion:	Effects on residential properties, community facilities and institutions and businesses, during construction
Indicator:	Effects from increased noise, dust, traffic and site visibility during construction
Potential Effect:	Disruption to the use and enjoyment of residential properties, community facilities and institutions and business operations in vicinity of Project site and along haul routes.

EFFECTS ASSESSMENT

Throughout the construction period, residential properties, community facilities and institutions and businesses in the vicinity of the Project and along the haul routes may experience nuisance effects from noise, dust, traffic and site visibility. While the duration of construction is estimated to be approximately 14 months, depending on fill availability, approvals, weather and in-water working periods, and the actual construction period will be longer, nuisance effects will be more pronounced when construction activities are closer to shore. None of these effects are expected to be of sufficient magnitude to preclude the ongoing use of these residential properties, community facilities and institutions or businesses during construction, however their enjoyment may be diminished. Some residents, facility or business operators may choose to adjust how and when they might undertake outdoor activities during peak construction.

MITIGATION MEASURES

Mitigation measures are warranted to minimize disruption from nuisance effects (i.e. noise, dust, traffic) and site visibility. The following measures shall be implemented:

- Minimize nuisance effects by implementing the mitigation measures identified for the physical environment (i.e., air quality and noise) as outlined above in Section 7.2 above.
- No construction work on weekends and statutory holidays and between 7pm and 7am unless special permissions are obtained.
- Adhere to selected haul route(s) for delivery of lakefill materials, if designated by the City at the time of construction. During construction, the City will continue to implement a broad-based approach to notifying the public regarding construction schedule and activities that may be disruptive to people’s enjoyment of residential properties, community facilities and institutions and businesses in the vicinity of the Project and along the haul routes. As during the EA process a variety of methods can be employed, including postings on the City’s website, mail-outs/letters, newspaper advertisements and notices, social media, roadside signage, direct communications via email/phone. In addition, the City intends to:
- Utilize the existing 311 system available to Mississauga residents, facility and business operators for registering of public enquires and allow for their resolution in accordance with the City’s policies. The City will monitor and effectively respond to public complaints in a timely manner.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on the use and enjoyment of residential properties, community facilities and institutions and business operations is considered to be a **Minor Adverse Effect**. Standard mitigation measures and the application of best management practices have proven to be effective.

Criterion:	Effects on business activity during construction
Indicator:	Effects on business activity
Potential Effect:	Increased business activity due to presence of workforce and City spending on goods and services during construction (and establishment)

EFFECTS ASSESSMENT

During construction there will be a small workforce that may choose to purchase goods and services within Port Credit.

The City will need to purchase a wide range of goods and services to implement the 1PSEPM Project. Examples of goods likely to be required include armour stone and fill materials; materials for site infrastructure; sod and vegetation for plantings. Examples of required and barging services include surveying, engineering and design services; demolition, construction, trucking services; forestry services; environmental management services; landscape design services.

MITIGATION MEASURES

Measures are warranted to enhance local benefits. These include:

- Encouraging purchasing of goods and services from local business operations (i.e., City of Mississauga and Region of Peel) through an open and well advertised contracting or procurement opportunities.
- Investigate opportunities for sourcing goods and services from MCFN in consultation with the City's Procurement Services during the detailed design stage.
- Build capacity within MCFN to support the 1PSEPM Project's environmental management activities through their involvement in the detailed design and *Fisheries Act* Authorization process and other means as mutually agreed.

NET EFFECT

A **Minor Positive Effect** is anticipated. Positive effects are enhanced with greater involvement of the local business community and MCFN in Project planning and implementation.

7.5.2. EFFECTS OF ESTABLISHMENT

Criterion:	Area of open space or parkland created
Indicator:	Total area to be made available for recreation including trails
Potential Effect:	Creation of 18,000 m ² of parkland for community use and enjoyment

EFFECTS ASSESSMENT

The Project will create 18,000 m² of parkland and trail for community and visitor use and enjoyment. Public access and use of the existing marina site is not permitted. The waterfront trail will connect through this area from St. Lawrence Park in the east to J.J. Plaus Park in the west and permit users to access the multi-use trail providing vistas back to Port Credit.

MITIGATION MEASURES

None Warranted.

NET EFFECT

A **Major Positive Effect** can be anticipated. The 1PSEPM Project will add a substantial area of new parkland to the City’s existing waterfront park inventory and provide greater connectivity between parklands along the waterfront. This will serve to attract City residents and visitors to the waterfront and improve their waterfront experience.

Criterion:	Disruption to use and enjoyment of property during establishment
Indicator:	Effects of park and marina operations (air emissions, noise, dust, and traffic, site visibility) at residential properties, community facilities, institutions and businesses.
Potential Effect:	Marina and park operations are similar to existing conditions. There is potential for increased activity by park users by virtue of the larger park space thus, some community members may experience altered enjoyment of their private properties and community features as a result of this increased use.

EFFECTS ASSESSMENT

There is potential for increased activity by park users by virtue of the larger park space thus, some residents living near the marina and some visitors may experience increased noise and traffic during periods of peak use. This may result in increased enjoyment of recreational spaces and/ or reduced enjoyment of private properties and community features (e.g., St. Lawrence Park, Trail) as a result of this increased use.

This Project creates land to move the existing marina from the western wharf to the new land created around the eastern breakwater. As such, no significant change to current traffic patterns associated with the marina operation is anticipated. Marina and park operations are similar to existing conditions. There will be parking for the marina and parkland areas created as part of the 1PSEPM Project preferred alternative development.

MITIGATION MEASURES

Marina operations will comply with all municipal bylaws including, noise by-laws.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on the use and enjoyment of property during establishment is **Negligible**. This effect is likely to be best managed through adaptive management during the establishment phase.

Criterion:	Disruption to use and enjoyment of property during establishment
Indicator:	Effects of visibility of new lakefill area including park activities and marina operations at residential properties, community facilities, institutions and businesses.
Potential Effect:	Local residents living in dwellings facing Lake Ontario may experience a change to their use and enjoyment of their properties due to the visibility of the new lakefill and marina facilities, including parkland, parking areas and winter boat storage.

EFFECTS ASSESSMENT

Residents living in dwellings facing Lake Ontario may experience a change to their use and enjoyment of their properties due to the visibility of the new lakefill and marina facilities, including parkland, parking areas and winter boat storage. Currently, some residents and people at business locations (i.e., multi-storey hotels) see the breakwater, the existing docking facilities and the buildings and operations associated with the existing Port Credit Harbour Marina.

The new lakefill area will be landscaped however, it will take time for vegetation to grow such that it provides a visual screen. During the winter months, fencing and surveillance will be needed around winter boat storage. It is during the winter that the visual impact may be greater. For some residents and hotel patrons, views of the parking and winter boat storage may be considered unpleasant, particularly if not fully screened by vegetation plantings along the east side of the lakefill. In most cases, views of the lake will remain unobstructed. For others, screening of the existing PCHM and new views of the parkland created at the end of the lakefill might be considered as a positive change.

MITIGATION MEASURES

Mitigation measures are warranted to minimize disruption to people’s enjoyment of property during the establishment phase. Mitigation measures are:

- Involve local residents, groups with interest and businesses in the park planning process through public engagement to provide input into the City’s plans.
- The City will ensure that parkland is continuously maintained and that all parking and winter boat storage meets City requirements.
- Develop, implement, and maintain vegetation to screen, where possible, the parking/boat storage area from local residences.

NET EFFECT

Taking into the consideration the implementation of mitigation measures, the net effect of the Project on the use and enjoyment of residential properties is considered to be a **Minor Adverse Effect**. This effect is likely to be best managed through the involvement of local residents in the park and marina planning process and through adaptive management during the establishment phase.

Criterion:	Changes in community character
Indicator:	Opportunity to enhance the unique character of Port Credit Village and its marina functions along the waterfront.
Potential Effect:	“Keeping the Port in Port Credit” and the establishment of additional waterfront parkland will enhance the unique character of Port Credit Village.

EFFECTS ASSESSMENT

The relocation of the marina within the Port Credit Harbour basin and the provision of additional parkland is consistent with the desire to “keep the Port in Port Credit” and enhances the unique character of Port Credit Village. The Project is consistent with the vision developed through the Inspiration Port Credit process and as outlined in the Port Credit Local Area Plan. Specifically, the Project:

- supports Port Credit as a distinct waterfront community with public access to the shoreline, protected views and vistas to Lake Ontario, and active waterfront uses;
- enhances and promotes the pedestrian and cyclist environment, creating well connected and balanced parks and open spaces and reinforcing high quality-built form;
- supports the enhancement of the natural environment; and
- promotes a healthy and complete community by providing a range of opportunities to access the environment, recreational, educational, community and cultural infrastructure that can assist in meeting the day- to-day needs of residents.

The 1PSEPM Project also supports the objectives of the Comprehensive Master Plan, that the Mississauga City Council adopted OPA 65 for 1 Port Street East in 2017. In this context, the 1PSEPM Project should help the City achieve the following:

- supports the overall vision of Port Credit as an evolving waterfront village;
- celebrates the site’s urban waterfront context; and
- draws people to the water’s edge to live, work, make, learn, shop and play.

MITIGATION MEASURES

None warranted.

NET EFFECT

A **Major Positive Effect** can be anticipated. The 1PSEPM Project will enhance the unique character of Port Credit Village in a manner that is consistent with the vision developed through the Inspiration Port Credit process and as outlined in the Port Credit Local Area Plan.

Criterion:	Effects on business activity during establishment
Indicator:	Effects on business activity
Potential Effect:	With the larger community space enabled by the lakefill, there is potential for increased activity that may increase noise, air emissions and traffic in the area. At the same time this will draw additional potential customers to local businesses.

EFFECTS ASSESSMENT

The Project will create a new parkland and trails which will enhance connectivity across the waterfront in Port Credit. This has the potential to affect local businesses both positively and negatively. The park and connectivity will draw additional people to use the area creating additional potential customers for area businesses. Businesses may also experience nuisances related to traffic and/or noise.

MITIGATION MEASURES

None Warranted

NET EFFECT

A **Minor Positive Effect** is anticipated. Positive effects are enhanced with greater involvement of the local business community in Project planning and implementation.

7.6. CULTURAL ENVIRONMENT

7.6.1. EFFECTS OF CONSTRUCTION

Criterion:	Potential for displacement of built heritage resources due to construction
Indicator:	Presence or absence of built heritage resources and cultural heritage landscapes within the Project footprint
Potential Effect:	Potential for the displacement or disturbance of built heritage resources within the footprint of the Project.

EFFECTS ASSESSMENT

There are no built cultural heritage resources within the footprint of the Project nor immediately adjacent to the 1PSEPM Project site therefore, there will be no displacement nor disturbance of heritage resources.

MITIGATION MEASURES

None Warranted

NET EFFECT

No Net Effect of the Project on cultural heritage resources is anticipated.

Criterion:	Potential for marine- and land-based archaeological resources
Indicator:	Presence or absences of archaeological resources within the Project footprint
Potential Effect:	Potential for displacement or damage to archaeological resources during construction.

EFFECTS ASSESSMENT

Both the marine and on-land archaeological assessments conducted within the Project Study Area concluded that there are no marine or land based archaeological resources within the footprint of the Project. Therefore, there will be no displacement or risk of damage to archaeological resources. Notwithstanding this conclusion, should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act* (Scarlet Janusas Archaeology Limited, 2024).

MITIGATION MEASURES

Any person discovering the archaeological resources must cease alteration of the site immediately and the City is required to engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*. Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence. Further, the *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33* requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Service (Scarlet Janusas Archaeology Limited, 2024).

NET EFFECT

No Net Effect of the Project on archaeological resources is anticipated.

Criterion:	Potential for effect from construction and establishment on traditional uses of lands by Indigenous communities.
Indicator:	Extent of traditional uses of lands and waters within 1PSEPM Project Study Area
Potential Effect:	Construction activities and establishment (i.e., the presence of the lakefill) can potentially limit the ability for Indigenous communities to use the land and water for traditional uses.

EFFECTS ASSESSMENT

The 1PSEPM Project is being developed on the traditional territory of MCFN, who are the Aboriginal and treaty rights holders and host First Nation within the Regional and Local Study Areas. The 1PSEPM Project Site is an area of historical and cultural significance to MCFN. The Project Site is located at the mouth of the Credit River, which was once an essential part of MCFN’s settlements, trade, harvesting, and continues to be an important site for MCFN’s way of life and heritage today.

In addition, MCFN holds unextinguished Aboriginal rights and title over the waters, beds of water, and lakebeds throughout MCFN’s territory, including the Credit River. In 2016, MCFN submitted claims to Canada and Ontario to find a negotiated resolution reconciling their Aboriginal title to these lands and waters with the Crown and the public’s continued use of them.

The courts have found that Aboriginal title includes rights such as to participate in decision making about development and uses of the area, benefit from it, continue an ongoing relationship with the area, among other rights similar to fee simple title (Tsilhqot'in Nation v. British Columbia, 2014 SCC 44). This means that MCFN's Aboriginal title rights to the water and wands under water include: 1) the right to decide how the land/waters will be used, 2) the right of enjoyment and occupancy of the land/waters 3) the right to the economic benefits of the land/waters, and 4) the right to pro-actively use and manage the land/waters. These rights will be impacted by the 1 PSEPM Project and will require further discussion between the City and MCFN to craft appropriate mitigation and accommodation measures.

Notably, the courts have also found that consultation and accommodation must be focused on Aboriginal rights, not only "as an afterthought to the assessment of environmental concerns" (Clyde River (Hamlet) v. Petroleum Geo-Services Inc., 2017 SCC 40, para 51). Since the City has been delegated the duty to consult regarding the 1PSEPM Project, further discussions between the City and MCFN will be required to discuss and reach agreement on ways that MCFN's rights to participate in decision making, benefit from the economic development, and continue their cultural and spiritual relationship with the lands and waters, can be accommodated and addressed. For greater certainty, this may include reaching agreement on topics such as MCFN's involvement in decision-making, compensation, employment or contracting opportunities, as well as ongoing stewardship and monitoring opportunities.

The 1PSEPM Project also falls within an area of known or suspected historical occupation by the Six Nations of the Grand River as represented by the Elected Chief and Council and the Haudenosaunee Confederacy Chiefs Council (HCCC). The HCCC has delegated the Haudenosaunee Development Institute ('HDI') to represent HCCC interests in the development of lands within the traditional territory of the Haudenosaunee. HDI is also charged with ensuring that the perpetual care and maintenance of the Haudenosaunee interests is maintained. In addition, the Huron Wendat Nation currently located in Wendake, Quebec (Nation Huronne-Wendat) have historic ties and interests in areas along the north shore of Lake Ontario and they hold rights to engagement for all matters dealing with cultural heritage. As such, these Indigenous communities may also consider this 1PSEPM Project as infringing on their rights and interests.

MITIGATION MEASURES

Mitigation measures are warranted to minimize the potential for effect from construction on traditional uses of lands by Indigenous communities. Mitigation measures are:

- The City is committed to consulting with MCFN, throughout the design, development, and implementation of the 1PSEPM Project to discuss and reach agreement on ways that MCFN benefits from the Project, and continue their cultural and spiritual relationship with the lands and waters, can be accommodated and addressed. Consistent with the direction of the courts, these accommodation measures must be focused on accommodating impacts to MCFN's rights and not only on accommodating for 1PSEPM Project's environmental impacts and other concerns.

- The City will consult with MCFN who have indicated that they may wish to complete ceremonial or other site-visits prior to construction or during establishment. The City will provide MCFN with adequate notice and work to develop mutually agreeable provisions to ensure these activities can be completed by MCFN in a culturally appropriate manner and respecting the City's health and safety requirements.
- The City will continue to engage and communicate with other potentially interested Indigenous communities regarding their interests in relation to the 1PSEPM Project. Within their capacity to do so, the City will support requests to the Province to provide further mitigation measures for adverse environmental impacts considered in the EA and are committed to working with these other Indigenous communities to resolve issues of concern should they arise.

NET EFFECT

The City acknowledges the potential infringement of rights and interests with respect to the lands, waters, and resources claimed by MCFN. MCFN are the Aboriginal and treaty rights holders and host First Nation government within the Regional and Local Study Areas.

The results of this EA demonstrate that net adverse effects on the environment from the 1PSEPM Project are either minor or negligible in nature. The City has made commitments to mitigate impacts to MCFN rights as described in this EA.

7.7. COSTS

This capital cost of the conceptual design for the preferred alternative will be refined following the EA. The capital cost will include:

- Construction of berm and placement of fill material
- Shore protection
- Landscaping
- Site servicing

The cost of contingency, design, approvals and administration will also be part of the capital cost estimate. Additional cost estimates will also be prepared for the marina. The capital costs for the Project would need to be approved by Council following the EA approval by MECP.

8. MONITORING AND ADAPTIVE MANAGEMENT

8.1. MONITORING

The City and MCFN have noted that certain data regarding existing conditions in the study areas may be dated or become dated before the 1PSEPM Project begins construction or is ultimately established. The City, MCFN and others share a desire to undertake monitoring prior to and during construction, and in the establishment phase of the 1PSEPM Project to ensure the effectiveness of the Project design and mitigation measures, particularly with respect to aquatic and terrestrial habitats. MCFN has expressed their expectations for robust monitoring programs that can accurately assess residual impacts and identify the need for additional mitigation or remedial actions as adaptive management measures.

The development of a monitoring plan is an important part of the detailed design phase of the Project. A monitoring program serves several functions throughout the life of the 1PSEPM Project:

- **EA compliance monitoring** will ensure compliance with EA commitments and ensure that the 1PSEPM Project is constructed according to the conceptual design requirements assessed in the EA and final design elements.
- **Environmental performance monitoring** will determine if the 1PSEPM Project functions as intended during the establishment and post establishment phases. Monitoring information will be used to determine if the aquatic habitat is functioning as anticipated or if modifications are required.

During the detailed design stage and as part of the *Fisheries Act* Authorization process, the City will consult with MCFN and others to develop and implement these monitoring programs. The regulators, MCFN, and members of the public will be able to come for site visits, ask questions, provide input and discuss applicable mitigation and monitoring measures that may be required.

8.1.1. EA COMPLIANCE MONITORING

EA compliance monitoring for the 1PSEPM Project will address the following key issues related to the physical and biological effects and mitigation measures identified for the 1PSEPM Project by ensuring:

- compliance with all commitments made in the EA including the implementation of mitigative measures as identified in the EA;
- compliance with erosion and sediment control plans;
- compliance with stormwater management plans;
- compliance with turbidity management protocol;
- the implementation of aquatic habitat mitigation measures;
- compliance with avoidance of migratory breeding bird periods;

- the implementation of best management practices during construction (e.g. air quality mitigation measures for dust, vehicle emissions management, noise management);
- compliance with all federal, provincial and municipal permits, licenses and approvals;
- compliance with fuel storage and handling and spill response plans; and
- document the as-built features immediately following construction completion.

EA compliance monitoring will continue until final grading and the establishment phase is completed. Once completed, the environmental performance monitoring program will begin. Table 8.1 lists the commitments made during the EA that are subject to EA compliance monitoring. The City will adhere to these commitments if the Project proceeds.

Table 8.1: Summary of General Commitments Resulting from the 1PSEPM Project EA

Project Phase	Commitment	EA Report Section Title	EA Report Chapter or Section
Detailed Design	The conceptual design detailed in Chapter 6 will be refined during detailed design. The park design will include a public engagement process.	Description of the Preferred Undertaking	Chapter 6
	The City will ensure that an “Erosion and Sediment Control Plan” is developed that will apply for the duration of construction activities.	Physical Environment, Effects of Construction	Section 7.2.1
	The City will ensure that contractor(s) develop a construction phase “Spills Management Plan”.	Physical Environment, Effects of Construction	Section 7.2.1
	The City will develop a fish and fish habitat offset plan as part of the <i>Fisheries Act</i> Authorization.	Biological Environment, Effects of Construction	Section 7.4.1
	The City will develop a “Stormwater Management Plan” for the established lakefill.	Physical Environment, Effects of Establishment	Section 7.2.1
	The City will ensure that contractor(s) develop a construction phase “Fugitive Dust Management Plan”.	Physical Environment, Effects of Construction	Section 7.3.1
	The City will ensure that contractor(s) develop a construction phase “Noise Management Plan”.	Physical Environment, Effects of Construction	Section 7.3.1
	The City will develop a monitoring plan consisting of EA compliance monitoring and environmental performance monitoring.	Monitoring and Adaptive Management	Chapter 8
Construction	All in-water work will be completed during an appropriate in-water work timing window, as set out by Fisheries and Oceans Canada, to comply with fisheries regulations.	Biological Environment, Effects of Construction	Section 7.4.1
	The City will implement the mitigation measures identified for effects of Construction on all environmental components	Detailed Assessment of the Preferred Alternative	Chapter 7
	<ul style="list-style-type: none"> The material being used as lakefill shall meet the definition of “inert fill” in O.Reg. 347, having regard to relevant MECP lakefilling guidance, including the MECP document entitled “Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario” (2011). The City shall ensure that an appropriate testing process is undertaken during construction. 	Physical Environment, Effects of Construction	Section 7.2.1

Project Phase	Commitment	EA Report Section Title	EA Report Chapter or Section
	The City will ensure that vegetation removals will be offset by compensatory planting as part of the proposed park (wildlife friendly native, non-invasive trees and shrubs within the landscaping plan)	Biological Environment, Effects of Construction	Section 7.4.1
	The City will ensure that notice and details of the Project construction has been provided to PCHM to be distributed to users. In addition, construction information will be posted to the Project website	Socio-economic Environment, Effects of Construction	Section 7.5.1
	The City will implement the construction phase monitoring plan developed during detailed design consisting of EA compliance monitoring and environmental performance monitoring.	Monitoring and Adaptive Management	Chapter 8
Establishment	The City will undertake visual inspections of the breakwater revetments	Breakwaters	Section 6.3.1
	The City will maintain the marina, park space, multi-use trails and parking lot in accordance with current maintenance practices.	Facilities	Section 6.3.2
	The City will implement the mitigation measures identified for effects of Establishment on all environmental components.	Detailed Assessment of the Preferred Alternative	Chapter 7
	The City will implement the existing Goose Management program on the 1PSEPM Project site (as required).	Biological Environment, Effects of Establishment	Section 7.4.2
	The City will implement the establishment phase monitoring plan developed during detailed design consisting of EA compliance monitoring and environmental performance monitoring.	Monitoring and Adaptive Management	Chapter 8

8.1.2. ENVIRONMENTAL PERFORMANCE MONITORING

For the 1PSEPM Project, the purpose of environmental performance monitoring is to determine whether the Project design is achieving its desired outcomes during and after the establishment phase, in terms of:

- Resiliency of the lakefill to changing lake levels and coastal processes;
- Amount and quality aquatic habitat created or enhanced;
- The success of the vegetation plantings, the use of the site by birds and other wildlife, and the influence of park users and City operations on birds and other wildlife;
- The presence or absence of non-native invasive species, pests and nuisance wildlife; and
- Other matters as determined during detailed design.

Results of Environmental Performance Monitoring may trigger adaptive management measures where necessary and/or form the refinement of the as-built features of the lakefill and/or requirements of additional aquatic habitat compensation. Monitoring would commence at the completion of the 1PSEPM Project construction, following final grading and cover stabilization and when as-built documentation is complete.

The specific details and measures to be included in the environmental performance monitoring program for the 1PSEPM Project will be developed through the detailed design and into the construction phase.

9. RECORD OF CONSULTATION

9.1. CONSULTATION AND ENGAGEMENT OBJECTIVES

1PSEPM Project EA consultation activities met the requirements and best practice for the provincial EA process.

The following objectives guided EA consultation and engagement activities:

1. To meet the consultation and engagement requirements for a provincial Individual EA.
2. To provide opportunities to participate in the consultation and engagement processes to anyone interested.
3. To provide clear, concise information about the 1PSEPM Project that is easy for the public to understand and to clearly communicate the potential adverse impacts and benefits.
4. To create opportunities for meaningful two-way exchange of information between the proponents, their consultants, Indigenous communities, regulatory agencies, marina users, the public and other interested parties.
5. To produce accurate and comprehensive reports that capture all feedback and advice received.
6. To thoroughly review and consider all feedback and advice received through the consultation and engagement, demonstrating how that feedback and advice has influenced the 1PSEPM Project and its EA.

9.2. APPROACH TO REGULATORY CONSULTATION AND COMMUNITY ENGAGEMENT

The consultation process was designed to directly inform decision-making at key points in the EA. At each of these points, the public and agencies had the opportunity to provide their feedback and advice through the consultation mechanisms discussed above. The key points in the EA process are:

- Development and evaluation of 'Alternative Methods'.
- Selection of preliminary Preferred Alternative;
- Confirmation and refinement of Preferred Alternative;
- Assessment of impacts and mitigation measures; and
- Recommendations regarding monitoring and adaptive management plans.

Targeted consultation was undertaken on an as required basis with key stakeholders including representatives from:

- The local and surrounding neighbourhoods (including the general public, representatives of resident associations, and organizations with recreational, environmental, cultural, heritage, business, and other interests);
- The City of Mississauga, the Province of Ontario, and the Government of Canada; and
- Agencies (i.e., Credit Valley Conservation)

9.3. PUBLIC AND STAKEHOLDER ENGAGEMENT

9.3.1. NOTIFICATIONS

Consultation with the agencies, interested parties, stakeholders and public were ongoing throughout the EA Stage of the 1PSEPM Project. Consultation began with the publication and distribution of the Notice of Commencement for the EA and updates to the City's 1PSEPM Project webpage. Notifications of virtual PICs were emailed to those on the Project mailing list and mailed to surrounding area residents and businesses. Emails were also sent to regulatory agencies and Indigenous communities to provide notification and request meetings to continue to discuss the 1PSEPM Project at the EA Stage.

9.3.2. PUBLIC INFORMATION CENTRE #1

A virtual Public Information Centre (PIC) #1 took place online from February 17 to March 17, 2022. A recorded presentation was provided to explain the lakefill alternatives assessed and the preliminary preferred lakefill alternative. The public had access to the PIC materials online and hard copies were mailed upon request. This allowed residents to participate when it was convenient for them.

The City notified interested stakeholders of the PIC through an email to those on the mailing list, mailing to area residents and businesses, a notice in Mississauga News, eBlasts to the Project email list, social media advertising and posts, roadway signage, and posters at Port Credit Harbour Marina.

The public provided feedback through an online survey on the alternatives considered, the evaluation criteria and the results of the evaluation.

The City prepared a summary document with an overview of EA PIC #1, and responses to questions submitted through the survey. The City received 130 completed surveys and over 550 views to the online presentation. Topics of discussion and questions centered around the following:

- Marina continuity
- Environmental components
- Fishing boats
- Costs

- Marina services
- Wharf re-development by the Canada Lands Company
- Parkland
- Status of the Ridgetown
- Traffic and parking

Responses to questions posed and a summary of the EA PIC#1 were posted on the Project website. The feedback gathered informed the evaluation of the alternatives and the preferred lakefill alternative. In general, those providing feedback were supportive of the evaluation of alternatives and the preferred alternative.

To be notified of future engagement opportunities, including the next EA PIC, participants were asked to subscribe to news alerts to be kept up to date on the Project by email.

9.3.3. PUBLIC INFORMATION CENTRE #2

A virtual EA PIC#2 was held for a month starting on August 25, 2022. A recorded presentation was provided on the Project website and available through YouTube to present the preferred lakefill alternative, the preliminary design of the parkland space and marina along with an overview of key environmental effects. The public provided feedback through an online survey focusing on the Preferred Large Lakefill Alternative and the key features of the marina and parkland.

The City received 130 completed surveys and approximately 500 views of the online presentation. Topics of discussion and questions centered around the following:

- Amount of parking and the configuration of parkland and parking
- Impact of the Project on aquatic life, birds, and waterfowl
- Providing opportunities for recreation (e.g., a beach area for swimming and access for kayaks, canoes and paddle boards, a boat launch for personal watercraft)
- The resilience of the lakefill
- Noise from construction and noise from operation of the marina
- Construction duration
- Traffic impacts on Lakeshore Road
- Site visibility and landscaping

A 1PSEPM Project EA “Pop-up Event” took place on Saturday, August 27, 2022, at Credit Village Marina. Staff were onsite to answer questions and discuss the EA PIC#2 materials that were available at the event.

Participants of the pop-up event were asked to complete an online survey. The City prepared a summary document available on the Project website with an overview of EA PIC #2 and responses to questions submitted through the survey.

To be notified of future engagement opportunities, including the next EA PIC, participants were asked to subscribe to news alerts to be kept up to date on the Project by email.

9.3.4. PUBLIC INFORMATION CENTRE #3

Following EA PIC#1 and EA PIC #2, the City held EA PIC #3 virtually from September 14 to October 31, 2023. Creating a 24/7 community meeting, the public had access to the PIC materials, including the Draft EA document and the Record of Consultation on the Project website. The City also provided a recorded presentation to provide an overview of the Draft EA and present the preferred large lakefill alternative.

Hard copies were available at Port Credit Library and for mailing upon request. This allowed residents to participate when it was convenient for them. The City notified the public of the PIC through a mailing to area residents and businesses, a notice in Mississauga News, eBlasts to the Project email list, social media advertising and posts, roadway signage, and posters at Port Credit Harbour Marina.

In addition to the virtual engagement, the City also held a second “Pop-up Event” on Saturday, September 30, 2023, at Credit Village Marina, attended by over 150 people. City staff were onsite to answer questions and discuss the EA PIC #3 materials, including the Draft EA.

The public provided feedback through a survey. The City received 238 completed surveys and over 1,200 views to the online presentation. The City prepared a summary document that includes responses to feedback submitted through the survey.

To be notified of future updates, including the final EA submission, people were asked to subscribe to news alerts to be kept up to date on the Project by email.

9.3.5. SUMMARY OF PUBLIC COMMENTS AND RESPONSES

Table 9.1 provides a summary of the comments received from the public throughout the EA phase. Responses were developed by the City and the consultant team following each PIC.

Table 9.1: Summary of Public Comments and Responses

Theme	Comments or Questions	Comment Consideration / Question Response
Marina continuity	Is there an update on the Port Credit Harbour Marina lease?	At PIC#2 (August/September 2022) the City provided an update and advised participants that Canada Lands and Centre City Capital Ltd. have reached an agreement to extend the marina lease for the management of the Port Credit Harbour Marina. This lease extension allows for the continued operations of the existing marina and boating seasons while the City works on its marina plans.
Environmental components	How will the City manage potential Canada geese population issues on the new lakefill parkland?	City staff monitor geese populations annually across waterfront areas, including parks and marina facilities. Each year City staff work with various partners to implement a proven comprehensive Goose Management program that controls the population of resident geese within waterfront areas of the City. The Goose Management program will continue annually and will be applied to the new marina area.
	Is there a way to protect the small beach area east of the breakwater, which may be impacted by the lakefill construction?	This small beach largely falls within the Project footprint and will be removed. However, the beach will be re-established very slowly after the new lakefill is in place. The loss of this beach was identified as an impact of the Project in Chapter 7 of the EA.
	Will there be any impact to the nearby water treatment plant and the water flow in the lake?	Water flow in the lake will not change, as the new lakefill will not alter the water circulation patterns created by the existing breakwater. No impact on the water treatment plant is anticipated.
	How confident is the Project team that the large lakefill alternative will not have long-term negative effects on marine life and ecology?	A goal of the Project is to enhance lake and fish habitat and improve it over existing conditions. Lakefill Projects along the north shore of Lake Ontario are being designed to create fish habitat and monitoring data has demonstrated the success of these efforts. Fisheries and Oceans Canada and Credit Valley Conservation will be consulted during permitting.
	What kind of stormwater controls are being considered for the parking area and for the park?	The approach to storm water management is detailed in Chapter 6 of the EA. A storm water management plan will be developed during detailed design that outlines the design features and best management practices.
	Can you provide more details on the parking lot?	Detailed design of the parking lot will follow the EA. It is anticipated that the parking lot will serve the marina and park users.

Theme	Comments or Questions	Comment Consideration / Question Response
	What kind of environmental controls and spill response is there for the marina?	The City's two marinas are currently part of, and in good standing, with the Clean Marine Eco-Rating Program. This environmental program allows marina operators and businesses to follow best environmental practices to reduce and prevent water, air and land pollution associated with recreational boating activities in Ontario. The City also has protocols in place in the event of an environmental incident such as a spill. The City's existing protocols and the participation in the Clean Marine Eco-Rating Program would be extended to the proposed marina at 1 Port Street East.
	What will the green space be planted with? The marina parking area should be environmentally friendly and consider permeable parking.	Consideration to the use of permeable paving, and the type of plantings in the green space will be determined during detailed design, with emphasis on naturalized landscaping with native, non-invasive plants species.
	What will the water quality be like with 450 slips and boats?	The Project is creating the land base to move the existing marina operation. There is no anticipated change in marina use such that water quality would change and with the implementation of the Clean Marine Eco-Rating Program there is potential for improvements in water quality.
	Are there provisions that can mitigate against algae?	There are ongoing algae issues all along the north shore of Lake Ontario. Considerable scientific research is underway to understand the algae issue and recommend ways it may be managed. It is not anticipated that the proposed lakefill Project will alter the algae issues at this site
	How is this proposal being considered in the context of other improvements to the waterfront and the Credit River by the City?	The EA considers the impacts of the 1PSEPM Project in the context of existing and future baseline conditions, including other City improvements in proximity to the site. Waterfront parks are at capacity and new waterfront parkland would help to alleviate the pressure on existing parks.
	Will this Project be net zero carbon?	We are pleased to say that at the same time as the City approved the Climate Change Action Plan, Council also approved the Corporate Green Building Standard (December 2019) and the proposed marina building, should it be built, would be subject to these standards.
Fishing boats	What is happening with regards to the fishing boats?	The new marina will offer a variety of slip sizes to accommodate a wide range of boats, including commercial operations. Programming of the marina is an operational matter that will need to be undertaken following the EA in consultation with stakeholders.

Theme	Comments or Questions	Comment Consideration / Question Response
Marina services	Can boaters coming from other places arrive at the Marina for a day?	Yes, the proposed marina will accommodate slips for transient boaters.
	Where will boats be launched from?	There will not be a public boat launch at this location. Boat launching facilities are provided by the City at other waterfront locations, including Lakefront Promenade Marina and the future launch planned for Marina Park.
	Will winter boat storage be provided?	The conceptual design presented in Chapter 6 of the EA proposes the location and amount of boat storage possible. A more precise estimate of area for parking/storage for boats versus parkland will be an outcome of the detailed design process after the EA
	What is being proposed for boat security?	Security for boats will be addressed as part of the detailed design and development of detailed operation plan.
	Comments about not enough boat storage being provided on the lakefill.	Chapter 6 of the EA proposes the area required for parking and winter boat storage and the number of slips associated with the marina. The considerations around the location and amount of boat storage will be addressed during detailed design.
	What is the existing slip count in relation to the preferred large lakefill alternative?	The estimated number of slips at existing marina is 470, and the number of boats using the existing marina facility is approximately 250. The large lakefill alternative includes approximately 450 slips. The approximate mix of the slip sizes will be updated in the next phase of the study during detailed design.
	How can the public be assured that variances will not be approved to remove the marina aspect of this Project?	The approved Master Plan and Official Plan Amendment for this site identifies a marina to be provided on the lands between Elizabeth and Helene streets. The City has been working with Canada Lands based on this work. Canada Lands and the City executed an agreement for a phased transfer of the breakwater, 2 acres of land, and the deep-water harbour to the City for the purposes of developing a marina on the eastern portion of this site. This EA is building on previous work and studying alternatives to expand the land base for additional waterfront parkland and marina related function. The aim is to “Keep the Port in Port Credit”. A decision on the Project will be made by Council following EA approval.
	Questions with respect to how sewage from boats will be managed, provision of fuel, marina operations, safety and security, and management of litter in the park.	The City appreciates and notes all feedback received regarding the features and the operation of the marina. These issues will be addressed during detailed design and the development of a detailed operation plan. The public will have future consultation opportunities during the detail design phase of the Project.

Theme	Comments or Questions	Comment Consideration / Question Response
Wharf re-development by the Canada Lands Company	What is the future of the wharf development owned by Canada Lands?	A future mixed-use neighbourhood is permitted as per an approved Master Plan and Official Plan Amendment to be developed on the wharf portion of lands where the existing Port Credit Harbour Marina and service building is currently located. The timing of the development of the wharf is dependent on the landowner and related required approvals and will likely involve comprehensive community consultation. A future mixed-use development of the Canada Lands Company property is not subject to the EA Act and not within the scope of the 1PSEPM Project EA.
Parkland	Will the park be available year-round?	The park will be accessible to the public year-round, subject to weather condition.
	Is there a plan to have public washrooms on this site?	The City intends on providing a public washroom on site.
	What public attractions are planned for the future parkland, if any?	The programming and design details for the parkland will be determined during detailed design following the EA. The public will have an opportunity to provide feedback throughout that process.
	How does the City know more parkland is needed?	The City's waterfront parks are highly used and are currently at capacity. This Project presents a unique opportunity to provide new waterfront parkland and trail access along the water's edge where none currently exists. This site provides a unique opportunity to provide views of Port Credit, Lake Ontario, and beyond. The City's Waterfront Parks Strategy Refresh (2019) supports additional waterfront parkland, expanding continuous public shoreline access, and improving views and visibility to Lake Ontario. Specifically for the 1 Port Street East site, the Waterfront Parks Strategy Refresh recommends continuing to explore the opportunity for a full service marina and expansion of the eastern breakwater for public access.
	How will the park area be maintained?	The park area will be maintained in accordance with the City's current park maintenance standards and best practices.
Status of the Ridgetown	Will there be access to the Ridgetown as part of this Project?	Lakefilling around the Ridgetown is not proposed as part of the 1PSEPM Project EA. Public access to the Ridgetown is not permitted or planned for safety reasons.
	Can anything be done to remove or beautify the boat (the Ridgetown) at the south end of the breakwater?	The Ridgetown is part of the breakwater creating the harbour basin. It cannot be removed without creating significant impacts. Beyond serving its function as part of the breakwater, the Ridgetown is outside the scope of this Project.

Theme	Comments or Questions	Comment Consideration / Question Response
Traffic and parking in Port Credit / Lakeshore Road	How will the increased traffic due to boaters and park visitors be addressed?	This Project creates land to move the existing marina from the wharf to the new land created around the eastern breakwater on the east side of the harbour basin. There will be parking for the marina created as part of the site development. Chapter 7 of the EA indicates that no significant change to current traffic patterns associated with the marina operation is anticipated.
	How will traffic be impacted on Lakeshore?	During construction there is anticipated to be approximately 48 truckloads or 96 truck movements per day or approximately 12 per hour. Adding 12 vehicle movements per hour to the existing traffic volumes creates an imperceptible change. Opportunities to further minimize traffic by bringing more materials to site by barge will also be considered. There will be little or no change to traffic once the site is operational as there is no change to the capacity of the marina. Increased traffic may occur as a result of how the parkland is used.
Amount of parking and the configuration of parkland and parking	Concerns raised with respect to configuration of parkland and parking. Comment received that it is undesirable to have to walk through or past a parking lot to access the park area.	The trail on the eastern side of the lakefill will have vegetation screening from the parking area providing a park-like quality to the walk to the park. This is challenging to show on the drawings due to scale. Details of the park and parking design will be refined in the detailed design phases following the EA.
	A number of comments were received about the amount of parking proposed for the lakefill area. Some respondents thought there was too much parking while others thought there should be more parking.	The amount of parking provided is consistent with the requirements set out in previous planning documents. Many people commented that there should be no parking or winter storage at the site however, one of the purposes of the Project is to create land to permit the relocation of the marina from the west side of the basin to the east side of the basin. There is limited land available for the proposed marina at the 1 Port Street East site, therefore parking and winter storage will be located on the lakefill to make the marina economically viable. The parking provided will be available to both marina users and park user.
	Will there be adequate parking for vehicles with trailers designated?	No, there will not be designated parking for vehicles with trailers.
	Will the parking be paid and overnight?	There have been no decisions around paid parking or parking hours. Parking operation details will be addressed in detailed design.
Impact of the Project on aquatic life, birds, and waterfowl	Concerns were raised about the effect on birds and waterfowl currently using the area.	Construction activities will likely disturb the birds and waterfowl currently using the area. However, the species using the area are very tolerant of urban activities and will relocate to another part of the waterfront while construction is occurring. Dependent on timing, studies will be done prior to the start of construction to ensure nesting is not occurring.

Theme	Comments or Questions	Comment Consideration / Question Response
Providing opportunities for recreation (e.g., a beach area for swimming and access for kayaks, canoes and paddle boards, a boat launch for personal watercraft)	Suggestion to provide a beach area for swimming access	Coastal conditions in this area are not conducive to the creation of a beach as part of the 1PSEPM Project.
	Comments with respect to provision of a location to launch kayaks, canoes and paddle boards at the 1 Port Street East site.	There are no formal launching facilities for non-motorized boats planned for this site. Non-motorized launching facilities will be provided nearby at Marina Park and Lakefront Promenade Park.
The resilience of the lakefill	What consideration is being given to strong east wind, wave action and hazardous winter weather conditions?	The design of the lakefill takes into consideration the ability to withstand changing lake levels (flooding hazards) and coastal processes (wave action, shoreline erosion) including future changes associated with climate change. The design of shore protection will consider wave spray and reduce risks associated with severe waterfront conditions. Access may be limited during severe weather conditions
	What will be the increase in height of the lakefill compared to the existing breakwater?	The height of the lakefill will be higher than the existing rubble breakwater. The south tip of the landfill will be the highest and will gradually reduce in height as it approaches the existing shore. The south tip of the landform is anticipated to be in the order of 4 metres above average summer water level and the lakefill will match existing land elevation at the shore.
Noise from construction and noise from operation of the marina	Concerns about noise from construction and noise from operation of the marina (noisy boaters blasting music for example).	Construction activities will abide by the City's Noise Control By-law, which limits the noise impacts and hours of construction. The operation of the marina and the behaviour of individual boaters is an existing condition and is not anticipated to change because of the lakefill.
	Assuming the existing marina will be retained in some form during construction of the new landfill, what would be the effect on boaters continuing to use that marina, e.g. dust, noise, interference with access?	There may be some impacts to navigation and use within the basin for short periods of time. Boaters may experience construction noise and dust for short periods of time as a result of construction activities. Access to the existing marina is not anticipated to change.
Construction duration	Will construction be done over 14 consecutive months or is it intended to be spread over several years?	It is anticipated that the construction of the lakefill will take approximately 14 months to complete. However, there may be pauses in construction due to weather conditions, or times when construction may not be permitted because of permit conditions. This will add additional time to the total construction period.
Site visibility and landscaping	Will the trees and landscaping on the east side of the lakefill ensure that the parking lot is not visible from St Lawrence Park and Tall Oaks Park?	There will be trees and landscaping along the east side of the lakefill to provide some visual screening. The type of vegetation to be planted will be determined during detailed design. Visual screening will be an important parameter in selection of plant material.

9.4. ENGAGEMENT WITH INDIGENOUS COMMUNITIES

The 1PSEPM Project Team has been and continues to be engaged with Indigenous communities as per the Crown's Duty to Consult as delegated by MECP. Indigenous communities that have a documented history of occupying territory that includes the 1PSEPM Project or Regional Study Areas and have potential or established treaty rights around the Project or its vicinity will continue to be sent the information for the Project as it progresses. This information includes regular updates and information with respect to potential environmental impacts. As well, an open invitation extended to Indigenous communities to meet with the Project Team to discuss the proposal in greater detail and discuss issues of interest. Letters and emails were sent prior to each PIC to inform the Indigenous communities of the PICs as well as to invite the communities to meet with the City.

The following Indigenous communities were contacted during the EA process:

- Mississaugas of the Credit First Nation;
- Six Nations of the Grand River;
- The Haudenosaunee Confederacy Chiefs Council as represented by the Haudenosaunee Development Institute (HDI); and
- Huron Wendat Nation.

The Haudenosaunee Confederacy Chiefs Council has been in discussions with the City. In June 2022, HDI sent a letter to the City stating that they believe the Haudenosaunee rights and interests were not considered or incorporated into the current Individual EA Terms of Reference for the Project. The City acknowledges HDI's position.

The Huron-Wendat Nation informed the Project Team that they would like to continue to be notified of any future archaeological work associated with this Project. The City has continued to keep the Huron-Wendat Nation involved in the EA process and will inform Indigenous communities should the need for additional archaeological work arise.

Table 9.2 summarizes correspondences, meetings and other events held with Indigenous communities other than with MCFN.

Table 9.2: Indigenous Engagement (other than with MCFN)

Date	Type	Summary
HDI		
February 1, 2022	Email and Notice	Notice of Commencement of EA and Notice of PIC#1
February 7, 2022	Email	Response from HDI (Mr. Aaron Detlor) opposing the Project.
February 10, 2022	Email	City response to HDI (Mr. Aaron Detlor) noting HDI’s email has been forwarded by the City to MECP for review and direction. The City also attached a completed HDI “Application for Consideration and Engagement for Development”. A hard copy of the application, Marine Archaeological Assessment, a study area map, land title information, the anticipated EA schedule, along with the \$7,000 cheque were mailed to HDI at the address identified on the application.
February 10, 2022	Email	Response to City’s email from HDI (Mr. Aaron Detlor) expressing opposition to the Project.
February 10, 2022	Email	HDI thanked the City for the application and the payment of the processing for the initial review. HDI indicated a view that Mississauga has engagement obligations stemming from its Provincial Policy Statement commitments which to date have not been fulfilled. HDI indicated that Mississauga has failed to date to engage and coordinate on this and other Projects. HDI asked the City to withdraw the Terms of Reference. Canada Lands Company was copied and await their response.
February 16, 2022	Email	City email to HDI (Mr. Aaron Detlor) with digital copies of the Marine Archaeological Assessment, a study area map, and the anticipated EA schedule, which we couriered to HDI in hard copy. The City provided a Project overview and information about EA PIC #1. The City also attached a draft aquatic ecology technical memo, along with photographs and a bathymetry and rock type map. The City expressed a desire to chart out a mutually agreeable EA engagement process as the EA advances towards a final submission to the MECP. The City extended an open invitation for HDI to meet with the City. Subsequently, City email to HDI with requested title information for the 1 Port Street East property.
February 24, 2022	Email	City email notification to HDI that the EA PIC #1 presentation and survey are available on the Project website and accessible until March 17, 2022. A website link was provided. City asked if HDI would like a hard copy of these materials, including the presentation transcription.

Date	Type	Summary
February 28, 2022	Email	HDI reiterates that the Project will impair infringe and interfere with Haudenosaunee rights and that there was no engagement with respect to the Terms of Reference approved in September 2021. HDI noted specifically that they do not consent or agree that an EA is reasonable or appropriate for addressing established rights and interests particularly where there is no mechanism within the EA process to address accommodation. HDI indicated that they trust that the City of Mississauga will not be proceeding with this Project until such time as a process for engagement is agreed upon particularly where this Project will require the consent of the Haudenosaunee to move forward.
February 28, 2022	Email	HDI emailed the City to ask who the City reached out to at MECP and provide their contact information. The City responded the same day with the contact information for the MECP Project officer assigned to this Project.
February 17 to March 17, 2022	PIC#1	EA PIC #1 a pre-recorded presentation and an on-line survey. Presentation focused on the status of the 1PSEPM Project and EA process.
June 8, 2022	Meeting	The City had completed the application HDI required and provided HDI with the related fee to support capacity to consult in February 2022. City and HDI held a meeting to provide an update on EA and request for involvement in the 1PSEPM Project. HDI advised the City that the Project will impair infringe and otherwise interfere with Aboriginal Rights and interests. HDI asked for the City of Mississauga to commence discussions with respect to accommodations to infringements of Haudenosaunee rights and requested engagement to proceed on the Inspiration Port Credit Charting the Future Course Master Plan.
June 8, 2022	Email	HDI advised the City that the Project will impair infringe and otherwise interfere with Haudenosaunee rights and interests. HDI indicated that Haudenosaunee rights and interests were not considered or incorporated into the current Individual EA Terms of Reference for the Project. HDI does not believe the Individual EA to be an appropriate process for advancing the goals of reconciliation where when pre-empted by way of the ToR from discussing treaty rights, justifications and/or accommodations. HDI indicated that they do not consent to the process to date HDI asked for the City to commence discussions with respect to accommodations to infringements of Haudenosaunee rights and interests. HDI would also like engagement to proceed on the Inspiration Port Credit Charting the Future Course Master Plan which to date had not occurred. HDI attached a copy of a letter from HDI to the Canada Lands Company (CLC) regarding the 1PSEPM Project and the transfer of lands. HDI indicated that the CLC has never meaningfully engaged or consulted with the Haudenosaunee in respect of the Haudenosaunee rights and interests in the Subject Lands or any other lands held by the CLC.

Date	Type	Summary
June 9, 2022	Email	HDI confirmed their view that the Project will impair, infringe, and otherwise interfere with Aboriginal Rights and interests. HDI confirmed their request for the City of Mississauga to commence discussions with respect to accommodations to infringements of Haudenosaunee rights and requested engagement to proceed on the Inspiration Port Credit Charting the Future Course Master Plan.
August 11, 2022	Email and Notice	Notice of PIC#2 and encouragement of HDI to actively participate in the EA process, contact the City of Mississauga’s staff directly with comments or to discuss other ways the City can engage the community in the EA process.
August 25 to September 22, 2022	PIC#2	EA PIC #2 included a pre-recorded presentation and an on-line survey. Presentation focused on alternative means of carrying out the 1PSEPM Project and EA status.
September 19, 2022	Letter	City response to June 9, 2022, Email from HDI and provision of additional information requested at the June 9, 2022, meeting.
August 31, 2023	Email and Notice	Notice of EA PIC#3 sent to HDI, with encouragement to actively participate in the EA process, contact the City of Mississauga’s staff directly with comments or to discuss other ways the City can engage the community in the EA process.
September 14 to October 31, 2023	EA PIC#3	EA PIC #3 included a pre-recorded presentation and an on-line survey. Presentation focused on the preferred alternative for the 1PSEPM Project and EA findings.
November 17, 2023	Letter	Letter from MECP to the City regarding consultation by the City with HDI encouraging the City to continue with good faith efforts to engage HDI by sending Project updates and documentation.
November 20, 2023	Letter	Letter sent by MECP to HDI regarding the 1PSEPM Project. The letter to HDI emphasizes that the City must continue to provide HDI with notices about the proposed Project, as well as documentation and summaries submitted as part of the EA. The City must also continue to document any consultation activities with, and input from HDI on the EA and proposed Project. The ministry encouraged HDI, on behalf of HCCC, to continue to participate in the consultation process
Six Nations of the Grand River		
February 1, 2022	Email and Notice	Notice of Commencement of EA and Notice of PIC#1
February 17 to March 17, 2022	EA PIC#1	EA PIC #1 a pre-recorded presentation and an on-line survey. Presentation focused on the status of the 1PSEPM Project and EA process.

Date	Type	Summary
August 11, 2022	Email and Notice	Notice of EA PIC#2 and encouragement of the Six Nations of the Grand River to actively participate in the EA process, contact the City of Mississauga's staff directly with comments or to discuss other ways the City can engage the community in the EA process.
August 25 to September 22, 2022	EA PIC#2	EA PIC #2 included a pre-recorded presentation and an on-line survey. Presentation focused on alternative means of carrying out the 1PSEPM Project and EA status.
August 31, 2023	Email and Notice	Notice of EA PIC#3 sent to Six Nations, with encouragement to actively participate in the EA process, contact the City of Mississauga's staff directly with comments or to discuss other ways the City can engage the community in the EA process.
September 14 to October 31, 2023	EA PIC#3	EA PIC #3 included a pre-recorded presentation and an on-line survey. Presentation focused on the preferred alternative for the 1PSEPM Project and EA findings.
Huron Wendat Nation		
February 1, 2022	Email and Notice	Notice of Commencement of EA and Notice of PIC#1
February 17 to March 17, 2022	EA PIC#1	EA PIC #1 included a pre-recorded presentation and an on-line survey. Presentation focused on the status of the 1PSEPM Project and EA process.
August 11, 2022	Email and Notice	Notice of PIC#2 and encouragement of the Huron Wendat Nation to actively participate in the EA process, contact the City of Mississauga's staff directly with comments or to discuss other ways the City can engage the community in the EA process.
August 25 to September 22, 2022	EA PIC#2	EA PIC #2 included a pre-recorded presentation and an on-line survey. Presentation focused on alternative means of carrying out the 1PSEPM Project and EA status.
August 31, 2023	Email and Notice	Notice of EA PIC#3 sent to Huron Wendat Nation, with encouragement to actively participate in the EA process, contact the City of Mississauga's staff directly with comments or to discuss other ways the City can engage the community in the EA process.
September 14 to October 31, 2023	EA PIC#3	EA PIC #3 included a pre-recorded presentation and an on-line survey. Presentation focused on the preferred alternative for the 1PSEPM Project and EA findings.

9.4.1. ENGAGEMENT WITH THE MISSISSAUGAS OF THE CREDIT FIRST NATION

The 1PSEPM Project is being developed on the traditional territory of the Mississaugas of the Credit First Nation who are the Aboriginal and treaty rights holders and host First Nation government within the Regional and Local Study Areas. The 1PSEPM Project Site is an area of historical and cultural significance to MCFN. In addition, MCFN holds unextinguished Aboriginal rights and title over the waters, beds of water, and lakebeds throughout MCFN’s territory, including the Credit River. In 2016, MCFN submitted claims to Canada and Ontario to find a negotiated resolution reconciling their Aboriginal title to these lands and waters with the Crown and the public’s continued use of them.

The City first corresponded with MCFN in June 2019 at the commencement of the Terms of Reference stage of the EA process. Regular communications continued throughout the ToR stage. In February 2022, following the approval of the ToR and at the commencement of the EA stage, the City continued with its notifications and correspondence. MCFN were constrained in their ability to meet due to the ongoing COVID pandemic during most of this time period.

A formal introductory meeting was held in November 2022. Since then, a meaningful dialogue took place regarding MCFN’s rights and interests, issues and concerns regarding the 1PSEPM Project.

On July 20, 2023, the City provided MCFN with an advanced copy of the Draft EA report and an EA summary to MCFN for their review and comment. The City funded a peer reviewer to assist MCFN in this review. The City received MCFN’s comments on September 7, 2023, with a presentation by MCFN was made to the City regarding the peer review findings and MCFN’s priority issues. The City dispositioned each comment and shared this information with MCFN on October 16, 2023. Items that required further discussion were addressed in an in-person meeting held on March 13, 2024, with MCFN, the City and its consultants. The City has updated its original dispositioned comment table and the Draft EA was revised and updated accordingly and shared with MCFN.

On August 8, 2024, as requested at the March 13, 2024, in-person meeting, the City prepared a letter to MCFN outlining the benefits of the EA and the Project. The City also sent the tracked changes or “red-line” version of the draft EA to demonstrate how MCFN comments and direct input was used. The City also attached the updated Comment Disposition Table with City responses to MCFN comments to date, and Stage 1 Archaeological Assessment for the land-based portion of the Project.

Table 9.3 summarizes correspondences, meetings and other events held with MCFN. Key items are provided in the Record of Consultation report (under separate cover).

Table 9.3: Engagement with the Mississaugas of the Credit First Nation

Date	Type	Summary	Participants	Actions and Next Steps
February 1, 2022	Email with Letter and Notice	Notice of Commencement of EA and Notice of PIC#1 to MCFN. The email included a link to the approved ToR and the Project website . City wanted to chart out a mutually agreeable EA engagement process as the EA advances towards a final submission to the MECP. City suggested a meeting to develop this plan.	MCFN: <ul style="list-style-type: none"> • Chief Stacey Laforme • Department of Consultation & Accommodation (DOCA) City: <ul style="list-style-type: none"> • Beata Palka 	No response from MCFN.
February 17 to March 17, 2022	PIC#1	EA PIC #1 a pre-recorded presentation and an on-line survey. Presentation focused on the status of the 1PSEPM Project and EA process.	N/A	City posted PIC#1 summary report on the Project website .
March 24, 2022	Email	Request for a meeting and involvement in the 1PSEPM Project EA sent to MCFN. Three potential meeting dates were suggested by the City at the end of March 2022.	MCFN: <ul style="list-style-type: none"> • Chief Stacey Laforme • DOCA City: <ul style="list-style-type: none"> • Beata Palka 	No response from MCFN.
August 11, 2022	Email with Letter and Notice	Notice of PIC#2 sent to MCFN, with encouragement to actively participate in the EA process, contact the City of Mississauga’s staff directly with comments or to discuss other ways the City can engage the community in the EA process.	MCFN: <ul style="list-style-type: none"> • Chief Stacey Laforme • DOCA City: <ul style="list-style-type: none"> • Beata Palka 	No response from MCFN.
August 25 to September 22, 2022	PIC#2	EA PIC #2 included a pre-recorded presentation and an on-line survey. Presentation focused on alternative means of carrying out the 1PSEPM Project and EA status.	N/A	City posted PIC#1 summary report on the Project website .

Date	Type	Summary	Participants	Actions and Next Steps
September 1, 2022	Email	Update on EA PIC#2 and request for involvement in the 1PSEPM Project sent to MCFN. Forwarded letter previously sent to Chief Stacey Laforme and DOCA on August 11, 2022.	MCFN: <ul style="list-style-type: none"> • Mark LaForme • Casey Jonathan City: <ul style="list-style-type: none"> • Beata Palka 	No response from MCFN.
November 7, 2022	Email	MCFN requested a 30-minute introductory meeting with others at MCFN to discuss the 1PSEPM Project EA. City provided a Project status update via email with information about EA PIC #2 and a link to the Project website and availability for a meeting.	MCFN: <ul style="list-style-type: none"> • Casey Jonathan • Jessica Maurice City: <ul style="list-style-type: none"> • Beata Palka 	City and MCFN meeting scheduled for November 15, 2022.
November 9, 2022	Email	City shared the Marine Archaeological Assessment completed as part of the EA. The City previously shared this report with MCFN during the Terms of Reference stage in 2020 and offered to provide a hard copy.	MCFN: <ul style="list-style-type: none"> • Casey Jonathan • Jessica Maurice City: <ul style="list-style-type: none"> • Beata Palka 	N/A

Date	Type	Summary	Participants	Actions and Next Steps
November 15, 2022	Meeting (Virtual)	<p>Introductory meeting with MCFN about the 1PSEPM Project and the status of the EA. The City delivered a presentation regarding the 1PSEPM Project objectives, the preferred lakefill alternative, and the Project schedule. At MCFN’s request, the City provided an overview of previous communications with MCFN.</p> <p>MCFN requested that they review the EA prior to draft submission. As treaty holders, MCFN requires an elevated amount of review and engagement. MCFN indicated that this will be an iterative process where City will have to show how MCFN’s concerns have been addressed.</p> <p>MCFN requested to be involved in the detailed design of the preferred alternative following the EA approval/City’s approval for the Project to move ahead.</p> <p>MCFN Question: Who owns the current marina at 1 Port St.? City Response: Marina is privately-owned by Centre City Capital limited on lands leased from Canada Lands Company. The proposed marina is to be owned by the City.</p> <p>MCFN Question: What type of EA is this? City Response: This is an individual EA.</p> <p>MCFN Question: What is the area subject to EA? City Response: Clarification provided about area subject to the EA (not wharf lands)</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Casey Jonathan • Jessica Maurice <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • Anneliese Grieve (City’s Consultant) 	<p>City provided MCFN with dates for follow up virtual meeting with DOCA.</p> <p>City updated the overall EA schedule to allow time for MCFN review of EA prior to draft submission.</p> <p>MCFN to coordinate dates for a follow-up meeting</p>
January 27, 2023	Proposed Meeting (Virtual)	<p>MCFN proposed a follow-up meeting to discuss status of the 1PSEPM Project and EA, including a detailed presentation of the preferred alternative.</p>	N/A	<p>Meeting cancelled by MCFN due to illness.</p> <p>Meeting rescheduled for March 1, 2023.</p>

Date	Type	Summary	Participants	Actions and Next Steps
March 1, 2023	Meeting (Virtual)	<p>Presentation to MCFN on status of the 1PSEPM Project and EA, including the presentation of the preferred alternative.</p> <p>MCFN Question: What has been Fisheries and Oceans Canada’s (DFO) involvement. City Response: DFO has been involved in terms of data collection. Credit Valley Conservation (CVC) was also involved in data collection. DFO is an approval agency.</p> <p>MCFN Question: When was MCFN first contacted and consulted? City responded with dates and details.</p> <p>MCFN Question: Is there an opportunity to create more habitat along the east edge of the proposed lakefill? City Response: The water lot edge is along that side and is a constraint. Method of stacking of the rocks can help create habitat.</p> <p>MCFN Question: Why is there parking on the breakwater? City Response: Parking is essential to create an economically viable marina.</p> <p>MCFN Question: What will mitigate oil and fuel runoff? City Response: Best industry practices and low impact development features will mitigate impacts.</p> <p>MCFN Question: How will the marina practice sustainability? City Response: Marina green standards and industry best practices will be applied.</p> <p>MCFN Question: Is City familiar with MCFN’s water claim. City Response: City is very familiar with the claim. The claim was acknowledged in the TOR and again the EA. MCFN requested ongoing and direct dialogue regarding rights and interests with respect to this Project at a higher level within the City.</p> <p>MCFN restated that they would like to see the EA to provide comments and inquired about fees for engagement/ capacity dollars. City suggested that MCFN submit an email request outlining the requirements for MCFN review. MCFN indicated that they cannot provide an estimate of costs at this point.</p> <p>Request to create a shared City and MCFN digital folder for Project documents.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Jessica Maurice • Casey Jonathan • Fawn Sault • Mark Laforme • Abby Laforme <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • Olav Sibille • Tomasz Wlodarczyk (City’s Consultant) 	<p>City committed to afford MCFN with an opportunity to review the Draft EA prior to submission.</p> <p>City would allow four to six weeks for MCFN review prior to the PIC #3.</p> <p>City would provide MCFN with access to its EA Consultants if required.</p> <p>City provided MCFN with DFO and CVC contacts involved in the EA to date on May 5, 2023.</p> <p>City provided a contact from the City for these higher-level discussions regarding accommodation.</p> <p>City and MCFN to coordinate a follow-up meeting.</p>

Date	Type	Summary	Participants	Actions and Next Steps
March 3, 2023	Email and Letter	<p>MCFN’s letter outlines their Aboriginal Treaty Rights and interests with respect to the 1PSEPM Project.</p> <p>MCFN requested the City to undertake a parallel consultation process to determine how Aboriginal and treaty rights can be respected as part of any proposed development plans, including in stewardship and environmental processes; with the goal of ensuring that the final EA submitted to the government can be done with MCFN’s full support and that there are no outstanding concerns about unaddressed impacts on Aboriginal or treaty rights.</p>	<p>Letter To:</p> <ul style="list-style-type: none"> • City of Mississauga, Mayor Bonnie Crombie <p>From:</p> <ul style="list-style-type: none"> • Chief R. Stacey Laforme 	City to respond to MCFN’s letter.
March 20, 2023	Email and Letter	Letter to respond to MCFN letter of March 3, 2024. The letter emphasizes that the City of Mississauga recognizes and upholds MCFN’s rights regarding meaningful consultation as well as recognizing the ongoing negotiations and unceded rights regarding all bodies and systems of water throughout your territory.	<p>To:</p> <ul style="list-style-type: none"> • Gimaa Laforme <p>From:</p> <ul style="list-style-type: none"> • City of Mississauga, Mayor Bonnie Crombie 	City to continue to reach out and schedule meetings with MCFN.
March 29, 2023	Email	City provided MCFN with a high-level schedule of EA next steps, and dates for a follow up meeting.	<p>MCFN:</p> <ul style="list-style-type: none"> • Chief Stacey Laforme • Mark LaForme • Fawn Sault • Casey Jonathan • Jessica Maurice <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • John Dunlop • Olav Sibille 	City and MCFN meeting scheduled for April 28, 2023

Date	Type	Summary	Participants	Actions and Next Steps
April 28, 2023	Meeting	<p>Follow-up meeting with MCFN. MCFN extended their gratitude to the City for responding to their letter and recognizing MCFN’s rights and interest in the Project and expressed appreciation for consultation on the Project.</p> <p>MCFN requested meetings to walk through the Draft EA and habitat impacts and compensation.</p> <p>MCFN would like to be kept in the loop and support any funding applications for the Project made by the City.</p> <p>City responded to MCFN’s earlier question regarding DFO and CVC contacts and will follow up with an email. MCFN noted someone from DOCA will reach out to MCFN.</p> <p>MCFN expressed a desire to continue to work with the City beyond the EA to provide input on more detailed design in future.</p> <p>City offered to share studies that inform the EA. MCFN requested a data room for documents. MCFN requested a summary of each chapter in advance of the EA completion.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Chief Stacey Laforme • Mark LaForme • Fawn Sault • Casey Jonathan • Jessica Maurice <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • John Dunlop • Olav Sibille • Tomasz Wlodarczyk (City’s Consultant) 	<p>City provided CVC and DFO contacts to MCFN via email on May 5, 2023.</p> <p>City shared background documents through the shared digital folder (BOX software) on June 12, 2023.</p>
June 23, 2023	Email	<p>Correspondences between City and MCFN providing MCFN with Draft EA Report Summary Report.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Casey Jonathan • Fawn Sault • Mark LaForme • Kathleen Ryan <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • John Dunlop 	<p>City to arrange meeting to present Draft EA findings</p> <p>City to send complete Draft EA to MCFN within a month</p>

Date	Type	Summary	Participants	Actions and Next Steps
July 5, 2023	Meeting (Virtual)	<p>Meeting held to present the Draft EA findings.</p> <p>City walked MCFN through the EA summary. The document is a 30-page overview of the EA and includes a summary of each chapter.</p> <p>City indicated that they plan to attend the July 28 DOCA open house, and set up a booth about the EA.</p> <p>MCFN indicated that they are supportive of City continuing discussions with MCFN parallel to EA PIC #3. PIC#3 can proceed.</p> <p>City and MCFN agreed to continue discussions and set up another meeting once the Draft EA document is provided and reviewed by MCFN.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Fawn Sault • Mark LaForme <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • Olav Sibille • John Dunlop • Tomasz Wlodarczyk (City's Consultant) 	<p>City uploaded an updated EA summary to the BOX folder on June 23, 2023</p> <p>City to send MCFN the full Draft EA Report</p> <p>MCFN to send the City the DOCA event details, including timing and location.</p> <p>City to finalize the EA PIC #3 dates and share the Notice with MCFN.</p>
July 20, 2023	Email	<p>Correspondences between City and MCFN providing MCFN with Draft EA Report.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Casey Jonathan • Fawn Sault • Mark LaForme • Kathleen Ryan <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • John Dunlop 	<p>Follow-up City and MCFN meeting scheduled for September 7 to discuss the Draft EA comments.</p>

<p>September 7, 2023</p>	<p>Meeting (Virtual)</p>	<p>Meeting to review MCFN comments on Draft EA. MCFN walked the City through their review memorandum. Discussion focused on:</p> <p>Aquatic Species at Risk</p> <p>American Eel and Lake Sturgeon consideration should be made for these species and habitat enhancements.</p> <p>Adhere to timing windows for Lake Sturgeon, young Lake Sturgeon are sensitive in the spring (April/May)</p> <p>Fish Habitat (General)</p> <p>MCFN Question: When were the actual site assessments completed? City Response: Summer of 2020 by the consulting team. Consulting team to double check date of CVC data.</p> <p>MCFN Question: Is there any anticipated fish salvage (removal of fish prior to construction)? City Response: This is not anticipated. Construction is done with clean stone material and turbidity is monitored. The area is not going to be enclosed during construction. Some precautions may be taken to remove fish near the breakwater. If an area is enclosed then fish would be removed.</p> <p>No new info on the in-water works at this time. MCFN requested to see in writing what the restricted period are. City indicated that timing windows to be determined with DFO during permitting and based on detailed design.</p> <p>MCFN acknowledged that there will always be some fish mortality and that fish will be disturbed by the noise. They will likely escape the area.</p> <p>Coastal Engineering</p> <p>MCFN Question: Can we incorporate more bio-engineering/less armourstone on the east breakwater? City Response: Work is constrained to the City's waterlot. Design incorporates softer treatment on the south end – gravel, cobble. City can see if there are opportunities for more greenery in detailed design. For armourstone to be stable, it has to touch stone on all sides.</p> <p>MCFN indicated that according to the Province, they own the lake bottom east of the site.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Kathleen Ryan • Casey Jonathan • Fawn Sault • Desiree Schram <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • Tomasz Wlodarczyk (City's Consultant) • Milo Sturm (City's Consultant) 	<p>MCFN to share their memorandum containing their review comments.</p> <p>City indicated that it will proceed with PIC#3 and MCFN review of Draft EA report in parallel.</p> <p>City committed to preparing a comment disposition table for review by MCFN</p>
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Date	Type	Summary	Participants	Actions and Next Steps
		<p>MCFN Question: Can there be habitat creation on the Province’s lake bottom? City Response: Yes if City can secure access to the adjacent lake bottom.</p> <p>City recognizes MCFN’s comment regarding their ownership of the water lots.</p> <p>Other</p> <p>MCFN requested that the City explore Ridgetown as a habitat opportunity – suggestion to get creative with this, aquatic habitat on bottom and terrestrial on top.</p> <p>City indicated that it would refer to the Indigenous Art Walk as a potential opportunity for public art and signage in the EA.</p>		
September 8, 2023	Email and Memo	<p>As a follow up to the September 7 meeting, MCFN provided a memo with comments on the Draft EA entitled “Review of the Draft Environment Assessment for the 1 Port Street East Proposed Marina” Prepared for: Mississaugas of the Credit First Nation % Casey Jonathon (Major Projects). Prepared by: Kathleen Ryan (BSc., MSc.). Dated: August 30, 2023. A copy of this memorandum is attached.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Casey Jonathan <p>City:</p> <ul style="list-style-type: none"> • Beata Palka 	<p>City to prepare a comment disposition table to address MCFN comments and arrange for follow-up meeting.</p>
September 11, 2023	Email with Letter and Notice	<p>Notice of PIC#3 sent to MCFN, with encouragement to actively participate in the EA process, contact the City of Mississauga’s staff directly with comments. The letter also included an invitation to participate in a “pop-up” event at the Port Credit Village Marina on September 30, 2023, to present the findings of the EA.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Kathleen Ryan • Casey Jonathan • Fawn Sault • Desiree Schram <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • Tomasz Wlodarczyk (City’s Consultant) • Milo Sturm (City’s Consultant) 	<p>City preparing disposition table to MCFN Draft EA comments.</p>

Date	Type	Summary	Participants	Actions and Next Steps
September 14 to October 31, 2023	EA PIC#3 and Pop-up Event	EA PIC #3 was held virtually from September 14 to October 31, 2023 (ongoing), with a pre-recorded presentation and survey. The City presented Draft EA findings and sought feedback on the 1PSEPM Project and the Draft EA. The City also held a pop-up event with staff available to answer questions and discuss the 1PSEPM Project.	N/A	N/A
October 16, 2023	Email with City's Comment Disposition Table.	The City prepared a Comment Disposition Table that addressed each MCFN comment systematically with a response, highlighting where there was agreement with MCFN Comment. Otherwise, the table provided more information or commentary to provide context.	MCFN: <ul style="list-style-type: none"> • Casey Jonathan • Fawn Sault City: <ul style="list-style-type: none"> • Beata Palka 	MCFN were asked to review the table and provide commentary as to their agreement or disagreement with the City's dispositions, or to identify priority areas for further discussion.
November 30, 2023	Email	MCFN requested a discussion on some of the Draft EA sections to better reference MCFN's rights over the area as well as MCFN's expectations for meaningful engagement and partnership on the Project going forward	MCFN: <ul style="list-style-type: none"> • Casey Jonathan City: <ul style="list-style-type: none"> • Beata Palka 	City to focus discussions as requested by MCFN.

Date	Type	Summary	Participants	Actions and Next Steps
November 30, 2023	Meeting	<p>City provided a status update on the EA and a high-level overview of previous communications with MCFN Discussion on MCFN rights and future engagement included:</p> <ul style="list-style-type: none"> • MCFN is in the process of negotiating aboriginal title to these lands and waters. • MCFN has the right to decide how lands are being used. • MCFN is happy with the importance of this site being emphasized in the EA and disposition table • MCFN wants ongoing stewardship role and not just economic opportunity. • MCFN likes the issues chart with acknowledging history, and detailed tracking of comments and responses. Disposition table is well done • MCFN want to provide additional edits to the draft EA, beyond the items identified in the cultural environment, Indigenous community pieces, existing land use, history. • MCFN’s main concern is that the Project is altering and destroying habitat (39,000 sq. m habitat deficit). 	<p>MCFN:</p> <ul style="list-style-type: none"> • Kathleen Ryan • Casey Jonathan • Fawn Sault • Alexandria Winterburn, • Erika Voaklander <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • John Dunlop • Tomasz Wlodarczyk (City’s Consultant) 	<p>City to provide entire EA in word copy.</p>

<p>March 13, 2024</p>	<p>In-person Meeting</p>	<p>MCFN, the City and consultant met in-person at the Mississauga City Hall to discuss items flagged by MCFN in the City’s comment disposition table as requiring further discussion. Key themes that were discussed were:</p> <p>Involvement/consultation with MCFN throughout the 1PSEPM Project. The City indicated its support of this through EA, Detailed Design, Implementation, Monitoring and clearly stated in the next version of the EA.</p> <p>Aquatic and Terrestrial Habitat. MCFN involvement / consultation regarding the Fisheries Act authorization process and in identify suitable habitat offsets with improvements and creation of new habitat, creating a healthy space. MCFN and the City want to create a Project that improves the environment. The City’s Forestry section will take the lead on this work in the future.</p> <p>Species at Risk. CVC has been contacted by the consulting team (i.e. Eel population). American Eels were introduced to Lake Ontario and Eel habitat can be created. DFO, CVC and MCFN share this goal. There will be on-site and off-site habitat compensation or offsets required.</p> <p>Questions were raised regarding the rules around the use of fill in the lakefill.</p>	<p>MCFN:</p> <ul style="list-style-type: none"> • Casey Jonathan • Fawn Sault <p>City:</p> <ul style="list-style-type: none"> • Beata Palka • Sharon Chapman • John Dunlop • Tomasz Wlodarczyk (City’s Consultant) 	<p>Final Draft EA will have reference to specific City commitments to MCFN Fisheries Act authorization is law and MCFN will be recognized as a partner with the City through detailed design, Fisheries Act Authorization (including offsetting) Project implementation and monitoring.</p> <p>Final Draft EA to address gaps regarding aquatic Species at Risk</p> <p>Final Draft EA to clarify the rules around the use of fill in the lakefill.</p> <p>MCFN requested that the City provide a memorandum regarding the benefits of the Project to MCFN.</p> <p>City agreed to share a “red-line” Final Draft EA with MCFN.</p> <p>City and MCFN agreed that there is a need to determine an appropriate mechanism(s) for City and MCFN to continue detailed discussions beyond the EA phase.</p> <p>Chief Sault asked to meet</p>
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Date	Type	Summary	Participants	Actions and Next Steps
				with City Manager about an MOU with MCFN MCFN to provide letter(s) to City in support of the EA and to support funding applications pending review of the revised comment disposition table and the “red-line” Final Draft EA.
June 17 to June 19, 2024	Email	Email from MCFN to notify the City that there is a new Project contact, Richard Karsseboom. MCFN noted there has been great work collaborating between the City and MCFN on this Project.	MCFN: <ul style="list-style-type: none"> • Casey Jonathan City: <ul style="list-style-type: none"> • Beata Palka 	City to send future correspondences to new MCFN contacts
August 8, 2024	Email and Letter	As requested at the March 13, 2024, meeting, the City prepared a letter to MCFN outlining the benefits the City wants to highlight to MCFN as a result of the EA. The City also sent the tracked changes version of the EA, disposition table with City responses to MCFN comments, and Stage 1 Archaeological Assessment for the portion of site proposed for the marina building.	MCFN: <ul style="list-style-type: none"> • Mark LaForme • Richard Karsseboom City: <ul style="list-style-type: none"> • Beata Palka • John Dunlop • Sharon Chapman 	MCFN to let the City know if there are any additional questions or comments on the draft EA.

Out of respect for the input provided by MCFN, the following table consolidates the key commitments made by the City to MCFN regarding its involvement in moving forward with the 1PSEPM Project.

Table 9.4: Summary of Commitments to MCFN Resulting from Engagement on the 1PSEPM Project EA

Project Phase	Commitment	EA Report Chapter or Section Title	EA Report Chapter or Section
General	The City is committed to consulting MCFN, throughout the detailed design and implementation of the 1PSEPM Project to discuss and reach agreement on ways that MCFN's rights can be accommodated and addressed.	Cultural Environment	Section 7.6
Detailed Design	The detailed design will be developed in consultation with MCFN.	Detailed Design Framework	Section 6.6
	During the detailed design stage, the City will consult with MCFN and others to: <ul style="list-style-type: none"> Identify and incorporate accurate, culturally appropriate, and informative signage or similar components related to the significance of the Project's location, historically and today, to MCFN and the City. Both the City and MCFN desire to recognize Indigenous culture in the 1PSEPM Project. 	Description of the Preferred Undertaking	Section 6.6
	During the detailed design stage, the City will consult with MCFN and others to: <ul style="list-style-type: none"> Identify and incorporate feasible bioengineering approaches (natural fiber blankets and planting native vegetation buffers for shoreline stabilization). It is acknowledged that the severity of the coastal conditions may not allow for the use of bioengineering options along the shoreline of the lakefill. Bioengineering will however be considered for offsetting measures to be undertaken away from the 1PSEPM Project. 	Description of the Preferred Undertaking	Section 6.6
	During the detailed design stage, the City will consult with MCFN and others to: <ul style="list-style-type: none"> Develop feasible vegetation plans including how those can support creating a naturalized habitat less used by the public (e.g., to provide quality habitat for species such as migratory birds and habitat preferences of local at-risk wildlife). The MCFN have identified the Monarch Butterfly, Mottled Duskwing, and turtles as species that should be considered in the development of vegetation plans. 	Detailed Design Framework	Section 6.6
	The City will ensure that the contractor(s) develop a construction phase "Surface Water Quality" management plan aimed at minimizing turbidity and the resuspension of potentially contaminated sediments in the marina basin and Lake Ontario. MCFN will be consulted on a draft plan before it is finalized and included as part of the detailed design and/or Fisheries Act Authorization. The plan will include a regular monitoring component.	Physical Environment, Effects of Construction	Section 7.2.1
	The City will ensure that an "Erosion and Sediment Control Plan" is developed that will apply for the duration of construction activities. MCFN will be consulted on a draft plan	Physical Environment,	Section 7.2.1

Project Phase	Commitment	EA Report Chapter or Section Title	EA Report Chapter or Section
	before it is finalized and included as part of the detailed design and/or Fisheries Act Authorization. The plan will include a regular inspection plan.	Effects of Construction	
	The City will ensure that contractor(s) develop a construction phase “Spills Management Plan”. MCFN will be consulted on a draft plan before it is finalized and included as part of the detailed design and/or Fisheries Act Authorization.	Physical Environment, Effects of Construction	Section 7.2.1
	Develop a “Stormwater Management Plan” for the established lakefill. MCFN will be consulted on a draft plan before it is finalized and included as part of the detailed design and/or Fisheries Act Authorization. The plan will include a regular inspection and monitoring component.	Physical Environment, Effects of Establishment	Section 7.2.1
	The City will ensure that contractor(s) develop a construction phase “Fugitive Dust Management Plan”. MCFN will be consulted on a draft plan before it is finalized and used by the City or its contractors.	Physical Environment, Effects of Construction	Section 7.3.1
	The City will ensure that contractor(s) develop a construction phase “Noise Management Plan”. MCFN will be consulted on a draft plan before it is finalized and used by the City or its contractors.	Physical Environment, Effects of Construction	Section 7.3.1
	During the detailed design stage and as part of the Fisheries Act Authorization process, the City will consult with MCFN and others to develop and implement monitoring programs. The regulators, MCFN, other interested Indigenous communities and members of the public will have opportunities for site visits, ask questions, provide input and discuss applicable mitigation and monitoring measures that may be required. Opportunities for MCFN members to work with City staff or consultants will be identified.	Monitoring and Adaptive Management	Chapter 8
Fisheries Act Authorization	The City will develop a fish and fish habitat offset plan as part of the <i>Fisheries Act</i> Authorization in collaboration with MCFN. MCFN can participate directly in the development of the provisions to be contained in the Authorizations, including specific roles and responsibilities regarding monitoring.	Biological Environment, Effects of Construction	Section 7.4.1
	The City will develop a fish and fish habitat offset plan as part of the <i>Fisheries Act</i> Authorization. In seeking the <i>Fisheries Act</i> Authorization from DFO, the City will consult with MCFN and others to: <ul style="list-style-type: none"> • Investigate the feasibility of the creating and/or enhancing fish habitat along the eastern side of the east breakwater to provide a larger range of habitat function (forage, refuge, spawning, nursery) for fish, without affecting public safety or the function of the Project. 	Detailed Design Framework Biological Environment, Effects of Construction	Section 6.6 and Section 7.4.1

Project Phase	Commitment	EA Report Chapter or Section Title	EA Report Chapter or Section
	<p>The City will develop a fish and fish habitat offset plan as part of the <i>Fisheries Act</i> Authorization. In seeking the <i>Fisheries Act</i> Authorization from DFO, the City will consult and work collaboratively with MCFN and others to:</p> <ul style="list-style-type: none"> Investigate the feasibility of the creating and/or enhancing fish habitat in areas proximal to the Credit River and/or within the Credit River watershed and other opportunities aimed at addressing the fish habitat deficit created by the Project. The City anticipates feasible fish habitat offsets will be reflected in the Fisheries Act Authorization for the 1PSEPM Project. 	<p>Detailed Design Framework Biological Environment, Effects of Construction</p>	<p>Section 6.6 and Section 7.4.1</p>
	<p>The City will develop a fish and fish habitat offset plan as part of the <i>Fisheries Act</i> Authorization. In seeking the <i>Fisheries Act</i> Authorization from DFO, the City will consult and work collaboratively with MCFN and others to:</p> <ul style="list-style-type: none"> Investigate feasible opportunities for the incorporation of habitat suitable for American Eel and Lake Sturgeon in the habitat feature at the south end of the Project site, including the provision of abundant large interstitial habitat, benthic invertebrate habitat, low and high-energy zones as part of the habitat offsetting plan. Investigate feasible opportunities for the incorporation of habitat suitable for American Eel and Lake Sturgeon in areas proximal to the Credit River, within the Credit River watershed and/or Lake Ontario. 	<p>Detailed Design Framework Biological Environment, Effects of Construction</p>	<p>Section 6.6 and Section 7.4.1</p>
	<p>In seeking the <i>Fisheries Act</i> Authorization from DFO, the City will consult with MCFN and others to:</p> <ul style="list-style-type: none"> Integrate requirements for site observations during construction activities that would trigger fish salvage. 	<p>Detailed Design Framework Biological Environment, Effects of Construction</p>	<p>Section 6.6 and Section 7.4.1</p>
<p>Construction</p>	<p>The City will ensure that vegetation removals will be offset by compensatory planting as part of the proposed park (wildlife friendly native, non-invasive trees and shrubs within the landscaping plan). The City will consult with MCFN and others to:</p> <ul style="list-style-type: none"> develop feasible landscaping and vegetation plans including how those can support creating a naturalized habitat less used by the public (e.g., to provide quality habitat for species such as migratory birds and habitat preferences of local at-risk wildlife). The MCFN have identified the Monarch Butterfly, Mottled Duskwing, and turtles as species that should be considered in the development of vegetation plans. 	<p>Biological Environment, Effects of Construction</p>	<p>Section 7.4.1</p>

Project Phase	Commitment	EA Report Chapter or Section Title	EA Report Chapter or Section
	Investigate opportunities for sourcing goods and services from MCFN in consultation with the City's Procurement Services during the detailed design stage. Efforts will be made to build capacity within MCFN to support the 1PSEPM Project's environmental management activities through their involvement in the detailed design and <i>Fisheries Act</i> Authorization process and other means as mutually agreed.	Socio-economic Environment, Effects of Construction	Section 7.5.1
	The City will work consult with MCFN who have indicated that they may wish to complete ceremonial or other site-visits prior to construction or during establishment. The City will provide MCFN with adequate notice and work to develop mutually agreeable provisions to ensure these activities can be completed by MCFN in a culturally appropriate manner and respecting the City's health and safety requirements.	Cultural Environment, Effects of Construction	Section 7.6.1
	During construction, the City will consult with MCFN in implementing monitoring programs. The regulators, MCFN, other interested Indigenous communities and members of the public can come for site visits, ask questions, provide input and discuss applicable mitigation and monitoring measures that may be required.	Monitoring and Adaptive Management	Chapter 8
Establishment	During establishment, the City will consult with MCFN in implementing monitoring programs. The regulators, MCFN, other interested Indigenous communities and members of the public can come for site visits, ask questions, provide input and discuss applicable mitigation and monitoring measures that may be required. Opportunities for MCFN members to work with City staff or consultants will be identified.	Monitoring and Adaptive Management	Chapter 8
	The City will undertake visual inspections of the breakwater revetments and aquatic habitat features. MCFN can participate in these inspections.	Breakwaters	Section 6.3.1
Post EA Modifications	Should a material change be required to the 1PSEPM Project during construction and establishment, a screening process will guide the preparation of a technical memorandum that the City will submit to the appropriate groups with interest, MCFN as well as other interested parties for review (in consultation with the MECP). If the proposed modification results in an increase or worsening of the identified effects, further regulatory action may be required to assess the effects and identify appropriate mitigation. Any further regulatory action may require further consultation with MCFN, public consultation and/or broader agency consultation.	Screening Questions for Post-EA Modifications	Section 10.3

9.5. AGENCY CONSULTATION

Following the approval of the Terms of Reference, the City maintained contact regulatory agencies throughout the EA Stage of the Project. Regular contact began with the publication of the Notice of Commencement for the EA and notifications of online and virtual PICs, with surveys for feedback, input and questions, due to Covid-19.

Table 9.5 summarizes correspondence, meetings and other events held with regulatory agencies. This does not include contacts made during the preparation of the EA requesting available data. Key items are provided in the Record of Consultation report (under separate cover).

Table 9.5: Record of Agency Consultation

Date	Type	Summary
February 2, 2022	Email and Notice	Notice of Commencement of EA and Notice of PIC#1
February 17 to March 17, 2022	EA PIC#1	EA PIC #1 included a pre-recorded presentation and an on-line survey. Presentation focused on the status of the 1PSEPM Project and EA process.
March 17, 2022	Letter	Response to Notice of Commencement indicated MHSTCI’s interest in this EA relates to its mandate of conserving Ontario’s cultural heritage, which includes: <ul style="list-style-type: none"> • archaeological resources, including land and marine; • built heritage resources, including bridges and monuments; and • cultural heritage landscapes.
March 30, 2022	Letter	Response to notice of Commencement from MNDMNRF expressed an interest in understanding how much coldwater habitat (by area and depth) may be impacted by the proposed alternatives. They would like to continue to be circulated on this Project as it moves toward detailed design and as more sampling and habitat information becomes available.
April 6, 2022	Email	Response to MNDMNRF indicated the City’s intention to only lakefill within the City’s waterlot and that further fish and fish habitat studies are to be conducted with respect to the preferred alternative in the next phase of the EA. The City will continue to circulate MNDMNRF on this Project.
August 15, 2022	Email and Notice	Notice of PIC#2
August 16, 2022	Email	Invitation to the 1 PSEPM Project Pop-Up Event
August 25 to September 22, 2022	EA PIC#2	EA PIC #2 included a pre-recorded presentation and an on-line survey. Presentation focused on alternative means of carrying out the 1PSEPM Project and EA status.
August 16, 2022	Email	Request to meet to discuss the Project and the refinement of the preferred alternative together with the detailed assessment of the effects.
September 8, 2022	Meeting	Regular Project update meeting between the City and CVC to discuss CVC concerns and what does CVC wants to see/review.
January 10, 2023	Email	Provides CVC comments on Technical Memorandum on Coastal Design Hazard Considerations
January 16, 2023	Email	Provides Consulting Team’s responses to CVC ‘s comments on Technical Memorandum on Coastal Design Hazard Considerations

Date	Type	Summary
February 9, 2023	Email	Notice from CVC that they can no longer provide comments on certain aspects of EAs as per recent regulatory changes. CVC provided observations on the Aquatic Ecology Technical Memo
July 28, 2023	Email	MECP provides guidance for the upcoming draft EA review regarding comments and responses to MECP, non-MECP Ministries and Indigenous communities.
August 31, 2023	Email and Notice	Notice of EA PIC#3
September 14, 2023	Email and Notice	Notice of EA PIC#3 to City Fire Services Department and the federal Crown Indigenous Relations and Northern Affairs Canada (CIRNAC).
September 14, 2023	Email and Notice	Notice of EA PIC#3 to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). CIRNAC is the federal department responsible for the advancement of reconciliation with Indigenous Peoples. The Notice was also sent to the City's Fire Services.
September 15, 2023	Email and Letter	Letter of advice from Transport Canada related to the Canadian Navigable Waters Act, Railway Safety Act, Transportation of Dangerous Goods Act and the Aeronautics Act.
October 25, 2023	Letter	Letter from Canada Lands Company expressing an interest in reviewing the City's response and updates to comments received as part of PIC#3 and the Draft EA Report, and to seeing an updated Project timeline based on issuance of the Final EA Report.
September 14 to October 31, 2023	EA PIC#3	EA PIC #3 included a pre-recorded presentation and an on-line survey. Presentation focused on the preferred alternative for the 1PSEPM Project and EA findings.
September 27, 2023	Email	MECP recommended that in presenting the Record of Consultation in its draft EA, the City should separate government agency, stakeholder, public and Indigenous consultation, and that the records follow the table format. Calls, meeting notes, emails, etc. should be captured and included.
November 10, 2023	Email	MECP Project Officer provides City with Environmental Assessment Branch's comments on Draft EA.
November 17, 2023	Letter	MECP recognized that HDI has expressed concerns about the Project and has advised that they require Mississauga to withdraw the ToR previously approved by the Minister. MECP requested that the City continue to make good faith efforts to engage HDI on the Project and continue to send Project updates and documentation, including the draft EA.

Date	Type	Summary
November 17, 2023	Letter	MECP reconfirms the Ministry’s expectations regarding Indigenous consultation and the consultation record. The Ministry reconfirmed that it reviews consultation conducted by proponents when it assesses the Crown’s obligations and provides consultation-related direction to proponents during the EA process. The City of Mississauga’s responsibilities for procedural aspects of consultation. The Ministry emphasized that they should maintain an accurate and up to date record of consultation for each individual Indigenous community.
November 20, 2023	Letter	MECP forwards a letter sent by MECP to HDI regarding the 1PSEPM Project. The letter to HDI emphasizes that the City must continue to provide HDI with notices about the proposed Project, as well as documentation and summaries submitted as part of the EA. The City must also continue to document any consultation activities with, and input from HDI on the EA and proposed Project. The ministry encouraged HDI, on behalf of HCCC, to continue to participate in the consultation process
December 1, 2023	Email	DFO provided their draft policy related to offsetting harmful impacts on fish and fish habitat and the new Interim Standard and Codes of Practice. These were provided to the City for information only.
December 18, 2023	Email	The City discussed with the MECP Project Officer an error in the EA PIC #3 and draft EA notice published in the Mississauga News. While the City provided the correct notice, the Mississauga News published the EA PIC #2 notice in error on August 31 and September 14, 2023. This notice had the correct Project website where the public would have seen the accurate information. The City described its multiple methods of notification used for EA PIC#3.
December 20, 2023	Email	The MECP Project Officer indicated to the City that as long as the City can demonstrate multiple methods have been used to notify the Public, which the City had, the Ministry does not require the notice to be reissued.
January 25, 2024	Meeting	The CVC attended a meeting of the City of Mississauga’s core team working on the 1PSEPM Project. The CVC delivered a presentation regarding the approach taken to Jim Tovey Lakeview Conservation Area Offsetting and new DFO guidance documents available to the City.
February 7, 2024	Letter	The Ministry of Citizenship and Multiculturalism (MCM) indicated that it is satisfied that the fieldwork and reporting for the marine archaeological assessment is consistent with the terms and conditions for a marine archaeological licence and that the report will be entered into the Ontario Public Register of Archaeological Reports.
March 21, 2024	Electronic Submission	City submits information requested by MECP under the authority of the Environmental Assessment Act. The Project and summary information provided in the MECP form will be posted on the EA page of the MECP website.

Date	Type	Summary
March 27, 2024	Email	MECP Project Officer requested that the City provide an status update on the 1PSEPM Project and timing for future submissions to the Ministry.
March 27, 2024	Email	City responded to MECP request for a Project update. The City indicated that it has had very productive discussions with MCFN and that the City is aiming to submit the Final EA within the next couple of months.
April 17, 2024	Email with Letter	City's archaeological consultant requested that MCM undertake an expedited review of its Archaeological Assessment for the on-shore portion of the 1PSEPM Project
April 19, 2024	Emails with Attachment	City's archaeological consultant submitted a report package containing the Archaeological Assessment for the on-shore portion of the 1PSEPM Project to PastPort@ontario.ca for screening. The MCM confirmed receipt and assigned the Project report package with PIF number P027-0454-2024.
April 26, 2024	Email	MCM indicated that the City's archaeological consultant's request for an expedited review of report number 64215 submitted under Project Information Form P027-0454-2024 on Apr 19, 2024, has been granted. Review would be completed approximately June 10, 2024.
April 29, 2024	Email with Attachments	City provided the MECP Project Officers with an EA summary form (requested by the MECP) for the 1PSEPM Project EA and the City's Comment Disposition Table with responses to the Government Review Team comments. The City proposed to schedule a meeting with the Province to review the noise and air quality comments.
May 6, 2024	Email	The MECP Project Officer forwarded comments from the Conservation and Source Protection Branch reiterating earlier comments and requesting that vulnerability scoring be included in the Final Draft EA, that threats to drinking water be assess during all Project phases, and encouraged the City to continue engaging with the Credit Valley Source Protection Authority to determine whether fuel storage would be a significant drinking water threat.
May 6, 2024	Email	The MECP Project Officer forwarded comments from the Ministry's Air Quality Analyst and Noise Engineer indicating that neither of them has any additional comments regarding the responses provided in the City's Comment Disposition Table.
May 10, 2024	Email	The MECP Project Officer forward comments for the Ministry's Climate Advisor indicating that they do not have further comments on the responses the City provided in the Comment Disposition Table.
May 13, 2024	Email	The MECP Project Officer indicated that the Senior Advisor regarding Indigenous Consultation has reviewed the City's Comment Disposition Table and has no further comments at this time.

Date	Type	Summary
May 15, 2024	Email	MECP Project Officer indicated that there are no additional comments from the Ministry's Environmental Assessment Branch at this time and the Ministry will review the "red-line" version of the Final Draft EA.
May 22, 2024	Email	MECP Project re indicated that the Species at Risk Branch had reviewed the City's Comment Disposition Table in relation to the Endangered Species Act, 2007 and that the City's responses are satisfactory.
May 22, 2024	Email	MECP Project Officer requested an update of City's Comment Disposition Table to address missing comments from the Surface Water program. The City subsequently responded to the email noting that the Surface Water comments are addressed in the disposition table originally submitted.
July 2, 2024	Letter	Canadian Wildlife Service (CWS) letter to the City providing advice regarding avoiding harm to migratory birds and particularly with respect to nesting Barn Swallows (<i>Hirundo rustica</i>), and the City's responsibilities under the <i>Migratory Birds Convention Act, 1994</i> (MBCA) and associated <i>Migratory Birds Regulations, 2022</i> (MBR) and the <i>Species at Risk Act</i> (SARA).
September 3, 2024	Letter	The MECP's Conservation and Source Protection Branch (CSPB) provided additional comments for the City to address in the Final EA. They requested that the City assess the risk to drinking water related to road salt storage and application during all phases of the Project and encouraged the City to continue to engage with the local Source Protection Authority on the matter of the handling and storage of fuel during all phases of the Project. They described seven policies in the Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Protection Plan that the City should be aware of and consider before Project development.

10. ENVIRONMENTAL ASSESSMENT AMENDMENT PROCESS

The 1PSEPM Project is estimated to take approximately 14 months of construction to complete, depending on fill availability, approvals, weather and in-water working periods, and will exist in perpetuity as part of the Mississauga waterfront. The dynamism inherent with construction Projects suggest that there might be a need for some Project modifications (i.e., adaptive measures) between the time of EA approval and the time that full establishment of the marina, parkland features, created terrestrial and aquatic habitat features are achieved.

The adaptive management approach outlined in Chapter 8 will identify the need for Project modifications where necessary. Adaptive measures and other changes identified during the period between EA approval and detailed design will be screened by the City of Mississauga to determine if additional regulatory approval (e.g., EA addendum, CVC permitting, public consultation) is required before proceeding. To facilitate this process, a Project-specific approach for assessing modifications to design or construction phasing have been established.

This chapter outlines the existing regulatory tools through which post-approval EA modifications can be made and describes the Project specific approach that will be used for post approval review of modifications proposed for the 1PSEPM Project.

The City is committed to consulting with MCFN about the development of the 1PSEPM Project, including discussing any potential changes or amendments that may be required, particularly with respect to any modifications to the Fisheries Act Authorization. For greater certainty, the City will promptly inform MCFN of any Project modifications and provide an opportunity for direct discussions with MCFN, in addition to any public or other processes that may be established.

10.1. REGULATORY PROVISIONS FOR POST EA MODIFICATIONS

Section 11.4 of the EA Act includes provisions for amending a Project design in situations where there is a change in circumstances or new information becomes available following EA approvals. Currently, post-approval modifications to a Project occur on a Project specific basis through amendment provisions included in an EA application or approval documents.

The Minister of Environment Conservation and Parks can approve amendments to an approved undertaking when post-approval modifications are proposed where provisions for amendments have been included in the EA document.

10.2. THE 1PSEPM PROJECT APPROACH TO POST EA MODIFICATIONS

Chapter 8 outlined an environmental performance monitoring program that will be implemented to identify if modifications to the 1PSEPM Project are required. As such, there may be design modifications that result from changing circumstances over the time during the establishment phase. Thus, a clear method to identify the types of modifications that will trigger further environmental approval is needed.

The City of Mississauga is responsible for reviewing monitoring data and identifying opportunities to alter or improve the Project. When Project modifications are identified, the city will prepare a technical memorandum to document the proposed modifications and their potential effects. The technical memo will draw upon the appropriate expertise to determine the effects of proposed modifications in relation to the predicted effects outlined in the EA. This will form the basis from which the magnitude (i.e., minor or major) of the proposed modifications can be determined. The technical memo will include the following information:

- The need for modifications (e.g. new information from monitoring program);
- A description of the design and functions;
- A description of the proposed modifications;
- An assessment of how modifications will affect Project outcomes;
- An assessment of the predicted effects on the environment;
- A comparison of the anticipated effects from proposed modifications to the effects predicted from the original design; and
- A conclusion on the magnitude of the proposed modification (minor or major).

The technical memo will be circulated to the appropriate stakeholders, including the MECP, for review. The technical memorandum will assess the magnitude of the proposed change in relation to the predicted effects outlined in the EA and the desired Project outcomes by screening the proposed modifications against a set of criteria. The final determination of magnitude (major modification vs. minor modification) will be done in consultation with the MECP. If the proposed modification increases the likelihood of achieving desired Project outcomes and/or does not change or reduces the environmental effects identified in the EA, then the modification will be considered minor and will not trigger any further action. Where there is the potential to increase the environmental effects identified in the EA, then the modification may be considered major, and the appropriate regulatory body will determine the need for any additional regulatory requirements. In addition, there may be the need for additional consultation with the broader EA stakeholder community.

All technical memoranda and/or addenda will be submitted to the MECP for inclusion in the Project files as part of the public record. Documentation and compliance with modification procedures and clarification of the assessment of any proposed changes may be subject to MECP review.

10.3. SCREENING QUESTIONS FOR POST-EA MODIFICATIONS

Proposed Project modifications will be screened against a set of criteria to determine the magnitude (minor or major) of modifications on the environmental effects predicted in the EA. Table 10.1 includes proposed screening questions.

Table 10.1: Proposed Screening Questions

Screening Questions	Yes - Action	NO - Action
Does the proposed modification affect a condition of approval of the EA or any other approval or permit?	City in consultation with MECP will determine if further regulatory action is required	Proceed if the answer to all other screening questions is NO.
Does the proposed modification result in lakefill beyond the City’s waterlot or City owned property?	City to determine if modifications are to proceed and additional mitigations required	Proceed if the answer to all other screening questions is NO.
Does the proposed modification change the amount of parkland or access to the waterfront?	City to determine if modifications are to proceed and additional mitigations required	Proceed if the answer to all other screening questions is NO.
Does the proposed modification reduce the anticipated quality and/or function of the aquatic habitat feature on-site?	City in consultation with DFO/MECP will determine if further regulatory action and/or aquatic habitat compensation is required	Proceed if the answer to all other screening questions is NO.

Should a material change or modification be required to the 1PSEPM Project during construction and establishment, this screening process will guide the preparation of a technical memorandum that the City will submit to MCFN as well as other interested parties for review (in consultation with the MECP). If the proposed modification results in an increase or worsening of the identified effects, further regulatory action may be required to assess the effects and identify appropriate mitigation. Any further regulatory action may require further consultation with MCFN, public consultation and/or broader agency consultation.

Table 10.2 provides examples of major vs. minor modifications. These are only provided as general examples and a final determination of magnitude will follow screening and consultation with the MECP.

Table 10.2: Examples of Minor vs. Major Project Modifications

Minor Project Modifications	Major Project Modifications
Adjusting the conceptual layout regarding the areas of parkland, parking, winter storage.	Shrinking the area of the proposed aquatic habitat feature.
Adjusting the landscaping as proposed in the conceptual layout.	Developing habitat offsets adjacent to the lakefill and outside of the City waterlot.
Adjusting the orientation and size of the public access trail.	

11. ADVANTAGES AND DISADVANTAGES

In concluding the EA, the overall advantages and disadvantages of the 1PSEPM Project are assessed. Advantages are positive net effects to the natural and human environment, and disadvantages are negative net effects. The purpose of this section is to provide an overall conclusion as to whether, in comparison to the “Do Nothing” Alternative, the negative net effects of the 1PSEPM Project are acceptable, based on a balanced assessment against the positive benefits. The “Do Nothing” alternative does not create the new land base that would permit the development of a new marina therefore, not meeting the purpose of the undertaking. However, the EA Act requires this final comparison of the undertaking to the “Do Nothing” alternative to develop final conclusions.

Table 11.1 summarizes the key advantages and disadvantages of the 1PSEPM Project.

Table 11.1: Advantages and Disadvantages of the 1PSEPM Project

Advantages	Disadvantages
<ul style="list-style-type: none"> • Creation of 2400 m² of higher quality aquatic habitat. Additional habitat will be create off-site to compensate for habitat loss • Planting of native vegetation within a park setting providing new rest area for migratory birds • Addition of 18,000 m² of parkland along the waterfront including the waterfront site trail would enhance tourism potential and local business activity • New views from the created landform to Lake Ontario and back towards Port Credit • Relocation rather than loss of marina operations and services, including approximately 450 boat slips, winter boat storage, and potential for a marina service building. • Consistent with several City of Mississauga Waterfront Parks Strategy goals including improving trail connections and providing more natural, sustainable ecological features; • Consistent with the Visioning for Inspiration Port Credit and Master Plan; • Consistent with the Lake Ontario Integrated Shoreline Study priorities including the creation of fish habitat along existing shoreline erosion structures and incorporate fish habitat features in repair and replacement of structures. 	<ul style="list-style-type: none"> • Lakefilling will result in the loss or alteration of 29,000 m² of common aquatic habitat • Minor vegetation removal along 1 Port Street site perimeter and on existing breakwater • Nuisance effects from construction (dust, noise, vehicle emissions) for approximately 14 months for local residents, businesses and recreational users • Increased truck and vehicle traffic from construction for approximately 14 months affecting residents, businesses, recreational users and road users along the haul / access route. • Some residents may experience a change in views from their residences

A review of Table 11.1 clearly illustrates that the outcomes of the 1PSEPM Project are strongly beneficial for all aspects of the environment, resulting in a rejuvenated waterfront that will allow improved public access to the water's edge, keep the marina at a size similar to the existing, and be a destination for residents and visitors alike. The 1PSEPM Project will achieve the purpose of the Project set out in the ToR and reaffirmed in the EA by providing an expanded land base for additional waterfront parkland and marina at the 1 Port Street East site.

The disadvantages of the 1PSEPM Project will primarily occur during construction. Temporary negative effects include minimal nuisance effects (i.e., air, noise and traffic) to residents, recreational users and businesses, all of which will be minimized by best management practices. The permanent loss or alteration of aquatic habitat will be offset by creation of a new higher quality aquatic habitat feature, the replacement of like for like habitat along the eastern edge of the new landform, and, where possible, the incorporation of structural aquatic habitat features along the toe of the revetment. Additional habitat will be created off-site in compensation for the habitat removal and alternation. In general, the new habitat features will result in higher quality and higher functioning habitat.

In conclusion, the negative net effects of the 1PSEPM Project, most of which occur during construction and are temporary or negligible, are more than offset by the much greater positive contributions of the 1PSEPM Project, particularly related to on-going marina operations and the provision of new parkland and access to the waterfront.

12. REFERENCES

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13. GLOSSARY

Term	Definition
Adaptive management	A learning process where management of an ecological system is adjusted based on future changes to the system.
Alternative Methods	Different ways of implementing a Project. For the 1PSEPM Project, these include the amount of habitat created, the extent of linkages created, and size of the land creation footprint, among others.
Alternative 1PSEPM Project configuration	See “Alternative Methods”
Alternatives To	Different ways of approaching and dealing with a problem or opportunity. For the 1PSEPM Project, these are: <ul style="list-style-type: none"> • ‘Do Nothing’ or ‘Status Quo’; and • Create a new land base.
Archaeological resources	An object, material or physical feature that may have cultural heritage value or interest.
Artificial shoreline	The edge of a body of water that has been significantly modified by humans.
Baseflow	The amount of moving of water entering stream channels from groundwater sources in the drainage of large lakes.
Bathymetry	The measurement of the depth of water in oceans, seas, or lakes.
Bioswale	A channel designed to concentrate and convey stormwater runoff while removing debris and pollution through filtration and deposition.
Breakwater	A structure built on a coast for protecting a beach or harbour from the effects of weather and sediment.
Brownfield	Relating to a former industrial or commercial site where future use is affected by real or perceived environmental contamination
Built heritage resources	Significant buildings, structures, monuments, installations or remains associated with architectural, cultural, social, political, economic or military history and identified as being important to a community.
Coastal processes	Natural forces that affect the areas near and along a shoreline, which include erosion, waves, and changes in water levels.
Cultural heritage landscape	A defined geographic area of heritage significance which has been modified by human activities and is valued by a community.
Cultural woodland/thickets/communities	Ecological areas that are heavily influenced by historic or ongoing human disturbance.
Depositional zone	An area in a watercourse where sediment build-up occurs.
Dredging	The digging, gathering, or pulling out of sediment to deepen harbours and waterways.

Term	Definition
Duty to Consult	A legal requirement for the Crown to consult with Indigenous communities when a Project may have an adverse effect on the rights of Indigenous communities in some way. The duty to consult may extend to municipalities by express statute and delegation by the Crown.
Embayment	A recess in a coastline which forms a bay.
Extirpated	Describes the situation in which a species or population no longer exists within a certain geographical location
First Nations	Various Indigenous peoples in Canada who are neither Inuit nor Métis.
Flood conveyance channel	A structure constructed to safely transfer floodwaters within or away from developed or developing areas.
Fluvial	Of or found in a river.
Flyway	A seasonal route followed by birds migrating to and from their breeding areas.
Footprint	The size and shape of the land creation for the 1PSEPM Project.
Gabion	Caged riprap (rock or other material) used along shorelines to control erosion.
Geomorphology	The study of landforms, the processes that created them, and the history of their development.
Geotechnical	Related to soil and bedrock.
Glacial till	Rock and soil material that has been carried by a glacier as it moves and is left behind when the glacier melts or retreats.
Guild (related to birds)	Groups of species in a community that exploit the same set of resources in a similar manner but are not necessarily closely related.
HADD	Harmful alternation, disruption or destruction (of fish habitat)
Important Bird Area	An area recognized as being globally important habitat for the conservation of bird species.
Indigenous Communities	Communities or groups of First Nations, Métis or Inuit people.
Infilling	See “Lakefill”
Lakefill	An area of land bordering a lake that was originally underwater, but has been raised above the surface of the water by adding materials such as soil, stones, etc.
Littoral (drift, zone, processes)	Related to the part of a sea, lake or river that is close to the shore.
Marine archaeological resource	Site where evidence of past human activity is preserved that is fully or partially submerged or that lies below or partially below the high-water mark of any body of water.
MCFN	Mississaugas of the Credit First Nation
Mitigation measures	Recommended actions to reduce, avoid or offset the potential adverse effects of a Project.
Multi-use trail	A trail that is shared by bicycles and pedestrians.
Navigable waterway	Any body of water which can be safely crossed by vessels.

Term	Definition
Nearshore	See “Littoral”.
Nuisance effects	Results of Project activities that cause inconvenience or annoyance to people or businesses in the vicinity of the Project.
Parameters of concern	Characteristics of water which are measured to determine its quality.
Preferred Alternative	The alternative means for carrying out the 1PSEPM Project that was selected through a comparative evaluation of potential alternative lakefill footprints.
Proponent	The person, body, or government agency that proposes, owns, manages, or controls a Project.
Reasoned trade-off analysis	A process where the effects of decreasing one or more key factors and simultaneously increasing one or more other key factors in a decision, design, or Project are determined.
Remediation	The removal of pollution or contaminants from soil, groundwater, sediment, or surface water.
Resident species	A type of animal that spends the majority of its life-cycle in one area and does not migrate.
Resilience	The capacity of an ecosystem to respond to disturbance by resisting damage and recovering quickly.
Riparian habitat	Habitat (the natural environment in which organisms live) that is located at the interface between land and a river or stream.
Riprap	Rock or other material used to protect shorelines from erosion.
Sedimentation	The process by which naturally-occurring particles suspended in water are transported and eventually settle at the bottom of a water body or watercourse.
Shoreline treatment	A measure which is applied to the edge of a water body in order to change its characteristics.
Slip (for a boat)	A slip is a location for a boat to moor which is outlined by a pier on each side of the boat, unlike the dock, which has a pier on one side only. A slip can also serve multiple vessels within a single area, the shore-sides of which are lined with piers. The essential characteristic of a slip is that it's open on one end only.
Stonehooking	The historic/past mining of sand, gravel, stone and blocks of shale from the shoreline of a lake.
Substrate	A substance or layer that underlies something, or on which some process occurs, in particular the surface or material on or from which an organism lives, grows, or obtains its nourishment.
Terrestrial	Related to the earth's land area, including its man-made and natural surface and sub-surface features, and its interfaces and interactions with the atmosphere and surface waterbodies.
Undertaking	An enterprise or activity (i.e., a “Project”) by the government or a company.
Upland habitat	The dry habitat along the sides of a watercourse (i.e., river or creek).

Term	Definition
Viewscape	Those features of an area which provide a range of sights and are considered a community asset. These may include pleasing vistas, scenes and views, among others, that provide a sense of place and character.
Vista	A broad sweeping view of a landscape or open water.
Water lot	One of a regular system of pieces of land which are partly or wholly covered by a water body.

1 Port Street East Proposed Marina Environmental Assessment

Appendix A - Terms of Reference



1 Port Street East Proposed Marina Environmental Assessment

Terms of Reference



FINAL TERMS OF REFERENCE (Amended)
for
1 Port Street East Proposed Marina
Environmental Assessment

Prepared for:
City of Mississauga

Prepared by:
Shoreplan Engineering Limited

July 2020

EXECUTIVE SUMMARY

The City of Mississauga (City) is the proponent undertaking an Individual Environmental Assessment (EA) for the 1 Port Street East Proposed Marina Project (1PSEPM). The Port Credit Harbour Marina (PCHM) is currently located on the west portion of the site (the wharf). PCHM is privately operated by Centre City Capital Limited on the wharf leased from Canada Lands Company, the owners of a portion of 1 Port Street East. The PCHM lease is set to expire in 2023 and a future mixed-use neighbourhood is proposed to be developed on the wharf. This development process is expected to be initiated by Canada Lands Company (Canada Lands). The timing of the development of the wharf is dependent on the landowner and related required approvals. The future mixed-use wharf development of the site is not part of this EA.

The marina at 1 Port Street East plays an economic and cultural role within the Port Credit community. The issue of how to protect for a sustainable full-service marina as the site is redeveloped into a new mixed-use neighbourhood has become increasingly important. The City is undertaking the 1PSEPM Project to investigate expansion of the land base around the eastern breakwater to provide continued marina function and services at this site, as well as create public access to the waterfront, create new parkland, and enhance the site's ecological functions.

This part of the Mississauga waterfront has been the subject of many studies. The 1PSEPM Project was identified in the City Council approved Inspiration Port Credit 1 Port Street East Comprehensive Master Plan (2016) as a key opportunity to “Keep the Port in Port Credit”. The 1PSEPM Project is intended to help fulfill the vision of the Master Plan:

“to ensure that an iconic and vibrant mixed-use waterfront neighbourhood and destination with a full-service marina is developed at the 1 Port Street East Site”

City Council subsequently approved an implementing [Official Plan Amendment](#) in 2017 that establishes the appropriate development policies for the site including a future marina use on the eastern portion of the site. Based on this work, Canada Lands and the City executed an agreement for a phased transfer of the breakwater, 2 acres of land, and the deep water harbour to the City for the purposes of developing a marina on the eastern portion of this site. The 1PSEPM Project is building on this previous work.

The 1PSEPM Project is subject to the requirements of the Ontario *Environmental Assessment Act (EA Act)* as an Individual EA. The scope of works and activities anticipated for the 1PSEPM

Project cannot be covered under the Municipal Engineer’s Association (MEA) Municipal Class Environmental Assessment because the proposed undertaking is to create a new land base around the eastern breakwater for a new marina and parkland rather than for purposes of flood or shoreline protection as contemplate by the Municipal Class EA. The new land base will provide flood and shoreline protection but this is not the reason for creating the new land base. This Terms of Reference (ToR) is the first step of an Individual EA. It sets out the work plan for preparing the EA and carrying out the required public consultation. This ToR:

- indicates that the environmental assessment will be prepared in accordance with the requirements set out in subsection 6.1 (2) of the Ontario *EA Act*;
- indicates that the environmental assessment will be prepared in accordance with such requirements as may be prescribed for the type of undertaking the proponent wishes to proceed with;
- sets out in detail the requirements for the preparation of the environmental assessment; and
- is accompanied by a description of the consultations by the proponent and the results of the consultations.

The public, government agencies, Indigenous communities, interest groups, and property owners were consulted throughout the development of the ToR and will continue to be consulted during the preparation of the EA. This ToR has been submitted to the Ministry of the Environment, Conservation and Parks (MECP) for review and approval. . The comments received on the Draft ToR and the City’s responses have been summarized and included in the Record of Consultation submitted to the MECP for review and approval.

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1.0 INTRODUCTION

The City of Mississauga (City) is undertaking an Individual Environmental Assessment (EA) for the 1 Port Street East Proposed Marina Project (1PSEPM Project). The Port Credit Harbour Marina (PCHM) is currently located on the west portion of the site (the wharf). PCHM is privately operated by Centre City Capital Limited on the wharf leased from Canada Lands Company, the owners of a portion of 1 Port Street East. The PCHM lease is set to expire in 2023 and a future mixed-use neighbourhood is proposed to be developed on the wharf. This development process is expected to be initiated by Canada Lands Company (Canada Lands). The timing of the development of the wharf is dependent on the landowner and related required approvals. The future mixed-use wharf development of the site is not part of this EA.

The City is undertaking the 1PSEPM Project to investigate expansion of the land base around the eastern breakwater to provide continued marina function and services at this site, as well as create public access to the waterfront, new parkland, and enhance the site’s ecological functions. This part of the Mississauga waterfront has been the subject of many studies. The 1PSEPM Project was identified by the “Inspiration Port Credit” initiative as a key opportunity to “Keep the Port in Port Credit”. Figure 1-1 provides a map showing the lands and water lots at 1 Port Street East and the 1PSEPM Project study area.

1.1 ENVIRONMENTAL ASSESSMENT FRAMEWORK

The 1PSEPM Project is subject to the requirements of the Ontario *Environmental Assessment Act (EA Act)* as an Individual EA. The 1PSEPM Project cannot be covered under the Municipal Engineer’s Association (MEA) Municipal Class Environmental Assessment because the proposed undertaking is to create a new land base around the eastern breakwater that would allow for the establishment of a new marina and parkland rather than for purposes of flood or shoreline protection as contemplate by the Municipal Class EA. The new land base will provide flood and shoreline protection but this is not the reason for creating the new land base.



Source: Shoreplan; Photo by BP Imaging, August 2014

This Terms of Reference (ToR) document is the first step of an Individual EA. It sets out the work plan for preparing the EA and carrying out the required public consultation. However, should new issues arise during the EA, this ToR does not preclude their investigation at the discretion of the proponent, if the issues are within the purpose/goal of the 1PSEPM Project.




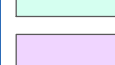
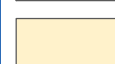

This ToR:

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- indicates that the environmental assessment will be prepared in accordance with such requirements as may be prescribed for the type of undertaking the proponent wishes to proceed with;
- sets out in detail the requirements for the preparation of the environmental assessment; and
- is accompanied by a description of the consultations by the proponent and the results of the consultations.

The public, government agencies, Indigenous groups, interest groups, and property owners were consulted throughout the development of the ToR and will continue to be consulted during the preparation of the EA. All activities carried out during the EA will be documented in the EA Report.

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- LEGEND**
-  Project Study Area for 1 PSEPM Project EA
 -  Property and Waterlot Line for 1 Port St. E
 -  Land for Marina, Buildings, and Staging
 -  Breakwater and Waterlots - First Conveyance
 -  Second Conveyance
 -  Canada Lands Company Development Area (Not Part of City Project)



SCALE: 1:4,000
WHEN PLOTTED CORRECTLY AT 11 x 17
NAD 1983 UTM Zone 17N

NOTES
This map is for conceptual purposes only and should not be used for navigational purposes.
Basedata:

CITY OF MISSISSAUGA

1 PORT STREET EAST PROPOSED MARINA PROJECT ENVIRONMENTAL ASSESSMENT - TERMS OF REFERENCE

WHARF, LAND AND WATER LOTS AT 1 PORT STREET EAST

December 3, 2019	Rev 0.0	Figure No.
Project No. 209.40718.00000		1-1



1.2 PROPONENT

The City of Mississauga (City) is the proponent for this project. The City is interested in ensuring that any proposed plans along the Mississauga waterfront are in conformance with various planning and guiding documents, including Inspiration Port Credit. Pending Environmental Assessment approval from the Province of Ontario and Council approval and funding, the City will develop and implement the project.

1.3 ENVIRONMENTAL ASSESSMENT STUDY AREAS

The environmental assessment will be based on three general **study areas**. These study areas will be confirmed and may need to be refined during the EA process, to allow for flexibility as the process proceeds.

Project Study Area (PSA)The Project Study Area (PSA) is shown in Figure 1-2. It includes a portion of the 1 Port Street East property, inclusive of the water lot, located in Port Credit, Mississauga, at the mouth of the Credit River. It is bound by Port Street East to the north, Stavebank Road to the west, Helene Street South to the east and Lake Ontario to the south. The lands and water lot collectively have an area of approximately 21.4 hectares, comprised of:

- The Breakwater & Ridgetown Water Lot (7.9 ha);
- Elizabeth and Helene Street Rights of Way (0.8 ha); and
- The Basin Water Lot (12.7 ha).

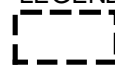


Local Study Area (LSA).....The Local Study Area (LSA) is shown in Figure 1-3. It is comprised of the areas within the Port Credit Community Node Character Area and the Old Port Credit Village Heritage Conservation District. The area is bounded by the CN tracks to the north, Mississauga Road to the west, Elmwood Avenue to the east and Lake Ontario to the South. This area includes the primary access roads from the QEW to the project site.

Regional Study Area (RSA)The Regional Study Area (RSA) is shown in Figure 1-4. The RSA extends beyond the LSA. Depending on the particular criterion this may include portions of the Credit River watershed up to approximately 5 km upstream, the Lake Ontario shoreline and shoreline neighbourhoods within the boundaries of the City of Mississauga. This study area will be used to describe the broader setting for project and used to discuss cumulative effects of the project.

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LEGEND

-  Project Study Area for 1 PSEPM Project EA
-  Arterial
-  Local Street



SCALE: 1:4,000
WHEN PLOTTED CORRECTLY AT 11 x 17
NAD 1983 UTM Zone 17N

NOTES
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Basedata:

CITY OF MISSISSAUGA

1 PORT STREET EAST PROPOSED MARINA PROJECT ENVIRONMENTAL ASSESSMENT - TERMS OF REFERENCE

PROJECT STUDY AREA

December 3, 2019	Rev 0.0	Figure No.
Project No. 209.40718.00000		1-2







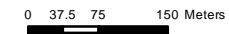
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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LEGEND

-  Project Study Area for 1 PSEPM Project EA
-  Local Study Area
-  Arterial
-  Local Street



SCALE: 1:8,085
WHEN PLOTTED CORRECTLY AT 11 x 17
NAD 1983 UTM Zone 17N

NOTES

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Basedata:

CITY OF MISSISSAUGA

1 PORT STREET EAST PROPOSED
MARINA PROJECT ENVIRONMENTAL
ASSESSMENT - TERMS OF REFERENCE

LOCAL STUDY AREA


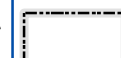
December 3, 2019	Rev 0.0	Figure No.
Project No. 209.40718.00000		1-3

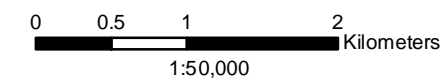


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LEGEND

-  LOISS Boundary
-  Municipal Boundary



WHEN PLOTTED CORRECTLY AT 11 x 17
NAD 1983 UTM Zone 17N

NOTES

This map is for conceptual purposes only and should not be used for navigational purposes.

Basedata:

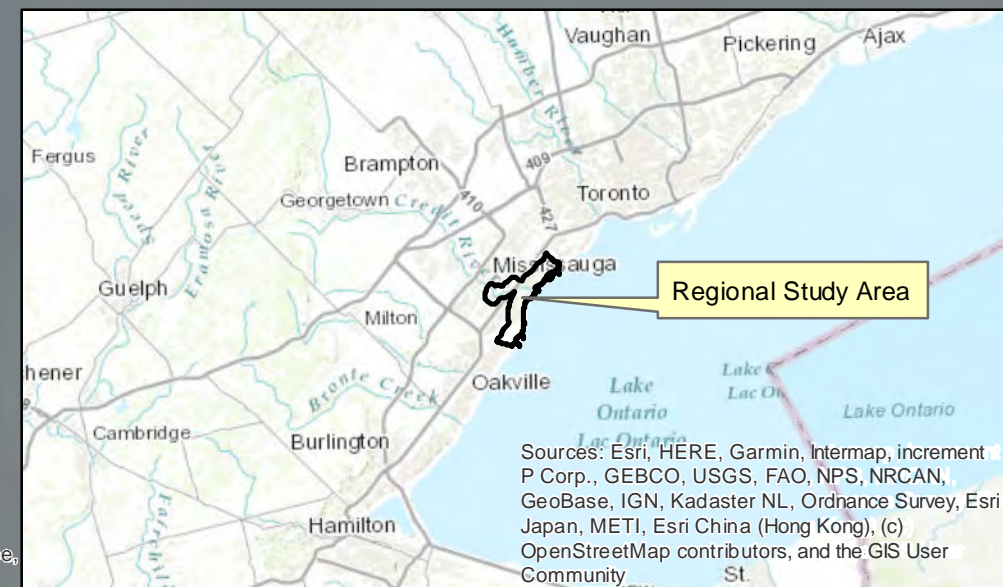
CITY OF MISSISSAUGA

1 PORT STREET EAST PROPOSED MARINA ENVIRONMENTAL ASSESSMENT - TERMS OF REFERENCE

REGIONAL STUDY AREA

December 3, 2019 Rev **0.0** Figure No.

Project No. 209.40718.00000 **1-4**



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Source: Esri, DigitalGlobe, Community

1.4 ENVIRONMENTAL ASSESSMENT TEMPORAL BOUNDARIES

The temporal boundaries for the 1PSEPM Project EA are as follows:

Construction Phase: The time during which the land base is being constructed, including lakefilling, on-site infrastructure development, habitat creation and site restoration. Estimated start date is the beginning of 2023.

Establishment Phase: The time after the parkland and marina is constructed and officially open to the public for use and during which monitoring and adaptive management of the 1PSEPM Project would be undertaken. The duration of the establishment phase will be defined during the EA, and should the project proceed to implementation, the duration of the establishment phase will be confirmed during detailed design. In general, this may be anywhere from one to five years after the completion of construction.

1.5 DRAFT TOR REVIEW

The draft version of the ToR was circulated to the Ministry of the Environment, Conservation and Parks (MECP), other regulatory agencies, Indigenous communities, and the general public for review. The comments received and the proponent's responses are summarized in the Final ToR and included in a Record of Consultation (RoC). Where comments necessitated changes to the ToR, these changes have been made.

2.0 PURPOSE OF THE PROPOSED UNDERTAKING

The following sections provide a description of the purpose of the 1PSEPM Project. The description is framed in terms of both the “problem” (expanding the land base on the east side of the breakwater to provide continued marina function on the site) and the “opportunity” (enhancing access to the waterfront and increased parkland) which the 1PSEPM Project presents.

2.1 PLANNING CONTEXT

There is a long history of planning, public engagement, scientific and economic studies with respect to the Port Credit waterfront, specifically the 1 Port Street East site. The following provides a brief summary. A more detailed review of the key background documents and how they support the problem and opportunity assessment will be included in the EA.

Inspiration Port Credit

“Inspiration Port Credit” was a city-building initiative that contributed to the planning framework for transforming Port Credit into an exceptional, high quality, waterfront village. Inspiration Port Credit focused on the 1 Port Street East site, partially owned by Canada Lands Company (Canada Lands), and 70 Mississauga Road South site, formerly owned by Imperial Oil Limited. These properties are two of the City's key waterfront sites in Port Credit. Their revitalization will assist in delivering on the City's Strategic Plan action of creating a model sustainable community on the waterfront. The key documents that have been generated by Inspiration Port Credit that define the planning context for the 1PSEPM Project are:

- Port Credit Local Area Plan of Mississauga Official Plan (2014);
- Mississauga Recreational Boating Demand and Capacity Study (2015);
- Mississauga Marina Business Case (2015);
- 1 Port Street East Comprehensive Master Plan (2016); and
- 1 Port Street East Official Plan Amendment 65 (2017).

Port Credit Local Area Plan of Mississauga Official Plan

The Port Credit Local Area Plan as adopted by Mississauga City Council on March 5, 2014 in the form of Official Plan Amendment No. 19 expresses a Vision for Port Credit, as an evolving urban waterfront village. Significant elements, which give Port Credit its sense of place, are intended to be preserved and enhanced, such as the main street village character along portions of Lakeshore Road (east and west), heritage buildings and landscapes, community facilities, stable residential neighbourhoods, open space, parks, and marina functions along the waterfront. The

Vision reinforces the importance of retaining and enhancing the built elements that provide residents with a sense of local community and social activity.

The Vision is intended to manage change to ensure an appropriate balance is maintained between growth and preservation of what makes Port Credit a place where people want to live, learn, work and play. The Vision is based on six principles:

1. Protect and enhance the urban village character recognizing heritage resources, the mainstreet environment, compatibility in scale, design, mixture of uses and creating focal points and landmarks.
2. Support Port Credit as a distinct waterfront community with public access to the shoreline, protected views and vistas to Lake Ontario, the Credit River and active waterfront uses.
3. Enhance the public realm by promoting and protecting the pedestrian, cyclist and transit environment, creating well connected and balanced parks and open spaces and reinforcing high quality built form.
4. Support the preservation, restoration and enhancement of the natural environment.
5. Balance growth with existing character by directing intensification to the Community Node, along Lakeshore Road (east and west), brownfield sites and away from stable neighbourhoods. Intensification and development will respect the experience, identity and character of the surrounding context and Vision.
6. Promote a healthy and complete community by providing a range of opportunities to access transportation, housing, employment, the environment, recreational, educational, community and cultural infrastructure that can assist in meeting the day-to-day needs of residents.

Mississauga Recreational Boating Demand and Capacity Study (2015)

In 2015, the City completed a study on boating demand and capacity to determine anticipated demand for recreational boating facilities on Mississauga's waterfront. The study concluded that the demand for slips exceeds supply and additional slips are needed in Mississauga. The study determined that marinas and boating facilities increase public access to the waterfront; provide more amenities on the waterfront; act as tourism attractions; enhance the physical appearance of the waterfront; raise real estate property values on the waterfront; and, in nearby neighbourhoods, act as a catalyst for new commercial and residential development. In doing so marinas and boating facilities increase the tax base and create improved aquatic habitat.

Marina Business Case (2015)

In 2015, the City completed a Marina Business Case which was a critical study informing the 1 Port Street East Comprehensive Master Plan. The recommendations of the Business Case emphasized the importance of City involvement in protecting for a future marina use at 1 Port Street East. The Business Case concluded that a future marina at 1 Port Street East is an economic, recreational and cultural heritage imperative and of strategic importance to Port Credit and Mississauga. The Business Case looked at a number of marina models at this site and defined the most sustainable model as a full-service marina with the majority of uses on-site. It also determined that a marina can work within a mixed-use context.

1 Port Street East Comprehensive Master Plan (2016)

Building upon the principles from the Mississauga Official Plan, the Port Credit Local Area Plan, and community engagement activities undertaken during 2014 and 2015, the City of Mississauga prepared a Comprehensive Master Plan (Planning Partnership, 2016). The Master Plan describes the City's vision to ensure that an iconic and vibrant waterfront neighbourhood and destination with a full-service marina be developed at the 1 Port Street East site. The Master Plan reports on two concepts for a potential new marina, comprised of floating slips, a potentially expanded land base, and various marina services. One of the principles of the Master Plan speaks to a new development protecting and enhancing natural and cultural heritage resources, including important views, the marina function and marina heritage.

1 Port Street East Mississauga Official Plan Amendment (OPA 65)

Based on the Inspiration Port Credit Comprehensive Master Plan, Mississauga City Council adopted OPA 65 for 1 Port Street East in 2017 that establishes the appropriate development policies for the site including a future marina use on the eastern portion and mixed use development for the wharf portion of the site. OPA 65 clarified that the lands will be redeveloped in a manner that recognizes the site's rich marine history and waterfront location. The site will be a city-wide and regional destination that offers recreational and leisure activities with public access and views to the waterfront.

The site's key attractions will include a marina and marina-related facilities. The site will feature high quality design and prioritize pedestrians and cyclists. Innovative sustainable design and green building technologies will be show-cased, and the site's natural and cultural heritage resources will be protected and enhanced. The site should achieve the following:

1. is woven into the fabric of Port Credit and the city;

2. supports the overall vision of Port Credit as an evolving waterfront village;
3. celebrates the site’s urban waterfront context;
4. provides for a mix of uses including, residential, office, retail, indoor and outdoor markets, and makerspaces;
5. links the marine and cultural history of the site together; and
6. draws people to the water’s edge to live, work, make, learn, shop and play.

Council Direction

In October 2017, City Council authorized staff to execute an agreement of purchase and sale with Canada Lands for the eastern portion of the property at 1 Port Street East, including the basin water lot; the eastern breakwater water lot; and 2 acres of land between Elizabeth and Helene streets south of Port Street. As shown on Figure 1-1, the initial conveyance was completed on January 24, 2018 transferring the breakwater and a portion of the water lot into City ownership. The second conveyance will be triggered by the City gaining approvals (including the EA) and engaging a contractor to undertake the marina construction and issuing a “Ready to Commence Construction” notice to Canada Lands. City Council has also authorized staff to move forward with a Marina Action Plan by pursuing external funding opportunities and undertaking the required Environmental Assessment and pre-design studies.

2.2 ENVIRONMENTAL MANAGEMENT CONTEXT

A number of studies have also been undertaken that describe issues, opportunities, goals and objectives along the Lake Ontario shoreline and nearshore areas for Mississauga, Toronto and Lake Ontario, and are applicable to the 1PSEPM Project. A more detailed summary of the key background documents and how they support the problem and opportunity assessment will be included in the EA.

Credit River Estuary: Species at Risk Research Project

In 2014, the CVC completed a comprehensive Species at Risk (SAR) research project focussed on the Credit River estuary from the river mouth to the first riffle upstream at the Mississauga Golf and Country Club and its adjacent lands. The project aimed at:

1. identifying all existing SAR and Species of Conservation Concern (SCC);
2. developing a short-list of SAR and SCC species that represent a wide variety of guilds/functional groups;
3. identifying common habitat requirements and threats to the species;
4. identifying a range of restoration activities; and
5. identifying data gaps and potential future monitoring activities.

Although there were no SAR or SCC identified specifically on the eastern breakwater, a variety of species have been observed at nearby parks and at the mouth of Credit River itself. The report encourages plantings for migratory birds at all municipal parks and makes several recommendations for enhancing habitat in the vicinity of the 1PSEPM Project.

Fish Community Objectives for Lake Ontario

In 2017, the Lake Ontario Management Unit of the Ontario Ministry of Natural Resources and Forestry (MNRF) and the Great Lakes Fisheries Section of the New York State Department of Environmental Conservation jointly developed a common set of goals and objectives for fish communities in Lake Ontario (Stewart et. al., 2017). These goals and objectives aimed to sustain or increase the abundance of desirable fish in order to provide sustainable benefits to humans using fish for food, recreation, culture, ecological function, and aesthetics. The goals and objectives that were set by the MNRF and are most relevant to the 1PSEPM project are those for the nearshore zone of the lake, as follows:

Goal:

To protect, restore, and sustain the diversity of the nearshore fish community, with an emphasis on self-sustaining native fishes, such as Walleye, Yellow Perch, Lake Sturgeon, Smallmouth Bass, Largemouth Bass, Sunfish, Northern Pike, Muskellunge, and American Eel.

Objectives:

- a. Maintain healthy, diverse fisheries—maintain, enhance, and restore self-sustaining local populations of Walleye, Yellow Perch, Smallmouth Bass, Largemouth Bass, sunfish, Muskellunge, and Northern Pike to provide high-quality, diverse, fisheries.
- b. Restore Lake Sturgeon populations—increase abundance of naturally produced Lake Sturgeon to levels that would support sustainable fisheries.
- c. Restore American Eel abundance—increase abundance (recruitment and escapement) of naturally produced American Eel to levels that support sustainable fisheries.
- d. Maintain and restore native fish communities—maintain and restore native nearshore fish communities.

Integrated Watershed Monitoring Program (IWMP) Report

In their most recent annual report (2017), CVC presented results from its Integrated Watershed Monitoring Program (IWMP) (Credit Valley Conservation, 2019). The report provides a high-level summary of climate, groundwater, stream, forest and wetland conditions in the Credit River Watershed based on observed conditions. The report also identifies key issues of concern

throughout the watershed. Key issues of concern identified by CVC relevant to the 1PSEPM project were regarding:

1. Lake Ontario water levels - Water levels in Lake Ontario have reached an all-time high in the nearly 100-year record, causing flooding of shoreline trails and parks, and raising water levels in the lower Credit River. Flooding and high-water levels are causing damage to property and infrastructure in urban centres.
2. Climate change - A changing climate is expected to increase the magnitude and frequency of extreme events, including ice storms, flooding, high winds and drought (such as the drought in 2016). Intense storms are expected to become more common, resulting in more frequent flooding and more extensive damage to infrastructure. Older infrastructure (including roads, bridges, stormwater management and wastewater treatment facilities) in many parts of the watershed was not designed for changing climate.

Living by the Lake: 2019-2039 - An Action Plan to Restore the Mississauga Shoreline

The Credit Valley Conservation (CVC) began developing an action plan to restore the Mississauga shoreline by conducting the Lake Ontario Integrated Shoreline Strategy (LOISS) project. This project identified opportunities for the protection and restoration of natural ecosystems along the shoreline, inland, and into the lake in the nearshore environment.

LOISS identified the role of existing features in meeting the needs of wildlife, but also to identified priority areas for both restoration and creation of aquatic and terrestrial habitat to enhance existing features and functions. Implementation of the Project has contributed directly to significant improvements in aquatic habitat and functions within the LOISS study area that extends the length of the shoreline within CVC's jurisdiction, from the Harding Waterfront Estate on the west to Marie Curtis Park on the east, including five kilometres up the Credit River and six kilometres into Lake Ontario.

Based on the findings of the LOISS and the Credit River Estuary Species at Risk Research Project, the CVC developed and approved the Living by the Lake Action Plan in 2018 which envisions a “revitalized shoreline that maximizes access for people while maintaining and restoring health, aquatic and terrestrial habitat features and functions.” Actions identified in the vicinity of the 1PSEM project include:

- Exploring the feasibility of re-creating wetland habitat at mouth of Credit River to support aquatic species;
- Investigate opportunities to enhance open coast habitat for cold water fish species;

- Study fish use of the nearshore at St. Lawrence Park to inform habitat enhancement and/or protection; and
- Explore opportunities to relocate and improve quality of common tern nesting habitat at Port Credit Harbour Marina.

The City will collaborate with CVC to conserve, enhance and restore the health of the Mississauga shoreline while providing public access to the water's edge and protecting viewing to the lake.

Climate Change Action Plan (2019)

The City of Mississauga developed a Climate Change Action Plan (2019), creating a 10-year road map for tackling climate change. It is the City's first comprehensive climate change action plan. It sets out actions to reduce greenhouse gas (GHG) emissions and help the city adapt to a changing climate over the next ten years. The plan has two goals:

1. Reduce greenhouse gas (GHG) emissions 80 per cent by 2050, with a long-term goal of becoming a net-zero community.
2. Increase resilience and the capacity of the city to withstand and respond to current and future severe weather event associated with climate change (e.g., extreme heat, flooding).

In recent years, there has been damage to parks and along the shoreline due to severe weather events and the introduction of invasive species. The City will emphasize resilient solutions for shoreline treatment to protect infrastructure, the natural environment and enhance water quality.

2.3 PROBLEM/OPPORTUNITY ASSESSMENT

The purpose of the 1PSEPM Project is to provide an expanded land base for additional waterfront parkland and marina alternatives at the 1 Port Street East site. This Project is a key element of Inspiration Port Credit's Charting the Future Course 1 Port Street East Comprehensive Master Plan (2016).

The 1PSEPM Project is intended to help fulfill the following vision:

"to ensure that an iconic and vibrant mixed-use waterfront neighbourhood and destination with a full-service marina is developed at the 1 Port Street East Site"

The wharf at 1 Port Street East was constructed in mid 1950s to facilitate commercial shipping on the Great Lakes. The east breakwater (which is the focus of this EA) was added between

1958 and 1961 in two phases. The “Ridgetown” was added in 1974 and the site converted to a recreational marina in about 1974.

Currently, the Port Credit Harbour Marina is one of the largest privately-operated full-service marinas on the Greater Toronto Area’s (GTA) Lake Ontario shoreline. It is also one of the deepest on the north shore of Lake Ontario. The marina caters to seasonal and transient boaters, charter fishing boats, and cruisers. The Port Credit Harbour Marina is considered by the City of Mississauga and its residents to be an important asset. Previous studies, as discussed in Section 2.1, have documented the community desire to continue the marina operations at this site.

As shown on Figure 1-1, Canada Lands Company currently owns a portion of the 1 Port Street East site and water lot where the existing Port Credit Harbour Marina is located. As documented in the studies discussed in Section 2.1, the wharf is anticipated to be sold and redeveloped into a mixed-use residential community. These studies have also identified that an expanded land base primarily along the eastern breakwater can help to accommodate the relocation of the marina.

The 1PSEPM Project will delineate the boundaries of the land base expansion along the eastern breakwater to permit the relocation of the marina.

Simultaneously, expansion of the land base will also:

- Create an opportunity for the provision of new waterfront parkland with safe public access
 - There is no public access associated with the existing privately-owned marina. The public increasingly seeks access to the water’s edge through public parkland and along continuous trails and this project provides an opportunity to create access where none currently exists.
- Allow for improved aquatic and terrestrial habitat
 - The existing breakwater was constructed in the late 1950’s when the provision of quality aquatic habitat was not part of project planning. The 1PSEPM Project provides an opportunity for the enhancement of aquatic and terrestrial habitats in the vicinity of the breakwater in a manner that achieves an overall ecological gain that is consistent with the stated objectives of CVC’s LOISS.

2.4 DESCRIPTION AND RATIONALE FOR THE UNDERTAKING

The final description and rationale for the preferred undertaking will be further developed and provided in the EA as required under the Ontario *EA Act*. It will relate to the ability of the 1PSEPM Project to address the identified problem and opportunity, reflect the advantages and disadvantages of the preferred alternative, and include more detail on the purpose and rationale for the undertaking.

3.0 ENVIRONMENTAL ASSESSMENT AND APPROVAL REQUIREMENTS

3.1 THE ONTARIO *ENVIRONMENTAL ASSESSMENT ACT* (ONTARIO EA ACT)

To meet the requirements of the Ontario *EA Act*, the 1PSEPM Project Individual EA will be conducted in two stages. Stage one involved collecting public input and understanding concerns to develop this ToR. The submission and approval of this ToR completes stage one. Stage two involves the preparation and submission for approval of the Individual EA in accordance with the EA ToR.

This ToR was completed as set out in section 6(2)(c) and 6.1(3) of the Ontario *EA Act* and follows the “Code of Practice: Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario” (Ministry of Environment, Conservation and Parks, 2014. Revision 2.). Thus, this is a ‘focussed’ ToR. It sets out the work plan for preparing the EA and carrying out the required public consultation.

The EA will be prepared in accordance with the requirements of this ToR and will generally follow the “Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario” (Ministry of Environment, Conservation and Parks, 2014. Revision 2.). Once the EA has been prepared, the City of Mississauga will submit the EA for review by the public and government agencies and decision by the Minister of the Environment, Conservation and Parks. The EA will contain the following:

- a description of the purpose of the undertaking;
- a description of and a statement of the rationale for,
 - the undertaking,
 - the alternative methods of carrying out the undertaking.
- regarding the undertaking, the alternative methods of carrying out the undertaking, a description of,
 - the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly,
 - the effects that will be caused or that might reasonably be expected to be caused to the environment, and
 - the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment,
- an evaluation of the advantages and disadvantages to the environment of the undertaking and the alternative methods of carrying out the undertaking; and

- a description of any consultation about the undertaking by the proponent and the results of the consultation.

This ToR describes how the City of Mississauga intends to undertake the EA and evaluates the alternatives to the undertaking. However, the ToR provides flexibility to address new circumstances that may be identified as the EA study progresses. This flexibility is not designed to permit the City to completely change the scope of the 1PSEPM Project, but rather to allow for the adjustment of the 1PSEPM Project without having to start the process over again.

3.2 THE IMPACT ASSESSMENT ACT (IAA)

On June 21, 2019, Bill C-69, which includes the *Impact Assessment Act* (“IAA”), new federal legislation governing environmental assessments at the federal level, received Royal Assent. The IAA also created the new Impact Assessment Agency of Canada (the Agency). The *Impact Assessment Act* (IAA) came into force on August 28, 2019 repealing its predecessor, the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

A marina project such as the 1PSEPM Project is not currently described on the Physical Activities Regulations (SOR/2019-285)¹ and does not require a federal EA under the new IAA. Moreover, the lands owned by Canada Lands (a non-agent commercial Crown corporation) are not federal lands and their conveyance to the City does not require Canada Lands to undertake a federal EA under the new IAA.

3.3 OTHER APPROVALS

Federal and provincial permits under the following legislation are anticipated to be required as part of the 1PSEPM Project. Additional federal and provincial requirements may be identified during the EA. Municipal approvals may also be required and will be identified as part of the EA.

3.3.1 Other Federal Approvals

- The Federal Fisheries Act applies to developments that are anticipated to impact fish habitat. The Act prohibits serious harm to fish, and by extension within the Act, fish habitat. In cases where unavoidable impacts are anticipated (after avoidance and mitigation measures are used), the Act’s policies require that protection of fish habitat

¹ Source: <http://www.gazette.gc.ca/rp-pr/p2/2019/2019-08-21/html/sor-dors285-eng.html>

be achieved. Where serious harm of fish is unavoidable, protection is most often achieved by way of employing habitat off-setting measures.

- Navigation Protection Act is administered by Transport Canada. Navigable waters include all bodies of water that are capable of being navigated by any type of floating vessel for transportation, recreation or commerce. The creation of land under the Navigation Protection Act requires a formal approval under section 5(1)(2).
- Migratory Birds Convention Act (MBCA). This Act is administered by Environment and Climate Change Canada and regulates potentially harmful human activities that may affect the conservation of migratory birds – both individuals and populations – and their nests. With some notable exceptions, a permit must be issued for any activities that may affect migratory birds identified under Article I of the MBCA, including waterfowl, cranes, rails, shorebirds, pigeons, migratory insectivorous birds, and other migratory nongame birds. Recently (2019) the Federal government has begun a review of the MBCA to provide better protection to migratory bird species and to modernize the Act with respect to enforcement issues and issues related to migratory bird hunting.
- Species at Risk Act. The Species at Risk Act (SARA) is also administered by Environment and Climate Change Canada. The SARA contains prohibitions against the killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling or trading of individuals of endangered, threatened and extirpated species listed in Schedule 1. The SARA also contains a prohibition against the damage or destruction of their residences (e.g. nest or den). The SARA applies to all species on federal lands as well as aquatic species and migratory birds off federal lands. DFO administers the SARA for aquatic species, while Environment and Climate Change Canada administers the SARA for all other federally listed species at risk including migratory birds. Review under the SARA is typically undertaken in conjunction with requirements under the Fisheries Act. A permit is required for activities that may affect species listed on Schedule 1 and which contravene the SARA's general or critical habitat prohibitions.

3.3.2 Other Provincial Approvals

- Lakes and Rivers Improvement Act. The Lakes and Rivers Improvement Act is administered by the Ministry of Natural Resources and Forestry (MNRF) and provides for the use of the water of lakes and rivers and regulates improvements in them. The Act requires MNRF approval for construction in lakes and rivers. The Minister of Natural Resources and Forestry is given discretionary powers relating to the repair, reconstruction and removal of dams, maintenance of water levels, and regulation of use of waters or works. A permit under the Lakes and Rivers Improvement Act may be required.

- Under the Public Lands Act (PLA), constructing a building, trail, or water crossing on public lands and/or dredging or filling shore lands requires an authorization from the MNR. While it is not anticipated nor is it the City's intent that the lakefill alternatives will extend beyond the City's water lot depending on the alternative selected, a PLA authorization may be required.
- Conservation Authorities Act and Regulations 160/06. Under Ontario Regulations 160/06, CVC has the ability to:
 - Prohibit, regulate or require the permission of the authority for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or for changing or interfering in any way with a wetland; and
 - Prohibit, regulate or require the permission of the authority for development, if in the opinion of the authority, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.

The proposal to infill portions of Lake Ontario along the shoreline is within the jurisdiction of CVC and is therefore subject to the Regulations above. Permits may be required for development along the shoreline within the 1PSEPM Project Study Area.

- *Clean Water Act.* The *Clean Water Act (CWA)*, administered by the MECP, sets the legal framework to ensure that communities are able to protect their municipal drinking water supplies by developing collaborative, locally driven, science-based protection plans. Under Regulation 288/07 of the Act, local Source Protection Committees are to develop policies to address significant, moderate and low threats to source water within Intake Protection Zones. Communities will have to conform to policies addressing significant drinking water threats and have regard for policies addressing moderate and low drinking water threats. On this basis, relevant policies of the SPP should be considered.
- *Endangered Species Act.* The *Endangered Species Act (ESA)*, administered by the MECP, protects species identified as being Endangered, Threatened or Extirpated in Ontario. Species status is determined by the Committee on the Status of Species at Risk in Ontario (CASSARO). Under the Act, species are protected (Section 9) as well as their habitats (Section 10). Permits may be required from the MECP for any works within areas identified as habitat of a Species at Risk in Ontario (SARO) and for sampling SARO species. A Section 17 permit for the protection and recovery of a provincial species at risk may be required if SARO species are found in the project study area.

4.0 “ALTERNATIVES TO” THE UNDERTAKING

4.1 DESCRIPTION OF “ALTERNATIVES TO” THE UNDERTAKING

The Ontario EA Act requires the identification and evaluation of “Alternatives To” the undertaking, including the consideration of the “Do Nothing” alternative. “Alternatives To” the undertaking are defined as different ways to solve the identified problem or address the identified opportunity. The 1PSEPM Project is an opportunity to move forward with the implementation of the City approved 1 Port Street East Comprehensive Master Plan and ensure the continuation of the site’s historic marina function, which is key to the cultural identity of the Port Credit community.

Various planning studies undertaken with significant public and stakeholder engagement looked at the long-term vision for this part of Port Credit. It was clear that the community wanted to keep the marina in Port Credit and the deep-water harbour at this location was considered an asset that gave this site a unique advantage against any other. Following extensive study, including a Marina Business Case (2015), 1 Port Street East Comprehensive Master Plan (2016) and Official Plan Amendment (2017), which were approved by City Council, the City identified that a marina was most appropriate on the lands between Elizabeth and Helene Street, an expanded eastern breakwater, and the entire waterlot. The existing harbour basin is a natural location for a marina and the costs associated with creating a harbour basin in other locations would be prohibitive. Based on the previous studies, Canada Lands Company, the owners of the 1 Port Street East site, executed an agreement for a phased transfer of the breakwater, 2 acres of land, and the deep water harbour to the City for the purposes of developing a marina on the eastern portion of this site. Therefore, alternative sites for a new marina outside of Port Credit have not been considered and the City’s intention has consistently been to explore replacing the marina services and facilities within the existing basin.

A marina at this site supports Port Credit’s cultural heritage and character, as this site has historically accommodated marine functions due to the protected harbour basin. For these reasons no additional sites along the Mississauga waterfront were assessed as alternatives and focus has been placed on the expansion of the land base along the breakwater at the 1 Port Street East site to permit relocation of the marina and associated operations.

For the purposes of this ToR, the “Alternatives To” that are subject to evaluation are defined as:

1. **Do nothing.** This alternative will not create additional parkland or preserve a future public marina function at the site. The second conveyance of land and water lot from

Canada Lands to the City would not take place, leaving the development of the entire property at the discretion of the Canada Lands.

2. **Create a new land base.** This alternative involves creating a new land base around the eastern breakwater that would allow for the establishment of a new marina and additional parkland in accordance with the City’s approved 1 Port Street East Comprehensive Master Plan. The exact location and extent of filling will be determined in the next phase of this EA. To a large extent, the location and extent of filling will determine what can be created or constructed on this new land base.

4.2 EVALUATION OF ‘ALTERNATIVES TO’ THE UNDERTAKING

These “Alternatives To” are evaluated in a qualitative manner in Table 4-1 in terms of their environmental effects and their main advantages and disadvantages with respect to their ability to address the 1PSEPM Project “problem” and “opportunity”. An overall rationale for the selection of the “Alternative To” that will be carried forward to the development of “Alternative Methods” during the EA is also provided based on net effects, advantages and disadvantages.

Table 4-1: Evaluation of Alternatives to the Undertaking

Environmental Component	Criteria	Do Nothing	Create a New Land Base
Physical Environment	Resiliency to changing lake levels and coastal processes	The long-term integrity of the existing pier and the eastern breakwater will continue to be at risk from changing lake levels and coastal processes	A new land base can be designed with sufficient flexibility with respect to changing coastal processes and lake levels to ensure its the long-term integrity and wharf protection.
	Effects on water quality in the Local Study Area	There is no potential for changes to water quality	Construction will result in temporary increased turbidity from lakefilling. Mitigation is available to minimize adverse effects.
	Potential for disturbance of contaminated soils	There is no potential for disturbance of contaminated soils	Construction has the potential to disturb contaminated soil. Mitigation is available to minimize adverse effects.
Atmospheric Environment	Change to air quality	There is no potential for changes to air quality	Dust from construction activities, trucks hauling fill and emissions from construction equipment may be sources of nuisance effects. Mitigation is available to minimize adverse effects.
	Changes to ambient noise conditions	There is no potential for change in noise levels	Noise from construction activities and trucks hauling fill may be sources of nuisance effects. Mitigation is available to minimize adverse effects.

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Environmental Component	Criteria	Do Nothing	Create a New Land Base
Biological Environment	Area and quality of terrestrial habitat	There is no potential for loss or disturbance of terrestrial habitat	Some existing vegetation on the existing property and eastern breakwater would be lost and/or disturbed. Mitigation will be available to minimize adverse effects.
		No potential for improvement to terrestrial habitat.	Creating a new land base offers opportunities to improve terrestrial habitat and enhance migratory bird habitat and habitat connectivity through new plantings.
	Area and quality of aquatic habitat	There is no potential for effects on aquatic habitat	Although lakefilling activities may cover some existing low-quality aquatic habitat, this alternative provides the opportunity to create better habitat conditions. Removal of existing aquatic habitat will likely require an authorization under the <i>Fisheries Act</i> , and habitat compensation will be stipulated under this authorization in order to meet the Habitat Policy Guiding principle of “No Net Loss”. A new land base can be designed so that it is self-compensating, so that the creation of new aquatic habitat as part of Project design will compensate for the removal of existing aquatic habitat.
	Potential to maintain or improve connections for aquatic species	Existing connections for aquatic species are maintained. No opportunities to improve connections for aquatic species.	A new land base with enhanced aquatic habitat may maintain or improve the ability of aquatic species to move within the nearshore areas and upstream in the Credit River.
Socio-economic Environment	Area of open space or park land created	Without the conveyance of additional land and water lot from Canada Lands to the City, no additional land base is created such that it can be made available for public amenities, parks and trails.	Creating a new land base offers opportunities to establish parkland that support passive recreational activities for visitors and residents of the City of Mississauga and beyond.
	Potential for changes to use of waterfront for recreation	Any development of the wharf and the water basin to the east of the wharf will be at the discretion of Canada Lands. This development may	Creating a new land base will increase opportunities for public use of and access to the site. Changes in activities should be compatible with activities associated with the marina and marina activities to avoid conflict.

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Environmental Component	Criteria	Do Nothing	Create a New Land Base
		change/restrict the use of the waterfront for recreation.	
	Potential for change to navigation	Any development of the wharf and the water basin to the east of the wharf will be at the discretion of the Canada Lands Company. Changes to navigation are not likely.	The placement of lakefill may alter navigation patterns in the harbour basin and on the eastern side of the pier during construction. Safe navigation will be maintained during the establishment phase.
	Disruption to use and enjoyment of property during construction and establishment	There is no potential for disruption to use and enjoyment of residential properties, community facilities and institutions.	Construction activities may produce temporary nuisance effects that can disrupt people’s use and enjoyment of their property, community facilities and institutions. Mitigation is available to minimize adverse effects.
	Changes in community character	The ultimate loss of marina functions along the waterfront will result in irreversible harm to the unique character of Port Credit Village.	Creating a new land base offers the opportunity to maintain marina functions along the waterfront and the unique character of Port Credit Village. The presence of new recreational and commercial land uses has the potential to enhance community character.
	Effects on business operations during construction and establishment	The ultimate loss of marina functions at the 1 Port Street East site will result in adverse effects on business operations. No potential for generating positive effects to business operations. Existing businesses might cease operations and jobs could be lost.	<p>Creating a new land base offers the opportunity to maintain marina functions along the waterfront and maintain marina-related jobs and business operations.</p> <p>Construction and establishment activities will produce temporary nuisance effects that may result in short-term disruption to business operations. Mitigation is available to minimize adverse effects.</p> <p>Construction and establishment activities will generate business opportunities to improve business activity and enhance operations.</p>
Cultural Environment	Potential for disturbance or destruction of marine- and land-based archaeological resources, displacement of built	There is no potential for effects on cultural heritage resources	Construction has the potential for the disturbance and destruction of marine and land based archaeological resources. A new land base may have the potential to impact built heritage resources and cultural heritage landscapes.

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Environmental Component	Criteria	Do Nothing	Create a New Land Base
	heritage resources and/or cultural heritage landscapes by demolition and/or removal and disruption of resources by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the character and setting of the cultural heritage resource.		
	Potential for effect from construction and operations on traditional uses of lands by Indigenous communities	No potential effects on traditional uses of lands and waters	A new land base must allow for the use of lands and waters by Indigenous communities.
Cost	Capital and operating Costs	Avoids the capital costs of new construction. Ongoing maintenance and repairs of the existing breakwater will be incurred.	A new land base will require funding for construction. Costs for ongoing maintenance and repairs will also be incurred for the existing breakwater.

The “do nothing” alternative does not create a new land base that would allow for the development of a new marina, additional parkland and public access and enhancements to terrestrial and aquatic habitat. Therefore, this alternative does not meet the purpose of the 1PSEPM project. There are no clear advantages to this alternative other than the avoidance of new construction costs and negative environmental effects on various environmental components during construction. The main disadvantages of the ‘do nothing’ alternative are:

- Doing nothing would stall the implementation of the City-approved 1 Port Street East Comprehensive Master Plan with respect to the continuation of the site’s historic marina function, which is key to the cultural identity of the Port Credit community. The “Do Nothing” alternative would forego the creation of new waterfront parkland and improved aquatic and terrestrial habitat.
- The long-term integrity of the existing wharf and the eastern breakwater will continue to be at risk from changing lake levels and coastal processes. City costs for ongoing maintenance and repairs remain and may rise over time.

New land can be created through lakefilling to allow for the establishment of a marina and supporting facilities and infrastructure, provide waterfront access and parkland at the 1 Port Street East site. The disadvantages of this alternative relate to its potential for adverse environmental effects on various environmental components during construction. Measures are available (e.g., traffic controls, dust management, noise abatement, spill management) to mitigate these adverse environmental. The main advantages of this alternative are:

- Promotes the implementation of the City-approved 1 Port Street East Comprehensive Master Plan with respect to the continuation of the site’s historic marina function;
- Avoids the ultimate loss of marina functions along the waterfront in Port Credit and its adverse effects on recreational boating, business operations and community character of Port Credit Village.
- A new land base can be designed with sufficient flexibility with respect to changing coastal processes and lake levels to ensure its long-term integrity.
- Creating a new land base offers opportunities to enhance terrestrial and aquatic habitats and establish parkland that can support passive recreational activities for visitors and residents of Mississauga and beyond.

In conclusion, the “create a new land base” alternative will be carried forward to the development of “Alternative Methods” during the EA. The potential for negative and positive environmental effects described in Table 4-1 will be considered in more detail in the EA. The “Do Nothing” alternative will be re-assessed against the preferred alternative in the EA.

5.0 DESCRIPTION, EVALUATION AND RATIONALE FOR ‘ALTERNATIVE METHODS’ OF CARRYING OUT THE UNDERTAKING

The following sections describe the iterative steps that are proposed in developing *alternative 1PSEM project configurations* (‘Alternative Methods’) during the EA. The alternatives will be assessed as to their ability to achieve the purpose of the 1PSEM Project. Criteria and indicators will be used to assess the potential for negative and positive environmental effects and will address all components of the environment for each alternative.

Alternative 1PSEM Project configurations (i.e., different shapes for the land base) are proposed. These 1PSEPM Project configurations along with the process used to develop them will be the subject of public and agency consultation and as such they may be modified, refined or additional configurations may be developed as a result of comments received.

5.1 STEP 1 – DETERMINATION OF FOOTPRINT FOR ALTERNATIVES

The first step in defining the alternative 1PSEM Project configurations is to develop a range of *footprints*² up to a maximum spatial extent. This range of footprints will be determined through consideration of physical constraints such as the:

- size of the water lot,
- the potential impact to marine archaeological resources (if any),
- water depth,
- the technical viability of the footprint in relation to coastal processes and the effects of climate change;

The maximum size of the land base is limited by the size of the water lot and the newly created land base cannot extend beyond the water lot boundaries as it would not be under City ownership if it does.

Based on previous studies, it is understood that the smaller the land base, the fewer opportunities to provide a full range of marina services and public amenities. The larger the land base the greater the opportunity to provide a full range of marina services, increased public access, parkland and other amenities. Two distinct alternative footprints as defined below will be assessed in the EA:

- Alternative 1: Nominal Lakefill (Figure 5-1); and

² “Footprint” refers to the size and shape of the newly created land base.

- Alternative 2: Extended Lakefill (Figure 5-2).

These two footprint alternatives are considered the minimum and maximum limits of the lakefill, that is, the final land base and project configuration is likely to fall between these two distinct footprints. However, the City may consider alternative methods other than Alternatives 1 and 2 in the EA. Because the size of the footprint will largely determine the extent of opportunities available to provide marina facilities, public amenities and habitat improvements; different alternative 1PSEPM Project configurations of marina facilities, public amenities, and habitat improvements will be developed subsequently during ToR Section 5.2 – Step 2 “Identification of Desired Design Elements”.

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- LEGEND**
-  Project Study Area for 1 PSEPM Project EA
 -  1 Port Street East Breakwater Lot in City Ownership
 -  1 Port Street East Wharf Development Area in Canada Lands Company Ownership
 -  Breakwater Repair
 -  Lake Fill Above and Below Datum (74.2m)
 -  Arterial
 -  Local Street



SCALE: 1:4,000
 WHEN PLOTTED CORRECTLY AT 11 x 17
 NAD 1983 UTM Zone 17N

NOTES
 This map is for conceptual purposes only and should not be used for navigational purposes.

Basedata:

CITY OF MISSISSAUGA

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ALTERNATIVE 1 - NOMINAL LAKEFILL

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- LEGEND**
- Project Study Area for 1 PSEPM Project EA
 - 1 Port Street East Breakwater Lot in City Ownership
 - 1 Port Street East Wharf Development Area in Canada Lands Company Ownership
 - Breakwater Repair
 - Lake Fill Above Datum (74.2m)
 - Lake Fill Below Datum (74.2m)
 - Arterial
 - Local Street



SCALE: 1:4,000
WHEN PLOTTED CORRECTLY AT 11 x 17
NAD 1983 UTM Zone 17N

NOTES
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Basedata:

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ALTERNATIVE 2 - EXTENDED LAKEFILL

December 3, 2019	Rev 0.0	Figure No.
Project No. 209.40718.00000		5-2



5.2 STEP 2 – IDENTIFICATION OF DESIRED DESIGN ELEMENTS

The range of footprints determined in the previous step will be further refined in this step through an iterative process to include the key design elements listed below:

- The approximate number, locations and sizes of boating slips;
- Marina services, including public parking, on-site winter boat storage, marina related businesses and services.
- Open space or parkland area, including trail connections and opportunities for recreation; opportunities to provide views of Lake Ontario and back to the City;
- Aquatic and terrestrial habitat features; and
- Other physical infrastructure (i.e., stormwater management, fencing).

These design elements will be conceptual, allowing them to be evaluated in the EA, but subsequently implemented by the City in a flexible and adaptive manner. Major changes to these design elements following EA approval would be subject to an amendment procedure, review and approval by the MECP and other regulators as required.

These layers of information will be developed by the 1PSEPM Project Team. A key aspect of this step will be to optimize the balance between maintaining an economically viable marina, terrestrial and aquatic habitat gains, and parkland and waterfront access.

The result of this step will be alternative 1PSEPM Project configurations which respect the range of 1PSEPM Project footprints. Coarse level habitat creation and recreational opportunities will be defined for each alternative such that differences between them can be assessed.

5.3 STEP 3 – COMPARATIVE EVALUATION OF SHORT LIST OF ALTERNATIVES

The alternative 1PSEPM Project configurations will be described in sufficient detail to adequately identify their potential impacts to the environment, evaluate and compare each alternative on the basis of net effects (i.e., after the consideration of mitigation) and their respective advantages and disadvantages. For example, the purpose of the comparative evaluation is to choose the alternative which has the greatest potential to minimize negative effects and maximize the positive effects or desired outcomes. The comparative evaluation will be undertaken using the preliminary evaluation criteria and indicators presented in Table 5-1, considering net effects (i.e., after mitigation is applied). The preliminary evaluation criteria and indicators will be refined and finalized as part of the EA based on public and agency comments. Criteria and indicators are organized by broad “Environmental Components”. Rationale for

including each criterion is provided in Table 5-1. For all 1PSEPM Project configurations, mitigation measures to minimize negative effects or enhance positive benefits will be identified. For each indicator, each alternative 1PSEPM Project configuration will be given a qualitative score of ‘least preferred’, ‘moderately preferred,’ or ‘most preferred’. The evaluation will result in the identification of a preferred alternative based on the evaluation criteria using a reasoned trade-off analysis which explicitly considers trade-offs between the alternatives, thereby keeping more desirable alternatives over those less desirable. Public and agency input will also be sought on the alternative 1PSEPM Project configurations and the decision method. The analysis by indicator will be presented in an evaluation matrix. For this evaluation, the effects from construction and establishment activities will be considered separately for each alternative.

Table 5-1: Preliminary List of Comparative Evaluation Criteria and Indicators for Evaluation of ‘Alternative Methods’

Environmental Component	Criteria	Indicator(s)	Rationale
Physical Environment	Resiliency of proposed lakefill to changing lake levels and coastal processes	Ability of proposed alternative to withstand changing lake levels (i.e., flooding hazards)and coastal processes (shoreline erosion) including future changes associated with climate change.	Design flexibility with respect to changing coastal processes and lake levels is important to ensure the long-term integrity of the 1PSEPM Project.
	Effects on surface water quality in the Local Study Area	Changes to surface water quality (turbidity, <i>E.coli</i> , algae, parameters of concern from stormwater discharges)	Surface water quality will affect the recreational opportunities along the waterfront. Mitigation will be necessary to minimize adverse effects.
	Potential for disturbance of contaminated soils	Area of contaminated soils to be managed/remediated for the 1PSEPM Project	Construction has the potential to disturb contaminated soil. Preference would be given to the alternative that provides for the least disturbance of contaminated soils and/or provides the most flexibility and efficiencies in managing contaminated soil issues. Mitigation will be necessary to minimize adverse effects.
	Ability to manage contaminated soils and groundwater	Ease of <i>remediation</i> /risk management	Preference should be given to the alternative that permits the implementation of appropriate

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Environmental Component	Criteria	Indicator(s)	Rationale
			remediation and/or risk management options easily and cost effectively.
	Risks to existing and future municipal drinking water	Changes in risks to municipal drinking water from project activities.	Construction and establishment activities may pose a risk to drinking water (e.g., fuel spills) or be incompatible with source protection policies. Mitigation will be necessary to minimize adverse effects.
Atmospheric Environment	Change to air quality	Changes to air quality during construction and establishment	Dust from construction activities, trucks hauling fill and emissions from construction equipment may be sources of nuisance effects. Marina operations and vehicle traffic may be sources of nuisance effects. Mitigation will be necessary to minimize adverse effects.
	Changes to ambient noise conditions	Changes to day-time noise levels during construction and establishment and compliance with relevant MECP noise limits.	Noise from construction activities and trucks hauling fill maybe sources of nuisance effects. Marina operations and vehicle traffic will be sources of nuisance effects. Mitigation will be necessary to minimize adverse effects.
Biological Environment	Area and quality of terrestrial habitat	Total area of terrestrial habitat created, enhanced, disrupted or lost	Terrestrial habitat serves to increase the diversity, sustainability and linkages of the natural areas and also helps to increase the probability of occurrence of a wider range of wildlife species. Terrestrial habitat can support populations of terrestrial birds, mammals, insects, reptiles, and amphibians. Some structures may attract nuisance species.
		Potential effects on terrestrial Species at Risk (SAR) and Significant Wildlife Habitat (SWH)	
		Potential for the creation of habitat for nuisance species.	
		Qualitative assessment of improvement to terrestrial habitat for enhancement of migratory bird habitat and habitat connectivity	Indicator describes the types of terrestrial habitat that will be created. Greater diversity is an indicator of ecosystem function and has the potential to attract a wider variety of animal and plant species. Migratory birds require

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Environmental Component	Criteria	Indicator(s)	Rationale
			suitable habitat to rest. Enhancements in habitat and connectivity would provide greater quality resting options for these birds.
	Area and quality of aquatic habitat	Total area and types of aquatic habitat disrupted or removed	The amount of aquatic habitat removed and created will influence the aquatic species diversity. The greater the net area of habitat created (i.e., habitat created minus habitat removed), the more likely that the area is able to support a variety of habitat forms. Some structures may attract nuisance species.
		Potential effects on aquatic Species at Risk (SAR) and Significant Wildlife Habitat (SWH)	
		Potential for the creation of habitat for nuisance species	
		Amount to self-compensation with respect to fish habitat	
Potential to maintain or improve connections for aquatic species	Qualitative assessment of connections for movement of aquatic species within lake and the Credit river	Lake Ontario and the Credit River provide important habitat for fish and provide natural linkages between the lake and areas inland. The 1PSEPM Project may maintain or improve the ability of aquatic species to move within the nearshore areas and upstream in the Credit River.	
Socio-economic Environment	Area of open space or parkland created	Total area to be made available for recreation including trails	Parkland used for passive recreational activities serves the purpose of creating public linkages throughout and beyond the project site. Parkland used for passive recreational activities can enhance people’s use and enjoyment of the waterfront

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Environmental Component	Criteria	Indicator(s)	Rationale
	Potential for changes to use of waterfront for recreation	Potential for use of area for new activities such as fishing, birding, etc. Compatibility of recreational activities with boating and marina business activities	The 1PSEPM Project will allow public use and access to the project site. New recreational opportunities can enhance people’s use and enjoyment of the waterfront. Changes in activities should be compatible with activities associated with the marina and marina businesses to avoid conflict. Mitigation will be necessary to minimize adverse effects.
		Changes to navigable area as a result of project implementation.	The placement of lakefill may alter navigation in the harbour basin and on the eastern side of the pier.
	Disruption to use and enjoyment of property during construction and establishment	Effects of construction (noise, dust, traffic, site visibility) at residential properties, community facilities and institutions.	Construction activities may produce nuisance effects that can disrupt people’s use and enjoyment of their property. Mitigation will be necessary to minimize adverse effects. Conversely, parkland used for passive recreational activities can enhance people’s use and enjoyment of the waterfront.
		Effects of marina operations (air emissions, noise, dust, traffic and site visibility) at residential properties, community facilities and institutions.	Operation activities may produce nuisance effects that can disrupt people’s use and enjoyment of their property, community facilities and institutions. Mitigation will be necessary to minimize adverse effects.
	Changes in community character	Effects of marina operations on the unique character of Port Credit Village and its marina functions along the waterfront.	The presence of new recreational and commercial land uses tied to the marina may diminish or enhance the unique character of Port Credit Village.
	Effects on business operations during construction and establishment	Adverse effects on business operations from increased noise, dust, traffic and site visibility) to business operations during construction and establishment.	Construction and establishment activities may produce nuisance effects that may result in disruption to business operations. Mitigation will be necessary to minimize adverse effects.

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Environmental Component	Criteria	Indicator(s)	Rationale
		Positive effects to business operations in the Local Study Area.	Construction and establishment activities will generate business opportunities to improve business activity and enhance operations.
Cultural Environment	Potential for displacement of built heritage resources and/or cultural heritage landscapes by demolition and/or removal and disruption of resources by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the character and setting of the cultural heritage resource.	Direct or indirect impacts to built heritage resources and cultural heritage landscapes within the study areas.	Built heritage resources and cultural heritage landscapes may be impacted by the proposed undertaking. If recommended through screening, a Cultural Heritage Report: Existing Condition and Preliminary Impact Assessment will be undertaken by a qualified person to identify existing baseline conditions, identify preliminary potential-specific impacts and recommend measures to avoid or mitigate potential negative impacts.
	Potential disturbance or destruction of marine- and land-based archaeological resources	Archaeological resources within study areas	Archaeological resources may be impacted by the proposed undertaking. Archaeological assessment(s) will be undertaken by licensed archaeologist(s) as necessary. The presence of archaeological resources will necessitate the application of measures to avoid or mitigate negative effects. A marine archaeological assessment was undertaken and will be submitted to MHSTCI for review. A Stage 1 Archaeological Assessment will be undertaken for the entire study area during the EA process if recommended through screening.
	Potential for effect from construction and operations on traditional uses of lands by Indigenous communities.	On-going traditional uses of lands within 1PSEM Project Study Area	The ability for Indigenous communities to continue with their traditional uses of lands and water requires assessment..
Cost	Potential to phase implementation of land creation, naturalization and park development	Ease of construction	It is desirable to choose an alternative that is relatively easy to construct to minimize cost and complexity.

Environmental Component	Criteria	Indicator(s)	Rationale
	Capital cost	Estimated capital cost	Alternatives will be compared based on their estimated overall costs, with less expensive options that maximize the marina and public amenities being preferred.
	Annual marina operations and maintenance costs	Annual cost of operations and maintenance of marina and naturalized and park areas	It is desirable that the 1PSEM Project be as self-sustaining as possible to achieve low maintenance costs.
	Sustainability of active and informal park spaces	Qualitative assessment of maintenance requirements of 'park' space	Sustainability of the 1PSEM Project is important and it is desirable to minimize active maintenance requirements.
	Cost of management of groundwater and soil contamination	Total cost associated with remediation/risk management	The costs to remediate soils and the associated risk management are a significant component of the overall project costs.

5.4 STEP 4 – CONFIRM, REFINE AND UNDERTAKE DETAILED ASSESSMENT OF PREFERRED ALTERNATIVE

The preferred alternative will need to be confirmed and refined more thoroughly for the detailed assessment. The refinement will include the development of a phasing plan and construction plan including construction techniques and associated mitigation measures. The detailed assessment will result in a final discussion of how the preferred alternative meets the purpose of the Project, its net environmental effects, how it minimizes negative effects and/or maximizes positive effects, and its advantages and disadvantages, according to the following components of the environment and Project costs, namely:

- Physical Environment;
- Atmospheric Environment;
- Biological Environment;
- Socio-economic Environment;
- Cultural Environment (including Aboriginal Interests); and
- Costs.

The detailed assessment will also give consideration the potential for cumulative effects with existing, planned and reasonably foreseeable projects and activities in the study areas.

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A summary of environmental effects and mitigation measures, and an assessment of 1PSEPM Project advantages and disadvantages will be provided in the EA. It is anticipated that the detailed assessment will include the development of preliminary environmental management plans for construction and establishment (as required).

6.0 DESCRIPTION OF THE ENVIRONMENT POTENTIALLY AFFECTED BY THE PROPOSED UNDERTAKING

The purpose of this chapter is to present a brief overview of the environment potentially affected by the proposed 1PSEPM Project so that the reader has familiarity with issues to be addressed and the complexity of the environment likely to be affected by the Project.

6.1 PHYSICAL ENVIRONMENT

6.1.1 Lake Water Levels

Regional, Local and Project Study Areas

Water levels on Lake Ontario fluctuate on short-term, seasonal and long-term basis. Water levels of the Great Lakes, including Lake Ontario, are referenced to chart datum. Chart datum is generally selected so that the water level seldom falls below it. The referenced chart datum on the Great Lakes is the International Great Lakes Datum (1985). For Lake Ontario the chart datum is 74.2 m. Nautical charts refer to this datum. The chart datum is periodically adjusted for the differential movement of earth's crust.

Seasonal fluctuations reflect the annual hydrologic cycle which is characterized by higher net basin supplies during the spring and early part of summer with lower supplies during the remainder of the year. Seasonal water levels on Lake Ontario generally peak in the summer (typically in June) with the lowest water levels generally occurring in the winter (typically in December). The average annual water level fluctuation has been approximately 0.6 metres, but this is changing. Although water levels below chart datum are rare, the lowest monthly mean on record was approximately 0.46 metres below chart datum.

Short-term fluctuations last from less than an hour up to several days and are caused by local and regional meteorological conditions. These fluctuations are most noticeable during storm events when barometric pressure differences and surface wind stresses cause temporary imbalances in water levels at different locations on the lake. These storm surges, or wind-setup, are most noticeable at the ends of the Lake, particularly when the wind blows down the length of the Lake. Due to the depth of Lake Ontario, storm surge is not as severe as occurs elsewhere on the Great Lakes (such as in Lake Erie).

Long-term water level fluctuations on the Great Lakes are the result of persistently high or low net basin supplies. More than a century of water level records show that there is no consistent or predictable cycle to the long-term water level fluctuations (Figure 6-1). Some climate change studies that examined the impact of global warming have suggested that long-term water levels

on the Great Lakes will be lower than they are today. Those changes, however, are expected to have a lesser impact on Lake Ontario than on the upper lakes because the Lake Ontario water levels are regulated. For the time being most approving agencies, including CVC, require that the 100-year instantaneous water level (the peak water level that has a 1% probability of occurring during any given year) be used for the design and assessment of shoreline protection structures. 100-year instantaneous water levels determined by MNRF still apply. Water levels in Lake Ontario have been regulated since the 1950s and have varied by approximately two metres over this period, although the regulations tended to reduce the extreme high and low levels. A new regulation plan by the International Joint Commission aims for a more natural management approach and therefore greater variability in water levels. Under the new plan, lake levels are expected to rise and fall in patterns more similar to the pre-regulation period.

6.1.2 Waves

The wave climate at Port Credit has a bi-nodal distribution of the total wave power with predominant easterly and southwesterly peaks. Figure 6-2 shows the directional distribution of the total offshore wave power, as well as the highest wave heights extracted from a hindcast database. Approximately 73% of the total power comes from the east, approximately 23% comes from the southwest and the remaining 4% is distributed over all other directions. Figure 6-3 presents “all-directions” wave height and period exceedance curves which show the percentage of time a given wave height or period is exceeded. Figure 6-4 and Figure 6-5 respectively, show the monthly and annual variation of the total offshore wave power from the 36-year hindcast.

As waves propagate from deep to shallow water, they undergo a transformation due to the changing water depths. Wave refraction, diffraction, and breaking cause changes to both the significant wave height and the mean wave direction. Due to the orientation of the nearshore contours, waves coming from the southwest undergo much more refraction than waves coming from the east. That produces a much narrower wave energy peak focused towards the east. For example, Figure 6-6 shows a comparison of the offshore wave energy distribution with the nearshore wave energy distribution for a point just offshore. Figure 6-7 and 6-8 are wave height contour and vector diagrams showing the transformation of the peak easterly and southwesterly waves respectively.

Figure 6-1: Lake Ontario Historic Water Level Data (1918-2018)
(Fisheries and Oceans Canada 2019)

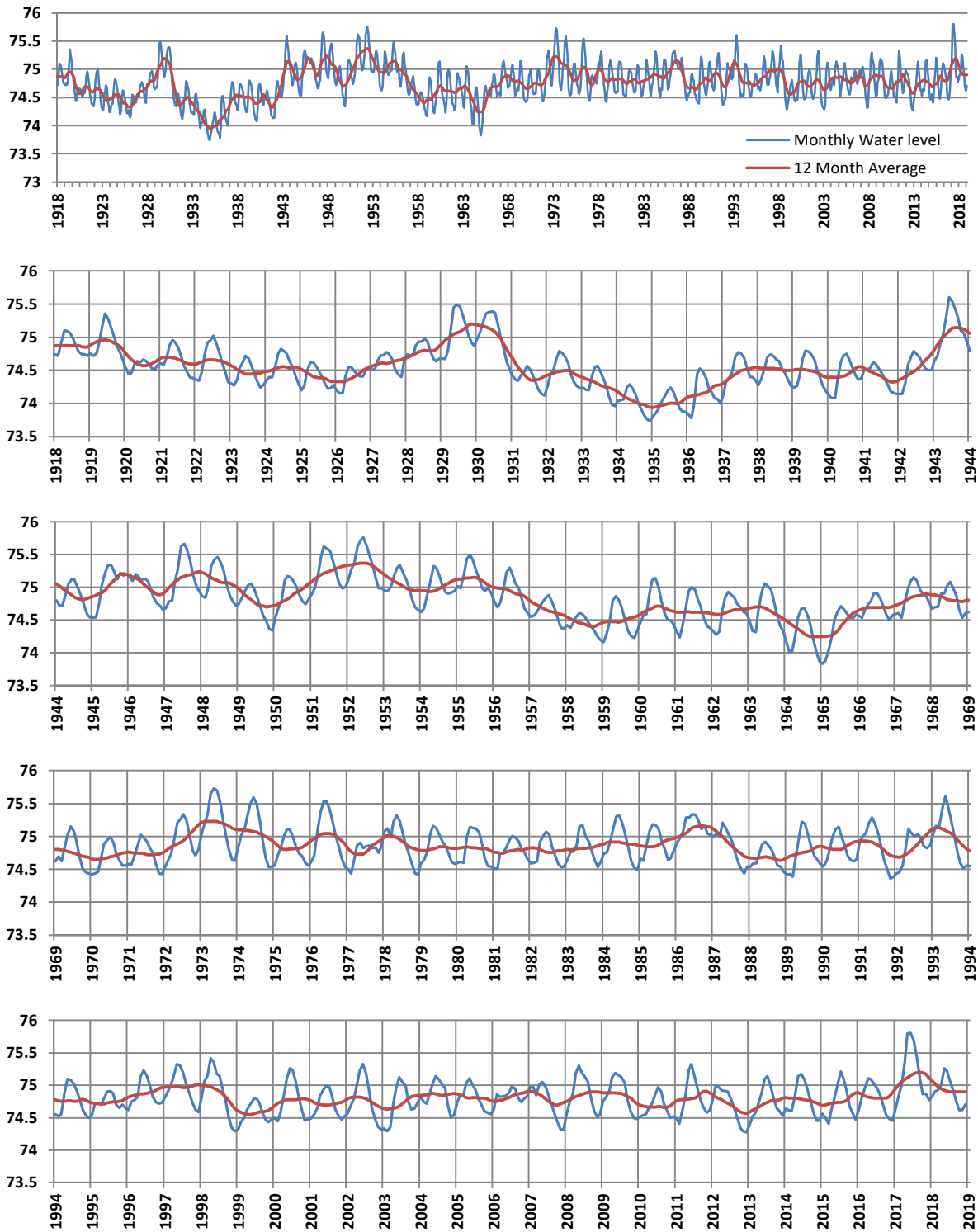


Figure 6-2: Distribution of Highest Wave Heights and Total Wave Power
(Shoreplan, 2019)

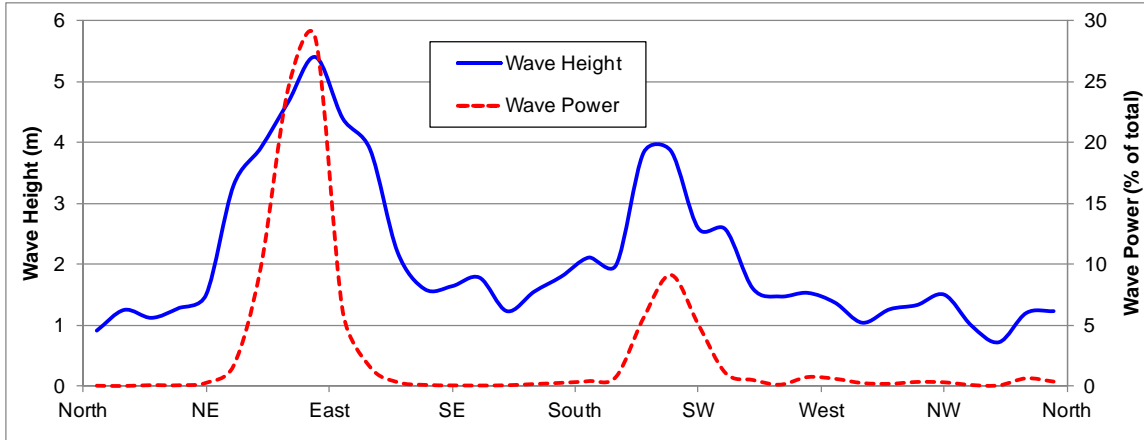


Figure 6-3: Wave Height and Period Exceedance Curves
(Shoreplan, 2019)

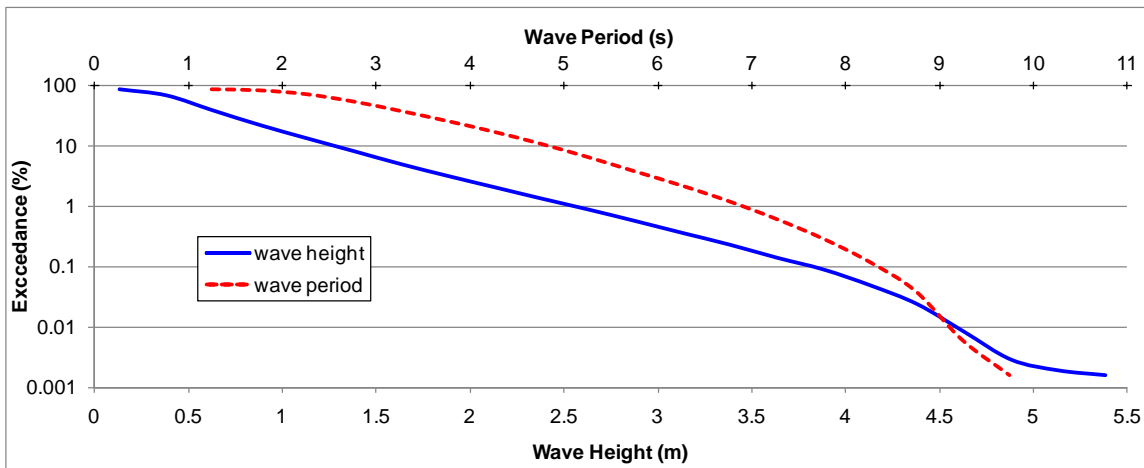


Figure 6-4: Monthly Distribution of Total Wave Power

(Shoreplan, 2019)

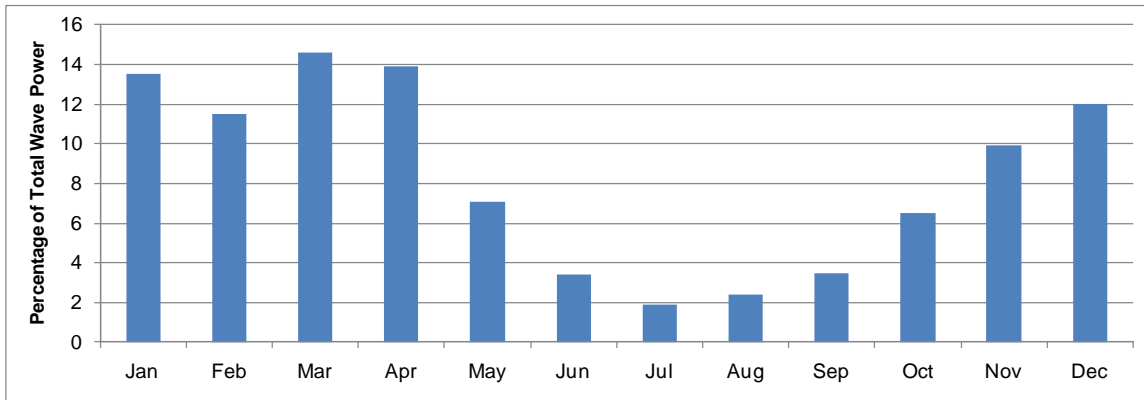


Figure 6-5: Annual Distribution of Total Wave Power

(Shoreplan, 2019)

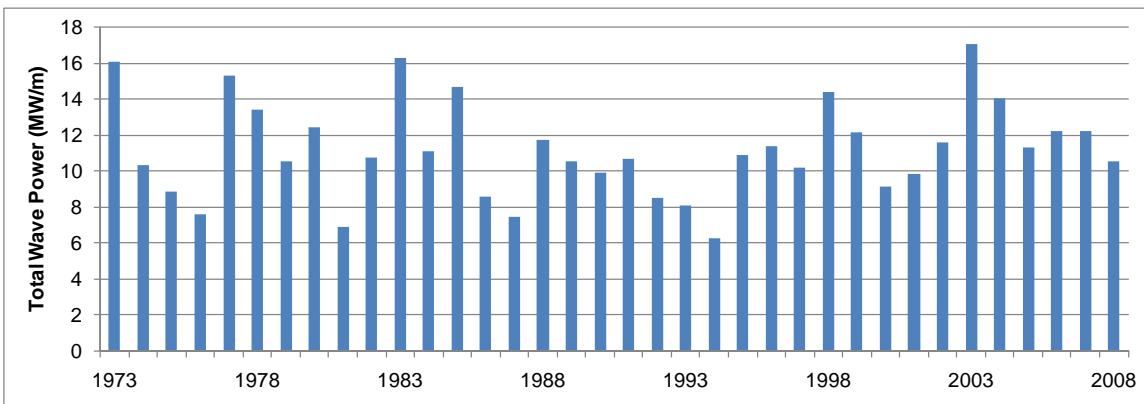


Figure 6-6: Offshore and Nearshore Wave Energy Distributions
(Shoreplan, 2019)

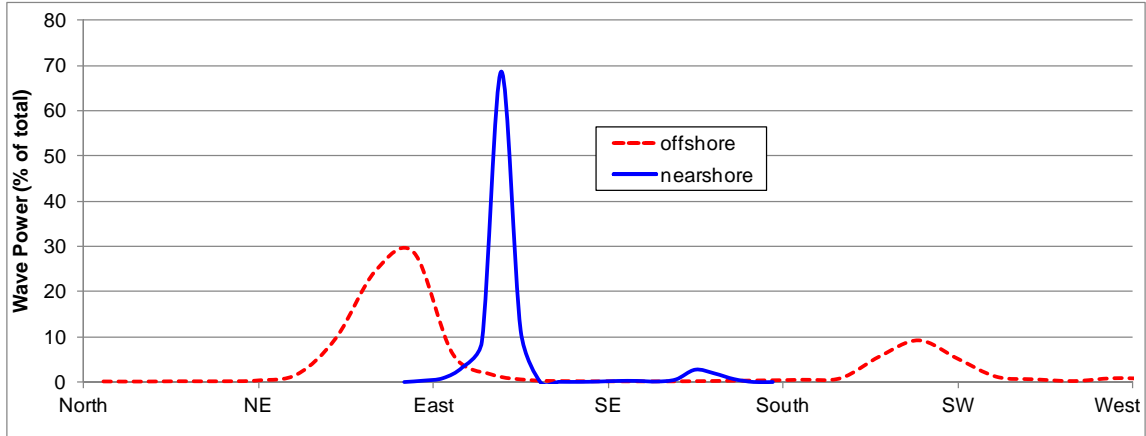


Figure 6-7: Transformation of Easterly Waves
(Shoreplan, 2019)

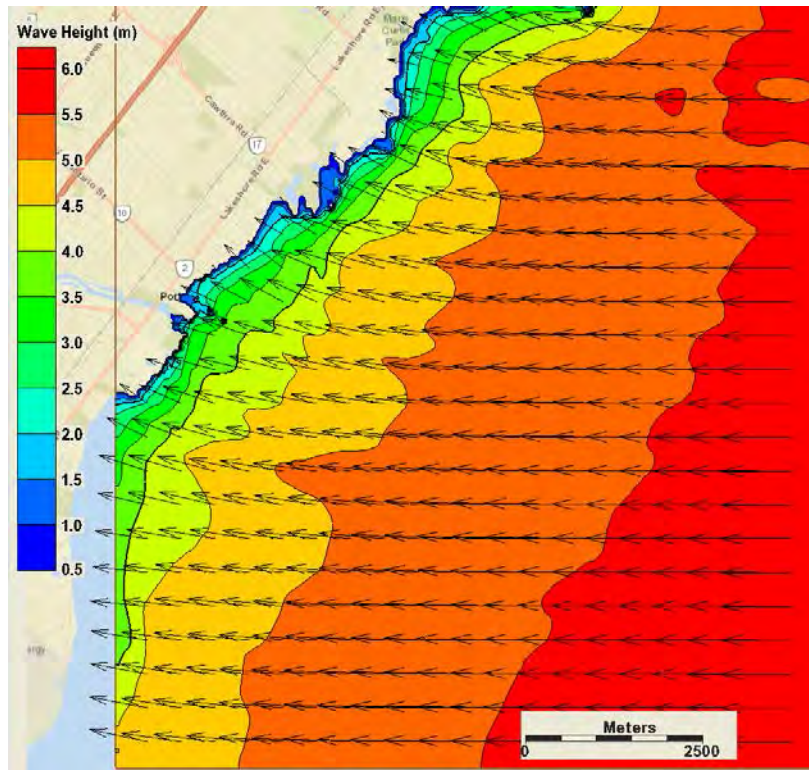
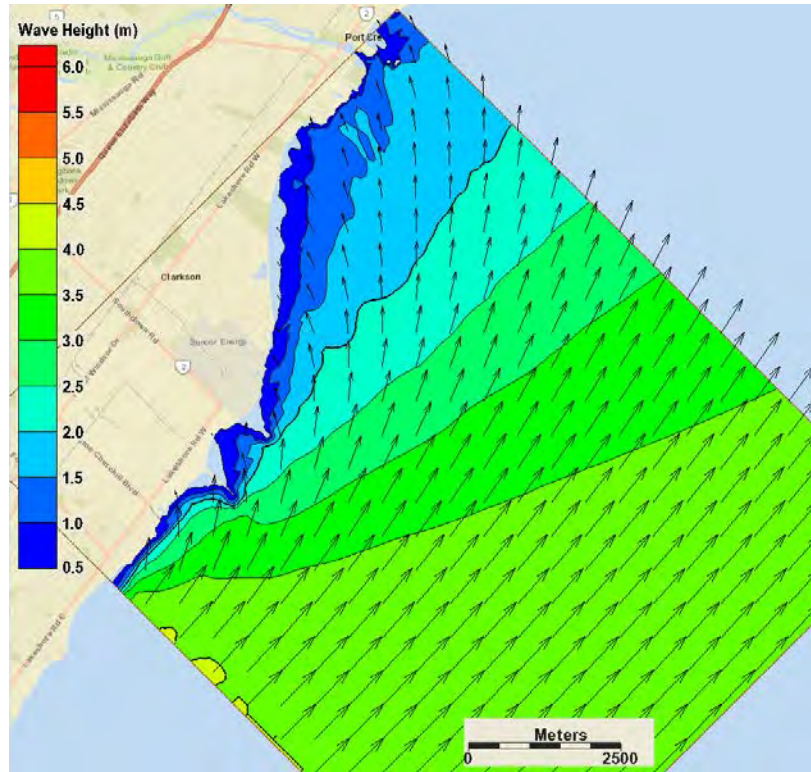


Figure 6-8: Transformation of Southwesterly Waves
(Shoreplan, 2019)



6.1.3 Ice and Debris

Regional, Local and Project Study Areas

Ice cover and winter mean ice cover on Lake Ontario has been declining since the early 1970s, and this is attributed to increasing surface water temperatures. Increases in air temperature are generally coincident with increases in water temperature, with the greatest warming and associated reductions in dissolved oxygen anticipated in the nearshore area. Shore ice, which is ice that forms around the perimeter of the lake, can both protect and damage shorelines, depending upon local conditions (Credit Valley Conservation, 2018).

CVC conducted ice monitoring along the LOISS shoreline in February 2014 and found that ice accumulation was greatest in protected areas (with complete coverage in the Credit River upstream of Lakeshore Road and in Lakefront Promenade Park embayment and marina) and areas of shallower depth (e.g. Rattray Marsh beach).

Debris from various watercourses and storm sewer systems is typically made up of urban refuse such as plastic bags, water bottles, and take-out containers, as well as woody debris such as sticks and logs which is considered beneficial. Debris is widely scattered across beach shorelines during storm events and tends to collect against structures that extend out into the lake.

6.1.4 Lake and River Water Quality

Regional, Local and Project Study Areas

Rainfall and snowmelt run off surfaces rapidly and in unnaturally large amounts in areas of high urban density. This runoff gathers speed and erosional power and takes up contaminants as it travels into receiving waters. Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes. Storm sewer overflows and rivers are major sources of bacterial, nutrient, and *total suspended solids* (TSS) loadings along the Regional and Project Study Areas. Additional pollutants from upstream agricultural areas also contribute. These pollutants can harm fish and wildlife populations, kill native vegetation and foul drinking water supplies (Aquafor Beech Limited, 2011).

A LOISS Background Review identified that the largest watercourse within the Regional Study Area, the Credit River has the greatest effect on most water quality parameters. It contributes 86% of the suspended solids, 66% of the nitrates, and 80% of the heavy metals entering Lake Ontario from within the study area.

6.1.5 Geomorphology

Regional and Local Study Areas

Within the Mississauga city limits approximately 90% of the shoreline is protected with man-made structures. The nearshore bottom within the Regional Study Area is composed mainly of shale bedrock, overlain with erodible cohesive tills varying from low plains to low and moderate height bluffs. Extensive filling has created a number of reaches that can be characterized as artificial shores.

Examples of beaches within the Regional Study Area include Rattray Marsh, Lakeside Park, Tall Oaks Park, Helen Molasy Memorial Park, Brueckner Rhododendron Gardens, Richard's Memorial Park, and Jack Darling Memorial Park. In the Project Study Area, a small sandy beach is located just east of the eastern breakwater.

A number of creeks flow to Lake Ontario along the Mississauga shoreline. These include (from west to east): Clearview, Avonhead, Lakeside, Sheridan, Turtle, Birchwood, Moore, Lornewood, Tecumseh, Cumberland, Cooksville, Serson, and Applewood.

The Credit River flows through the City of Mississauga. The Credit River is approximately 90 km long and is connected to over 1,500 km of smaller creeks and streams which drain into the river (Credit Valley Conservation, 2009). Downstream from the QEW to the river mouth, the Credit River becomes more turbid and underlain by finer silts and mud owing to its gentle gradient and backwater effects from Lake Ontario. The estimated 2-year flow of the river as it intersects with Lake Ontario is 126cms (Credit Valley Conservation, 2014).

Project Study Area

Within the Project Study Area, 100% of the shoreline is man-made and can be characterized as artificial. The east breakwater consists of large armour stones with a stone core. The west shoreline is formed by a steel sheet pile wharf. The north shore is formed by a conglomerate of structures and informal structures. The land within the Project Study Area is all infill. There are no creeks outlets or creeks running under the Project Study Area.

The mouth of the Credit River is just to the west of the Project Study Area.

6.1.6 Sedimentation

Regional, Local and Project Study Areas

The shoreline from Toronto to Burlington is generally referred to as a non-drift zone due to the lack of littoral (coastal) sediments. On many shores of the Great Lakes, littoral sediment supply originates from erosion of shoreline bluffs and the nearshore lakebed. Within the study areas, much of the shoreline has been hardened, essentially eliminating bluff erosion, and the nearshore lakebed is erosion-resistant bedrock. Some sediment transport does take place but there is no significant source of new littoral material.

The Credit River yields the greatest amount of sediment supply to Lake Ontario near the Project Study Area, as the overall size of the Credit River basin is almost three times greater than the next largest basin. The Credit River Adaptive Management Study (Credit Valley Conservation, 2014) estimated that the total sediment yield from the Credit River to Lake Ontario is over 174,000 tonnes per year, and primarily composed of fine sands and silt particles.

Sedimentation and bathymetric studies were completed for Snug Harbour, the Credit River channel and river mouth (Geomorphoc Solutions, 2011). A comparison with data sets from

1989, 1995, 1996, 2010 and 2011 identified areas of sediment loss and gain and revealed that Snug Harbour and the river mouth are experiencing sedimentation.

In 2014, the City of Mississauga completed a project to restore the navigability of the Credit River by removing excess sediment in the Snug Harbour and along portions of the Credit River channel near the mouth of the River. The deposition in the near the mouth of the Credit River is a natural function of decreasing flow velocity as the river mouth widens. Historically, these conditions supported a coastal wetland in this area. Wave action likely also influences deposition in this area.

6.1.7 Bathymetry

Figure 6-9 illustrates the bathymetry within the existing Port Credit Marina basin and for the area of the lakebed adjacent to the basin. Bathymetry reveals both the depth of water and the topography of the lakebed. This information is important in understanding the cost and effects of placement of lakefill.

Figure 6-9: Bathymetry in the Project Study Area
From: Ontario Hydrographic Chart No. 2070 – Harbours in Lake Ontario, 1971



6.1.8 Soils and Geology

Local and Project Study Areas

The Local and Project Study Areas are underlain by shale bedrock of the Georgian Bay Formation. The Georgian Bay Formation is grey shale that is up to 175 m thick, with fracturing limited to the upper few metres of the Formation. A variety of surficial deposits are associated with the Iroquois Plain in the Local Study Area. Coarse-textured glaciolacustrine deposits are primarily sand, gravel minor silt and clay that were foreshore and basinal deposits. Areas of bedrock are either exposed or thinly drift-covered Georgian Bay Formation shale. Modern alluvium (river deposits) was laid down by the Credit River within its floodplain, along with Stavebank Creek, Kenolli Creek, Mary Fix Creek and others.

The area of the pier is comprised of lakefill put in place in the 1950s. The nature of the lakefill is unknown at this time, as are details of any subsurface contamination.

6.1.9 Source Protection Areas

Local and Project Study Areas

The *Clean Water Act* (2006) aims to protect existing and future sources of drinking water. To achieve this, vulnerable areas are delineated around surface water intakes and wellheads for every municipal residential drinking water system that is in a source protection area. The Project and Local Study Areas are located within the Credit Valley Source Protection Area, a surface water Intake Protection Zone (IPZ) and a Highly Vulnerable Aquifer (HVA). Parts of these study areas may be located in an Event-based Modelling Area (EBA) (Ministry of Environment, Conservation and Parks, 2020).

6.1.10 Climate Change Considerations

Coastal processes and characteristics of the shoreline area in Port Credit are sensitive to climate conditions. Wind created waves can contribute to flooding, erosion and movement of sediments and debris along the shoreline. Stronger and more frequent winds can aggravate these conditions. Mild winters reduce lake ice cover that protects the shoreline from erosion, while cold winters can cause ice to build up along the shoreline.

For this Project, the potential impact of climate change on water levels is an important consideration. Generally, water levels on Lake Ontario are predicted to decline, but there is no absolute agreement on this. Strategies will need to consider many possible lake level scenarios,

and adaptive strategies will need to be able to respond to higher and lower lake levels than were seen in the past (Harris, 2016).

6.2 ATMOSPHERIC ENVIRONMENT

Air quality in the City of Mississauga is affected by both the emission sources that release pollutants into the air, and by the climate, or atmospheric conditions, such as wind speed, wind direction, and temperature. The climate in the Greater Toronto Area consists of fairly cold and windy winters and typically hot, humid summers.

Air quality in Region of Peel was subject to extensive study along the Hurontario Street corridor from Port Credit to Brampton as part of the Hurontario-Main Light Rail Transit Project (2014). These studies concluded that existing air contaminant levels for the majority of the contaminants are less than their relevant Ambient Air Quality Criteria (AAQC), even when considering the maximum concentrations over multiple stations and multiple years. However, Particulate matter (i.e., PM₁₀, PM_{2.5}), acrolein, benzene, and benzo(a)pyrene do exceed their criteria at least some of the time. PM₁₀ and PM_{2.5} have maximum concentrations that are above their 24-hour AAQC and CAAQS. These elevated maximums result from high particulate matter events that occur in the GTA from time-to-time. However, for both of these contaminants, the annual means are well below the thresholds, indicating that on an average day, the ambient concentrations of PM₁₀ and PM_{2.5} are below the criterion (City of Mississauga, 2014).

The City of Mississauga helps reduce local air pollution by promoting and providing residents with a number of alternative transportation options that help to get cars off the road; ensuring City buildings are energy efficient; and planting more trees. The City has an Idling Control By-law that encourages drivers to stop unnecessary vehicle idling. This reduces emissions from vehicles which reduces greenhouse gas emission and air contaminants.

The major sources of noise in the study area are both natural (i.e., Lake Ontario) and anthropogenic. Transportation is the major source of noise in Port Credit, including road traffic noise on Lakeshore Road West, Mississauga Road South, and internal roadways within Port Credit, as well as rail traffic on the CN Oakville Subdivision rail line. Existing residential, retail and commercial development within Port Credit are not considered significant noise sources and are generally not audible over the ambient road and rail traffic noise (Valcoustics Canada Ltd., 2017).

6.3 BIOLOGICAL ENVIRONMENT

The ecology of natural heritage systems in urban areas are typically composed of fragmented habitats, isolated woodlands and wetlands, lower biodiversity, impacted hydrology with lowered groundwater levels and flashier surface water hydrology, and the presence of invasive species. Urbanization and associated microclimatic changes affect species composition; thus, as habitats simplify, the resources and competitive requirements of many wildlife species are not met (Credit Valley Conservation, 2018).

Historically, the Lake Ontario shoreline in Mississauga was composed of a mix of natural habitats: deciduous and mixed forests, open savannahs and coastal wetlands. Survey records from the early 1800s refer to a 'dense forest' from Burlington to Etobicoke Creek and for 'many miles northward' (Clarkson, 1977).

The area along the Lake Ontario shoreline is highly dynamic by the action of waves, and wind. Terrestrial linkages between the Lake Ontario shoreline and the Credit River are weak on both east and west sides of the river. Low density residential subdivisions and armoured banks of the Credit River provide little cover and access for wildlife between J.C. Saddington and J.J. Plaus Parks and upstream to the forested areas of Credit River valley.

Despite urbanization and changing shoreline conditions over time, there remains the potential for Species at Risk (SAR) habitat and Significant Wildlife Habitat (SWH) to occur in the study areas.

6.3.1 Aquatic Habitat

Regional and Local Study Areas

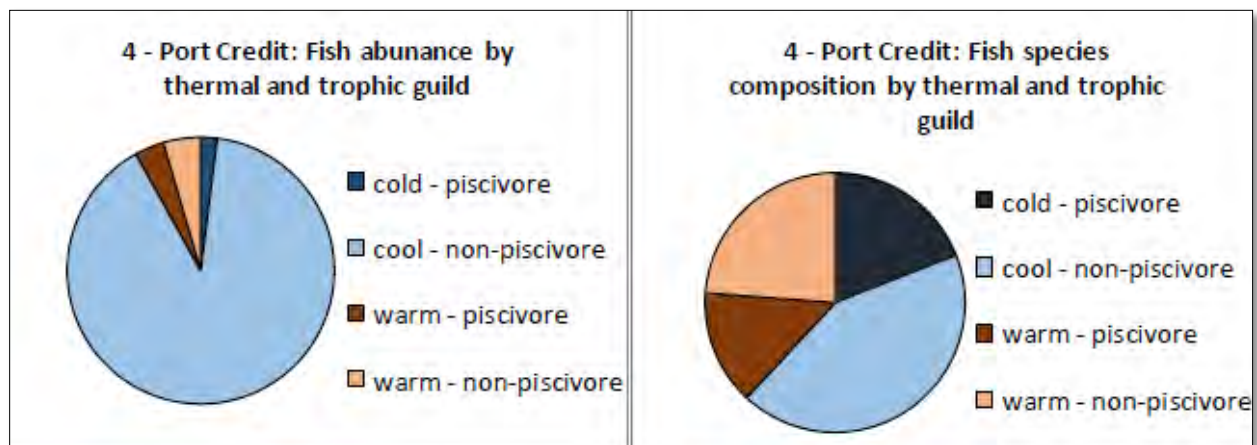
Aquatic habitats have undergone a substantial change from their historic conditions. Land use change, filling, dredging, and disturbance are the most notable historic and current threats to aquatic habitats along the shore of Lake Ontario. Stone hooking, the removal/mining of rock from the lake bottom, has left a legacy along the Mississauga shoreline that has resulted in wholesale changes in, and destruction of, nearshore aquatic habitat through the removal of structure and shelter for fish including the once extirpated Lake Ontario population of Atlantic Salmon (Martin, 2007). The loss of virtually all cobble substrates and the elimination of Lake Trout spawning reefs are also attributed to stone hooking (Whillans, 1979).

The shoreline in the Regional and Local Study Areas consists of erosion protection structures (armour stone, revetments, concrete, rubble, rip rap, etc.) most of the shoreline west of the Project Study Area being artificial.

Twenty-seven species of fish have been recorded in the Port Credit area since 2008. The nearshore community is comprised of species including Smallmouth Bass, Northern Pike, Pumpkinseed, Yellow Perch and Brown Bullhead. Records also include the following species of note: American Eel, Atlantic Salmon, Walleye, Longnose Gar, Bowfin, and White Bass.

Figure 6-10 illustrates fish abundance and fish species composition by thermal and trophic guild in the Port Credit area (Credit Valley Conservation, 2018).

Figure 6-10: Port Credit Fish Abundance
(Credit Valley Conservation, 2002)



Project Study Area

The Credit River at Lake Ontario can be described as estuary or river mouth habitat. This habitat is a mixing zone where a flowing river mixes with the static water of Lake Ontario. Substrates found here are generally finer sands and silts that have been carried as bedload by the river and deposited into the river mouth. Habitat alteration, periodic dredging and the presence of Carp have contributed to the absence of aquatic vegetation beyond very tolerant species that are typically found adjacent to the breakwater. Examples of species of fish found in the Project Study Area include Pike, Bass, Walleye, Bowfin and Dace (Credit Valley Conservation, 2002).

6.3.2 Vegetation

6.3.2.1 Forests

Regional and Local Study Areas

To the west of the Project Study area, along the Lake Ontario shoreline of Mississauga, deciduous forests, mixed deciduous-coniferous forests and *cultural woodlands* are some of the

most common (though underrepresented) communities. Most of these remnant natural areas are small in size, fragmented by roads, trails and development and are thus isolated from each other. Larger tracts are found at Rattray Marsh Conservation area (approximately 38 ha). Further inland, forested communities remain at Cawthra Woods (approximately 20 ha) and along the main Credit River valley at Dundas Street.

Trees in the study area are predominantly those in deciduous forest and cultural woodlands. Of note is the Stavebank Oak Forest and Tallgrass Prairie near the southern end of the Credit River Marshes which includes prairie indicator species such as Black Oak (*Quercus velutina*), Indian Grass (*Sorghastrum nutans*) and Big Bluestem (*Andropogon gerardii*) (CVC 2014).

Project Study Area

The Project Study Area is predominately urbanized with only a few trees growing on the breakwater near the shoreline.

6.3.2.2 Wetlands

Regional and Local Study Areas

Wetlands make up less than 1% of the Regional Study Area. Rattray Marsh located at the mouth of Sheridan Creek, west of the Project Study area, is the last remaining large baymouth bar coastal wetland between Oshawa and Burlington (Credit Valley Conservation, 2018).

Shallow depths due to sedimentation upstream of the CN Rail bridge to just upstream of the QEW overpass has provided suitable conditions for the establishment of the Credit River Marshes coastal wetland complex. These wetlands comprise eight wetland units and are designated as provincially significant by MNRF and as a Centre for Biodiversity by CVC. The marshes themselves support a diverse complex of habitat types, their location, access and structure provide unique habitat for turtles, snakes, amphibians and birds (including waterfowl). The Credit River Marshes rival Rattray Marsh in quality and species richness, providing habitat for reptiles and amphibians including Eastern Milksnakes (*Lampropeltis triangulum*), Common Watersnakes (*Nerodia sipedon*), Snapping Turtles (*Chelydra serpentina*) and Map Turtles (*Graptemys geographica*).

Project Study Area

There are no wetlands located within the Project Study Area.

6.3.3 Birds

Most resident and migrant bird species require natural spaces to survive within an urban environment. Birds often face many stresses in urban ecosystems, particularly area-sensitive forest birds. Waterfront parks in particular offer some of the only remaining habitat within the larger landscape. In urban areas, high quality habitat supporting abundant food resources for migrant birds is limited.

In Mississauga, waterfront parks have been known to play an important role in sustaining migratory bird populations by providing habitat and resources for birds before and after their arduous flight around/over Lake Ontario. The Local and Project Study Areas are both located within an important migratory zone, which includes portions of both the Atlantic and Mississippi flyways.

Regional and Local Study Areas

All along the lakeshore in Mississauga are remnant natural features and manicured parks which offer potential stopover and breeding habitat for species of migrant and resident birds. Surveys since 2010 are beginning to document the diversity of birds that make use of the shoreline areas within the Regional Study Area. Some natural areas are known ‘hotspots’ for birds (for example Rattray Marsh Conservation Area); however, some migrant birds may make use of sub-optimal habitat when large natural tracts are limited and when inclement weather conditions impede further migration.

The vegetated ravines and river valley systems along the north shore of Lake Ontario within the Regional Study Area serve an important role in sustaining migratory bird populations by providing green north/south corridors through largely urban areas. The area west of Port Credit to Burlington has been identified as the *Western Lake Ontario Important Bird Area* and is most notable for its congregations of waterfowl, particularly overwintering waterfowl.

Sheltered embayments, creek mouths and some non-natural structures, such as the pier and breakwater at marina can also provide important habitat for water birds. Aggregations of waterfowl and cormorants are frequently noted in these areas.

Project Study Area

Its proximity to the shoreline and key migratory corridors allowed many species of birds to use this area as a stopover to rest and wait out inclement conditions. This includes the mouth of the Credit River, the wharf and water basin to the east. Some existing buildings and structures

at the existing Port Credit Harbour Marina and in Port Credit may provide roosting and nesting habitat for birds.

6.3.4 Amphibians

Amphibians are key ecological indicators as most spend a portion of their life in both aquatic and terrestrial habitats. Because of this dependency on multiple habitats amphibians are sensitive to ecological stressors and the quality of the ambient environment. Human disturbance, pollution, climate change, and alterations to the hydrologic cycle can have an impact on survival, health and population size.

Regional and Local Study Areas

Observations indicate that the natural areas along Lake Ontario shoreline in the Regional Study Area contain seven species of frogs and toads: Green Frog, American Toad, Bullfrog, Wood Frog, Western Chorus Frog, Northern Spring Peeper, and Northern Leopard Frog. Many of these records are historic (greater than 20 years old), and the species are sensitive to urban pressures.

Salamander diversity and abundance within the Regional Study Area is low. The most common salamander species is the Red-backed salamander although records of Yellow-spotted Salamander and Jefferson's Salamander exist for the area. The Red-backed salamander is a completely terrestrial species; all other salamanders in the Regional Study Area require wetland habitat to complete a portion of their lifecycle. The relative paucity of other salamander observations in the Regional Study Area may speak to the lack of suitable habitat (i.e., vernal pools, forested wetlands) across the landscape.

Project Study Area

There is no suitable breeding habitat for forest and wetland breeding in the Project Study Area.

6.3.5 Reptiles

Regional, Local and Project Study Areas

Reptile populations in the larger Lake Ontario shoreline area have not been studied in-depth. Within the larger coastal wetland communities of Rattray Marsh Conservation Area and the Credit River Marshes, turtle observations are common. Similarly, water snake observations are common at the Credit Village Marina. However, it is unknown the extent to which these populations move along the Lake Ontario shoreline. For example, turtles often fare poorly in

urban environments, where habitat is limited and fragmented, and encounters with humans are frequent.

6.3.6 Mammals

Regional and the Local Study Area

There has been no comprehensive study for mammals within the larger Regional Study Area. Many mammals are secretive and difficult to capture and are thus underreported. Common mammals occur within the broader Regional Study Area. Some less common species such as Red Squirrel and Eastern Chipmunk indicate that some larger habitat patches supporting area-sensitive species exist. Other mammals such as American Mink, Beaver and Muskrat indicate the importance of the shoreline area to species that make use of both terrestrial and wetland communities. Natural areas along the lakeshore and along the Credit River and Lake Ontario tributary creeks are important for the movement of these species and their ability to find adequate resources for food and shelter.

Project Study Area

Eleven mammal species are known to use the Project Study Area for all or some of their life cycle. These species are typical of urban areas and include the Eastern Gray Squirrel, Eastern Chipmunk, Raccoon, and Muskrat.

6.4 SOCIO-ECONOMIC ENVIRONMENT

6.4.1 Land Use

The land use descriptions in this section are based on the existing Mississauga Official Plan (City of Mississauga, 2015). Mississauga Official Plan consists of a principal document and a series of local area plans. Official Plan policies for lands within the Port Credit Community Node and Port Credit neighbourhoods are contained in the Port Credit Local Area Plan. In conjunction with the Mississauga Official Plan, the Port Credit Local Area Plan (Area Plan) provides policies for lands in south central Mississauga, which guide development and the preparation of zoning by-law amendments.

6.4.1.1 Existing Land Use

Local Study Area

Existing land uses within the Local Study Area are residential, commercial, industrial, institutional, open space/greenbelt, and vacant lands (City of Mississauga, 2012). Port Credit is generally a stable area with a distinct community identity, with a focus on the Lake Ontario

waterfront, the harbour and its heritage. The community is anchored by established residential areas at the eastern and western parts of the community and is served primarily by a commercial corridor along Lakeshore Road. Port Credit's heritage can be found in the unique buildings in and around the harbour area and the Lakeshore Road commercial areas. Port Credit's location makes the community a focal point of residential, commercial, open space and tourism and recreation activity on the Mississauga waterfront.

In 1988, the City of Mississauga defined by by-law Old Port Credit village south of Lakeshore Road West on the west side of the Credit River as an area to be examined for possible future designation as a heritage conservation district. In 2004, the City enacted the Old Port Credit Village Heritage Conservation District (HCD) Plan. This plan guides physical changes to the area over time to ensure that modifications contribute to the area's special character. The area to which the HCD Plan applies was one of the topics examined through a 2017 update process regarding the District. Among the updates made, the HCD Plan was refined such that the eastern boundary of the District encompasses the entire Credit River, as well as the City-owned property located on the northeast side of the harbour.

The 2016 population of Port Credit is estimated at approximately 12,500 people. Residential development consists of a combination of dwelling types and forms. High-density areas are centrally located near the Port Credit GO Transit Station, medium and high-density development along Lakeshore Road, as well as low density areas characterized by tree-lined streets in grid patterns. Lakeshore Road has a “main street” commercial character with on-street parking and sidewalks accommodating active pedestrian use. The street is framed by one- to two-storey buildings with small storefront shops. Small-scale industrial and commercial uses exist south of the Canadian National Railway tracks along Queen Street and Queen Street West. Most of the lands in the area are developed with the exception of the West Village Partners (formerly Imperial Oil) lands west of Mississauga Road South, which are slated for mixed-use development. Several commercial areas are located along Queen Street and Queen Street West, just south of the CN Railway. Other uses along the Port Credit waterfront include a working harbour, fishing, boating and marine services.

6.4.1.2 Future Land Use

Local and Project Study Areas

The land use designations in Port Credit are shown in Figure 6-11 as per the City of Mississauga's Official Plan. This plan describes the future development of Port Credit as an “urban waterfront village”, based on the principles of a mixture of land uses, a variety of

densities, pedestrian and cycling friendly infrastructure, transit and supportive urban forms, a significant public realm, and public access to the waterfront.

As part of Inspiration Port Credit, the City worked with the community and stakeholders to create the 1 Port Street East Comprehensive Master Plan. The draft Port Credit Local Area Plan identified the site as having potential as a mixed use, water-related development that takes advantage of the site's location in downtown Port Credit and on the lake. The master plan set out a detailed vision for the 1 Port Street East site that ultimately set out permitted uses, densities, heights and building forms as detailed in the Official Plan Amendment (City of Mississauga, 2017).

Notes:

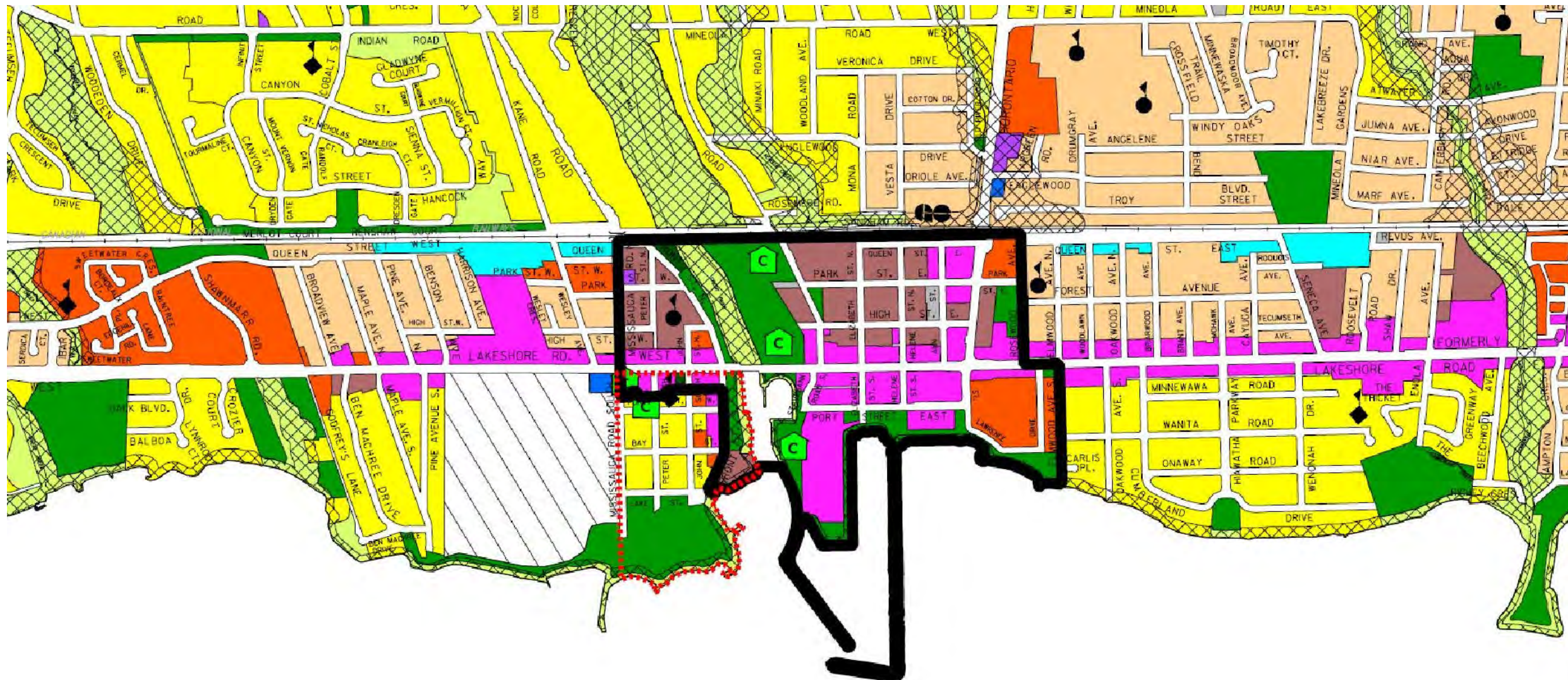
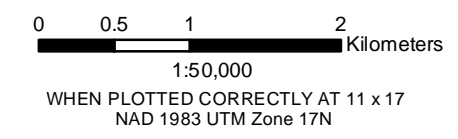
1. The limits of the Natural Hazards shown on this schedule are for illustrative purposes only. The appropriate Conservation Authority should be consulted to determine their actual location.
2. Base map information (e.g. roads, highways, railways, watercourses), including any lands or bodies of water outside the city boundaries, is shown for information purposes only.
3. Roads shown on this schedule are existing or under construction and are shown for information purposes only. For future roads refer to Schedule 5, Long Term Road Network.



LEGEND

- LAND USE DESIGNATIONS
- Residential Low Density I
 - Residential Low Density II
 - Residential Medium Density
 - Residential High Density
 - Mixed Use
 - Convenience Commercial
 - Motor Vehicle Commercial
 - Business Employment
 - Public Open Space
 - Private Open Space
 - Greenbelt
 - Utility
 - To Be Determined

- LAND USE LEGEND
- Community Node Boundary
 - Heritage Conservation District
 - Natural Hazards
 - Public School
 - Catholic School
 - Community Facilities
 - Local Area Plan Boundary



CITY OF MISSISSAUGA

1 PORT STREET EAST PROPOSED MARINA PROJECT ENVIRONMENTAL ASSESSMENT - TERMS OF REFERENCE

PORT CREDIT LAND USE DESIGNATIONS

December 3, 2019	Rev 0.0	Figure No.
Project No. 209.40718.00000		6-11



6.4.2 Recreation

Regional and Local Study Areas

The nearshore areas of Lake Ontario and the Credit River in the City of Mississauga are prime locations for recreational boating, canoeing and kayaking. Currently there are three marinas along the waterfront in Mississauga – Lakefront Promenade Marina, Credit Village Marina, and the Port Credit Harbour Marina currently operating at the 1 Port Street East Site. Marine uses within the Lakefront Promenade Marina area include motor boating, boat launching, shoreline and boat-based fishing, canoeing and kayaking. During the summer, the Lakefront Promenade Marina is a busy destination for local Mississauga residents, visitors from elsewhere in Mississauga, and tourists from outside the City.

Centre City Capital Limited (CCCL) operates the Port Credit Harbour Marina (PCHM) through a lease with Canada Land Company, the owner of a portion of the property. CCCL has operated the marina since 1978. CCCL sub-leases space to several businesses complementary to marine use.

PCHM is one of the largest privately-operated full-service marinas on the GTA Lake Ontario shoreline. The depth of water in the marina basin, one of the deepest on the north shore, allows the marina to accommodate boats up to 75 feet in length. The number of slips operated within the existing marina basin has fluctuated over time. The marina caters to seasonal and transient boaters, charter fishing boats, and liveboards.

Port Credit is also the go-to spot for fishing enthusiasts throughout the Greater Toronto Area and is home to several fishing charter companies. Every summer on the shores of Lake Ontario, the annual Great Ontario Salmon Derby, North America’s largest freshwater fishing derby, takes place for a six-week period in July and August. Over a 50-day period, the derby has had an estimated 21,000 people annually. The event attracts fishermen from all over the world and is an important tourist attraction to the City.

A number of waterfront parks are located within the Local Study Area, with the nearest parks to the 1PSEPM Project site being:

- **St. Lawrence Park** is located along St. Lawrence Drive immediately to the east of the 1PSEPM Project site. This is a small waterfront park with water’s edge seating and lake activity viewing areas.
- **Port Credit Memorial Park East** is located along the Credit River north of Lakeshore Road. It is a place to enjoy river activities and explore the area’s history related to the Credit River

and includes a water's edge walkway and seating; a Waterfront Trail below the Lakeshore bridge. Many of the City's festivals are hosted at Memorial Park. The municipal library is located within the park and the Port Credit Memorial Arena is located adjacent to the park.

- **Marina Park** is located along the Credit River's west edge and will serve as an important connection between Memorial Park West and J.C. Saddington Park.
- **J.C. Saddington Park** is located on the west shore of the Credit River. It is considered a destination park focusing on all-season family activities and events with a park pavilion, parking, water's edge seating and lake activity viewing areas.
- **J.J. Plaus Park** is located on Stavebank Road South, west of the 1 Port Street East site. This is a small riverfront park with water's edge seating, lake activity viewing areas, a restaurant and a surface parking area.

A Waterfront Trail runs throughout the Regional and Local Study Areas. The Mississauga section of Waterfront Trail stretches from Lakeside Park in the west to Marie Curtis Park in the east.. Through Port Credit, the trail is on paved asphalt, with some portions aligned along residential streets. Currently, the 1 Port Street East site is a missing link in the waterfront trail network.

Project Study Area

Currently, land-based "open lake views" (or vistas) from the Project Study Area to Lake Ontario are partially screening and limited as public access to the Project Study Area is restricted.

6.4.3 Traffic and Transportation

Local Study Area

Port Credit is served by four major corridors: Lakeshore Road which runs east-west through Port Credit, Mississauga Road which runs north from Lakeshore Road, the Queen Elizabeth Way (QEW) highway, and Hurontario Street, which runs north from central Port Credit. All roads in the Local Study Area are under the jurisdiction of the City of Mississauga, with the nearest regional arterial road being Cawthra Road to the east of Hurontario Street.

Lakeshore Road is an east-west major arterial roadway that extends through the entirety of the City of Mississauga, providing connections to the QEW at Mississauga Road and Hurontario Street. In Port Credit, Lakeshore Road West becomes Lakeshore Road East at the Credit River. Lakeshore Road operates with four travel lanes with a posted speed limit of 50 km/h, and with lay-by parking on both sides of the street. Lakeshore Road West has signalized intersections with Mississauga Road. Lakeshore Road East has signalized intersections at Stavebank Road, Elizabeth Street, Helene Street and Hurontario Street.

Traffic conditions along the Lakeshore Road corridor can become congested, particularly on left turn movements at signalized intersections, during the weekday peak hours due to the relatively high traffic volumes carried during these periods (BA Consulting Group Ltd., 2017).

Project Study Area

Current access to the 1PSEPM site is via Port Street. This is an east-west minor collector road under the jurisdiction of the City of Mississauga that runs between Stavebank Road and Hurontario Street. Port Street West has a two-lane cross-section and a posted speed limit of 40 km/h, with parking permitted on both sides of the street.

6.4.4 Business Activity

Local Study Area

Port Credit is a unique hub for shopping, events, music and activities on the waterfront, with a wide array of restaurants, retail stores, services and cafes, all within walking distance from each other, the Credit River and Lake Ontario. The majority of these businesses are located along Lakeshore Road. A hotel is located across from the PCHM on Stavebank Road. PCHM is one of the largest privately-operated full-service marinas on the Greater Toronto Area's lakefront and includes marina related businesses.

6.4.5 Commercial Fishing

Regional and Local Study Areas

Ontario's commercial fisheries contribute millions of dollars to the province's economy every year. The Ministry of Natural Resources and Forestry (MNRF) sets annual quotas and issues annual licences for the commercial harvest of fish, primarily in the Great Lakes. More than 500 active commercial fishing licences are held in Ontario. Lake Ontario has the smallest commercial fishery of all the Great Lakes. Harvested species include Yellow Perch, Lake Whitefish, Bullhead, and American Eel. Vessels used in Lake Ontario's commercial fishing industry are primarily steel built fish tugs built in the mid-1900s. The modern harvesting techniques used by the commercial fishing industry in Lake Ontario are primarily gill netting, trap netting and trawling. Fish monitoring trawl sites exist offshore from Port Credit (Canadian Seabed Research , 2017).

6.5 CULTURAL ENVIRONMENT

Regional and Local Study Areas

The Regional and Local Study Areas have a long history of human use and settlement, beginning with nomadic peoples approximately 12,000 years ago and continuing through to the present-day industrial uses and parkland. Portions of this area would originally have had a very high potential for Indigenous community sites of the pre-contact and post-contact periods. However, it is the consensus of both previous and current studies that there is little or no potential for such sites to survive owing to the extent of 19th Century and later landscaping and construction impacts along the shoreline. Extensive lakefilling and dredging activities were the primary disturbances within and adjacent to the Project Study Area.

The Port Credit Heritage Conservation District is within the Local Study Area to the west and adjacent to the Project Study Area. The *MHSTCI Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* checklist will be applied to the Project Study Area plus adjacent properties to identify any other resources potentially affected by the project.

There are no recognized Indigenous reserves or communities currently located within the Regional, Local or Project Study Areas. Although several Indigenous communities have an interest in the lands and waters in the Port Credit area, the Mississaugas of the Credit First Nation (MCFN) have the most direct interest in the lands and waters in the Local and Project Study Areas, the lakebed and the waters of Lake Ontario. They are a Mississauga Ojibwa First Nation located near Hagersville in south-central Ontario. The MCFN made claims to land on which the City of Mississauga is founded through the disputed Toronto Purchase of 1787. In 2010, the Government of Canada agreed to compensation for the lands, based on the ancient value of the land, extrapolated to current dollars.

Project Study Area

In the summer of 2019, a marine archaeological in-water assessment and background research were undertaken at the 1PSEPM Project site. Side scan sonar and magnetometer were used to investigate the area, and any targets found using these methodologies were further investigated using forward looking sonar (on a remote operated vehicle) and video. Background research indicated that the Project Study Area had been heavily modified via development, dredging, redevelopment and additional periodic dredging.

Only one target was found during the marine archaeological survey. This target consisted of at least two very large metal frames with uprights in some places and cut rectangular holes. This

target lay immediately adjacent to the Ridgetown. Examination confirmed that the Ridgetown was not lying on any part of the target. Given that the area of the Ridgetown was dredged prior to its being positioned as a breakwater, it is unlikely that the target was in this location at that time. It is possible that the development of this breakwater (Ridgetown) may have had materials associated with the development that were discarded after its completion. This is not any type of structure that could have been transported by any natural means, and only by intentional disposition. No additional cultural targets were located, and the remaining area of the marine archaeological survey is considered clear of cultural/archaeological concerns.

A Stage 1 archaeological assessment, if recommended through completion of the *MHSTCI Criteria for Evaluating Archaeological Potential* checklist, will be undertaken by a licensed archaeologist for the project study area to confirm or not the presence of archaeological resources.

In September of 2016 the MCFN filed an Aboriginal Title Claim to Waters within the Traditional Lands of the Mississaugas of the Credit. The First Nation continues to revere water as a spiritual being that must be accorded respect and dignity. Water is also vital to the survival of the Mississaugas of the Credit First Nation and all other forms of life. The Mississaugas of the Credit First Nation assert that they have unextinguished Aboriginal title to all water, beds of water, and floodplains contained in their treaty lands and territory.

Other Indigenous communities with known or suspected historical occupation of the Local and Project Study Areas are the Six Nations of the Grand River as represented by the Elected Chief and Council and the Haudenosaunee Confederacy Chiefs Council, and the Huron Wendat Nation. Other Indigenous communities and organizations (e.g., Métis Nation of Ontario, Peel Aboriginal Network) may also have an interest in the EA.

7.0 ENVIRONMENTAL ASSESSMENT STUDIES AND SCHEDULE

Table 7-1 presents the scope of the environmental assessments studies to be completed during the EA Stage, including baseline studies and effects assessment.

Table 7-1: Environmental Assessment Studies

Environmental Component	EA Component	Proposed Scope
Physical Environment	Baseline Studies	<ul style="list-style-type: none"> Investigate and characterize physical conditions such as lake levels and flooding frequency, coastal processes and shoreline hazards that may affect (or be affected by) the alternatives considered and create effects to the land base or marina once implemented. Historical, prevailing and projected conditions (e.g., lake levels) will be described (if available). Investigate and characterize the study area’s source protection classification, particularly vulnerable areas.
	Effects Assessment	<ul style="list-style-type: none"> Assess the resiliency of the proposed alternative to coastal conditions. Conduct a special case specific engineering analysis referred to in Lake Ontario Shoreline Hazards Report (Shoreplan Engineering Limited, dated September 2005) for Reach 6a. The EA will specifically address the shoreline hazards as defined in the Provincial Policy Statement and supporting Technical Guide and as it is considered in the CVC Ontario Regulation 160/06. Assess the Project’s potential risks to drinking water and its compatibility with relevant source protection policies. Identify mitigation measures to be included as part of detailed design of individual marina elements.
Atmospheric Environment	Baseline Studies	<ul style="list-style-type: none"> Investigate and characterize air emissions of existing municipally run marina facilities, including AERMOD screening level modelling. Investigate and characterize noise emissions of existing municipally run marina facilities, using CADNA modelling.
	Effects Assessment	<ul style="list-style-type: none"> Model and characterize the likely air and noise emissions during construction and establishment, including stationary and mobile equipment at municipally run facilities. Assess potential effects of noise and air emissions on adjacent residents and park users and likely compliance with relevant air quality standards, MECP noise limits and City of Mississauga’s noise by-law. Identify mitigation measures to be included as part of detailed design.
Biological Environment	Baseline Studies	<ul style="list-style-type: none"> Describe Lake Ontario water quality, inventory existing aquatic and terrestrial habitat and species, including species at risk (SAR) and significant wildlife habitat (SWH), on the project site and

1 Port Street East Proposed Marina Environmental Assessment – Final Terms of Reference

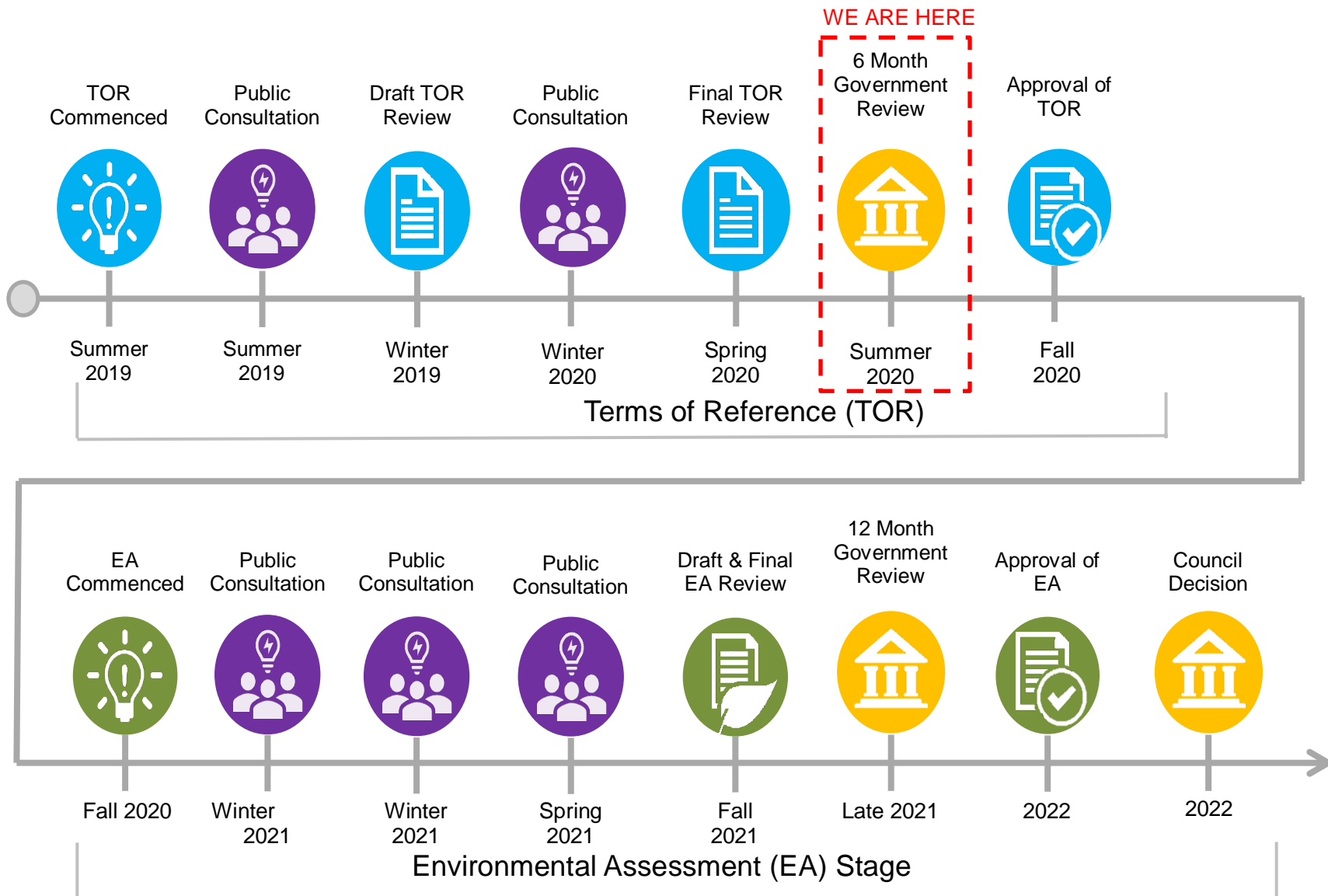
Environmental Component	EA Component	Proposed Scope
		adjacent to it.
	Effects Assessment	<ul style="list-style-type: none"> • Determine the potential for alternatives to result in adverse effects on surface water, soil and groundwater quality • Determine the potential for alternatives to result in serious harm to fish or fish habitat • Determine the potential for alternatives to result in adverse effects on the terrestrial ecology • Conduct a screening assessment regarding SAR and SWH • Identify mitigation measures, aquatic and terrestrial habitat restoration and enhancement opportunities • Examine the potential for bird-friendly design of the shoreline.
Socio-economic	Baseline Studies	<ul style="list-style-type: none"> • Investigate and characterize the existing and future residential, recreational, economic and institutional features that may be potentially affected by the Project • Characterize the existing and likely future transportation network and traffic conditions
	Effects Assessment	<ul style="list-style-type: none"> • Determine how materials and workers will arrive to the site during construction and how this will alter traffic volumes • Determine the potential for disruption to navigation, boating and marina use by boaters/sailors. • Determine the potential for alternatives to result in disruption to the use and enjoyment of property and recreational uses near the marina site taking into consideration likely nuisance effects (e.g., odours, noise and traffic etc.) • Determine the potential for alternatives to impact marine-related jobs and business operations Determine the potential for alternatives to result in a positive change in community character and/or beneficial social and recreational activities near the marina site • Identify mitigation measures, transition and enhancement opportunities.
Cultural Environment	Baseline Studies	<ul style="list-style-type: none"> • Investigate and characterize the potential for cultural heritage resources to be affected by the project. • Should the results of the screen checklists warrant, a Stage 1 archaeological assessment and a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment will be undertaken. • A marine archaeological assessment has been undertaken.
	Effects Assessment	<ul style="list-style-type: none"> • Determine the potential for alternatives to result in effects to cultural heritage resources such as archaeological resources, cultural heritage landscapes and built heritage resources. • Propose and recommend measures to avoid or mitigate potential negative impacts to known or potential cultural heritage resources.

Table 7-1 provides a graphic illustrating the environmental assessment process and proposed timelines. The ToR Stage commenced in July 2019 and the first consultation event, a Public Information Centre (PIC), was held in Port Credit on July 18, 2019. A second PIC was held in January 2020 during the review of the draft ToR.

The draft ToR was subject to initial government agency and public review in the winter of 2020, with a Final ToR issued for a formal 6 month government agency review in the spring of 2020. Approval of the ToR is anticipated in the fall of 2020.

The EA Stage is expected to commence in the winter of 2021, during which three formal consultation events will be held. A draft EA report will be subject to initial government agency and public review with a Final EA issued for a formal 12-month government agency review in late 2021. Approval of the EA is anticipated in 2022. A decision by Mississauga City Council on the 1PSEPM Project can be expected upon the approval of the EA.

Figure 7-1: The Environmental Assessment Process and Schedule



8.0 CONSULTATION

8.1 CONSULTATION ON TOR

The objective of the public, agency and Indigenous community consultation on the ToR was to consult with all potentially affected and interested stakeholders about the ToR and the proposed consultation plan for the EA such that there is stakeholder buy-in as to how the EA will be conducted. ToR consultation mechanisms have included a Notice of Commencement and Notice of Submission published in newspapers and online and emailed to the 1PSEPM Project contact list, PICs, website updates, mobile signs, and newsletters. Consultation with agencies and Indigenous communities has included email and telephone correspondence and face-to-face meetings where appropriate. For a full description of ToR consultation to date, please refer to the Record of Consultation submitted in conjunction with the ToR.

8.2 CONSULTATION PLAN FOR THE EA

8.2.1 Guiding Principles

1PSEPM Project EA consultation activities will meet the requirements and best practice for the provincial EA process. The 1PSEPM Project is part of the Inspiration Port Credit area, and a number of other projects being led by the City, Region of Peel, and CVC are taking place at the same time. Given the potential for consultation fatigue, public consultation events and activities will be coordinated between the various projects to allow for a streamlined conduit of information to and from the public for the various projects. The City acknowledges that as this and other project move forward, new issues and new stakeholders may emerge. It is the City's intent to address new issues and involve new stakeholders in the 1PSEPM Project EA.

8.2.2 Consultation Objectives

The following objectives will guide EA consultation activities:

1. To meet the consultation requirements for the provincial Individual EA.
2. To provide opportunities to participate in the consultation process to anyone interested.
3. To provide clear, concise information about the 1PSEPM Project that is easy for the public to understand.
4. To create opportunities for meaningful two-way exchange of information between the proponents, their consultants, and consultation participants.
5. To produce accurate and comprehensive reports that capture all feedback and advice received.

6. To thoroughly review and consider all feedback and advice received through the consultation and demonstrate how that feedback and advice has influenced the 1PSEPM Project.

8.2.3 Regulatory Consultation and Community Engagement Mechanisms

Consultation with the agencies, interested parties, stakeholders and public will be ongoing throughout the EA Stage of the Project. Consultation activities during the EA Stage will be a continuation of the activities that were successful during the ToR Stage. Consultation will begin with the publication and distribution of the Notice of Commencement for the EA. The City's project webpage will also be updated with information related to the EA Stage. Notifications of PICs will be mailed to study area residents and businesses. Letters will also be sent to regulatory agencies and Indigenous communities to provide notification and request meetings to continue to discuss the project and the EA Stage. Three Public Information Centres (PICs) are planned during the EA Stage.

The PICs will share information through a formal presentation and on display boards and provide an opportunity for interested people to ask questions of team members. Information presented at each PIC will be posted online following the event to further solicit comments. Throughout the EA Stage meetings with stakeholder groups and Indigenous communities will be held to discuss and resolve issues and concerns. New or emerging issues will be tracked and new stakeholders will be added to the City's database.

The consultation process will be designed to directly inform decision-making at key points in the EA. At each of these points, the public and agencies will have the opportunity to provide their feedback and advice through the consultation mechanisms discussed above. The key points in the EA process are:

- Development and evaluation of 'Alternative Methods';
- Selection of preliminary Preferred Alternative; and
- Confirmation and refinement of Preferred Alternative including mitigation and effects management / adaptive management plans.

Once the Draft EA is prepared, all interested stakeholders, agencies and Indigenous communities will be notified of the opportunity for review and comment. All comments received will be included in the Final EA and notification will be published through letters, traditional media and social media of the availability of the Final EA for review and comment.

Targeted consultation on an as required basis with key stakeholders including representatives from:

- The local and surrounding neighbourhoods (including the general public, representatives of resident associations, and organizations with recreational, environmental, cultural, heritage, business, and other interests); and
- The municipal, provincial, and federal government (City of Mississauga, Region of Peel, Province of Ontario, Government of Canada).
- Agencies (Credit Valley Conservation)

8.2.4 Indigenous Communities

The 1PSEPM Project Team is engaged with Indigenous communities and interested community members as per the Crown's Duty to Consult. Indigenous communities that have a documented history of occupying the 1PSEPM Project or Regional Study Areas and have potential or established Aboriginal or treaty rights in the vicinity of the Project will continue to be consulted for the Project as it progresses. This information includes regular updates, notices of archeological findings in the Project Study Area and potential environmental impacts. As well, an open invitation will be extended to Indigenous communities to meet with the Project Team to discuss the proposal in greater detail and discuss issues of interest. No input was received from Indigenous communities on the Consultation Plan for the EA. The City remains flexible to meet with Indigenous communities at key decision points and as required or desired by the Indigenous communities. Indigenous communities will be contacted at each decision point and invited to attend all consultation events.

The following Indigenous communities were contacted during the ToR Stage and will continue to be contacted during the EA process:

- Mississaugas of the Credit First Nation;
- Six Nations of the Grand River as represented by the Elected Chief and Council
- Haudenosaunee Confederacy Chiefs Council; and
- Huron Wendat Nation.

9.0 MONITORING AND ADAPTIVE MANAGEMENT

The development of a monitoring plan will be an important part of the EA. Monitoring is used to verify expected environmental effects to determine if additional mitigation or impact management measures are required and to ensure the fulfilment of commitments made in the EA and conditions of approval. A monitoring plan will be developed during the 1PSEPM EA which is expected to, at a minimum, include the following information:

- The frequency of the proposed monitoring;
- Monitoring methods proposed;
- Submission procedures for the results of monitoring activities;
- List of the proposed commitments and how and when they will be addressed;
- The location of monitoring documents; and
- Any applicable emergency response plans.

A strategy and schedule for completing a monitoring plan will be developed and included in the EA. The monitoring plan will consider all relevant 1PSEPM Project phases: planning, detailed design, tendering, construction, establishment and post-establishment. It will also address the MECP's requirement for compliance and effects monitoring. Compliance monitoring is an assessment of whether an undertaking has been designed, constructed, implemented and/or operated in accordance with the commitments in the EA document and the conditions of approval. Effects monitoring consists of activities carried out by the proponent after the approval of the EA to determine the environmental effects of the undertaking.

9.1 EA COMMITMENTS

The EA will include a comprehensive list of commitments made by the City of Mississauga during the ToR process, including where or how they have been dealt with in the EA. The EA will also include a comprehensive list of commitments made by the City during the preparation of the EA. These will include all commitments relating to:

- Impact management measures (such as mitigation measures);
- Additional works and studies to be carried out;
- Monitoring;
- Public consultation and contingency planning; and
- Documentation and correspondence.

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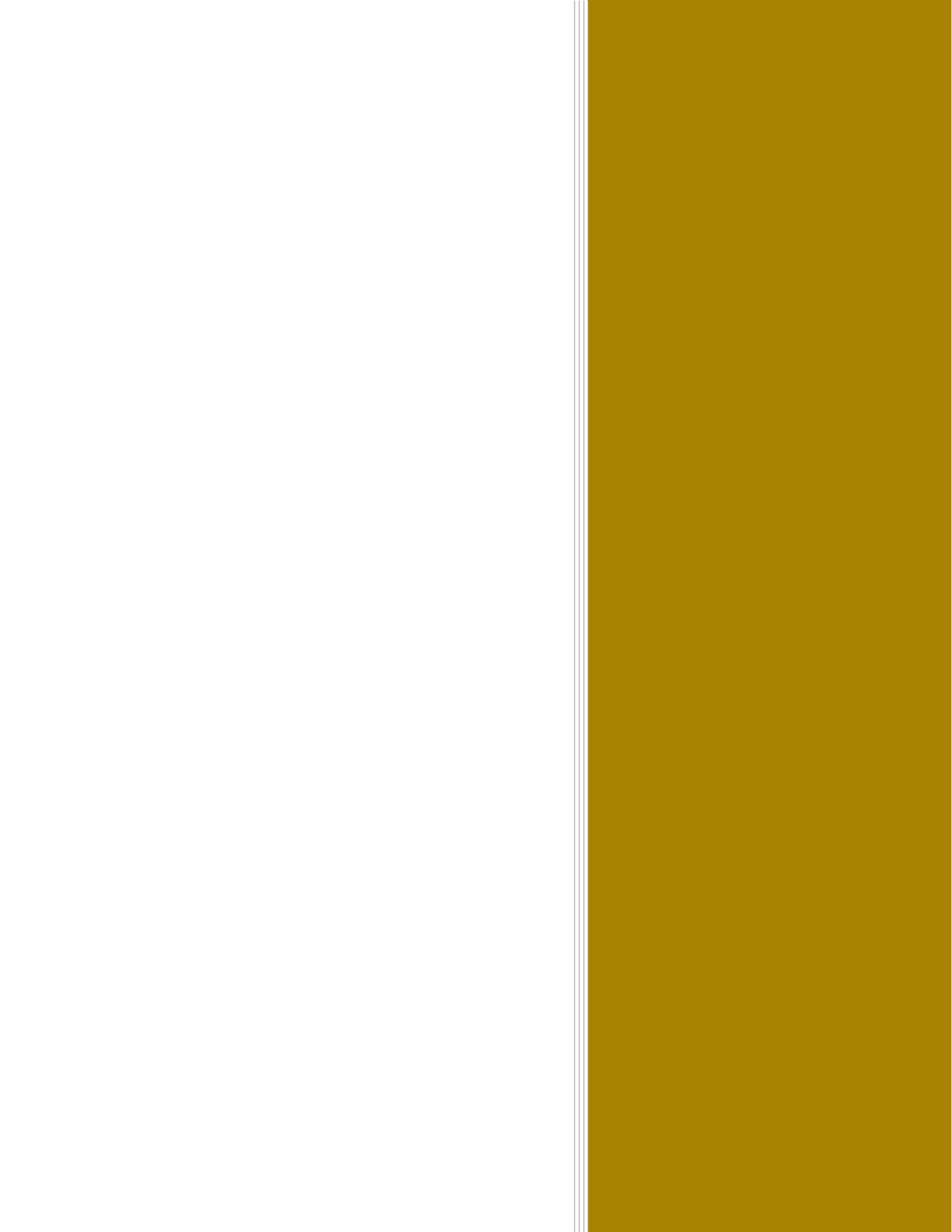
GLOSSARY

Term	Definition
Adaptive management	A learning process where management of an ecological system is adjusted based on future changes to the system.
Alternative Methods	Different ways of implementing a project. For the 1PSEPM Project, these include the amount of habitat created, the extent of linkages created, and size of the land creation footprint, among others.
Alternative 1PSEPM Project configuration	See “Alternative Methods”
Alternatives To	Different ways of approaching and dealing with a problem or opportunity. For the 1PSEPM Project, these are: <ul style="list-style-type: none"> • ‘Do Nothing’ or ‘Status Quo’; • Create a new land base.
Archaeological resources	Includes artifacts, archaeological sites, marine archaeological sites, as defined under the Ontario Heritage Act. The identification and evaluation of such resources are based upon archaeological fieldwork undertaken in accordance with the Ontario Heritage Act.
Archaeological site	Any property that contains an artifact or any other physical evidence of past human use or activity that is of cultural heritage value or interest.
Artificial shoreline	The edge of a body of water that has been significantly modified by humans.
Baseflow	The amount of moving of water entering stream channels from groundwater sources in the drainage of large lakes.
Bathymetry	The measurement of the depth of water in oceans, seas, or lakes.
Breakwater	A structure built on a coast for protecting a beach or harbour from the effects of weather and sediment.
Brownfield	Relating to a former industrial or commercial site where future use is affected by real or perceived environmental contamination
Built heritage resources	A building, structure, monument, installation or any manufactured or constructed part or remnant that contributes to a property’s cultural heritage value or interest as identified by a community, including an Indigenous community. Built heritage resources are located on property that may be designated under Parts IV or V of the Ontario Heritage Act, or that may be included on local, provincial, federal and/ or international registers.
Coastal processes	Natural forces that affect the areas near and along a

Term	Definition
	shoreline, which include erosion, waves, and changes in water levels.
Cultural heritage resources	Include archaeological resources, built heritage resources and cultural heritage landscapes.
Cultural heritage landscape	A defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may include features such as buildings, structures, spaces, views, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. Cultural heritage landscapes may be properties that have been determined to have cultural heritage value or interest under the Ontario Heritage Act, or have been included on federal and/or international registers, and/or protected through official plan, zoning by-law, or other land use planning mechanisms.
Cultural woodland/thickets/communities	Ecological areas that are heavily influenced by historic or ongoing human disturbance.
Depositional zone	An area in a watercourse where sediment build-up occurs.
Dredging	The digging, gathering, or pulling out of sediment to deepen harbours and waterways.
Duty to Consult	A legal requirement for the Crown to consult with Indigenous communities when a project may have an adverse effect on the rights of Indigenous communities in some way. The duty to consult may extend to municipalities by express statute.
Embayment	A recess in a coastline which forms a bay.
Extirpated	Describes the situation in which a species or population no longer exists within a certain geographical location
First Nations	Various Indigenous peoples in Canada who are neither Inuit nor Métis.
Flood conveyance channel	A structure constructed to safely transfer floodwaters within or away from developed or developing areas.
Fluvial	Of or found in a river.
Flyway	A seasonal route followed by birds migrating to and from their breeding areas.
Footprint	The size and shape of the land creation for the 1PSEPM Project.
Gabion	Caged riprap (rock or other material) used along shorelines to control erosion.
Geomorphology	The study of landforms, the processes that created them,

Term	Definition
	and the history of their development.
Geotechnical	Related to soil and bedrock.
Glacial till	Rock and soil material that has been carried by a glacier as it moves and is left behind when the glacier melts or retreats.
Guild (related to birds)	Groups of species in a community that exploit the same set of resources in a similar manner, but are not necessarily closely related.
Important Bird Area	An area recognized as being globally important habitat for the conservation of bird species.
Indigenous communities	Communities or groups of First Nations, Métis or Inuit people.
Infilling	See “Lakefill”
Lakefill	An area of land bordering a lake that was originally underwater, but has been raised above the surface of the water by adding materials such as soil, stones, etc.
Littoral (drift, zone, processes)	Related to the part of a sea, lake or river that is close to the shore.
Marine archaeological site	An archaeological site that is fully or partially submerged or that lies below or partially below the high-water mark of any body of water.
Métis	One of the Aboriginal peoples in Canada who trace their descent to mixed First Nations and European heritage.
Mitigation measures	Recommended actions to reduce, avoid or offset the potential negative effects of a project.
Multi-use trail	A trail that is shared by bicycles and pedestrians.
Navigable waterway	Any body of water which can be safely crossed by vessels.
Nearshore	See “Littoral”.
Nuisance effects	Results of project activities that cause inconvenience or annoyance to people or businesses in the vicinity of the project.
Parameters of concern	Characteristics of water which are measured to determine its quality.
Proponent	The person, body, or government agency that proposes, owns, manages or controls a project.
Reasoned trade-off analysis	A process where the effects of decreasing one or more key factors and simultaneously increasing one or more other key factors in a decision, design, or project are determined.
Remediation	The removal of pollution or contaminants from soil, groundwater, sediment, or surface water.
Resident species	A type of animal that spends the majority of its life-cycle in one area and does not migrate.

Term	Definition
Resilience	The capacity of an ecosystem to respond to disturbance by resisting damage and recovering quickly.
Riparian habitat	Habitat (the natural environment in which organisms live) that is located at the interface between land and a river or stream.
Riprap	Rock or other material used to protect shorelines from erosion.
Sedimentation	The process by which naturally-occurring particles suspended in water are transported and eventually settle at the bottom of a water body or watercourse.
Shoreline treatment	A measure which is applied to the edge of a water body in order to change its characteristics.
Slip (for a boat)	A slip is a location for a boat to moor which is outlined by a pier on each side of the boat, unlike the dock, which has a pier on one side only. A slip can also serve multiple vessels within a single area, the shore-sides of which are lined with piers. The essential characteristic of a slip is that it's open on one end only.
Stonehooking	The historic/past mining of sand, gravel, stone and blocks of shale from the shoreline of a lake.
Substrate	A substance or layer that underlies something, or on which some process occurs, in particular the surface or material on or from which an organism lives, grows, or obtains its nourishment.
Terrestrial	Related to the earth's land area, including its man-made and natural surface and sub-surface features, and its interfaces and interactions with the atmosphere and surface waterbodies.
Undertaking	An enterprise or activity (i.e. a “project”) by the government or a company.
Upland habitat	The dry habitat along the sides of a watercourse (i.e. river or creek).
Viewscape	Those features of an area which provide a range of sights and are considered a community asset. These may include pleasing vistas, scenes and views, among others, that provide a sense of place and character.
Vista	A broad sweeping view of a landscape or open water.
Water lot	One of a regular system of pieces of land which are partly or wholly covered by a water body.
100-year instantaneous water level	The peak water level that has a 1% chance of occurring during any given year.



TERMS OF REFERENCE - NOTICE OF APPROVAL

ENVIRONMENTAL ASSESSMENT ACT

SUBSECTION 6(4)

APPROVAL OF TERMS OF REFERENCE

FOR

THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT

RE: Proponent: City of Mississauga

Terms of Reference: 1 Port Street East Proposed Marina Environmental Assessment

Undertaking: Proposed marina, public access to waterfront and parkland

EA File No.: 19071

As provided for by subsection 6(4) of the Environmental Assessment Act, Terms of Reference, as submitted for approval to the Ministry of the Environment, Conservation and Parks on July 9, 2020 and revised through the submission of an amended Terms of Reference by the City of Mississauga dated September 11, 2020 is hereby approved.

Pursuant to subsection 6.1(1) of the Environmental Assessment Act, any environmental assessment for the above-noted undertaking, submitted to the Ministry of the Environment, Conservation and Parks pursuant to subsection 6.2(1) of the Environmental Assessment Act, must be prepared in accordance with the Terms of Reference as hereby approved.

Reasons:

I am satisfied that an environmental assessment prepared in accordance with the Terms of Reference will be consistent with the purpose of the Environmental Assessment Act and the public interest for the following reasons:

1. The Terms of Reference ensures that the environmental assessment will be completed using a comprehensive public, Indigenous community and government agency consultation process that is open and transparent;

2. The Terms of Reference provides a sufficient level of detail to confirm that the completed environmental assessment should contain a sufficient level of detail to accurately assess the environmental effects of all alternatives and the proposed undertaking;
3. The Terms of Reference sets out a planning process that will ensure the completed environmental assessment will be consistent with the purpose of the Act and the public interest; and,
4. There are no outstanding issues that have not been incorporated into the Terms of Reference or that cannot be addressed during the preparation of the environmental assessment.

Dated the 16 day of September, 2021 at TORONTO.



Minister of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3

1 Port Street East Proposed Marina Environmental Assessment

Appendix B - Technical Memoranda



Memorandum

SHOREPLAN

To: Beata Palka
The City of Mississauga

Copy: Credit Valley Conservation

From: M. Sturm, P. Eng.

Date: December 8, 2022

Re: 1 Port Street East Proposed Marina
Coastal Design and Hazards Considerations
Shoreplan File 19-2991

This memo is provided at the request of Credit Valley Conservation (CVC), to facilitate their commenting process during the preparation of the individual environmental assessment for the 1 Port Street Proposed Marina project.

This memo addresses the coastal engineering aspects of the project only, namely:

1. Coastal Conditions
2. Impact on Coastal Processes
3. Shoreline Hazards Assessment

1.0 Coastal Conditions

1.1 Existing Conditions

Various components of coastal conditions at the site were described in the Terms of Reference and further refined during the process of generating alternatives. The existing coastal conditions are described in the attached Appendix A. This appendix contains a draft of the assessment of existing coastal conditions including existing shoreline conditions, bathymetry, lake levels, wave conditions, ice and littoral sediment transport.

1.2 Coastal Design of Preliminary Alternatives

Coastal conditions for the three preliminary alternatives, small, medium and large, were assessed by considering the existing coastal conditions described in Appendix A. A critical aspect of the assessment is the wave conditions and appropriate design conditions were extracted from the analysis of existing condition and applied to

the conceptual design of the protection works and guided the construction methodology development. The design parameters for shore protection will be consistent with requirements of the Provincial Technical Guide (MNR 1998) and consistent with respect to the requirements of the Provincial Policy, specifically with respect to climate change impacts. The design of protection works considered design high water level of 76.1 m GSC. This design high water level was selected by CVC in their updated shoreline management plan. Design waves have a return period of 1 : 100 years. The south side of the small, medium and large alternatives are subjected to design waves in the order of 4.5m, 3.5 m and 2.5 m respectively. The waves along the east side of the fill area delay gradually to reach approximately 1.5 meter near the existing shore.

The protection structures considered in the alternative design stage were armour stone revetments and were designed using standard stability equations. The revetments were assumed to have a slope of 2H:1V and consist of double layer randomly placement armour stone with appropriate underlayers to provide support and filter properties. The crest elevations were approximated by using standard wave run up equations and wave overtopping equations. The further into the lake the lakefill alternative extends, the higher the crest elevation or flatter the slope of the revetment is required.

Quantity estimates for fill material and protection works were developed for the three size alternatives and relative comparison of the three made. Construction times for each of the alternatives were estimated. The quantities of fill and stone materials for coastal protection are presented in Table 1. The estimated construction times are also listed in the table. In the preliminary alternative stage of the design, it was assumed that the lakefill will be completed to an elevation of 78.0 m on average and the crest of shore protection will be in the order of 79.0 m on the south side and gradually reduce to an elevation of 78.0 at the existing shore.

The construction methodology is similar to that applied at the Jim Tovey Lakeview Conservation Area (JTLCA) project. For now, it is assumed that all stone material, including core and berm fill material, will be purchased. Given the relatively small size of the project, in comparison the JTLWC and unknown implementation schedule, the use of concrete rubble was not considered in the planning process but is appropriate if available at the time of construction.

The construction methodology and schedule assume that stone material will be supplied by both truck and by barge. It is assumed that the supply will be split 50/50. Based on recent construction projects completed within the City of Toronto, the supply of stone material by barge or self-unloaders is available and competitively priced. The construction is anticipated to proceed by constructing a berm along the perimeter of the proposed lakefill, creating an enclosed cell that would be filled with core stone material. The

construction of the berms and cell could proceed from both water side and land side simultaneously.

1.3 Coastal Design of Preferred Alternative

The preferred alternative is a refinement of the large lakefill alternative. The coastal component of the refinement considered the opportunity to enhance aquatic habitat in the area and a refinement of the shore protection structures. It should be noted that the design of shore protection structure is still at the conceptual level. The design wave conditions are illustrated on Figure 1.1. The wave condition at the south end of the lakefill and along the east side are very similar to the existing wave conditions along the existing east breakwater presented in Appendix A.

The construction methodology for the preferred alternative is the same as described above for the preliminary alternatives. The construction methodology and schedule assume that stone material will be supplied by both truck and by barge. It is assumed that the supply will be split 50/50. The construction is anticipated to proceed by constructing a berm along perimeter of the proposed lakefill, creating an enclosed cell that would be filled with core stone material. The construction of the berms and cell could proceed from both water side and land side simultaneously.

The shore protection structures are proposed to be armour stone revetments with 2H:1V slopes, double layer with random placement. The opportunity to undulate the shoreline and create aquatic habitat features along the east side was considered. However, such undulation would reduce the width of the created land and also its functionality. As an alternative, an aquatic habitat feature is proposed at the south end of the lakefill. The proposed feature will create approximately 2,400 sq. m of semi-sheltered moderately shallow water area where substrate can be selected, and structural habitat provided. The concept is presented on Figure 1.2. Details of the substrate and habitat features will be further developed by the project team in consultation with the regulatory agencies. The anticipated wave conditions within this embayment under design storm conditions is shown in Figure 1.3.

2.0 Impact on Coastal Processes

Impacts on coastal processes are typically considered to be either local or regional. Impact may include alteration of sediment transport or waves and wave energy related impacts. These are briefly discussed below.

The impact of the proposed structure on regional sediment transport is null. The proposed structure does not extend any further offshore than the existing structures. Impact on along shore regional transport is controlled by the offshore extent and thus there is no impact on

along shore transport. Impact on cross-shore transport, or on-shore off-shore transport could be caused by creation of a sheltered embayment that creates potential sedimentation areas or concentrate wave energy that would increase transport. The proposed lakefill parallels the existing breakwater alignment and parallels the direction of major incoming waves. As such no such impacts occur.

Local impact can be potentially caused by wave reflections. The south tip of the proposed lakefill is to have a underwater slope between 2h:1v and 3H:1v. This is flatter than the south tip of the existing breakwater. The east side of the proposed fill is to be sloped at 2H:1v. This slope is the same or marginally flatter that the existing east side of the breakwater, thus no change in the local scour pattern along the bottom will occur.

3.0 Shoreline Hazards Assessment

The Provincial Policy Statement (PPS) identifies natural hazards along the shorelines of the Great Lakes and outlines the principles of land management and conservation to ensure public safety. Conservation Authorities or the Ministry of Northern Development, Mines and Natural Resources are responsible for the review of projects under their Regulations and Guidelines. The policy identifies three potential hazards. These are Erosion Hazard, Flood Hazard and Dynamic Beach Hazard. The Technical Guide prepared in 1998 by then Ministry of Natural Resources also identifies Artificial Lands and provides guidance on hazard assessment along these types of shorelines. This is in recognition of the fact that lands may be created that do not have characteristics of natural lands and application of the standard shoreline hazards would be inappropriate. The concept of Artificial Lands is described below.

3.1 Artificial Lands

The concept of "Artificial Lands" is described on the Technical Guide for the Great Lakes –St. Lawrence River System prepared by the Ministry of Natural Resources. The "artificial" classification is noted in the recommended shoreline classification scheme. Requirements and methods of dealing with artificial shores are described in Part 7 of the document entitled "Addressing the Hazard". Despite this recognition of artificial land classification, the Regulations adopted by conservation authorities in the province have not recognized any special regulations or policies that need to be applied to these lands. The regulations and policies of CVC are no different.

Our experience is that artificial lands are treated as special cases and specific agreements consistent with the suggested requirements outlined in the technical guide are applied. The criteria provided in the Technical Guide to define the artificial shore type include those shorelines that:

1. cannot be classified on the basis of their physiographic characteristics due to human activities and/or alterations to the shoreline;
2. involve structural changes that extend inland;
3. involve protection works that exist above and below the waterline and extend alongshore for about 1 km;
4. have the protection works under public ownership and/or are maintained by a public agency or a significant private concern; and
5. have shoreline processes and flood, erosion and dynamic beach hazards which have been significantly altered by the protection work.

It is our professional opinion that the lands created for the support of the marina at 1 Port Street are completely artificial, being constructed by process of lake filling and connections to lands previously created by lake filling. This meets the requirements of point 1, 2, and 5. We also understand that the lands will be ultimately owned by the City of Mississauga, which addresses the requirement of point 4.

We are also of the view that the lakefill meets the requirement of point 3, although the lakefill is only approximately 600 meters long. This landfill is connected to adjacent lands that are already owned by the City of Mississauga or by Crown corporations. The City of Mississauga owns waterfront lands directly to the east up to and including Tall Oaks Park. This is additional approximately 500 meters of shoreline that will become connected to the proposed lakefill. The wharf lands to the west, from which the present marina operates, are owned by Crown Corporation that meets the intent of ownership described in Point 4. This shoreline is also approximately 500 meters long and artificially constructed. Further, the east bank of the Credit River was altered and filled south of Lakeshore Road and is owned by the City of Mississauga. This part of the shore is in the order of 300 meters long and includes J. J. Plaus Park and Snug Harbour.

3.2 Maintenance Access

Since the stability of the artificial lands depends on the structures, the provision of maintenance access is a very critical aspect of any assessment of artificial lands. Very few civil structures are designed to be without the need for some maintenance within the planning horizon. The planning horizon is taken as 100 years within the provincial shoreline hazard context. Maintenance access for shoreline structures is commonly taken as 5 meters to and along the shoreline structure. This travel width allows access for most heavy equipment, such as excavators or cranes.

In the case of 1 Port Street East proposed marina project, a maintenance access of 5 meters is a reasonable width. This site also provides the opportunity to access the works with marine based

equipment. Although marine based construction is generally not considered for shore protection, it is a viable method at this site due to the presence of deep water.

3.3 Maintenance and Monitoring

Any civil infrastructure works require periodic maintenance and repair and eventual replacement. Shoreline structures, such as shore protection works, are no exception. Design life of coastal infrastructure varies depending on the purpose and nature of the structure. Typically, a design life of 25 to 50 years is used in design. During the design life, maintenance of the structures may be required, but typically is minimal. The potential for maintenance requirements is likely to increase with age of the structure. Thus, monitoring of the condition of the shoreline structures is a prudent practice.

Figure 1.1 Design Wave Conditions, Preferred Alternative

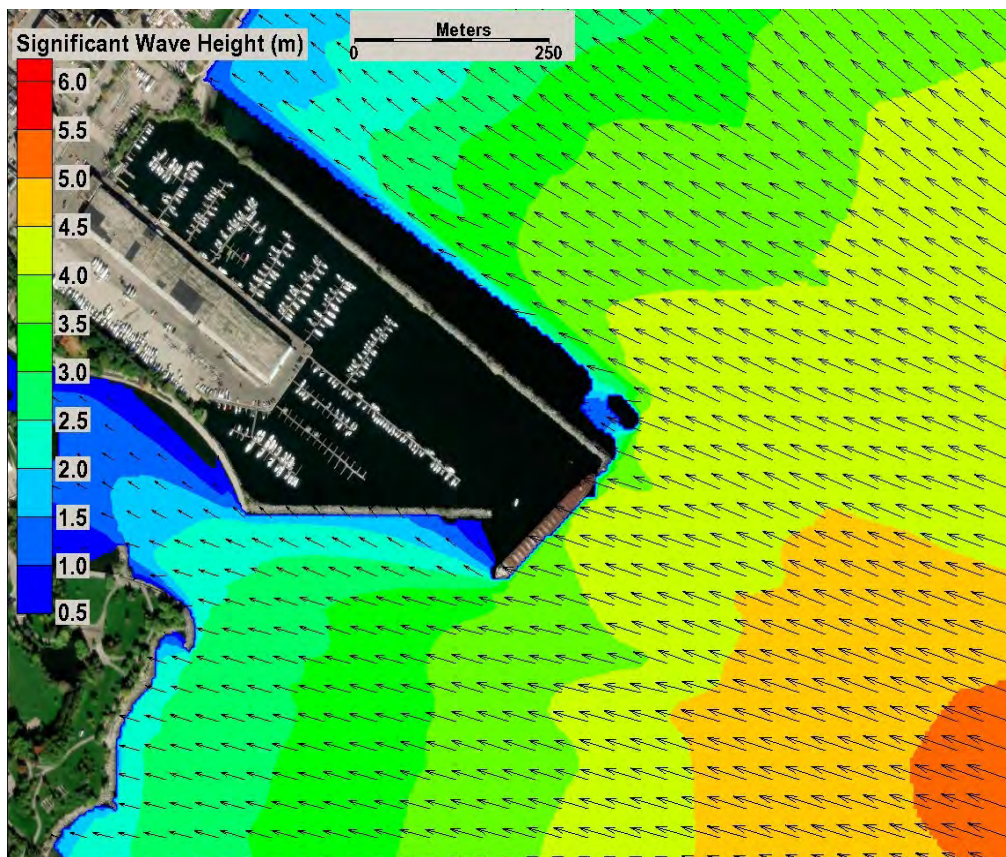


Figure 1.2 Semi-Sheltered Aquatic Habitat Area

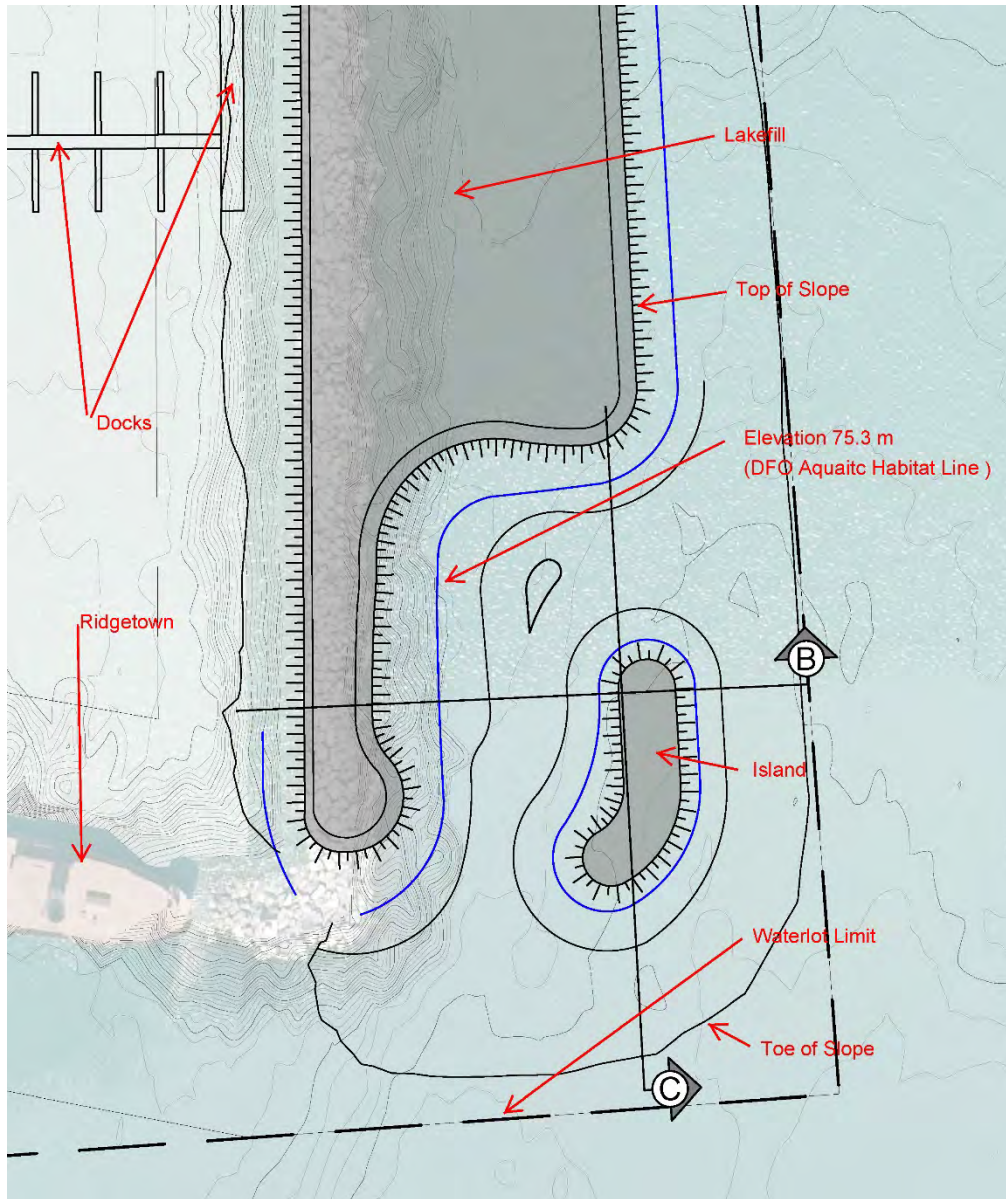
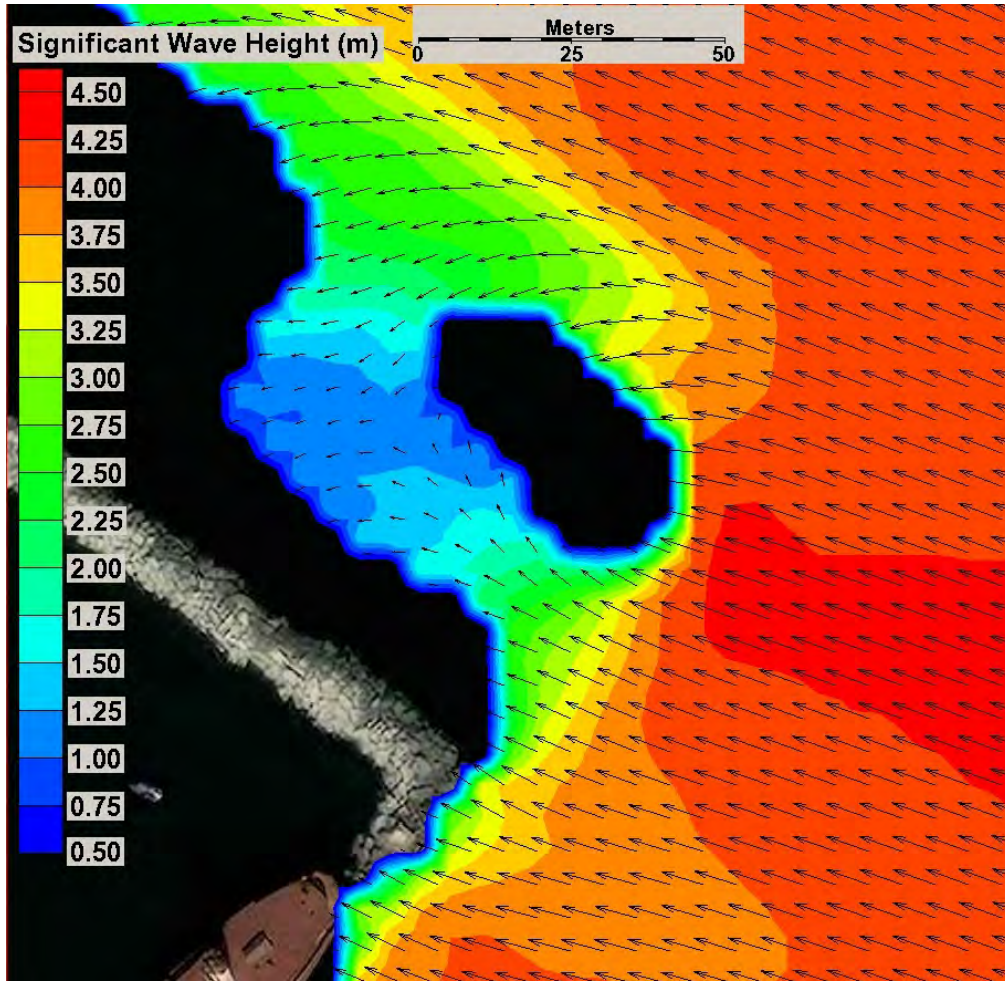


Figure 1.3 Design Wave Conditions In South End Embayment



SHOREPLAN

Appendix A

**Partial DRAFT REPORT
(Appendix A to CVC Memo 2022 12 08)**

**1 Port Street East Proposed Marina
Environmental Assessment**

Coastal Technical Report



prepared by

**Shoreplan
Engineering Limited**

2022

SHOREPLAN

1 Port Street East Proposed Marina Environmental Assessment Coastal Technical Report

Prepared for

City of Mississauga

by

SHOREPLAN

SHOREPLAN ENGINEERING LIMITED

VERSION	DATE	STATUS	COMMENTS
01	2021-12-08	partial draft	for CVC information only
0			

This report was prepared by Shoreplan Engineering Limited for use by the City of Mississauga. The material within reflects the judgment of Shoreplan based on the information available to them at the time of preparation. Any use of this report by Third Parties, including relying on decisions made because of this report, are the responsibility of the Third Parties. Shoreplan Engineering Limited is not responsible for any damages suffered by any Third Party as a result of decisions made, or actions based, on this report.

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1.0 Introduction

The City of Mississauga (City) is undertaking an Individual Environmental Assessment (EA) for the 1 Port Street East Proposed Marina Project (1PSEPM Project). This document describes the coastal engineering work carried out in support of the EA. It describes the baseline inventory of coastal conditions, the development and assessment of alternative concepts, a detailed assessment of the preferred alternative, and the identification of mitigation measures.

1.1 Environmental Assessment Study Areas

The environmental assessment is based on three general study areas; the project study area, the local study area, and the regional study area. The Project Study Area (PSA) is shown in Figure 1.1. It includes a portion of the 1 Port Street East property, inclusive of the water lot, at the mouth of the Credit River in Mississauga. It is bound by Port Street East to the north, Stavebank Road to the west, Helene Street South to the east and Lake Ontario to the south.

The Local Study Area (LSA) is shown in Figure 1.2. It is comprised of the areas within the Port Credit Community Node Character Area and the Old Port Credit Village Heritage Conservation District. The area is bounded by the CN tracks to the north, Mississauga Road to the west, Elmwood Avenue to the east and Lake Ontario to the South. This area includes the primary access roads from the QEW to the project site.

The Regional Study Area (RSA) is shown in Figure 1.3. The RSA extends beyond the LSA. Depending on the particular criterion this may include portions of the Credit River watershed up to approximately 5 km upstream, the Lake Ontario shoreline and shoreline neighbourhoods within the boundaries of the City of Mississauga. This study is used to describe the broader setting for project and to discuss cumulative effects of the project.

Figure 1.1 EA Project Study Area



Figure 1.2 Local Study Area



Figure 1.3 Regional Study Area



2.0 Baseline Environmental Conditions

2.1 Shoreline

Regional Study Area

The majority of the shoreline within the 1PSEPM Regional Study Area has been protected with either formal or informal shoreline protection structures. Some sections of shoreline that have not been intentionally protected appear to be experiencing reduced erosion rates due to the influence of adjacent structures. An example of this is the sand beach shoreline fronting the Lorne Park Estates, immediately adjacent to the northern most headland at Jack Darling Park Shoreplan.

As part of the CVC Lake Ontario Shoreline Hazards study (Shoreplan, 2005) defined a total of 87 shoreline reaches within the CVC watershed. Amongst other attributes, a general shoreline type and shoreline protection type were assigned to each reach. Table 2.1 and Table 2.2 were developed from that data. The shoreline length values were determined from digital mapping provided by the City of Mississauga and exclude major structures such as piers and breakwaters but include the shoreline within the Port Credit marinas and Lakefront Promenade Park.

Table 2.1 General Shoreline Statistics

Shoreline Type	Length (m)	% of Total Length
all reaches	20,145	
artificial shoreline	9,003	45%
cohesive shore with protection structure	7,779	39%
cobble beach	1,454	7%
sand beach	834	4%
cohesive shore with protective beach or rubble	799	4%
unprotected cohesive bank or bluff	276	1%

Table 2.2 General Shoreline Protection Statistics

Shoreline Protection Type	Length (m)	% of Total Length
revetment	6,072	30%
wall	4,332	22%
beach	3,495	18%
wall and revetment	2,924	15%
rubble	1,417	7%
headland-beach (artificial)	904	4%
none	858	4%
rip-rap berm	143	< 1%

The nearshore bottom within the 1PSEPM Regional Study Area is composed mainly of shale bedrock, overlain with erodible cohesive tills varying from low plains to low and moderate height bluffs. Extensive filling has created a number of reaches that are characterized as artificial shores.

Examples of beaches within the 1PSEPM Regional Study Area include cobble beaches at Rattray Marsh, the Petro Canada Clarkson Refinery, Lakeside Park and Fusion Park; and sand beaches at Richard's Memorial Park, Lorne Park Estates and Jack Darling Park, and adjacent to the mouth of Etobicoke Creek.

2.2 Bathymetry

Regional, Local and Project Study Areas

Figure 2.1 illustrates the bathymetry within the local and project study areas. Bathymetry reveals both the depth of water and the topography of the lakebed. This information is important in understanding the cost and effects of placement of lakefill and is a key input to the numerical models used to determine the site wave conditions. Figure 2.2 shows the bathymetry used in the nearshore wave transformation model described in Section 2.4. The data presented in Figure 2.2 was synthesized from a number of Canadian Hydrographic Service survey field sheets.

Figure 2.1 Bathymetry in the Project and Local Study Areas

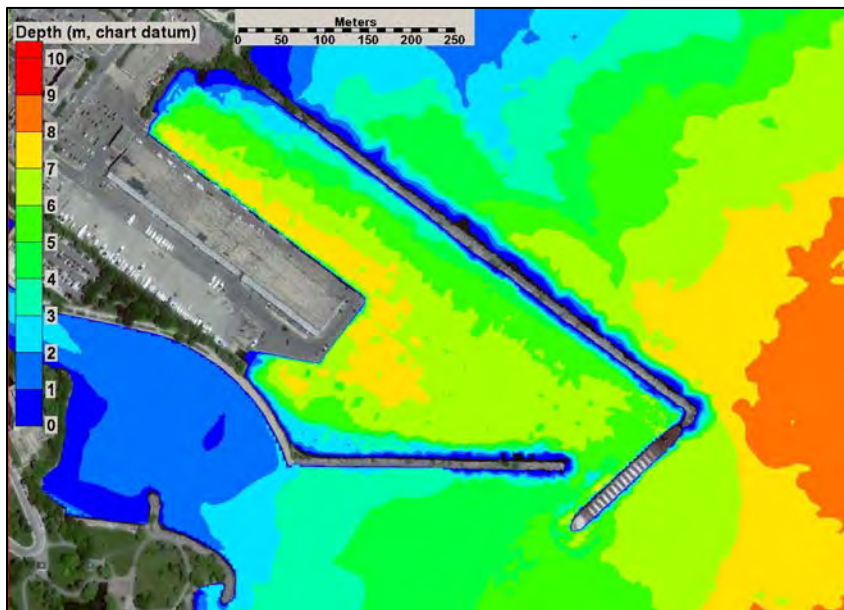
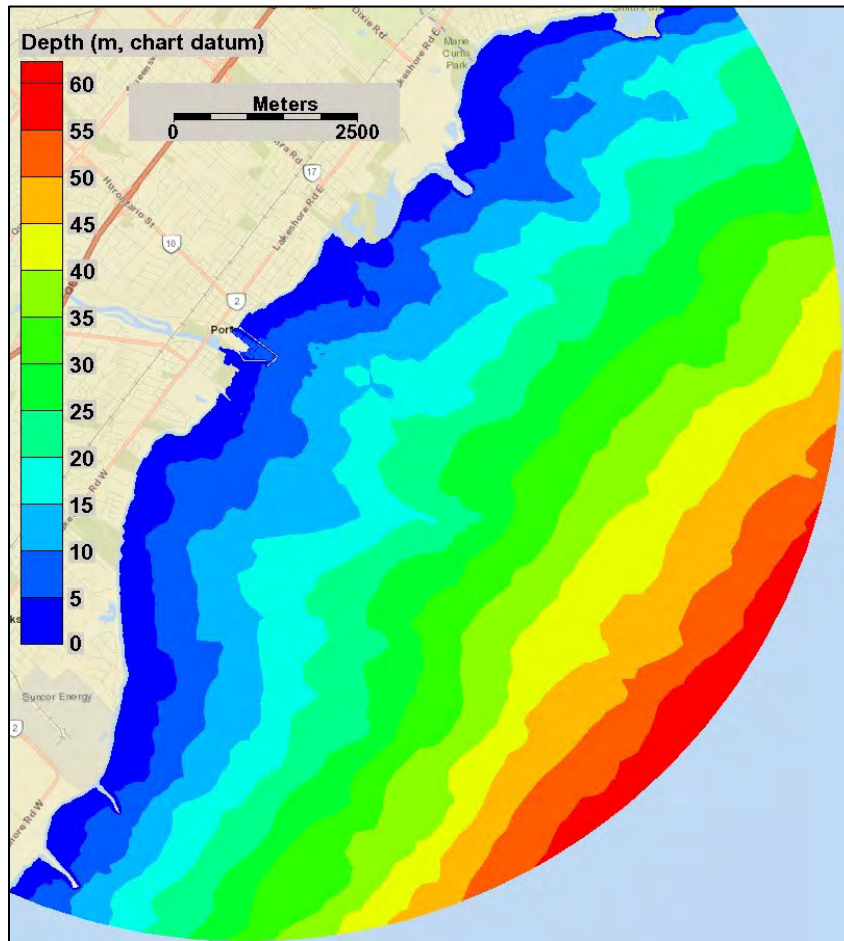


Figure 2.2 Bathymetry in the Regional Study Area



2.3 Lake Water Levels

Regional, Local and Project Study Areas

Water levels on Lake Ontario fluctuate on short-term, seasonal and long-term basis. Water levels of the Great Lakes, including Lake Ontario, are referenced to chart datum. Chart datum is generally selected so that the water level seldom falls below it. The referenced chart datum on the Great Lakes is the International Great Lakes Datum (1985). For Lake Ontario the chart datum is 74.2 m. Nautical charts refer to this datum. The chart datum is periodically adjusted for the differential movement of earth's crust.

Seasonal fluctuations reflect the annual hydrologic cycle which is characterized by higher net basin supplies during the spring and early part of summer with lower supplies during the remainder of the year. Seasonal water levels on Lake Ontario generally peak in the summer (typically in June) with the lowest water levels generally occurring in the winter (typically in December). The average annual water level fluctuation has been approximately 0.6 metres, but this is changing. Although water levels below chart datum are rare, the lowest monthly mean on record was approximately 0.46 metres below chart datum.

Short-term fluctuations last from less than an hour up to several days and are caused by local and regional meteorological conditions. These fluctuations are most noticeable during storm events when barometric pressure differences and surface wind stresses cause temporary imbalances in water levels at different locations on the lake. These storm surges, or wind-setup, are most noticeable at the ends of the Lake, particularly when the wind blows down the length of the Lake.

Long-term water level fluctuations on the Great Lakes are the result of persistently high or low net basin supplies. More than a century of water level records show that there is no consistent or predictable cycle to the long-term water level fluctuations. Some climate change studies that examined the impact of global warming have suggested that long-term water levels on the Great Lakes will be lower than they are today. Those changes, however, are expected to have a lesser impact on Lake Ontario than on the upper lakes because the Lake Ontario water levels are regulated. For the time being most approving agencies, including CVC, require that the 100-year instantaneous water level (the peak water level that has a 1% probability of occurring during any given year) be used for the design and assessment of shoreline protection structures.

MNR (1989) calculated instantaneous water levels for all Canadian shores on the Great Lakes using a combined probability analysis of monthly mean lake levels and storm surges. A coarse grid circulation model was used to interpolate surge values between stations where measured data was used to calculate the surge height return periods. Toronto and Burlington were the data stations either side of the Mississauga sector. The water levels presented in that report were typically used for designs and assessments, but the 2017 and 2019 high water level have led to a re-assessment of those values. CVC recently adopted 100-year design water level values of 76.0m CGVD for development east of the Clarkson Pier and 76.1m CGVD for development west of the Clarkson Pier. Those values are used in the EA. The Project Study Area is east of the Clarkson Pier, where the 100-year design water level is 76.0m CGVD.

2.3.1 Climate Change

Climate change is expected to impact both water levels and storm conditions. A considerable amount of research has been done on climate change and its expected effects on the Great Lakes, but while results vary considerably, there is general consensus on several key points. Overall, storm frequency and intensity are both expected to increase, while mean water levels may fall. Climate change impacts on Lake Ontario water levels are expected to be less than on the other Great Lakes because its water levels are regulated.

Lofgren et al (2002) used two general circulation models to provide input to a suite of hydrologic models for the Great Lakes basin. The Coupled General Circulation Model (CGCM1) from the Canadian Centre for Climate Modelling and Analysis predicted a drier future climate while the HadCM2 model from the United Kingdom Meteorological Office's Hadley Centre for Climate Prediction and Research predicted a wetter future climate. The CGCM1 model results predicted lower lake levels due to a decrease in precipitation, and an increase in air temperature which results in increased evaporation. The HadCM2 model results predicted a small increase in water levels, indistinguishable from the natural variation that occurs on Lake Ontario. The predicted water level increase was caused by increased precipitation and a smaller increase in

air temperature. Table 2.3 shows the predicted changes in annual mean lake levels from the two models, for 2030, 2050, and 2090.

Table 2.3 Predicted Water Level Changes from Lofgren et al (2002)

Predicted Changes in Lake Ontario Annual Mean Water Level (m)			
model	2020	2050	2090
CGCM1	-0.35	-0.53	-0.99
HadCM2	+0.02	+0.04	+0.01

McDermid et al. (2015) synthesized available science on the observed and predicted impacts of climate change in the Great Lakes basin. They reported a lack of clarity in the understanding of multiple factors influencing water level projections for the Great Lakes, and a low confidence in the current projections of future water levels resulting from climate change.

Bonsal et al (2019) noted that disturbances to the water cycle by humans (dams, diversions and withdrawals) make it difficult to discern climate-related changes. They also noted that most studies of future levels used models that include phenomena that can have significant effects on water balance, such as lake-effect snow, which transfers large amounts of water from the lake to the land. Projected net basin supplies showed changes to the season cycles for 2041-2070 compared with 1961-2000 producing an increase in water levels during the winter and early spring and a decrease in summer and early fall. Overall estimates were a decrease in net basin supply of 1.7% to 3.9% in Lakes Superior, Michigan, Huron, and Erie, and 0.7% in Lake Ontario. On average, under a range of emission scenarios, most regional climate model studies project a lowering of future Great Lake levels by 0.2 m for the 30-year time period centred on the 2050s, as compared to the 1971–2000 mean. However, there is a considerable range (from a 0.1 m increase to a 0.5 m decrease). They also noted a low confidence in the estimate of future water levels as a result of climate change. All of the studies they reviewed agreed that there will continue to be large year-to-year and multi-year variability in lake levels, possibly even above and below the historically observed extremes

Given the low confidence in predicted future water levels, the design water level described in Section 2.3 was not changed to account for the potential impacts of climate change.

2.4 Wave Conditions

Regional, Local and Project Study Areas

Due to a scarcity of locally measured wave conditions, a process known as hindcasting is used to develop a long-term wave database suitable for statistical analysis. Hindcasting uses recorded wind data to model the wave conditions expected to have occurred due to those winds. By hindcasting we can produce wave climates which represent expected conditions over a period of years.

Wave conditions within the study area were determined by first hindcasting waves at an offshore location where wave generation is not effected by water depth, then transferring those

waves in to the nearshore region accounting for the effects of refraction, diffraction, and wave breaking.

A 48-year wave hindcast was completed by using Toronto Island wind data to produce deep water wave conditions offshore of the site. Wind data recorded from January 1, 1973 to December 31, 2020 was used to produce hourly estimates of the deep-water significant wave height, peak wave period and mean wave direction. Wind data prior to 1973 was not used due to the relatively high occurrence of missing data.

The hindcast was prepared using Shoreplan's parametric hindcast model PHEW. Toronto Island wind data was selected as the best wind data source for Lake Ontario hindcasting on the basis of extensive calibration and verification exercises carried out on different Shoreplan projects including the Etobicoke Motel Strip (Shoreplan, 1995), Port Union Road (Shoreplan, 1998) and Frenchman's Bay (Shoreplan, 2009). During those projects waves hindcast with Trenton, Toronto Island, Burlington, Hamilton and St. Catharines wind data were compared to measured wave data from a total of twelve buoys deployed at nine locations (Kingston, Point Petre, Main Duck Island, Prince Edward Point, Port Hope, Cobourg, Toronto, Burlington and Grimsby). All measured wind and wave data was obtained from Environment Canada.

The general purpose of the hindcast calibration and verification undertaken was to determine which measured wind data set best represents the actual over-water winds that generate waves. This was done by hindcasting to sites where wave data had been measured then comparing the hindcast and measured waves. Typical calibrations involved scaling wind speeds to improve the overall match. It was found that Toronto Island wind data provided the best hindcasts for Central and Western Lake Ontario.

The PHEW hindcast model has been used for coastal assessments and coastal structure designs at numerous site along western Lake Ontario including Frenchman's Bay, Port Union Road, the Scarborough Bluffs, Ashbridges Bay, Tommy Thompson Park, Ontario Place, Humber Bay Parks, Mimico Linear Waterfront Park, Lakefront Promenade Park, Port Credit, Oakville Harbour, Shell Park, Burloak Waterfront Park, Burlington Beach, Fifty Point, Grimsby Waterfront Parks and the entrance to the Welland Canal.

The deep-water wave climate offshore of Port Credit has a bi-nodal distribution of the total wave power with predominant easterly and southwesterly peak. Figure 2.3 shows the directional distribution of the highest wave heights and the total wave power from the hindcast data. Figure 2.4 presents wave height and period exceedance curves, which show the percentage of time any given wave height or period is exceeded. Figure 2.5 shows the results of an extreme value analysis completed in order to determine a design wave height. For structural design the 100-year return period wave condition is used. At the upper 90% confidence interval the 100-year wave condition has a significant wave height of 5.9m with a peak wave period of 10.5 seconds. That wave comes from the east.

The 100-year offshore wave was transferred in to the project study area using the SWAN two-dimension spectral wave model developed at Delft University of Technology. The model simulates a steady-state spectral transformation of directional random waves co-existing with ambient currents in the coastal zone. It includes features such as wave generation, wave reflection, wave diffraction, and bottom frictional dissipation. Model bathymetry (described in Section 2.2) was developed from Canadian Hydrographic Service field sheets. A flexible grid

was used with grid spacing ranging from approximately 5m in project study area to 250m at the offshore boundary.

Figure 2.6 shows the 100-year offshore wave condition transferred inshore at the 100-year instantaneous water level. This represents the upper limit of design conditions usually considered in coastal applications. Extreme values of both offshore wave conditions and water levels are typically considered because both play a major role in determining the nearshore wave condition. Figure 2.7 shows the same model results within the project study area.

Figure 2.3 Distribution of Highest Hindcast Wave Heights and Total Wave Power

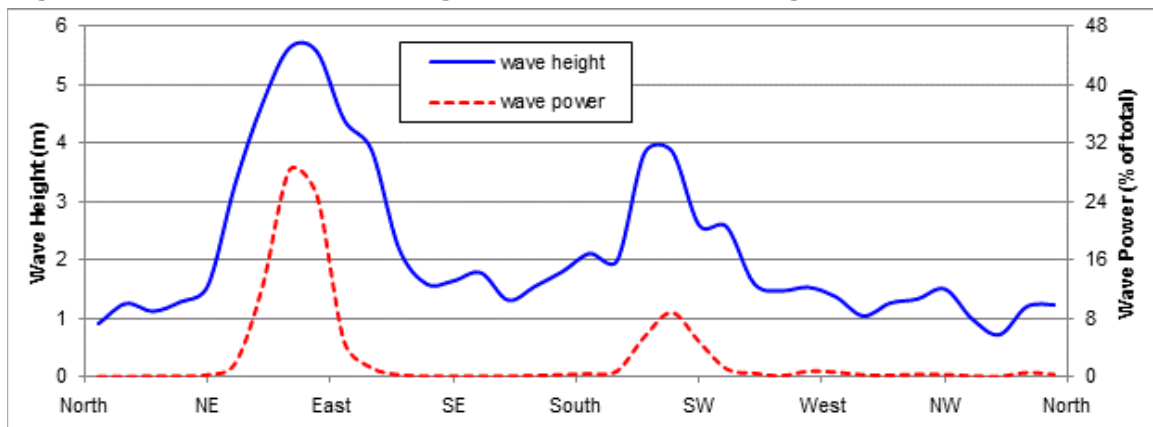


Figure 2.4 Wave Height and Period Exceedance Curves

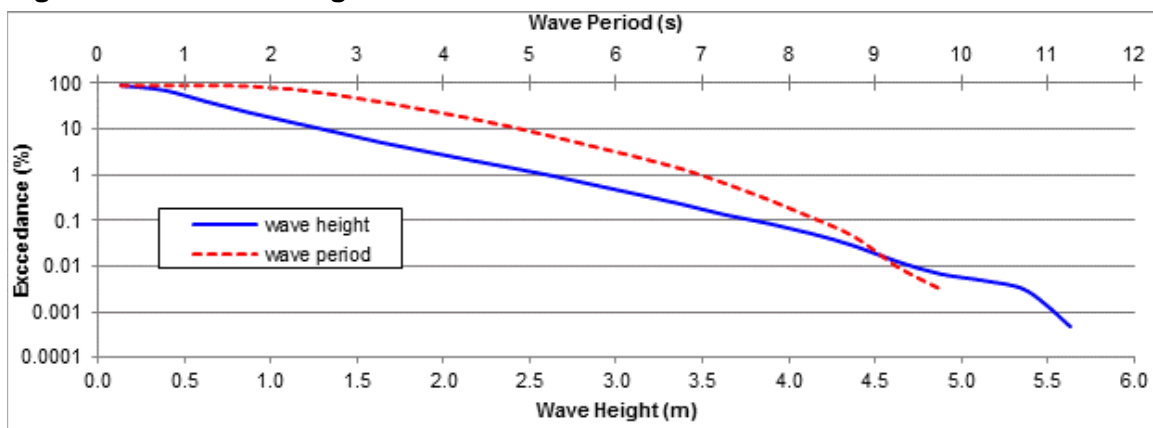


Figure 2.5 Peak-Over-Threshold Extreme Value Analysis (Easterly Storms)

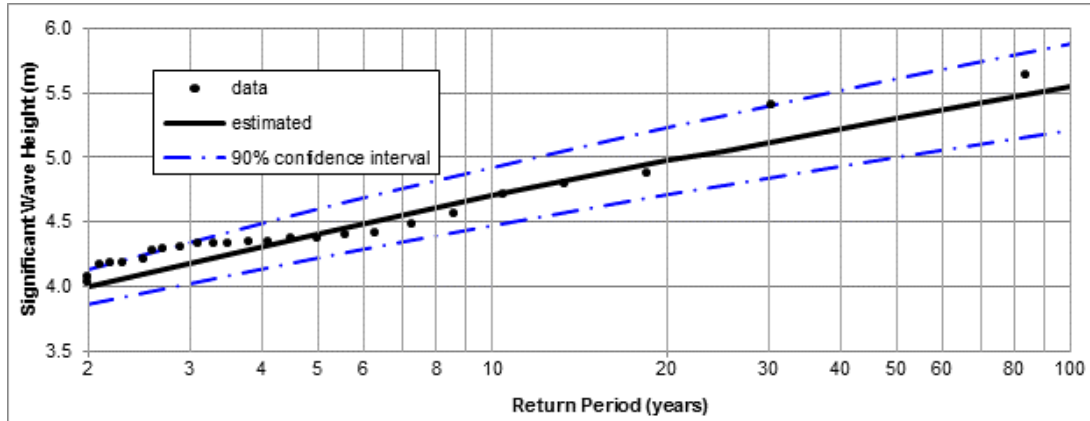


Figure 2.6 Design Wave Transformation (100-yr wave, 100-yr water level)

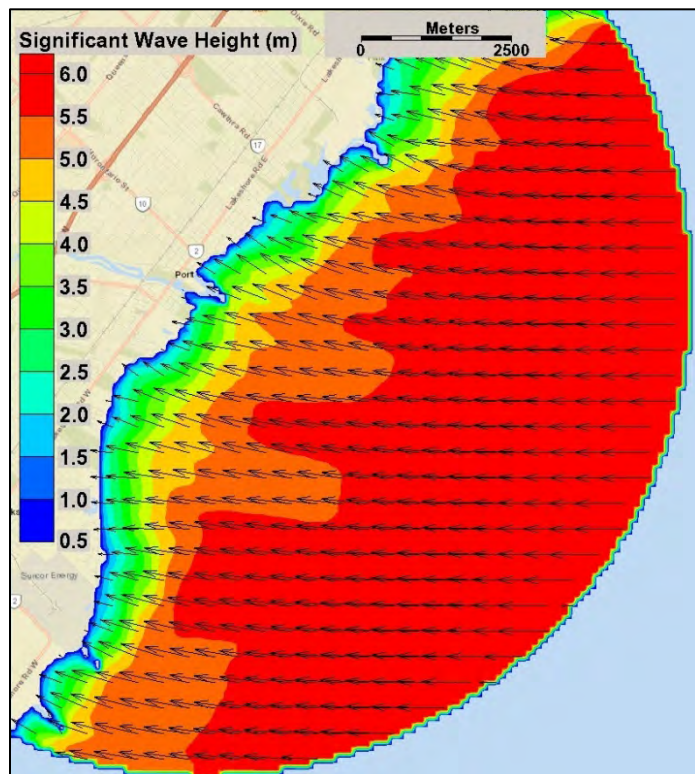
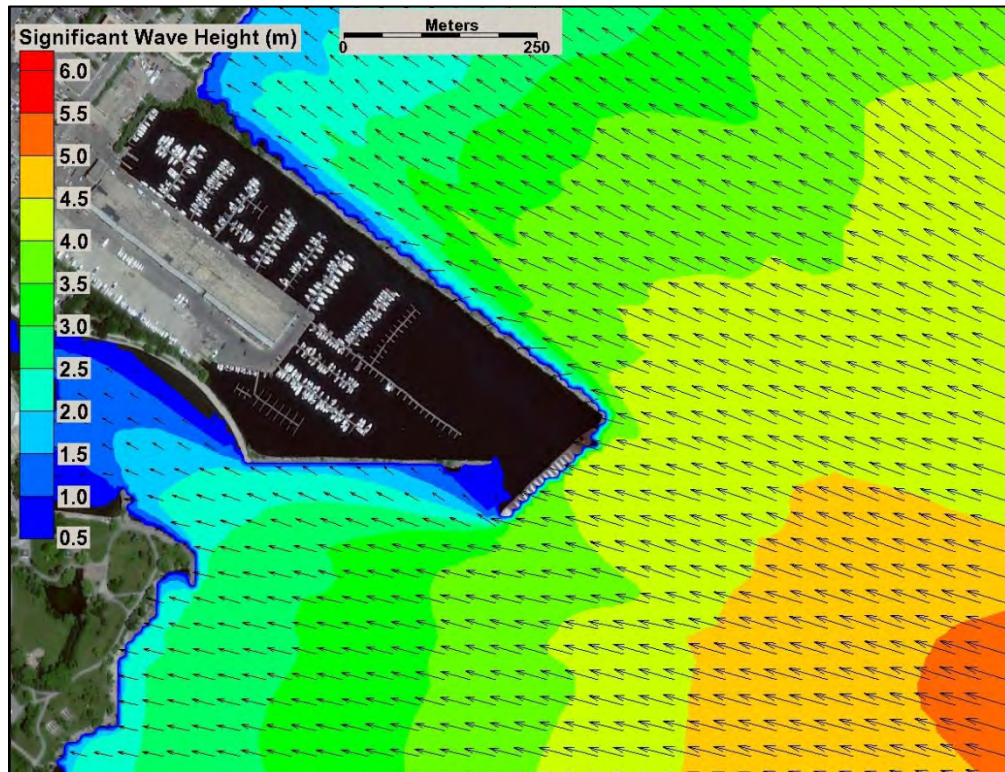


Figure 2.7 Design Wave within the Project Study Area



2.5 Ice and Debris

Regional, Local and Project Study Areas

Ice cover and winter mean ice cover on Lake Ontario has been declining since the early 1970s, and this is attributed to increasing surface water temperatures. Increases in air temperature are generally coincident with increases in water temperature, with the greatest warming and associated reductions in dissolved oxygen anticipated in the nearshore area. Shore ice, which is ice that forms around the perimeter of the lake, can both protect and damage shorelines, depending upon local conditions (Credit Valley Conservation, 2018).

CVC conducted ice monitoring along the shoreline in February 2014 and found that ice accumulation was greatest in protected areas (with complete coverage in the Credit River upstream of Lakeshore Road and in Lakefront Promenade Park embayment and marina) and areas of shallower depth (e.g. Rattray Marsh beach).

Debris from various watercourses and storm sewer systems is typically made up of urban refuse such as plastic bags, water bottles, and take-out containers, as well as woody debris such as sticks and logs which is considered beneficial. Debris is widely scattered across beach shorelines during storm events and tends to collect against structures that extend out into the lake.

2.6 Littoral Sediment Transport

Regional, Local and Project Study Areas

The shoreline from Burlington to Toronto is generally referred to as a non-drift zone due to the lack of littoral (coastal) sediments. On many shores of the Great Lakes, littoral sediment supply originates from erosion of shoreline bluffs and the nearshore lakebed. Within the regional, local and project study areas, the majority of the shoreline has been hardened, essentially eliminating bluff erosion, and the nearshore lakebed is erosion-resistant bedrock. Some sediment transport does take place because of nearshore bottom deposits, but there is no significant source of new littoral material. Sediment introduced via the watercourses (creeks, rivers, etc.) that discharge into Lake Ontario is typically fine grained and tends to deposit in deeper water offshore of the littoral zone. Littoral Sediment Transport patterns will not be notably altered by any of the alternatives considered.

3.0 Development of Alternatives

The three alternative plans of lakefilling are presented on Figures 3.1 to 3.3 and illustrate a range of fill alternatives being considered for assessment, Alternatives A, B, and C. These layouts were developed to allow for comparison of the fill alternatives. The figures also show associated dock layouts within the marina basin. Brief descriptions of the alternatives are provided below.

The size of Alternative A, the smallest of the three, is based on work carried out in the preparation of the Mississauga Marina Business Case Study (2015). A lakefill of this size was required to support the marina repair/maintenance shop operations by providing winter storage for the number of boats that was expected to sustain winter operation of the shop.

Each landform has a “green” public space at the south end. The green space represent land area that remains after the parking requirements for the marina are satisfied. The parking requirements are based, except for the smallest lakefill alternative, on 0.6 ratio of parking spaces to slips as per City’s requirements. Additional 30 spaces are added as suggested on the Planning Partnership report. The smallest alternative is based on a parking ratio of 0.5 and no additional public parking spaces.

The crest elevation of the lakefill structure was established to be 78.0m GSC, which is approximately 3 m above typical summer water level. This was chosen to remain approximately level with Port Street. The conceptual lakefill design for all alternatives involves constructing a stone access berm on the lakebed up to elevation 78.0m with a crest width of 6m to allow for construction equipment to move along the berm. The access berm will be positioned along the eastern and southern boundaries of the lakefill extension, so that the eastern toe of the berm is positioned just inside the existing water lot, with spatial allowances for installing shore protection structures.

The western (interior) slope of the access berm will have a 1.5H:1V slope, while the eastern slope will feature a gentler 2H:1V slope to increase the stability of the shore protection structures. With the access berm completed, the space between the existing breakwater and access berm will be filled. This fill will be placed on top of the existing breakwater as well to bring the lakefill up to an even 78.0m across the structure.

3.1 Dock Layout

The typical dock layout used to assess basin capacity was created using an average slip of 11 m. The dock layout follows the general dock pattern established in the preferred alternative identified in the Mississauga Marina Business Case Study (2015). An access dock parallels the east breakwater/landform. This dock is accessible from the north shore and may be also accessible from the east breakwater/landform. This main access dock will be minimum 4 meters wide. Main docks extend in the westerly direction from the access docks and support finger docks that extend north and south from the main docks. The main docks are proposed to be 2.4 m wide and finger docks are 1.0 m wide. Finger docks are spaced 10 meters apart (clear distance) and are 11 m long. Fairways are set at twice the length of the slips or 22 meters. This results in the main docks being spaced 46.4 meters apart central line to central line. This layout is based on typical design requirements and an adjustment can be made in the detailed design

phase. The actual basin will ultimately have a mix of various sizes of slips to accommodate various sizes of boats expected to populate the basin.

For the small (A) and medium (B) size lakefill alternatives, the dock layout shows seven main dock spines extending from the main access dock in the north part of the basin directly opposite the CLC wharf. Each of these main docks accommodates 28 slips/boats. Each main dock may accommodate 30 boats if boats are added along the side of the main access dock. This is not a desirable location and it is suggested that it is filled only once the capacity of the basin is reached. Using the 28 slip count, the proposed layout accommodates a total of 196 slips.

The large lakefill landform allows for docks to be extended to the south end of the basin. The potential layouts are illustrated on Figures 3.3. The number of slips illustrated in these layouts is 456.

3.2 Conceptual Shoreline Protection Structures

For each alternative, armour stone revetment structures were designed to stabilize and protect the lakefill extension of the pier. Shore protection design assumes that the landforms will be protected with armour stone revetments. Typical cross sections have been developed.

The lake facing slope of the access berm will be covered with a filter layer of rip rap overlain by a double layer of random placement armour stone. The size of the armour stone will increase farther offshore along the lakefill extension where larger waves are expected to break against the structure. In all locations double 4-6 tonne toe armour stones are required to stabilise the revetment structure and to prevent future undermining from scour.

3.2.1 Alternative A- Small Lakefill

For the small alternative, the lakefill would extend approximately 200m offshore. The design wave conditions in this area offshore require the main body of the structure be protected by a double layer of 2-4 tonne random placement armour stone revetment. The southern end of the structure will experience harsher wave conditions and will require 3-5 tonne armour stone. The armour stone revetment will rise to an elevation of 78.0m, in line with the top of the lakefill. The crest width of the revetment will be approximately 4m, backed by a rip rap splash pad to absorb water from wave overtopping. The crest has been designed to reduce wave overtopping water during design conditions while maintaining a low elevation of the structure to avoid blocking sightlines from the park.

3.2.2 Alternative B – Medium Lakefill

For the medium alternative, the lakefill would extend approximately 340m offshore. The design wave conditions in this area offshore require the structure be protected by a double layer of 3-5 tonne random placement armour stone revetment. This armour stone size increase would begin from the point where Alternative B extends beyond Alternative A. The southern end of the structure will be protected by 3-5 tonne armour stone as well. The armour stone revetment will rise to an elevation of 78.5m for the extension beyond Alternative A. The crest width of the revetment will be approximately 4.5m, backed by a rip rap splash pad to absorb water from wave overtopping. The crest has been designed to reduce wave overtopping water during

design conditions while maintaining a low elevation of the structure to avoid blocking sightlines from the park.

3.2.3 Alternative C – Large Lakefill

For the largest alternative, the lakefill would extend approximately 690m offshore. The design wave conditions in this area offshore require the structure be protected by a double layer of 3-5 tonne random placement armour stone revetment. This armour stone size increase would begin from the point where Alternative C extends beyond Alternative B. The southern end of the structure will experience harsher wave conditions and will require 4-6 tonne armour stone. The armour stone revetment will rise to an elevation of 79.0m for the extension beyond Alternative B, as the larger waves pose a greater overtopping threat. The crest width of the revetment will be approximately 5m, backed by a rip rap splash pad to absorb water from wave overtopping. The crest has been designed to reduce wave overtopping water during design conditions while maintaining a low elevation of the structure to avoid blocking sightlines from the park.

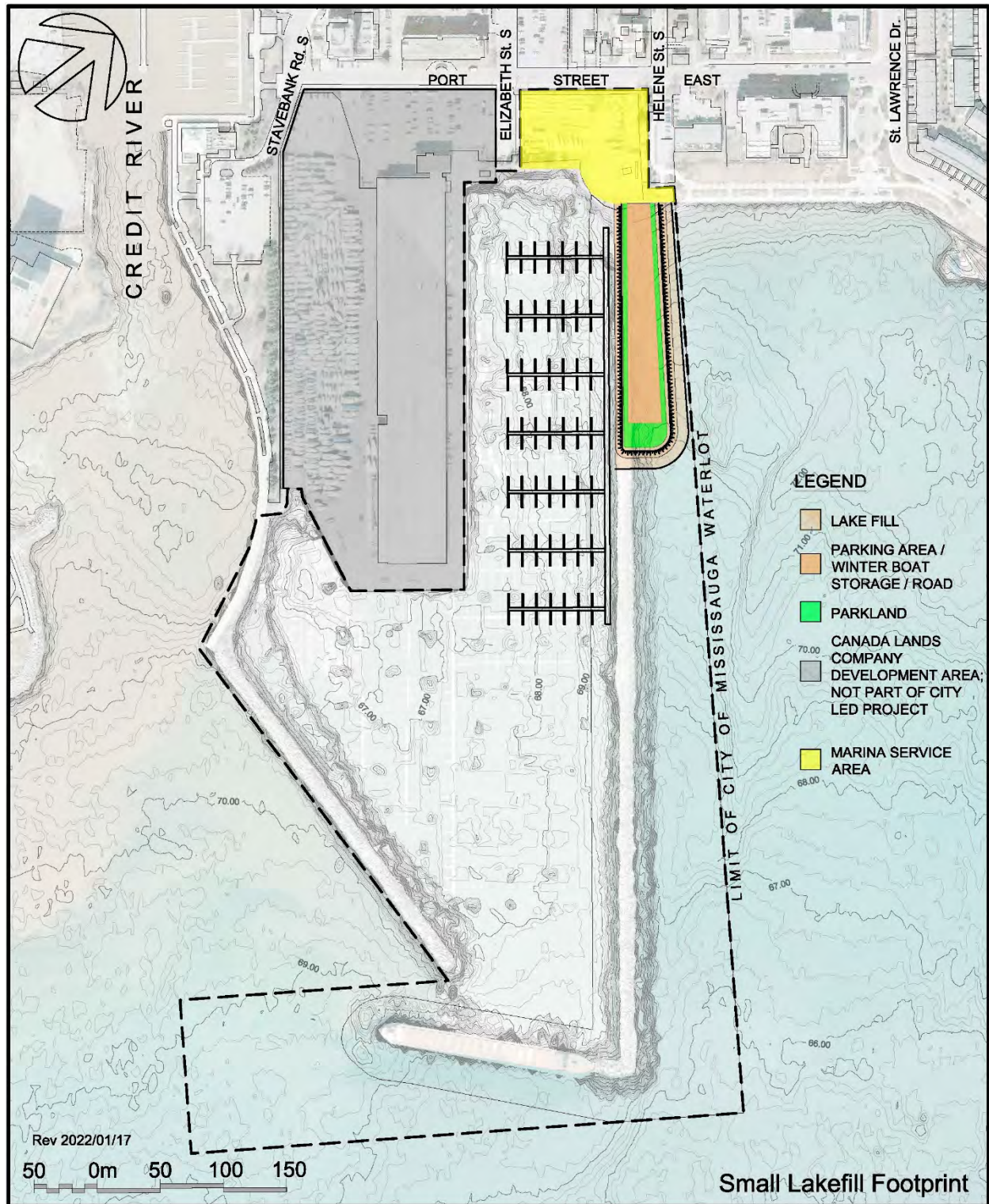


Figure 3.1 Alternative A, Small Lakefill

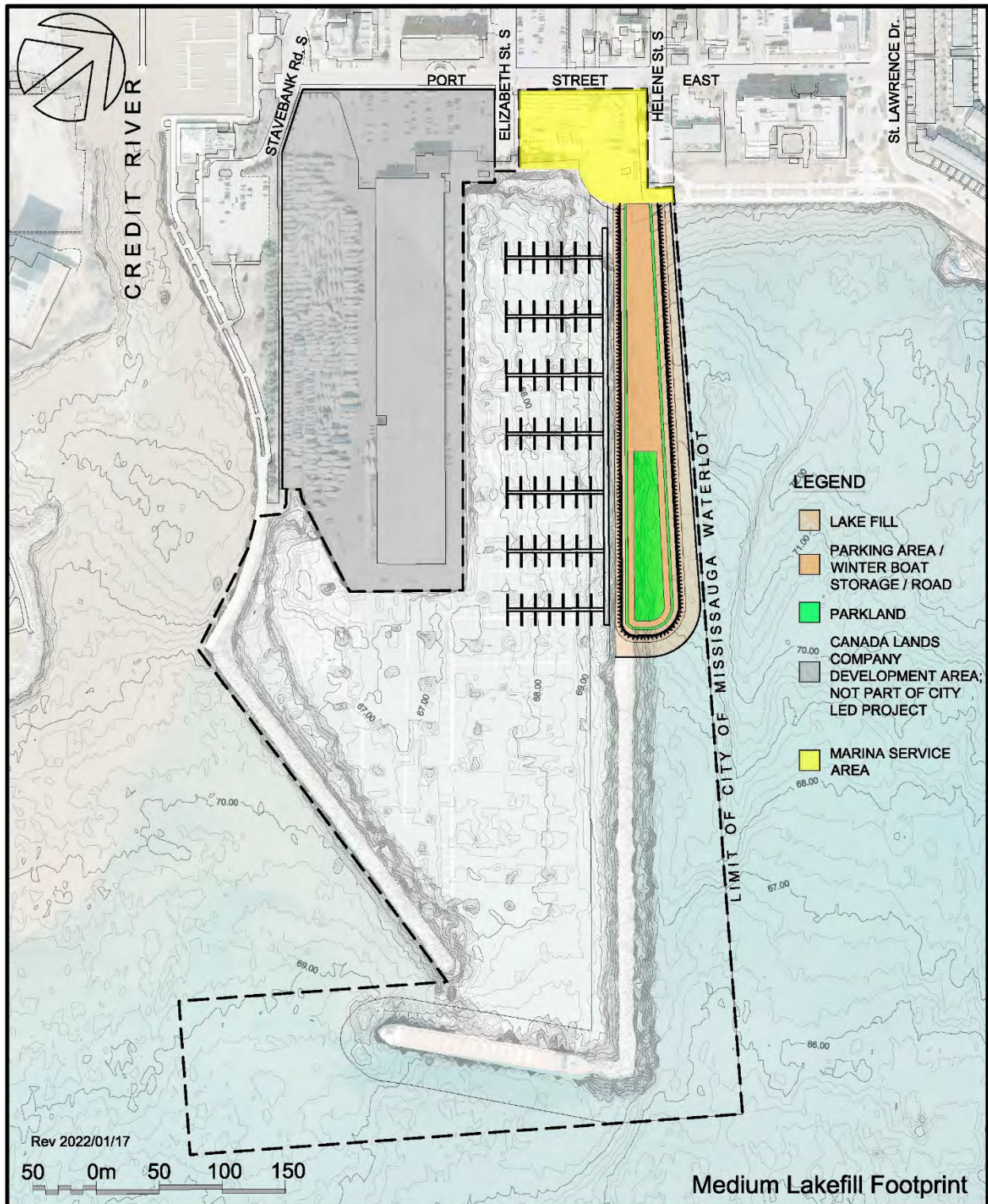


Figure 3.2 Alternative B, Medium Lakefill

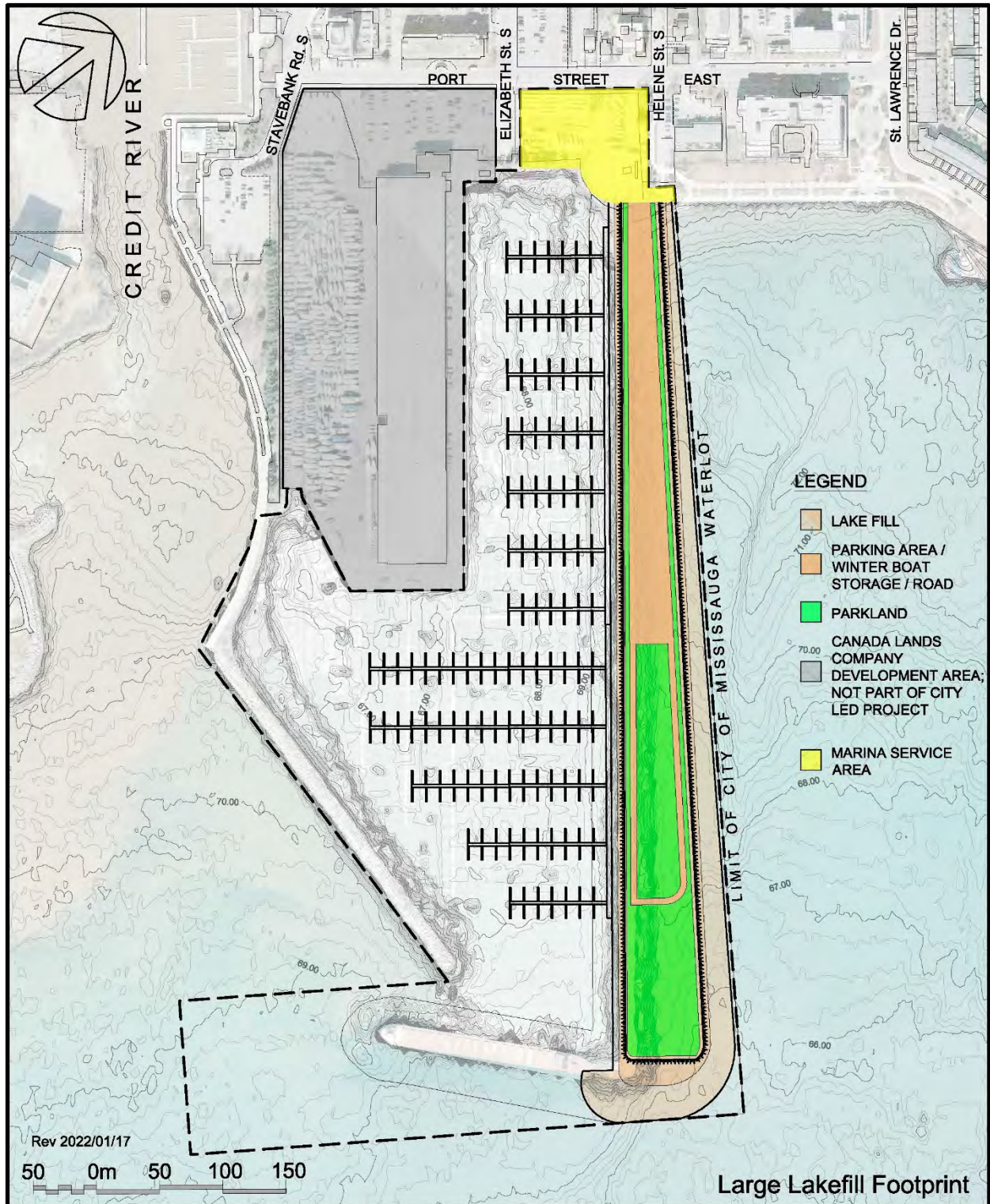


Figure 3.3 Alternative C, Large Lakefill

3.3 Volumes Estimates

The required volumes of material for each alternative were estimated by first drafting a conceptual cross section of the extended pier at the halfway point from shore of the Alternative A extension, halfway between the ends of the A and B extension, and again between the B and C extensions. This cross section was drawn using the average lakebed elevation and pier structure width at each cross section location. With the cross sections drafted, cross-sectional areas of each element (access berm material, confined fill, rip rap, and armour stone), could be measured.

The volumes were then estimated by taking cross-sectional areas from a typical cross section midway along each conceptual pier alternative. According to Figure 2.1, the lakebed elevation decreases linearly along the length of the existing breakwater. Therefore, volumes for each design alternative were obtained by averaging the cross-sectional areas from each midpoint cross section along the length of the proposed design and by multiplying by the length of the extension. For Alternative A, the cross sectional areas were multiplied by the length (195m) to calculate the volumes for the “trunk” of the structure. The volumes required to construct the “head” of the structure were then calculated for the portion where the shore protection structure wraps around the pier into the original breakwater. For Alternative B, the volumes of the trunk for A were added to the volumes of the trunk for B, plus the head of the structure for B. For Alternative C, the trunks of A, B, and C are added to the head of C for the total volume.

Breakwater Structure	ALTERNATIVE A (m³)	ALTERNATIVE B (m³)	ALTERNATIVE C (m³)
<i>Armour Stone (tonnes)</i>	14000	30000	72000
<i>Rip Rap (tonnes)</i>	4000	9000	26000
<i>Access Berm (tonnes)</i>	37000	88000	262000
<i>Confined Fill (tonnes)</i>	33000	79000	216000
TOTALS	88000	206000	576000

3.4 Capacity of each Alternative

The capacity of the small, medium, and large lakefill Alternatives mentioned in the description of the alternatives is summarized in the below table.

Available Features	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
<i>Boat Slips</i>	196	196	456
<i>Parking Spaces</i>	130	150	340
<i>Winter Storage Spaces</i>	50	60	140
<i>Park Area (m²)</i>	500	4600	15000

The reasons for the proposed number of boat layouts for small and medium size lakefill alternatives are as follows. First, although the exact number of slips that were occupied last season or will be occupied this coming season is not known, it is expected that demand in the

order of 200 boats will exist in 2023 when the transition plan will be implemented. A greater number of slips cannot be provided without upgrading the outer part of the existing breakwater or extending the lakefill. The outer part of the existing breakwater is very low and excessive wave overtopping may occur that could damage docks and moored boats.

Relating this dock slip layout to the parking capacity of the lakefill, the small alternative can support the parking requirement for the 196 slips. The requirement is for 100 spaces using a parking ratio of 0.5 with 30 spaces added for general public parking. The parking ratio of 0.5 was suggested in both the Business Plan Study and the Planning Partnership study. The resulting south end park area is very small. The park area is estimated to be in the order of 500 sq. m.

The medium size lakefill can readily accommodate the 196 slips. The requirement is for 120 parking spaces using a parking ratio of 0.6 with 30 spaces added for general public parking. The parking area could accommodate up to 60 boats for winter storage. The park area is estimated to be in the order of 4,600 sq. m.

The 456 slip layout requires 310 parking spaces using a parking ratio of 0.6 with the 30 spaces added for general public parking. The parking area could accommodate up to 140 boats for winter storage. The remaining park area is estimated to be in the order of 15,000 sq. m.

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Markham Office Number: 905 415 7248

January 19, 2023

Memorandum

To: Beata Palka
The City of Mississauga

From: Michael Roy

cc: Credit Valley Conservation

Subject: AQUATIC ECOLOGY TECHNICAL MEMORANDUM FOR THE 1 PORT STREET EAST PROPOSED MARINA PROJECT (1PSEM PROJECT)

1.0 INTRODUCTION

The City of Mississauga (the City) is undertaking the Environmental Assessment (EA) for the 1 Port Street East Proposed Marina Project (1PSEPM Project) to investigate expansion of the land base around the eastern breakwater to provide continued marina services at this site, as well as create public access to the waterfront, new parkland and enhance the site's ecological functions. This section of the Mississauga Waterfront has been the subject of many studies seeking to identify improvements to habitat function, public access, and recreational activities. The 1PSEPM Project was identified by Inspiration Port Credit as a key opportunity to "keep the Port in Port Credit", while enhancing public access and ecological function of the site.

SLR has been retained by Shoreplan Engineering Inc. (Shoreplan) to (among other disciplines) investigate and address the aquatic and terrestrial ecology and habitat conditions within the Study Area in support of the Baseline Conditions Characterization and the Environmental Effects phases of the study. This memo is provided at the request of Credit Valley Conservation (CVC), to facilitate their commenting process during the preparation of the Individual Environmental Assessment for the 1PSEPM Project.

This memo address:

1. Existing aquatic habitat conditions based upon the compilation of secondary source material and underwater field investigations performed by SLR ecologists
2. Potential effects to fish habitat
3. Conceptual fish habitat off-setting and enhancement opportunities
4. Existing terrestrial habitat conditions based upon the compilation of secondary source material and reconnaissance level field investigations
5. Potential effects to terrestrial habitat
6. Conceptual terrestrial habitat creation and enhancement opportunities

1.1 PURPOSE

The objectives of the aquatic and terrestrial ecology work are to provide meaningful input to the EA through the documentation of existing fish and terrestrial habitat conditions, assessing potential project effects, and identifying opportunities to improve the existing aquatic and terrestrial habitat of this location. This work also contributes toward the 1PSEPM Project achieving conformity of the with the *Fisheries Act*. The key tasks include:

- Obtain, review, and synthesize background information and data from Credit Valley Conservation (CVC), Fisheries and Oceans Canada (DFO), Ministry of Natural Resources and Forestry (MNR), and the Credit River Anglers Association (CRAA), related to existing fish presence, usage, and aquatic habitat within the marina and nearshore area.
- Investigate and characterize the existing aquatic habitat and document critical habitat features.
- Evaluate potential effects to fish and terrestrial habitat.
- Identify habitat restoration and enhancement opportunities.

The challenge associated with this undertaking includes determining the need for, and if required, developing candidate offsetting measures to address potential harm or loss to known fish habitat. While working with CVC on the Lake Ontario Integrated Shoreline Strategy (LOISS) assessment projects, our Team has identified technically feasible opportunities to enhance the aquatic habitat within the CVC watershed. As the 1PSEPM Project moves through the EA process, it will be important to also identify onsite offsetting opportunities as that is typically DFO’s preferred approach. SLR is also aware of other nearby projects within the Credit River, that may provide beneficial enhancement to offset this potential impacts of this project.

2.0 AQUATIC ECOLOGY OF THE STUDY AREA

2.1 METHODS

2.1.1 Desktop Analysis

As part of the desktop analysis, SLR ecologists collected, reviewed, and interpreted secondary source materials prepared by private consultants and government agencies, regarding existing fish and aquatic habitat conditions with the Study Area. Additionally, SLR reviewed available open-source reports and databases to support the characterization of existing conditions at the site. Documents reviewed as part of the desktop analysis are presented in Table 1.

Table 1: Information Source Summary and Description

Data Description	Source
LOISS Assessment and Mapping of Coastal Engineering Structures, December 2016	CVC, Shoreplan
LOISS Background Report APP B Fluvial Geomorphology, 2011	Aquafor Beech Limited
LOISS Characterization Final, December 2018	CVC
Credit River Estuary Report Final, March 31, 2014	CVC
Memo One Port Street – Heat Model, July 2017	CVC
Memo – Cost Estimate for One Port Street Fish Habitat Compensation, August 3, 2017	CVC
Aerial Imagery	Google Earth
Bathymetry Mapping	Online website

Data Description	Source
Ministry of Natural Resources and Forestry, Natural Heritage Information Centre (NHIC), Element Occurrences, 2018, Accessed on-line December 1, 2020 “Map A Natural Heritage Map”	Online website
Ministry of Natural Resources and Forestry, Land Information Ontario (LIO), Wetlands, ANSI, Natural Features, GIS shapefiles and metadata Downloaded December 1, 2020	Online website
Fisheries and Oceans Canada Distribution Maps for Fish and Mussel Species at Risk (modified 2019-08-23).	Online website

2.1.2 Agency Consultation

In addition to querying publicly available digital sources, data requests were prepared and submitted to organizations for additional fish and aquatic habitat information. This information will assist SLR in further characterizing flood limits, regulatory or jurisdictional boundaries or limits, surficial geology, wetland delineation and evaluation, fish community data, and known elemental occurrences for Species at Risk (SAR) and regulated habitat mapping within the Study Area. Data requests were submitted to the following organizations:

- Maricris Marinas, Planner, CVC
- Bohdan Kowalyk, District Planner, Aurora District, MNRF
- Ministry of the Environment, Conservation and Parks (MOECP)

To date, SLR has not yet received the requested data.

2.1.3 Aquatic Habitat Field Characterization

Information gathered as part of the desktop analysis was supplemented with observations and data collected by SLR ecologists, during recent field investigations. On May 19th, 2021, SLR ecologists completed an aquatic habitat assessment within the Study Area in Lake Ontario, to document and characterize existing aquatic habitat conditions, critical habitat features, and potential areas or opportunities for aquatic habitat restoration and enhancement. A boat and boat operator were hired and used to access the Study Area and perform habitat characterization activities. The field investigation was completed on a calm and sunny day to maximize the quality of data collected. Data was collected along multiple transects to aid in the translation of field observations to maps and figures, for use later in the EA. SLR ecologists executed transects perpendicular to the breakwater, to collect observations and data at various water depths.

For this field investigation, the Study Area was divided into three primary locations to support the characterization of aquatic habitat: east side of (eastern) breakwater, west side of (eastern) breakwater, and within the marina (basin). The Eastern Breakwater, Western Breakwater, and Marina Basin are presented on Figure 1 for reference.

Data to support the characterization of the existing aquatic habitat was collected using the following equipment:

- Heron Instruments underwater camera with a downrigger;
- Raymarine Axiom 3D Vision and Hummingbird GPS sonar;
- YSI Sonde;
- Fish Hawk wireless X4D temperature and depth console; and,
- Ponar dredge.

Specific habitat parameters recorded in the field, included:

- Substrate classification;
- Water depth;
- In-stream and riparian vegetation;
- Bank stability and cover;
- Areas of critical habitat for potential SAR;
- Habitat for various life stages of fish (e.g., spawning, rearing, migration, overwintering);
- Supplemental habitat features such as nursery or feeding areas; and,
- Presence of fish barriers and system connectivity.

In-situ water quality parameters collected in the field included electrical conductivity, water and air temperature, and dissolved oxygen concentration. Representative photographs of each sampling location were taken. Fish sampling activities were not included within this scope of work.

Substrate type was visually classified as a percentage, using six categories based on particle diameter: boulder (300 – 600 mm); rubble (100 – 300 mm); cobble (75 – 100 mm); gravel (5 – 75 mm); sand (1 – 5 mm); and fine (<1 mm). Aquatic vegetation cover was concurrently assessed, with percent cover classified into one of four categories: none (0%); sparse (0-25%); moderate (25-50%); and dense (50-100%). Substrate and aquatic vegetation cover were assessed at several points along a single transect.

The spatial extent of observed aquatic habitats were recorded by hand on base maps, which included representative aerial imagery of the Study Area. After returning from the field, maps were updated and generated by SLR GIS specialists to illustrate habitat features, functions, and dependencies.

3.0 PRELIMINARY KEY FINDINGS

3.1 DESKTOP ANALYSIS

3.1.1 Bathymetry

Water levels on Lake Ontario fluctuate on short-term, seasonal and long-term basis. Water levels of the Great Lakes, including Lake Ontario, are referenced to chart datum. Chart datum is generally selected so that the water level seldom falls below it. The referenced chart datum on the Great Lakes is the International Great Lakes Datum (1985). For Lake Ontario the chart datum is 74.2 metres above sea level (masl). Nautical charts refer to this datum.

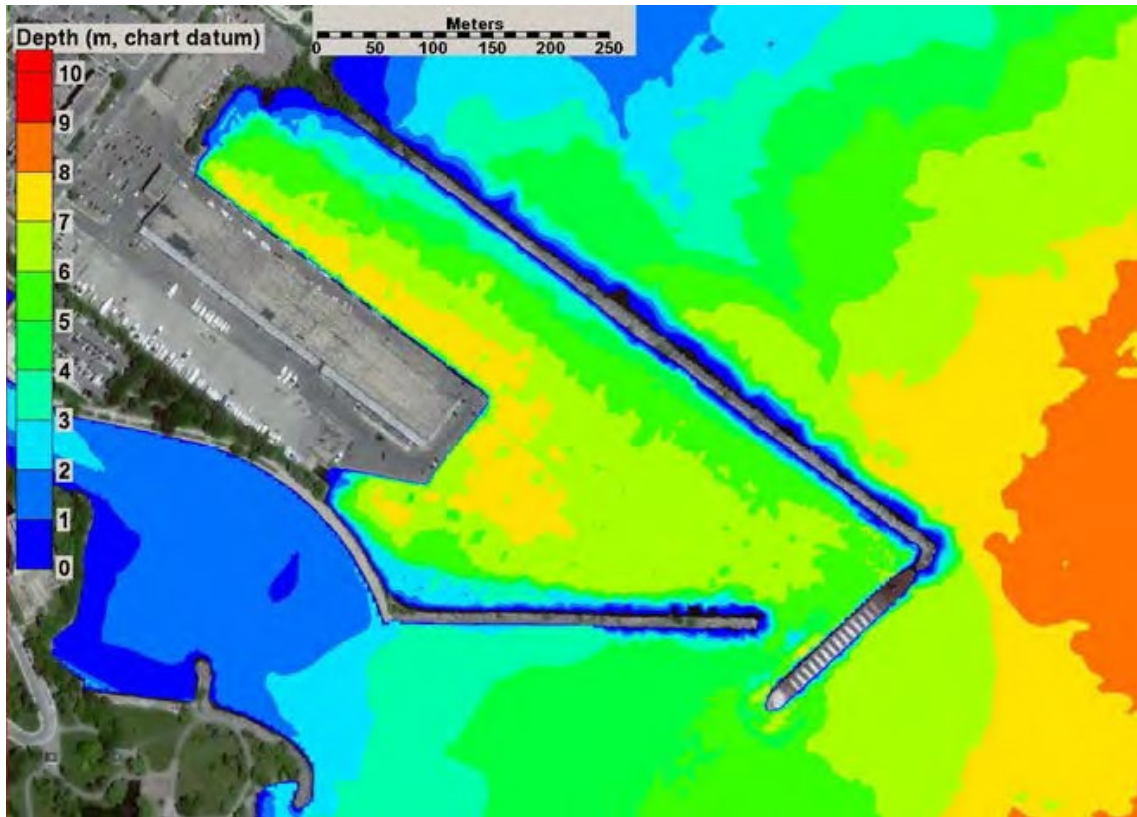
Figure 3.1 illustrates the bathymetry within the local and project study areas. Bathymetry reveals both the depth of water and the topography of the lakebed. This information is a key consideration in the evaluation the potential effects on fish habitat resulting from the placement of lakefill. The lake bottom elevation around the toe of the existing and proposed structures varies between a maximum of approximately 76.0 masl near the interface with the mainland, and a minimum of approximately 66.0 masl at the lakeward most point of the structure.

3.1.2 Littoral Sediment Transport

The shoreline from Burlington to Toronto is generally referred to as a non-drift zone due to the lack of littoral (coastal) sediments. On many shores of the Great Lakes, littoral sediment supply originates from erosion of shoreline bluffs and the nearshore lakebed. Within the regional, local and project study areas, the majority of the shoreline has been hardened, essentially eliminating bluff erosion, and the nearshore lakebed is erosion-resistant bedrock. Some sediment transport does take place because of nearshore bottom deposits, but there is no significant source of new littoral material. Sediment introduced via the watercourses (creeks,

ivers, etc.) that discharge into Lake Ontario is typically fine grained and tends to deposit in deeper water offshore of the littoral zone. Littoral Sediment Transport patterns will not be notably altered by any of the alternatives considered.

Figure 3.1 Bathymetry in the Project and Local Study Areas



3.1.3 Fish Presence

The Credit River and Lake Ontario are home to at least 65 cold, cool, and warm-water fish species, including forage, coarse, and sport fish, which are further identified in the Fishes of the Credit River Watershed document, produced by CVC (2002). It is further understood that of the 65 potential fish species, 58 native fish species have been recorded in the Port Credit region, of which, 23 are considered lake species (CVC 2018). It is anticipated that most fish species found within the Credit River and ultimately, Lake Ontario, may utilize the nearshore areas within the Study Area to complete all or some of the life cycles. It is also known that nearshore fish species diversity and productivity is higher than those of offshore habitats (CVC 2018); two thirds of adult fish species and three quarters of young of the year fish species show a high affinity for sand, gravel or silt substrates, which are often associated with vegetation in the nearshore area (Lane *et al.* 1996 in CVC 2018).

Fish sampling is an ongoing priority for CVC and is conducted using a boat electrofisher, within the Port Credit Coastal Reach (mouth of the Credit River). The results of fish sampling activities between 2008 and 2014 indicate that the Port Credit Coastal Reach has the highest fish species richness (31) and second highest average number of individuals per 1000 seconds (~210), of all assessed locations (CVC 2018). However, when

total fish biomass is considered, the Port Credit Harbour Marina is typically ranked 3rd or 4th, of the 7 locations surveyed. It should also be mentioned that when the total fish biomass is corrected to remove Common Carp from the calculation, the Port Credit Harbour Marina is roughly tied for 1st, with 3 other locations. This would seem to indicate that the Port Credit Harbour Marina provides less optimal aquatic habitat for Common Carp, when compared to other embayment's or river mouths assessed. Additionally, when considering embayment's and river mouth sites, embayment's are often the primary contributor to total biomass values and are known to contribute up to 80% of annual total biomass (CVC 2018). A list of documented fish species with potential presence within the Credit River, at the mouth of the Credit River, or within the vicinity of the Study Area is presented in Table 2. Not all fish species (or required habitats) will be present within the Study Area.

Table 2: Documented fish presence near or within the Study Area and associated potential habitat usage.

Common Name	Scientific Name	Documented Presence in Credit River (Y/N)	Documented Presence in Port Credit Coastal Reach (Y/N)
Bowfin Family (Family <i>Amiidae</i>)			
Bowfin	<i>Amia calva</i>	Y	N
Catfish Family (Family <i>Ictaluridae</i>)			
Brown Bullhead	<i>Ameiurus nebulosus</i>	Y	Y
Channel Catfish	<i>Ictalurus punctatus</i>	Y	N
Stonecat	<i>Noturus flavus</i>	Y	Y
Drum or Croaker Family (Family <i>Sciaenidae</i>)			
Freshwater Drum	<i>Aplodinotus grunniens</i>	Y	N
Freshwater Eel Family (Family <i>Anguillidae</i>)			
American Eel	<i>Anguilla rostrata</i>	Y	Y
Goby Family (Family <i>Gobiidae</i>)			
Round Goby	<i>Neogobius melanostomus</i>	N	Y
Herring Family (Family <i>Clupeidae</i>)			
Alewife (gaspereau)	<i>Alosa pseudoharengus</i>	Y	Y
Gizzard Shad	<i>Dorosoma cepedianum</i>	Y	Y
Lamprey Family (Family <i>Petromyzontidae</i>)			
American Brook Lamprey	<i>Lethenteron appendix</i>	Y	N
Sea Lamprey	<i>Petromyzon marinus</i>	Y	Y
Minnow Family (Family <i>Cyprinidae</i>)			
Goldfish	<i>Carassius auratus</i>	Y	N
Redside Dace	<i>Clinostomus elongatus</i>	Y	N
Northern Redbelly Dace	<i>Chrosomus eos</i>	Y	N
Finescale Dace	<i>Chrosomus neogaeus</i>	Y	N
Spotfin Shiner	<i>Cyprinella spiloptera</i>	Y	Y
Common Carp	<i>Cyprinus carpio</i>	Y	Y
Brassy Minnow	<i>Hybognathus hankinsoni</i>	Y	N
Common Shiner	<i>Luxilus cornutus</i>	Y	Y

Common Name	Scientific Name	Documented Presence in Credit River (Y/N)	Documented Presence in Port Credit Coastal Reach (Y/N)
Redfin Shiner	<i>Lythrurus umbratilis</i>	Y	N
Northern Pearl Dace	<i>Margariscus nachtriebi</i>	Y	N
Hornyhead Chub	<i>Nocomis biguttatus</i>	Y	Y
River Chub	<i>Nocomis micropogon</i>	Y	Y
Golden Shiner	<i>Notemigonus crysoleucas</i>	Y	Y
Emerald Shiner	<i>Notropis atherinoides</i>	Y	Y
Blacknose Shiner	<i>Notropis heterolepis</i>	Y	N
Spottail Shiner	<i>Notropis hudsonius</i>	Y	Y
Rosyface Shiner	<i>Notropis rubellus</i>	Y	Y
Sand Shiner	<i>Notropis stramineus</i>	Y	N
Mimic Shiner	<i>Notropis volucellus</i>	Y	N
Bluntnose Minnow	<i>Pimephales notatus</i>	Y	Y
Fathead Minnow	<i>Pimephales promelas</i>	Y	Y
Blacknose Dace	<i>Rhinichthys atratulus</i>	Y	Y
Longnose Dace	<i>Rhinichthys cataractae</i>	Y	Y
Creek Chub	<i>Semotilus atromaculatus</i>	Y	Y
Mudminnow and Pike Family (Family <i>Esocidae</i>)			
Northern Pike	<i>Esox lucius</i>	Y	Y
Central Mudminnow	<i>Umbra limi</i>	Y	N
Perch Family (Family <i>Percidae</i>)			
Rainbow Darter	<i>Etheostoma caeruleum</i>	Y	Y
Iowa Darter	<i>Etheostoma exile</i>	Y	Y
Fantail Darter	<i>Etheostoma flabellare</i>	Y	Y
Johnny Darter	<i>Etheostoma nigrum</i>	Y	Y
Yellow Perch	<i>Perca flavescens</i>	Y	Y
Logperch	<i>Percina caprodes</i>	Y	Y
Walleye	<i>Sander vitreus</i>	Y	Y
Salmon Family (Family <i>Salmonidae</i>)			

Common Name	Scientific Name	Documented Presence in Credit River (Y/N)	Documented Presence in Port Credit Coastal Reach (Y/N)
Pink Salmon	<i>Oncorhynchus gorboscha</i>	Y	N
Coho Salmon	<i>Oncorhynchus kisutch</i>	Y	N
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Y	Y
Rainbow Trout	<i>Oncorhynchus mykiss</i>	Y	Y
Atlantic Salmon	<i>Salmo salar</i>	Y	Y
Brown Trout	<i>Salmo trutta</i>	Y	N
Brook Trout	<i>Salvelinus fontinalis</i>	Y	N
Sculpin Family (Family <i>Cottidae</i>)			
Mottled Sculpin	<i>Cottus bairdi</i>	Y	N
Slimy Sculpin	<i>Cottus cognatus</i>	Y	N
Smelt Family (Family <i>Osmeridae</i>)			
Rainbow Smelt	<i>Osmerus mordax</i>	Y	N
Stickleback Family (Family <i>Gasterosteidae</i>)			
Brook Stickleback	<i>Culaea inconstans</i>	Y	N
Threespine Stickleback	<i>Gasterosteus aculeatus</i>	Y	N
Sturgeon Family (Family <i>Acipenseridae</i>)			
Lake Sturgeon	<i>Acipenser fulvescens</i>	Y	N
Sucker Family (Family <i>Catostomidae</i>)			
Longnose Sucker	<i>Catostomus catostomus</i>	N	Y
White Sucker	<i>Catostomus commersoni</i>	Y	Y
Northern Hog Sucker	<i>Hypentelium nigricans</i>	Y	Y
Silver Redhorse	<i>Moxostoma anisurum</i>	Y	N
Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>	Y	Y
Greater Redhorse	<i>Moxostoma valenciennesi</i>	N	Y
Sunfish Family (Family <i>Centrarchidae</i>)			
Rock Bass	<i>Ambloplites rupestris</i>	Y	Y

Common Name	Scientific Name	Documented Presence in Credit River (Y/N)	Documented Presence in Port Credit Coastal Reach (Y/N)
Pumpkinseed	<i>Lepomis gibbosus</i>	Y	Y
Smallmouth Bass	<i>Micropterus dolomieu</i>	Y	Y
Largemouth Bass	<i>Micropterus salmoides</i>	Y	Y
Black Crappie	<i>Pomoxis nigromaculatus</i>	Y	N
Temperate Bass Family (Family <i>Moronidae</i>)			
White Perch	<i>Morone americana</i>	Y	N
White Bass	<i>Morone chrysops</i>	Y	Y
Trout-Perch Family (Family <i>Percopsidae</i>)			
Trout-perch	<i>Percopsis omiscomaycus</i>	Y	N

3.1.4 Aquatic Habitat

Night-time water temperatures and daytime air temperatures collected in the summer between 2008 and 2014 averaged 20°C and 21°C, respectively (CVC 2018). While these averages are important to consider, they are based on a relatively small sample size (nine).

The shoreline of the Port Credit Coastal Reach, which includes the Study Area, is highly engineered, with only 1% left in a natural state as documented by CVC (2018). This engineered shoreline is made up of rock armouring, the Ridgetown, and other breakwater structures. These erosion protection structures are necessary, due to the deep bathymetry of the area, which reduces the ability for large waves to break on shallow lakebed areas, thereby dissipating energy and reducing sediment transport from shore.

Flows and sediment from the Credit River are transported to the west, as far away as Tecumseh Creek (CVC 2018). Transport of sediment and particle-bound phosphorus from the watershed exceed Provincial Water Quality Objectives (PWQO) and reduce the water quality in the mouth of the Credit River and nearshore Lake Ontario (CVC 2018). These contributions may provide suitable food resources to harmful algae species, which may feed on the excess nutrients. Additional watershed contributions of chloride in the winter months also pose a risk to existing aquatic habitat.

Port Credit is known for historic and ongoing fisheries research and both recreational and commercial fishing activities. Incidental observations indicate that Burbot (*Lota lota*), Lake Whitefish (*Coregonus clupeaformis*), and Herring (*Clupeidae* sp.) were common occurrences in the past, however, both Burbot and Herring are very uncommon sightings in Port Credit today. It is expected that both wetlands and sheltered embayment's play a critical role in reproduction of these species and the loss of wetland habitat (Faulkner Marsh) may have reduced spawning sites for these species near the mouth of the Credit River (CVC 2018). Additional spawning areas, such as off-shore shoals, are important spawning sites for Lake Trout and while historically documented, are typically difficult to locate in present day.

3.2 AQUATIC HABITAT FIELD CHARACTERIZATION – KEY FINDINGS

3.2.1 East Side of (Eastern) Breakwater

Directly east of the existing (eastern) breakwater, large boulders extend into the water lot for several metres, at an estimated a 1.5H:1V slope. The boulders provide stability and erosion protection for the marina and nearshore area, while the bank irregularities and lakebed roughness provide instream cover for a variety of documented fish species. Beyond the large boulders, the lakebed substrate is dominated by coarse sand and cobble, with sand becoming more prevalent along the shoreline. An area of hardpan was documented east of the Study Area and was dominated with gravel. Multiple cobble dominated shoals were documented along the eastern edge of the Study Area and were oriented both parallel and perpendicular to the existing (eastern) breakwater. The composition and distribution of lakebed substrates as determined from the field investigations performed as part of this EA are illustrated on Figure 3-2.

No macrophyte presence was observed at the time of the aquatic habitat assessment, however, an assessment during late summer may provide additional observations on potential seasonal growth that may occur. Algae and Zebra Mussels (*Dreissena polymorpha*) were documented in places along the shoreline, existing (eastern) breakwater, hardpan area. The concentration of Zebra Mussels appeared to increase as water depths increased. Water depths of greater than 8 m were documented within the Study Area east of the existing (eastern) breakwater.

No fish were observed during the aquatic habitat assessment.

Aquatic habitat and substrates documented within the Study Area east of the existing (eastern) breakwater do not appear to be limited to the Study Area orientated parallel to shore and extending east well beyond the water lot boundary. The only exception to this is the large cobble dominated area located toward the terminus of the breakwater which is almost entirely positioned within the water lot. No areas of critical habitat for potential SAR were documented during the field investigation.

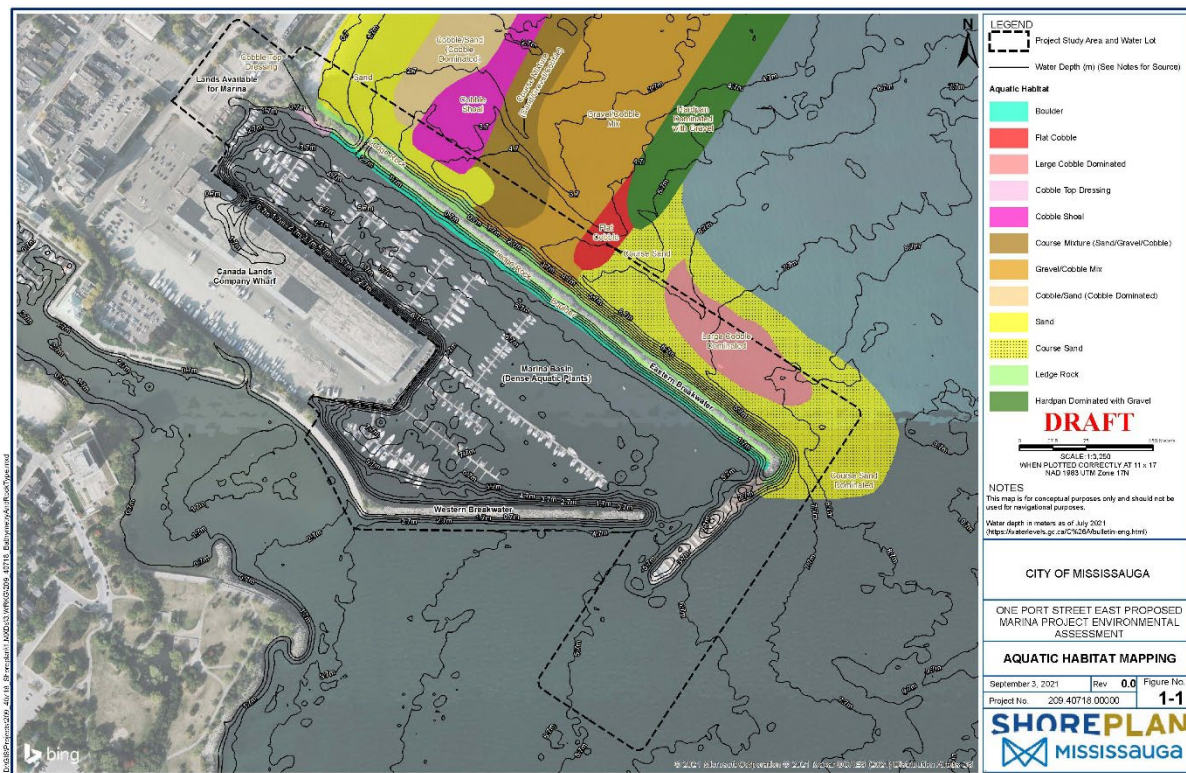
3.2.2 West Side of (Eastern) Breakwater

Directly west of the existing (eastern) breakwater, large boulders extend into the marina for several metres, at an estimated a 1.5H:1V slope. The boulders provide stability and erosion protection for the marina and nearshore area, while the bank irregularities and lakebed roughness provide instream cover for a variety of documented fish species. Based on the placement and organization of the boulders along the west side of the existing (eastern) breakwater, it is assumed that a barge was utilized from the west side. However, depending on the severity of weather events and wave action, the boulders along the east side of the existing (eastern) breakwater may have experienced movement since the time of construction. Beyond the large boulders, the substrate documented along the west side of the existing (eastern) breakwater is dominated by sand and cobble, with areas of soft detritus.

Significant algal and macrophyte growth was documented, when compared to the east side of the existing (eastern) breakwater. This may be due to reduced wave action, flow, and potentially increased residence time of water within the marina. Water depths of greater than 2.5 m were documented within the Study Area west of the existing (eastern) breakwater.

Multiple fish species and individuals were observed within the marina, although only Brown Bullhead and Cyprinids Sp. were identified. It is assumed that many other fish species or families were observed but could not be identified.

Figure 3.2 Bathymetry and Substrate Composition and Distribution in the Project and Local Study Areas



Aquatic habitat and substrates documented within the marina basin appear to be consistent throughout the assessed area. It is assumed that the dense macrophyte growth within the marina basin provides suitable nursery and foraging habitat for many species documented in the Study Area. No areas of critical habitat for potential SAR were documented during the field investigation.

3.2.3 Within the Marina Basin

Within the marina basin, the substrate is dominated by sand, with fine sediments and other particulate matter resting in isolated pockets.

Moderate to dense algal and macrophyte growth was documented within the marina basin and provides significant cover and surfaces for important life process (e.g., refuge and spawning) of some fish species with documented presence in the Study Area. The density of plant life may be in part due to the sheltered nature of the waters within the marina basin and the potential accumulation of nutrients from overland or other sources.

Multiple fish species (e.g., Brown Bullhead, Cyprinid Sp.) were observed within the marina basin and it is expected that multiple life stages are present.

Aquatic habitat and substrates documented within the marina basin do not appear limited and are consistent through the assessed area within the marina basin. No areas of critical habitat for potential SAR were documented during the field investigation. The (eastern) breakwater appears to be stable on both the east and west side of the assessed area.

3.2.4 Fish Habitat Summary

Substrate to the east of the existing (eastern) breakwater are diverse, abundant, and well distributed both within and outside of the local Study Area. No areas of critical habitat for SAR were identified. Based on the findings of the desktop analysis and field investigation it appears that the Study Area provides a variety of substrates at varying depths that likely afford aquatic habitat opportunities for several fish species and life stages of fish with documented presence in or near the study area.

The areas within the existing marina basin and along the west side of the existing (eastern) breakwater provide important nursery and foraging areas for both small-bodied fish and large predaceous fish species. These habitats within the marina basin appear to be well distributed through the assessed area and are not limited to areas that may be impacted by potential short duration construction activities.

4.0 EVALUATION OF ALTERNATIVES

The three alternative plans of lakefilling are presented on **Figures 4.1 to 4.3** and illustrate a range of fill alternatives considered for assessment, Alternatives A, B, and C. Each landform has a “green” public space at the south end. These layouts were developed to allow for comparison of the fill alternatives. The figures also show associated dock layouts within the marina basin. Brief descriptions of the alternatives are provided below.

4.1 CONCEPTUAL SHORELINE PROTECTION STRUCTURES

For each alternative, armour stone revetment structures were designed to stabilize and protect the lakefill. Each alternative has been designed to be resilient to coastal conditions including high water and changes anticipated because of climate change. Construction of each alternative is assumed to be similar to that used at the Jim Tovey Conservation Area.

Figure 4.1 Alternative A, Small Lakefill

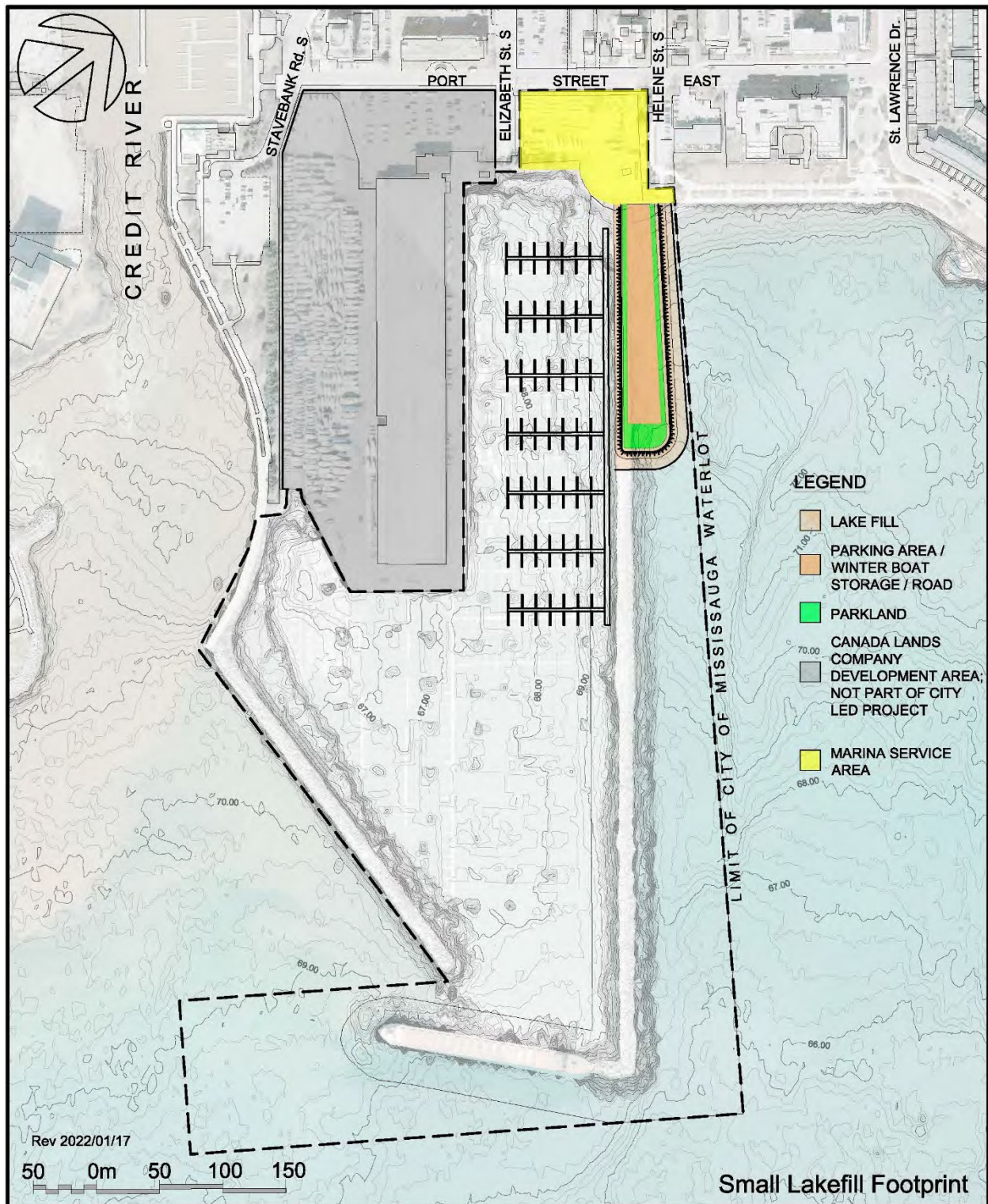


Figure 4.2 Alternative B, Medium Lakefill

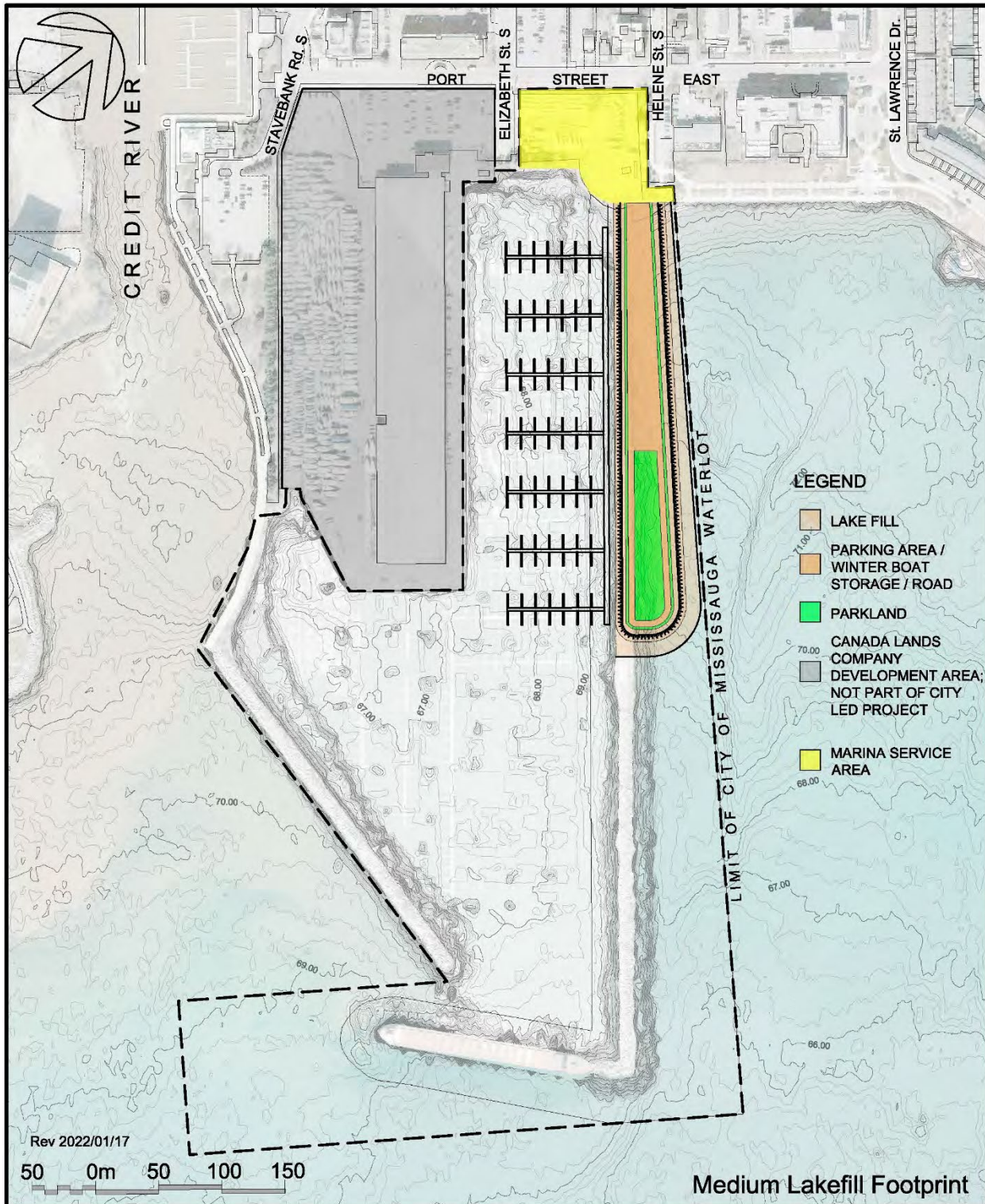
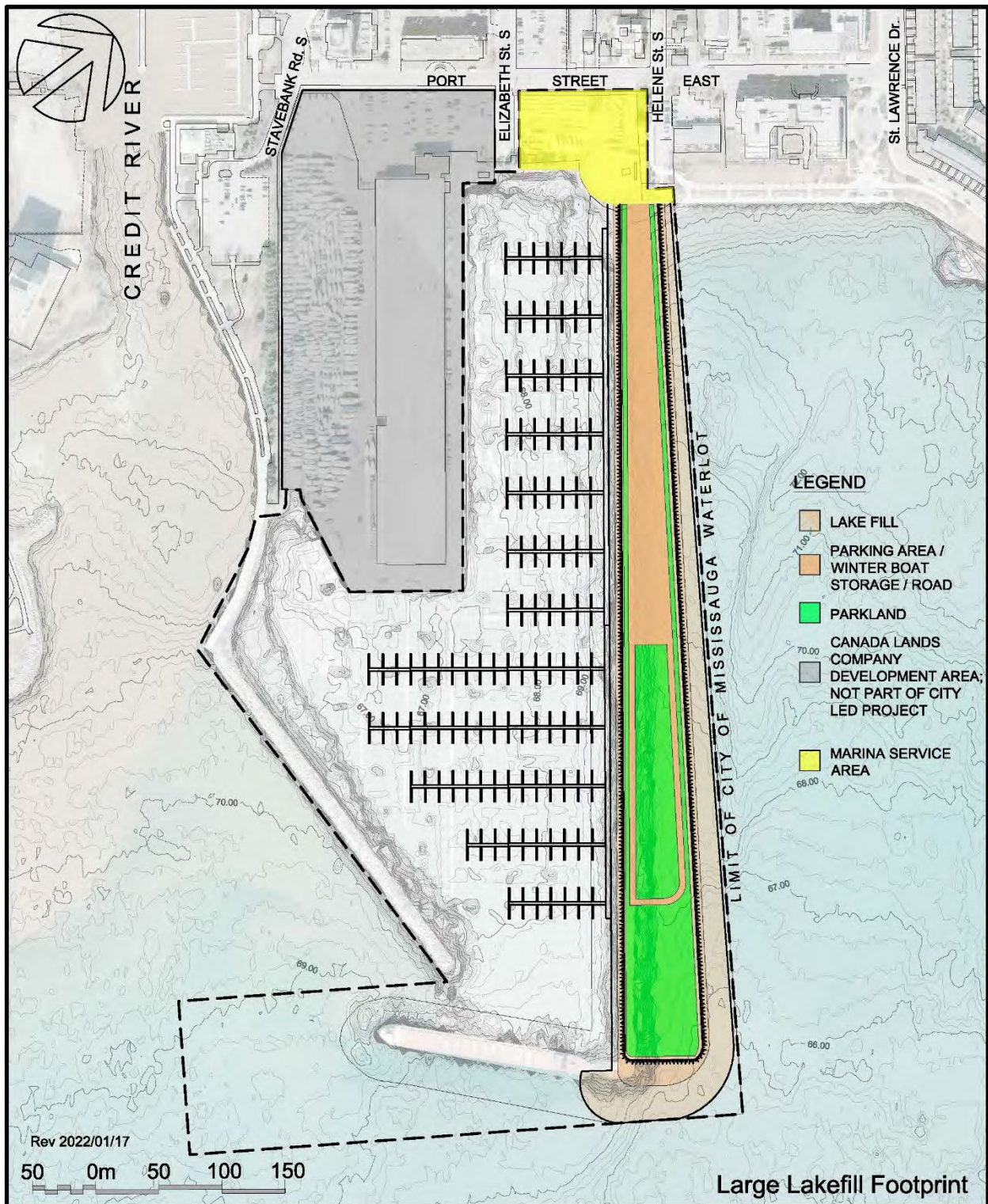


Figure 4.3 Alternative C, Large Lakefill



5.0 PREFERRED ALTERNATIVE

The preferred alternative for the 1 Port Street East Proposed Marina Project (1PSEPM) is the large lakefill alternative. This alternative provides the opportunity to create the largest area of parkland relative to the marina space required for parking, boat storage and marina facilities. It also provides for a similar sized marina to what exists today (greatest number of slips). With a larger footprint, perimeter, and location jetting into deeper waters in Lake Ontario this alternative proposes the largest removal of existing aquatic habitat area. However, baseline studies indicate that existing fish habitat that would be lost is not limiting in Lake Ontario, and opportunities exist to create new habitat of greater quality than what will be lost. With a large land base, this alternative offers the most potential to enhance terrestrial habitat over what exists now. Conversely, as the largest footprint alternative, it also has the highest cost and will take the longest to construct resulting in potential construction nuisance effects for the longest period. However, the effects from construction will be relatively short-term and mitigable while the lakefill area and its benefits will exist for the long-term. Overall, the Large Lakefill Footprint alternative, and therefore the preferred alternative.

5.1 BREAKWATER

The shoreline protection features of the 1PSEPM conceptual design consists of an armour stone revetment as well as a secondary breakwater structure at the lakeward end also protected with an armour stone revetment, which will shelter an aquatic habitat creation area. The slope of the revetment can vary but 2H:1V is the most common and is the proposed slope for most of the 1PSEPM Project, with the exception of certain areas of the structure reaching approximately 3H:1V.

With the lake bottom elevation around the toe of the structure varying between a maximum of approximately 76.0 m near the interface with the mainland, and a minimum of approximately 66.0 m at the lakeward most point of the structure, the depth at the toe of the revetment will vary between 0.2 and 10.2 m under design high water levels. The total area of fish habitat affected by the breakwater construction would include fill that occurs below the nearshore zone of the lake beginning at the shoreline which has been established as 74.2 masl based on the International Great Lakes Datum 1985. (Minns et al. 2005) and accepted by DFO as the elevation below which fish habitat occurs.

Structural aquatic habitat features will be incorporated along the toe of the revetment as described in the following sections.

6.0 IMPACT ANALYSIS

It is anticipated that the extent of some of these aquatic habitats within the water lot may be reduced by the placement of fill, however, these substrates habitat does not appear limiting with regional study area along the shoreline of Lake Ontario.

Habitat compensation will be used to address the proposed removal or disruption of fish habitat to occur due to the construction of the 1 Port Street East Proposed Marina Project.

6.1 EFFECTS OF CONSTRUCTION

6.1.1 Effects on surface water quality in the Local Study Area

Construction activities for the 1PSEPM Project are expected to involve land creation and protection by placing the armour stone shoreline protection and lakefill materials on the lake bottom.

Sediment re-suspension is unavoidable to some extent and occurs whenever materials are placed onto a lake bottom. The placement of armour stone on the lake bottom to create the shore protection structure will result in the disturbance and resuspension of existing sediments from the lake bottom into the water column resulting in increased turbidity and potentially reduced surface water quality. Turbidity is a reduction in water clarity. Water is considered turbid when the presence of suspended particles becomes conspicuous and considered to be impaired or of lower quality.

Sediment / particle size combined with wave action and wind direction are key factors in determining whether, and how far, sediments move and are redistributed within the lake. Lakebed substrate where the lakefill is proposed to be constructed is dominated by coarse sand and cobble, with sand becoming more prevalent along the shoreline. An area of hardpan and multiple cobble dominated shoals along the eastern edge of the placement area also exist. These types of sediment are less likely to be resuspended and will likely resettle quickly near the area of disturbance. For the portion that may be resuspended, sediments are likely to be transported towards the shore and the existing beach by wave action.

Mitigation measures are warranted to minimize adverse effects on surface water quality during construction and will be detailed as part of the on-going effects assessment.

- Follow best management practices in “Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario”
- Utilize only clean fill for lakefill construction. No contaminated fill shall be placed in the lakefill area or in Lake Ontario.
- Restrict operations to calm water days (i.e., suspend operations during periods of high wave action).
- The City will continue to seek the advice and input from Ontario MECP, the CVC and the federal DFO in developing its detailed design and mitigation plan.

6.1.2 Effects on Aquatic Habitat in the Local Study Area

The Study Area provides a variety of substrates at varying depths that likely afford aquatic habitat opportunities for several fish species and life stages of fish with documented presence in or near the study area. The preferred alternative will result in the largest area of lakebed infill and as a result require the removal or overprint of approximately 29,200 m² of fish habitat. This is in addition to the replacement of like for like habitat along the eastern face of the existing breakwater that is replicated in the proposed marina design.

It is important to recognize that the approx. 6,300 m² of this total area consists of fish habitat that would be affected and removed for any of the lakefill alternatives under consideration. This common area represents the portion of the study area with relatively higher productivity potential that occurs in the shallow (1-3m depth) sand dominated and cobble habitat closer to shore. Similarly, approx. 4,700 m² of an additional nearshore habitat in water depth between 3 - 5m with relatively uniform mixture and distribution of cobbles and gravel would also be removed by Alternative 2. The additional required 18,600 m² of lake fill to create Alternative 3 occurs over relatively deep (5m -8m depth) nearshore habitat consisting of cobble apron surrounded by sand (Figure 3.2). While attractive in structure and substrate composition to some open coast fish species, this relatively deeper habitat in an area of high energy wave action (waves colliding with the existing break wall over deeper water generally contain/release greater energy than those that dissipate energy along the lake bottom before reaching shore) is considered less productive than the shallow nearshore habitat common to Alternative 2 and certainly that of Alternative 1.

The fish community likely to be affected by the 1PSEPM project consists of fish species typically found utilizing nearshore habitat with a variety of coarse substrates, including common fish such as White Sucker, Common Carp, Alewife, Lake Chub, Longnose Dace, Emerald Shiner and the invasive Round Goby.

7.0 AQUATIC HABITAT CREATION

The loss of approximately 29,200 m² of fish habitat proposed to create the Preferred Alternative for the 1 Port Street East Proposed Marina Project (1PSEPM) will require the creation of a habitat off-setting strategy in order to conform with the federal *Fisheries Act* and achieve low to none net effect in the context of the EA. A central component of the *Fisheries Act* includes the prohibition against causing the harmful alteration, disruption or destruction (HADD) of fish habitat (section 35) unless the carrying on of the work, undertaking or activity is authorized by the Minister and the work, undertaking or activity is carried on in accordance with the conditions established by the Minister.

An offsetting measure is one that counterbalances unavoidable death of fish and harmful alteration, disruption or destruction of fish habitat resulting from a work, undertaking or activity with the goal of protecting and conserving fish and fish habitat. Offsetting measures should support available fisheries management objectives and local restoration priorities and be conducted in a manner consistent with the department's offsetting policy. Offsetting measures may take a variety of forms ranging from localized improvements to fish habitat to more complex measures that address limiting factors to fish production.

In recognition of the need for habitat offsetting to address the potential loss of productive fish habitat, the development of the natural heritage components of the 1PSEPM project configuration of the Preferred Alternative has incorporated design elements to self-compensate for a portion of the proposed habitat alteration as well as deliberate fish habitat creation components.

7.1 SEMI-SHELTERED EMBAYMENT CREATION

As noted previously, 58 native fish species have been recorded in the Port Credit region, of which, 23 are considered lake species (CVC 2018). It is anticipated that most fish species found within the Credit River and ultimately, Lake Ontario, may utilize the nearshore areas within the Study Area to complete all or some of the life cycles with approximately two thirds of adult fish species and three quarters of young of the year fish species exhibiting a high affinity for sand, gravel or silt substrates.

The opportunity to undulate the shoreline and create aquatic habitat features along the east side was considered. However, such undulation would reduce the width of the created land and its functionality and ability to be programed to its full potential.

The fish habitat creation component of the 1PSEPM design proposes to create and enhance aquatic habitat at the southern (lakeward) terminus of the proposed lakefill. Here, the proposed shoreline will be sculpted westward to create a lakeward facing embayment that will be protected by an armour stone island to be created further out into the lake adjacent to the headland. The proposed feature will create approximately 2,400 sq. m of semi-sheltered moderately shallow water area where substrate can be selected, and structural habitat provided at varying depths. The concept is presented on Figure 6.1 with cross-sections illustrated in Figure 6.2.

The east side of the lakefill will be constructed in the same manner as the remainder of the infill area. Here opportunities may exist to flatten the side slope and or create a shallow underwater terrace along portions of the wall to be sheltered by the island and create littoral areas to provide productive areas for forage fish reproduction and feeding.

The island breakwater will be protected by a layer of randomly placed armour stone. Smaller sized material will line the interior of the berm on the embayment side whereas the larger material will protect the lakeside which is exposed to waves from the open lake. The base of the embayment will be lined with smaller boulder

and cobble sized material over a gravel apron to provide a variety substrate for aquatic vegetation and fish habitat.

It is envisioned that the embayment side will slope down to meet the boulder substrate at the bottom of the fish habitat area. In addition to shallow littoral areas along the side slopes, this will create relatively shallow fish habitat in an area of exiting deep water. These elevated bed elevations at the entrance will help to reduce the severity of waves that enter the aquatic habitat area to create a relatively shallow low energy sheltered refuge adjacent to deeper water of the open lake. The lower interior areas will provide variance in depth to maximize habitat diversity similar to that to be removed in the shallow areas. As a result, the lee side of the island habitat will provide quality spawning and foraging fish habitat for open coast fish species such as Alewife, Lake Trout and juvenile salmonids; sheltered habitat for important Lake Ontario feeder fish species such as Emerald Shiner, Lake Chub and Spottail Shiner as well as nearshore fish species such as White Sucker, Common Carp and Longnose Dace. Of note, LIOSS cites Alewife and Emerald Shiner being the most abundant coolwater open coast species along this portion of the shoreline.

It should be noted that the design of the aquatic habitat area and the shore protection structure is still at the conceptual level and details of the substrate and habitat features will be further developed by the project team in consultation with the regulatory agencies.

7.2 CONSISTENCY WITH LOISS

The Lake Ontario Integrated Shoreline Strategy (LIOSS) (CVC, 2018) aims to provide guidance for local, regional, provincial and federal governments for planning restoration initiatives, developments, and land-use decisions. This study emphasizes opportunities for protecting and restoring ecosystems along the shoreline, inland to the first major barrier on the Credit River, and into Lake Ontario's nearshore environment. A key element of LOISS is to improve the diversity and quantity of terrestrial and aquatic habitat of the shoreline. In doing so, it identifies fish habitat improvement priorities for the lakeshore and nearshore areas in the vicinity of the Credit River mouth, including the Local and Project Study Areas. The proposed creation of the semi-sheltered embayment aligns with one of the key priorities for the Port Credit Coastal Reach which is to create fish habitat (e.g., spawning, rearing, feeding, cover) along existing shoreline erosion structures and incorporate fish habitat features in design for repair and replacement structures.

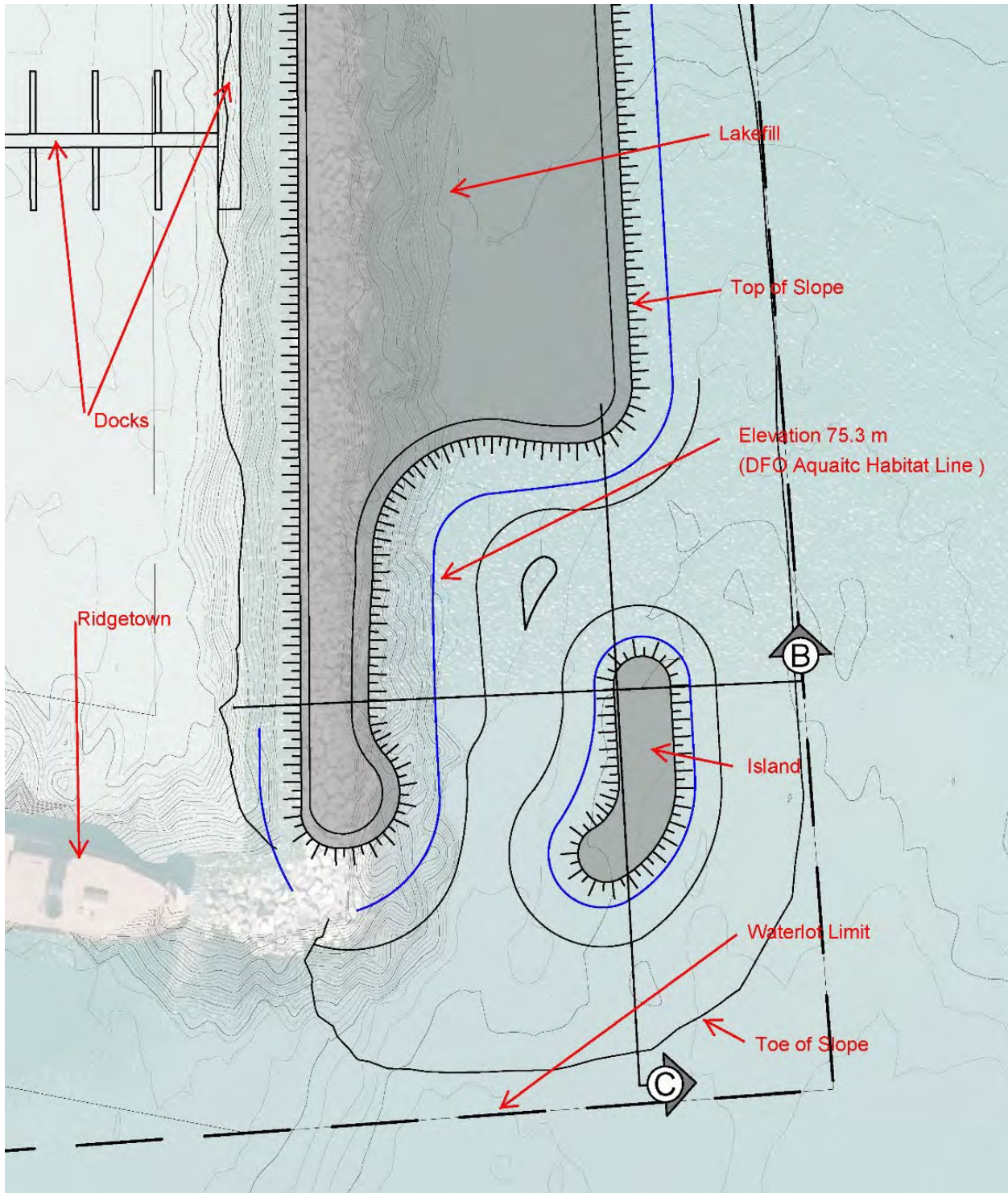


Figure 6.1 Semi-Sheltered Aquatic Habitat Area

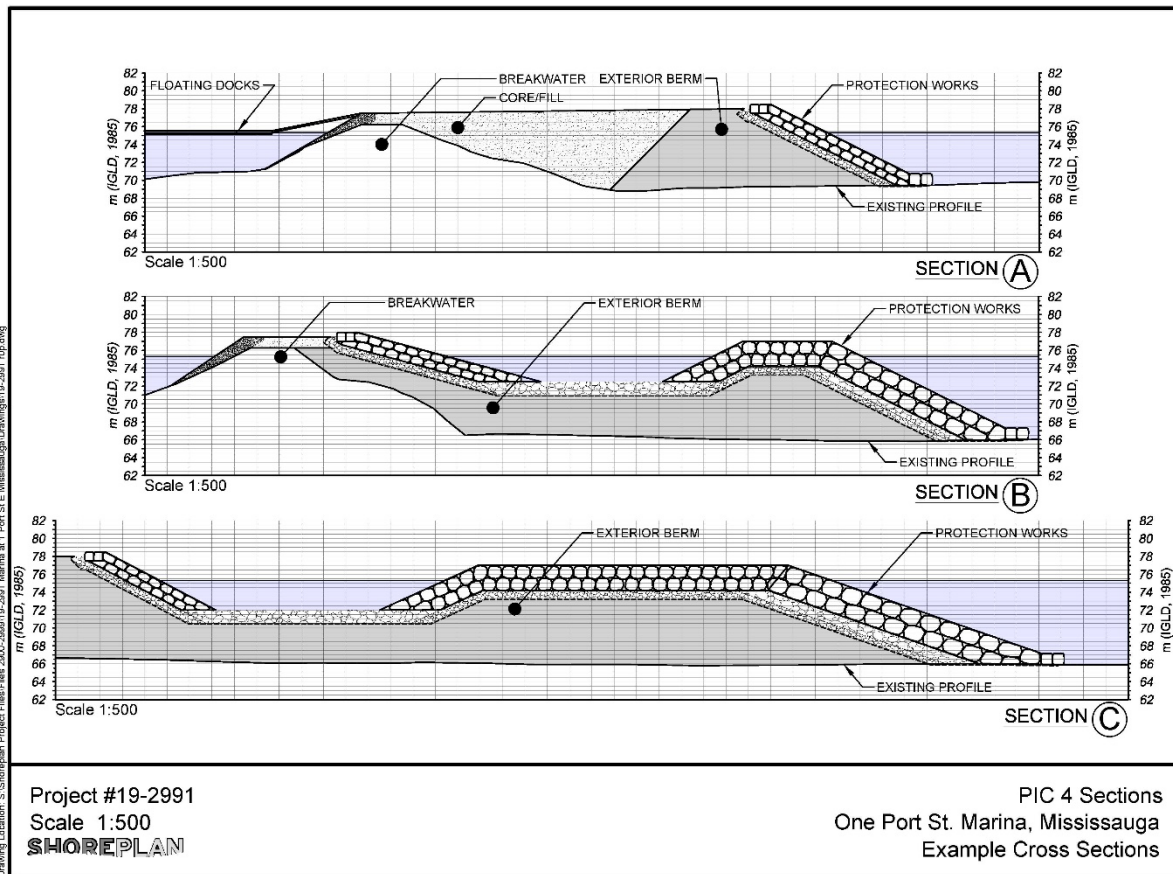


Figure 6.2 Cross-sections of the Proposed Lakefill and Semi-Sheltered Aquatic Habitat Area (see Figure 6.1 for cross-section locations)

7.3 ADDITIONAL HABITAT OFF-SETTING MEASURES AND OPPORTUNITIES TO CREATE FISH HABITAT

7.3.1 Creation of underwater crevices to afford fish cover to create shelter and improve predator/prey interactions

The outer wall of the proposed lake fill will be constructed in a similar manner to the existing break wall and extend no further lakeward. Consisting of armour stone, the slope of the revetment will typically be 2H:1V for most of the 1PSEPM construction. Consequently, the new break wall will replace (like for like) existing fish habitat along the eastern face of the existing armour stone peninsula at greater than a 1:1 area ratio due to the new revetment achieving a marginally less steep than the existing break wall. through the placement of rock fill to create the breakwater structure.

7.3.2 Introduction of Structural aquatic habitat features will be incorporated along the toe of the revetment

Submerged nearshore habitat is important for spawning and feeding. However, the extensive shoreline hardening that has occurred over the past 200 years combined with erosion-resistant bedrock within the

nearshore lakebed (largely a result of historic stonehooking activities), provides for limited habitat diversity in the nearshore area throughout the Regional Study Area.

The toe stones of the revetment are likely to have sizable crevices between them, although the stones should be touching their adjacent stones. These toe stones will be laid upon naturally occurring firm substrates such as sand, gravel and small cobbles. Together, these features (large armour stone and relatively smaller substrates) will create microhabitats for spawning, shelter and predator prey interactions for a variety of fish species known to utilize the nearshore area of the Project Study Area including Smallmouth Bass, White Sucker, Common Carp, Alewife, Lake Chub, Longnose Dace and Emerald Shiner.

In addition, structural aquatic habitat features could be incorporated along the toe of the revetment to replicate and improve the existing habitat along the east side of the breakwall. The habitat features would provide excellent forage, spawning and nursery habitat conditions for fish species such as Emerald Shiner, Yellow Perch and Johnny Darter that are commonly found in the littoral areas of the open coast (LIOSS, 2018). Note: due to the position of the proposed revetment toe to the boundary of the City's waterlot, permission from the provincial Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDRMNR) under the *Public Lands Act* may be required to construct a portion of this habitat improvement measure adjacent to the waterlot.

7.3.3 Off-Site Compensation

Nearshore aquatic habitat consisting of gravel, cobble and small boulder substrates used to occur in abundance along this portion of Lake Ontario. With the extent of historic stonehooking in this portion of Lake Ontario, most of the nearshore habitat elements that may have provided this function are now absent from the Project Study Area and much of the Regional Study Area.

Two other LIOSS priorities: Increase diversity of habitats (e.g., cover, vegetation, shoals, etc.) for suitable target fish species in the Credit River estuary, embayments and open coast; and investigate the feasibility to create shoals off Credit River mouth to enhance existing and historic Lake Trout/Whitefish habitat, provide opportunities for habitat creation in the Local Study Area should the undertaking require additional off-setting measures.

For example, the Lakebed east of the water lot could be augmented through areas surcharged with point shoal and rock piles to create spawning habitat for Lake Trout/Whitefish. Similar to adding structural aquatic habitat features along the toe of the revetment, this option may require permission under the Public Lands Act to these habitat improvement measures adjacent to the waterlot.

A second viable habitat improvement / off-setting option is to manipulate or create habitat structure such as submerged woody cover and /or shoals strategically within the existing harbour in proximity to the western interior wall, away from the primary access/egress boating channel. This shoreline associated with the harbour embayment is fairly protected from coastal processes (waves, currents, erosion, etc.). These habitats support submergent aquatic vegetation containing diverse communities of warmwater species with some top predators. While Northern Pike and Smallmouth Bass are found regularly, LIOSS reports that species such as Largemouth Bass, Bowfin, Black Crappie and Yellow Perch are not found in high numbers in this area (Stewart et al. 2013). Installing or modifying habitat to target some of these less common occurring species would create high value habitat off-setting measures.

8.0 TERRESTRIAL FEATURES

8.1 EXISTING CONDITIONS

In comparison to unaltered natural environments, the ecology of natural heritage systems in urban areas are typically composed of fragmented habitats, isolated woodlands and wetlands, lower biodiversity, impacted hydrology with lowered groundwater levels and flashier surface water hydrology, and the presence of invasive species. Urbanization and associated microclimatic changes affect species composition; thus, as habitats simplify, the resources and competitive requirements of many wildlife species are not met (Credit Valley Conservation, 2018).

The 1PSEPM Project study area occurs in the ecoregion 7E – Lake Erie - Lake Ontario. This ecoregion covers the northern shorelines along Lake Ontario and Lake Erie and is divided into six ecodistricts. The flora and fauna in Ecoregion 7E are the most diverse in Canada and include several provincially significant plants, animals, and vegetation communities.

The Project Study Area is predominately urbanized and paved. Ornamental deciduous and coniferous trees and shrubs exist along most of the perimeter of the 1 PSEPMP site with clusters of trees growing on the breakwater near the shoreline. These tree clusters were deciduous trees comprised predominately Silver Maple, (*Acer saccharinum*), Green Ash (*Fraxinus pennsylvanica*), elms (genus *Ulmus*), willows (genus *Salix*) and mulberry (*Morus alba*). As shown in Figure 8.1, it is estimated that there exists approximately 1,700 m² (0.17 ha) of vegetation in the Project Study Area.

Figure 8.1: Existing Vegetation in the Project Study Area



While shallow depth in the Credit River due to sedimentation upstream of the CN Rail bridge to just upstream of the QEW overpass has provided suitable conditions for the establishment of the Credit River Marshes coastal wetland complex, no wetlands occur within the Project Study Area.

Waterfront parks offer some of the only remaining habitat within the larger landscape of urban areas to offer habitat supporting food resources and resting / touch-down areas for migrant birds. These parks also act as 'stepping-stones' or isolated islands of natural habitat that provide landscape level connectivity to species in an urban matrix. The Local and Project Study Areas are located within an important migratory zone, which includes portions of both the Atlantic and Mississippi flyways. While the existing vegetation offers approximately 0.17 ha of treed canopy for migrating and urban resident bird species, the mouth of the Credit

River and its eight provincially significant wetland units located immediately west of the project study area offer far more habitat diversity and area for migrating birds. Some existing buildings and structures at the marina and in Port Credit provide roosting and nesting habitat for some bird species including a colony of Common Tern.

In a naturalized setting, the nearshore zone of a lake provides essential habitat for biota by affording both shoreline corridor linkage functions and a link between the terrestrial and open water environments. In urbanized environments, these connections often become disrupted or removed entirely. Aside from the remnant sand beach occurring at the interface of the shoreline and the eastern side of the existing break wall, the existing shoreline within the project study area offers little to no opportunity for wildlife movement along the shore or between the lake and upland areas. The hardened sheet pile shoreline created along the waterfront creates a barrier between terrestrial and nearshore habitats and the extensive use of fences along the shoreline of the Local and Regional Study Areas create further fragmentation along the shoreline corridors for both people and wildlife.

8.2 EFFECTS ON TERRESTRIAL HABITAT IN THE LOCAL STUDY AREA

The construction of any of the 1PSEPM Project alternatives would require the removal of approximately 0.1 ha of trees fronting the shoreline of the existing marina and those positioned along the existing break wall: representing approximately half of the existing trees within the project study area (Figure 8.1). The remnant sand beach occurring at the interface of the shoreline and the eastern side of the existing break wall will also be removed by the construction of any of the three alternatives 1PSEPM Project. Being common elements to be removed under all marina construction alternatives, the opportunity to recreate similar shoreline habitat, canopy cover and wildlife friendly nearshore habitat areas was a strong consideration in the natural heritage evaluation of the alternatives.

8.3 TERRESTRIAL HABITAT CREATION AND NATURALIZATION

In addition to considering the fill required for the site, conceptualizing the topography allows for advantageous (but approximate) placement of landscape features such as primary trails, parkland, naturalized habitat and connections. These amenities and features are conceptual depicted in Figure 8.2.

An important advantage of the 1PSEPM Project preferred alternative is the ability to provide a relatively large parkland and trail system that will include naturalized areas and wildlife friendly elements. A larger parkland and trail system is envisioned to be created as part of the refinement of the preferred alternative. Microhabitat variations in topography, drainage and other habitat structures will be addressed at the detailed design stage.

During detailed design, efforts will be made to use plant species that are phenotypically best suited to the Great Lakes/St. Lawrence Lowlands, including species that are consistent with CVC's approved planting lists and the use of Carolinian species where appropriate. Another important consideration in the selection of plants will be the use of native suitable native trees and shrubs and other flora that are highly suited to meeting the needs of native fauna including fruit- and cone-bearing trees and shrubs and those producing autumn fruit such as Dogwood (*Cornus* sp.), Mountain-ash (*Sorbus* sp.), Nannyberry, Wild Raisin, Highbush Cranberry (*Viburnum* sp.) Winterberry (*Ilex verticillata*) and Staghorn Sumac (*Rhus typhina*).

The resulting mosaic of passive recreational parkland, trails and naturalized microhabitats will serve as a migratory rest and launching habitat for birds and butterflies flying over Lake Ontario, offering additional replacement habitat as compared to the area to be lost under any alternative scenario. The largely un-treed area of the parkland and other amenity areas would also serve as a potential raptor prey habitat.

Figure 8.2 Preliminary Preferred Concept

1 Port Street East Proposed Marina Environmental Assessment

PRELIMINARY PREFERRED CONCEPT



9.0 OTHER CONSIDERATIONS AND NEXT STEPS

9.1.1 Next Steps

The large lakefill footprint alternative will now be subject to refining the undertaking for the purposes of the detailed assessment. The detailed assessment will examine how the preferred alternative meets the purpose of the undertaking; it describes the net environmental effects; how it minimizes adverse effects and/or maximizes positive effects; and summarizes its advantages and disadvantages, according to the components of the environment identified in the study terms of reference namely: Physical Environment; Atmospheric Environment; Biological Environment; Socio-economic Environment; Cultural Environment (including Interests of Indigenous Communities); and Costs.

Through discussions with MNDMNRF, DFO and Conservation Authority biologists during detailed design, it is anticipated that the additional ecological benefits and suitable habitat compensation techniques will be developed to achieve a neutral (no) net effects on fish habitat.

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1 Port Street East Proposed Marina Environmental Assessment

Appendix C - Archaeological Assessments



MARINE ARCHAEOLOGICAL ASSESSMENT ONE PORT STREET EAST PROPOSED MARINA AND BREAKWATER EXPANSION CITY OF MISSISSAUGA

Prepared for

**Shoreplan Engineering
The City of Mississauga**

And

Ministry of Tourism, Culture and Sport

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September 30, 2019
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Executive Summary

Scarlett Janusas Archaeology Inc. was retained by Shoreplan Engineering to conduct the marine archaeological in-water assessment and background research for an area of the proposed marina and breakwater expansion at One Port Street East, City of Mississauga (Port Credit), Ontario. The “site” is comprised of lands and water lot located at the southern edge of Port Credit, east of the Credit River along the Lake Ontario shoreline.

Background research indicated that the Study Area had been heavily modified via development, dredging, redevelopment and additional periodic dredging. The breakwater formed by the ship, the Ridgetown, was established in 1937.

The 2019 marine archaeological licence (2019-09) was used to assess the specific areas around the existing breakwater (Ridgetown) and the existing breakwater on the east side of the existing marina. Side scan sonar and magnetometer were used to investigate the area, and any targets found using these methodologies were further investigated using forward looking sonar (on a remote operated vehicle) and video.

The 2019 archaeological assessment was conducted under marine archaeological licence 2019-09 on August 20th, 2019 under sunny skies with occasional clouds and a high of 27°C. Water visibility ranged from one to three metres.

Only one target was found during the marine archaeological survey. This target consisted of at least two very large metal frames with uprights in some places, and cut rectangular holes. This target lay immediately adjacent to the Ridgetown, with literally only inches separating the two. Examination confirmed that the Ridgetown was not lying on any part of the target. Given that the area of the Ridgetown was dredged prior to its being positioned as a breakwater, it is unlikely that the target was in this location at that time. It is possible that the development of this breakwater (Ridgetown) may have had materials associated with the development that were discarded after its completion. This is not any type of structure that could have been transported by any natural means, and only by intentional disposition. There are no records of any “materials” being discarded at this time, but that does not negate the possibility that the metal framework had been associated with the development of the breakwater, or specifically, with the Ridgetown itself. The Ridgetown did suffer from a cracked hull and repairs were made to her in situ. Whether these structures are associated with this repair episode has not been definitively established.

Based on the background research and marine archaeological assessment, the following recommendations are made:

- 1) There was some unidentified metal framework, possibly associated with the Ridgetown, which may have cultural heritage value. However, this area of the “site” will not be impacted by the current construction/infilling proposal. Avoidance of the area located at the southwest intersection of the east-west and north-south breakwaters, immediately adjacent to the breakwater formed by the

Ridgetown, is recommended. If, this area will be impacted at some future date, or through modifications to the construction plan, drawings of the framework must be made, and, attempt at identifying what these frameworks were part of, or represent.

- 2) No additional cultural targets were located, and the remaining area of the marine archaeological survey is considered clear of cultural/archaeological concerns. No additional archaeological assessment is recommended.
- 3) Compliance regulations must be adhered to in the event that archaeological resources are located during the project development.

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.

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Project Personnel

Project Manager
Principal Archaeologist,
And Report Preparation

Scarlett Janusas (P027- Land License)
2019-09

Marine Historian

Patrick Folkes

Geotechnical Team

Jim Garrington, Field Operations Manager
Jake Frans, Field Operations

MARINE ARCHAEOLOGICAL ASSESSMENT ONE PORT STREET EAST PROPOSED MARINA AND BREAKWATER EXPANSION CITY OF MISSISSAUGA

1.0 INTRODUCTION

1.1 Project Description

Scarlett Janusas Archaeology Inc. was retained by Shoreplan Engineering to conduct the marine archaeological in-water assessment and background research for an area of the proposed marina and breakwater expansion at One Port Street East, City of Mississauga (Port Credit), Ontario. The “site” is comprised of lands and water lot located at the southern edge of Port Credit, east of the Credit River along the Lake Ontario shoreline (Figure 1). Only the area denoted on Figure 1 as “breakwater and waterlots – first conveyance” form the Study Area for the marine archaeological assessment, and area of 7.9 hectares.

The underwater archaeological license was held by Scarlett Janusas (2019-09) and work was conducted on August 20th, 2019 under good survey conditions.

Work is being conducted as part of An Individual Environmental Assessment and the client is the City of Mississauga.

“A community-based vision for the 1 Port Street East site was articulated through the City of Mississauga-led Inspiration Port Credit project in a City Council-approved The Inspiration Port Credit Charting the Future Course Master Plan. The Master Plan vision is “to ensure that an iconic and vibrant mixed-use waterfront neighbourhood and destination with a full service marine is developed at the 1 Port Street East Site.” The proposed development of this marina and the new lands created by the eastern breakwater expansion will:

- Enable the continuation of the site’s historic marina function, which gives economic benefit and is key to the cultural identity of the Port Credit Community;
- Create significant waterfront parkland with safe public access;
- Allow for improved aquatic and terrestrial habitat” (City of Mississauga 2019:21).

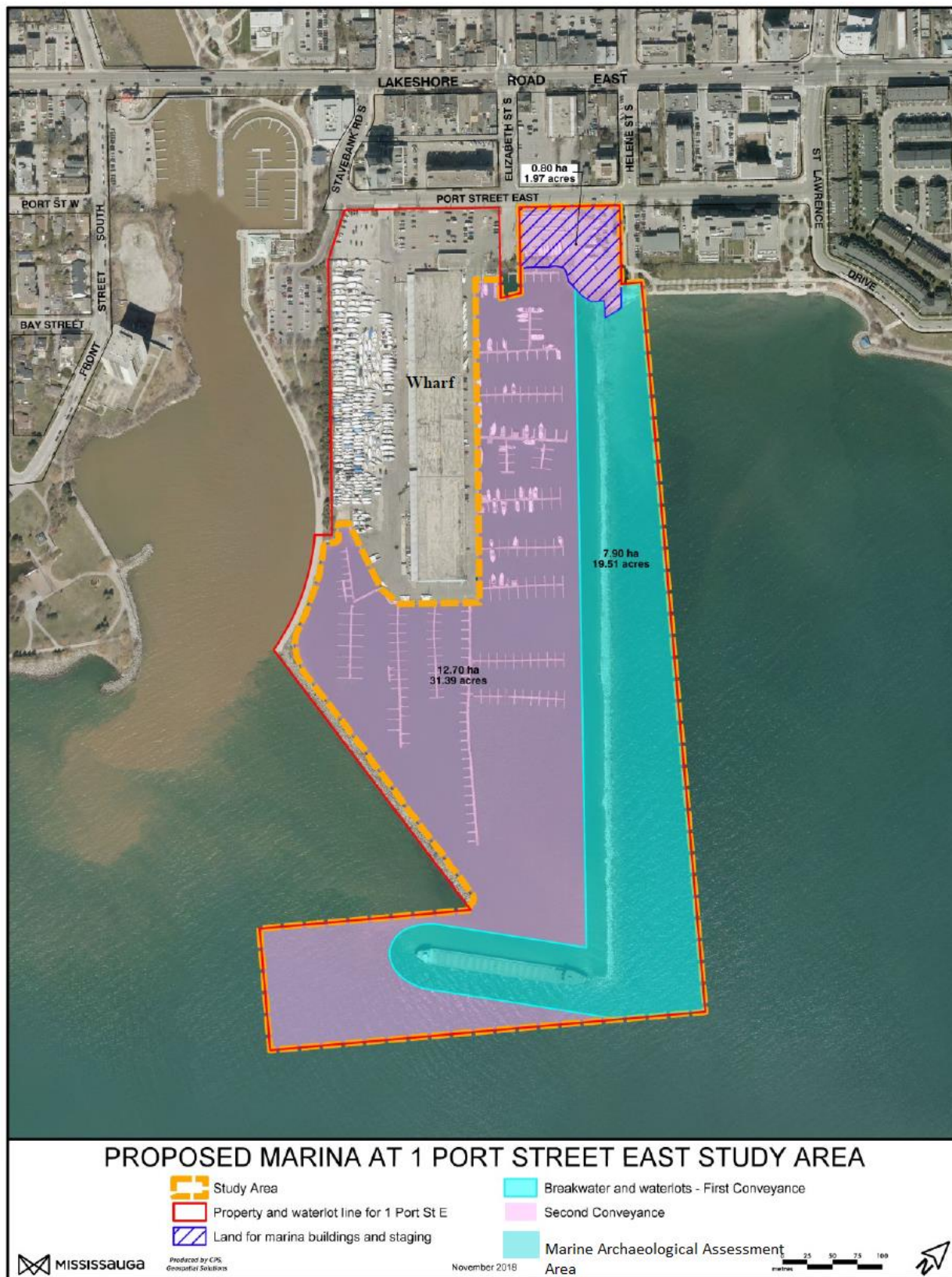
Of note, is that the property at 1 Port Street East is listed on the City of Mississauga’s heritage register, which identified the Port Credit Harbour as a Cultural Landscape. “The pier on the east side of the Credit River provides a panoramic view of the entire Mississauga shoreline” (ibid: 24).

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.

1.2 Indigenous Engagement

No Indigenous engagement was undertaken for this project.

Figure 1: Study Area (from City of Mississauga 2019: Figure 1)



2.0 PROJECT METHODOLOGY

2.1 Background Research

As part of the background research, an examination of the following was conducted:

- the Site Registration Database (maintained by the Ontario Ministry of Tourism, Culture and Sport) was examined for the presence of known archaeological sites in the project area and within a radius of one kilometer of the project area by contacting the data coordinator of the Ministry of Tourism, Culture and Sport;
- reports of previous archaeological fieldwork near the property;
- topographic maps at 1:10 000 (recent and historical) or the most detailed map available;
- historic settlement maps such as the historic atlases;
- Sessional papers;
- Surveyor's notes;
- Charts;
- available archaeological management/master plans or archaeological potential mapping;
- any other avenues that assist in determining archaeological potential were examined.

The detailed background research of the marine archaeology was conducted as it pertained to the specific study area.

2.2 Field Work

Field work was conducted by SJA and Shark Marine on August 20th, 2019 under good weather conditions. Water was either completely flat or had a slight chop to it. Conditions were considered favourable to conduct the marine archaeological assessment, with visibility ranging from one to three metres (depending on bottom type).

2.2.1 Geotechnical Survey

A geotechnical/archaeological survey, supervised by a licensed archaeologist (Scarlett Janusas, license number 2019-09), consisted of side scan sonar survey sonar and magnetometer survey. The purpose of the survey was to determine if there were any objects or structures that may be of archaeological or cultural significance within the study area and proposed areas of possible impact, and to provide appropriate mitigation recommendations.

The scope of the work included:

- Side scan sonar mapping to locate any object or structure on bottom and also to aid in identifying geographic features Side scan was conducted along 10 m line spacing, with range set to 30 metres, for coverage of 60 m;
- Magnetometer survey to locate any objects in search area with ferrous content (intervals were conducted at 10 m intervals);
- Visual confirmation of any targets or anomalies detected (if not buried) using forward looking sonar and video.

Equipment used included the survey craft (boat). It was a 22' boat equipped with a data network and mounting points allowing for "plug and play" addition of survey specific hydrographic equipment. For this survey, the vessel was equipped with a GPS compass, Side Scan Sonar, Magnetometer and "Barracuda" Remotely Operated Vehicle. In addition,

GPS Compass Specifications:

Accuracy:	<1 metre
Data Range:	10 Hz
Heading Accuracy:	<0.75° RMS
Pitch/Roll Accuracy:	<1.5° RMS

The side scan sonar provides a detailed image of the bottom. A Tritech Starfish model 425f was used, with real time acquisition through Shark Marine DiveLog software. The side scan sonar was mounted to the survey vessel and ran along a predetermined grid set to 10 meter line spacing to match the magnetometer. The side scan was set to a 30 meter range (60 m total swath) providing full coverage of the survey area. Data recorded with the side scan sonar was mosaicked and made into a geo tiff and .kml file (found on the accompanying usb stick).

The side scan sonar specifications are:

Frequency	450 nominal
Ranges	up to 300 m

A magnetometer is capable of measuring very small variations in the Earth's magnetic field allowing ferrous objects to be detected as "anomalies". A Shark Marine ProMAG was used for this survey. The magnetometer was towed along a 10 metre grid throughout the survey area behind the survey vessel to prevent any ferrous components on the vessel from influencing its readings.

Data collected by the magnetometer can be viewed on Google Earth using the .kmz file accompanying this report.

There are differences in the colour scales on the completed magnetic charts resulting from the deployment of two magnetometers being used as well as

possible differences in atmospheric conditions and solar activities between deployments (site visits) causing different scales to be used.

Magnetometer specifications are:

Sensitivity	0.02 nT
Accuracy	0.01 nT
Gradient Tolerance	over 10,000 nT/meter

The Barracuda ROV was used to ground truth targets detected throughout the survey area using its camera and imaging sonar. The ROV was deployed from the survey vessel and programmed to approach the target locations. Once in proximity of a target, a technician took over control of the ROV and gathered video and sonar data.

Barracuda specifications are:

Camera 1: HD
 Lighting: 2x 1850 lumen LED lights
 Depth Rating: 300 m
 Forward looking Sonar
 Frequency 900/2250 kHz
 Range: up to 60 m

Video from the survey can be found on the accompanying USB stick. The video titles are:

Directory of \\MISMAR - Mississauga Marina Breakwater Survey\NavCam

2019-08-20	12:24 PM	1,728,622,592	MISMAR-Boat-Vid1-2019-08-20-12-03-48.avi
2019-08-20	12:34 PM	569,650,176	MISMAR-Boat-Vid1-2019-08-20-12-26-09.avi
2019-08-30	11:59 AM	864,535	MISMAR-Boat-Video-2019-08-20-12-07-53.jpg
2019-08-30	12:00 PM	969,932	MISMAR-Boat-Video-2019-08-20-12-10-46.jpg
2019-08-30	12:01 PM	996,255	MISMAR-Boat-Video-2019-08-20-12-11-15.jpg
2019-08-30	12:03 PM	1,105,359	MISMAR-Boat-Video-2019-08-20-12-18-58.jpg

Brief descriptions with timed notations are provided in section 5.0.

3.0 RESULTS

3.1 Background Research

3.1.1 Current Environment

The marine archaeological assessment study area encompasses part of the Lake Ontario shoreline, and two existing breakwaters. The shoreline appears to be largely modified (Figure 2), and the east breakwater/pier was built from large armour stone which extends below the water line (Figures 3 – 6, 8). The most southerly breakwater consists of the Ridgetown (Figures 10-13). There is an area inside the east breakwater/pier (i.e. west of the same) which is a small area of water between the breakwater and the marina and floating docks. There is a fence that is now submerged near the shoreline inside this area (Figure 9). It is likely that because of the high water in 2019, that this may have been dry in other years. The area inside the east breakwater/pier and closer to the shore also has a high preponderance of submerged vegetation (Figure 7) The east breakwater is being reclaimed by nature, with the presence of small trees and other vegetation (Figures 2, 5 – 7, 9)..

Figure 2: Modified Shoreline – Inside Corner of East Breakwater facing NW



Figure 3: Inside East Breakwater facing South



Figure 4: East Breakwater and Ridgetown facing Southwest



Figure 5: East Breakwater near North End showing Vegetation Reclamation facing E



Figure 6: East Breakwater from North End facing South



Figure 7: Heavy Weed Growth Inside Corner of East Breakwater facing NE



Figure 8: Inside East Breakwater facing NNW



Figure 9: Fence inside East Breakwater, North End, facing NE



Figure 10: Outside East Breakwater and Intersection of Ridgetown facing SW



Figure 11: Ridgetown, South Breakwater facing NW



Figure 12: Bow of Ridgetown facing NE



Figure 13: Inside Corner of the Ridgetown Breakwater facing NE



3.1.2 Prehistory of the Study Area

Prior to any human occupation, glaciers covered much of Southern Ontario. As these glaciers retreated, they left behind large meltwater lakes and streams and a landscape of barren tundra interspersed with open forests. This environment supported large mammals such as moose, elk and large herds of caribou and left the waters teeming with fish. The first human inhabitants probably moved into this region of Ontario approximately 11,000 years ago following the retreat of the Laurentide Ice Sheet.

Lake Ontario changed in size over several thousand years with the retreat of the Laurentide Ice sheet. The area of current Port Credit was under water at various

times extending back from the existing shoreline north between three and four kilometres (Coleman 1937: Map No. 45f). It is unlikely that there are any Paleo Indigenous sites in the study area.

The Lake Iroquois shoreline ranges in elevation from 90 m asl to above 140 m asl. It runs along Dundas Street for the most part on the east end of Toronto and into Mississauga.

People of the early and middle Archaic periods (7000BC-2500BC) lived similar lives to those of the Paleo-Indians. They remained in small nomadic groups, often moving further inland during the winters as they followed the caribou herds. However, their stone tools and weapons became more advanced as the level of their skill and craftsmanship progressed, often adding ornamentation and intricate carved details to their items. By the late Archaic period (2500BC-1000BC) they were involved in trade networks for sought after raw materials such as tobacco and also engaged in burial ceremonies.

Two identifiable cultures that developed in Southern Ontario during the Ontario Iroquoian Period were the Pickering Culture and the Glen Meyer Culture. These groups occupied the areas to the southwest and to the east of the Toronto and Mississauga Region. About 1300 A.D. these groups merged closing the 'geographical gap' between them. The merging of these two groups during the Middle Iroquoian Phase (1300 – 1400 A.D.) was called the Uren Culture. This era is characterized by a significant increase in population, but the still localized use of land and resources. The Middleport cultures followed the Uren Culture, and by its end, there was a fairly homogenous Iroquoian culture spread across southern Ontario, from which the Wendats, Tionontaté, Attiwandaron and Eries would emerge (TRCA 2017). These groups are located primarily in south and central Ontario. Each group was distinct but shared a similar pattern of life already established by the 16th century (Trigger, 1994, p.42).

The geographic distribution of pre-contact Ontario Iroquoian sites describes two major groups east and west of the Niagara Escarpment: the ancestral Attiwandaron to the west, and the ancestral Huron-Wendat to the east. The border between these two groups was often contested but it is believed that the Credit River Valley may have functioned as a boundary between the two groups. It is unclear if this area was home to frontier Attiwandaron communities or primarily Huron-Wendat that had experienced profound cultural change as a result of exchange and intermarriage with neighbouring Attiwandaron people.

The Huron-Wendat flourished during the Middle Iroquoian period. This was marked by an increase in population and the establishment of year-round villages that were occupied from between five to thirty years. These villages were between one to six hectares in size and were often palisaded. Longhouses were occupied by multiple families under a matriarch (TRCA 2017).

The Late Iroquoian period saw the movement of two groups of Wendats (Hurons) from the Toronto area to Wendake (Huronie by the French). It is thought that one of the reasons for their movement from the area had to do with the formation of a league among the five Iroquois nations south of Lake Ontario sometime after 1450. They had invited the Ontario Iroquoians to join them, but after this invitation was refused, they had engaged in escalating warfare with the Ontario Iroquoians, including the Wendats (ibid).

Beginning in the late 1400s, the Wendats began to abandon their villages and moved north to Georgian Bay and Lake Simcoe. Archaeologists believe that this movement was complete prior to their contact with Europeans in the 1600 (ibid.) At the time of European Contact, the area “south of Lake Simcoe and along the north shore of Lake Ontario remained a no-man’s land, with no permanent settlements and traversed only by raiding parties from the north or from the south” (Robinson, 1965, p.11). The area was used as hunting grounds by both the Huron- Wendat and the Iroquoian Confederacy.

This left the region north of Toronto without permanent inhabitants until the Mississaugas moved south from the northern shores of Lake Huron.

Southern Ontario became a vast hunting territory for the Five Nations Iroquois, who now threatened more distantly established Anishinabe, including the Ojibway of Lake Huron.

By the 1680s, the Anishinabe of the Upper Great Lakes began to mount an organized counter-offensive against the Iroquois. In the early 1690s, the Ojibway, Odawa and Potawatomi, politically and militarily allied as the Three Fires Confederacy, initiated a series of offensives that gradually pushed the Iroquois back into their original homeland territory south of Lake Ontario. After the Iroquois retreated to their homeland south of Lake Ontario, the Mississaugas negotiated a peace treaty with the Mohawk Nation. Upon returning from these negotiations, the Mississaugas decided to settle permanently in southern Ontario. Although an exact date cannot be confirmed, historians generally agree that the process of southern Ontario settlement by Mississaugas occurred in circa 1695 (PRA n/d).

The Mississaugas settled in the area between Toronto and Lake Erie during the late 1600’s. In about 1720, French traders established a fur trade post at the western end of Lake Ontario. From this time onwards, the Mississaugas were regularly involved in the regional fur trade. By 1750, another French trade post had been built in the area of present-day Toronto (Fort Rouille). A practice soon developed by which French, and later English fur traders would extend credit to the Mississaugas at a particular river location. As a result, this river became known as the Credit River. By extension, the Mississaugas established in the region became known to Europeans as the Mississaugas of the Credit (PRA n/a).

In the 1820s, the Mississaugas of the Credit established a mission settlement on the Credit River under the direction of the Reverend Peter Jones. The mission settlement quickly developed as a successful agricultural community and political centre. The continued settlement in the area by Euro-Canadian people put more pressure on the ability of the Mississaugas to continue to make a living and remain in their territory.

In response to this pressure they petitioned the colonial government to secure for them exclusive rights to key fisheries in 'land surrender' agreements.

The text of the 1805 Toronto Purchase defined specific, exclusive rights to fisheries for the Mississaugas in the Twelve Mile Creek, the Sixteen Mile Creek, the Etobicoke River, and the Credit River. In 1829, the Mississaugas of the Credit sought further protection of their fishing rights in a petition to the Upper Canada government to secure their salmon fishery on the Credit River. Later that year, an Act of Parliament was passed confirming exclusive rights of the River Credit Mississaugas to hunt and fish along that river. The Act was confirmed again in 1835.

The following years were not kind and due their population was decimated due to contagious disease. Further encroachment by Euro-Canadian settlers on their land forced the Mississaugas to move to the Grand River Reserve to establish a new settlement.

3.2 Modern Shorelines

Geomorphic Solutions (2012) undertook a Lake Ontario shoreline recession project. Included in this study was a characterization of the shorelines, including bathymetry at nearby Tall Oaks Parks (Figure 14, Geomorphic Solutions 2012: Figure F3) and also a graphic representation of shorelines as they appeared in 1946, 1954, 1978 and 2007 (Figure 15, Geomorphic Solutions 2012: Figure G.4.). The bathymetry does not change much in the study area, where the maximum depth reached was just under 10 metres. The 1946 contour line appears to be the furthest inland by approximately 100 metres from the 2007 shoreline. This suggests that the original shoreline has long since been infilled and used for development.

3.3 Historic Background: Port Credit Harbour

Although the mouth of the Credit River saw some use as a shipping point, in particular for timber, following the cession of the lower valley of the river Mississauga First Nations in 1820, the attempt to create a suitable harbour did not occur until a village plot was surveyed in 1833/34. The immediate difficulty lay with the geography of the outlet by which the river in its natural course entered Lake Ontario in a shallow bend to the west of the latter man-made exit. This is apparent in the 'Plan of the Town Plot of Port Credit' of 1843 (Figure 16).

Figure 14: Nearby Bathymetry at Tall Oaks Park (Geomorphic Solutions 2012: Figure F.3)



Figure 15: Modern Shorelines: 1946, 1954, 1978 and 2007 (Geomorphic Solutions 2012: Figure G.4)

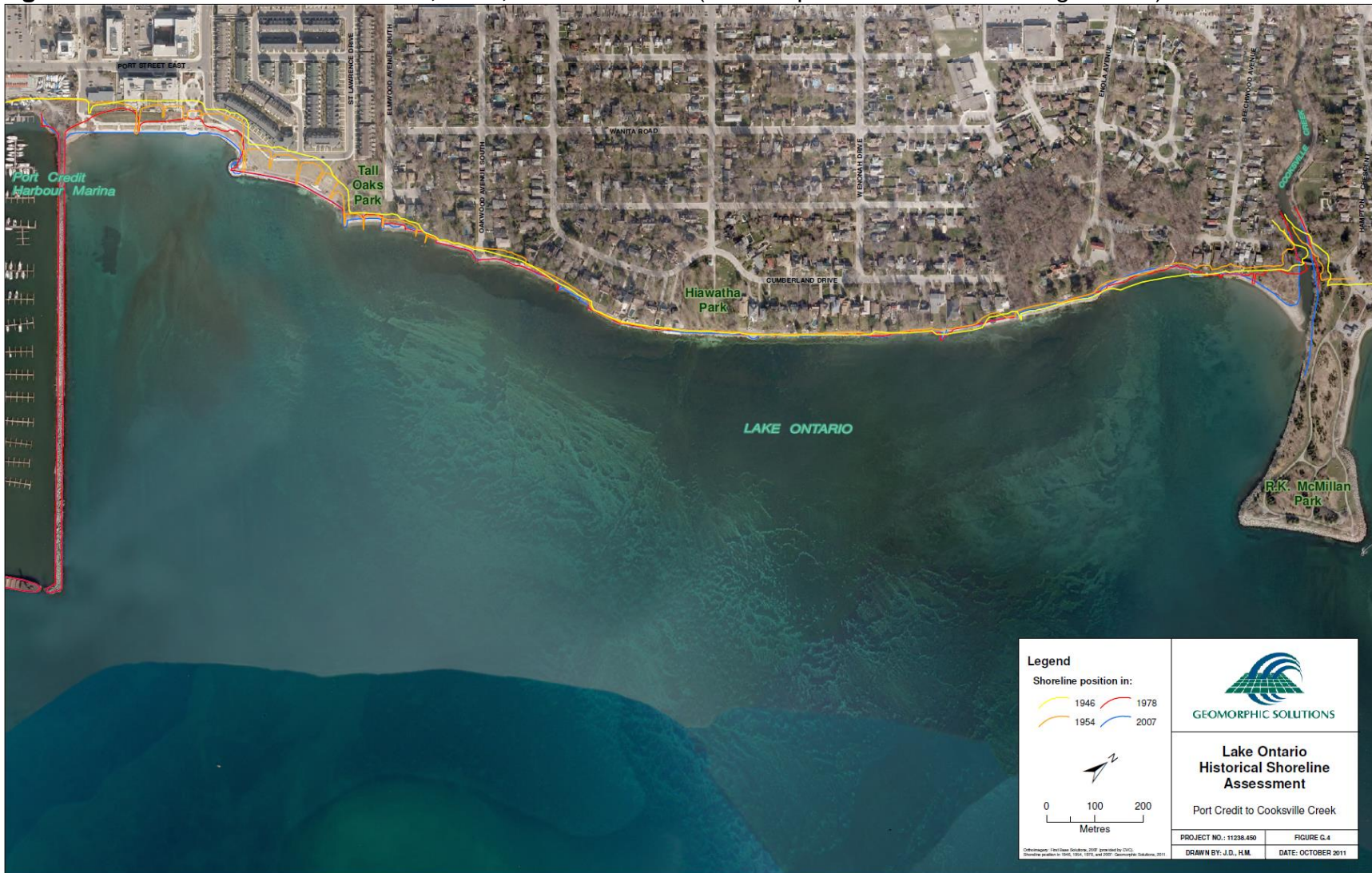
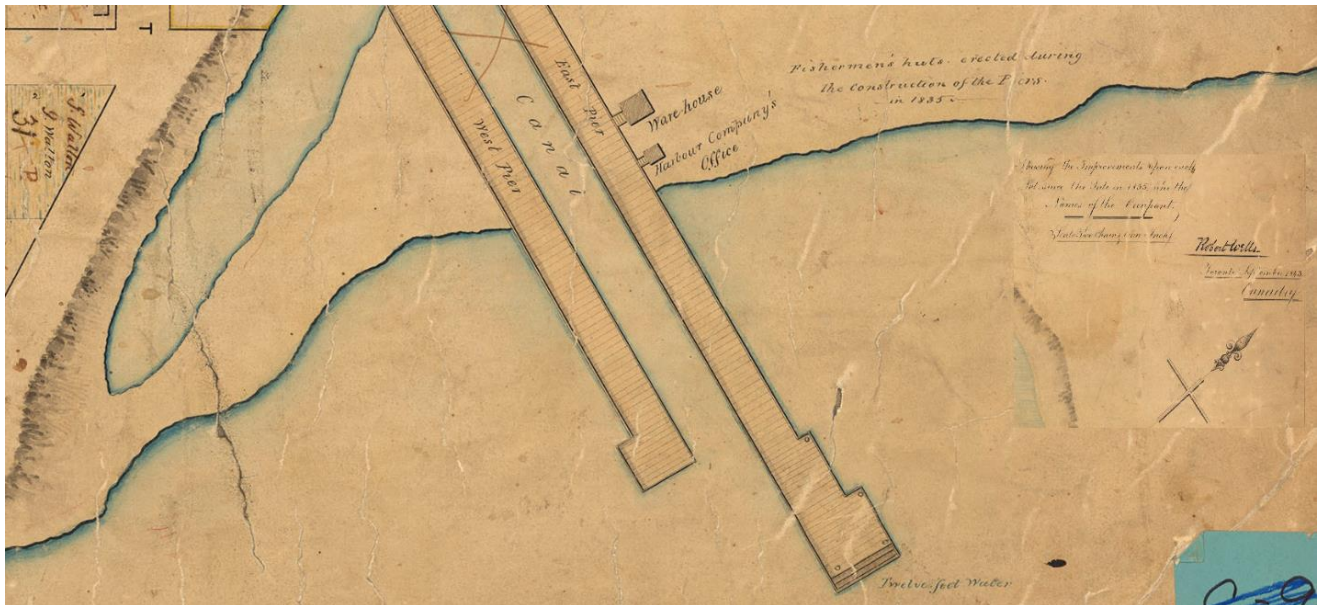


Figure 16: Plan of the Town Plot of Port Credit 1835 (updated 1843) (online MIKAN No. 2148226)



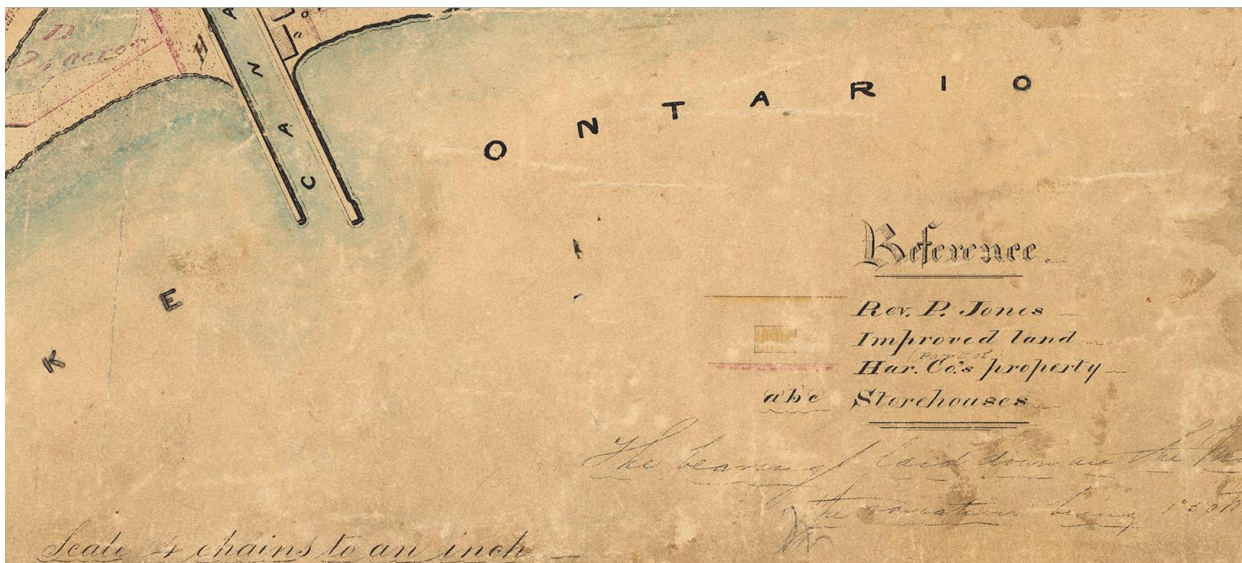
The Port Credit Harbour Company was organized in 1833 and applied for incorporation to the Provincial Legislative Assembly with the declared object of “constructing a Harbour at the mouth of the River Credit” (CEWDA 1833). An Act incorporating the Company was passed by the Legislature the following March (CEWDA 1834). The Mississauga, investing their annuity funds, became holders of half of the stock of what they referred to as “a certain adventure or undertaking for constructing a Harbour at Port Credit” (Mackenzie 1836: A132-1).

Construction began in 1835 and in 1836 and '37 the Provincial “steam dredging machine” was used to open a channel through the shallows of the foreshore directly into the river. Of record is the financial account charged to contractor E.W. Thomson for use of the dredge for 31¼ days from 18 August to 16 October, 1837 (Mackenzie 1838a: 353).

Parallel piers defining the dredged channel were built into the lake perpendicular to the shore. It is likely that stone-filled cribs were used. The piers were in place by the summer of 1837 when the sidewheeler Burlington, connecting Toronto and Hamilton, advertised Port Credit as a point of call (Chronicle & Gazette 1837). The harbour proper, that is the basin formed in the river inside the piers, was sufficiently advanced by the onset of winter in 1837 that two schooners, the Prosperity and Jane which had laid up therein, were abruptly requisitioned by the Government to transport supplies and volunteers to Toronto to aid in the suppression of the so-called Mackenzie’s rebellion (Mackenzie 1838b: 409-10). Although Port Credit was said in 1843 to have “a good pier”, business was minimal and the Provincial Board of Works described its usefulness and the

revenue (harbour dues) derived from it as unsatisfactory, largely due to the lack of good road access from the hinterland (Barker 1844:14; RBW 1845:16). Nevertheless, exports from the port in 1844 did include quantities of wheat, flour, pork, whiskey, square timber, and other produce (Smith 1846:49). At mid-decade five schooners were owned in the village and one, the Caledonia, 128 tons, had been built there in 1842. The steamers Eclipse and Queen City also touched there on their regular routes. Figure 17 illustrates the Plan of the Extension of the Town Plot of Port Credit in 1846. There was planned modification of the shoreline along the piers and some planned additional buildings.

Figure 17: Plan of the Extension of the Town Plot of Port Credit 1846 (online MIKAN No. 2148223)



In the late 1840s and through the 1850s several schooners were built at Port Credit – the British Queen (1847), Credit Chief (1849), Swift (1850), Jenny Lind (1850), Margaret (1854), and Resolute (1857). Thereafter ship building declined and only the scow-schooners Minnie Blakeley (1873) and Russian (1877) were launched. By the 1880s the harbour would be dominated by a fleet of small, shallow-draught stone-hookers, a business which lasted into the twentieth century.

Figure 18 illustrates the 1850 map Toronto Township, specifically Port Credit Town Plot. This demonstrates that the plan of 1846 (Figure 17) came to fruition by 1850.

Figure 18: 1850 Toronto Township, Port Credit Town Plot



Similar to other small harbours created at the mouths of rivers, silting was a major constraint on use. It was noted in 1857 that whereas Port Credit could accommodate a large number of schooners “the want of a dredge, however, renders it almost useless” (Hodder 1857:26). The piers as constructed in the 1830s clearly show the same configuration in 1877 (Figure 19) and appear to have remained unchanged post-1900 (IHACP 1877:52). By that time they had, however, fallen into disrepair. The Sailing Directions of 1921 described them as “in ruins and are partly submerged”, and the 100-foot (30.48 m) wide channel between them had but four feet of water at its outer end (DNS 1921). The state of the north pier is apparent in photographs of 1917 (Figures 20 and 21) and aerial photographs of 1949 (Figure 22). The 1958 edition of the Great Lakes Pilot reported the 800-foot (243.84 m) long channel as being hazarded by the ruins of the north pier (Great Lakes Pilot 1958).

Figure 19: Peel County Historical Atlas Map of Port Credit

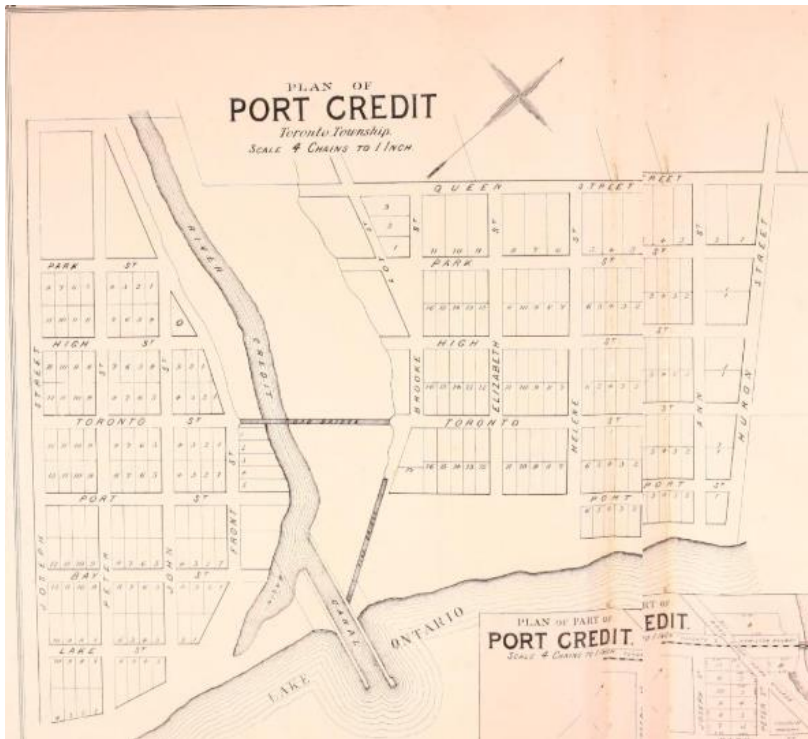


Figure 20: Deterioration of the Piers, 1917 (online MIKAN No. 3385911)



Figure 21: Pier Almost Fully Submerged 1917 (online MIKAN No. 3393405)



Figure 22: 1949 Aerial View of Port Credit Harbour
(<https://www.insauga.com/guess-what-year-these-photos-were-taken>)



The outer end of the north pier bore a lighthouse (Figures 23 - 26) through most of its existence, even during the decades of neglect and decay. Officially, the light was constructed in 1863, but Hodder (1857:26) noted its presence in 1857, though he complained that it was “not even lighted with that regularity which the safety of vessels trading to the port absolutely demands”. In 1891 it was described as a white, square wood tower standing 37-feet (11.28 m) above the high-water mark (Light House Board 1891:56-57). While the pier gradually eroded after 1900, the lighthouse, though abandoned in 1918, survived until destroyed by fire in 1936. In another account by Kathleen Hicks (Hicks 2007), she indicates that the Department of Marine and Fisheries supervised the building of the lighthouse in 1882. It is possible, although unlikely that this is a rebuild of the earlier lighthouse. It is more likely that this was an upgrade to the existing structure. In Hicks account she indicates that the lighthouse was a 36 foot high white frame building with a wooden crib standing on a stone foundation at the end of the pier on the east side of the Port Credit Harbour. Hicks also notes that there is a report that the lighthouse was built in 1863 by Frederick Capreol but that there is no evidence to substantiate this. Regardless, there was a contract awarded for the construction of the lighthouse to Roderick Cameron of Lancaster in the amount of \$1500.00 as recorded in the Sessional Papers. The lighthouse keeper (first) was Alexander Blakely. In 1936, the lighthouse was destroyed by an accidental fire (Figure 27). No light is listed for the harbour as late as 1940. The decline of Port Credit harbour during the first decades of the century is evidenced by the fact that it was omitted from the Canadian government’s port directories published in 1909, 1913/14, and 1923.

Figure 23: Port Credit Lighthouse 1904

(<http://www.lighthousefriends.com/light.asp?ID=1719>)



Figure 24: Port Credit Lighthouse and St. Lawrence Starch Company ca. 1920 (<https://www.insauga.com/port-credit-harbour-way-back-in-the-day>)

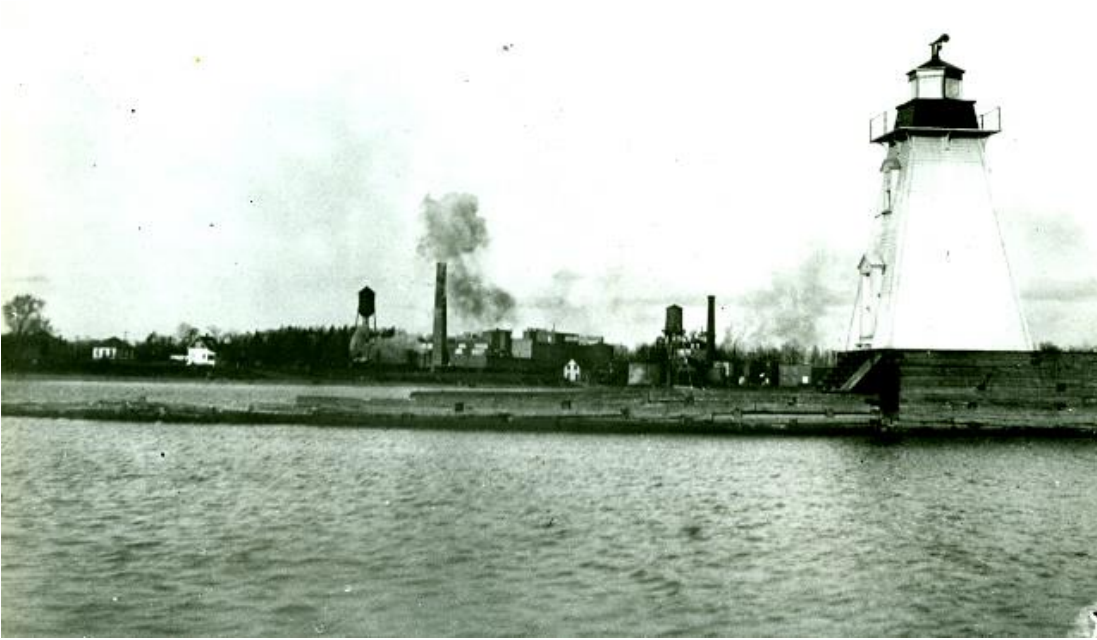


Figure 25: Port Credit Lighthouse post 1920 (<http://www.lighthousefriends.com/light.asp?ID=1719>)



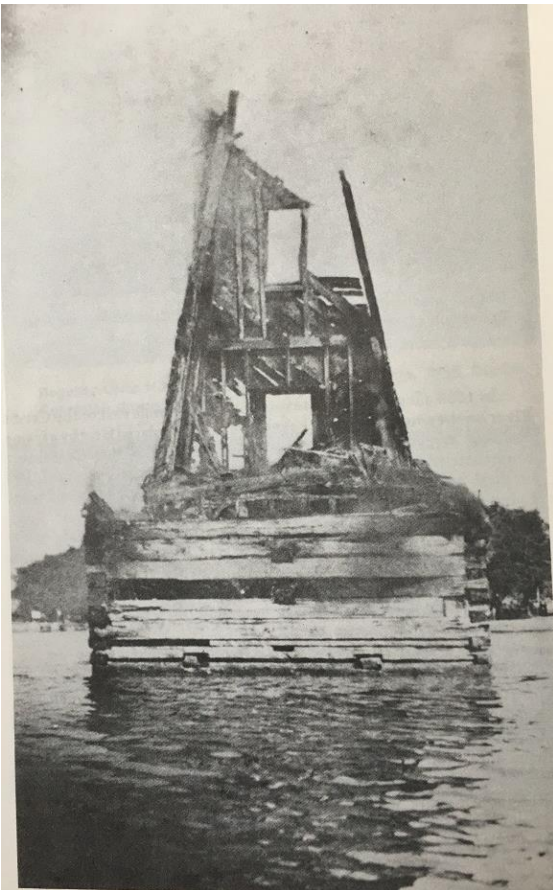
Figure 26: 1920 Lighthouse

(<https://torontoguardian.com/2016/04/vintage-fishing-photographs/>)



City of Toronto Archives, Fonds 1244, Item 9192

Figure 27: 1936 Lighthouse Burned



The remnants of the original piers, in particular the north pier, were destroyed with the redevelopment of the historic shoreland and the filling in of the adjacent waters beginning in the early 1960s. In 1962 the entrance to the river was closed to shipping owing to construction and dredging (Great Lakes Pilot 1963:89). By 1967 a new harbour (east of the old river entrance) was complete. It was described in the Great Lakes Pilot of that year as being “formed by two breakwaters, lying 500 feet (152.4 m) apart at the entrance. The eastern breakwater, 2,350 feet (716.28 m) in length, extends in a southeasterly direction from shore two cables (1,200 feet / (365.76 m) northward of the Credit River. The west breakwater, irregular in shape, extends from the northern side of the entrance to the river. A channel, 280 feet (85.34 m) wide at the entrance and 226 feet (66.88 m) wide alongside the wharf, has been dredged to a depth of 22 feet (6.71 m). A turning basin lying between the outer end of the wharf and the breakwater entrance...has been dredged to the same depth (Great Lakes Pilot 1967:83). The wharf, bearing a warehouse of the Canada Steamship Lines (CSL), had a berthing length of 1,000 feet (304.8 m). Figures 28 to 32 illustrate aerial perspectives of the study area.

Figure 28: Early undated Photography of Mouth of Port Credit River
(Mississauga Library System)



Figure 29: 1907 Birds Eye View of Port Credit Harbour
(photograph by Arthur G. Bradley, online)



Figure 30: 1949 Aerial of Port Credit Harbour
(Mississauga Library System, online)



Figure 31: 1960s Aerial View of Study Area



Figure 32: 1972 Aerial View of Study Area

<https://www.insauga.com/guess-what-year-these-photos-were-taken>



The CSL wharf and warehouse, leased from the federal government, were in service from the spring of 1963 (Globe and Mail 1964). How long they were used by CSL as a trans-shipment point for package freight is unclear, but the Company appears to have withdrawn about 1970.

The dock and adjoining basin were then assumed by the municipality for use as a marina. To protect the small-craft dockage, the basin was safeguarded by the sinking of a former bulk carrier, the Ridgetown, to form a protective breakwater. The Ridgetown, formerly the William E. Cory launched at Chicago on June 24th, 1905, was filled with stone and scuttled on June 21, 1974 (Various Media Sources). The Ridgetown cost \$475,000 to build by the Chicago Shipbuilding Co. and was listed as Hull #67. The William E. Cory was the first flagship of the Pittsburgh Steamship Co. out of Cleveland, Ohio. She was powered by a 1800 ihp triple expansion steam engine and two coal-fired boilers. Both the engine and boilers were built by the American Ship Building Co. of Cleveland in 1905. The Cory sailed from Chicago to Duluth on her maiden voyage. Not without mishaps, she was driven aground on Gull Island Reed in the Apostle Islands of Lake Superior on November 28th, 1905. She was salvaged, but not easily. It took a work team of 158 men, four steamers and two tugs to move her off the reef and to be refloated. The Cory was reconstructed as a barge/freighter with 17 hatches. A new tank top and new boilers were installed in her in April of 1937. She was still known as the Cory, until she was laid up in 1960 and sold to Upper Lakes Shipping Ltd., and placed into the British registry as the Ridgetown (1963). In 1965 she was again transferred, this time to the Upper Lakes Shipping Ltd of Toronto. She operated until November 1969, when she was laid up in Toronto. She was then sold in May of 1970 to the Canadian Dredge and Dry Dock of Toronto. In 1970, the Ridgetown was towed to Port Colbourne, loaded with stone and towed to Nanticoke, where she formed a temporary breakwater for the construction of the Ontario Hydro Power plant. Once her duty was completed her, she was towed by the tugs Salvage Monarch and Helen M. McAllister to Toronto in 1973 to spend the winter. In 1974, the Ridgetown was again loaded with stone and sunk as the current breakwater at the entrance of the Port Credit Harbour. Her cabins and smoke stack were still intact (<http://www.mhsd.org/photogallery/rdgtown.htm>).

The following is from The Scanner, Monthly News Bulletin Of The Toronto Marine Historical Society (1986: Volume 18, No. 7): "Marine News...During 1974 she [the Ridgetown] was loaded with stone and sunk off Port Credit as a permanent breakwater. It is said there may have been defects in the stone bed onto which the Ridgetown was placed but, whatever the reason, the 81-year-old former steamer's hull had recently cracked and it was feared that she might break up if repairs were not made. Tugs from McKeil Work Boats Ltd., using the Hamilton crane barge Cargo Master, have been working on the bed beneath Ridgetown, and efforts to repair the ship's hull have apparently been put in hand as well".

The western breakwater constructed in the 1960s, noted above, overlays the line of the historic pier of 1835 and the site of the lighthouse which once existed at its tip.

4.0 PROJECT METHODS

4.1 Field Work

2019 field work was conducted by SJAI and Shark Marine on August 20th, 2019. Water was either completely flat or had a slight chop to it. Water visibility was between one to three metres depending on depth of water.

Field work consisted of side scan sonar, a magnetometer survey and ground truthing with a forward looking sonar and video.

4.2 Geotechnical Survey

The intensive marine archaeological survey, supervised by a licensed archaeologist (Scarlett Janusas, license number 2019-09) was comprised of a side scan sonar, a magnetometer survey and ground truthing with a remote operated vehicle (ROV) equipped with forward looking sonar and a video of viable targets. The purpose of the marine archaeological assessment was to determine if there were any cultural resources in the study area, to determine significance of any targets, and to provide appropriate mitigation recommendations.

The scope of the work included:

- Side Scan Sonar survey
- Magnetometer survey
- Forward looking sonar and Visual assessment to complement the forward looking sonar data;
- And assess significance of cultural materials in the study area.

The “Barracuda” remote operated vehicle (ROV) is equipped with a high definition camera, forward looking imaging sonar, a total navigation system allowing the Barracuda to maintain geodetic positioning even while submerged. Video was taken at the same time as gathering the forward looking sonar data to link the files.

The side scan sonar was towed from the side of the survey vessel along a predetermined survey grid set to 10 metre interval line spacing to match the path of the magnetometer.

The magnetometer was towed behind the survey vessel to prevent ferrous components on the vessel from influencing its readings. The magnetometer was towed along a 10 metre interval line spacing.

The Barracuda ROV was used for ground truthing of viable targets using forward looking imaging sonar and a video camera. The ROV was deployed from the survey vessel and programmed to approach the target locations. A Shark Marine operator then took over manual control of the ROV to gather both sonar and photographic data.

Video from the survey can be found on the accompanying digital media.

5.0 FIELDWORK RESULTS

5.1 Fieldwork Results

The study area was clear of cultural materials except for one area directly adjacent to the breakwater, the Ridgetown, at the northeast inside corner of the Ridgetown. The target is covered with vegetation and mussels, but upon investigation it was determined that the materials of the two pieces were metal. This target, known as target S2, consisted of two large metal frames, independent of each other. The metal frames appear to be approximately 1.8 metres in height, with uprights pieces an additional one to two metres in height, with rectangular holes approximately 8 by 10 inches (20.32 to 25.4 cms) in size with possible wire or metal (painted yellow) hanging down from the interiors. The pieces appear to be approximately 9.3 metres in length. The thickness of the flat pieces is about four inches (10.16 cms) in thickness. There are several chains or cables that run over the flat sections of the structure and off to the sides. Based on the latter it is obvious that these chains were used to secure the structure into place, or to secure something to the structure.

Table 1: Video and Observations

Video #	Time Frame	Description	Still Image
MISMAR-Boat-Vid1-2019-08-20-12-03-48.	00:01:08	Possible chain/cable off structure	
	02:02	End of S2 abuts <u>Ridgetown</u> , ~1 metre in width	
	04:07	Several chains/cables off side, cables extend over top of the structure	
	06:44	Cable on both sides, not under the ship	
	08:21	Upright at perpendicular angle, metal	
	10:10	Another chain/cable	
	10:43	Corner below upright	
	15:28	Square holes with yellow wire/painted metal	

Figure 33 illustrates the results of the side scan sonar. Figures 34 and 35 illustrates the magnetometer results. Figure 36 illustrates that target information.

Figure 33: Sidescan Sonar Results

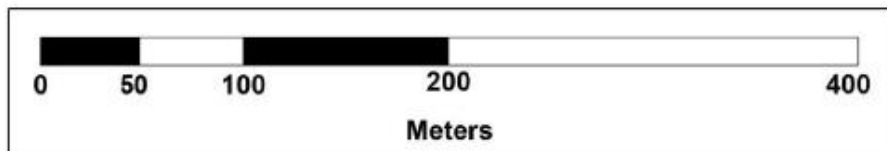


1 Port Street East Port Credit Archaeological Assessment

Side Scan Sonar Mosaic

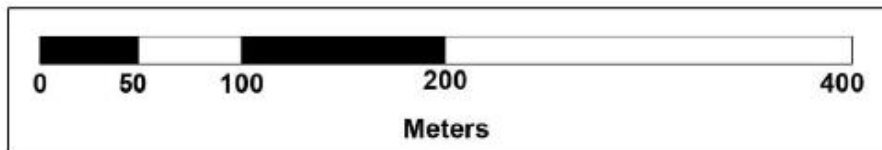
Survey Conducted - August 2019

Drawing by: Jake Frans



23 Nihan Drive, St Catharines,
Ontario, Canada, (905) 687-6672

Figure 34: Magnetometer Gamma Mosaic



1 Port Street East Port Credit Archaeological Assessment

Magnetometer Gamma Mosaic

Survey Conducted - August 2019

Drawing by: Jake Frans



23 Nihan Drive, St Catharines,
Ontario, Canada, (905) 687-6672

Figure 35: Magnetometer Gradient Mosaic

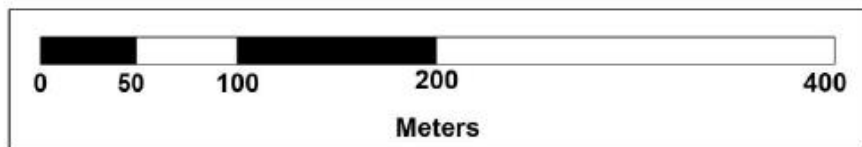


1 Port Street East Port Credit Archaeological Assessment

Magnetometer Gradient Mosaic

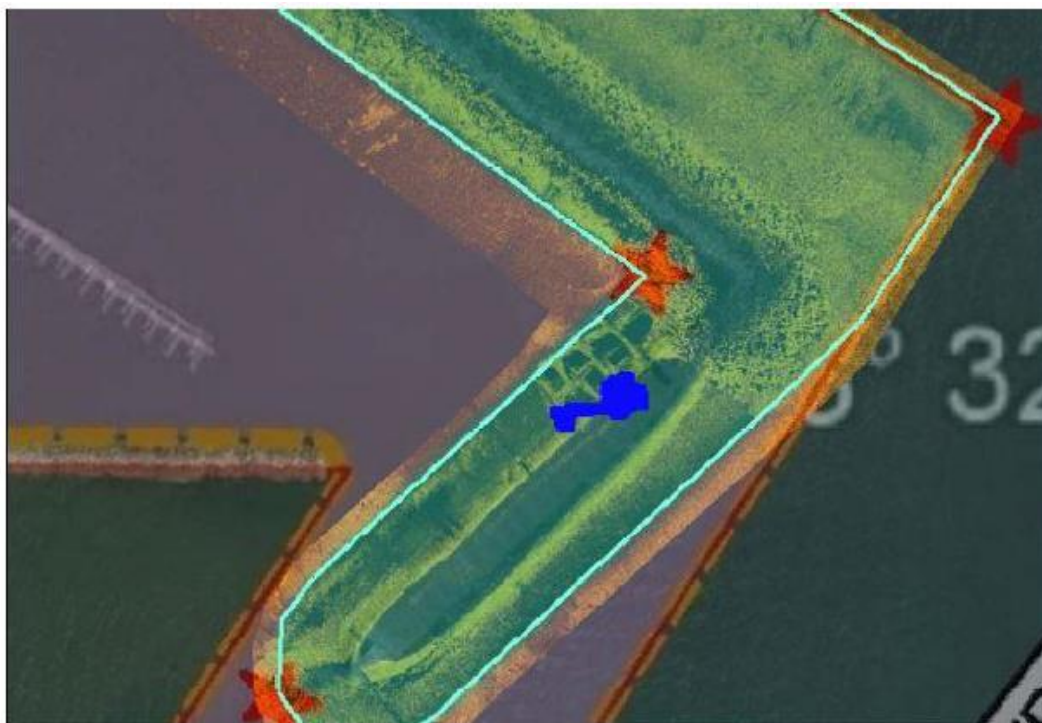
Survey Conducted - August 2019

Drawing by: Jake Frans



23 Nihan Drive, St Catharines,
Ontario, Canada, (905) 687-6672

Figure 36: Target S2

**Target S2 - large structure**

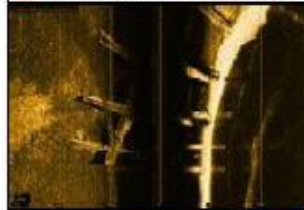
Group: Group 1

Description: large structure adjacent to another similar structure, this one has spacing between appendages 10.5 m possibly metal platform with 6 inch x 6 inch square holes in the intersections, fastened



with chain at various points, comes up tight to the Bridgetown hulk but does not appear to cross the ship below. Approximately 40m long by 8m wide

Latitude: 4332.9053,N
Longitude: 07934.5275,W
Depth: 5.8m
Dive Number: -1



6.0 CONCLUSIONS AND RECOMMENDATIONS

While there has been a suggestion made by Shoreplan Engineering that these pieces are part of former wharfage, SJA I has not been able to confirm this as a possibility.

Instead, based on some additional information, it is unlikely that this is wharfage. First, these are large metal pieces, and would not “float” to the area.

It is known that there were repairs needed on the Ridgetown and work along the bottom of where the Ridgetown was to be laid. The steamer’s hull had cracked, and tugs from the McKeil Work Boats Ltd. used a crane barge to repair the ship’s hull and to work on the beneath the hull.

McKeil Marine is headquartered in Burlington, but is unlikely that if they did leave any “repair materials” that there would be any corporate memory of the same nor an admittance to having left something behind. There is no mention of small vessel wharfage being left behind in the Town Council minutes (within the context of harbour management). It is unlikely that any section of wharfage could break free in sheltered water and not be recovered in such shallow waters.

The exact function and identity of Target S2 therefore remains an unknown at this time. There is no intended work planned for the area of S2 and it is not in any immediate danger from either direct or indirect impact.

Based on the results of the 2019 marine archaeological assessment of the study area, the following is recommended:

- 1) There was some unidentified metal framework, possibly associated with the Ridgetown, which may have cultural heritage value. However, this area of the “site” will not be impacted by the current construction/infilling proposal. Avoidance of the area located at the southwest intersection of the east-west and north-south breakwaters, immediately adjacent to the breakwater formed by the Ridgetown, is recommended. If, this area will be impacted at some future date, or through modifications to the construction plan, drawings of the framework must be made, and, attempt at identifying what these frameworks were part of, or represent.
- 2) No additional cultural targets were located, and the remaining area of the marine archaeological survey is considered clear of cultural/archaeological concerns. No additional archaeological assessment is recommended.
- 3) Compliance regulations must be adhered to in the event that archaeological resources are located during the project development.

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.

The area of recommended avoidance is illustrated in Figure 37.

Figure 37: Area of Recommended Avoidance

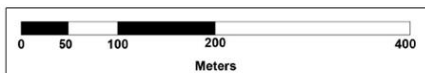


1 Port Street East Port Credit Archaeological Assessment

Side Scan Sonar Mosaic

Survey Conducted - August 2019

Drawing by: Jake Frans



 Area of Recommended Avoidance

SHARK
SHARK MARINE
TECHNOLOGIES INC.
23 Nihan Drive, St Catharines,
Ontario, Canada, (905) 687-6672

7.0 COMPLIANCE LEGISLATION

According to the 2011 Standards and Guidelines (Section 7.5.9) the following must be stated within this report:

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the Ontario Heritage Act.

Should previously undocumented archaeological resources be discovered, they may be an archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.

The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

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**STAGE 1 ARCHAEOLOGICAL ASSESSMENT
ONE PORT STREET EAST, PORT CREDIT
BLOCK A AND PART BLOCK B
TOWN PLOT OF PORT CREDIT RESERVE
GEOGRAPHIC TOWNSHIP OF TORONTO
FORMER COUNTY OF PEEL, RMW OF PEEL
ORIGINAL REPORT**

Prepared for:

Shoreplan Engineering Limited

and

Ministry of Citizenship and Multiculturalism

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**License #: P027, PIF #: P027-0454-2024
March 15, 2024
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Acknowledgement

We begin by acknowledging the land on which we have conducted this archaeological assessment in the current Regional Municipality of Peel as part of the Treaty Lands and Territory of the Mississaugas of the Credit. For thousands of years, Indigenous peoples inhabited and cared for this land. In particular we acknowledge the territory of the Anishinabek, Huron-Wendat, Haudenosaunee and Ojibway/Chippewa peoples; the land that is home to the Metis; and most recently, the territory of the Mississaugas of the Credit First Nation who are direct descendants of the Mississaugas of the Credit. We are grateful to have the opportunity to work on this land, and by doing so, give our respect to its first inhabitants.

We hope that through our work we will honour the Indigenous communities of the area, both past and present.

Executive Summary

The proponent retained the services of Scarlett Janusas Archaeology Inc. (SJA) to conduct a Stage 1 archaeological resource assessment on property proposed for the creation of a new land base to support an operation of an existing marina, including the existing marine base, hereafter referred to as the Study Area. The Study Area forms one section of the greater Project Area.

Permission to access the Study Area and to conduct all activities associated with the Stage 1 archaeological assessment was provided by the proponent. The Study Area is located on an existing marina lot for storage of boats, trailers and vehicles, as well as a small beach area along the southeast section of the Study Area. Previous development of the property includes use of the area as a storage for marina boats, trailers, cars and for storage of fuels. The Study Area at the municipal address of One Port Street, Block A and part of Block B, in the town plot of Port Credit Reserve, geographic township of Toronto, former County of Peel, Regional Municipality of Peel. The Study Area is approximately 1.1 hectare in size.

The archaeological assessment has been conducted as part of an Environmental Assessment study.

Background research indicated that there are 13 registered archaeological site within a one-kilometre radius of the Study Area. Soils of the entire study area have been subject to deep and extensive development disturbance, including some contamination. The Study Area has been identified by the environmental assessment as “all fill”. Water sources include Lake Ontario, onto which the property fronts.

The Stage 1 archeological assessment (property visit) of the Study Area was conducted under license P027 (Scarlett Janusas, PIF#: P027-0454-2024) on March 4th, 2024 under good assessment weather conditions with a high of 17°C.

Based upon the background research of past and present conditions, and the property visit, the following is recommended:

- No further archaeological assessment is required for the Study Area; and,
- Compliance legislation must be adhered to in the event of discovery of deeply buried cultural materials or features.

This archaeological assessment has been conducted under the 2011 Standards and Guidelines for Consultant Archaeologists (Ministry of Citizenship and Multiculturalism 2011).

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Project Personnel

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STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT ONE PORT STREET EAST, PORT CREDIT BLOCK A AND PART BLOCK B TOWN PLOT OF PORT CREDIT RESERVE GEOGRAPHIC TOWNSHIP OF TORONTO FORMER COUNTY OF PEEL, RMW OF PEEL ORIGINAL REPORT

1.0 PROJECT CONTEXT

1.1 Development Context

The proponent retained the services of Scarlett Janusas Archaeology Inc. (SJA) to conduct a Stage 1 archaeological resource assessment on the property referred to as One Port Street East, Port Credit. The City of Mississauga's "*objective is to expand the land base around the eastern breakwater to provide continued marine function and services at the site, create public access to the waterfront, new parkland and enhance the site's ecological functions with new terrestrial and aquatic habitat*" (Shoreplan et. al 2023: 1). For the purposes of this report the property undergoing archaeological assessment will hereafter be referred to as the "Study Area".

Permission to access the Study Area and to conduct all activities associated with the Stage 1 archaeological assessment was provided by the proponent. The Study Area is located on a municipal lot with no extant structures, a paved asphalt and gravel pad supporting boat and trailer storage. The Study Area encompasses part of Block B and all of Block A of the Port Credit Reserve, with two street segments from Elizabeth Street and Helene Street South. The north side of the property is bounded by Port Street East and the south side by Lake Ontario, specifically the Port Credit marina and associated waters and wharves.

The property lies in the Town of Port Credit, City of Mississauga, and former County of Peel, now known as the Regional Municipality of Peel (Maps 1 – 3). The Study Area is approximately 1.1 hectare in size.

The Stage 1 archaeological assessment was triggered by the Environmental Assessment Act.

This archaeological assessment has been conducted under the 2011 Standards and Guidelines for Consultant Archaeologists (Ministry of Citizenship and Multiculturalism 2011).

1.2 Historical Context

1.2.1 Current Environment

The Study Area measures approximately 89 metres (northwest -southeast) by 140 metres wide (approximately east-west). The area is surrounded by a chain link fence. Study Area is approximately 1.1 hectares in size. The Study Area is bound by Lake Ontario and the Port Credit marina to the south, Elizabeth Street to the east, Port Street East to the north and existing marina boat storage area to the west.

The majority of the area is occupied by paved area for storage of boats, trailers and fuel. Elizabeth Street borders the east side of the study area and is lined with trees, sidewalks and is paved. East of the eastern breakwater (southeast portion of the Study Area), large boulders extend into the water lot for several metres, and are used to provide stability and erosion protection. The area consists of a small sandy shoreline with armour stone seawalls and revetments. The remainder of the Study Area abuts the marina shoreline which has been heavily modified. There are no portions of the study area that are original and unmodified. Shoreplan et. al (2024: 25) state that “*The land within the Project Study Area is all fill material.*”

1.2.2 Precontact Era

Archaeological evidence has shown that the area of the Credit River Valley and area have been represented in the record by the Iroquois, Algonquin and Ojibwa speaking peoples, and that their archaeological presence has been recorded in the area since the Middle Archaic period (500 BC – 500 AD).

Table 1 presents the cultural chronology of the general area.

1.2.3 Post Contact Era and Euro-Canadian Historic Period

The area of the current City of Mississauga was first encountered by French Traders in the early 1600s. Even Etienne Brûlé may have visited the area in 1615, although this is the subject of some dispute. The traders encountered Indigenous peoples at the mouths of rivers including that of the Credit River. The term, “Mississauga” translates to “River of the North of Many Mouths”. There is some variation on this translation, where the Mississauga refer to the river as “Missinihe” or “Trusting Water”. The name “Credit” River was derived from the activity of trading on credit.

Circa 1700, the Ojibwas replaced the Iroquois from the north shore of Lake Ontario, and the group known as the Mississauga settled around the mouth of the Credit River. The French had set up a trading post at the mouth of the river by the 1720s. With the decline of the French power in the area, the British established trade with the Mississauga and built a trading post and Government Inn on the east bank of the river mouth in 1798.

Representatives of the British Crown and the Indigenous Mississauga met on August 2nd, 1805 near the mouth of the Credit River and signed Treaty 13A, sometimes referred to either as the Mississauga Purchase or the First Purchase, where over 74,000 acres of land, excluding a one mile strip on either side of the Credit River from the waterfront to the modern Eglinton Avenue, was ceded to the British. The exclusion area became the Credit Indian Reserve. The tract of land was subject to survey in 1806, named the Toronto Township, and is referred to as the Old Survey.

More land was acquired through Treaty 19 (October 28th, 1818) which is known as the Second Purchase. It included over 600,000 acres of land, and is referred to as the new survey (conducted in 1819), which includes most of the Region of Peel as it appears today. Efforts were made to assimilate the Mississauga by building a village for them north of Port Credit in 1826 (current site of the Mississauga Golf and Country Club). Two other treaties with the Mississauga were signed (Treaty 22 and 23), which saw the “surrender” of much of the “Credit Indian Reserve”, where the Indigenous people were relocated to the New Credit Reserve near Brantford in 1847.

The Port Credit village was first surveyed in 1834 and harbour construction coincided with early settlement. Settlement was slow to begin due primarily to the one mile provision for the Mississauga on either side of the river. The relocation of the Indigenous community to Brantford created opportunity for commercial expansion in the area. The founding of Port Credit is linked to the waterfront. Early days provided opportunity utilizing the fish resources directly at the mouth of the harbour and Lake Ontario; there was rafting of lumber and grain downstream to await loading onto ships; and the stonehookers were busy “harvesting” the hard shale from the nearshore lake bottom for use in construction. This prosperity was short-lived, however, with the advent of a fire in the mid-1850’s which destroyed the west end of the harbour. Coinciding with this era was the construction of the Grand Trunk and Great Western Railways which diverted business away from the harbour centre.

Port Credit became a “police village” in 1909, and was incorporated as a village in 1914. In 1961, Port Credit became a “city” and in 1974 was amalgamated into the City of Mississauga. In 2005, the Old Port Credit Village was designated a Heritage Conservation District (A.M. Archaeological Associates 2018: 1-2; bottom for use in construction (<https://heritagemississauga.com/mississaugas-history/>)).

1.2.4 The Property

The Study Area itself, located over 180 metres east of the Credit River, was examined through use of historic maps, review of the draft environmental assessment report and a property visit. The earliest of these maps dates to 1839 (Map 4). The 1839 map includes the Study Area but there is no indication of ownership, structure, topography or other archaeological potential indices. Map 5 illustrates the Thomas Park 1844 map. There are also no indices of any activity or ownership on this early map. The next map (Map 6) dates to 1846 and show the lots unoccupied and devoid of structures. Map 7 highlights the area as a swampy area. Map 8, an early 1800s edition map, shows the area as a

swamp. Tremaines 1877 map has the area as blocks, but no structures are shown. Aerial imagery from 1954 illustrates the area as having undergone some modification of the area through removal of vegetation and/or infilling. The 1975 aerial imagery shows the lots as having undergone total clearing. By 1985, the aerial imagery depicts the area being used for boat and trailer storage. The 1995, 2005, and 2024 imagery show no changes to the use of the Study Area other than that of storage.

1.2.5 Plaques or Monuments, and Designations

There are no commemorative plaques or monuments located on the Study Area or relating directly to the Study Area (OHP 2024; OHT 2024). There are no designated properties located in the Study Area.

1.2.6 Determination of Archaeological Potential

There are a number of variables that are evaluated when determining archaeological potential. These include:

- presence of previously identified archaeological sites;
- water sources (primary, secondary, features indicating past water sources, accessible or inaccessible shoreline);
- elevated topography;
- pockets of sandy soil in heavy soil or rocky ground;
- distinctive land formations;
- resource areas (food or medicinal plants, scarce raw materials, early Euro-Canadian industry);
- non-Aboriginal settlement (monuments, cemeteries);
- areas of early Euro-Canadian settlement;
- early historic transportation routes;
- listed or designated heritage property; and,
- and properties with archaeological potential as identified by local histories or informants.

1.2.7 Rationale for Fieldwork Strategy

The Study Area was subject to a property visit to verify the background research indicating that the area had no archaeological potential (based primarily on soil studies of the area). The property visit obtained photographs and observations across the entire area. The area itself was fenced and secured, prohibiting direct entry, but sufficient gaps in the fence and vegetation permitted good observation of the Study Area.

1.3 Archaeological Context

1.3.1 Previously Known Archaeological Resources/Assessments

A search conducted in March of 2024 through the Ministry of Citizenship and Multiculturalism PastPortal site indicated that there are 13 registered archaeological sites located within a one kilometre radius of the Study Area (Table 2).

Additionally, there has been one known archaeological assessment conducted within a 50 metre radius of the current Study Area. This is a marine archaeological assessment conducted by Scarlett Janusas Archaeology Inc. (2019-09) in 2019. The assessment results of that study indicated that there were remnants of a marine structure along the inside of a pier (SJA 2019).

1.3.2 Current Environment – Existing Features

The majority of the area is occupied by paved area for storage of boats, trailers and fuel. Elizabeth Street borders the east side of the study area and is lined with trees, sidewalks and is paved. East of the eastern breakwater (southeast portion of the Study Area), large boulders extend into the water lot for several metres, and are used to provide stability and erosion protection. The area consists of a small sandy shoreline with armour stone seawalls and revetments. The remainder of the Study Area abuts the marina shoreline which has been heavily modified. There are no portions of the study area that are original and unmodified. Shoreplan et. al (2024: 25) state that “*The land within the Project Study Area is all fill material.*”

1.3.3 Physiography, Bedrock and Topography

The underlying bedrock of the Study Area is the Georgian Bay formation (Chapman and Putnam 1973:4-5).

The Study Area lies in the physiographic region known as the Iroquois Plain (ibid: 324-326). The Credit River is associated with old lake built barrier beaches. Between the two beaches of the Iroquois Lake and present day Lake Ontario, the surviving portion of the bed of Lake Iroquois presents as a sloping plain, in some areas covered with stratified sands, and in other places soil.

The Study Area is relatively level with an elevation range of 72 to 74 metres above sea level.

1.3.4 Prehistoric Shorelines

The Lake Iroquois (former) shoreline occurs north of the study area. The Study Area would have been inundated during the time of Lake Iroquois.

1.3.5 Soils

Borehole drilling was conducted by Golder in 2016 for the onshore portion of One Port Street East. The profiles were relatively consistent showing asphalt (up to .09 m thick) “overlying non-cohesive fill material comprised of varying amounts of silt, sand, clay, and gravel. Fill materials were encountered at depths of 1.2 to 3.7 m below ground surface. This fill material contained occasional debris comprised of cinders, concrete, asphalt wood and/or glass, particularly in the western sections of the site. 2.4 m of riprap boulders were encountered in one borehole. Native soil was encountered at 3 m bgs at the edge of the site along the northern property boundary in only one borehole. Peat, approximately 0.3 to 0.6 m in thickness was encountered at three boreholes at depths ranging from 2.9 to 5.5 m bgs and a maximum depth of 7.3 bgs at the southern end of the property, nearest the shoreline. Sand, silty sand or gravelly sands underlay the peat. Cohesive silty clay was encountered at a depth of 2.1 m bgs at the edge of the site along the northern boundary in only one borehole. Weathered shale was encountered at depths ranging from 9.8 to 10.7 bgs” (Golder 2016).

In addition, some chemical analysis was conducted of soil samples from some of the boreholes. One borehole, located near the centre of the study area contained antimony, arsenic, barium, cadmium, copper, lead, mercury, molybdenum and zinc. Additional bore hole sampling produced other contaminants. It has been suggested that the contaminants are “likely to be from leaks and spills associated with above-ground storage tanks and piping the southwestern portion of the Project Study Area, boat storage and various marina activities, including winter salt application to pave areas” (Shoreplan et. al 2024:36).

As noted previously, Shoreplan et. al (2024) have indicated that there are no original soils in the Study Area. The borehole data supports this statement and also indicates that the previous development disturbance to the area is deep and extensive.

1.3.6 Drainage

The Study Area abuts Lake Ontario and lies approximately 180 metres east of the Credit River. There are no water sources located directly on the Study Area.

1.3.7 Vegetation

The vegetation in the Study Area consists of modern tree plantings along the perimeter of the roadways and surrounding the chain link fence of the Study Area. The area is otherwise devoid of any vegetation, excepting some weeds breaking through pavement. The area was formerly part of the Lake Erie-Lake Ontario ecoregion, which contain sugar maple, American beech, eastern white pine, alvar and grassland communities (Shoreplan et. al 2024: 47).

1.3.8 Dates of Fieldwork

The Stage 1 property visit was conducted on March 4th, 2024 under sunny skies and a high of 17 degrees Celsius.

As per the Ministry of Citizenship and Multiculturalism (2011: Section 2.1, Standard 3) the fieldwork was conducted under the appropriate lighting and weather conditions.

2.0 FIELD METHODOLOGY

2.1 Stage 1 (Background Research)

As part of the background research, an examination of the following was conducted:

- the Site Registration Database (maintained by the Ontario Ministry of Citizenship and Multiculturalism) was examined for the presence of known archaeological sites in the project area and within a radius of one kilometre of the project area by contacting the data coordinator of the Ministry of Tourism and Culture;
- reports of previous archaeological fieldwork within a radius of 50 m around the property;
- topographic maps at 1:10,000 (recent and historical) or the most detailed map available;
- historic settlement maps such as the historic atlases;
- available archaeological management/master plans or archaeological potential mapping;
- commemorative plaques or monuments; and,
- any other avenues that assist in determining archaeological potential were examined.

The Regional Municipality of Peel does not have its' own separate archaeological management plan, but individual communities either have a plan, are working at developing a plan, or have no current archaeological plans. Port Credit was amalgamated as part of the City of Mississauga and the City is currently in the process of developing an archaeological management plan, but the draft of the plan is not due until the fall of 2024, and therefore unavailable for this report (<https://yoursay.mississauga.ca/archaeology>). There are 13 registered archaeological site within a one-kilometre radius of the Study Area. There has been one known archaeological assessment conducted within 50 m of the Study Area (SJA1 2019), a marine archaeological assessment of the water portions of the larger Study Area. There are no historic commemorative plaques or monuments located on or directly related to the Study Area. While there is a heritage conservation district in Port Credit is lies primarily on the west side of the Credit River. Topographic and historic maps are presented in the Map section at varying scales. Borehole data gathered for the Study Area demonstrates that the area has been the subject of deep and extensive development disturbance.

3.0 RESULTS

3.1 Stage 1 Archaeological Assessment

The Study Area would have exhibited archaeological potential based on its proximity to Lake Ontario, however, the deep and extensive disturbance of the soils across the entire Study Area, with fill and contaminants (demonstrated through bore hole data and historic maps) obviates any archaeological potential for the Study Area. The property visit conducted on March 4th, 2024 confirmed that there are no areas that remain unmodified in the Study Area. Images 1 – 55 illustrate the observations of the Study Area.

3.2 Inventory of Documentary Records Made In Field

Documents made in the field include:

- Daily record log and field notes – 1 pages (double-sided)
- Image log – 2 pages
- Digital images – 58 colour images
- Field maps showing the location and orientation of image(s) taken.

4.0 ANALYSIS AND CONCLUSIONS

The entire Study Area has undergone deep and extensive development disturbance and there is no remaining portion that demonstrates any possibility of archaeological potential.

Based on Section 2.2 of the 2011 MCM Standards and Guidelines, no further archaeological assessment is required for the Study Area.

5.0 RECOMMENDATIONS

Based upon the Stage 1 background research of past and present conditions, and the property visit, the following is recommended:

- No further archaeological assessment is required for the Study Area; and,
- Compliance legislation must be adhered to in the event of discovery of deeply buried cultural materials or features.

This archaeological assessment has been conducted under the 2011 Standards and Guidelines for Consultant Archaeologists (Ministry of Citizenship and Multiculturalism 2011).

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

According to the 2011 Standards and Guidelines (Section 7.5.9) the following must be stated within this report:

This report is submitted to the Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Citizenship and Multiculturalism, a letter will be issued by the Ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the Ontario Heritage Act.

Should previously undocumented archaeological resources be discovered, they may be an archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.

The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

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[Final_Version_HCD_Plan_January_2020.pdf](https://www.mississauga.ca/wp-content/uploads/2020/11/02094946/approved-by-the-Local-Planning-Appeal-Tribunal-case-MM180055.-Final_Version_HCD_Plan_January_2020.pdf)

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1856 Plan of the Extension of the town plot of Port Credit Reserve

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8.0 TABLES

Table 1: Cultural Chronology of the General Area

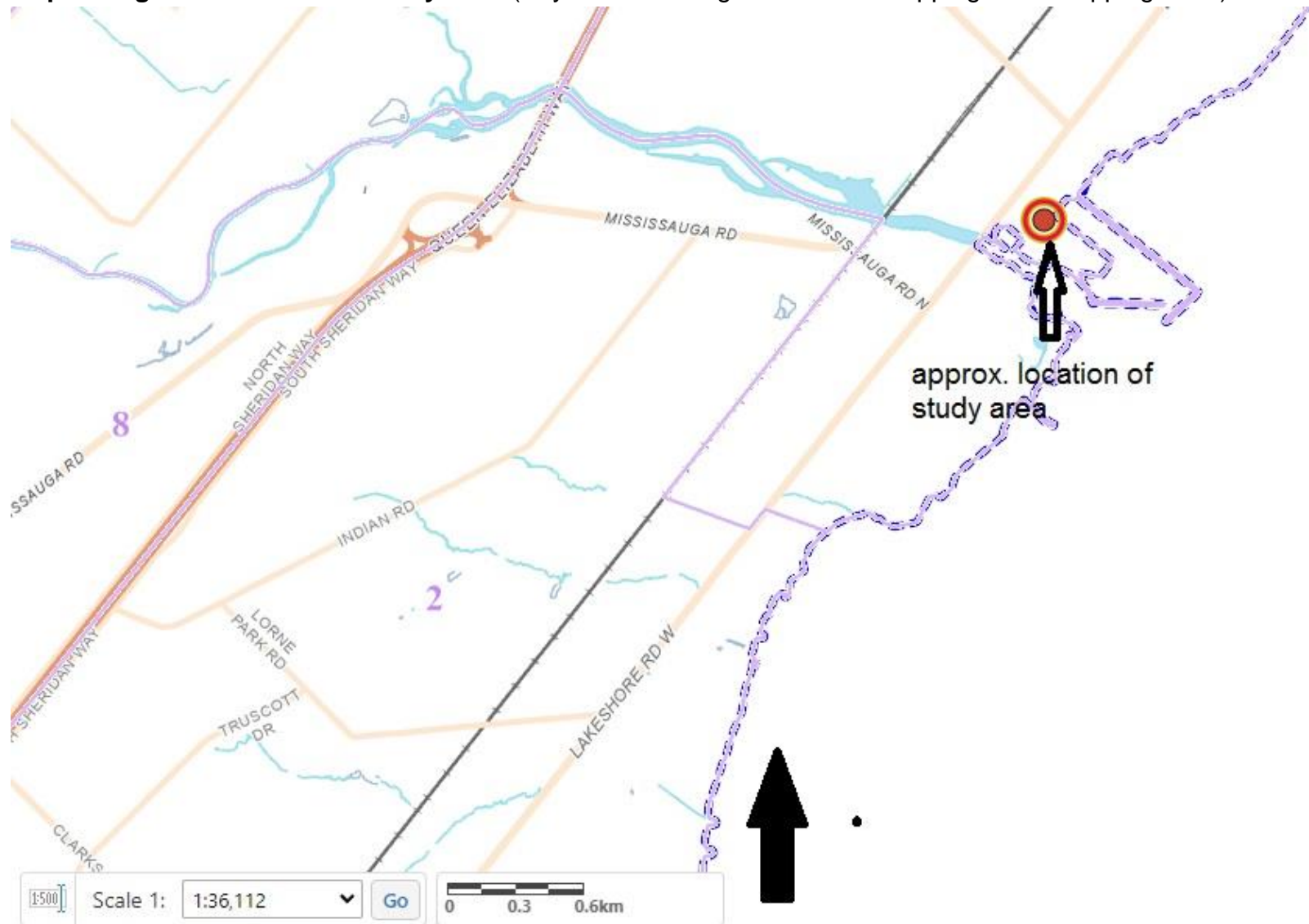
PERIOD	GROUP/ DESCRIPTOR OF DIAGNOSTICS	CULTURAL TIME RANGE	DESCRIPTOR
PALEO	Big game hunters in small nomadic groups		
Early	Fluted Point	9500-8500 BC	Lanceolate and fluted points
Late	Hi-Lo	8500-8000 BC	Side notched points
ARCHAIC	Nomadic hunters and gatherers		
Early	Nettling Bifurcate Based	7800-6900 BC 6900-6000 BC	Varied tool kit
Middle	Stanly/Neville Otter Creek Brewerton	6000-5000 BC 5000-3000 BC 3000-2500 BC	Bands had a ground and polished stone tool industry, and heavy reliance on fishing
Late	Narrow Point Broad Point Small Point	2500-1800 BC 1800-1500 BC 1500-800 BC	Bipolar reduction Net fishing, nuts Mortuary practices
WOODLAND	Introduction of pottery and agriculture		
Early	Meadowood	900-400 BC	Early pottery
Middle	Point Peninsula Princess Point	400BC-500 AD 500-900 AD	Trade networks Incipient horticulture
Early Late	Pickering/Glen Meyer	900-1280 AD	Transition to village life
Middle Late	Uren Middleport	1280-1330 AD 1330-1400 AD	Large village sites Rapid population growth
Late	Wendat (Huron) Neutral Petun St. Lawrence (Haudenosaunee)	1400-1650 AD	Well made ceramics, and tribal differentiation and warfare
HISTORIC	European settlers		
Early	Odawa, Ojibwa, Mississauga, Six Nations	1700-1875 AD	Fur trade, social displacement
Late	Odawa, Ojibwa, Mississauga, Six Nations Euro-Canadian	1790 to present	Reservations, presence throughout urban and rural areas Euro-Canadian settlement

Table 2: Archaeological Sites within One Km of Study Area

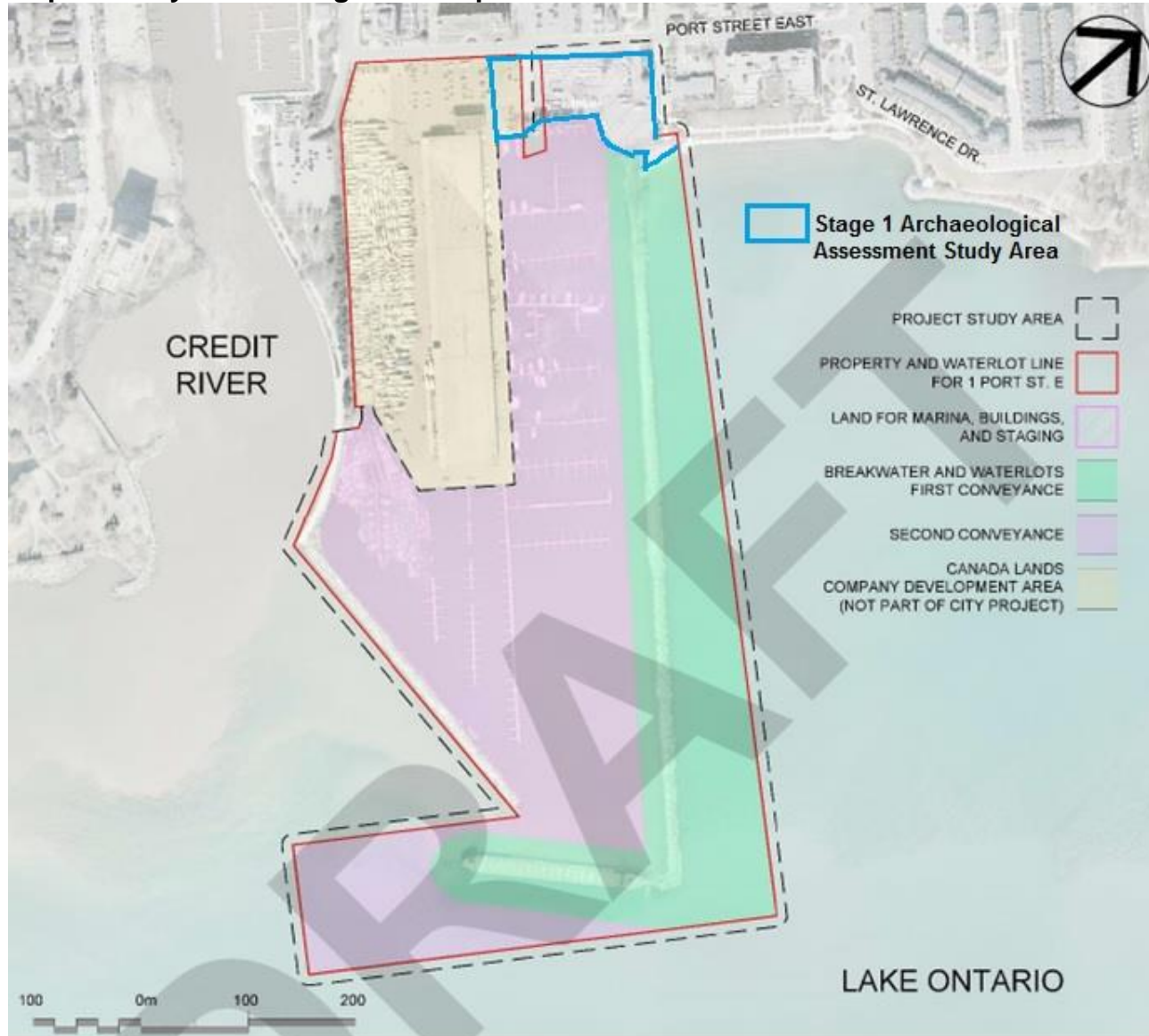
Borden No.	Site Name	Time Period	Site Type
AjGv-95	Tall Oaks	Pre Contact	Scatter
AjGv-9	Avonbridge	Archaic	Other camp/campsite
AjGv-84	Kane	Post-contact, Woodland	Camp/campsite, homestead
AjGv-83		Late Archaic, Middle Woodland	Camp/campsite
AjGv-73		Precontact, Middle Woodland	Scatter
AjGv-71	James Taylor	Pot contact	Warehouse
AjGv-57		Other	Burial
AjGv-5	Glenburny	Precontact	Campsite
AjGv-32	Scott O'Brien	Middle Archaic, Early and middle Woodland	
AjGv-13	Fort Toronto	Post contact	Village
AjGv-11	Port Street		
AjGv-10	Stavebank		
AgGv-1	Hare	Archaic, Middle Woodland	campsite

9.0 MAPS

Map 1: Regional Location of Study Area (City of Mississauga Interactive Mapping 2023 Mapping 2020)

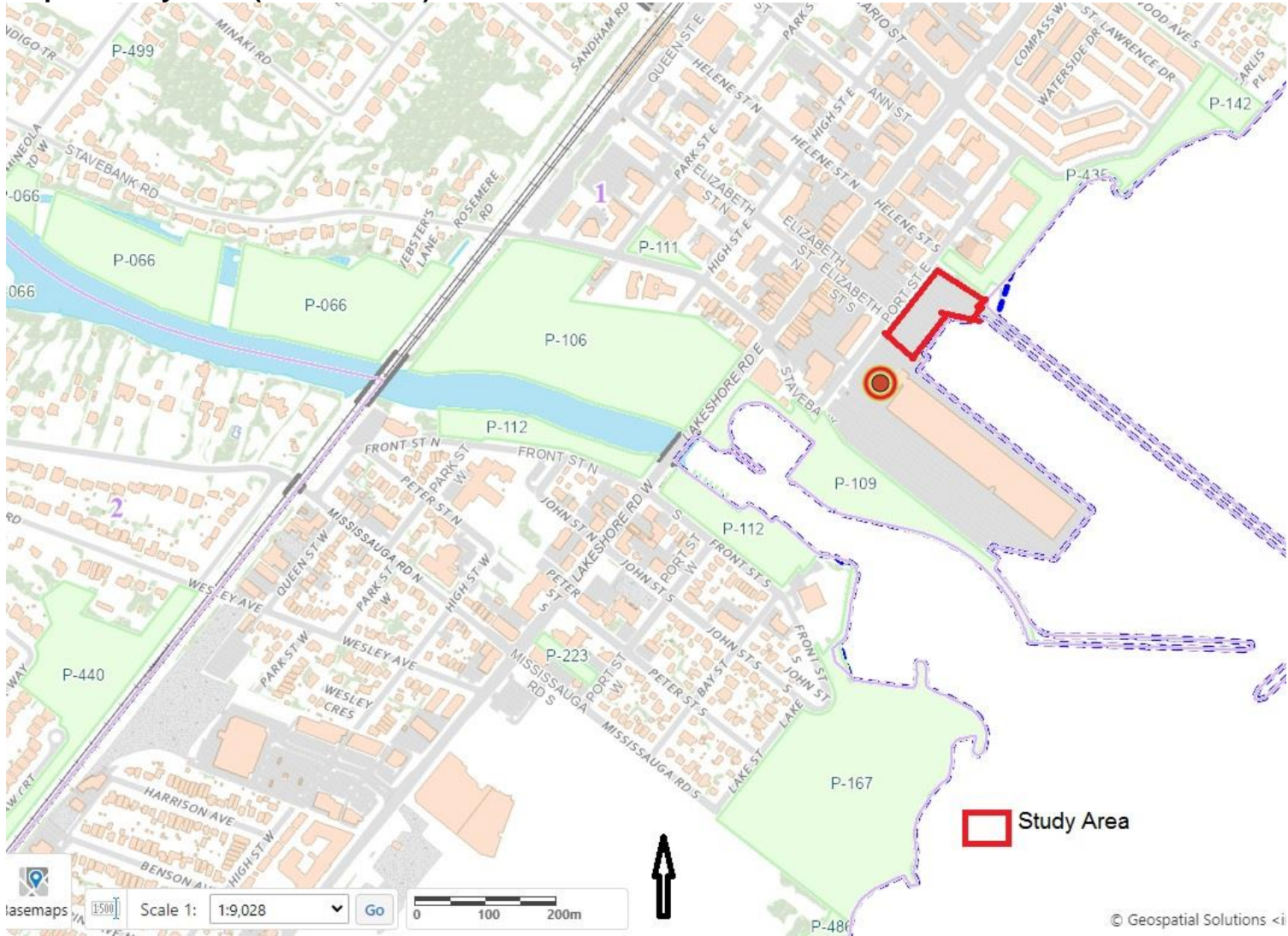


Map 2: Study Area in larger development context

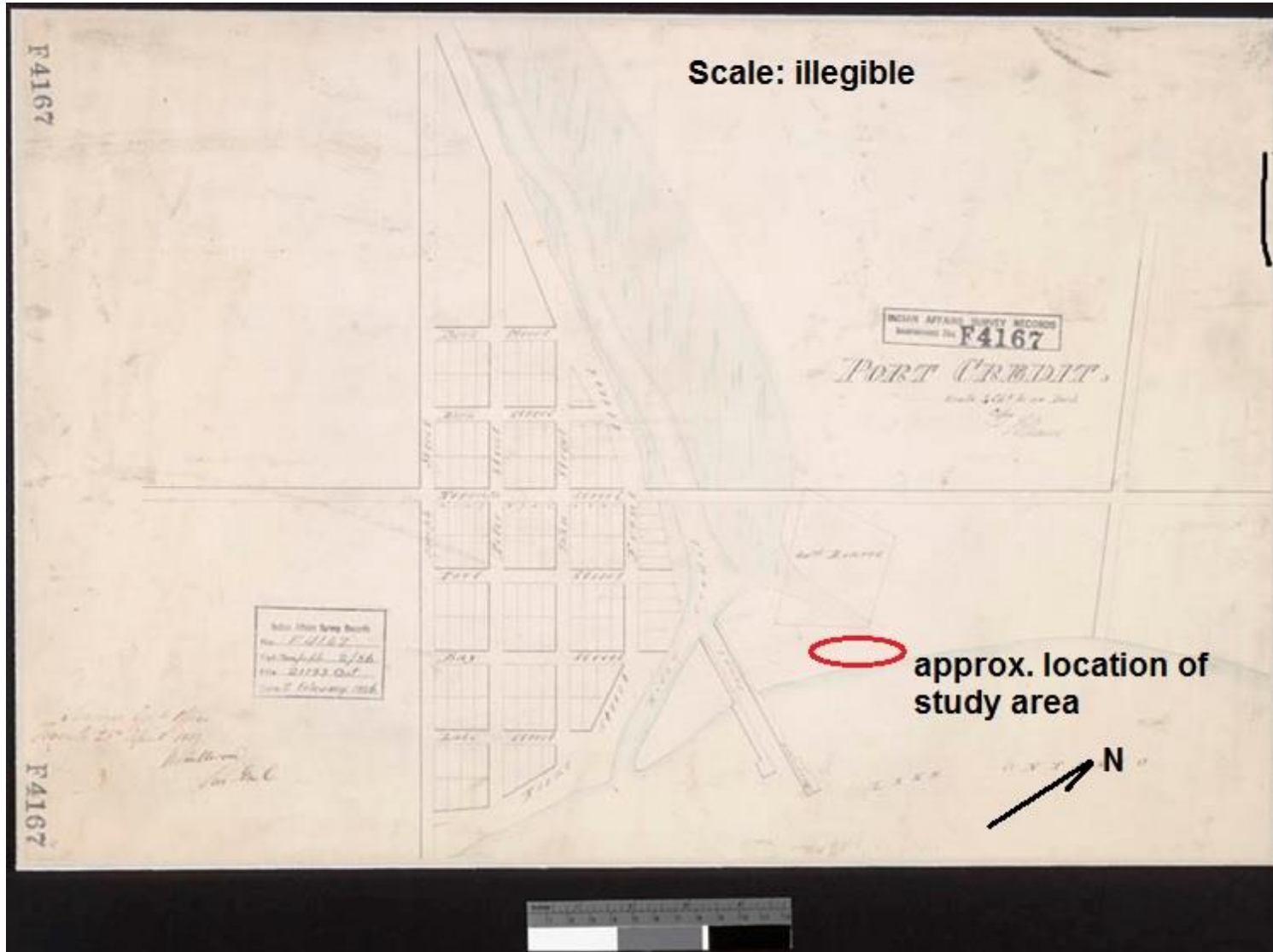


Adapted from Shoreplan et. al 2024: Figure 1.1

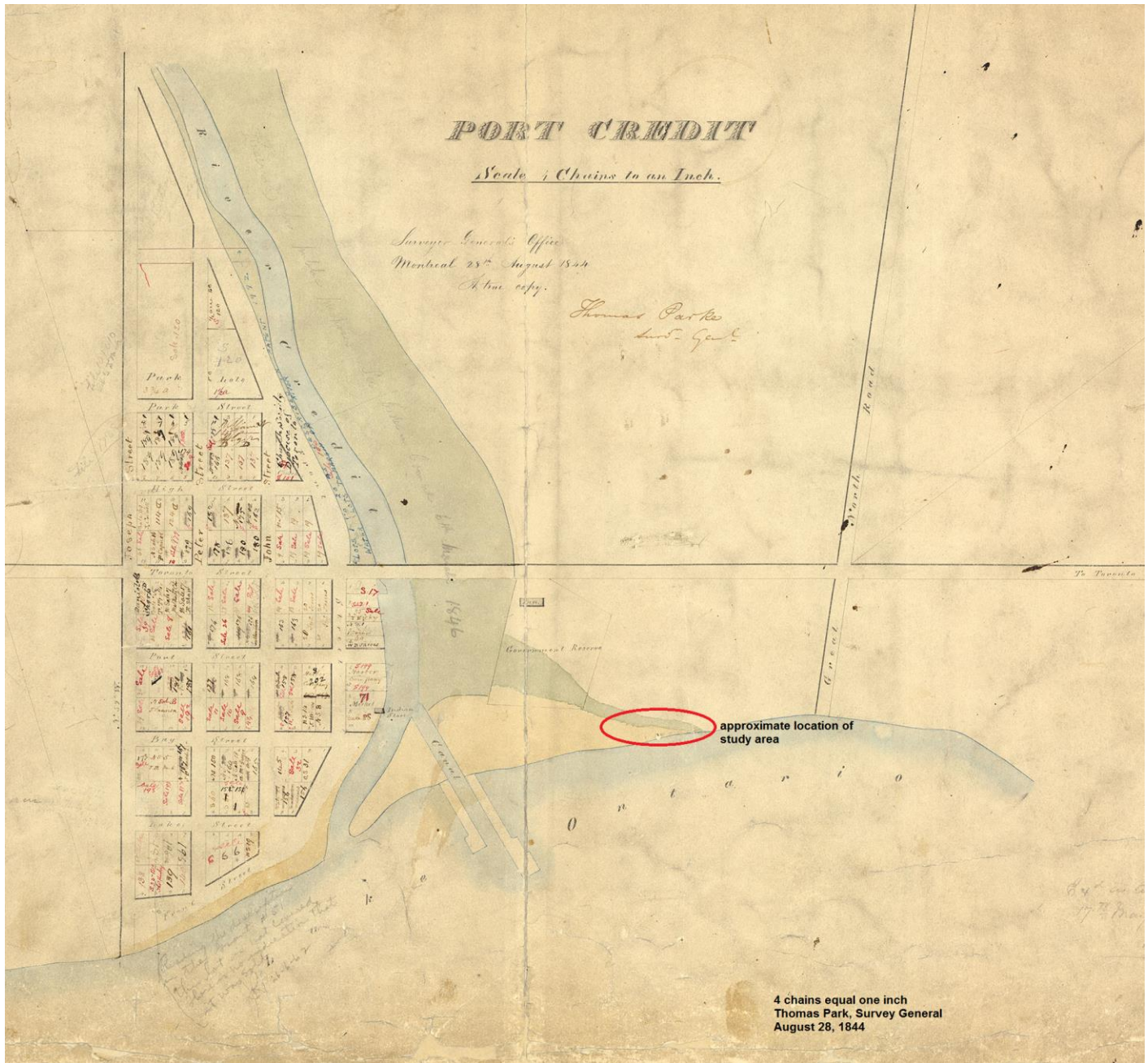
Map 3: Study Area (scale 1:9028)



Map 4: 1839 J.G. Chewett map of Port Credit



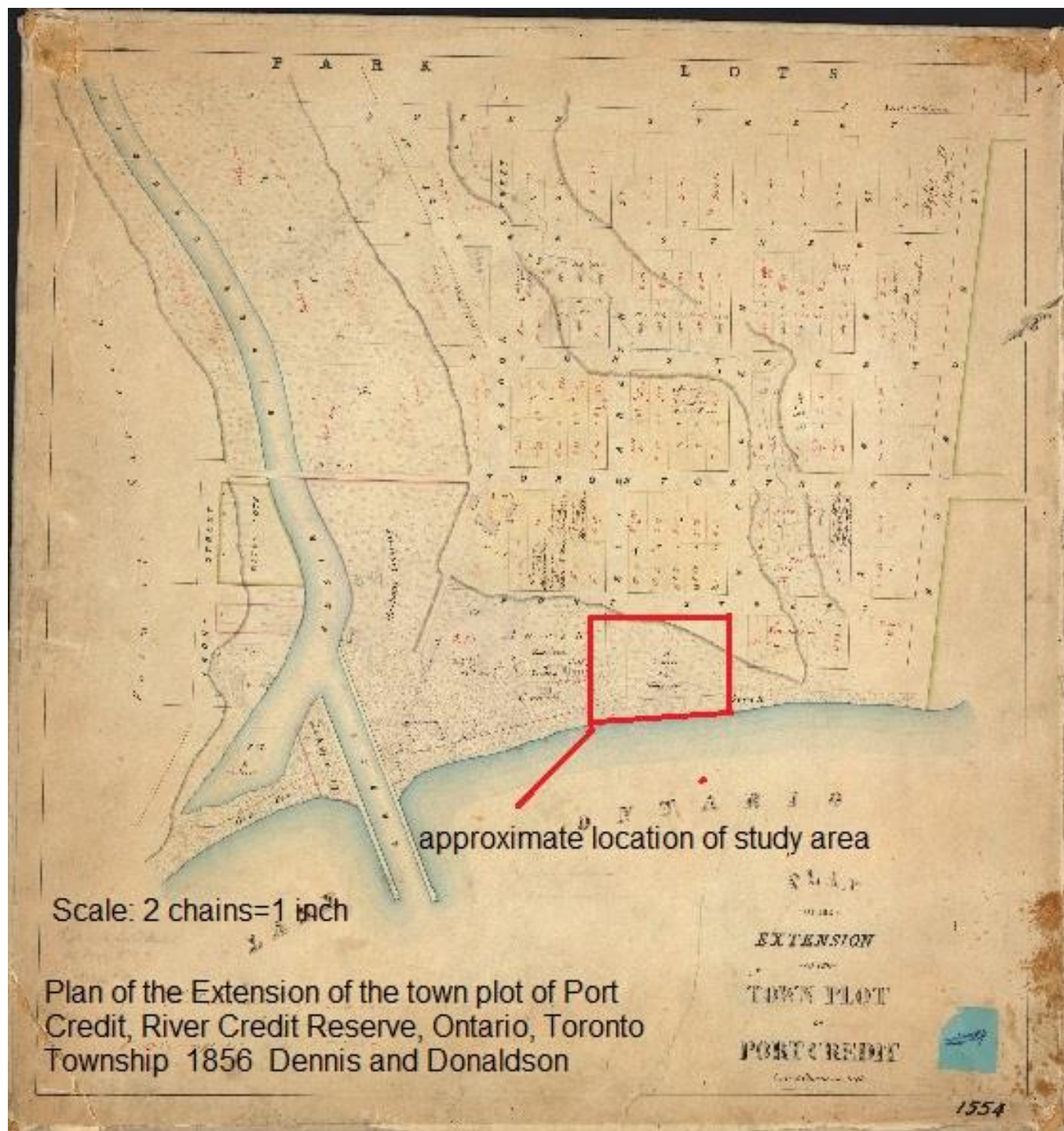
Map 5: Thomas Park 1844 map of Port Credit



Map 6: 1846 Plan of the Extension of the Town Plot of Port Credit, Canada



Map 7: 1856 Plan of the Extension of the town plot of Port Credit Reserve



Map 8: ca. Early 1800s map (illegible for author)

https://www.reddit.com/r/mississauga/comments/npytm/map_of_port_credit_printed_on_linen_in_1800s/1880

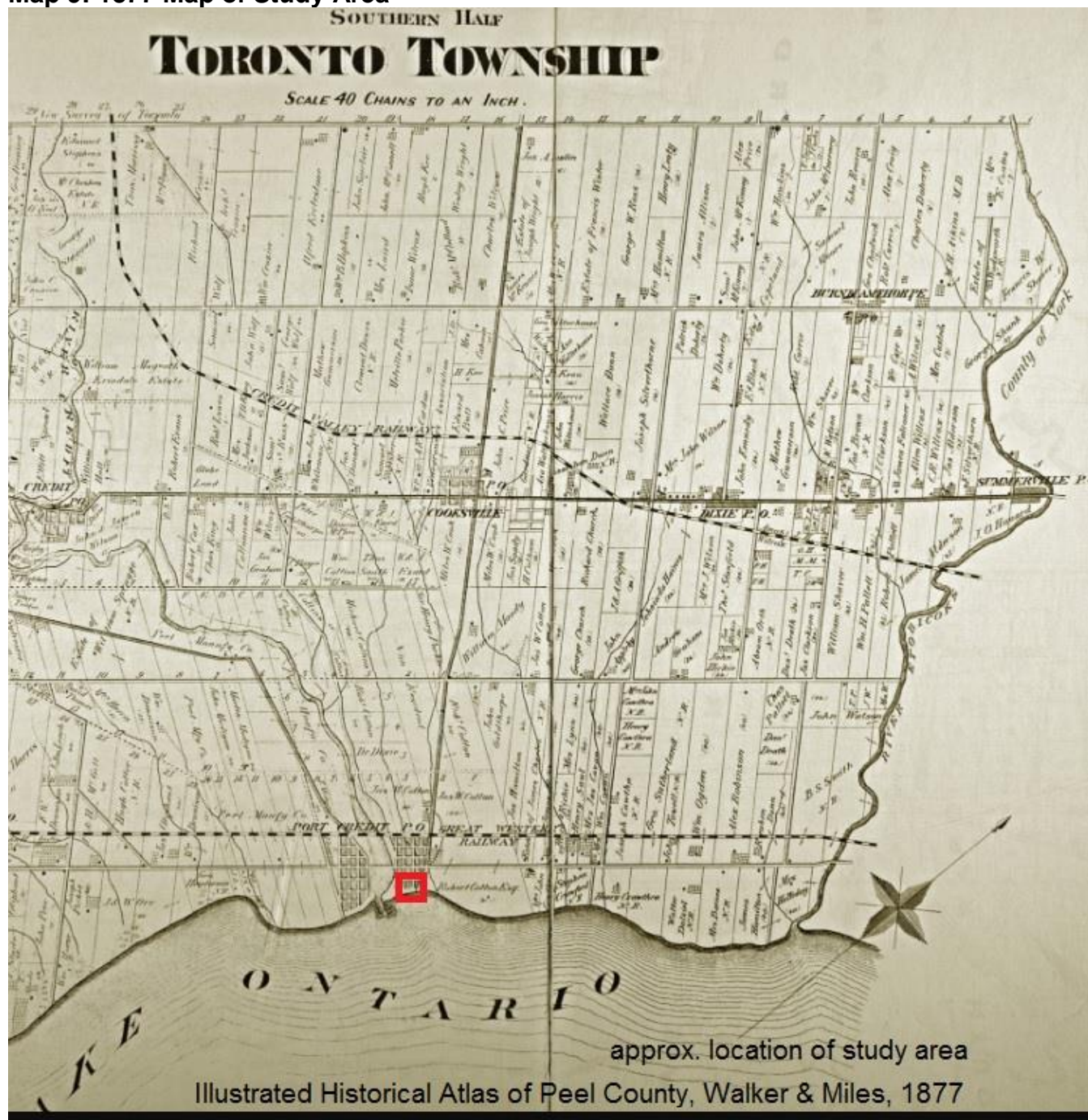


This part of the Village is marked out at the spot known as Lake Street marked by Graham in 1802

This is a plan of the village of Port Credit as it is now. It is somewhat different to the one in the map of 1802 as it is slightly different & is signed by J. B. Brown 22/12/1846

Scale 1" = 100 feet

Map 9: 1877 Map of Study Area



Map 10: 1954 Aerial View of Study Area



Map 11: 1975 Aerial View of Study Area



Map 12: 1985 Aerial View of Study Area



Map 13: 1995 Aerial View of Study Area



Map 14: 2005 Aerial View of Study Area



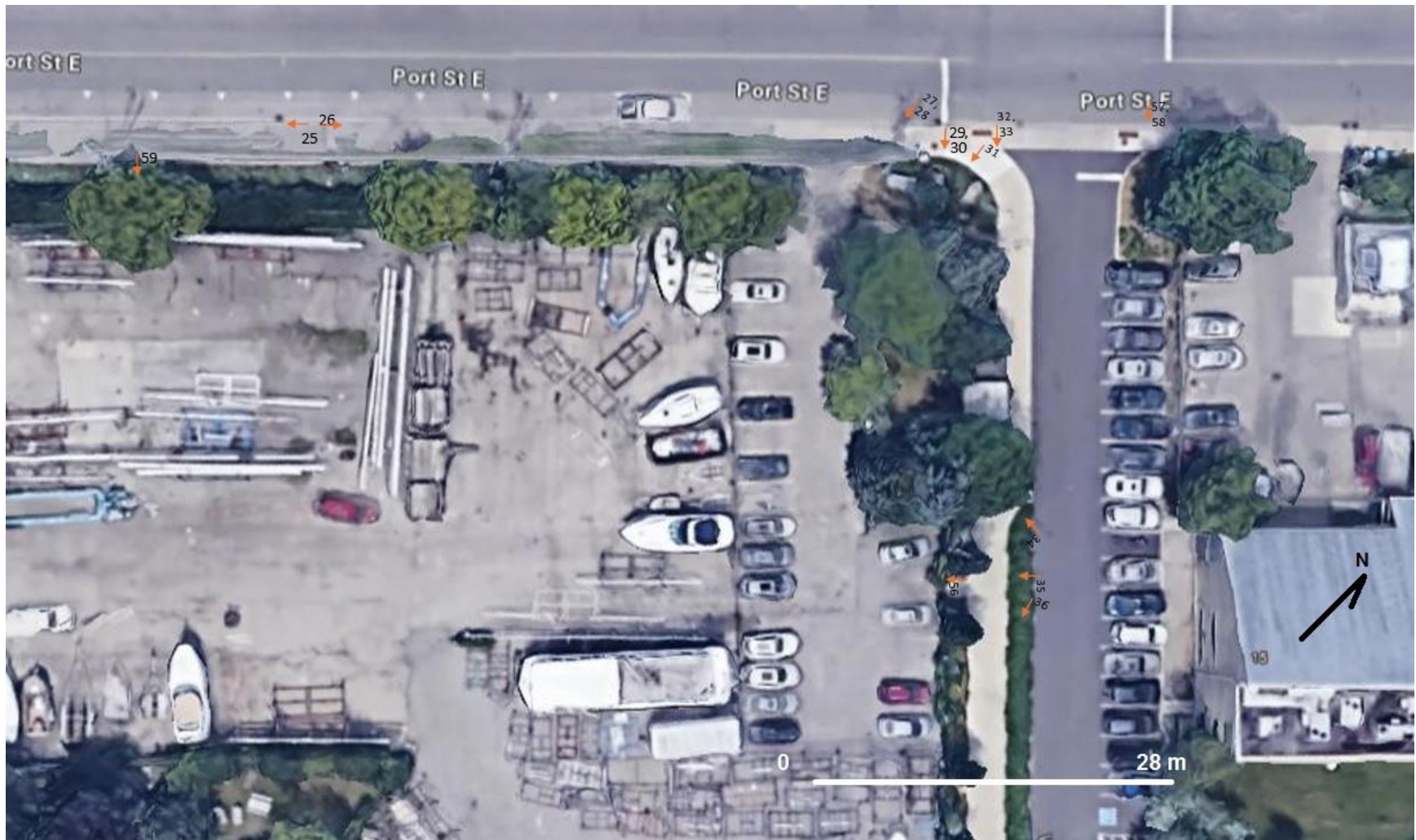
Map 15: 2024 Aerial View of Study Area



Map 16: Location and Direction of Images 1-24



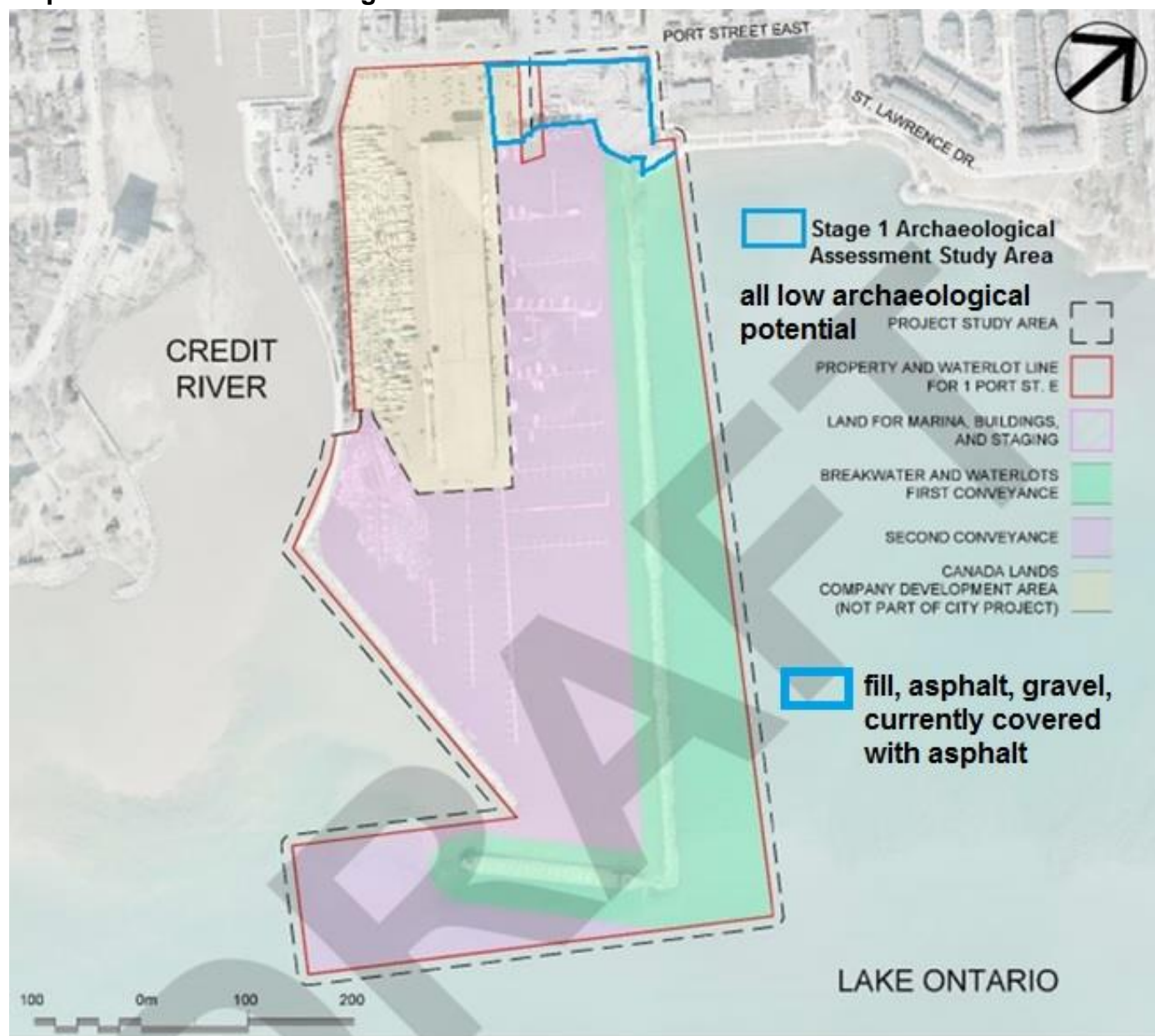
Map 17: Location and Direction of Images 25 -36 and 56-59



Map 18: Location and Direction of Images 37-42, 44-55 (Image 43 is a duplicate)



Map 19: Areas of Archaeological Potential



11.0 IMAGES

Image 1: Study Area facing NE



Image 2: Existing Asphalt – Disturbed Area facing E



Image 3: Study Area facing SE



Image 4: Asphalt Surface facing SW



Image 5: Pavement facing north



Image 6: Existing Pavement facing NE

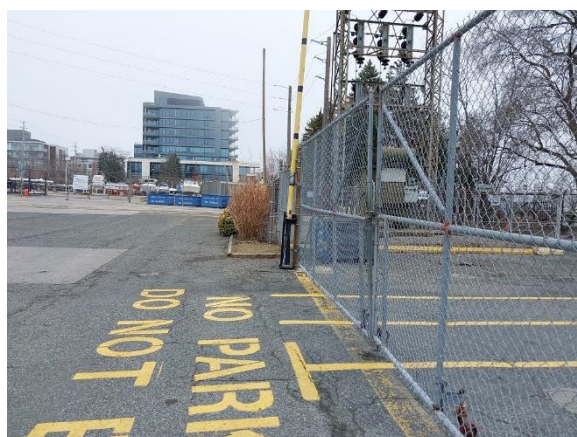


Image 7: Existing Pavement facing E



Image 10: Study Area facing E



Image 8: Existing pavement facing SE



Image 11: Study Area facing E



Image 9: Existing Pavement facing E



Image 12: Paved Area facing N



Image 13: Study Area facing SW



Image 16: Paved Area facing W



Image 14: Study Area facing E



Image 17: Paved Area facing W



Image 15: Study Area facing SE



Image 18: Paved Area facing SE

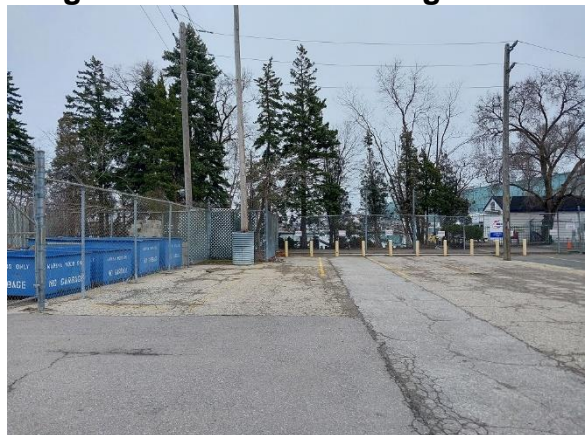


Image 19: Paved Area facing SW



Image 22: Disturbed Area (paved) facing S



Image 20: Paved Area facing W



Image 23: Disturbed Area (paved) facing E



Image 21: Pavement facing NE



Image 24: Disturbed Area (paved) facing SE



Image 25: Perimeter of Study Area facing NE



Image 28: Perimeter of Study Area facing S



Image 26: Perimeter of Study Area facing SE

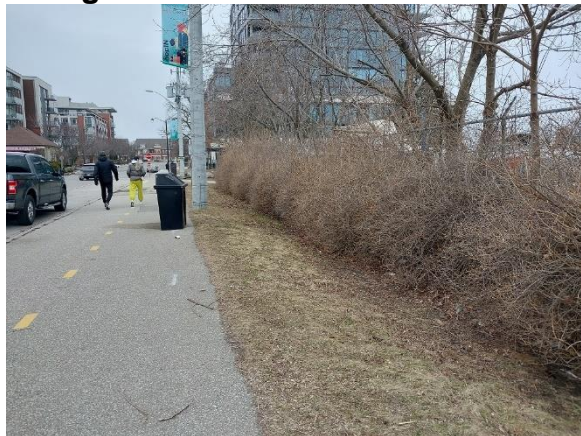


Image 29: Perimeter of Study Area, disturbed, facing SE



Image 27: Perimeter of Study Area facing S



Image 30: From corner of Study Area facing SE



Image 31: Corner of study area facing S



Image 34: Facing West along perimeter fencing



Image 32: Facing SE along Perimeter



Image 35: Facing NE into Study Area

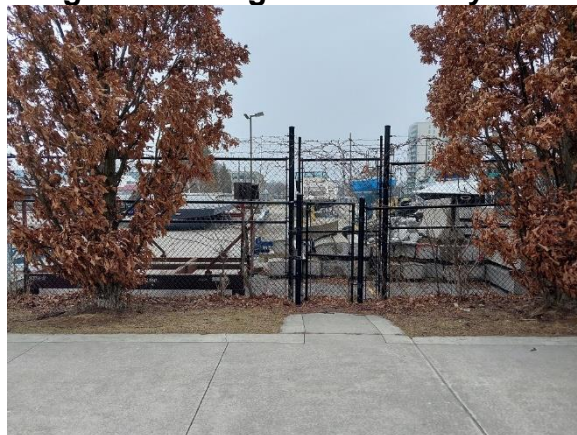


Image 33: Facing SE along perimeter



Image 36: Facing S along perimeter fencing



Image 37: Facing NW along Helene Street South (borders Study Area)



Image 38: Facing NW along Helene Street South (borders Study Area)



Image 39: Walkway outside Study Area facing W into Study Area

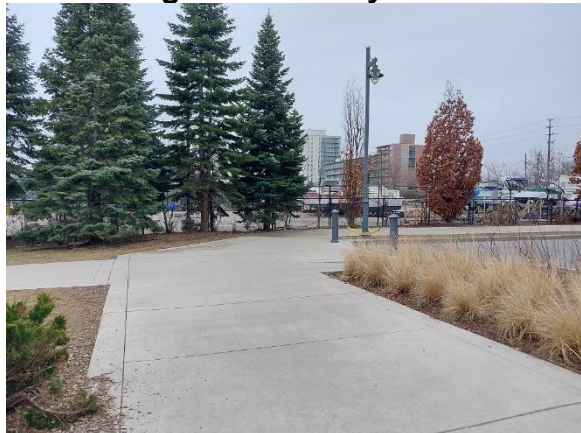


Image 40: Walkway outside Study Area facing SW into Study Area



Image 41: Marginal Beach with revetment blocks facing south



Image 42: Marginal Beach with revetment blocks facing south

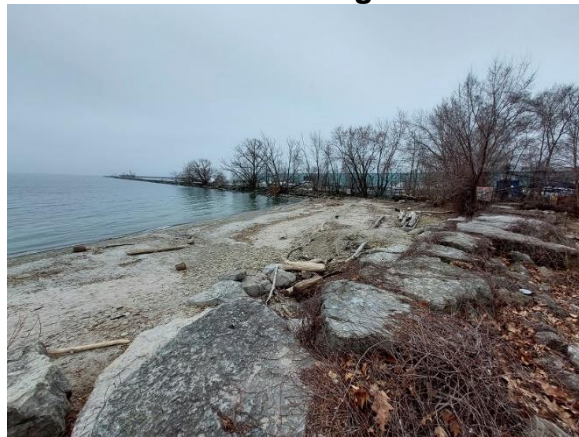


Image 43 is a duplicate and therefore not represented in the maps

Image 44: Outside of Study Area facing west into the Study Area



Image 45: Marginal Beach with revetment blocks facing south



Image 46: Facing SW, between beach and fencing - disturbed



Image 47: Facing SW, between beach and fencing - disturbed



Image 48: Facing W from the marginal beach



Image 49: Facing W from the marginal beach



Image 50: Facing NW into storage area - disturbed



Image 53: Marginal beach and storage area beyond fencing, facing SW



Image 51: Facing NW into storage area - paved

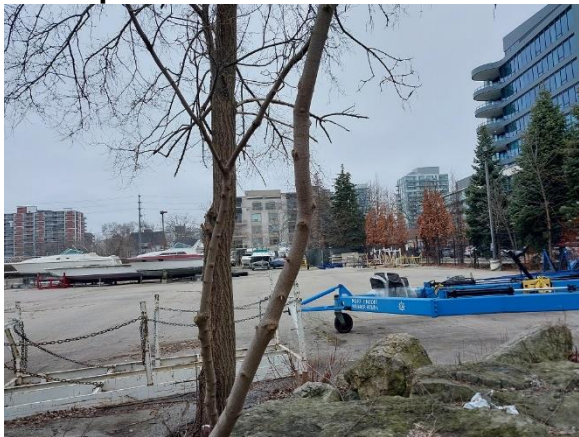


Image 54: Facing NW, edge of beach and revetment



Image 52: Storage area – disturbed, facing W



Image 55: Facing NW, edge of beach and fenced storage area



Image 56: Facing NE into Study Area



Image 59: Disturbed area facing SE



Image 57: From corner of Study Area facing SE (outside area proper)

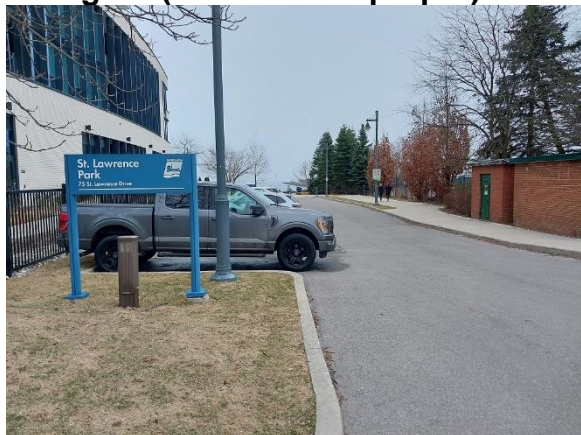


Image 58: Disturbed Area facing SE



12.0 APPENDICES

Appendix A: Image Log

Image #	Description	Direction
1	Study Area	NE
2	Existing Asphalt – Disturbed Area	E
3	Study Area	SE
4	Asphalt Surface	SE
5	Pavement	N
6	Existing Pavement	NE
7	Existing Pavement	E
8	Existing pavement	SE
9	Existing Pavement	E
10	Study Area	E
11	Study Area	E
12	Paved Area	N
13	Study Area	SW
14	Study Area	E
15	Study Area	SE
16	Paved Area	W
17	Paved Area	W
18	Paved Area	SE
19	Paved Area	SW
20	Paved Area	W
21	Pavement	NE
22	Disturbed Area (paved)	S
23	Disturbed Area (paved)	E
24	Disturbed Area (paved)	SE
25	Perimeter of Study Area	NE
26	Perimeter of Study Area	SE
27	Perimeter of Study Area	S
28	Perimeter of Study Area	S
29	Perimeter of Study Area, disturbed	SE
30	From corner of Study Area	SE
31	Corner of study area	S
32	Facing along Perimeter	SE
33	Facing along perimeter	SE
34	Facing along perimeter fencing	W
35	Facing into Study Area	NE
36	Facing along perimeter fencing	S
37	Facing long Helene Street South (borders Study Area)	NW
38	Facing along Helene Street South (borders Study Area)	NW
39	Walkway outside Study Area facing into Study Area	W
40	Walkway outside Study Area facing into Study Area	SW
41	Marginal Beach with revetment blocks	S
42	Marginal Beach with revetment blocks	S
43	Duplicate - scratch	
44	Marginal Beach with revetment blocks	S
45	Marginal Beach with revetment blocks	S
46	Facing between beach and fencing - disturbed	SW
47	Facing between beach and fencing - disturbed	SW
48	Facing from the marginal beach	W
49	Facing from the marginal beach	W

50	Facing into storage area - disturbed	NW
51	Facing into storage area - paved	NW
52	Storage area – disturbed	W
53	Marginal beach and storage area beyond fencing	SW
54	edge of beach and revetment	NW
55	edge of beach and fenced storage area	NW
56	Study Area	NE
57	From corner of Study Area (outside area proper)	SE
58	Disturbed Area f	SE
59	Disturbed area	SE

1 Port Street East Proposed Marina Environmental Assessment

Appendix D - Comments on Draft Environmental Assessment



1 Port Street East Proposed Marina Environmental Assessment

Appendix D1 - Agency Comments on Draft EA



City of Mississauga Responses to Government EA Review Team Comments – September 16, 2024

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
Ministry of the Environment, Conservation and Parks: Air Quality				
1	Section 7.3. of the Draft EA Report	Please clarify why the preferred alternative did not assess the full-service marina air emissions with respect to fueling operations for the boats.	A rationale should be provided as the fueling emissions were not assessed in the draft EA.	<p>The EA addresses the lakefill component of the project. As provided in Section 2.3 of the Draft EA, “The purpose of the 1PSEPM Project is to provide an expanded land base for additional waterfront parkland and marina alternatives at the 1 Port Street East site” and “The 1PSEPM Project will delineate the boundaries of the land base expansion along the eastern breakwater to permit the relocation of the marina.” Therefore, the EA does not include the marina service building nor marina operations.</p> <p>For more context, the Project involves simply moving existing operations from one side of the marina basin to the other. The fueling operation at the existing location at 1 Port Street East may or may not continue in the future, as there are City-operated fueling opportunities for boaters elsewhere. For the purposes of this EA, the existing air quality is not expected to measurably change as the emission sources are not expected to change.</p>
2	Section 7.3.1 of the Draft EA Report	There is the potential during construction of disturbing contaminated soils. Further clarification is required with respect to what type of	Additional clarification is required in Section 7.3.1 of the Draft EA Report.	Section 3.1.10 of the Draft EA summarizes the results of a Golder (2016) study of soil samples from boreholes in the Project Study Area. Section 6.5 details the construction activities, which involve the placement of clean fill in the

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		contamination exists in the study area. Depending on the type of contamination, ambient air monitoring may be required to monitor the off-site impacts at nearby sensitive receptors.		lake to create land. No excavation of contaminated soils is planned. As such, there are no changes to ambient air quality anticipated that might require monitoring at nearby sensitive receptors.
3	Table 8.1" Summary of Commitments Resulting from the 1PSEPM Project EA"	The draft EA highlights the mitigation measures that will be implemented during the construction phase of the project to minimize off-site particulate impacts. In addition to the mitigation measures listed, the ministry recommends that a best management fugitive dust plan should be developed and implemented during the construction phase of this undertaking.	The ministry recommends including a commitment in Table 8.1 "Summary of Commitments Resulting from the 1PSEPM Project EA".	Agreed. A commitment to the development of a fugitive dust management plan will be included in Table 8.1 "Summary of Commitments Resulting from the 1 PSEPM Project EA".
4	General	For a comprehensive list of fugitive dust prevention and control measures, please refer to Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities. Report	Recommendation	The EA will refer to the "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities. Report prepared for Environment and Climate Change Canada" (March 2005) document.

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		prepared for Environment and Climate Change Canada, March 2005.		
Ministry of the Environment, Conservation and Parks: Adaptation and Resilience Branch, and Climate Change Policy Branch				
1	General	<p>Overall comment: while the report refers to the City of Mississauga's Climate Change Action Plan, and its commitment to build resilient designs for the marina and park, there is limited analysis of either the potential for impact of the project on climate change, or the potential impact of climate change on the project. The report should also reference MECP's <u>guide on considering climate change in the environmental assessment process, 2017 and how it took it into account</u>. This is a companion document to the ministry's codes of practice which provide guidance on key aspects of the environmental assessment process.</p>	<p>Suggest the report include a more comprehensive assessment of the project's potential impacts on climate change.</p>	<p>MECP's Guide on Considering Climate Change in the EA Process was considered and will be cited in the final EA report as requested. The coastal engineering and the associated modelling recognized climate change scenarios and applicable changes for Lake Ontario to design the lakefill such that it will be resilient to climate change impacts. Similar information has been applied for other waterfront projects in the City, including the Jim Tovey Lakeview Conservation Area.</p> <p>Given that a marina is already in operation immediately adjacent to the planned lakefill area and that the 1PSEPM Project involves simply moving existing operations from one side of the marina basin to the other, there are no changes being proposed that would adversely or measurably contribute to climate change.</p> <p>The City notes that the design of the Project has considered impacts of climate change and concluded that the basin will be more resilient to coastal processes in the future than it is</p>

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				<p>today, as a result of its new design, likely mitigating the impact of extreme weather.</p> <p>There are further opportunities for enhanced resilience of the lakefill through the detailed design of the lakefill and the park.</p>
2	General	<p>The report does acknowledge the potential for flooding and extreme weather events to have impact on lake levels, wave action, and shoreline resilience. The basis of that assessment is stated as professional judgement with coastal processes modelling.</p> <p>The assessment notes that spills management plans will be developed for the project but doesn't acknowledge the possibility of extreme weather events possibly contributing to the cause of spills and their subsequent clean-up.</p>	Suggest the report provide more analysis of the project's potential impacts on climate change, throughout all of its phases.	<p>The Draft EA notes that the City shall ensure that contractor(s) develop a construction phase "Spills Management Plan" to maintain spills response capability, contain and clean-up all spills immediately upon detection.</p> <p>With respect to spills management during the establishment phase of the 1PSEPM Project, the City notes that the EA addresses the lakefill component of the project and not marina operations. To this end, the City notes that the design of the Project has considered impacts of climate change and concluded that the basin and the new lakefill will be more resilient to coastal processes in the future than the basin and the existing breakwater are today, as a result of its new design, likely mitigating the impact of extreme weather.</p>
5	3.2 Atmospheric Environment, 3.2.1 climate	Looks at current and past climate data and conditions.	Suggest this section also consider possible future variation in climate. Refer to the Provincial Climate Change Impact Assessment; the Ontario Climate Data	The Draft EA has considered possible future variation in climate. The conceptual design considered past and current wind and water level data, and recently updated water level data. The conceptual design reflects climate change considerations, taking into account

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			Portal; and Environment and Climate Change Canada's Climate Atlas for more information.	potential future increases in winds speeds, severe weather, changes in water levels, and potentially longer ice-free periods.
6	Table 9.1, summary of public comments and responses, Page 148	<p>In the table documenting questions asked by the public, there's a question "Will this project be net zero carbon?"</p> <p>The answer is the following: "We are pleased to say that at the same time as the City approved the Climate Change Action Plan, Council also approved the Corporate Green Building Standard (December 2019) and the proposed marina building, should it be built, would be subject to these standards.</p> <p>We would like to request some follow-up details, while also recognizing that the proponent is not required to demonstrate that the marina building will be net-zero and that the EA process limits the scope of what we can demand in terms of buildings.</p>		<p>The City shares the Ministry's and the public concern regarding climate change. Please note that the EA considers the creation of lakefill along the existing eastern breakwater, which will facilitate the existing marina moving from the western side of the basin to the eastern side. The marina service building and marina operations are not the subject of the EA.</p> <p>Question to the City: Mississauga's Corporate Green Building Standard Program has 3 stringency levels for energy and emissions performance for new municipally-owned buildings. What level is proposed for the marina building?</p> <p>City Response: The marina service building and marina operations are not the subject of the EA. The following information has been provided to the public in response to questions asked during consultation events, even though the marina service building and marina operations are not the subject of the EA.</p> <p>Should the EA be approved and if Council decides to proceed with the 1PSEPM project,</p>

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		<p>The response provided does not properly address whether “this project will be net-zero”. On the other hand, the question isn’t perfectly phrased – asking about “the project” implies the construction of the facilities, whereas asking whether the marina would be operationally net-zero would get at things like GHG emissions during operations and parking. Mississauga’s Climate Change Action Plan and Corporate Green Building Standard includes a supporting action, 5-1, which is “Build all new municipally-owned buildings to be more energy efficient and near net-zero”. Their building standards includes a range of requirements and three different levels of performance. The standards cover the operations of the buildings themselves (not the broader facilities) and also include things like bicycle</p>		<p>the marina building would be subject to Green Building Standards in place at the time of design and construction. Here is a link to Mississauga’s Green Development Standards website. Level 1 standard is currently mandatory. Level 2 will be mandatory by January 2025. Level 3 will be mandatory by 2030.</p> <p>Question to the City: Have you produced an estimate for the net GHGs that will be generated during the proposed construction and subsequent operation of the marina? To what extent have the project/alternatives already taken into account impacts on climate change in project planning and are there alternative methods to implement the project that would reduce potential emissions?</p> <p>City Response: The City has not prepared an estimate for the net GHGs that will be generated during the proposed construction and subsequent operation of the marina.</p> <p>The EA addresses the lakefill component. The EA does not include the marina service building nor marina operations. The 1PSEPM Project simply provides the opportunity for moving existing operations from one side of the marina basin to the other.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>parking and EV charging requirements.</p> <p>Questions for the proponent:</p> <ul style="list-style-type: none"> •Have you produced an estimate for the net GHGs that will be generated during the proposed construction and subsequent operation of the marina? To what extent have the project/alternatives already taken into account impacts on climate change in project planning and are there alternative methods to implement the project that would reduce potential emissions? •If a net GHG emissions assessment has not been completed for the project, please provide details of why that is the case. •Mississauga's Corporate Green Building Standard Program has 3 stringency levels for energy and emissions performance for new municipally-owned buildings. What level is proposed for the marina building? 		<p>Question to the City: To what extent have the project/alternatives already taken into account impacts on climate change in project planning and are there alternative methods to implement the project that would reduce potential emissions?</p> <p>City Response: The EA considered climate change throughout the assessment, particularly in the development of the conceptual design for the lakefill. The key considerations related to climate change included changes in wind speeds, water levels, severe weather, and ice-free periods. The “Alternatives To” and the “Alternative Methods” evaluations included the criterion “Resiliency to changing lake levels and coastal processes” to explicitly consider the effects of climate change on the 1PSEPM Project.</p> <p>Question to the City: If a net GHG emissions assessment has not been completed for the project, please provide details of why that is the case.</p> <p>City Response: A net GHG emissions assessment has not been undertaken for the following reasons:</p> <ul style="list-style-type: none"> • The current level of design of the Project is not sufficient for the completion of a

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				<p>GHG emissions assessment. Nevertheless, the construction of the lakefill will involve only a few pieces of heavy equipment on land and vessels in the lake. GHG emissions during construction are considered negligible. As such, a GHG emissions assessment is not warranted.</p> <ul style="list-style-type: none"> • The project facilitates a move of existing marina facilities from west side of basin to east side of basin with little change to activities. The emissions from any City building, structure or activity on the site are anticipated to be minor and likely lower than those of existing operations at the current marina.
Ministry of the Environment, Conservation and Parks: Conservation and Source Protection Branch				
1	General	<p>The study site is located at 1 Port Street East in the City of Mississauga, Regional Municipality of Peel. As shown in Figure 1 in Appendix A, the study area falls within an Intake Protection Zone (IPZ)-2 with vulnerability score 4.5, a Highly Vulnerable Aquifer (HVA) scoring 6, and an Event Based Area (EBA) for pipeline fuel/oil spills.</p> <p>The site is partially located in an EBA for pipeline fuel/oil</p>	<p>The proponent should consult with the local source protection authority if they have not already done so.</p>	<p>CVC has been and will continue to be consulted throughout project planning. Comments received from CVC have been addressed in the conceptual design of the lakefill and in Section 7 of the EA.</p> <p>The City agrees with the reviewer that the preferred alternative is not located in groundwater protection zones with high vulnerability scores and that any activities associated with the 1PSEPM Project would not be a significant drinking water threat. The Draft EA will be amended to state new threats to drinking water quality are not expected as a result of this project.</p>

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		<p>spills (see Appendix A). While the storage of fuel has not been identified in the EA for the 1PSEPM Project, if this activity were to occur at the site (e.g., marina fueling station) it could be a significant drinking water threat. If applicable, please consult with the Credit Valley Source Protection Authority to determine whether fuel storage would be a significant drinking water threat in the EBA. Finally, if fuel may be stored at the marina, please identify this in the EA.</p> <p>The proponent correctly identifies that the site is in an IPZ and an HVA and indicates that it may also be located in an EBA for pipeline fuel/oil spill. However, there is no discussion regarding the vulnerability scoring of the protection zones and whether any of the proposed activities associated with the project are significant, moderate, or low threats</p>		<p>The City notes that the EA addresses the lakefill component. The existing fueling operation at 1 Port Street East may or may not continue in the future as there are City-operated fueling opportunities for boaters elsewhere. For the purposes of this EA, new threats to drinking water quality are not expected.</p>

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		under the CWA. Please revise the report to clarify these points.		
Ministry of the Environment, Conservation and Parks: Noise				
1	Section 3.2.3	Section 3.2.3 of the report refers to a study by Valcoustics Canada Ltd., dated 2017.	This study was not provided for review and no noise review comments can be made regarding the study's contents, conclusions or any elements from it which may or may not have been used in the subject report.	The Valcoustics study referenced was not completed in support of the 1PSEPM Project and was simply used to describe the baseline noise conditions.
2	Section 3.2.3	Section 3.2.3 of the report identifies the nearest receptors as those residences located immediately north of the proposed project site along Port Street and Helene Street.	The report should identify and assess all the nearest (i.e., closest and most exposed) points of reception as defined in Ministry Publication NPC- 300 (in all cardinal directions except Lake Ontario's direction). In addition, the existing marina should also be assessed as a receptor if it will provide seasonal residences and living areas during the construction of the new marina.	The 1PSEPM Project will comply with the City's Noise Control By-law during construction. Marina operations are not the subject of this EA, and therefore do not require assessment.

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3	Table 5.1, p. 82	Table 5.1, p. 82 of the report mentions a qualitative approach to assessment of construction noise.	<p>The local construction municipal noise by-laws should be included in the report and adhered to in the field. The noise emissions of the equipment to be used for construction should be in compliance with the limits set out in the following documents:</p> <ul style="list-style-type: none"> a) Publication NPC-115, "Construction Equipment"; b) Publication NPC-118, "Motorized Conveyances" 	<p>More details on the City's Noise Control By-law will be provided in the amended EA document. Please note that in most residential areas, construction noise is allowed between 7 a.m. and 7 p.m. every day except Sundays or statutory holidays.</p>
4	Table 5.1, p. 82	Table 5.1, p. 82 of the report mentions a qualitative approach to assessment of marina operations.	<p>Clarify what the proposed marina operations will consist of and whether commercial and/or industrial type noise sources will be in operations at the proposed site. If so, a quantitative noise assessment should be performed at the nearest points of reception as per comment 2, above</p>	<p>As noted in Section 6 of the Draft EA, marina services and facilities will be located on existing land at 1 Port Street East. This portion of site is approximately 2 acres and currently a parking lot. The City will determine during detailed design the nature and size of the structure to occupy this space. Once these plans are finalized, the City will pursue the necessary approvals for the construction of the building.</p> <p>Any businesses choosing to lease space in the marina building will be responsible for securing any required approvals and permits, which are separate from this EA.</p>

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5	Section 6.4	Section 6.4 of the report mentions a future consideration for disruption of areas located near the site access route by heavy vehicular traffic.	It is noted that additional details and a quantitative noise assessment on the impact of heavy vehicular traffic along the site access route should be provided.	<p>Contractors hauling fill materials to the Project site will need to comply with Ontario's Highway Traffic Act. The truck movements associated with this project are small in comparison with existing traffic volumes.</p> <p>In 2020, the City amended its Noise Control By-law. The amended by-law prohibits anyone from making unnecessary noise in both stationary and moving motor vehicles, including creating unreasonable noise from mufflers, exhaust, or emission control systems. These controls are adequate to control noise from construction traffic.</p>
6	Section 6.5; Table 9.1, p. 151	Section 6.5 of the report mentions six (6) trucks per hour for an 8-hour day. Table 9.1, p. 151 of the report mentions twelve (12) trucks per hour or 100 truck movements per day.	The "predictable worst-case" scenario should be determined and used as part of the quantitative noise assessment discussed in comment 5.	<p>The response in Table 9.1 refers to the number of trucks (deliveries) per day and the number of truck movements per day. The 48 trucks per day as mentioned above appears to have been rounded to 50. The EA document will be modified to ensure consistency on these values.</p> <p>Each truck will perform 2 movements per delivery, 1 coming onto the site and then 1 exiting the site. Therefore, with regards to truck movements there will be 6 trucks per hour with 2 movements per truck equaling 12 truck movements per hour. 12 truck movements per hour at 8 hours each day gives a total of 96 truck movements per day. The</p>

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				<p>estimated 96 truck movements per day as mentioned above appears to have been rounded to 100. The EA document will be modified to ensure consistency on these values.</p> <p>The “predictable worst-case” scenario is 96 truck movements per day.</p>
7	Section 7.3	Section 7.3 of the report mentions noise shielding by way of construction site hoarding.		The EA has been edited to remove references to noise shielding by way of construction city hoarding. The 1PSEPM Project will comply with the City’s Noise Control By-law during its construction as have recently completed and ongoing development projects in the Port Credit area. Marina operations, which are not the subject of this EA, will also be subject to compliance with the By-law. Construction site hoarding is a standard construction mitigation measure aimed to ensure public safety, but can also provide minor noise shielding for any construction activities near the hoarding.
8	Section 7.3	Section 7.3 of the report mentions that activities that could create excessive noise will be restricted to daylight hours and adhere to municipal noise control by-laws.	Provide clarifications as to what these activities would be and assess them accordingly as per comments 3 through 5, as applicable.	Because the construction of the 1PSEPM Project will be subject to the City’s Noise Control By-law , excessive noise is not anticipated. The construction of the lakefill will involve only a few pieces of heavy equipment on land and vessels on the lake. Reference to ‘excessive noise’ has been removed from the EA.

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9	Section 7.3	Section 7.3 of the report mentions that no construction will be permitted on weekends and statutory holidays unless exemption from the noise by-law is granted by the City, who is also the proponent for the project.	Any construction activities associated with the project should adhere to the by-law. Provide details on the contents of the City noise by-law in regards to construction activities and construction noise.	All City led projects comply with the City's Noise Control By-law . The reference to the exemptions from the Noise Control By-law will be removed from the EA.
10	Section 8.1.1	Section 8.1.1 of the report mentions the implementation of best management practices during construction in regard (partially) to noise management	Details of this plan should be provided.	A noise management plan will be developed by the construction contractor following detailed design and procurement. For EA purposes, more details regarding the anticipated contents of a management plan will be added. The level of detail will be like that outlined for the Spills Management Plan in Section 7.1 of the Draft EA.
Ministry of the Environment, Conservation and Parks: Species at Risk Branch				
1	General	The Ministry of the Environment, Conservation and Parks (MECP) is responsible for the administration of the Endangered Species Act, 2007 (ESA). Species listed as threatened and endangered on the Species at Risk in Ontario List (Ontario Regulation 230/08)		The City will seek ESA authorization or exemption if required. However, as noted in Section 3.1 describes the existing biological environment. Since the preparation of the Draft EA, additional research and consultation with CVC was undertaken. This research identified the following aquatic SAR with some potential to be present in the Local Study Area:

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		<p>receive species protection (under section 9) and habitat protection (under section 10).</p> <p>The Ministry has records of several provincially protected species at risk (SAR) in the area of the proposed project including American Eel, Lake Sturgeon, Bank Swallow and Little Brown Myotis.</p> <p>These species receive general habitat protection.</p>		<p>American Eel, Lake Sturgeon (Great Lakes - Upper St. Lawrence River population), Shortnose Cisco, and Deepwater Sculpin. Further, a field level SAR screening was undertaken to make a determination of these SAR habitat use within the Project Study Area based on based on species range, habitat affinities and field work completed for the Project and professional judgement. This screening concluded that there is a “moderate” potential for suitable habitat to present in the Project Study Area for American Eel. There was low potential for suitable habitat for the remaining SAR identified. This screening will be presented in the Final EA. Additional information regarding the American Eel and its habitat in the study areas will also be presented in both the existing conditions and the effects assessment portions of the Final EA.</p> <p>With respect to terrestrial SAR, the Final EA will acknowledge that there are records of Bank Swallow and Little Brown Myotis in the study areas, but that suitable habitat in the Project Study Area does not exist.</p>
2	Page 126, Section 7.4.1.	The Ministry has records of Little Brown Myotis (endangered) in the area.	If any of the trees proposed for could provide suitable roosting habitat for SAR bats, then potential impacts	There is limited vegetation associated with the site and the trees slated for removal are either on the breakwater, which is submerged at times, or are street trees. Should these

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			<p>to SAR bats should be considered. In order to avoid direct impacts to individual SAR bats, the Ministry highly recommends removing the trees outside of the bat active season. The active season for Little Brown Myotis is considered to be April 1 to September 30. Should there be potential for Eastern Small-footed Myotis to be present, please note that the active season for this species is considered to be March 15 to November 30.</p>	<p>species be found on site, any tree removals will occur outside of the active bat season.</p>
3	Page 129, Section 7.4.1.	<p>The Ministry has records of provincially protected aquatic SAR in the area, including American Eel (endangered). General habitat for this species likely overlaps with the project area. Please see the recovery strategy for more guidance on the habitat of this species.</p>	<p>Potential impacts to American Eel and its habitat should be considered in the EA. The Ministry recommends that an Information Gathering Form (IGF) be submitted in relation to American Eel. The IGF will help the Ministry better understand whether the project will impact American Eel and/or its habitat. Failure to submit a complete and accurate IGF</p>	<p>Potential impacts to American Eel are not anticipated. However, the discussion in the EA will be expanded upon in response to MECP and Mississaugas of the Credit First Nation comments. The City will use the Information Gathering Form (IGF) as a guide. The City will seek ESA authorization or exemption if required following detailed design.</p>

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			with supporting rationale and not allowing adequate time for review and the issuance of any required authorizations could result in delays to the activity's anticipated start date.	
Ministry of the Environment, Conservation and Parks: Environmental Assessment Branch				
Cover letter	General	<p>Overall the consultation record is incomplete. Records are missing for all Indigenous communities identified: Mississaugas of the Credit First Nation, Six Nations of the Grand River (both elected council and HCCC) and Huron-Wendat.</p> <p>In a letter dated March 3, 2023 to the Mayor of Mississauga, MCFN noted that they did not consider the efforts to date by the proponent as meaningful engagement, rather as notification and additional meaningful and fulsome engagement is required. More consultation is likely</p>		<p>The City will be augmenting the Record of Consultation regarding all Indigenous communities to satisfy the Ministry's requirements.</p> <p>While the letter dated March 3, 2023 to the Mayor of Mississauga from MCFN noted that they did not consider the efforts to date by the proponent as meaningful engagement, substantial progress has been made in this regard that will be reflected in the Record of Consultation. The City has facilitated the MCFN review of the Draft EA and is collaborating with the MCFN to address issues of mutual concern. The City is also adding a new section in the EA about commitments and consultation with MCFN.</p>

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		required as rights may be impacted by the project.		
1	Section 9.4	Engagement with Indigenous Communities contains a high level overview but does not include where additional information is i.e. actual Record of Consultation with supporting documents	Reference as to where the records are located within the Draft EA.	The City will be augmenting the Record of Consultation regarding all Indigenous communities to satisfy the Ministry's requirements.
2	Appendix 3 Record of Consultation	Indigenous communities lumped together with other "stakeholders". Indigenous communities do not view themselves as stakeholders. The two should be separated.	Separate public and Indigenous consultation	The City will be modifying the Record of Consultation regarding all Indigenous communities to satisfy the Ministry's requirements.
3a	Appendix 3 Record of Consultation	Couple of letters are included in the record from the proponent to Six Nations of the Grand River and HCCC, Huron-Wendat and Mississaugas of the Credit dated Feb 1, 2022 and Aug 11, 2022	Couple of letters from proponent to communities are included but lacks the full record (emails, calls, etc.) Couple of letters are included in the record from the proponent to Six Nations of the Grand River and HCCC, Huron-Wendat and Mississaugas of the Credit dated Feb 1, 2022 and Aug 11, 2022	The City will be augmenting the Record of Consultation Engagement regarding all Indigenous communities to satisfy the Ministry's requirements.

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3b	IBID	While supplementary records were supplied on October 16, 2023 to MECP Project Lead in the format of a Disposition Table with MCFN, this does not adequately address the need for the actual records (emails, calls, meeting notes, etc.) for consultation.	All records must be included.	The City will be augmenting the Record of Consultation regarding all Indigenous communities to satisfy the Ministry's requirements.
3c	IBID	Supplementary information was again supplied on October 16, 2023 to MECP Project Lead for the Record of Consultation with MCFN in table format.	All records must be included - emails, phone calls, meeting notes for all communities that were identified. Six Nations of the Grand River (both the elected council and HCCC), Mississaugas of the Credit and Huron-Wendat Nation.	The City will be augmenting the Record of Consultation regarding all Indigenous communities to satisfy the Ministry's requirements.
3d	IBID	Within this information was a letter (March 3, 2023) to the Mayor of Mississauga in which MCFN indicates that while there has been some initial notification, it has been generic. Does not reflect meaningful commitment.	City should commit to working collaboratively with MCFN. MCFN believes that meaningful consultation has not taken place and that rights may be impacted by the proposed project. Further ongoing and meaningful consultation is required. The proponent should also be providing the	While the letter dated March 3, 2023 to the Mayor of Mississauga, MCFN noted that they did not consider the efforts to date by the proponent as meaningful engagement, substantial progress has been made in this regard that will be reflected in the Record of Consultation. The City has facilitated the MCFN review of the Draft EA and is collaborating with the MCFN to address issues of mutual concern. The City is also adding a new section in the EA about commitments and consultation with MCFN.

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			full records of consultation for all communities.	
Ministry of the Environment, Conservation and Parks: Surface Water				
1	Section 6.2.5, Page 109, Stormwater Management and 7.2.2. Effects of Establishment , Page 123	<p>Comment: Stormwater: Level of Protection criteria has not been proposed. Proponent is expected to commit to stormwater treatment level at EA stage.</p> <p>Note: It is widely accepted that Lake Ontario is classified as requiring an Enhanced Level 1 of protection – 80% TSS removal.</p>	Describe in detail what action you recommend to address your comments. Actions may include but are not limited to revisions to the document, information requests, proposed commitments or conditions, future permits and approvals etc.	The Enhanced Level 1 of protection with 80% Total Suspended Solids (TSS) removal can be achieved with and the City will commit to this level of treatment on the site.
2	Section 6.2.5, Page 109, Stormwater Management and Effects of Establishment, Page 123 7.2.2.	Based on Comment #1 (above) and given the close proximity to the receiver (Lake Ontario), the use of bioswales as a SWM measure to treat runoff from new impervious areas may not achieve the desired Enhanced Level 1 protection criterion.	Add text revisions throughout the Draft EA that commit to a treatment train approach in the development of SWM Plans for this undertaking. This is an opportunity to highlight innovative design and the use of environmental best management practices.	Enhanced Level 1 of protection with 80% TSS removal can be achieved. The use of HydroDome or similar products may form part of the solution. Details will be developed further during detailed design. The City will commit to this level of treatment on the site.

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		<p>As stated in the Draft EA document "...the conceptual design includes approximately 10,000 m2 of the Project site being allocated to parking. Parking areas are well known to be sources of many types of pollutants such as oil, gas, sediment, heavy metals, nutrients, and trash."</p> <p>Comment: The Ministry strongly recommends a treatment train approach that incorporates additional SWM mechanism(s) as to achieve the established level of protection for this undertaking. This may include, but not limited to, the use of OGS, permeable pavement and enhanced grasses swales. This is an opportunity to highlight innovative design and the use of environmental best management practices.</p> <p>Note: Appropriate SWM planning must also consider</p>	<p>For example: Page 124: Mitigation Measures: (proposed wording): The use of additional Low Impact Development (LID) practices such as permeable paving, oil/grit separators, bioretention and infiltration areas, sand filters, grassed swales, vegetated filter strips will be evaluated and, if needed, be implemented during detailed design as to achieve Enhanced Level 1 protection."</p>	

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		the new impervious area such as boat storage area, marina facilities etc.		
3	7.2.2. Effects of Establishment , Page 123	Comment: It is understood that the Proponent has evaluated the effects related to wave action (i.e., overtopping/spray), changing lake levels and severe weather conditions in the design and functionality of the new structure however, wave spray/overtopping, changing lake levels and/or severe weather-related precipitation may also compromise the SWM infrastructure for the property. Please consider the aforementioned with respect to the maintenance and integrity of the SWM mechanism(s) for the undertaking.	Please commit to assessing the potential impact of wave spray/overtopping, changing lake levels and/or weather-related precipitation on any future SWM infrastructure during detailed design.	The impact of wave action and variations and long-term climate change related changes in water levels have been considered in the conceptual design of the protection and land base. The same considerations have been made in the conceptual development of the SWM components to ensure they can function under the range of expected site conditions.
4	Page 147, Table 9.1 - Summary of Public	Editorial correction comment: Page 147, Table 9.1 - Summary of Public Comments and Responses, Environmental Components ~	Correct typo on Page 147, Table 9.1 – Summary of Public Comments and Responses, Environmental Components	Typo will be corrected.

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
	Comments and Responses	Under Comment Consideration/Question Response – I believe the text should read: “...detailed in Section 6.2.5...” not “...Section 6.5.2...”.		
5	7.2.1. Effects of Construction, Effects Assessment Page 118	Editorial correction comment: “The Project site is largely aved...”	Correct typo to read “paved”.	Typo will be corrected.
6	7.2.1. Effects of Construction, Mitigation Measures, Page 118	Under Mitigation Measures Section: “Stockpiling of materials and staging equipment shall be undertaken in designated locations as far away from the lake as possible.” Comment: Industry standards and governing agencies typically require that construction-related stockpiling/staging of equipment be located a minimum of 30 m away or more from any waterbody.	Please update the text to read that “construction-related stockpiling/staging of equipment be located a minimum of 30 m or more from any waterbody.” (Note: on Page 122, the 30 m is included in the text already).	The EA text will be updated. The industry standard for construction of waterfront/lakefill project is to refuel a minimum of 30 m from the lake and this will be strictly adhered to. No stockpiling of materials other than being used for shore protection works, such as rip rap and armour stone, is expected. Such stockpiling is typically minimal. However, some stockpiling of armour stone near the exposed end of lakefill is required for emergency storm protection. Storage of equipment will be on existing shore or well behind completed protection works.
7	7.2.1. Effects of C Turbidity, Page 119	Turbidity resultant from the construction of the undertaking will occur and	Update text ensuring that terms are consistent throughout the EA.	The proposed conceptual plan does not anticipate the modifications of the west side of the existing breakwater other than in the

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
	<p>and</p> <p>8.1.1. EA Compliance Monitoring, Page 141</p>	<p>temporarily impair water quality and aquatic habitat.</p> <p>As noted by the Proponent, the “placement of armour stone on the lake bottom to create the shore protection structure will result in the disturbance and resuspension of existing sediments from the lake bottom into the water column resulting in increased turbidity and potentially reduced surface water quality.” In addition, construction may also resuspend chemicals from contaminated sediment in the marina basin (west of the breakwater).</p> <p>The Ministry acknowledges that the Proponent has committed to following a Turbidity Management Protocol as listed in Section 8.1.1, Page 141 however, under the Mitigation Measure in 7.2.1. Effects of construction, Page 120, the</p>		<p>upper part of the slope to achieve the proposed higher elevation of the breakwater. Should the final design require disturbance of bottom sediment within the existing marina basin, appropriate sediment controls, such as the use of turbidity curtains, will be employed in the sheltered basin.</p> <p>The reference to “operational protocol” will be updated to “Turbidity Management Protocol”.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>term “an operational protocol” is used. It is inferred that “operational protocol” and “Turbidity Management Protocol” are the same.</p> <p>Please define and/or clarify.</p>		
8	7.2.1. Effects of Construction, Turbidity, Page 120	<p>The details provided related to Turbidity Management Plan (“operational protocol” as referred to on Page 120) at this review stage are considered acceptable.</p> <p>However, it is noted that the Proponent did not propose the use of sedimentation control measures (i.e., turbidity curtains, sheet piling) to mitigate the movement of turbid waters into surrounding areas during active construction (this site is not considered “standing water”).</p> <p>Comment: Please consider the use of sedimentation control measures to manage</p>	<p>Please revise text to ensure the Proponent considers various sedimentation control measures such as turbidity curtains to control turbid waters during active construction and real-time turbidity monitoring as well as thresholds that will require revised methodologies.</p> <p>Note: it is understood that the level of detail provided at this stage of review is acceptable.</p>	<p>The use of sedimentation control measures, such as turbidity curtains or sheet piling, is not practical and is not the standard practice on lakefill projects on the open coasts of the Great Lakes. The use of sediment control measures was considered, but not incorporated based on past experience. Such measures would be damaged during storm periods when no filling or in water construction activity would be occurring.</p> <p>Satisfactory results are achieved through construction management and operational controls, such as limiting construction to calm or near calm days.</p> <p>The City acknowledges the importance of a Turbidity Management Plan and commit to the development and implementation of such a plan for this project during detailed design.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>turbid water movement during this undertaking.</p> <p>General comment: It is understood that the nature of this construction will cause a temporary increase of turbidity and therefore impact surrounding water quality/aquatic habitat. The “Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario” (Gordon & Fletcher, 2011 (c)) states “a proponent of shore infilling ought to identify appropriate control measures prior to undertaking the project as well as remedial measures and contingency plans that will be taken if impacts do occur.”</p> <p>Given the importance to mitigate against construction-related impacts, the Ministry emphasizes the significance of developing a comprehensive Turbidity Management Plan for this undertaking.</p>		

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		<p>When developing the Turbidity Management Plan, please include, but not limited to the following: operational control modifications (i.e. reducing rate of construction etc.), turbidity trigger thresholds development/monitoring (i.e., use of real-time turbidity monitoring technology), tidal and weather- related influences and triggers, and the use of sedimentation control measures such as in-water turbidity curtains and/or other silt controlling equipment to mitigate the movement of turbid waters.</p>		
Ministry of the Environment, Conservation and Parks: Environmental Assessment Branch				
1	Table 1.1 page 5	Page numbers and sections referenced do not match the Terms of Reference (ToR) and draft EA report. For example, there are no Sections 7.1.2 or 7.3.2 in the draft EA. Socio-economic environment is in Section 7.5 of the draft.	Please revise as necessary to ensure all page references are aligned. Page and Section references do not align with the draft EA or in the ToR.	Agreed. All section references will be reviewed and corrected, where appropriate, based on the structure of the amended EA.

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
2	Section 3.5, Page 62	<p>A statement on page 62 states “the lands immediately adjacent to the study area are formerly on the Reserve of the Mississaugas of the Credit First Nation (MCFN).”</p> <p>Comment: This statement may cause confusion as MCFN present-day reserve is in Haldimand, adjacent to Six Nations of the Grand River. The adjacent lands and the project study area is within the ‘traditional territory’ of MCFN.</p>	Suggests replacing “reserve” to ‘traditional territory’ and should also specify that the project is also within the traditional territory of MCFN	The statement on Page 62 will be modified as suggested to avoid confusion.
3	Section 3.6, – cultural environment	<p>This section discussed a potential target identified as marine archaeological resources and states “the marine archaeological survey is considered clear of cultural/archaeological concerns”.</p> <p>Comments: Page 69 of the ToR committed to complete the screening checklist to determine whether a Stage 1 archaeological assessment</p>	<p>Provide documentation and additional information about the cultural environment and interpretation of the target. Confirm whether a checklist was completed to determine whether a Stage 1 archaeological assessment or cultural heritage report was required.</p> <p>Provide documentation from MCM that they have</p>	MCM issued a letter on February 7, 2024 indicating that based on the information in the “ <i>Marine Archaeological Assessment, One Port Street East, Proposed Marina and Breakwater Expansion, City of Mississauga</i> ”, dated October 14, 2019, filed on April 19, 2021, licence number 2019-09, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment is consistent with the terms and conditions for a marine archaeological licence. This report will be entered into the Ontario Public Register of Archaeological Reports.

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>and a Cultural Heritage report are warranted.</p> <p>Was a checklist completed and what was the result? Did MCM provide comments/confirmation that there are no cultural heritage concerns (marine, land)? -What is the target? -What about potential for cultural resources on land?</p>	<p>no concerns related to cultural heritage (land/marine) within the project study area.</p>	
4	Section 4, Table 4.1	<p>The 'Do Nothing' column on various criteria states "until the commencement of construction on the wharf..."</p> <p>Comment: This is confusing as construction is not being considered in the Do Nothing alternative.</p>	<p>Remove the sentence "until the commencement of construction on the wharf" and provide clear and concise advantages/disadvantage of the Do Nothing alternative comparatively against the various alternatives being considered including the preferred option.</p>	<p>Agreed. The sentence referencing "until the commencement of construction on the wharf" shall be removed from the evaluation.</p>
5	Page 78	<p>The construction period of alternative method ranges from 3 months for smallest footprint, 7 months for medium footprint, and 14 months for largest footprint. The 'effect assessment' on several criterion and</p>	<p>Compare the requirements and potential effects of the proposed alternative methods based on construction duration. Revise table and report as necessary.</p>	<p>Construction duration is relevant to the comparative evaluation and is part of the assessment presented in Table 5.3. The screening of indicators presented in Table 5.1 reflects on where there are no differences between the alternatives not construction duration.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>indicators concluded that there are no differences between any of the alternatives.</p> <p>Comment: The comparative evaluation does not take construction duration into consideration when evaluating the alternative methods. For example, should seasonal effects be evaluated given duration of construction ranges from 3 to 14 months, depending on the methods? Are there different building requirements between 3-month and 14 months construction period?</p>	<p>Alternatively, please explain why construction duration is not relevant in the comparative evaluation.</p>	
6	Section 7.4.1, page 126-127	<p>Page 126 - Effect assessment discussed songbirds during migratory season and are sensitive to human activities, including potential Species at Risk. But the 'potential effect' on page 127 indicates no SAR or SWH habitat.</p> <p>Comment: If there are potential for migratory birds that are considered SAR</p>	<p>Clarify or explain why the project study area is considered to have no SAR and SWH if there are concerns of songbirds (including SAR) within the project study area.</p>	<p>There are no terrestrial SAR or SWH in the study area. The reference to song birds (including SAR) will be removed from the EA to avoid confusion.</p>

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		<p>within the project study, it is clear why potential effect has been identified to have no SAR or SWH habitat within the project study area.</p>		
7	Page 127	<p>Potential effect indicates there may be increased potential for the transport of nuisance and invasive plant species via construction equipment. Comment: Unclear where or how construction equipment may carry invasive plant species. Are they considered invasive because they are not known locally? Is there any mitigation strategy should this becomes a problem?</p>	<p>Clarify or elaborate where construction equipment comes from and how they carry invasive plant species to the project study area. Provide a contingency plan should this become a problem.</p>	<p>The City cannot control where contractors source their construction equipment. It may come from neighboring developments in the City or from anywhere across Ontario. The movement of construction equipment that has not been properly washed has always and continues to be a source of potential invasive pest and plant species on new construction sites.</p> <p>Please see Clean Equipment Protocol for Industry (2016).</p> <p>Section 7.4.1 of the Draft EA provides commitments by the City to address this issue:</p> <ul style="list-style-type: none"> • Implement measures outlined in the City of Mississauga's "Invasive Species Management Plan & Implementation Strategy" (City of Mississauga, 2021).

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				<ul style="list-style-type: none"> Apply best management practices regarding cleaning of vehicles and equipment entering, exiting, and operating on-site. All contractors involved will follow the Ontario Invasive Plant Council's "Clean Equipment Protocol for Industry" (June 2016).
8	Section 7.5.1, page 132	<p>First bullet on 'Mitigation Measure' of the page states "implement mitigation measures for air quality, noise, etc."</p> <p>Comment: What are those measures for air quality and noise?</p>	<p>Please elaborate what the mitigation measures are. It would also be helpful to list the elements that are being considered instead of saying 'etc', as this leaves room for interpretation.</p>	<p>The intention of the wording in the Draft EA is that mitigation applied for air quality and noise impacts will serve to mitigate social impacts as well. The use of the acronym "etc" will be removed.</p>
9	Page 134	<p>Potential effect indicates there will be an increase of business activity for local business because "during construction there will be a small workforce that may choose to purchase goods and services within Port Credit"</p> <p>Comment: Is this based on current research or data of similar construction sites that show evidence of increase business activities during</p>	<p>Please elaborate and explain how the City determined that there will be increase of business activities for local businesses during construction. Provide any studies used to generate the conclusion.</p>	<p>The statement that "during construction there will be a small workforce that may choose to purchase goods and services within Port Credit" is a reasonable assertion that is based on experience with impacts of construction projects. Port Credit is a vibrant community that offers residents, visitors, and transient workers alike a variety of opportunities to eat, shop and purchase services. No specific studies have been completed nor is further study warranted for a positive impact of this type.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>construction period despite all the potential effects of traffic, disruption, public access?</p>		
10	Section 7.6.1, Page 139	<p>The 'Effect Assessment' on Page 139 indicates MCFN may consider the project as infringing on their rights and interests and the City acknowledges the potential of infringement of rights and interests of Indigenous communities as such consulting with the First Nations to determine if there are impacts and if further mitigation is required.</p> <p>The net effect on page 140 however states: "the result of this EA demonstrate that net adverse effects on the environment from the [project] are either minor or negligible in nature. As such, the City does not consider the [project] as infringing on any interest that Indigenous communities may have with respect to lands, waters, and</p>	Provide updated wording with respect to infringement on interests of Indigenous communities.	Section has been updated to reflect recent consultation with MCFN.

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>resources in the Project study areas.”</p> <p>Comment: Need more information why the City does not consider the project to infringe on the interest of Indigenous communities.</p>		
11	Section 8/8.1 pg.141 - Monitoring	<p>The draft EA needs to include more details on the monitoring plan and strategy. Page 75 of the ToR committed to develop a strategy and schedule for completing a monitoring plan and that would be included in the EA. The environmental performance monitoring plan needs to be outlined in more detail. Adaptive management measures should include potential options and plan for mitigation.</p>	<p>Provide additional details on monitoring strategy and plan. Elaborate the strategy that will be used to monitor compliance and ensure that they adhere to the commitments made in Table 8.1.</p>	<p>The monitoring plans provided in the Draft EA meet the ToR commitments and are similar to those provided in EA on other waterfront projects in the City.</p> <p>Table 0.1 “Summary of Commitments Resulting from the 1PSEPM Project EA” includes a commitment by the City to “develop a monitoring plan consisting of EA compliance monitoring and environmental performance monitoring”. This will be done as part of the detailed design process in consultation with the MECP, CVC and interested Indigenous communities.</p>
12	Page 141	<p>The bottom of page 141 mentions Section 8.1.3 for environmental performance monitoring program. This is not included in the draft EA.</p>	<p>Revise report to include performance monitoring program.</p>	<p>The monitoring plans provided in the Draft EA meet the ToR commitments and are similar to those provided in EAs on other waterfront projects in Ontario.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
				<p>Section 8.1.2 provides information regarding the purpose and approach to performance monitoring for the 1PSEPM Project.</p> <p>Table 0.2 “Summary of Commitments Resulting from the 1PSEPM Project EA” includes a commitment by the City to “develop a monitoring plan consisting of EA compliance monitoring and environmental performance monitoring”. This will be done as part of the detailed design process in consultation with the MECP, CVC and interested Indigenous communities.</p>
13	Table 8.1; revisit all sections in report	Sections mentioned in the ‘EA Report Section’ column either do not exist or correspond to the ‘EA Report Section Title’. For example, there are no Section 7.1.1. Section 7.1 in the report is “Identifying Net Effects’, not Physical environment	Revise all sections of report to ensure they are consistent and correspond with each other.	Agreed. All section references will be reviewed and corrected, as appropriate, based on the structure of the amended EA.
14		There is no discussion on how the City will address comments or concerns raised by the public, stakeholders or Indigenous communities.	Provide a plan on how the City intends to address comments or concerns that may arise during consultation or construction period.	During consultation undertaken throughout the ToR and EA, responses to questions submitted during PICs have been posted through summaries. Anyone that emailed a question at any time during the project has received a response. The City has been notifying the public about the project through a variety of methods (e.g. City’s website, mail-

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				<p>outs/letters, newspaper advertisements and notices, social media roadside signage, direct communications via email/phone). The City intends to continue notifications as the project progresses post-EA.</p> <p>In addition, Section 7.5 of the Draft EA states that the City intends to:</p> <ul style="list-style-type: none"> • ensure that notice and details of the Project has been provided to Port Credit Harbour Marina currently operating at 1 Port Street East to be distributed to users. In addition, construction information will be posted to the project website; and • utilize the existing 311 system available to Mississauga residents and business operators for registering of public complaints and allow for their resolution in accordance with the City's policies. <p>This broad-based approach to notifying the public will be outlined in the final EA.</p>
15		Missing Executive Summary	Provide an executive summary for the project. It should include an overview of the project.	<p>The City prepared a separate summary report on the request of the Mississaugas of the Credit First Nation (the document is posted on the City's 1PSEPM project website: https://www.mississauga.ca/wp-content/uploads/2023/09/1-Port-Street-East-Proposed-Marina-PIC-Draft-EA-Summary-Document-June-2023.pdf). This will be revised</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
				and provided with the City's final EA submission as an executive summary.
16	Page 107	Minor typo – should say west side not west 'site'	Make minor edit. Make minor edit.	Typographic errors will be corrected.
17	Section 7.2 to 7.6 (pages 118 - 139)	<p>Difficult to reference the different potential effects under a given criteria/indicator. Suggests adding sub-section for each 'potential effect' of criteria/indicator for ease to differentiate and reference. For example:</p> <p>7.2 Physical Environment.</p> <p>7.2.1 Effects of construction</p> <p>7.2.1.1 Increases turbidity and reduce water quality from runoff...</p> <p>7.2.1.2 Increased turbidity and reduce water quality from disturbance of sediments....</p> <p>7.2.1.3 Reduced soul, groundwater....</p>	Suggestion to add subsection for different potential effects under each criteria or indicator	The City has prepared the Draft EA document to be clear and concise. The City does not consider the effort, time and cost required to restructure the documents to be warranted. No similar comments have been received from internal City reviewers, members of the public nor the Mississaugas of the Credit First Nation that have reviewed the Draft EA in detail.
18		Need consultation records from stakeholders, agencies, and Indigenous communities, confirming they have no further comments or concerns with the EA or on		The City will seek to resolve questions and comments raised with respect to the Final EA. Where possible the City will collect documentation which confirms that comments and questions have been resolved. When this is not possible, the lack of further

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		the responses provided by the City in addressing their comments		correspondence will suggest that the issue is resolved.
Ministry of the Environment, Conservation and Parks: Conservation and Source Protection Branch (Supplementary Comments September 3, 2024)				
1	Section 1.3.2	<p>Under section 1.3.2 Other Provincial Approvals, the Clean Water Act, 2006 is discussed on page 12. Please revise the reference to the Regulation noted in the second sentence. For accuracy, the reference should be changed from Regulation 288/07 to Ontario Regulation 287/07.</p> <p>Moreover, both the Clean Water Act, 2006 and O. Reg. 287/07 require Source Protection Committees to prepare source protection plans with policies to address threats to drinking water sources within all source protection vulnerable areas instead of only within intake protection zones, which is one type of vulnerable area. As such, please</p>	Make text revisions to Section 1.3.2	Text revisions to Section 1.3.2 are made as requested.

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>revise the text on page 12 accordingly. Lastly, revise the second last sentence of this paragraph to read: “Communities Policy implementing bodies will have to conform to or comply with policies addressing significant drinking water threats, and have regard for policies addressing moderate and low drinking water threats” for accuracy.</p>		
2	Chapter 7	<p>The threat posed from the storage of fuel threat activity, as well as its associated mitigation measures are addressed in the draft revised EA report. As a reminder, the threat posed from the handling and storage of fuel should be considered not only during the construction phase of the project, but also during its maintenance and operation phases.</p>	<p>The City is encouraged to continue to engage with the local Source Protection Authority on the matter of the handling and storage of fuel during all phases of the undertaking.</p>	<p>Text in Chapter 7 has been modified to indicate that the City will continue to engage with the local Source Protection Authority on the matter of the handling and storage of fuel during all phases of the 1PSEPM Project.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
3	Chapter 7	It is not clear if the proponent assessed other potential drinking water threat activities such as the application, handling and storage of road salt or the handling and storage of dense non-aqueous phase liquids. If so, were these other potential activities assessed for source protection purposes during the construction, operation, and maintenance phases of the project.	The proponent will have to identify and assess whether these other risks pose a low, moderate, or significant risk to drinking water sources during each of the phases of the project.	Chapter 7 has been modified to clearly indicate that there no significant threat to drinking water from marina operations, including discharges of stormwater that may contain contaminants such as road salt or the dense non-aqueous phase liquids.
4	Chapter 7	The 1PSEPM Project Area intersects with an intake protection zone (IPZ)-2 with a vulnerability score of 4.5, a Highly Vulnerable Aquifer (HVA) with a score of 6, and within an Events-based Area (EBA) for pipeline fuel/oil spill within the Credit Valley Source Protection Area of the larger Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Protection Region. As such, some of the activities of the	None provided	Reference to the CTC policies relevant to the 1PSEPM Project was added to Section 6.6 with the intent that these policies would be considered during detailed design and marina operations.

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>project may be subject to the applicable policies of the CTC Source Protection Plan. There are seven policies in the CTC Source Protection Plan that the proponent should be aware of and consider before project development, as applicable. A brief description of each policy is provided.</p>		
5	Section 3.1.11	<p>It may be helpful to add the following text where appropriate: “Some of the activities that are undertaken for this proposed undertaking may pose a threat to drinking water sources. As such, the activities may be subject to some of the applicable policies of the approved Credit Valley, Toronto and Region and Central Lake Ontario Source Protection Plan.”</p>	Add text	The suggested text was added to Section 3.1.11.
Ministry of the Environment, Conservation and Parks: Air Quality Branch (Supplementary Comments September 12, 2024)				
1	Section 7.3.1	If this EA does not include the marina service building nor marina operations, the	Further Clarification is Required	Section 7.3 “Atmospheric Environment” has been modified to include a context section before Section 7.3.1 that clearly indicates that

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>proponent should clarify this in the air quality section of the Final Draft EA (Section 7.3.1 - pg 42). The Final Draft EA should include a rationale for not assessing the boat marina emissions as these contribute to greenhouse gases (GHGs) as well.</p>		<p>marina operations at a marina service building are not assessed as part of the EA. The context section will state that:</p> <p>“This EA addresses the lakefill component of the project. As provided in Section 2.3 of the Draft EA, the purpose of the 1PSEPM Project is to provide an expanded land base for additional waterfront parkland and marina alternatives at the 1 Port Street East site. The Project involves simply moving some of the existing operations from one side of the marina basin to the other.</p> <p>The fueling operation at the existing location at 1 Port Street East may or may not continue in the future, as there are City-operated fueling opportunities for boaters elsewhere.</p> <p>The City will determine during detailed design the nature and size of the proposed marina service building. Once these plans are finalized, the City will pursue the necessary approvals for the construction of the building.</p> <p>Any businesses choosing to lease space in the marina service building will be responsible for securing any required approvals and permits, which are separate from this EA.</p>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
				Moreover, the new marina is anticipated to host approximately the same numbers of boats as the existing marina does. Therefore, for the purposes of this EA, the existing air quality is not expected to measurably change as the emission sources are not expected to change.”.
2	Sections 9.1 and 2.1.6	There is one clarification required in regards to the marina boat / refueling emissions. Based on Table 9.1 of the Final Draft ToR, there is an existing estimate of 470 boats at the port and for the proposed large-lakefill alternative, the estimated number of boats is approximately 450 as there are other City’s boating fueling facilities. Further, the proponent’s response to the ministry’s TSS comment no. 1 notes that this EA does not capture the boating facility and thus the fueling emissions from the marina is not part of this undertaking. Further clarification is required since section 2.1.6 notes that the site's key attractions will	Further Clarification is Required	See above for text to be included in Section 7.3 “Atmospheric Environment” that provides further clarification in the EA regarding fueling operations.

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		include a marina and marina-related facilities (see page 42 of the final ToR)		
3	Table 8.1	A fugitive dust management plan is part of the commitments, Table 8.1 of the Final Draft EA.	No further comments	Comment has been addressed satisfactorily
4	Section 7.3.1	Section 7.3.1 includes the Cheminfo Services reference which captures the different dust mitigation measures during construction to minimize off-site impacts at nearest sensitive receptors.	No further comments	Comment has been addressed satisfactorily
Transport Canada				
1	Non-specific	Please note Transport Canada does not require receipt of all Individual or Class EA related notifications.	N/A	Comment noted.
2	Non-specific	We request that project proponents self-assess whether their project: <ol style="list-style-type: none"> Will interact with a federal property and/or waterway by reviewing the Directory of Federal Real Property, available 	If the criteria do not apply, Transport Canada's Environmental Assessment program should not be included in any further correspondence, and future notifications will not receive a response.	The draft EA indicates that the 1PSEPM Project will not interact with federal property and identifies the Canadian Navigable Waters Act as a potential permit that may be required. The draft EA assessed the potential impact of the project on navigation in Chapter 4 and concluded that impacts to navigation in Lake Ontario are not likely. The EA acknowledges that the creation of land under the <i>Navigation</i>

Comment Number	Draft EA Document Reference	Agency Comments	Proposed Solution	City Response
		<p>at at www.tbs-sct.gc.ca/dfrp-rbif/; and</p> <p>2. Will require approval and/or authorization under any Acts administered by Transport Canada* available at http://www.tc.gc.ca/eng/acts-regulations/menu.htm.</p> <p>Proposed projects that will occur on federal property (including reserve lands or lands owned by federal departments other than Transport Canada) will be subject to an Impact Assessment per Section 82 of the Impact Assessment Act, 2019 prior to exercising a federal power (including full or partial funding), and/or performing a function or duty (e.g. regulatory approval or issuance of a lease) in relation to that project.</p>		<p><i>Protection Act</i> requires formal approval under the Act.</p> <p>As such the City will continue to engage with Transport Canada with correspondence to be forwarded to: enviroOnt@tc.gc.ca.</p>

1 Port Street East Proposed Marina Environmental Assessment

Appendix D2 - Report of the MCFN Review
of the Draft EA



TECHNICAL REVIEW MEMO

Review of the Draft Environment Assessment for the 1 Port Street East Proposed Marina, City of Mississauga, Mississaugas of the Credit First Nation Territory.

Prepared for: Mississaugas of the Credit First Nation % Casey Jonathon (Major Projects)

Prepared by: Kathleen Ryan (BSc., MSc.)

Dated: August 30 2023

RE: 1 Port Street East Proposed Marina Project, Draft Environmental Assessment Report

Purpose and Scope of Review

The purpose of this memo is to evaluate the City of Mississauga's (the Proponent) Draft Environmental Assessment Report (the EA Report), which forms part of the Proponent's government approvals process for the proposed Marina Project (the Project) at 1 Port Street East, Mississauga, Ontario (the Site), Mississaugas of the Credit First Nation (MCFN) Territory. The purpose of the Project is to provide an expanded land base for additional waterfront parkland and marina expansion at the Site. The main component of the Project involves significant lake infill to create a land base for the marina expansion and re-design.

It should be noted here that the Project Site is an incredibly important location for MCFN. The Site is located at the mouth of the Credit River, which would have once been an essential part of MCFN's settlements, trade, travel, harvesting, and way of life, in what is now known as the Greater Toronto Area (GTA). The Project is also contemplating lake infill that impacts part of the lake bed, which is under an active Aboriginal Title Claim by MCFN.

Review and analysis of the documents identified below is intended to ensure that MCFN's Aboriginal and treaty rights and the environment of the MCFN Territory (lands, waters, wildlife) are protected from any potential negative impacts resulting from the above development and associated activities. It is also intended to ensure that MCFN input and involvement are incorporated throughout the planning and implementation phases of the Project and, where appropriate, that the Project provides benefit to MCFN and its membership.

Documents

- 1 Port Street East Proposed Marina Environmental Assessment, Draft Report. Dated: July 2023. Prepared by Shoreplan Inc., for the City of Mississauga.

Project Context

The Site is located on the east shore of the mouth of the Credit River and along the northern shore of Lake Ontario. The Site and its immediate vicinity are often referred to as Port Credit. The Port Credit wharf was originally constructed in the mid-1950's to support commercial shipping on the Great Lakes, and the east breakwater (main component of the Project and the Site) was constructed in the late 1950's. Over time, the marina at Port Credit has become one of the largest privately operated full service marinas along the shoreline of the GTA.

The Site was owned by Canada Lands until October 2018, when the initial conveyance to the City of Mississauga was completed, transferring the breakwater and a portion of the water lot. The second (and final) conveyance will take place following approval of the Environmental Assessment by the Ministry of Environment, Conservation and Parks (MECP) and approval by the City of Mississauga Municipal Council.

The objective of the Project is to expand the land base around the eastern breakwater at Port Credit to provide continued and enhanced marina function and services at the Site, while allowing for residential community development adjacent to the Site at Port Credit. The Project is aligned with the City of Mississauga's directives to create an urban waterfront village at the Port Credit site (Vision for Port Credit, Inspiration Port Credit / 1 Port Street East Comprehensive Master Plan).

An expanded land base at the east breakwater is the main component of the Project and is intended to accommodate relocation of marina infrastructure (new dock infrastructure and ~double the number of boat slips from to 450), and to create new waterfront parkland along the shore. An expanded land base would be accomplished with significant lake infill at the east breakwater, which would allow for creation of park space, enhancement and creation of fish habitat, and relocation of marina infrastructure. The EA Report notes that the Project provides an opportunity for terrestrial habitat creation and enhancement, and enhancement of relatively low quality aquatic habitats in the vicinity of the breakwater towards an overall ecological gain consistent with Credit Valley Conservation Authority (CVC) Lake Ontario Integrated Shoreline Strategy (LOISS) objectives

The EA Report considers potential impacts of the project across three (3) study areas. The Project Study Area (PSA), which includes the immediate areas subject to the Project activities, the Local Study Area (LSA), and Regional Study Area (RSA). The PSA includes 21.4 hectares of land and water (shore lot) area. The LSA includes an ~125 hectare area, including the shoreline and neighboring communities and ~1km of the Credit River, and RSA includes portions of the Credit River Watershed (~5km upstream), Lake Ontario shoreline, and shoreline neighborhoods within the City of Mississauga.

Figure 6.6 Recreational Spaces and Marina



Image Left: Proposed Project at Port Credit.

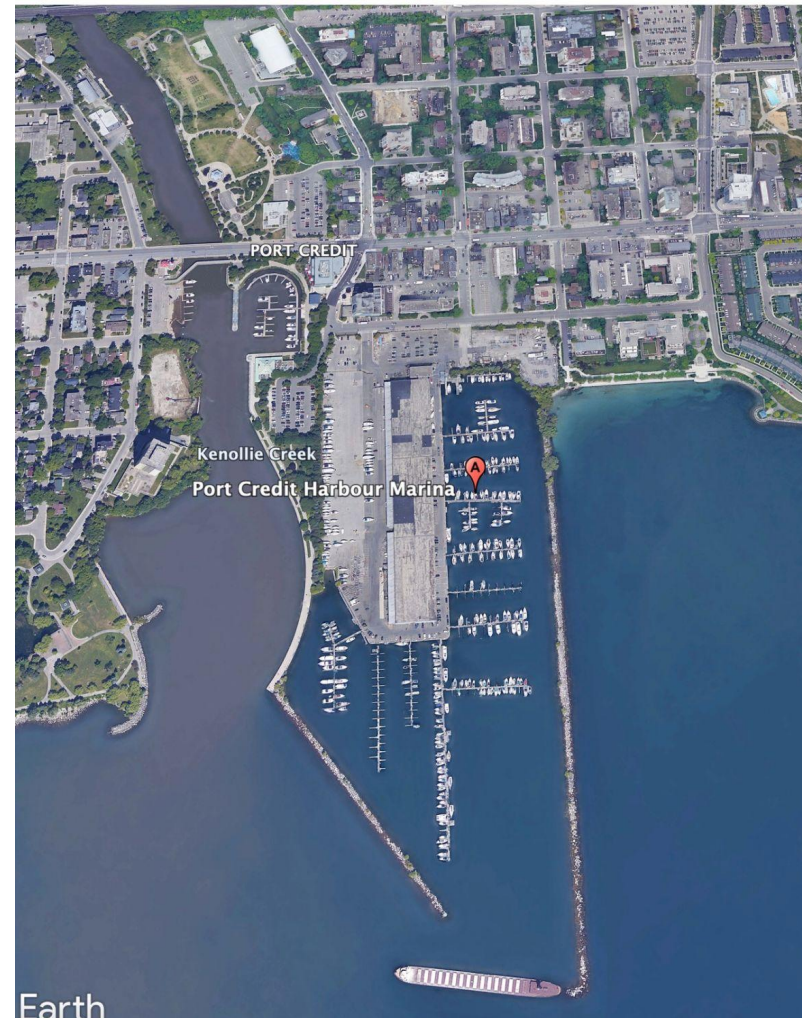


Image Right: Existing Conditions at Port Credit

Regulatory Context

The purpose of the EA Report is to meet the requirements of an Individual Environmental Assessment (EA) under the Ontario *Environmental Assessment Act*. The category of Individual EA is for projects that are large-scale, and complex with the potential for significant environmental impacts.

The EA Report requires approval by the Minister of Environment, Conservation and Parks (MECP) prior to construction. The Project is also subject to relevant provincial and federal permitting approvals processes required under the *Fisheries Act*, *Migratory Birds Convention Act*, *Endangered Species Act*, *Species at Risk Act*, *Conservation Authorities Act*, *Lakes and Rivers Improvement Act*, *Clean Water Act*, and the *Navigable Waters Act*.

Compliance with and an Authorization under the *Fisheries Act* will be required for the Project. A *Fisheries Act* Authorization is required when a Project or activity intends to cause harmful alteration, disruption, or destruction to fish or fish habitat. The core element of this Project is lake infill which involves the destruction and alteration of a significant amount of fish habitat around the Site, and will likely result in injury or mortality to some fish, and will result in a net loss of fish habitat that will need to be monitored and off-set or compensated. Specific conditions of the Authorization are not described in the EA Report. MCFN must be engaged by the Proponent and the responsible Crown for all authorizations and permits under federal and provincial legislation.

Fish and Fish Habitat

The Site is located along the northern edge of Lake Ontario, immediately adjacent to the Credit River mouth. River mouths or estuaries are incredibly important ecological features that support a wide range of fish, other aquatic species, as well as birds, reptiles, amphibians, and mammals.

- Shorelines within the PSA and LSA are only 1% natural shorelines, mostly engineered and hardened shorelines, with limited ecological function / value compared to naturalized shorelines. However, in urban environments, wildlife have adapted and are often present in habitats with relatively low ecological value.
- A CVC report cited in the EA Report indicates that 65 fish species have the potential to occur around the Site (Credit River and Lake Ontario); 58 native fish species in the Port Credit Region, 23 of which are lake-dominant species.
- The majority of these fish species will utilize nearshore areas during all or part of their life history (spawning, nursery, refuge, feeding, migration).
- A diversity of fish are known to use the existing marina area adjacent to the Site, which is protected, calm, and highly vegetated.

- SAR fish are not explicitly identified in the report, though Lake Sturgeon is referenced in the effects assessment and has been collected in the vicinity of the Site.
- The EA Report notes that no fish were observed during aquatic habitat assessments along the east breakwater. However, no information is provided about methodologies for any aquatic assessments completed as part of the Project. Brown bullhead and cyprinids were noted to be observed during assessments in the vegetated marina area. Sight based observations of fish (or no observations of fish by sight) are a poor indicator of fish presence / absence.
- The Project includes significant disturbance to the existing fish and fish habitat around the east breakwater including infill both above and below the water, and other disturbance and alterations to existing habitat features.
- While the existing habitat is relatively low quality, the infilling around the breakwater is considered destruction and alteration and a habitat loss under the *Fisheries Act*, and will likely result in some disturbance to existing fish present at the site, some stress, injury, or even mortality to fish during construction activities.
- Based on the summary of Aquatic Habitat Areas Modified and Lost, fish habitat alterations will include 13,000 m², and destruction (loss) will include 29,100 m² - totalling 42,100 m² of altered and destroyed fish habitat.

Table 6.1 Aquatic Habitat Areas Modified and Lost

Aquatic Habitat Depth Zone	Aquatic Habitat Modified	Aquatic Habitat Lost
0 m to 2 m	100 m ²	4,100 m ²
2 m to 5 m	1,000 m ²	8,100 m ²
5 m to 10 m	11,900 m ²	16,900 m ²
greater than 10 m	0 m ²	0 m ²
Total	13,000 m ²	29,100 m ²

- Habitat creation is proposed on the south edge of the east breakwall, and is composed of an embayment refuge area of approximately 2400m². While the habitat creation design in this location is good and will provide habitat functions for many fish species in the area, the area of habitat creation is low compared to the overall habitat alteration and loss.
- Creation and enhancement of additional fish habitat (beyond what is proposed here) along the eastern side of the east breakwater would likely provide a larger range of habitat function (forage, refuge, spawning, nursery) for fish, without impacting the function of the Project, future marina or parks.
- The deficit habitat (42,100m² - 2,400m² = **39,700m²**) should be compensated for or offset by

another habitat restoration, rehabilitation or enhancement project within the Site, in the Credit River Watershed, or another significant location in MCFN Territory, in consultation with MCFN. As noted above, this will likely be discussed as part of the *Fisheries Act Authorization* and MCFN must be part of these processes.

- Appendices that include relevant information collected by the CVC and others should be attached to the EA Report to allow the reader to reference these data.
- MCFN representatives should have the opportunity to participate in a monitoring and oversight capacity throughout the construction phase of the project, and in any related monitoring programs.

Terrestrial Habitat

The Site has relatively low terrestrial habitat value, and is dominated by hardscapes and marina infrastructure. There is vegetation that functions as habitat for terrestrial wildlife on the Site along the north edge of the marina, and along the east breakwater. Terrestrial habitats along the shoreline of Lake Ontario are considered very important for migratory and breeding birds for stop-over (rest/refuge) and feeding (even if they do not nest at these locations). Terrestrial habitats (even if they are small) are important for wildlife in urbanized areas due to the overall lack of continuous habitat and habitat connectivity.

- Detailed information about the terrestrial habitat and wildlife within the Site is not included and no detailed assessments were completed in the preparation of the EA Report.
- The EA Report indicates that there are 15 clusters of trees growing on the breakwater near the shoreline, none of which were planted but instead grew opportunistically. Tree species include silver maple, green ash, elms, willows, and mulberry. There is approximately 1700m² of vegetation at the Site (PSA).
- All information about terrestrial wildlife was gathered from Ontario Atlases (Bird, Herpetile, Insects) not from on-site assessments.
- Birds
 - A total of 84 bird species were recorded in the Ontario Breeding Bird Atlas (OBBA) within the atlas square that includes the Site.
 - A number of Species at Risk birds were included in the atlas square that includes the site. The EA Report notes that these species only have a 10% probability of being within the Project Site.
 - 4 Special Concern: Peregrine Falcon, Common Nighthawk, Eastern Wood-Pewee, Bald Eagle, and Wood Thrush.
 - 6 Threatened: Chimney Swift, Barn Swallow, Bank Swallow, Eastern Meadowlark, Bobolink, and Least Bittern.
 - 2 Endangered: Red-headed Woodpecker, Prothonotary Warbler.

- Amphibians
 - A total of 14 species of amphibians were recorded in the Ontario Herpetology Atlas (OHA) within the atlas square that includes the Site.
 - 7 of these species have been observed since 2000.
 - 1 species is Endangered in Ontario: Jefferson Salamander
 - lacking suitable habitat within the PSA
 - Natural areas of Lake Ontario contain 7 species of frogs and toads: Green Frog, American Toad, Bullfrog, Wood Frog, Western Chorus Frog, Northern Spring Peeper, and Northern Leopard Frog.

- Reptiles
 - A total of 12 species of amphibians were recorded in the Ontario Herpetology Atlas (OHA) within the atlas square that includes the Site.
 - 8 of these species have been observed since 2000 .
 - Ontario Endangered Species: Blanding's Turtle (Threatened), Blandings, Snapping Turtle Northern Map Turtle (Special Concern).
 - Limited habitat at the Site.

- Insects
 - A total of 62 species of insects were recorded in the Ontario Insect Atlas within the atlas square that includes the Site.
 - 50 of these species have been observed since 2000.
 - Two (2) Species at Risk
 - Special Concern: Monarch Butterfly,
 - Endangered: Mottled duskwing
 - No suitable breeding habitat for Monarchs at the Site. No discussion of habitat preference of Mottled duskwing.

- Mammals
 - 11 mammal species are known to use the Site for some or part of their life history.
 - Only Eastern Gray Squirrel, Eastern Chipmunk, Raccoon and Muskrat are explicitly noted as known at the Site.

- There are limited details about the vegetation plan / approach for the parking, park areas or the margin of the breakwater, though it is stated that consideration will be given to permeable pavement and creating naturalized habitat that is less actively used by the public, to support migratory songbirds. More information is needed about the approach that will be taken to provide high-quality terrestrial habitat for local wildlife at the Site. Habitat needs of at-risk wildlife with the potential to occur within the Site should be considered (Monarch Butterfly, Mottled duskwing, turtle species).

- It is stated that any vegetation removal or major construction will take place outside of the breeding bird period (protective of breeding and migratory birds).

Assessment

- Overall, the EA Report provides some of the necessary information to demonstrate that the Proponent has an adequate understanding of the existing environmental conditions at the Site.
- There were limited recent or Project-specific assessments completed at the Site related to the Project. Most information about the ecology and limnology of the Site were collected through desktop review, including previous assessments related to other projects at the Credit River, comprehensive aquatics reports from the Credit Valley Conservation Authority (CVC), and species presence information from the Ontario Breeding Bird, Herpetile, and Insect Atlases.
- Considering the lack of up-to-date and validated ecological data for the Site, the identification and evaluation of alternatives and impacts in the EA Report is adequate.
- The overall effects assessment determined a negligible impact on the environment at and surrounding the Site (across the PSA, LSA, and RSA). The overall impact of the Project will likely be negligible if all mitigation measures and wildlife timing windows are strictly adhered to, and additional terrestrial and aquatic habitat enhancement and creation measures are implemented.
- The EA Report notes that CVC has not identified species at risk (SAR) on the eastern breakwater, but have identified SAR at nearby parks and at the mouth of the Credit River. While the mouth of the Credit River is outside the PSA, it is within the LSA, and SAR observations at the Credit River mouth should be considered in the assessment of the Site, evaluation of impacts of the Project, in-water work timing windows, and in the conditions of the *Fisheries Act* Authorization. More specific information should be provided related to the CVC SAR Research Project (2014), and other fish assessments completed in the vicinity of the Site.
- It is difficult to determine the potential impact and benefit of the Project on aquatic and terrestrial wildlife at the Site, especially SAR fish, and migratory and breeding birds due to the lack of recent, Site-specific assessments and the lack of details regarding terrestrial habitat creation at the Site.
- Soil and (lake) sediment sampling completed as part of other projects (2016) show some exceedances of heavy metals and other contaminants (PHC, PAH) due to leaks and spills associated with above ground storage tanks and piping in the southwest portion of the PSA related to historical and boat storage and marine activities, including winter salt application.

This poses risks to aquatic life when upper level sediments are re-suspended during lake infill and related construction works. No new / up to date sampling was completed as part of the Project.

- Stormwater management is discussed and appropriate bioswale approaches have been proposed to manage run off from the parking areas, in addition to consideration of permeable parking lots to reduce run-off.
- Assessment of the current nearshore conditions at the Site, including substrate types and quality, and a review of the hydrological and limnological processes occurring along the shoreline and between the Credit River and Lake Ontario (sediment transport, hydrologic characteristics of wave action, currents, high water levels) are complete and aligned with the proposed approach to the Project.
- The majority of the new marina infrastructure (docks and walkways) are described as floating. This is the best option to reduce impacts to fish and fish habitat.
- The approach to armourstone is described as “random” which creates more spacing between armourstone. This will likely provide more habitat opportunities for aquatic life (interstitial spacing in below-ground armourstone). It is possible that other bioengineering approaches could be implemented (they exist), to reduce the amount of hardened structure at the Site.
- More information is needed about pre, during, and post construction monitoring that will occur at the Site, as well as the proposed construction schedule.
- More information will be needed at the detailed design stage regarding the creation of fish habitat on the south edge of the breakwater, and any other fish habitat enhancement or creation elements that will be added to the Site.
- Additional consultation and engagement will be required through detailed design and implementation of the Project.
- There is an opportunity to include accurate and appropriate educational signage or other elements related to the significance of this location to MCFN. These must be developed collaboratively with MCFN.

Key Concerns and Questions

1 - SAR Fish (Lake Sturgeon and American Eel)

- Though Site-specific observations of fish SAR (e.g., American Eel, Lake Sturgeon) are limited, considerations should be made for these species in the east breakwater design and

any other new or enhanced habitat features (American Eel), and in the timing of construction and implementation of mitigations (Lake Sturgeon and American Eel).

- The Proponent must confirm that there is no suitable American Eel habitat at the Site, and consider this species in the creation of new habitat (soft/mud substrates, vegetation, and interstitial refuge spaces).
- Due to the sensitivity of Lake Sturgeon, especially juvenile Lake Sturgeon that may be using nearshore areas as habitat, strict adherence to in-water work timing windows that include Lake Sturgeon life-history are required.

2 - Fish and Fish Habitat (General)

- When were the last assessment events (actual collection (general or targeted)) of aquatic and terrestrial species within the vicinity of the Project?
- Is any fish salvage anticipated to be required during construction?
- What fish / in-water work timing windows will be implemented during construction?
- Fish SAR are not explicitly discussed in the EA Report. However, American Eel and Lake Sturgeon are noted in a report table (CVC data) as recovered in the Credit River Coastal Reach (in the vicinity of the Project). These two fish must be considered in the application of in-water work timing windows and other mitigations, habitat destruction/alteration, and habitat creation and enhancement plans, as well as the *Fisheries Act* Authorization.
- How will the habitat deficit (**39,700m²** (alterations and destruction) 26,700m² (destruction only)) be offset or compensated for? MCFN must be involved in decisions regarding suitable offset or compensation projects in MCFN Territory.
- Are there additional concepts that could be considered that incorporate more natural elements or bioengineering approaches (e.g., less armourstone) into the east breakwater design?
- The proposed fish habitat creation at the southern edge of the east breakwater includes a well-designed small embayment refuge area. Though its design is good, the area covered by the fish habitat creation is relatively small compared to the area of habitat removal. Additional habitat enhancement and creation must be developed at the Site and likely off-Site.
- There are likely opportunities for additional aquatic habitat enhancements along the eastern edge of the breakwater, or potentially the shore extent just east of the Project (parallel to St.Lawrence Park) including the addition of diverse substrate, plantings within hardened elements, and plantings of submerged or emergent aquatic vegetation.

- There are a number of contaminants in the upper sediment layers at the Site, related to historical and ongoing use of the area, and deposition of contaminants from the outfall of the Credit River. How will the release of these be managed and monitored during construction?

4 - Terrestrial Wildlife

- The EA Report provides information about the presence of terrestrial wildlife at the Site based on desktop review of available resources. Though the resources referenced are trusted resources, additional ground-truthing and assessments should be completed prior to construction activities.
- There are limited details about the vegetation plan / approach for the parking, park areas or the margin of the breakwater. More information is needed about the detailed approach that will be taken to provide high-quality terrestrial habitat for local wildlife at the Site. Habitat needs of at-risk wildlife with the potential to occur within the Site should be considered (Monarch Butterfly, Mottled duskwing, turtle species).
- Adherence to breeding and migratory bird timing windows is required to protect these species from negative impacts and must be implemented during construction.
- MCFN must be updated and engaged on permits or authorizations granted under the relevant legislation to protect at-risk species at this site.

Recommendations

- MCFN must be consulted during detailed design and development of conditions under the *Fisheries Act* Authorization, and any other provincial or federal permits required to complete the Project (e.g., *Endangered Species Act*, *Species at Risk Act* or *Navigable Waters Act*).
- There is substantial deficit habitat (between 26,700 and 39,700 m²) that must be compensated for or offset by another habitat restoration, rehabilitation or enhancement project in MCFN Territory, in consultation with MCFN. This will likely be discussed as part of the *Fisheries Act Authorization*, and MCFN must be part of these processes.
- Habitat needs of at-risk and local terrestrial species must be considered during construction (retaining as much existing vegetation as possible), and in the design of new terrestrial habitat for the park and breakwater area. Detailed design of terrestrial habitat must be shared with MCFN.
- Standard mitigation measures are presented in the report, and are expected to be strictly adhered to. Mitigations related to turbidity and sediment release must be controlled to the greatest extent possible to protect fish and fish habitat during construction. In-water work timing windows must also be strictly adhered to, to protect sensitive life-stages of fish.

- Timing windows to protect terrestrial wildlife (migratory and nesting birds) must be adhered to.
- Prior to finalizing the EA Report, or during detailed design and prior to construction, current and more detailed assessments of fish habitat quality at the Site, including detailed water quality parameters (basic quality measures (DO, pH, Conductivity, etc.), nutrients, e.coli, pharmaceuticals, metals, etc.), substrate parameters, and vegetation assessments should be completed. This type of baseline is necessary to track the success of the Project in achieving overall increase in fish habitat quantity and quality and to monitor any operational impacts of the Project.
- MCFN should be engaged through the construction planning phase so that MCFN Field Liaison Representatives can be part of any pre-construction ecological monitoring, and part of oversight of mitigation measures and permit adherence during construction, through post-construction monitoring and operational works.
- The Proponent and MCFN should discuss appropriate education modules / signage or similar components that could be included in Site design.
- MCFN may wish to complete ceremonial or other site-visits prior to construction. Adequate notice and related provisions must be made to ensure these activities can be completed by MCFN.

Miigwetch,



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1 Port Street East Proposed Marina Environmental Assessment

Appendix D3 - MCFN Comments on Draft EA and City Dispositions



MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
Purpose and Scope of Review		
<p>It should be noted here that the Project Site is an incredibly important location for MCFN. The Site is located at the mouth of the Credit River, which would have once been an essential part of MCFN’s settlements, trade, travel, harvesting, and way of life, in what is now known as the Greater Toronto Area (GTA). The Project is also contemplating lake infill that impacts part of the lake bed, which is under an active Aboriginal Title Claim by MCFN.</p>	<p>Section 3.5.1 of the Draft EA report acknowledges that in 2016 MCFN filed an Aboriginal Title Claim to Waters within the Traditional Lands of the Mississaugas of the Credit. The Draft EA states “The First Nation continues to revere water as a spiritual being that must be accorded respect and dignity. Water is vital to the survival of MCFN and all other forms of life. MCFN assert that they have unextinguished Aboriginal title to all water, beds of water, and floodplains contained in their treaty lands and territory.”</p>	<p>Requires further discussion.</p> <p>The courts have found that Aboriginal title includes rights such as to participate in decision making about development and uses of the area, benefit from it, continue an ongoing relationship with the area, etc. Further conversations will be required to reflect this deeper level of engagement with MCFN both in the draft EA document itself as well as in practice as this moves ahead.</p> <p>City Response: The text provided by MCFN regarding Aboriginal Title and Rights has been integrated fully into the EA.</p> <p>Edit made in Section 3.5.1.</p>
Project Context		
<p>MCFN summarizes the project context in terms of its general location, historical context, current ownership and conveyances, land use planning objectives, the current functions of the marina, habitat creation, and the 1PSEPM project objectives and study areas. MCFN notes an “expanded land base at the east breakwater is the main component of the Project and is intended to accommodate relocation of marina infrastructure (new dock infrastructure and ~double the number of boat slips from to 450)”.</p>	<p>MCFN have appropriately summarized the project context and purpose. The City notes that the number of boat slips in the proposed marina is not being doubled. The estimated number of slips at the current marina is 470, whereas the proposed number of slips is 450. MCFN summary acknowledge that the Project provides an opportunity for terrestrial habitat creation and enhancement, and enhancement of relatively low quality aquatic habitats in the vicinity of the breakwater towards an overall ecological gain</p>	<p>Agreement.</p>

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
	consistent with Credit Valley Conservation Authority (CVC) Lake Ontario Integrated Shoreline Strategy objectives.	
Regulatory Context		
<p>MCFN summarize the purpose of the EA Report as meeting the requirements of an Individual Environmental Assessment (EA) under the Ontario Environmental Assessment Act and lists relevant provincial and federal permitting approvals processes that apply, including the requirement for a Fisheries Act authorization.</p> <p>Note: At the September 7, 2023 meeting, MCFN requested clarification as to the applicability of the provincial Public Lands Act.</p>	<p>MCFN have appropriately summarized the project’s regulatory context.</p> <p>The Public Lands Act is not applicable to the project as the project will be contained on a waterlot owned by the City. The Public Lands Act applies to Crown land under the control of the Province. The Public Lands Act is likely to apply to any use of lands beyond waterlot should additional fish habitat compensation be located to the east of the existing breakwater. This is not currently part of the 1PSEPM Project.</p>	<p>Further discussion between MCFN and the Province and DFO will be required for fish habitat offsetting/compensation outside of the City waterlot - but these additional habitat compensation projects should be a commitment part of the EA and <i>Fisheries Act</i> Authorization process with DFO to better balance the fish habitat losses with gains</p> <p>City Response: In seeking the <i>Fisheries Act</i> Authorization from DFO, the City will work collaboratively with MCFN and others to investigate the feasibility of the creating and/or enhancing fish habitat in areas proximal to the Credit River and/or within the Credit River watershed and other opportunities aimed at addressing the fish habitat deficit created by the Project. The City anticipates feasible fish habitat offsets will be reflected in the Fisheries Act Authorization for the 1PSEPM Project</p> <p>Edits made in Section(s): Table 9.4</p>
Compliance with and an Authorization under the <i>Fisheries Act</i> will be	The Draft EA report acknowledges that the 1PSEPM project will	Requires further discussion.

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
<p>required for the Project. A <i>Fisheries Act</i> Authorization is required when a Project or activity intends to cause harmful alteration, disruption, or destruction to fish or fish habitat. The core element of this Project is lake infill which involves the destruction and alteration of a significant amount of fish habitat around the Site, and will likely result in injury or mortality to some fish, and will result in a net loss of fish habitat that will need to be monitored and off-set or compensated. Specific conditions of the Authorization are not described in the EA Report. MCFN must be engaged by the Proponent and the responsible Crown for all authorizations and permits under federal and provincial legislation.</p>	<p>likely result in a net loss of fish habitat that will need to be monitored and off-set or compensated. However, the Draft EA report does not conclude that these adverse impacts are “significant”.</p> <p>Specific conditions of the Authorization are not described in the EA Report as these are yet to be determined during the permitting process of the detailed design.</p> <p>The City has committed to engaging with MCFN for authorizations and permits under federal and provincial legislation.</p>	<p>MCFN’s view is that this will be significant. Further discussions on this point will be needed with MCFN. The City’s commitment to further engagement – along with MCFN’s concern – should be recognized in the draft EA.</p> <p>City Response: The EA acknowledges MCFN’s view that that this habitat loss will be significant and the need for further engagement.</p> <p>Edits made in Section(s): 6.2.2 and Table 9.4</p>
<p>Fish and Fish Habitat</p>		
<p>SAR fish are not explicitly identified in the report, though Lake Sturgeon is referenced in the effects assessment and has been collected in the vicinity of the Site.</p>	<p>Table 3.3 of the Draft EA identifies the American Eel as having a documented presence in Credit River and in the Port Credit coastal reach. Table 3.3 also notes that Lake Sturgeon has a documented presence in the Credit River but not in the Port Credit coastal reach. The Final EA will identify these species as Species at Risk (SAR) fish.</p>	<p>The initial comment intended to identify that fish are likely utilizing habitat in areas adjacent to where they have been collected in specific surveys (such as the Project area) and that any fish collected in nearby surveys should be considered as part of the Project design, construction timing, and any fisheries related regulatory authorizations and/or habitat compensation projects.</p>
<p>The EA Report notes that no fish were observed during aquatic habitat assessments along the east breakwater. However, no information is provided about methodologies for any aquatic assessments completed as part of the Project. Brown bullhead and cyprinids were noted to be</p>	<p>The City has added a Draft technical memorandum entitled “Aquatic Ecology Technical Memorandum for the 1 Port Street East Proposed Marina Project” (January 2023) as an Appendix to the Draft EA. This memo addresses methodologies and data sources for</p>	<p>The draft aquatic ecology technical memorandum (Sept 2023) has been reviewed and provides more comprehensive information about aquatic environment conditions, data and data sources</p>

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
<p>observed during assessments in the vegetated marina area. Sight based observations of fish (or no observations of fish by sight) are a poor indicator of fish presence / absence.</p>	<p>the aquatic assessment completed as part of the Project, including engagement undertaken with relevant agencies for the purposes of data collection. The data collected both from secondary sources and in the field is considered sufficiently robust for the purposes of an EA.</p>	<p>used for this assessment. The data and sources are reputable.</p> <p>Much of the data is 20 years old, with some new data from 10 years ago (2014). This data is sufficient for planning purposes, but additional monitoring should be completed pre - during and post construction to support assessment of unexpected impacts related to project activities and to provide indicators of “success’ for habitat compensation projects.</p> <p>City Response: MCFN’s concern over data quality is acknowledged and a commitment pre, during and post construction monitoring is made. Monitoring programs will be designed and implemented collaboratively with MCFN.</p> <p>Edits made in Section(s): 7.4 “Area and quality of aquatic habitat” and 8.1. Commitments to monitoring with MCFN are in Table 9.4.</p>
<p>The Project includes significant disturbance to the existing fish and fish habitat around the east breakwater including infill both above and below the water, and other disturbance and alterations to existing habitat features.</p>	<p>It is acknowledged that fish and fish habitat will be disturbed during construction The Draft EA assessed that disturbance by taking into account the overall regional context, the implementation of mitigation and other factors such as the duration and the reversibility of the impact. As such the Draft EA assessed the “residual impact” and determined that this disturbance is not</p>	<p>Requires further discussion.</p> <p>MCFN’s view is that this will be significant. Further discussions on this point will be needed with MCFN.</p>

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	<p>significant. Rather, the Draft EA determined that the disturbance of existing fish and fish habitat due to project construction is Negligible with appropriate offsetting of remaining aquatic habitat losses. As noted in the Draft EA report and Appendix, baseline studies indicate that existing fish habitat that would be lost is “not limiting in Lake Ontario” and “that the effects from construction will be relatively short-term and mitigable while the lakefill area and its benefits will exist for the long-term”.</p>	<p>The use of the word significant by the reviewer is referring to the total area of lake bed and water to be disturbed and reflective of MCFN’s perspectives about the importance of aquatic habitats in their Territory and the significance of any impacts.</p> <p>General agreement that, with mitigations, the effects from construction will be relatively short term and properly implemented mitigations and habitat compensation project(s) will reduce the overall scale of impact. Monitoring plans must be established to confirm short term impacts and low overall impact.</p> <p>City Response: The City thanks MCFN for their clarification and general agreement that with mitigations, the effects from construction will be relatively short term and properly implemented mitigations and habitat compensation project(s) will reduce the overall scale of impact.</p> <p>Edits made in Section(s): None warranted, as commitments to monitoring and aquatic habitat are already included in the EA.</p>
<p>While the existing habitat is relatively low quality, the infilling around the breakwater is considered destruction and alteration and a habitat loss under the <i>Fisheries Act</i>, and will likely result in some disturbance to existing fish present at the site, some stress, injury, or even mortality to</p>	<p>Agreed. The Draft EA confirms that existing habitat is relatively low quality, and the infilling around the breakwater is considered destruction and alteration and a habitat loss under the <i>Fisheries Act</i>.</p>	<p>Further discussion required.</p> <p>MCFN’s concern is about the disturbance to fish and loss of fish habitat. Agreeing that this what</p>

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fish during construction activities.		<p>the EA says is not addressing the underlying concern about how the impact on fish/fish habitat is being addressed through the Project.</p> <p>City Response: An enhanced effects assessment on fish and fish habitat is provided along with additional mitigations and the need for Fisheries Act Approval and off-site compensation or offsetting to address MCFN’s concerns. The offset plan to be developed, in conjunction with DFO, the MCFN, as part of the Fisheries Act Authorization will provide appropriate habitat offsets to counterbalance total aquatic habitat removal. This entails investments in the creation of fish habitat off-site. The offset plan will also detail post construction monitoring techniques to evaluate the effectiveness of the offset strategies.</p> <p>Edits made in Section(s): 7.4.1 “Area and quality of aquatic habitat”.</p>
Based on the summary of Aquatic Habitat Areas Modified and Lost, fish habitat alterations will include 13,000m ² , and destruction (loss) will include 29, 100m ² – totalling 42,100m ² of altered and destroyed habitat. Habitat creation is proposed on the south edge of the east breakwall, and is composed of an embayment refuge area of approximately 2400m ² . While the habitat creation design in this	Agreed. The habitat creation design in this location was developed to provide habitat functions for many fish species in the area. The new habitat created is intended to be more productive and better suited to the aquatic community in the study area. The created and improved habitats will be of higher quality and will be designed to meet the needs of the aquatic ecosystem, now and into the future. Fisheries and Oceans Canada (DFO) considers both the amount and	<p>Further discussion required.</p> <p>MCFN’s concern is with the loss of fish habitat and how that will be compensated for. “Agreeing” that the EA says the new habitat created is intended to be more productive doesn’t address MCFN’s underlying concern about the impact on fish/loss</p>

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<p>location is good and will provide habitat functions for many fish species in the area, the area of habitat creation is low compared to the overall habitat alteration and loss</p>	<p>the quality of habitat created in determining if additional compensation is required.</p> <p>Section 7.4.1 of the Draft EA notes that “the Fisheries Act Authorization will provide appropriate habitat offsets to counterbalance total aquatic habitat removal. This entails investments in the creation of fish habitat off-site.”</p>	<p>of fish habitat in the first place. Further discussion on this point is required.</p> <p>MCFN will look to further discussion and a commitment from the City to action additional offsetting / compensation of the remaining 39,700m² of fish habitat deficit in locations in the immediate Project area and potentially other areas proximal to the Credit River and/or within the Credit River watershed.</p> <p>City Response: The Alternatives Analyses provide the rationale for selecting the “large” lakefill alternative. The need for Fisheries Act Approval and off-site compensation for offsetting to address MCFNs concerns about fish habitat loss is acknowledged in the EA. The offset plan to be developed, in conjunction with DFO, MCFN, as part of the Fisheries Act Authorization will provide appropriate habitat offsets to counterbalance total aquatic habitat removal.</p> <p>Edits made in Section(s): 6.6, and 7.4.1 “Area and quality of aquatic habitat” and Table 9.4.</p>
<p>Creation and enhancement of additional fish habitat (beyond what is proposed here) along the eastern side of the east breakwater would likely provide a larger range of habitat function (forage, refuge,</p>	<p>The preferred alternative was developed within the boundaries of the City’s waterlot. There is limited space within the City's waterlot to provide parkland, the marina and offset all of the habitat impact.</p>	<p>Further discussion is required.</p> <p>The City’s commitment to engaging with MCFN as</p>

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<p>spawning, nursery) for fish, without impacting the function of the Project, future marina or parks.</p>	<p>The development of additional fish habitat along the eastern side of the east breakwater may be a possible alternative within the offsetting plan, but is not part of the 1PSEPM Project. This can be explored further in the next stage of the project through discussions with MCFN, the Province and DFO.</p>	<p>part of the DFO approval – and MCFN’s concerns – should be noted in the draft EA.</p> <p>MCFN will look to further discussion and a commitment from the City to action additional compensation of the remaining 39,700 m² of fish habitat deficit in locations in the immediate Project area and potentially other areas proximal to the Credit River and/or within the Credit River watershed.</p> <p>City Response: The City’s commitment to engaging with MCFN as part of both detailed design and the DFO approval are now clearly noted in the EA.</p> <p>Edits made in Section(s): 6.6, and 7.4.1 “Area and quality of aquatic habitat” and Table 9.4.</p>
<p>The deficit habitat (42,100m - 2,400m² = 39,700m²) should be compensated for or offset by another habitat restoration, rehabilitation or enhancement project within the Site, in the Credit River Watershed, or another significant location in MCFN Territory, in consultation with MCFN. As noted above, this will likely be discussed as part of the <i>Fisheries Act Authorization</i> and MCFN must be part of these processes.</p>	<p>Agreed. Section 7.4.1 of the Draft EA notes that “the Fisheries Act Authorization will provide appropriate habitat offsets to counterbalance total aquatic habitat removal. This entails investments in the creation of fish habitat off-site. Section 7.4.1 also commits the City to the development of the offset plan “in conjunction with DFO and Indigenous Communities, as part of the Fisheries Act Authorization”.</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) as part of the DFO approval – and MCFN’s concerns – should be noted in the draft EA.</p> <p>City Response: The City’s commitments to engaging the MCFN (specifically, not only general “Indigenous Communities”) have been clarified throughout the EA and in a new summary table of</p>

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		<p>commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and summarized in Table 9.4.</p>
<p>Appendices that include relevant information collected by the CVC and others should be attached to the EA Report to allow the reader to reference these data.</p>	<p>Agreed. The City has added a Draft technical memorandum entitled “Aquatic Ecology Technical Memorandum for the 1 Port Street East Proposed Marina Project” (January 2023) as an Appendix to the Draft EA. This memo provides the data sources for the aquatic assessment completed as part of the Project to allow the reader to reference the data used.</p>	<p>Agreement.</p>
<p>MCFN representatives should have the opportunity to participate in a monitoring and oversight capacity throughout the construction phase of the project, and in any related monitoring programs.</p>	<p>Agreed. Table 8.1 of the Draft EA identifies the commitments resulting from the 1PSEPM Project EA and states “The City will develop a monitoring plan consisting of EA compliance monitoring and environmental performance monitoring.”</p> <p>This table will be modified to include a commitment that Indigenous communities will be afforded the opportunity to participate in monitoring and oversight capacity throughout the construction phase of the project.</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) on monitoring and oversight should be noted in the draft EA.</p> <p>City Response: The City’s commitments to engaging the MCFN (specifically, not only general “Indigenous Communities”) have been clarified throughout the EA and in a new summary table of commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and summarized in Table 9.4.</p>
<p>Terrestrial Habitat</p>		

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<p>Detailed information about the terrestrial habitat and wildlife within the Site is not included and no detailed assessments were completed in the preparation of the EA Report.</p> <p>All information about terrestrial wildlife was gathered from Ontario Atlases (Bird, Herpetile, Insects) not from on-site assessments.</p>	<p>The 1PSEPM Project site is currently a parking lot and a rock breakwater that is overtopped by waves. Ornamental trees, bushes and shrubs exist along the site’s perimeter. The Draft EA concluded that the site has relatively low terrestrial habitat value and is dominated by hardscapes and marina infrastructure. As such, detailed fieldwork was not considered necessary for the purposes of EA. The Draft EA utilized the best available data from secondary sources. The datasets available from the various ecological atlases are robust and up to date. For example, the Ontario Breeding Bird Atlas and the Ontario Herpetology Atlas provides detailed information on the population and distribution status of Ontario birds and reptiles published in 2022.</p> <p>Therefore, the data collected both from secondary sources and in the field is considered sufficiently robust for the purposes of an EA.</p>	<p>Agreement that the site likely has relatively low terrestrial habitat features, but this should make a detailed inventory (detailed fieldwork) a relatively low time-burden and straight forward. Additional on-site information should be gathered, in addition to the information available from the reputable resources listed here by the City.</p> <p>City Response: An additional field survey was undertaken in April 2024. New information regarding vegetation on-site in the context of determining the potential for wildlife habitat (i.e., bats) is provided. The City, MCFN and others share a desire to undertake monitoring prior to and during construction and in the establishment phase of the 1PSEPM Project to ensure the effectiveness of the Project design and mitigation measures, particularly with respect to aquatic and terrestrial habitats.</p> <p>Edits made in Section(s): 3.3.9, section 8 and Table 9.4.</p>
<p>Insects. Two (2) Species at Risk Special Concern: Monarch Butterfly, Endangered: Mottled duskwing No suitable breeding habitat for Monarchs at the Site. No discussion of habitat preference of Mottled duskwing.</p>	<p>Agreed. The Draft EA will be modified to indicate that suitable/preferred habitat for Mottled Duskywing does not occur within 1PSEPM Project site. Historic record of elemental occurrence in Mississauga predates 1990.</p>	<p>Agreement. Clarification should be provided in the EA that indicates habitat preference for Mottled Duskwing (and that habitat preferences do not align with habitat at site) and contextualizes the historical occurrence.</p>

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		<p>City Response: The suitable habitat preferences for the Mottled Duskwing have not been included. This is an oversight.</p> <p>However, the EA now clearly states that during the detailed design stage, the City will work collaboratively with the MCFN and others to develop feasible vegetation plans including how those can support creating a naturalized habitat for species such as the Monarch Butterfly, Mottled Duskwing and turtles.</p> <p>Edits made in Section(s): 6.6 and Table 9.4.</p>
<p>There are limited details about the vegetation plan / approach for the parking, park areas or the margin of the breakwater, though it is stated that consideration will be given to permeable pavement and creating naturalized habitat that is less actively used by the public, to support migratory songbirds. More information is needed about the approach that will be taken to provide high-quality terrestrial habitat for local wildlife at the Site. Habitat needs of at-risk wildlife with the potential to occur within the Site should be considered (Monarch Butterfly, Mottled duskwing, turtle species).</p>	<p>Agreed. Details regarding vegetation plans / approach to park areas or the margin of the breakwater are the subject of detailed design. The detailed design will be guided by the following commitments made in Section 7.4.1 of the Draft EA:</p> <ul style="list-style-type: none"> ○ Minimize the removal of existing trees to the extent possible, particularly along Port Street and adjacent to St Lawrence Park. ○ Tree protection measures will be determined during detailed design by the City. Removals will be offset by compensatory planting as part of the proposed park. ○ Planting will be wildlife friendly native, non-invasive trees and shrubs. ○ Considerations will be given to creating a naturalized habitat 	<p>MCFN’s concern should be noted in the draft EA and that further discussions will take place between the City and MCFN at the detailed design stage to address this concern.</p> <p>MCFN will expect to be engaged for a site visit and/or to review draft detailed vegetation plans (terrestrial component) once completed.</p> <p>MCFN will expect that the commitments made in the EA regarding terrestrial habitat are adhered to,</p>

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	<p>that is less actively used by the public to give migrating song birds important habitat during migration</p> <p>The Draft EA will be modified to ensure consideration is also given to the habitat needs of at-risk wildlife with the potential to occur within the site.</p>	<p>that the consideration of creating a naturalized habitat less used by public (to provide quality habitat for migratory birds) is committed to (rather than considered) and that terrestrial habitat plans are updated to include habitat preferences of local at-risk wildlife.</p> <p>City Response: The EA now clearly states that during the detailed design stage, the City will work collaboratively with the MCFN and others to develop feasible vegetation plans including how those can support creating a naturalized habitat for species such as the Monarch Butterfly, Mottled Duskwing and turtles.</p> <p>Edits made in Section(s): 6.6 and Table 9.4.</p>
<p>It is stated that any vegetation removal or major construction will take place outside of the breeding bird period (protective of breeding and migratory birds).</p>	<p>Agreed. Section 7.4.1 states that the City will “Comply with measures of the Migratory Birds Convention Act: vegetation removal will occur outside of breeding bird period (typically April 15-August 31).”</p>	<p>It is imperative that timing windows are strictly adhered to.</p> <p>Agreement.</p>
<p>Assessment</p>		
<p>Overall, the EA Report provides some of the necessary information to demonstrate that the Proponent has an adequate understanding of the existing environmental conditions at the Site.</p>	<p>Comment noted</p>	<p>N/A</p>
<p>Considering the lack of up-to-date and validated ecological data for the</p>	<p>Comment noted</p>	<p>Further discussion is required.</p>

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<p>Site, the identification and evaluation of alternatives and impacts in the EA Report is adequate.</p>		<p>MCFN’s concern is related to elements where there is not up-to-date or current data. Further discussions are needed on how and when these gaps will be addressed beyond only noting the comment.</p> <p>City Response: The MCFN’s concern over data quality is acknowledged and a commitment pre, during and post construction monitoring is made. Monitoring programs will be designed and implemented collaboratively with the MCFN.</p> <p>Edits made in Section(s): 7.4 “Area and quality of aquatic habitat” and 8.1. Commitments to monitoring with MCFN are in Table 9.4.</p>
<p>The overall effects assessment determined a negligible impact on the environment at and surrounding the Site (across the PSA, LSA, and RSA). The overall impact of the Project will likely be negligible if all mitigation measures and wildlife timing windows are strictly adhered to, and additional terrestrial and aquatic habitat enhancement and creation measures are implemented.</p>	<p>Comment noted</p>	<p>N/A</p>

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<p>The EA Report notes that CVC has not identified species at risk (SAR) on the eastern breakwater, but have identified SAR at nearby parks and at the mouth of the Credit River. While the mouth of the Credit River is outside the PSA, it is within the LSA, and SAR observations at the Credit River mouth should be considered in the assessment of the Site, evaluation of impacts of the Project, in-water work timing windows, and in the conditions of the <i>Fisheries Act</i> Authorization. More specific information should be provided related to the CVC SAR Research Project (2014), and other fish assessments completed in the vicinity of the Site.</p>	<p>A list of documented fish species with potential presence within the Credit River, at the mouth of the Credit River, or within the vicinity of the Local and Project Study Areas is presented in Table 3.3 of the Draft EA and Appendix 1.</p> <p>Section 2.2.1 of the Draft EA discusses some of the results of the CVC SAR Research Project (2014). Specifically, the Draft EA notes that “Although there were no SAR or SCC identified specifically on the eastern breakwater, a variety of species have been observed at nearby parks and at the mouth of Credit River itself”.</p> <p>Habitat occurring in the waterlot has a variety of substrate and depths common to much of the Lake Ontario shoreline. No uncommon habitat elements are present. Thus, addressing potential impacts to specific SAR identified in the LSA is captured under the discussion of potential impacts to fish habitat in general.</p> <p>Agreed that consideration of in-water work timing windows, and in the conditions of the <i>Fisheries Act</i> Authorization will need to consider SAR observations in the LSA.</p>	<p>The comment was intended to identify that all species that use the vicinity are likely to use the Project area (at some point) and all of these species and life stages (and not just those in the immediate project area) should be considered in the <i>Fisheries Act</i> Authorization and adherence to in-water timing windows.</p> <p>City Response: The City thanks MCFN for this clarification. It is standard practice for a wide range of species and their life stages to be considered both in the EA and the Fisheries Act Authorization. New information has been added regarding habitat preferences for aquatic Species at Risk that will be considered during detailed design, the Fisheries Act Authorization and in developing compensation or offsetting measures. Clarity has been provided regarding adherence to the applicable in-water timing windows.</p> <p>Edits made in Section(s): 3.3.1 and 7.4.1 “Area and Quality of Fish Habitat” and “Potential effects on aquatic Species at Risk (SAR) and/or habitat.”</p>
<p>It is difficult to determine the potential impact and benefit of the Project on aquatic and terrestrial wildlife at the Site, especially SAR fish, and migratory and breeding birds due to the lack of recent, Site-specific assessments and the lack of details regarding terrestrial habitat creation</p>	<p>The impacts of the 1PSEPM Project on aquatic and terrestrial wildlife at the site are provided in Chapter 7 of the Draft EA. The Draft EA commits the City to the development of a detailed design and obtaining a <i>Fisheries Act</i> Authorization that will address the</p>	<p>Ongoing discussion is required.</p> <p>Review of detailed design for aquatic and terrestrial habitat works, monitoring and</p>

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at the Site.	habitat offsets to counterbalance the productivity of aquatic habitat removal. The Draft EA also commits the City to the consideration of integrating woody vegetation and creating portions of naturalized terrestrial habitat that will support song birds during migration.	<p>construction schedules are required, once drafted.</p> <p>City Response: The EA does not include a schedule for detailed design, pre-construction monitoring nor for construction activities. However, the City has committed to undertaking these activities collaboratively with MCFN and schedules will be shared once they are developed post EA approval and post City Council’s decisions on how to proceed with the 1PSEPM Project.</p> <p>Edits made in Section(s): None required, as the EA already includes the City’s commitments to MCFN.</p>
Soil and (lake) sediment sampling completed as part of other projects (2016) show some exceedances of heavy metals and other contaminants (PHC, PAH) due to leaks and spills associated with above ground storage tanks and piping in the southwest portion of the PSA related to historical and boat storage and marine activities, including winter salt application. This poses risks to aquatic life when upper level sediments are re-suspended during lake infill and related construction works. No new / up to date sampling was completed as part of the Project.	<p>No new / up-to-date sampling of soils or lake sediments was undertaken as part of this EA. The Golder (2016) report was deemed sufficient for the purposes of the EA and indicated that within the existing marina basin and immediately east of the eastern breakwater, surface water quality generally met Provincial Water Quality Objectives (PWQO) standards, except for total nickel in one shallow surface water sample and copper at two shallow and deep surface water samples.</p> <p>Section 7.2.1 of the Draft EA provides an assessment of the impacts of on-shore works and sediment resuspension on water quality and provides mitigation measures to be implemented during construction. Taking into the consideration the effective implementation of mitigation measures, the net effect of the Project</p>	<p>Information noted and agreed that the Golder assessment is likely sufficient to indicate risk.</p> <p>MCFN will look to review and discuss additional pre-during-post construction monitoring plans, once they are developed.</p> <p>It is important to monitor any changes in metal or contaminant concentrations in water and/or sediment both during and post-construction to “test” that the effect of the Project is in-fact negligible - and so that further action can be taken on unexpected impacts.</p>

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	on surface water quality was considered <i>Negligible</i> .	<p>City Response: The City has committed to involving the MCFN in the detailed design, including the development of various management plans, and pre, during and post construction monitoring planning and implementation.</p> <p>Edits made in Section(s): 6.6 and Table 9.4.</p>
Stormwater management is discussed and appropriate bioswale approaches have been proposed to manage run off from the parking areas, in addition to consideration of permeable parking lots to reduce run-off.	Comment noted	Agreement.
Assessment of the current nearshore conditions at the Site, including substrate types and quality, and a review of the hydrological and limnological processes occurring along the shoreline and between the Credit River and Lake Ontario (sediment transport, hydrologic characteristics of wave action, currents, high water levels) are complete and aligned with the proposed approach to the Project.	Comment noted	Agreement.
The majority of the new marina infrastructure (docks and walkways) are described as floating. This is the best option to reduce impacts to fish and fish habitat.	Comment noted	Agreement.

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<p>The approach to armourstone is described as “random” which creates more spacing between armourstone. This will likely provide more habitat opportunities for aquatic life (interstitial spacing in below-ground armourstone). It is possible that other bioengineering approaches could be implemented (they exist), to reduce the amount of hardened structure at the Site.</p>	<p>Agreed. The conceptual design of the project used the best available options to provide habitat opportunities for fish.</p> <p>Bioengineering approaches will be considered within the semi-sheltered embayment at the south end of the site. However, the potential is very limited. No other part of the shoreline is suitable for bioengineering options.</p>	<p>Agreement.</p>
<p>More information is needed about pre, during, and post construction monitoring that will occur at the Site, as well as the proposed construction schedule.</p>	<p>Chapter 8 of the Draft EA provides an outline of the project’s approach to monitoring and adaptive management. Table 8.2 provides a commitment that “The City will develop a monitoring plan consisting of EA compliance monitoring and environmental performance monitoring” during detailed design. It is premature to develop a construction schedule prior to the completion of the detailed design.</p>	<p>Further discussion required.</p> <p>MCFN’s concern should be noted in the draft EA and that further discussions will take place between the City and MCFN at the detailed design stage to address this concern.</p> <p>City Response: The EA does not include a schedule for detailed design, pre-construction monitoring nor for construction activities. However, the City has committed to undertaking these activities collaboratively with the MCFN and schedules will be shared once they are developed post EA approval and post City Council’s decisions on how to proceed with the 1PSEPM Project.</p> <p>The City has committed to involving MCFN in the detailed design, including the development of various management plans, and pre, during and post construction monitoring planning and implementation.</p>

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Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
		<p>Edits made in Section(s): Throughout the EA, Section 6.6, Section 8 and Table 9.4.</p>
<p>More information will be needed at the detailed design stage regarding the creation of fish habitat on the south edge of the breakwater, and any other fish habitat enhancement or creation elements that will be added to the Site.</p>	<p>Comment noted</p>	<p>Further discussion required.</p> <p>MCFN’s concern should be noted in the draft EA and that further discussions will take place between the City and MCFN at the detailed design stage to address this concern.</p> <p>City Response: The City has committed to involving MCFN in the detailed design, including the development of various management plans, and pre, during and post construction monitoring planning and implementation.</p> <p>Edits made in Section(s): Throughout the EA, Section 6.6, Section 8 and Table 9.4.</p>
<p>Additional consultation and engagement will be required through detailed design and implementation of the Project.</p>	<p>Table 8.1 of the Draft EA will be modified to include a commitment that Indigenous communities will be consulted during the detailed design and implementation of the Project.</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) as part of the detailed design and implementation phases should be noted in the draft EA.</p> <p>City Response: The City’s commitments to engaging the MCFN (specifically, not only general “Indigenous Communities”) have been clarified</p>

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
		<p>throughout the EA and in a new summary table of commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and summarized in Table 9.4.</p>
<p>There is an opportunity to include accurate and appropriate educational signage or other elements related to the significance of this location to MCFN. These must be developed collaboratively with MCFN.</p>	<p>Agreed. The suggested education modules, signage, and other design components will be discussed with MCFN during detailed design.</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) as part of the detailed design phase should be noted in the draft EA.</p> <p>City Response: The City’s commitments to engaging the MCFN (specifically, not only general “Indigenous Communities”) have been clarified throughout the EA and in a new summary table of commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and summarized in Table 9.4.</p>
Key Concerns and Questions		
1 - SAR Fish (Lake Sturgeon and American Eel)		
<p>Though Site-specific observations of fish SAR (e.g., American Eel, Lake Sturgeon) are limited, considerations should be made for these species in the east breakwater design and any other new or enhanced habitat features (American Eel), and in the timing of construction and implementation of mitigations (Lake Sturgeon and American Eel).</p>	<p>Opportunities for the incorporation of habitat suitable for American Eel and Lake Sturgeon in the habitat feature at the south end of the Project site are limited although abundant large interstitial habitat, benthic invertebrate habitat and high-energy zones are anticipated to be created as part of the habitat offsetting plan.</p>	<p>The opportunity for additional habitat creation with features that support Lake Sturgeon or American Eel (noting different habitat preferences) and/or other fish species can be considered as part of habitat creation / restoration outside of the immediate (south end) Project area.</p>

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Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
	<p>The Project will however create habitat (interstitial refuge spaces) for the American Eel within the breakwater’s armourstone.</p> <p>The City will work collaboratively with DFO, the province and MCFN to identify and evaluate off-site opportunities that could provide new or enhanced habitat features as part of its habitat offsetting plan.</p>	<p>Habitat with features appropriate for these species can be considered as part of the additional 39,700 m² that still must be compensated for. This will likely require discussions between MCFN, the City, the Province and DFO.</p> <p>City Response: An enhanced effects assessment on fish and fish habitat Including SAR species), along with additional mitigations and the need for Fisheries Act Approval and off-site compensation or offsetting to address MCFNs concerns is provided. The offset plan to be developed, in conjunction with DFO, MCFN, as part of the Fisheries Act Authorization will provide appropriate habitat offsets to counterbalance total aquatic habitat removal.</p> <p>New information has been added regarding habitat preferences for aquatic Species at Risk that will be considered during detailed design, the Fisheries Act Authorization and in developing compensation or offsetting measures. Clarity has been provided regarding adherence to the applicable in-water timing windows.</p>

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Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
		<p>The City’s commitments to further engagement with the MCFN are provided throughout the EA and summarized in a table.</p> <p>Edits made in Section(s): 3.3.1 and 7.4.1 “Area and Quality of Fish Habitat” and “Potential effects on aquatic Species at Risk (SAR) and/or habitat, and Table 9.4.</p>
<p>The Proponent must confirm that there is no suitable American Eel habitat at the Site, and consider this species in the creation of new habitat (soft/mud substrates, vegetation, and interstitial refuge spaces).</p>	<p>The field studies undertaken as part of this EA and documented on Figure 3.9 of the Draft EA indicate that some habitat may exist for growing eels using substrate (rock, sand, mud), and woody debris. This type of substrate exists to at least 10 m depth. The interstitial spaces provided by the east breakwater may also be important to American Eel as cover. For these reasons, a precautionary approach has been adopted and the design of habitat offsetting measures will strive to incorporate habitat elements suitable for American Eel.</p>	<p>Further discussion required.</p> <p>As above, ongoing engagement on construction schedules, mitigations to protect fish and fish habitat (and SAR American Eel), fish habitat offsetting / compensation habitat design and implementation are required once more detailed information is available.</p> <p>City Response: The EA does not include a schedule for detailed design, pre-construction monitoring nor for construction activities. However, the City has committed to undertaking these activities collaboratively with the MCFN and schedules will be shared once they are developed post EA approval and post City Council’s decisions on how to proceed with the 1PSEPM Project.</p>

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Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
		<p>The City has committed to involving the MCFN in the detailed design, including the development of various management plans, the Fisheries Act Authorization, and pre, during and post construction monitoring planning and implementation.</p> <p>Edits made in Section(s): Throughout the EA, Section 6.6, Section 8 and Table 9.4.</p>
<p>Due to the sensitivity of Lake Sturgeon, especially juvenile Lake Sturgeon that may be using nearshore areas as habitat, strict adherence to in-water work timing windows that include Lake Sturgeon life-history are required.</p>	<p>Agreed. A timing window suitable for the Lake Sturgeon will be considered as part of the <i>Fisheries Act</i> Authorization process and taken into account in the construction schedule.</p>	<p>Timing windows to protect Lake Sturgeon must be part of the Fisheries Act Authorization and construction schedule. This commitment should be reflected in the EA.</p> <p>City Response: New information has been added regarding habitat preferences for aquatic Species at Risk that will be considered during detailed design, the Fisheries Act Authorization and in developing compensation or offsetting measures.</p> <p>Clarity has been provided regarding adherence to the applicable in-water timing windows.</p>

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		<p>The new information in the EA identifies the potential for aquatic SAR in the project areas; Lake Sturgeon, American Eel, Shortnose Cisco and Deepwater Sculpin. It is noteworthy that Lake Sturgeon (Great Lakes - Upper St. Lawrence River population), Shortnose Cisco, and Deepwater Sculpin have a low potential for use of the Project site.</p> <p>Edits made in Section(s): 3.3.1 and 7.4.1 “Area and Quality of Fish Habitat” and “Potential effects on aquatic Species at Risk (SAR) and/or habitat, and Table 9.4.</p>
<p>2 - Fish and Fish Habitat (General)</p>		
<p>When were the last assessment events (actual collection (general or targeted)) of aquatic and terrestrial species within the vicinity of the Project?</p>	<p>Latest fish abundance data is from 2002 published by CVC in a 2018 report entitled Credit Valley Conservation (2018). Lake Ontario Integrated Shoreline Strategy Characterization Report. Mississauga: Credit Valley Conservation. The City will confirm this with the CVC.</p>	<p>Much of the data is 20 years old, with some new data from 10 years ago (2014). This data is sufficient for planning purposes, but additional monitoring should be completed pre - during and post construction to support assessment of unexpected impacts related to project activities and to provide indicators of “success’ for habitat compensation projects.</p> <p>City Response: MCFN’s concern over data quality is acknowledged and a commitment pre, during and post construction monitoring is made.</p>

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Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
		<p>Monitoring programs will be designed and implemented collaboratively with the MCFN.</p> <p>Edits made in Section(s): 7.4 “Area and quality of aquatic habitat” and 8.1. Commitments to monitoring with MCFN are in Table 9.4.</p>
<p>Is any fish salvage anticipated to be required during construction?</p>	<p>As indicated in the meeting held with MCFN on September 7, 2023, fish salvage operations are not anticipated. Construction is done with clean stone material and turbidity is monitored. The construction area is not going to be enclosed during construction. Some precautions may be taken to remove fish near the breakwater and/or deter fish presence.</p>	<p>Agreement. Clarification provided during a MCFN-City meeting.</p> <p>As above, detailed construction and mitigation plans must be provided for review and clearly identify the observations during construction activities that would trigger fish salvage.</p> <p>City Response: The EA states that as appropriate, areas will be cleared of fish prior to fill placement. Any fish entrapped in fill areas will be removed to the lake.</p> <p>The City has committed that in seeking the <i>Fisheries Act</i> Authorization from DFO, the City will work collaboratively with MCFN and others to integrate requirements for site observations during construction activities that would trigger fish salvage.</p> <p>Edits made in Section(s): 7.4 “Area and quality of</p>

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		aquatic habitat” and 8.1. Commitments to developing triggers/methods for fish salvage and monitoring with MCFN are in Table 9.4.
<p>What fish / in-water work timing windows will be implemented during construction?</p>	<p>Appropriate in-water works timing windows will be developed during detailed design and the <i>Fisheries Act</i> Authorization process.</p>	<p>MCFN expects a commitment to adherence to all applicable in-water work timing windows and considerations for SAR fish in the fish habitat compensation plan(s).</p> <p>City Response: Appropriate in-water works timing windows will be developed during detailed design and the <i>Fisheries Act</i> Authorization process.</p> <p>Clarity has been provided regarding adherence to the applicable in-water timing windows.</p> <p>Edits made in Section(s): 7.4 “Area and quality of aquatic habitat”</p>
<p>Fish SAR are not explicitly discussed in the EA Report. However, American timing and Lake Sturgeon are noted in a report table (CVC data) as recovered in the Credit River Coastal Reach (in the vicinity of the Project). These two fish must be considered in the application of in-water work timing windows and other mitigations, habitat destruction/alteration, and habitat creation and enhancement plans, as well as the <i>Fisheries Act</i> Authorization.</p>	<p>Habitat occurring in the waterlot has a variety of substrate and depths common to much of the Lake Ontario shoreline. No uncommon habitat elements are present.</p> <p>Agreed that consideration of in-water work timing windows, the creation of a habitat off-setting plan and in the conditions of the <i>Fisheries Act</i> Authorization should consider American Eel and Lake Sturgeon.</p>	<p>MCFN expects a commitment to adherence to all applicable in-water work timing windows and considerations for SAR fish in the fish habitat compensation plan(s).</p> <p>City Response: Appropriate in-water works timing windows will be developed during detailed design and the <i>Fisheries Act</i> Authorization process. The agreed upon timing window will be stated as a condition in the <i>Authorization</i> from the DFO.</p>

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		<p>Clarity has been provided regarding adherence to the applicable in-water timing windows.</p> <p>Edits made in Section(s): 7.4 “Area and quality of aquatic habitat”</p>
<p>How will the habitat deficit (39,700m² (alterations and destruction) 26,700m² (destruction only)) be offset or compensated for? MCFN must be involved in decisions regarding suitable offset or compensation projects in MCFN Territory.</p>	<p>The Draft EA indicates that an offsetting plan will be required to address the habitat deficit identified in Chapter 6 of the Draft EA. The manner in which this offset is achieved will be subject to discussions with Fisheries and Oceans Canada.</p> <p>The City has committed to engaging with MCFN for authorizations and permits under federal and provincial legislation.</p>	<p>Further discussion required.</p> <p>MCFN’s concern should be noted in the draft EA and it should also note the City’s commitment that further discussions will take place between the City and MCFN to address this concern as part of the DFO or other permits/authorizations required.</p> <p>MCFN expects that the City will commit that deficit habitat will be fully compensated.</p> <p>City Response: The EA now states that an offset plan to be developed, in conjunction with DFO, the MCFN and other interested Indigenous communities, as part of the Fisheries Act Authorization will provide appropriate habitat offsets to counterbalance total aquatic habitat removal. This entails investments in the creation of fish habitat off-site. The offset plan will also detail post construction monitoring techniques to</p>

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		<p>evaluate the effectiveness of the offset strategies.</p> <p>Edits made in Section(s): 7.4 “Area and quality of aquatic habitat”.</p>
<p>Are there additional concepts that could be considered that incorporate more natural elements or bioengineering approaches (e.g., less armourstone) into the east breakwater design?</p>	<p>The conceptual design of the project used the best available options to provide habitat opportunities for fish. The use of armourstone is essential to the structural integrity of the lakefill. The approach to armourstone placement described in Chapter 6 of the Draft EA creates more spacing between armourstone. This will likely provide more habitat opportunities for aquatic life (interstitial spacing in below-ground armourstone).</p> <p>Severity of the coastal conditions does not allow for the use of bioengineering options along the shoreline of the lakefill.</p>	<p>MCFN will look to ongoing discussions with and commitments from the City, Province, and DFO regarding habitat compensation design / offsetting options beyond the immediate Project area.</p> <p>City Response: An enhanced effects assessment on fish and fish habitat is provided along with additional mitigations and the need for Fisheries Act Approval and off-site compensation or offsetting to address MCFNs concerns. There is a commitment to examine the feasibility of bioengineering options and habitat creation off-site, including the feasibility of the creating and/or enhancing fish habitat in areas proximal to the Credit River and/or within the Credit River watershed. There is also a commitment to examine the feasibility of habitat creation of the east side of the new lakefill.</p> <p>Edits made in Section(s): 6.6, 7.4 “Area and quality of aquatic habitat” and Table 9.4.</p>

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Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
<p>The proposed fish habitat creation at the southern edge of the east breakwater includes a well- designed small embayment refuge area. Though its design is good, the area covered by the fish habitat creation is relatively small compared to the area of habitat removal. Additional habitat enhancement and creation must be developed at the Site and likely off-Site.</p>	<p>Agreed. The Draft EA indicates that a habitat offsetting plan will be required at detailed design to address the habitat deficit identified in Chapter 6 of the Draft EA.</p>	<p>Agreement.</p> <p>See previous comments re: commitments to habitat creation.</p> <p>City Response: An enhanced effects assessment on fish and fish habitat is provided along with additional mitigations and the need for Fisheries Act Approval and off-site compensation or offsetting to address MCFNs concerns. There is a commitment to examine the feasibility of bioengineering options and habitat creation off-site, including the feasibility of the creating and/or enhancing fish habitat in areas proximal to the Credit River and/or within the Credit River watershed. There is also a commitment to examine the feasibility of habitat creation of the east side of the new lakefill.</p> <p>Edits made in Section(s): 6.6, 7.4 “Area and quality of aquatic habitat” and Table 9.4.</p>
<p>There are likely opportunities for additional aquatic habitat enhancements along the eastern edge of the breakwater, or potentially the shore extent just east of the Project (parallel to St.Lawrence Park) including the addition of diverse substrate, plantings within hardened elements, and plantings of submerged or emergent aquatic vegetation.</p>	<p>Agreed. The City will work collaboratively with Fisheries and Oceans Canada, the province and MCFN to identify and evaluate off-site opportunities that could provide new or enhanced habitat features as part of its offset program.</p>	<p>Agreement.</p> <p>MCFN will look for commitment from the City and the Province to advance these discussions for habitat creation beyond the immediate project</p>

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	<p>The development of additional fish habitat along the eastern side of the east breakwater is a possible alternative within the offsetting plan, but is not part of the 1PSEPM Project. This would necessarily involve engagement with MCFN, the Province and DFO.</p>	<p>area.</p> <p>City Response: An enhanced effects assessment on fish and fish habitat is provided along with additional mitigations and the need for Fisheries Act Approval and off-site compensation or offsetting to address MCFNs concerns. There is a commitment to examine the feasibility of bioengineering options and habitat creation off-site, including the feasibility of the creating and/or enhancing fish habitat in areas proximal to the Credit River and/or within the Credit River watershed. There is also a commitment to examine the feasibility of habitat creation of the east side of the new lakefill.</p> <p>Edits made in Section(s): 6.6, 7.4 “Area and quality of aquatic habitat” and Table 9.4.</p>
<p>There are a number of contaminants in the upper sediment layers at the Site, related to historical and ongoing use of the area, and deposition of contaminants from the outfall of the Credit River. How will the release of these be managed and monitored during construction?</p>	<p>Table 8.1 of the Draft EA identifies the commitments resulting from the 1PSEPM Project EA and states that “The City will develop a monitoring plan consisting of EA compliance monitoring and environmental performance monitoring.” For example, monitoring of turbidity during construction would be included in the EA compliance monitoring plan. Further details of the monitoring program will be developed as part of the detailed design and Fisheries Act Authorization processes.</p>	<p>MCFN will look for detailed information on pre - during - post construction monitoring program(s) as the project advances, and as part of regulatory approvals.</p> <p>MCFN will expect a robust monitoring program that can accurately assess residual impacts and identify the need for additional mitigation or remedial actions.</p>

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		<p>City Response: The EA does not include a detailed, pre-construction, construction or post construction monitoring program. However, the City has committed to undertaking these activities collaboratively with the MCFN during detailed design and the Fisheries Act Authorization processes. These plans will only be developed post EA approval and post City Council’s decisions on how to proceed with the 1PSEPM Project.</p> <p>The City has committed to involving the MCFN in the detailed design, including the development of various management plans, and pre, during and post construction monitoring planning and implementation.</p> <p>Edits made in Section(s): Throughout the EA, Section 6.6, Section 8 and Table 9.4.</p>
<p>4 - Terrestrial Wildlife</p> <p>The EA Report provides information about the presence of terrestrial wildlife at the Site based on desktop review of available resources. Though the resources referenced are trusted resources, additional</p>	<p>The 1PSEPM Project site is currently a parking lot and a rock breakwater that is overtopped by waves. Ornamental trees, bushes and shrubs exist along the site’s perimeter. The 1PSEPM Project</p>	<p>Further discussion required to ensure that no terrestrial wildlife of concern are in the trees/bushes along the site perimeter.</p>

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<p>ground-truthing and assessments should be completed prior to construction activities.</p>	<p>will need to comply with City policies and standards regarding vegetation removals and plantings through further study and ground-truthing prior to construction.</p>	<p>As discussed in an earlier comment, the size and relatively low complexity of the habitat on site, should allow the completion of additional assessments to ensure protection of wildlife and appropriate habitat creation.</p> <p>City Response: An additional field survey was undertaken in April 2024. New information regarding vegetation on-site in the context of determining the potential for wildlife habitat (i.e., bats) is provided. The City, MCFN and others share a desire to undertake monitoring prior to and during construction and in the establishment phase of the 1PSEPM Project to ensure the effectiveness of the Project design and mitigation measures for the protection of wildlife.</p> <p>Edits made in Section(s): Section 3.3.9, Section 8 and Table 9.4.</p> <p>MCFN’s interest is also in ensuring that future plans for this area support native species of plants and wildlife. This interest should be noted in the draft EA and that further discussions will take place between the City and MCFN at the detailed design stage to address this interest.</p>

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		<p>City Response: Section 7.4.2 of the EA states that on parkland created, native non-invasive species of trees, shrubs and other vegetation will be planted that may be used by urban tolerant wildlife and birds. The newly created area may function as a stopover for migratory birds. This potential terrestrial habitat has the potential to compliment other Lake Ontario shoreline and inland migratory bird habitat and increased habitat connectivity.</p> <p>The EA now clearly states that during the detailed design stage, the City will work collaboratively with the MCFN and others to develop feasible vegetation plans.</p> <p>Edits made in Section(s): 6.6 and in Table 9.4.</p>
<p>There are limited details about the vegetation plan / approach for the parking, park areas or the margin of the breakwater. More information is needed about the detailed approach that will be taken to provide high-quality terrestrial habitat for local wildlife at the Site. Habitat needs of at-risk wildlife with the potential to occur within the Site should be considered (Monarch Butterfly, Mottled duskwing, turtle species).</p>	<p>Agreed. Details regarding vegetation plans / approach to park areas or the margin of the breakwater are the subject of detailed design. The detailed design will be guided by the following commitments made in Section 7.4.1 of the Draft EA:</p> <ul style="list-style-type: none"> ○ Minimize the removal of existing trees to the extent possible, particularly along Port Street and adjacent to St Lawrence Park. ○ Tree protection measures will be determined during detailed design by the City. Removals will be offset by compensatory planting as part of the proposed park. 	<p>MCFN’s interest is in ensuring that future plans for this area support native species of plants and wildlife. This interest should be noted in the draft EA and that further discussions will take place between the City and MCFN at the detailed design stage to address this interest.</p> <p>City Response: The EA now clearly states that during the detailed design stage, the City will work collaboratively with the MCFN and others to</p>

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	<ul style="list-style-type: none"> ○ Planting will be wildlife friendly native, non-invasive trees and shrubs. ○ Considerations will be given to creating a naturalized habitat that is less actively used by the public to give migrating song birds important habitat during migration <p>The Draft EA will be modified to ensure consideration is also given to the habitat needs of at-risk wildlife with the potential to occur within the site.</p>	<p>develop feasible vegetation plans including how those can support creating a naturalized habitat for species of interest to the MCFN.</p> <p>Edits made in Section(s): 6.6 and Table 9.4.</p>
<p>Adherence to breeding and migratory bird timing windows is required to protect these species from negative impacts and must be implemented during construction.</p>	<p>Agreed. The Draft EA commits to compliance with appropriate breeding and bird timing windows with respect to vegetation removal.</p>	<p>Agreement.</p> <p>MCFN will expect all wildlife timing windows are strictly adhered to.</p> <p>City Response: Agreed. The EA commits to compliance with appropriate breeding and bird timing windows with respect to vegetation removal.</p> <p>Edits made in Section(s): None warranted, as the EA includes commitments to compliance with timing windows.</p>
<p>MCFN must be updated and engaged on permits or authorizations granted under the relevant legislation to protect at-risk species at this site.</p>	<p>Agreed. The City has committed to engaging with MCFN for authorizations and permits under federal and provincial legislation. In addition, the Draft EA will be modified to include a commitment that Indigenous communities will be afforded the opportunity to</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) as part of the detailed design phase should be noted in the draft EA.</p>

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	participate in monitoring and oversight capacity throughout the construction phase of the project.	<p>City Response: The City’s commitments to engaging the MCFN (specifically, not only general “Indigenous Communities”) have been clarified throughout the EA and in a new summary table of commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and Table 9.4</p>
Recommendations		
<p>1. MCFN must be consulted during detailed design and development of conditions under the <i>Fisheries Act</i> Authorization, and any other provincial or federal permits required to complete the Project (e.g., <i>Endangered Species Act, Species at Risk Act or Navigable Waters Act</i>).</p>	<p>Agreed. The City has committed to engaging with MCFN for authorizations and permits under federal and provincial legislation. In addition, the Draft EA will be modified to include a commitment that Indigenous communities will be afforded the opportunity to participate in monitoring throughout the construction phase of the project.</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) as part of the detailed design phase should be noted in the draft EA.</p> <p>City Response: The City’s commitments to engaging the MCFN (specifically, not only general “Indigenous Communities”) have been clarified throughout the EA and in a new summary table of commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and Table 9.4</p>
<p>2. There is substantial deficit habitat (between 26,700 and 39,700 m2 that must be compensated for or offset by another habitat restoration, rehabilitation or enhancement project in MCFN</p>	<p>Agreed. Section 7.4.1 of the Draft EA notes that “the Fisheries Act Authorization will provide appropriate habitat offsets to counterbalance total aquatic habitat removal. This entails</p>	<p>Further discussions required.</p> <p>City Response: Not Applicable. There appears to</p>

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
Territory, in consultation with MCFN. This will likely be discussed as part of the <i>Fisheries Act Authorization</i> , and MCFN must be part of these processes.	investments in the creation of fish habitat off-site.” The City has committed to engaging with MCFN for authorizations and permits under federal and provincial legislation.	be Agreement.
3. Habitat needs of at-risk and local terrestrial species must be considered during construction (retaining as much existing vegetation as possible), and in the design of new terrestrial habitat for the park and breakwater area. Detailed design of terrestrial habitat must be shared with MCFN.	The 1PSEPM Project site is currently a parking lot and a rock breakwater that is overtopped by waves. Ornamental trees, bushes and shrubs exist along the site’s perimeter. There are limited habitat opportunities for wildlife. Nevertheless, The Draft EA will be modified to ensure consideration is also given to the habitat needs of at-risk wildlife with the potential to occur within the site.	<p>MCFN will expect to be engaged for site visit and/or review draft detailed vegetation plans (terrestrial component) once completed.</p> <p>MCFN will expect that the commitments made in the EA regarding terrestrial habitat are adhered to, that the consideration of creating a naturalized habitat less used by public (to provide quality habitat for migratory birds) <u>is committed to (rather than considered)</u> and that terrestrial habitat plans are updated to include habitat preferences of local at-risk wildlife.</p> <p>City Response: The EA now clearly states that during the detailed design stage, the City will work collaboratively with the MCFN and others to develop feasible vegetation plans including how those can support creating a naturalized habitat for species of interest to the MCFN.</p> <p>Edits made in Section(s): 6.6 and Table 9.4.</p>

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
4. Standard mitigation measures are presented in the report and are expected to be strictly adhered to. Mitigations related to turbidity and sediment release must be controlled to the greatest extent possible to protect fish and fish habitat during construction. In-water work timing windows must also be strictly adhered to, to protect sensitive life-stages of fish.	Comment noted.	Agreement. MCFN will look to ongoing dialogue as construction timing window, mitigation and monitoring plans are refined.
5. Timing windows to protect terrestrial wildlife (migratory and nesting birds) must be adhered to.	The 1PSEPM Project site is currently a parking lot and a rock breakwater that is overtopped by waves. Ornamental trees, bushes and shrubs exist along the site’s perimeter. There are limited habitat opportunities for wildlife. The Draft EA commits to compliance with appropriate breeding and bird timing windows with respect to vegetation removal.	Agreement. Commitment to adherence to breeding bird timing windows is noted. MCFN will expect that all wildlife timing windows are strictly adhered to.
6. Prior to finalizing the EA Report, or during detailed design and prior to construction, current and more detailed assessments of fish habitat quality at the Site, including detailed water quality parameters (basic quality measures (DO, pH, Conductivity, etc.), nutrients, e.coli, pharmaceuticals, metals, etc.), substrate parameters, and vegetation assessments should be completed. This type of baseline is necessary to track the success of the Project in achieving overall increase in fish habitat quantity and quality and to monitor any operational impacts of the Project.	The need for and extent of any additional fish habitat or water quality assessments will be determined during detailed design in consultation with DFO, the Province, CVC and MCFN.	The City’s commitment to engaging with MCFN as part of these other permits / authorization required and to address MCFN’s concerns should be noted in the draft EA. City Response: The City will develop a detailed design for the 1 PSEPM Project based on the conceptual design presented in the Environmental Assessments. The detailed design will be developed in collaboration with the MCFN. The need for and extent of any additional permits will be determined during detailed design in consultation with DFO, the Province, CVC and MCFN. Given the City’s commitments to collaboration with the MCFN during detailed

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
		<p>design, it is also committed to MCFN involvement in further permitting processes as required.</p> <p>Edits made in Section(s): None warranted, as the EA includes commitments from the City to MCFN.</p>
<p>7. MCFN should be engaged through the construction planning phase so that MCFN Field Liaison Representatives can be part of any pre-construction ecological monitoring, and part of oversight of mitigation measures and permit adherence during construction, through post-construction monitoring and operational works.</p>	<p>Agreed. The City has committed to engaging with MCFN for authorizations and permits under federal and provincial legislation. In addition, the Draft EA will be modified to include a commitment that Indigenous communities will be afforded the opportunity to participate in monitoring and oversight capacity throughout the construction phase of the project.</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) as part of the monitoring and oversight should be noted in the draft EA.</p> <p>City Response: The City’s commitments to engaging MCFN (specifically, not only general “Indigenous Communities”) have been clarified throughout the EA and in a new summary table of commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and Table 9.4</p>
<p>8. The Proponent and MCFN should discuss appropriate education modules / signage or similar components that could be included in Site design.</p>	<p>Agreed. The suggested education modules, signage, and other design components will be discussed with MCFN during detailed design.</p>	<p>The City’s commitment to engaging with MCFN (specifically, not only general “Indigenous Communities”) as part of the detailed design phase should be noted in the draft EA.</p> <p>City Response: The City’s commitments to engaging MCFN (specifically, not only general “Indigenous Communities”) have been clarified</p>

MCFN Comments and City Responses – Disposition Table: MCFN Edits to Disposition Column (provided January 20, 2024) and Discussion Notes from Joint Meeting (Held March 13, 2024). City Responses to MCFN comments following Joint Meeting are provided in [Blue](#).

Mississaugas of the Credit First Nation (MCFN) Comments	City of Mississauga Responses and Comments	Disposition: 1. Agreement 2. Recommendation 3. Requires Discussion
		<p>throughout the EA and in a new summary table of commitments specifically to the MCFN.</p> <p>Edits made in Section(s): Throughout the EA and Table 9.4.</p>
<p>9. MCFN may wish to complete ceremonial or other site-visits prior to construction. Adequate notice and related provisions must be made to ensure these activities can be completed by MCFN.</p>	<p>Agreed. The Draft EA will be modified to include the potential for ceremonial or other-site visits once the City acquires the property. Adequate notice and safety precautions will need to be undertaken.</p>	<p>Further discussions / text for review required.</p> <p>City Response: The Draft EA has been modified to include the potential for ceremonial or other-site visits once the City acquires the property. Adequate notice and safety precautions will need to be undertaken</p> <p>Edits made in Section(s): 7.6.1 and Table 9.4.</p>

1 Port Street East Proposed Marina Environmental Assessment

Appendix D4 - Public and Stakeholder Comments
on Draft EA Following PIC#3





MISSISSAUGA

1 Port Street East Proposed Marina

Environmental Assessment

Public Information Centre #3 Summary

August 2024

**PARKS, FORESTRY
& ENVIRONMENT**

Project Overview

The City of Mississauga is completing an individual environmental assessment under the Environmental Assessment (EA) Act for the 1 Port Street East Proposed Marina Project. The EA is studying the proposed expanded land base for additional waterfront parkland and examining marina alternatives for this site. This EA pertains to the lakefill and the general distribution of uses on the lakefill. The ultimate configuration of the marina and programming of park space will be determined during detailed design, which will include public consultation.

Following [EA Public Information Centre \(PIC\) #1](#) and [EA PIC #2](#), the City held EA PIC #3 virtually from September 14 to October 31, 2023. Creating a 24/7 community meeting, the public had access to the PIC materials, including the Draft EA document and the Record of Consultation on the [project website](#). The City also provided a [recorded presentation](#) to provide an overview of the Draft EA and present the preferred large lakefill alternative.

Hard copies were available at Port Credit Library and for mailing upon request. This allowed residents to participate when it was convenient for them. The City notified the public of the PIC through a mailing to area residents and businesses, a notice in Mississauga News, eBlasts to the project email list, social media advertising and posts, roadway signage, and posters at Port Credit Harbour Marina.

In addition to the virtual engagement, the City also held a second “Pop-up Event” on Saturday, September 30, 2023 at Credit Village Marina, attended by over 150 people. City staff were onsite to answer questions and discuss the EA PIC #3 materials, including the Draft EA.

The public provided feedback through a survey. The City received 238 completed surveys and over 1,200 views to the online presentation. The feedback gathered will inform the final EA. This document includes responses to feedback submitted through the survey. Please note similar questions and comments have been grouped together, or shortened for clarity. Should the public have any additional questions, please email 1portstreteast@mississauga.ca.

To be notified of future updates, including the final EA submission, please subscribe to [news alerts](#) to be kept up to date on the project by email.

Responses to EA PIC #3 Feedback

General

- **Comments in support of the project.**

Approximately half of the survey respondents did not have any additional questions for the City. Comments were also received in support of the project and the preferred large lakefill alternative, including the public noting this is a great opportunity to upgrade the marina and enhance the Port Credit shoreline, marina continuity, excitement about next steps and wanting the project to move forward.

- **What is the objective of the EA?**

Response: Chapter 2 of the Draft EA details the problem and opportunity assessment for the project. In summary, the purpose of the project is to establish lakefill on the east side of the existing marina basin to permit the relocation of the marina services currently available in the basin to the east side, and create new waterfront parkland.

- **How soon can the project start?**

Response: The City will be submitting the Final EA to the Province in 2024. A decision on the project will be made by City Council following EA approval. If City Council approves the project and the City secures funding, detailed design will be developed by the City in consultation with the public, agencies, Indigenous communities, and other interested parties, along with permitting prior to proceeding to construction.

- **This money should be spent building homes for homeless people rather than a marina.**

Response: We fully acknowledge and understand that projects like the 1 Port Street East Proposed Marina Project can raise some important questions. We appreciate you voicing your care and concern toward the critical need for funding to help and support people experiencing homelessness in our community. We assure you that we are committed to assisting those in our community who are unhoused, including providing emergency shelter and basic needs. The [Open Window Hub](#) is one example of the initiatives we have undertaken to support at-risk individuals and those who are unhoused in our community. We're also actively engaged in partnerships with community groups, local food banks, various levels of government, and local agencies to provide immediate [support services and resources](#) to those in need.

The Region of Peel manages [housing services](#) for the homeless, those who are at risk of losing their housing and for those who need affordable housing. As part of [Growing Mississauga - an Action Plan for New Housing](#), the City is working on a plan to encourage the construction of more affordable rental housing in Mississauga.

The City will continue to fund and support community initiatives to help as many residents and individuals as we can to regain stability in their lives.

Lakefill

- **Can the lakefill also have condos and shops?**

Response: No, there cannot be condos and shops on the lakefill. The lakefill uses include parkland and trails with public access and parking with winter boat storage.

- **Will the lakefill be clean and free of toxins?**

Response: Yes, the lakefill materials must be clean in accordance with Provincial regulations.

- **Will the lakefill be protected from rising lake levels and erosion?**

Response: Yes, the lakefill has been conceptually designed to be resilient to rising lake levels and will be constructed of materials that are resistant to erosion. The detailed design of the lakefill will take into consideration the ability of the preferred alternative to withstand changing lake levels (flooding hazards) and coastal processes (wave action, shoreline erosion) including future changes associated with climate change. The design of shore protection will consider wave spray and propose design to reduce risks associated with severe waterfront conditions.

- **This project will cut the lake views in half. Design the lakefill to minimize the height so we are not looking at a wall of rock.**

Response: New views from the lakefill, in particular the parkland area, to Lake Ontario and back towards Port Credit will be created as a result of this project. The EA acknowledges that some residents may experience a change in views from their residences. The height of the lakefill is determined by the coastal conditions and wave heights to ensure those using the new landform can do so safely and to ensure that the lakefill is resilient to changing coastal conditions. There will be trees and landscaping along the east side of the lakefill to provide some visual screening. The type of vegetation to be planted will be determined during detailed design. Visual screening will be an important parameter in selection of pant material.

- **Why was the preferred large lakefill alternative selected?**

Response: The large lakefill alternative was selected as the preferred alternative following the EA assessment, which included public consultation, and the evaluation of the cost, physical, biological, socio-economic, and cultural environmental components. The preferred alternative provides the opportunity to create the largest parkland area relative to the marina space required for parking, boat storage and marina facilities. The selection and evaluation of the preferred alternative is described in detail in the EA.

Environmental Components

- **Concerns were raised about the effect on birds and waterfowl currently using the area.**
Response: Construction activities will likely disturb the birds and waterfowl currently using the area. However, the species using the area are very tolerant of urban activities and will relocate to another part of the waterfront while construction is occurring. Studies will be done prior to the start of construction to ensure nesting is not occurring.
- **Respondents provided comments about impacts of the project on aquatic life and if the habitat compensation can be achieved nearby along the shoreline**

Response: Whenever projects are proposed that alter or potentially harm aquatic habitat there must be compensation to replace any habitat lost in accordance with the requirements of the Federal Fisheries Act. The proposed lakefill will remove and alter fish habitat, which will be compensated on site with the fish habitat feature at the end of the lakefill, and additional compensation will likely be required off site. Opportunities to enhance habitat near the 1 Port Street East site along the shoreline will be explored.

Parkland

- **Questions and comments were received about the design and programming of the parkland on the lakefill. Suggestions included a beach area, spray pad, patio and restaurant, wider trails, fishing, and a desire for the City to “think big” about the park elements.**

Response: The City appreciates and notes all feedback received regarding the proposed lakefill parkland. The design of the parkland in the EA is conceptual. The programming and design details for the parkland will be determined during detailed design following the EA. The public will have an opportunity to provide feedback throughout that process.

- **What will the parkland be planted with? Please consider naturalized planting.**

Response: Naturalized landscaping with native, non-invasive plants species will be incorporated on the lakefill. During detailed design, the City will develop landscaping and vegetation plans to support creating a naturalized habitat less used by the public to provide quality habitat for species such as migratory birds and habitat preferences of local at-risk wildlife.

- **Concerns raised with respect to configuration of parkland and parking. Comment received to reconsider the width of the trails, in particular along the parking area that leads to the parkland, and to consider the connections of the vehicular, cyclist, and pedestrian access.**

Response: The trail on the eastern side of the lakefill will have vegetation screening from the parking area providing a park-like quality to the walk to the park. This is challenging to show on the drawings due to scale. Details of the park, parking design, trails and access will be refined in the future design phases and will include public consultation.

- **The Ridgetown is close to the parkland area. I hope there will be methods in place to keep people away from the Ridgetown.**

Response: Lakefilling around the Ridgetown is not proposed as part of the 1 Port Street East Proposed Marina EA. Public access to the Ridgetown is not permitted or planned for safety reasons.

- **Suggestion to provide a beach area for swimming access.**

Response: Coastal conditions in this area are not conducive to the creation of a beach with safe access to the water as part of this project.

- **Will the trails be wide enough to accommodate cyclists and pedestrians?**

Response: The trails will be designed to accommodate cyclist and pedestrian access.

Construction

- **Effects of construction on local residents from all projects in the area have not been adequately assessed.**

Response: It is not currently known if and when City Council will approve the funding for this project such that it can move to detailed design and construction. Only when the construction timing is known could impacts of construction of this project along with other projects in the area be understood. The EA acknowledges that throughout the construction period, residential properties, community facilities and institutions and businesses in the vicinity of the Project and along the haul routes may experience nuisance effects from noise, dust, traffic and site visibility and that mitigation measures are warranted to minimize disruption, including limiting construction work on weekends and statutory holidays, adherence to selected haul route for delivery of lakefill materials, and implementing a broad-based approach to notifying the public regarding construction schedule.

- **Who decides what the 'selected haul route is'? Will trucks be allowed to drive down Port Street East?**

Response: The City will determine the 'selected haul route' during detailed design. The site is located at 1 Port Street East so trucks will need to travel along Port Street East to reach the property. The traffic volumes associated with this project are not anticipated to represent a significant change to the traffic already experienced by area residents.

- **Why is construction access split 50/50 between land and water, and not 100% by water?**

Response: The viability of construction from the water is related to water depth. It is not possible to complete all the construction by transporting the materials on water. To the extent possible, opportunities to further minimize traffic by bringing more materials to site by barge are proposed.

- **Reference is made in the EA to 'best management practices' but what is the mechanism to ensure contractors adhere to these practices?**

Response: The City has processes in place through contracts and agreements that are part of the tendering process to ensure adherence by contractors. The EA has a full list of the best management practices, including include air quality mitigation measures for dust, vehicle emissions management, spill protocol, and noise management.

- **What is the estimated timeframe for construction and for how long will we be unable to access the site?**

Response: It is anticipated that the construction of the lakefill will take approximately 14 months and it is not intended to spread over several years however there may be pauses in construction due to lakefill availability, weather conditions, or times when construction may not be permitted because of fisheries issues. The areas that will be under construction are currently not accessible or have limited public access therefore, there will be only minor changes to access during construction.

Marina

- **Questions with respect to how sewage from boats will be managed, provision of fuel (including the Lakefront Promenade fuel dock), marina operations, marina building uses and height, safety and security, including access along the docks.**

Response: The City appreciates and notes all feedback received regarding the features and the operation of the marina. These issues will be addressed during detailed design and the development of a detailed operation plan. The public will have future consultation opportunities during the detail design phase of the project.

- **Will this marina be net zero carbon?**

Response: We are pleased to say that at the same time as the City approved the Climate Change Action Plan, Council also approved the Corporate Green Building Standard (December 2019) and the proposed marina building would be subject to the City's [Corporate Green Building Standard](#) in place at the time of design and construction. This standard that applies to all new builds and major renovations of City-owned and operated buildings. We are still in the early stages of the project and currently completing the environmental assessment, which will be followed by provincial approvals, Council decision on the project, permitting, and detailed design prior to proceeding with construction. There are many steps that need to occur before the design and construction are anticipated to begin.

- **Will public washrooms be provided?**

Response: The City intends on providing a public washroom on site as part of the marina service building.

- **Will there be enough room to store all the boats during the winter on the lakefill?**

Response: The City is limited to boat storage on the lakefill and off site storage locations for boats may need to be explored. The considerations around the location and amount of boat storage will be addressed during detailed design.

- **Will the slips be available year-round, including livaboards? What will happen to the existing boaters at Port Credit Harbour Marina?**

Response: The slips will be seasonal, as consistent with marina best practices, safety considerations, and existing City marina operations at Lakefront Promenade Marina and Credit Village Marina. Prior to the start of construction, a plan will be developed to address the transition of activities from the existing marina to the new facility, with consideration to current boaters and livaboards using the Port Credit Harbour Marina. The City is yet to determine if liveaboards will be permitted.

- **Where will boats and non-motorized crafts such as kayaks be launched from?**

Response: There will not be a public boat launch at this location. Boat launching facilities are provided by the City at other waterfront locations, including Lakefront Promenade Marina and the future launch planned for Marina Park, which will also include a non-motorized craft launch.

- **What kind of environmental controls and spill response will be in place for the proposed marina?**

Response: The City's two marinas are currently part of, and in good standing, with the Clean Marine Eco-Rating Program. This environmental program allows marina operators and businesses to follow best environmental practices to reduce and prevent water, air and land pollution associated with recreational boating activities in Ontario. The City also has protocols in place in the event of an environmental incident such as a spill. The City's existing protocols and the participation in the Clean Marine Eco-Rating Program would be extended to the proposed marina at 1 Port Street East.

- **Will the proposed marina be public or a private club? Will there be any fees for using the marina?**

Response: The proposed marina will be public. It is anticipated that the marina will be owned and operated by the City. There will be user fees for seasonal slips and transient boat users.

- **What percentage of Mississauga's population will use the marina?**

Response: It is anticipated that the proposed marina will have users from across Mississauga. The park area will be available for public use year-round, and the parking provided serve both the marina users and the park users. The City's waterfront parks are highly used and are currently at capacity. This project presents a unique opportunity to provide new waterfront parkland and trail access along the water's edge where none currently exists.

Parking

- **Comments were received about the amount of parking proposed for the lakefill area. Some respondents thought there was too much parking or parking should be located off-site (i.e. at the Port Credit GO Station) while others thought there should be more parking.**

Response: The amount of parking provided is consistent with the requirements set out in previous planning documents. The conceptual design of the preferred large lakefill alternative shows approximately 275 parking spaces can be accommodated. Many respondents commented that there should be no parking or winter storage at the site however, one of the purposes of the project is to create land to permit the relocation of the marina from the west side of the basin to the east side of the basin. There is limited land available for the proposed marina at the 1 Port Street East site, therefore parking and winter storage will be located on the lakefill to make the marina economically viable. The parking provided will be available to both marina users and park users. A more precise estimate of area for parking and boat storage versus parkland will be an outcome of the detailed design process after the EA.

- **Will the parking be paid and overnight?**

Response: There have been no decisions around paid parking or parking hours. Parking operation details will be addressed in detailed design.

- **Has the possibility of putting the parking underground been investigated?**

Response: As the existing breakwater is a rock formation and there is no existing land base, underground parking is not possible or feasible with lakefilling.

Traffic

- **How will traffic be impacted as a result of this project?**

Response: During construction there is anticipated to be approximately 50 truck loads or 100 truck movements per day or approximately 12 per hour. Adding 12 vehicle movements per hour to the existing traffic volumes creates an imperceptible change. Opportunities to further minimize traffic by bringing more materials to site by barge are proposed. This project creates land to move the existing marina from the wharf to the new land created around the eastern breakwater. As such, no significant change to current traffic patterns associated with the marina operation is anticipated. There will be parking for the marina created as part of the site development.

- **Is there a possibility to explore updating Lakeshore Road to have no parking to improve traffic flow from Mississauga Road to Hurontario Street? How is traffic being addressed in Port Credit and as part of this project?**

Response: Traffic impacts of construction and future operation of the proposed marina are addressed in the EA and specific recommendations are made to mitigate adverse impacts along haul routes and within the Village of Port Credit. The use of barges to bring some of the fill material to the site during construction is proposed to reduce traffic impacts. No significant change to current or past traffic patterns associated with the marina operation is anticipated. In addition:

- Exploring the removal of parking along Lakeshore Road is not part of this project.
- With respect to development applications and future developments that are not part of this project, individual traffic impact studies are required to be completed and City staff will review them as they are submitted.
- The City has commenced Lakeshore Transportation Studies, which includes three infrastructure projects in the Lakeview, Port Credit and Clarkson communities that build from the 2019 Lakeshore Connecting Communities Transportation Master Plan. Additional information is available on the [project website](#).

Wharf Development

- **The Centre City Project should have been permitted years ago so that taxpayer money did not need to be spent.**

Response: The concept prepared by Centre City Capital was considered as input into the Inspiration Port Credit Project. Please see the [1 Port Street East Comprehensive Master Plan](#) available on the [project website](#) for additional details.

- **What is the future of the wharf development owned by Canada Lands?**

Response: A future mixed-use neighbourhood is permitted, as per an approved Master Plan and Official Plan Amendment, and is proposed to be developed on the wharf portion of lands where the existing Port Credit Harbour Marina and service building are currently

located. The development of the wharf is not a City project and the timing of development is dependent on the landowner and related required approvals, and will involve comprehensive community consultation. A future mixed-use development on the Canada Lands Company property is not subject to the EA Act and thus, not within the scope of the 1 Port Street East Proposed Marina EA.

- **There are Barn Swallow nests within the current marina building and they migrate each summer to these nests. What is the plan to protect the Barn Swallows that use the current marina building?**

Response: The current marina building is not part of the project so there will be no disturbances to the Barn Swallow nests as a result of the proposed marina project by the City. The EA did assess the impacts to Species at Risk resulting from the project and includes mitigation measures, such as monitoring and removing birds and aquatic species before construction begins.

