BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

591 Liverpool Road, City of Pickering Environmental Impact Study

Prepared For:

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Prepared By:

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Date: *Project:*

March 2019 **216450**

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1. Introduction

Beacon Environmental Limited (Beacon) has been retained by Pickering Harbour Company Ltd. to undertake an Environmental Impact Study (EIS) for the property located at 591 Liverpool Road (hereafter 'subject property'), in the City of Pickering, Regional Municipality of Durham. The subject property is located on the east side of Liverpool Road at the south terminus and fronts onto the bay known as 'Hydro Marsh' (**Figure 1**). Frenchman's Bay Provincially Significant Coastal Wetland Complex (PSW) extends onto the eastern and southern portions of the subject property. The property is currently operating as Frenchman's Bay Marina and a municipal parking lot.

As the subject property has been identified on the Region's and City's Official Plan as containing a natural feature (i.e. wetland and waterbody) and located within the Region and City's Natural Heritage System, an EIS is required in support of the proposed development application.

The purpose of the EIS is to identify natural heritage features and functions on or adjacent to the subject property, assess impacts of the proposed development, and recommend mitigation measures to ensure that the significant natural features are not adversely affected by the proposed development. The EIS must also demonstrate that the proposed development complies with applicable environmental legislation, policies and regulations at the provincial, regional and local levels.

The findings of the EIS are presented in the following sections.

2. Policy Context

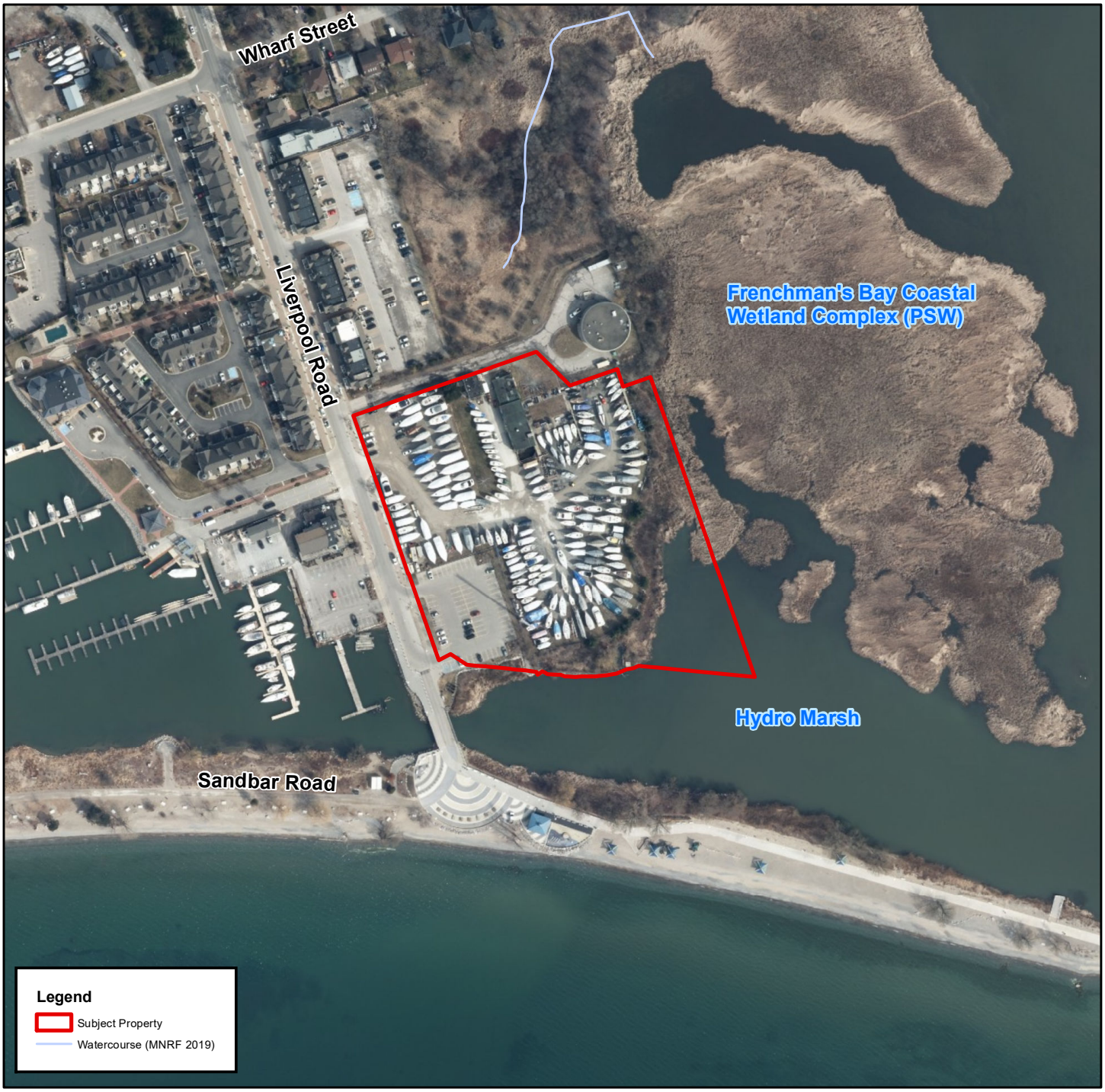
The plans and policies outlined in the following sections give direction and provide requirements for development on the property.

2.1 Provincial Policy Statement (2014)

Natural Heritage Policy 2.1 of the *Provincial Policy Statement* (PPS) (MMAH 2014) provides direction to regional and local municipalities regarding planning policies for the protection and management of natural heritage features and resources for applications pursuant to the *Planning Act*. It took effect on April 30, 2014, superseding the PPS of 2005. The PPS defines natural heritage features and provides planning policies for each. The key text from the PPS that applies to the study area is reproduced below. The study area is situated in Ecoregion 6E.

2.1.4 *Development* and *site alteration* shall not be permitted in:
a) *significant wetlands* in Ecoregions 5E, 6E and 7E; and
b) *significant coastal wetlands*.

2.1.5 *Development* and *site alteration* shall not be permitted in:
a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E and 7E;



Site Location	Figure 1
591 Liverpool Road, Pickering Pickering Harbour Company Ltd.	
First Base Solutions Web Mapping Service 2018	N W E S
UTM Zone 17 N, NAD 83	
0 25 50 100 Meters	1:3,000
BEACON ENVIRONMENTAL	Project 216450 March 2019

b) *significant woodlands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
c) *significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
d) *significant wildlife habitat*;
e) *significant areas of natural and scientific interest*; and
f) *coastal wetlands* in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b)

unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

2.1.6 *Development* and *site alteration* shall not be permitted in *fish habitat* except in accordance with *provincial and federal requirements*.

2.1.7 *Development* and *site alteration* shall not be permitted in *habitat of endangered species and threatened species*, except in accordance with *provincial and federal requirements*.

Of these features, provincially significant wetlands and significant ANSIs are identified directly by the Ministry of Natural Resources and Forestry (MNRF). Woodlands are identified using MNRF criteria, and other significant features may be identified using MNRF criteria or municipal criteria that meet the same standard. In Ontario, Fisheries and Oceans Canada (DFO) manages fish habitat and the MNRF manages fisheries. Habitat of endangered and threatened species is mainly governed by the provincial *Endangered Species Act* (2007) (See section 2.5).

Furthermore, development and site alteration shall not be permitted on "adjacent lands" to the natural heritage features/areas (i.e., within 120 m) addressed in policies 2.1.4, 2.1.5, 2.1.6 and 2.1.7 "unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated [through an EIS] that there will be no negative impacts on the natural features or on their ecological functions." Adjacent lands are defined in the PPS as "those lands contiguous to a specific natural heritage feature or area where it is likely that development or site alteration would have a negative impact on the feature or area."

2.2 Region of Durham Official Plan (Office Consolidation, 2017)

The Regional Municipality of Durham published its latest Official Consolidated Plan on May 11, 2017. It protects natural heritage features through a Greenlands System.

Greenlands include the following Key Natural Heritage Features (KNHF). The list of KNHFs is similar, but not identical, to the PPS list:

- significant habitat of endangered and threatened, special concern and rare species;
- fish habitat;
- wetlands;
- Life Science Areas of Natural and Scientific Interest (ANSIs);
- significant valleylands;

- significant woodlands;
- significant wildlife habitat;
- sand barrens, savannahs and tallgrass prairies; and
- alvars.

The Region of Durham Official Plan also recognizes the following Key Hydrologic Features (KHFs):

- permanent and intermittent streams;
- wetlands;
- lakes and their littoral zones;
- kettle lakes and their surface catchment areas;
- seepage areas and springs; and
- aquifers and recharge areas.

The subject property is designated on Schedule A, Map A-4 Regional Structure of the Durham Region Official Plan as Waterfront Areas which are designated as part of the existing Greenlands System. Key Natural Heritage and Hydrologic Features are identified on and adjacent to the subject property on Schedule B, Map B-1d Natural Heritage System & Key Natural Heritage and Hydrologic Features. Section 2.3.15 states that development or site alteration is not permitted within a key natural heritage and/or hydrologic feature and associated vegetation protection zone.

As per Section 2.3.14, the location and extent of key natural heritage and/or hydrologic features may be further confirmed through an EIS. The subject property falls within an Urban Area and the vegetation protection zone for any features present on the property shall be determined through an EIS completed in accordance with Policy 2.3.43 of the Plan. For development along Waterfront Areas, an EIS shall also incorporate the requirements outlined in Section 10C.2.1 of the Plan, to address impacts on the Lake Ontario shoreline, creeks, wetlands and near-shore wildlife habitat.

2.3 City of Pickering Official Plan (2018)

The City of Pickering published its latest Official Consolidated Plan (Edition 8) dated October 2018. It builds on the framework presented in the Region of Durham's Official Plan and protects natural heritage features through the Open Space System, which incorporates three types of natural areas: core areas, corridors and linkages. Schedule I – Land Use Structure to OPA 27 identifies the subject property as Natural Areas with Marina Areas.

Land uses for Natural Areas in the Open Space System are restricted and include conservation, environmental protection, restoration, education, passive recreation, existing residential and agricultural uses.

The Open Space System recognizes a connected and integrated natural heritage system comprised of KNHF and KHF and includes minimum vegetation protection zones. KNHF and KHF for the City's Open Space System are consistent with those identified in the PPS and Region of Durham OP. The City identifies the Natural Heritage System on Schedules IIIA through IIIE – Resource Management: Natural Heritage Features of the OP. Schedule IIIA identifies the eastern and southern portions of the subject property as Natural Heritage System and Schedule IIIC identifies the Natural Heritage System on the subject property as being comprised of Shorelines, Significant Valley Lands and Stream Corridors and

Wetlands. Schedule IIID identifies the subject property as within an area of High Aquifer Vulnerability and Groundwater Recharge.

Section 16.51 requires that within the Open Space System, outside of the Oak Ridges Moraine and the Seaton Urban Area, development or site alteration proposed within the minimum area of influence of a KNHF or HSF requires an environmental study to be completed. Table 18 summarizes the minimum area of influence and prescribes the following minimum protection zone for KNHF and HSF:

- **Wetlands** – all land within 30 metres of any part of the feature;
- **Fish habitat -** all land within 30 metres of any part of the feature;
- **Significant valleylands -** all land within 30 metres of any part of the feature;
- **Significant woodlands** – all land within 10 metres from the dripline of woodlands;
- **Permanent and intermittent streams inside the Pickering urban area –** all land within 10 metres of the stable top of bank or the limit of the floodplain, whichever is the greater;
- **Seepage areas and springs** – all land within 30 metres of any part of the feature;
- **Shoreline along Lake Ontario** – all lands within 30 m of the shoreline; and
- Any additional distances demonstrated as necessary through technical reports.

The subject property is within the South Pickering urban area and Section 16.51(c) states:

> *Consider vegetation protection zones smaller than those distances specified in Table 18 in the South Pickering where the conservation authority determined it to be appropriate, and where it can be demonstrated that there is no increase in risk to life or property; no impact to the control of flooding, erosion, dynamic beach, or pollution; and where a net environmental benefit can be established on the property.*

2.4 Toronto and Region Conservation Authority Regulations (Ontario Regulation 166/06) (2006)

The Toronto and Region Conservation Authority regulates land use activities in and adjacent to wetlands, shorelines, watercourses and valleylands under Ontario Regulation 166/06 (*Regulation for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*), made under the *Conservation Authorities Act*.

The TRCA may grant permission to develop within regulated areas "if, in its opinion, the control of flooding, erosion...pollution or the conservation of land will not be affected by the development". As part of its permitting process, TRCA typically requires the proponent to prepare an Environmental Impact Statement (EIS), which must demonstrate that the development can proceed without resulting in any alteration to a watercourse or interference to the hydrologic function of a wetland.

Wetland refers to any wetland, regardless of whether they have been formally evaluated or not. Generally, development within the flood limit of a watercourse is not allowed. However, subject to conformity with the applicable Official Plans and the completion of appropriate studies and Conservation Authority permits, development *may* be permitted within other regulated areas. The TRCA generally requires that all watercourses be protected from adjacent development. This is often achieved through the use of a vegetative buffer.

The entire property is located within a TRCA regulated area due to the proximity to the Lake Ontario shoreline and Frenchman's Bay PSW.

2.4.1 Toronto and Region Conservation Authority Living City Policies for Planning and Development (2014)

The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority (LCP) was approved by the Authority Board on November 28, 2014. The document replaced TRCA's previous policy document, the Valley and Stream Corridor Management Program (1994).

The LCP has been developed to guide the implementation of TRCA's legislated and delegated roles in the planning approval process. It was developed to conform with provincial legislation including the Oak Ridges Moraine Conservation Plan, the Greenbelt Plan, the Places to Grow Growth Plan, and the 2014 PPS.

The LCP contains policies related to terrestrial resources, water resources, natural features and areas, natural hazards, and potential natural cover and buffers. Section 7.3 contains TRCA's policies for how to define, protect, enhance, and secure a Natural Heritage System. Section 7.3.1.4. prescribes the following buffers to natural features and natural hazards:

- **Valley or Stream Corridors** – a 10 metre buffer from the greater of the long term stable top of slope/bank, stable toe of slope, Regulatory flood plain, meander belt, and any contiguous natural features or areas;
- **Woodlands** - a 10 metre buffer from the dripline and any contiguous natural features or areas;
- **Wetlands** – a 30 metre buffer from provincially significant wetlands and a 10-metre buffer for all other wetlands and any contiguous natural features or areas;
- **Lake Ontario Shoreline** – a 10 metre buffer from the greater limit of the flood hazard, erosion hazard and/or dynamic beach hazard and any contiguous natural features or areas;
- Any additional distances prescribed by federal, provincial, or municipal requirements or standards (e.g., Greenbelt); and
- Any additional distances demonstrated as necessary through technical reports.

2.5 Federal *Fisheries Act* (1985)

All fish habitat (direct and indirect) is protected under the Federal *Fisheries Act* (1985). In Ontario, the federal department of Fisheries and Oceans Canada (DFO) manages fish habitat and the Ontario Ministry of Natural Resources and Forestry (MNRF) manages fisheries.

The *Fisheries Act* was updated through Bill C-38 which came into effect November 25th, 2013. Key changes include the combination of former Sections 32 and 35 into a new Section 35 addressing the removal of Harmful Alteration, Disruption or Destruction (HADD) of fish habitat. The prohibitions on killing fish and causing harmful alteration, disruption or destruction of fish habitat (HADD) have been replaced with a single prohibition in Section 35 against causing '*serious harm to fish'* that are part of a commercial, recreational or aboriginal fishery, or to fish that support such a fishery.

"Serious harm to fish" is defined as "*the death of fish or any permanent alteration to, or destruction of, fish habitat*". "*Serious harm to fish"* includes the following:

1. *The death of fish*
2. *A permanent alteration to fish habitat of a spatial scale, duration or intensity that limits or diminishes the ability of fish to use such habitats as spawning grounds, or as nursery, rearing, or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes*

The destruction of fish habitat of a spatial scale, duration, or intensity that fish can no longer rely upon such habitats for use as spawning grounds, or as nursery, rearing, or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes. Determining the applicability of the Section 35 prohibition to particular water bodies is now made on a case-by-case basis through a self-assessment process to determine impacts to fish and fish habitat and next steps. Development activities taking place in or near water may affect fisheries by adversely affecting fish or fish habitat. DFO recommends that proponents of these activities should:

- Understand the types of impacts their projects are likely to cause;
- Take measures to avoid and mitigate impacts to the extent possible; and
- Request authorization from the Minister and abide by the conditions of any such authorization, when it is not possible to avoid and mitigate impacts of projects that are likely to cause serious harm to fish.

2.6 Endangered Species Act (2007)

Ontario's *Endangered Species Act*, 2007 (ESA) came into effect on June 30, 2008 and replaced the former 1971 Act. Under the ESA, species in Ontario are identified as extirpated, endangered, threatened, or of special concern and each species is afforded different levels of protection. The ESA protects species listed as threatened or endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO).

Section 9 of the ESA generally prohibits the killing or harming of a threatened or endangered species, as well as the destruction of its habitat. Section 10 of the ESA prohibits the damage or destruction of the habitat of all endangered and threatened species. A permit from MNRF is required under Section 17(2) (c) of the ESA for any works proposed within habitat of a threatened or endangered species.

3. Study Methodology

To characterize natural heritage resources and functions associated with the subject property and adjacent lands, Beacon Environmental completed a review of available background information and undertook seasonal field investigations. A summary of the background information and field investigations undertaken is summarized below.

A Terms of Reference for the EIS was submitted to TRCA and approved on January 10, 2019 (**Appendix A**). Correspondence from Aurora District, MNRF dated November 22, 2017 was received with respect to Species at Risk (**Appendix B)**

3.1 Background Review

Background documents and supporting technical documents containing information relevant to the biophysical features of the subject property were gathered and reviewed. This included the following sources:

- Regional Municipality of Durham Official Plan (2017);
- City of Pickering Official Plan (2018);
- Toronto and Region Conservation Authority Regulations (2006) and Policies (2014);
- Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC);
- *Endangered Species Act* (2007);
- Frenchman's Bay Harbour Entrance Environmental Study Report (2009); and
- Frenchman's Bay Stormwater Management Master Plan (2009).

Other sources of information, such as aerial photography and topographic maps, were also consulted prior to commencing field assessments.

3.2 Field Investigations

Beacon ecologists undertook seasonal field investigations on the subject property and adjacent lands in 2017. A summary of the field visits and survey dates is presented in **Table 1**. More detailed survey descriptions are provided in the subsections that follow.

Table 1. Dates of Field Investigations

Survey	Date of Survey(s)
Amphibian Surveys	April 15, May 24 and June 28, 2017
Breeding Bird Surveys	June 8 and June 20, 2017
Ecological Land Classification & Floristic Inventory	August 24, 2017
Feature Staking with Agencies	September 13, 2017
Aquatic Habitat Assessment	October 6, 2017

3.2.1 Amphibian Surveys

Breeding amphibian surveys were completed according to Environment Canada's Marsh Monitoring Program Protocol (Bird Studies Canada, 2009) and consisted of auditory surveys undertaken during the prime breeding period to record calling males that are present. Three surveys are spread throughout the breeding season to include the short temporal peak for each species of interest. Survey dates are spaced to record different amphibian species that call during different times in the spring. These

surveys are conducted to record the presence or absence of breeding amphibians in potentially suitable habitat.

Breeding amphibian surveys on the subject property were completed after dusk and during suitable temperature conditions. All areas that contained potential breeding amphibian habitat (i.e., wetlands) were surveyed from a distance that would enable calling amphibians to be heard. Survey conditions are provided in **Table 2**; wind conditions are provided using the Beaufort Scale.

Table 2. Breeding Amphibian Survey Conditions

Survey Date	Weather
April 15, 2017	Temp.:8°C, Wind: 0. Precip.: None
May 24, 2017	Temp.:17°C, Wind: 3. Precip.: Light rain
June 28, 2017	Temp.:17°C, Wind: 3. Precip.: None

3.2.2 Breeding Bird Surveys

Breeding birds were surveyed during two visits to the subject property; each visit commenced between 6:30 am and 7:30 am, on days with low to moderate winds (0-3 Beaufort Scale), no precipitation, and temperatures within 5 ^{O}C of normal average temperature. The entire site was walked such that all singing birds could be heard or observed and recorded. That is, the surveyor is within 50 -100 m of all parts of the site depending on habitat. All birds heard and seen were recorded in the location observed on an aerial photograph of the site.

3.2.3 Ecological Land Classification

Vegetation communities were mapped and described according to the Ecological Land Classification (ELC) system for southern Ontario (Lee *et al.*, 1998), which involved delineating vegetation communities on an aerial photograph of the property and recording pertinent information concerning the structure and composition of the vegetation in each community. At the same time as vegetation community mapping was undertaken, a floral inventory occurred, which consisted of a compilation of a list of plants observed on the property.

3.2.4 Feature Staking with Agencies

Feature staking was conducted with staff from the Ministry of Natural Resources and Forestry (Steve Varga) and Toronto Region Conservation Authority (Elyssa Elton and Gretel Green) to delineate the limits of the PSW, top of bank and dripline on September 13, 2017. Members of the consulting team were also present as well as a land surveyor. The limits of the top of bank and dripline were not staked in the field but agreed by all parties that the limit of the natural feature (i.e. greater of dripline or top of bank) would be concurrent with the existing chain link fence.

3.2.5 Aquatic Habitat Assessment

The nearshore aquatic habitat was assessed on October 6, 2017. The nearshore area was accessed using a canoe. Characteristics of the nearshore habitat were documented form the shoreline to a maximum depth of approximately 1 m. Observations were made in regards to the substrate, depth, presence of aquatic macrophytes, shoreline vegetation, signs of recent erosion, presence of man made structures or other anthropogenic influences. A handheld GPS was used to record the position of the observations within 5 m accuracy.

4. Existing Conditions

The subject property fronts onto a bay that is referred to as 'Hydro Marsh' which is connected to Frenchman's Bay through a channel crossed by Liverpool Road. The subject property is currently operating as Frenchman's Bay Marina with a municipal parking lot. Frenchman's Bay and Hydro Marsh are coastal lagoons that are separated from Lake Ontario by a barrier beach. Frenchman's Bay is permanently connected to Lake Ontario by the harbour entrance channel. The eastern and southern portions of the property form part of the Frenchman's Bay Provincially Significant Coastal Wetland Complex.

The site is located in close proximity to silts and clays associated with deep water deposits of glacial Lake Iroquois and modern river deposits consisting of sand, silt and minor gravel. The site is predominantly comprised of native deposits of sandy clayey silt, silty sand, gravelly sand, gravelly silt sand and sand and silt overlain by fill material (Golder, 2019).

4.1 Aquatic Resources

As requested by TRCA at the pre-consultation meeting, Sections 4.1.1 and 4.1.2 provide an overview of the watershed in which the subject property occurs.

4.1.1 Frenchman's Bay Watershed

The watershed is approximately 2,260 ha and is comprised of four main tributaries (Amberlea Creek, Dunbarton Creek, Pine Creek and Krosno Creek) and local areas (Bay Ridges and West Shore) which drain into Frenchman's Bay and Hydro Marsh. The watershed is heavily urbanized with more than 75% of the watershed occupied by development and infrastructure. The major areas of natural cover within the watershed are located within the headwaters of Pine Creek and open water courses in Pine Creek and Dunbarton Creek (MMM Group, 2009).

The watershed is underlain by several layers of glacial sediment and intersects the shore of the former Lake Iroquois resulting in deposits of lacustrine clary and sands across the upper part of the watershed. The Iroquois Bluff defines the northern boundary of the watershed and groundwater discharge from the foot of the bluff provides baseflow for Dunbarton Creek and Pine Creek (MMM Group 2009).

Frenchman's Bay covers an area of 47 ha including Hydro Marsh. The wetland complex is comprised of 12% swamp and 88% marsh. Aerial photography review of Frenchman's Bay reveals that approximately 60% of the wetland has been lost since 1937 (MMM Group, 2009). Environmental monitoring was undertaken by TRCA in 2002 for Frenchman's Bay and Hydro Marsh and indicated a high level of disturbance within the wetland (MMM Group, 2009).

4.1.2 Krosno Creek Subwatershed

The subject property is located within the Krosno Creek subwatershed. The subwatershed is approximately 670 ha and drains into Hydro Marsh. The surficial geology of the subwatershed is comprised of clay/silt and till with sand/gravel underlaying Hydro Marsh. The majority of the subwatershed is urbanized with approximately 76% occupied by development and infrastructure. The undeveloped portion is limited to the southwest limits of the subwatershed, associated with Hydro Marsh and Alex Roberston Park (MMM Group, 2009).

Krosno Creek has a limited extent of open watercourse as the upper reaches are drained by storm sewers and overland flow and the creek is piped north of Highway 401. The creek provides a significant deposition of sediment into Hydro Marsh (MMM Group, 2009).

4.1.3 Aquatic Habitat

Hydro Marsh is described as *a warm shallow turbid water system with moderate submergent and emergent vegetation on silty sand substrate (TRCA 2009).* The shoreline and nearshore areas adjacent to the subject property lack the complexity required to provide high quality fish habitat. The majority of the shoreline has been graded and some parts are hardened for shoreline protection. Cover for fish is limited to a couple of dead trees that have fallen in the water from shore and some shallow areas with emergent and submergent aquatic macrophytes. These shallow nearshore areas provide limited opportunity for spawning or as nursery habitat for generalist fish species only. These species are able to thrive in a wide variety of environmental conditions and can make use of a variety of different resources.

Beacon Environmental completed observations of the nearshore habitat and sampling locations are shown on **Figure 2**. It should be noted that the Lake Ontario water level was well above average in 2017. The water level in August 2017 was 67 cm higher than in August 2012 (NOAA, 2017). The water was slightly turbid with a greyish tone and with visibility generally less than 1 m depth during the field investigation.

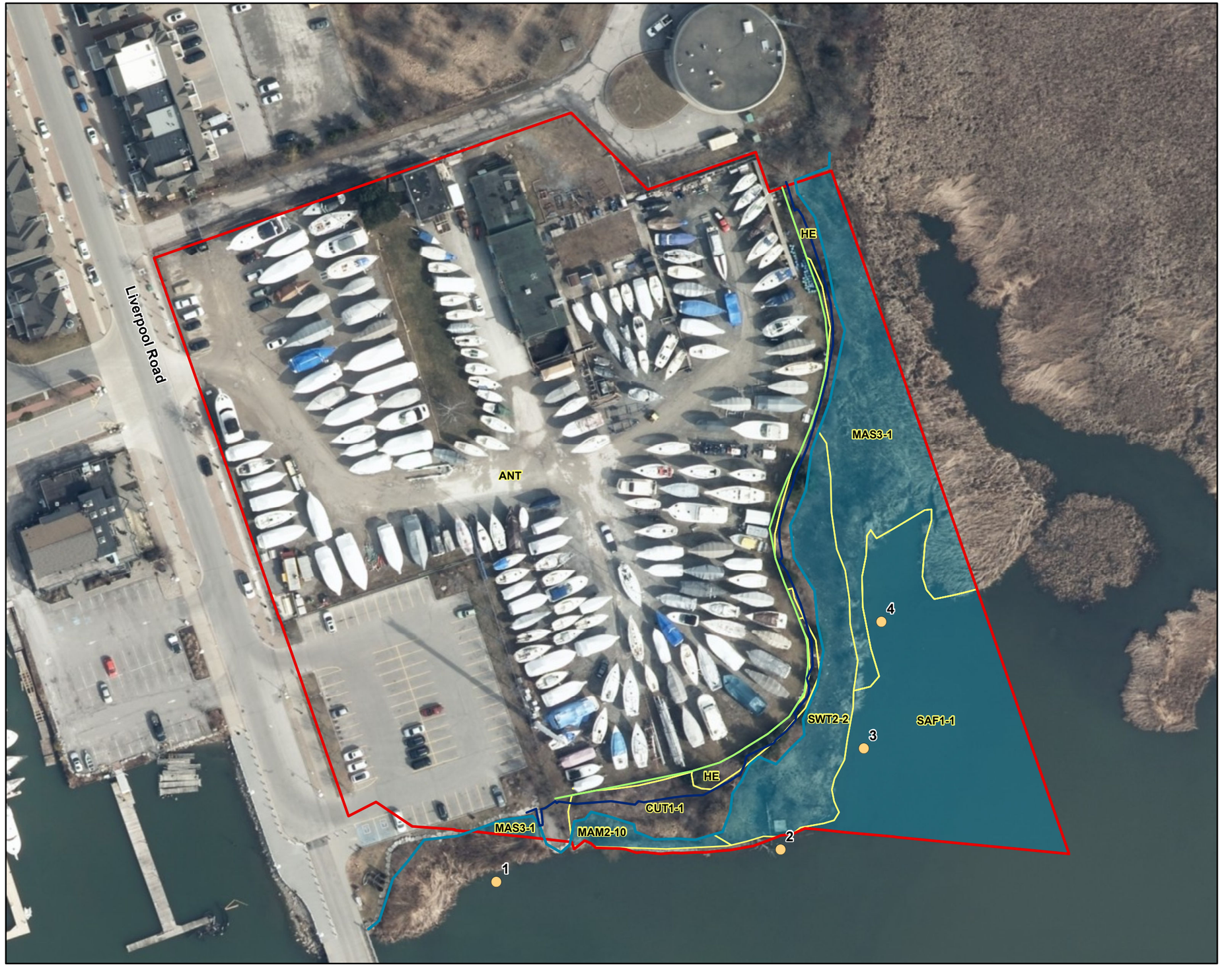
The banks above the water level were steep gradient throughout the study area. At Aquatic Sampling Location 1 (ASL-1; **Figure 2**), the shoreline was hardened by cobble sized stone (rip rap) and boulders.

Shoreline vegetation was dominated by emergent hydrophytic macrophytes with a varying composition of dense stands of cattails (*Typha* spp.; ASL-3), Phragmites (*Phragmites australis*; ASL-1) and Yellow Iris (*Iris pseudacorus*; ASL-2 and ASL-3). Woody vegetation is scattered along the shoreline and includes a mature Crack Willow (*Salix fragilis*; ASL-1), Red-Osier Dogwood (*Cornus sericea*) and Willow shrubs (*Salix* spp.; ASL-3). A partially submerged fallen tree provides good cover for fish in the nearshore area at ASL-2.

Existing Conditions

Figure 2

591 Liverpool Road, Pickering
Pickering Harbour Company Ltd.



Legend

- Subject Property
- ELC Communities
- Wetland
- Provincially Significant Wetland (MNRF 2017)
- Dripline (TRCA 2017)
- Aquatic Habitat Survey Locations
- Floodline

ELC Code	ELC Community
Wetland Communities	
SWT2-2	Willow Mineral Thicket Swamp
MAM2-10	Forb Mineral Meadow Marsh
MAS3-1	Cattail Organic Shallow Marsh
SAF1-1	Water Lily Floating-leaved Shallow Aquatic
Cultural Communities	
CUT1-1	Sumac Cultural Thicket
HE	Hedgerow
ANT	Anthropogenic

UTM Zone 17 N, NAD 83

First Base Solutions
Web Mapping Service 2018

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There is abundant aquatic macrophyte growth throughout the study area comprised of submergent and emergent species including Duckweed (*Lemnoideae* spp.), Canada Waterweed (*Potamogeton canadensis*), Richardson's Pondweed (*Potamogeton richardsonii*), and Slender Pondweed (*Potamogeton pusillus*). Abundant White Water Lily (*Nymphaea odorata*) was observed at ASL-3 and ASL-4.

Throughout the study area, the shoreline is low gradient with average depth of less than 1 m extending out to 5 m from the shoreline. The nearshore substrate consisted of fines throughout the study area with one exception; a small patch of gravel observed at ASL-2.

A section of the shoreline is occupied by an abandoned boat launch/lift constructed of metal and concrete at ASL-2. The foundation of this structure is severely eroding and the concrete is crumbling in many places. A partially collapsed steel wire fence is also present at this location.

Submerged silt fences attached to metal stakes were observed at ASL-4. These fences are located approximately 20 m from the shoreline. The water level was recorded to be approximately 1 m depth in this location. These fences appear to have been installed years ago and are currently in poor condition with large holes and partial detachment from the metal stakes.

4.1.4 Fisheries Resources

The fish community of Frenchman's Bay and Hydro Marsh is described in the Frenchman's Bay Harbour Entrance Environmental Study Report (TRCA, 2009) as follows:

> *"Hydro Marsh fisheries monitoring between 1998 and 2008 recorded a total of 1,074 individuals representing a total of 19 species. The dominant species is alewife (Alosa pseudoharengus) comprising almost 25% of the total number of fish captured in the study area. Subdominant species present are gizzard shad, brown bullhead, pumpkinseed, common carp, fathead minnow, yellow perch, golden shiner, bowfin, largemouth bass, white sucker and northern pike. Common carp represented more than 50% of the total biomass of the study area. Brown bullhead comprised the second highest biomass followed by bowfin, largemouth bass and pumpkinseed."*

Detailed fisheries surveys were not conducted due to availability of fisheries data and as in-water works are not proposed.

4.2 Terrestrial Resources

4.2.1 Vegetation Communities

The subject property is predominantly anthropogenic as it is comprised of an active marina and municipal parking lot. Frenchman's Bay Provincially Significant Coastal Wetland Complex extends onto the southern and eastern portions of the site.

There are scattered landscape trees located along the existing chain link fence and in the parking lot. These trees were subject to a Tree Inventory and Preservation Plan conducted by D.A. White Treecare (2019).

Vegetation on the subject property was classified according to Ecological Land Classification (ELC) to the vegetation type (**Figure 2**).

4.2.1.1 Wetland Communities

Willow Mineral Thicket Swamp (SWT2-2)

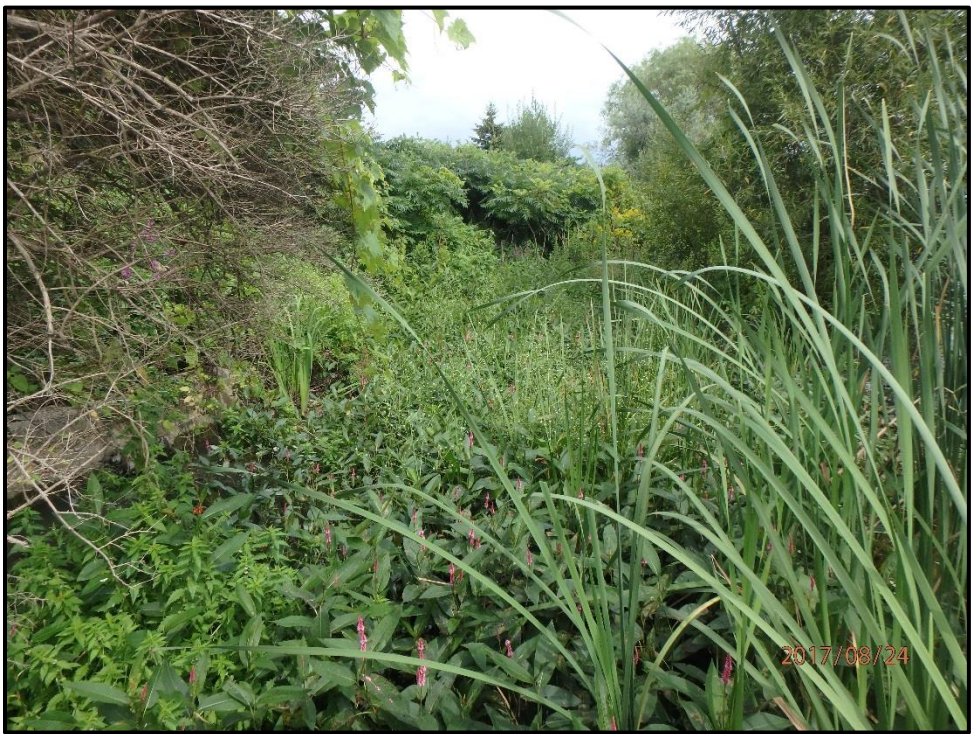
This community forms part of the Frenchman's Bay Provincially Significant Coastal Wetland Complex and is dominated by Sandbar Willow (*Salix exigua*) with Pussy Willow (*Salix discolor*), Bebb's Willow (*Salix bebbiana*), and Red-Osier Dogwood. Associated species include Hybrid Cattail (*Typha x glauca*), Spotted Jewelweed (*Impatiens capensis*), Common Duckweed (*Lemna minor*), and Greater Duckweed (*Spirodela polyrhiza*; **Photograph 1**).

Photograph 1. Willow Mineral Thicket Swamp

Forb Mineral Meadow Marsh (MAM2-10)

This community forms part of the Frenchman's Bay Provincially Significant Coastal Wetland Complex and is comprised of Spotted Jewelweed, Tall Goldenrod (*Solidago canadensis* var. *scabra*), Panicled Aster (*Symphyotrichum lanceolatum*) and Grass-leaved Goldenrod (*Euthamia graminifolia*).

A small area dominated by Water Smartweed (*Polygonum amphibium*) and Water Plantain (*Alisma plantago-aquatica*) are located downstream of a headwall at the western limits of this community (**Photograph 2**).



Photograph 2. Water Smartweed Inclusion at Headwall

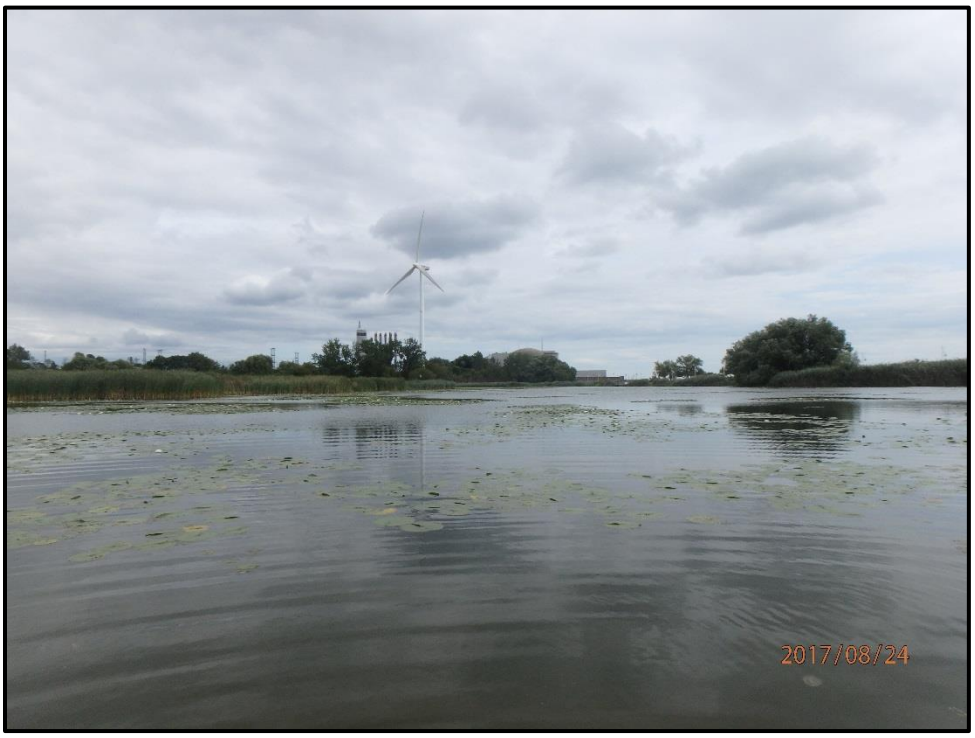
Cattail Organic Shallow Marsh (MAS3-1)

This community forms part of the Frenchman's Bay Provincially Significant Coastal Wetland Complex and is dominated by Hybrid Cattail, Broad-leaved Cattail (*Typha latifolia*) and Narrow-leaved Cattail (*Typha angustifolia*). Associated species include Bulbet-Bearing Water Hemlock (*Cicuta bulbifera*), Broad-fruited Bur-reed (*Sparganium eurycarpum*) and Common Reed (*Phragmites australis*) (**Photograph 3**).

Photograph 3. Cattail Organic Shallow Marsh

Water-Lily Floating-leaved Shallow Aquatic (SAF1-1)

This community forms part of the Frenchman's Bay Provincially Significant Coastal Wetland Complex and is dominated by White Water Lily with Common Duckweed, Greater Duckweed and Water-milfoil (*Myriophyllum* sp.; **Photograph 4**).



Photograph 4. Water-Lily Floating-leaved Shallow Aquatic

4.2.1.2 Cultural Communities

Sumac Cultural Thicket (CUT1-1)

This community is dominated by Staghorn Sumac (*Rhus typhina*) with Tatarian Honeysuckle (*Lonicera tatarica*), Common Buckthorn (*Rhamnus cathartica*), and Multi-flora Rose (*Rosa multiflora*). The ground flora is dense and comprised of Tall Goldenrod, Canada Thistle (*Cirsium arvense*), New England Aster (*Symphyotrichum novae-angliae*), Queen Anne's Lace (*Daucus carota*), and Butter and Eggs (*Linaria vulgaris*; **Photograph 5**).

Photograph 5. Sumac Cultural Thicket

Hedgerow (HE)

This community is located along the fence line of the marina and is comprised of planted saplings including White Spruce (*Picea glauca*), Bur Oak (*Quercus macrocarpa*), White Pine (*Pinus strobus*), Red Oak (*Quercus rubra*), and Norway Spruce (*Picea abies*; **Photograph 6**).

Photograph 6. Hedgerow Along Marina Fence Line

Anthropogenic (ANT)

The subject property is predominantly anthropogenic and comprised of an active marina and municipal parking lot. There are scattered landscape trees located along the existing chain link fence and in the parking lot.

4.2.2 Flora

A total of sixty-nine (69) species were recorded on the subject property (**Appendix C**). Native species accounted for 48% of the species recorded on the subject property, the majority of which were located within Frenchman's Bay PSW. No provincially endangered or threatened species or regionally rare species were recorded on the subject property. Two regionally uncommon species – Bur Oak (*Quercus macrocarpa*) and Large Bur-reed (*Sparganium eurycarpum*) were recorded on the eastern portion of the property. Bur Oak occurred within the hedgerow communities and appeared to be planted. Large Bur-reed occurred within Frenchman's Bay PSW along the shoreline of Hydro Marsh. Both regionally uncommon species occurred within the staked feature limits (dripline and PSW).

4.2.3 Amphibians

Surveys for breeding amphibians were conducted on the subject property with a focus on the Frenchman's Bay PSW. The subject property is susceptible to a high degree of background noise from

Lake Ontario, Nuclear Power Plant, vehicular traffic and pedestrian traffic, making audio surveys difficult.

During the first survey, a few individuals of Spring Peeper (*Pseudacris crucifer*) were recorded throughout the Frenchman's Bay PSW.

No amphibians were recorded during the second survey.

During the third survey, American Toad (*Anaxyrus americanus*) was recorded in the Frenchman's Bay PSW adjacent to the subject property.

No threatened or endangered amphibian species were recorded and all those observed in the adjacent PSW are common and abundant in Ontario (NHIC 2012).

4.2.4 Breeding Birds

A total of 16 species of breeding birds were recorded on the subject property (**Appendix C**).

The avian assemblages at this location fall into one of two categories, either urban generalist species or wetland birds found closely associated with water, reflecting the habitat on site. The most abundant breeding records were common species regularly found in disturbed urban areas including: Red-winged Blackbird (*Agelaius phoeniceus*), Song Sparrow (*Melospiza melodia*), European Starling (*Sturnus vulgaris)*, and House Sparrow (*Passer domesticus*). The wetland birds recorded at this site included Marsh Wren (*Cistothorus palustris*), Willow Flycatcher (*Empidonax traillii*) and Swamp Sparrow (*Melospiza georgiana*) and were found in the marsh area.

Two species listed under the ESA were actively breeding on the subject property, Least Bittern (*Ixobrychus exilis*) and Barn Swallow (*Hirundo rustica*). Least Bittern is a threatened, area-sensitive and uncommonly encountered species that is notoriously difficult to observe due to their excellent camouflage and cryptic behaviour in tall emergent vegetation characteristic of many shallow marshes. A single Least Bittern was recorded during both breeding bird surveys on the fringes or outside of the property boundaries. Given that only a small portion of marsh extends onto the subject property, it is likely the majority of the bird's territory falls outside of the subject property boundaries. Barn Swallow is a threatened aerial insectivore and was observed exhibiting breeding behaviour during both avian surveys. Nesting activity was identified under a large concrete overhang in the reservoir on the south side of the marina office, however the nest structures were not safely accessible. Approximately 2-3 pairs were determined to be breeding based on the number of adults present and repeatedly returning to this structure.

The TRCA ranks species of regional conservation concern as L1 (highest concern) through L5 (least concern). Two birds at this location receive an L2 ranking (of regional concern), Least Bittern and Marsh Wren. Both of these birds are wetland specialists and are closely tied to marsh habitats.

4.3 Threatened and Endangered Species

In response to a request for information, the MNRF provided correspondence (November 22, 2017) that there are known occurrences of species at risk on or adjacent to the subject property. Beacon has conducted field surveys and a general habitat assessment to assess the potential for each of the indicated species to be present. The presence of these species on the property was based on the results of seasonal surveys and an assessment to determine if suitable habitat was present for any other endangered or threatened species that are known to occur in the vicinity of the subject property (**Table 3**).

Table 3. Potential Threatened and Endangered Species Which May Occur on Subject Property

Species	ESA[1] Status	SARA[2] Status	COSEWIC[3] Status	Species or Habitat Present on the Subject Property
American Eel *Anguilla rostrata*	Endangered	No Status	Threatened	This species could potentially be associated with Hydro Marsh which is outside the development footprint and will be maintained post-development.
Butternut *Juglans cinerea*	Endangered	Endangered Schedule 1	Endangered	Seasonal studies have confirmed this species is not present.
Little Brown Myotis *Myotis lucifugus*	Endangered	Endangered Schedule 1	Endangered	There is no suitable habitat for this species on the subject property.
Northern Myotis *Myotis septentrionalis*	Endangered	Endangered Schedule 1	Endangered	There is no suitable habitat for this species on the subject property.
Eastern Small-footed Myotis *Myotis*	Endangered	No Status	No Status	There is no suitable habitat for this species on the subject property.
Tri-colored Bat *Perimyotis subflavus*	Endangered	Endangered Schedule 1	Endangered	There is no suitable habitat for this species on the subject property.
Bank Swallow *Riparia riparia*	Threatened	No Status	Threatened	There is no suitable habitat for this species on the subject property. Seasonal studies have confirmed the species is not present.
Barn Swallow *Hirundo rustica*	Threatened	No Status	Threatened	Species is present on the subject property (see Section 4.4.1).
Blanding's Turtle *Emydoidea blandingii*	Threatened	Endangered Schedule 1	Endangered	This species could potentially be associated with the PSW. The PSW will be maintained post-development and is being provided with a buffer.
Chimney Swift *Chaetura pelagica*	Threatened	Threatened	Threatened Schedule 1	There is no suitable habitat for this species on the subject property.

Species	ESA[1] Status	SARA[2] Status	COSEWIC[3] Status	Species or Habitat Present on the Subject Property
Lake Sturgeon *Acipenser fulvescens*	Threatened	No Status	Threatened	This species could potentially be associated with Hydro Marsh which will be maintained post-development.
Least Bittern *Ixobrychus exilis*	Threatened	Threatened Schedule 1	Threatened	Species is present on the subject property (see Section 4.4.2).

1- ESA – Endangered Species Act
2- SARA – Species at Risk Act
3- COSEWIC – Committee on the Status of Endangered Wildlife in Canada

4.3.1 Barn Swallow

Barn Swallow are threatened both provincially and federally. These birds are aerial insectivores and typically occur in close association with human habitation. These birds construct mud-based nest cups on vertical anthropogenic surfaces including barns or under bridges. Nesting activity was identified under a large concrete overhang in the reservoir on the south side of the marina office, however it was not possible to visually confirm the presence of nests as the area was not safely accessible. Approximately 2-3 pairs were determined to be breeding based on the number of adults present and repeatedly returning to this structure. Compensation for the impacts to this species will be provided in accordance with the requirements of Section 23.5 of the ESA.

4.3.2 Least Bittern

Least Bittern are threatened both provincially and federally. The Least Bittern is an uncommonly encountered species that is notoriously difficult to observe due to their excellent camouflage and cryptic behaviour in tall emergent vegetation characteristic of many shallow marshes. A single Least Bittern was recorded during both breeding bird surveys on the fringes or outside of the property boundaries within the PSW. It is likely the majority of the bird's territory fall outside of the property boundaries as only a small portion of marsh extends onto the subject property.

4.4 Other Wildlife

Based on the existing habitat conditions on the property the potential for wildlife habitat was assessed, however no other specific wildlife surveys were conducted. There is evidence of heavy beaver activity in the Willow Mineral Thicket Swamp (SWT2-2), with numerous willow stumps and the presence of a beaver lodge (**Photograph 7**).

Photograph 7. Beaver Lodge

Additionally, the property likely provides habitat for a limited number of common disturbance-tolerant wildlife species. Some mammals common to southern Ontario are also likely present in limited numbers. For example, Grey Squirrel (*Sciurus carolinensis*), Racoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Eastern Cottontail (*Sylvilagus floridanus*), Red Fox (*Vulpes vulpes*), Woodchuck (*Marmota monax*), and Porcupine (*Erethizon dorsatum*) and several other common species are likely to occur.

MNRF correspondence identified the potential for a number of species of special concern to be present on or adjacent to the property. A habitat assessment was conducted to determine if suitable habitat was present for any special concern species (**Table 4**).

Table 4. Special Concern Species Which May Occur on Subject Property

Species	ESA[1] Status	SARA[2] Status	COSEWIC[3] Status	Habitat Present on the Subject Property
Black Tern *Chlidonias niger*	Special Concern	No Status	No Status	Suitable habitat is present in the PSW. Seasonal studies have confirmed this species is not present.
Northern Map Turtle *Graptemys geographica*	Special Concern	Special Concern Schedule 1	Special Concern	This species could potentially be associated with the PSW. The PSW will be maintained post-development and is being provided with a buffer.

Species	ESA[1] Status	SARA[2] Status	COSEWIC[3] Status	Habitat Present on the Subject Property
Peregrine Falcon *Falco peregrinus*	Special Concern	Special Concern Schedule 1	No Status	There is no suitable habitat for this species on the subject property.
Snapping turtle *Chelydra serpentina*	Special Concern	Special Concern Schedule 1	Special Concern	This species could potentially be associated with the PSW. The PSW will be maintained post-development and is being provided with a buffer.
Monarch *Danaus plexippus*	Special Concern	Special Concern Schedule 1	Endangered	There is no suitable habitat for this species on the subject property.

4.5 Landscape Connectivity

Landscape connectivity is recognized as an important component of natural heritage planning. A wide range of benefits can be attributed to maintaining connectivity within the natural landscape. In essence, corridors allow organisms to move between areas of high habitat importance. Conservation of distinct habitat types to protect species may be less effective unless the corridors between them are also protected or restored.

The subject property occurs in an area where the local landscape has been altered through past and present anthropogenic use and is highly urbanized. From a wildlife perspective, the property is situated directly adjacent to existing urban land uses to the north and west. Frenchman's Bay Provincially Significant Coastal Wetland Complex and the Lake Ontario shoreline located on the southern and eastern portions of the property forms part of both a terrestrial and aquatic corridor within the local landscape. This corridor provides numerous ecological functions including wildlife habitat, shoreline protection, connecting core natural areas, and facilitating seed dispersal and exchange of genetic material.

This linkage for movement will be maintained post development and will be provided with a buffer.

4.6 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) designation is the responsibility of the planning authority and determination of it on a site by site basis is generally not an appropriate manner in which to determine this constraint. However, there is guidance in two provincial documents: the Significant Wildlife Technical Guide (OMNR, 2000) and the Natural Heritage Reference Manual (MNRF, 2015). SWH is generally divided into four broad categories including: seasonal concentration areas, rare vegetation communities and specialized habitats for wildlife, habitats of species of conservation concern, excluding habitats of threatened and endangered species, and animal movement corridors.

The City of Pickering Official Plan does not identify Significant Wildlife Habitat, nor does the proposed development envelope provide potential for SWH due to its anthropogenic nature.

5. Assessment of Significant Natural Heritage Features

The findings of the background review and field investigations have been relied upon to confirm whether the subject property supports any of the natural heritage components recognized under the PPS, and the City policies. The Natural Heritage Reference Manual (MNRF, 2010) was consulted to provide additional technical guidance where required.

Frenchman's Bay Provincially Significant Coastal Wetland Complex and Hydro Marsh is located on the eastern and southern portions of the subject property. These features also form part of the Frenchman's Bay Coast Marsh Candidate Life Science ANSI.

Seasonal field investigations were conducted in June 2017 to confirm the presence of threatened or endangered avian species. Barn Swallow was recorded on the subject property and will be addressed with the MNRF. Least Bittern was recorded within the PSW on the subject property. No other threatened or endangered species have been recorded on the subject property.

There are no significant woodland or valleyland features on the subject property. This has been confirmed in the field and through consultation with staff from TRCA.

The Planning Authority has not identified Significant Wildlife Habitat on the subject property or within its boundaries. No thresholds for number of individuals of species of conservation concern, or particularly density thresholds, have been developed to determine significance within the municipality. Based on these factors, an analysis of the seasonal field investigation data indicates that no features on the subject property meet the criteria for Significant Wildlife Habitat.

6. Proposed Development Plan

The proposed development consists of two multi-storey, multi-use (commercial and residential) buildings with underground parking (**Figure 3**). Site access will be provided from a private road on the north side of the site from Liverpool Road. An Open Space Block separates the proposed buildings from the Frenchman's Bay Provincially Significant Coastal Wetland Complex and Hydro Marsh.

6.1 Site Servicing

A Functional Servicing Report (FSR) has been prepared by Sabourin Kimble & Associates Ltd. (February 2019). A summary of the FSR with respect to stormwater and servicing is detailed below.

6.1.1 Stormwater Management

Stormwater will be collected in an internal storm sewer and discharge to Krosno Creek on the south side of the subject property via an existing headwall. Overland flow from the Open Space Block will drain to a bioretention swale which will overflow to Frenchman's Bay PSW.

Quality control will be provided through an Oil and Grit Separator (OGS) system and low impact development (LID) measures including a green roof and bioretention swale with plantings.

6.1.2 Sanitary Servicing

A 900 mm diameter trunk sewer is located within the western portion of the site and conveys flows north to the pumping station. Sanitary drainage for the proposed buildings will be provided internally and connected to the existing 900 mm trunk sewer via a single sanitary stub proposed at an existing manhole. Region of Durham staff have indicated that there is sufficient capacity with the existing 900mm diameter sewer for the subject lands.

6.1.3 Watermains

A 200 mm PVC watermain is located adjacent to the subject lands on the east side of Liverpool Road. An internal watermain system is proposed to be connected to the existing 200 mm watermain.

7. Impact Assessment

Background review and field investigations identified that the subject property is primarily comprised of an active marina storage yard and municipal parking lot. The eastern and southern portions of the property form part of the Frenchman's Bay Provincially Significant Coastal Wetland Complex.

Effects of the proposed development of the property will include:

- Dewatering for underground parking garage;
- Buffer encroachment of 0.12 ha into 30 m PSW buffer;
- Alteration in the conveyance of surface water drainage to the PSW;

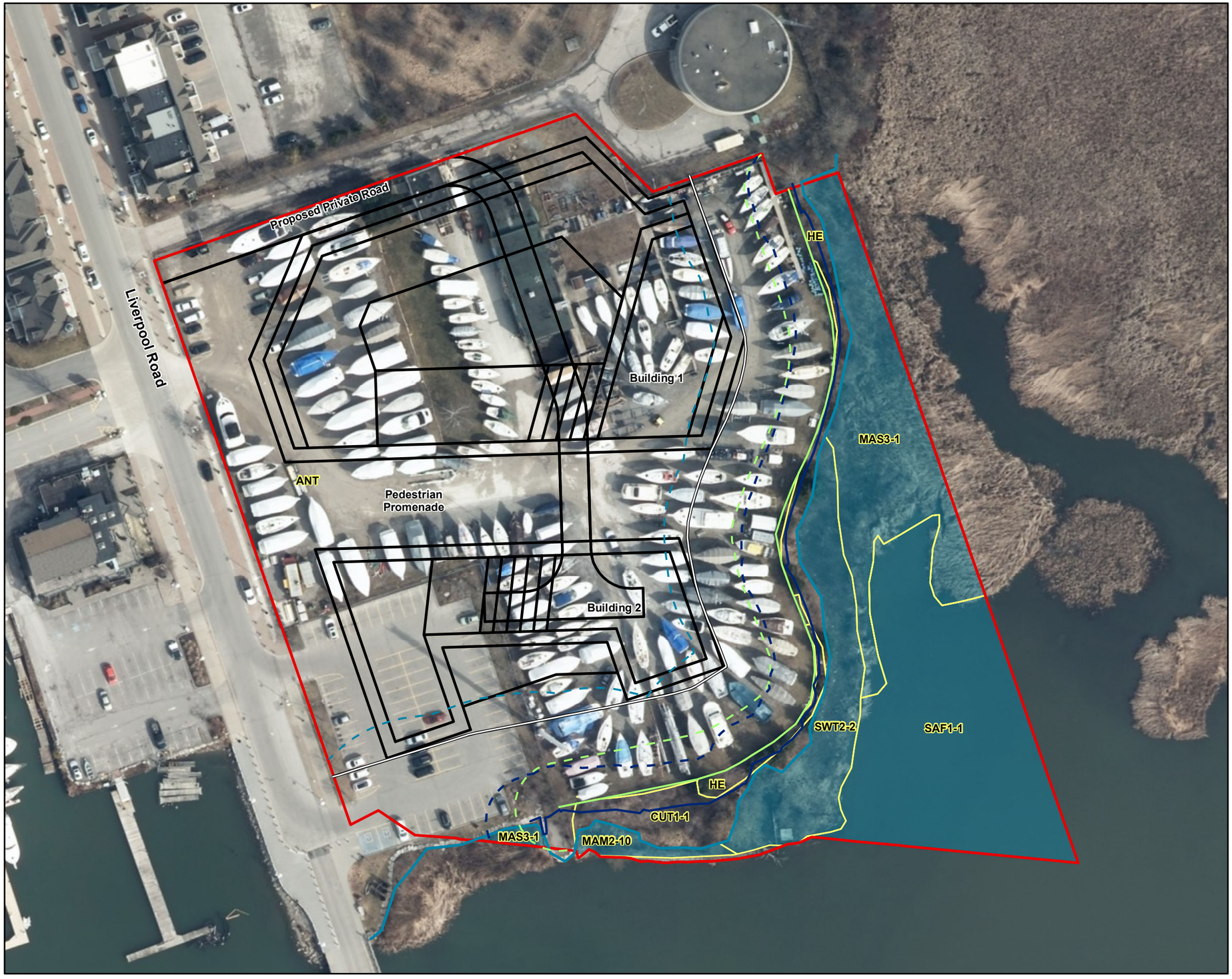
- Stormwater servicing installation and associated grading in the Open Space Block:
- Removal of 12 trees within the proposed development area and injury to 19 trees adjacent the proposed development (D.A. White Tree Care, 2019);
- Soil mobilization during site grading and stockpiling of material;
- Indirect noise and light effects to wildlife; and
- Displacement of wildlife resulting from site preparation and disturbance during construction.

The impacts related to the dewatering for the underground parking garage to be confirmed through detailed design.

Proposed Development

Figure 3

591 Liverpool Road, Pickering
Pickering Harbour Company Ltd.



Legend

- Subject Property
- Proposed Development
- Building Setback
- ELC Communities
- Provincially Significant Wetland (MNRF 2017)
- Provincially Significant Wetland + 30 m
- Wetland
- Dripline & Top of Bank (TRCA 2017)
- Dripline & Top of Bank + 10 m
- Floodline
- Floodline + 10 m

ELC Code	ELC Community
Wetland Communities	
SWT2-2	Willow Mineral Thicket Swamp
MAM2-10	Forb Mineral Meadow Marsh
MAS3-1	Cattail Organic Shallow Marsh
SAF1-1	Water Lily Floating-leaved Shallow Aquatic
Cultural Communities	
CUT1-1	Sumac Cultural Thicket
HE	Hedgerow
ANT	Anthropogenic

UTM Zone 17 N, NAD 83

First Base Solutions
Web Mapping Service 2018

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Project 216450
March 2019

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8. Recommended Mitigation Measures

8.1 Buffer to Natural Heritage Features

The limits of the natural features present on site have been staked with MNRF and TRCA. Natural feature limits include PSW, dripline and top of bank on the subject property. The proposed limit of development is located outside of the natural features and buildings are setback a minimum of 20 m from the limit of natural features. The proposed development is also greater than 10 m from the floodline. A landscape plan is being prepared for the buffer that will provide a "Vision" for the property and the buffer treatment will be determined in consultation with the City of Pickering and TRCA.

8.1.1 Frenchman's Bay Provincially Significant Coastal Wetland Complex

A variable buffer of 22.3 m to 35.6 m is proposed from the PSW with an overall buffer area of 0.55 ha. While this buffer is 0.12 ha smaller than the area of 0.67 ha that would be provided by a continuous 30 m buffer, it far exceeds the existing buffer area (**Figure 4)**. The existing land uses are within 2.1 to 15.7 m of the PSW with an existing buffer area of 0.11 ha which includes the existing boat storage area and municipal parking. The proposed buffer will include the removal of 808 m^2 of impervious surface (municipal parking lot) from the PSW setback, replacing it with natural area and plantings. The proposed buffer increases the setback to the feature and is sufficient to mitigate the impacts of any stormwater surface runoff resulting from the proposed development, which will effectively decrease as a result of the removal of hard surfaces (SKA 2019). Additionally, the proposed development is located at a greater setback than the existing urban land use, while existing urban land use to the north is within 15 m of the PSW. The variable buffer to the feature from the proposed development will not include permanent structures or hard surfaces.

8.1.2 Hydro Marsh Shoreline

A minimum buffer of 20 m is proposed from the high-water mark and contiguous vegetation dripline. This buffer is of a sufficient size to protect the shoreline from the proposed development as it far exceeds the buffer area from the adjacent land uses. The municipal parking lot and active boat storage area are within 2.1 m of the shoreline, which results in the existing buffer area providing a very limited ecological function. Wildlife movement along the shoreline is currently limited by the existing, heavy anthropogenic use and physical barriers (i.e. chain link fence). The proposed 20 m buffer will enhance the shoreline corridor providing an overall benefit compared to existing condition.

8.1.3 Woody Vegetation Dripline and Top of Bank

A minimum buffer of 20 m is proposed from the dripline and top of bank as agreed upon with the TRCA, which is of a sufficient size to protect the dripline from the proposed development. This buffer will prevent the encroachment of the proposed development into the root zones of any trees located along the shoreline. The proposed 20 m buffer will provide a setback from the feature limit which does not currently exist and exceeds the standard minimum buffers of 10 m.

8.2 Water Balance

Surface water from the proposed buffer area is proposed to drain to a bioretention swale which will overflow to the wetland. It is anticipated that the Frenchman's Bay PSW is not overly sensitive to changes in surface water flow but is more sensitive to fluctuations in the Lake Ontario water levels (SKA 2019).

8.3 Low Impact Development Techniques (LIDs)

In order to minimize the impact of development on the future water balance for the site, infiltration mitigation measures will be promoted and incorporated within the proposed development (SKA 2019). As noted in the FSR, due to the proximity of the subject property to Lake Ontario, it is anticipated that the water table will be too high to allow for infiltration galleries. A green roof is proposed for one of the buildings and a bioretention swale with plantings is proposed within the buffer area. These measures will retain 5 mm of runoff and provide promote uptake of stormwater runoff by vegetation.

8.4 Avian Species at Risk

8.4.1 Barn Swallow

Barn Swallow nests can be removed outside of the breeding season, however, prior to removal, the MNRF Registry process must be followed. Compensation structures can be built after a nesting structure is removed, but must be built before the next nesting season, so that no breeding season is missed. Section 23.5 of Ontario Regulation 242/08 provides direction on this process. A Mitigation and Restoration record will be created and the structures must be monitored for three years.

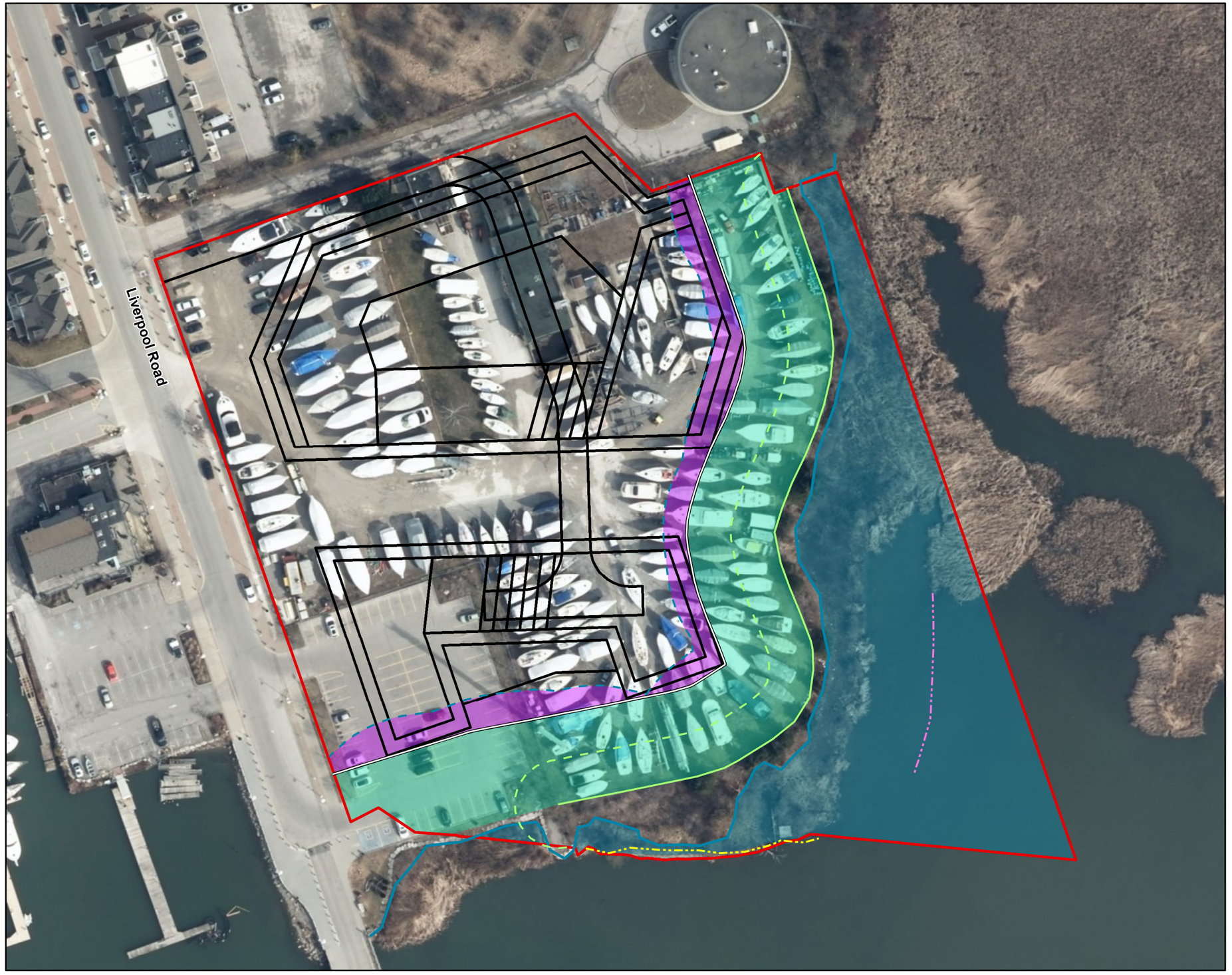
8.4.2 Least Bittern

Impacts to suitable habitat are being mitigated by design as the development envelope is confined to the existing hardscape and no encroachment into the PSW is proposed. Additional protection to the habitat is provided from the variable buffer to the PSW.

The species shows resiliency to urban development as it has persisted in the area, despite the surrounding land use. No additional impacts to the existing urban development are anticipated from the proposed development.

8.5 Aquatic Habitat

In Ontario, the MNRF has the responsibility for setting timing window guidelines. Any in water works (i.e. below the high water level) to be undertaken as part of the proposed development shall respect the fisheries timing window. Restricted activity timing windows are applied to protect fish from impacts of works or undertakings in and around water during spawning migrations and other critical life history stages. A restricted activity timing window is recommended for the protection of spring spawning



Proposed Buffer Encroachment and Enhancement Areas

Figure 4

591 Liverpool Road, Pickering
Pickering Harbour Company Ltd.

Legend

- Subject Property
- Proposed Development
- Building Setback
- Wetland
- Provincially Significant Wetland (MNRF 2017)
- Provincially Significant Wetland + 30 m
- Dripline & Top of Bank (TRCA 2017)
- Dripline & Top of Bank + 10 m
- Steel Wire Fence(On The Shoreline)
- Filter Cloth Fence (20m From Shore; Submerged)
- Provincially Significant Wetland 30 m Buffer Encroachment (0.12 ha)
- Area of Enhancement (0.44 ha)

UTM Zone 17 N, NAD 83

First Base Solutions
Web Mapping Service 2018

0 5 10 20 Metres

1:900

Project 216450
March 2019

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species between March 15 and July 15 based on the fish community documented in Hydro Marsh and the guidelines on the Fisheries and Oceans Canada (DFO) website.

8.5.1 Enhancement Opportunities

Two opportunities for improvement of the aquatic habitat were identified that could provide enhancement to the PSW and fish habitat along the shoreline (**Figure 4**).

- An old steel wire fence is present along the shoreline west of the access pad near ASL-1. The fence is partially collapsed and in the water at ASL-2. The removal of this structure and fence and revegetating the area is an opportunity to improve the aquatic habitat along the shoreline within the PSW.
- There is an old submerged filter cloth fence attached to steel posts present approximately 20 m from the shoreline at ASL-4. The fence is in poor condition and its current function is not clear. Removing this filter cloth fence is an opportunity to improve the nearshore aquatic habitat.

These works will be conducted in consultation with TRCA as they are within a regulated area and a permit may be required. Works will be conducted outside of the fisheries timing window and detailed restoration plans will be prepared for each area.

8.6 General Mitigation Measures

8.6.1 Tree Preservation Plan

A companion Tree Inventory and Preservation Plan has been prepared by D.A. White Tree Care (January 2019) and has been submitted under a separate cover.

Tree protection measures detailed in the report should be in place on the property prior to construction and should be inspected as prescribed. Trees removed should be replanted on the subject property post construction.

8.6.2 Timing of Vegetation Removal

The federal *Migratory Bird Convention Act* (1994) protects the nests, eggs and young of most bird species from harm or destruction. Environment Canada considers the 'general nesting period' of breeding birds in southern Ontario to be between late March and the end of August. This includes times at the beginning and end of the season when only a few species might be nesting. It is recommended that during the peak period of bird nesting (i.e., between mid-April and mid-July), no vegetation clearing or disturbance to nesting bird habitat should occur.

In the 'shoulder' seasons of April 1 to April 15, and July 16 to August 31, vegetation clearing could occur, but only after an ecologist with appropriate avian knowledge has surveyed the area to confirm lack of nesting. For any proposed clearing of vegetation within the breeding bird season an ecologist

should undertake detailed nest searches immediately prior (within two days) to site alteration to ensure that no active nests are present.

If nesting is found, then vegetation clearing in an area around the nest, the size of which depends on the specific circumstances, has to wait until nesting has concluded. The likelihood of nesting birds being present in the 'shoulder' seasons also depends on the habitat type.

From September 1 through to March 31, vegetation clearing can occur without nest surveys, but the need to ensure nest protection still applies (i.e., if an active nest is known to be present it must be protected).

8.6.3 Erosion and Sediment Control

Construction works such as grading, grubbing and excavation can cause the movement of sediment into the wetland or adjacent shoreline. An erosion and sediment control plan will be prepared prior to construction works. Silt fencing should be installed at the limit of development (i.e. outside feature and proposed buffer) to minimize sediment leaving the construction area and should be removed when development work is completed and exposed soils stabilized.

Standard Best Management Practices should also be employed during the construction process.

8.6.4 Noise and Light Effects

Lighting along the southern and eastern edge of the proposed development should be directed downward and away from all natural features to minimize the impact of the proposed development on the function of these areas. This includes any lighting along natural features as part of the future development.

8.6.5 Fencing

The existing chain link fencing will be maintained post-development in order to limit the intrusion of people and pets into the PSW.

9. Policy Conformity

9.1 Provincial Policy Statement

The area of proposed development on the subject property is almost entirely anthropogenic and is outside the natural features. The study area does not contain significant wetlands, significant woodlands, significant valleylands, significant wildlife habitat, or significant areas of natural and scientific interest.

Frenchman's Bay Provincially Significant Coast Wetland Complex is located on the eastern and southern portions of the subject property. The proposed development of the subject lands will not result in the removal of any portion of the wetland and will provide variable buffer greater in area than the existing buffer. Mitigation measures are proposed to minimize indirect impacts during the construction phase.

Barn Swallow and Least Bittern have been recorded on the property through seasonal field investigations. Section 8.3 discusses how this will be addressed in the context of the regulations of the ESA to ensure the requirements of the Act are met.

The area of proposed development on the subject property is entirely outside of fish habitat (i.e. above the high water level). The proposed buffer is sufficient to protect the adjacent warm water fish habitat.

9.2 Regional Municipality of Durham Official Plan

The proposed developable land is outside of the limits of the natural features on the property as staked by MNRF and TRCA in 2017. A minimum 20 m buffer is proposed from the Hydro Marsh shoreline, woody vegetation dripline and top of bank, which exceeds the minimum 10 m buffer prescribed by TRCA. A variable buffer of 22.3 to 35.6 m with an area of 0.55 ha is provided to the PSW and shoreline and a minimum buffer of 20 m is provided to the top of bank and dripline. The proposed buffer is in excess of the existing buffer of 0.11 ha and is sufficient to protect the natural features and their functions.

This EIS recommends buffers to protect the features and outlines mitigation measures to limit the potential impacts on the adjacent natural features during development.

9.3 City of Pickering Official Plan

The limits of the natural features present on the subject property were confirmed and the proposed developable land is outside of the limits of the natural features as staked by MNRF and TRCA in 2017.

A minimum 20 m buffer is proposed from the Hydro Marsh shoreline, woody vegetation dripline and top of bank. A variable buffer of 22.3 to 35.6 m is provided to the PSW and shoreline and a minimum buffer of 20 m is provided to the top of bank and dripline. The proposed buffer is in excess of the existing buffer of 0.11 ha. As the subject property is within the South Pickering urban area, minimum vegetation protection zones smaller than those specified in the Official Plan can be considered.

This EIS recommends buffers to protect the features and outlines mitigation measures to limit the potential impacts on the adjacent natural features during development. While the recommended buffers are smaller than the minimum vegetation protection zones specified in the Official Plan (30 m), they are sufficient to protect the natural features present on the subject property. The proposed development will not result in an increase in risk to property or impact to the control of flooding or pollution from the existing land use. The proposed development includes a buffer width greater than what is provided by the existing land uses, which will enhance the shoreline corridor compared to existing conditions.

9.4 Toronto Region Conservation Authority Regulations and Policies

Frenchman's Bay PSW and Hydro Marsh on the eastern and southern portions of the subject property are regulated by the TRCA and a permit will be required for development adjacent to these features. The dripline of the shoreline vegetation and top of bank was confirmed in the field with TRCA in 2017. The limits of the PSW were staked in the field with MNRF in 2017.

The proposed development is located outside of all natural features present on the subject property. A minimum 20 m buffer is proposed from the Hydro Marsh shoreline, woody vegetation dripline and top of bank, which exceeds the minimum 10 m buffer prescribed by TRCA. The proposed development is also located greater than 10 m from the flood line.

A variable buffer of 22.3 m to 35.6 m is proposed from the PSW with an overall buffer area of 0.55 ha. While this buffer is 0.12 ha smaller than the area of 0.67 ha that would be provided by a continuous 30 m buffer, it far exceeds the existing buffer area. The existing marina and municipal parking are within 2.1 to 15.7 m of the PSW and the current buffer area is only 0.11 ha from the existing marina and municipal parking. The proposed buffer is in excess of the existing buffer and is sufficient to mitigate the impacts of stormwater surface flow resulting from the proposed development. The buffer treatment will be determined in consultation with the City of Pickering and TRCA.

Mitigation measures as detailed in Section 8 are proposed to offset the 0.12 ha encroachment into the 30 m buffer from the PSW and include the removal of 808 m^2 of existing parking lot, removal of debilitated fencing from Hydro Marsh and low impact development techniques.

9.5 Federal Fisheries Act

The area of proposed development on the subject property is entirely outside of fish habitat (i.e. above the high water level).

Any in water works to be undertaken as part of the proposed enhancement opportunities shall respect the fisheries timing window. Restricted activity timing windows are applied to protect fish from impacts of works or undertakings in and around water during spawning migrations and other critical life history stages. A restricted activity timing window is recommended for the protection of spring spawning species between March 15 and July 15 based on the fish community documented in Hydro Marsh and the guidelines on the Fisheries and Oceans Canada (DFO) website.

9.6 Endangered Species Act

Barn Swallow and Least Bittern have been recorded on the property through seasonal field investigations. Section 8.3 discusses how this will be addressed in the context of the regulations of the ESA to ensure the requirements of the Act are met.

No other threatened or endangered species were recorded.

10. Summary

Beacon Environmental has conducted a background review and field investigations in order to prepare this Environmental Impact Study for the proposed development of the subject property. The proposed plan has been developed to achieve conformity with applicable natural heritage policies as set out in the PPS, Region of Durham Official Plan and City of Pickering Official Plan.

The limits of the natural features (PSW, Hydro Marsh) that are located on the eastern and southern portions of the subject property have been subject to seasonally appropriate field investigations and have been staked with the MNRF and TRCA. Development is not proposed within these features and an appropriate buffer has been applied to protect the features and their ecological function.

TRCA regulates the wetlands, shorelines and waterbodies on the subject property, therefore proposed development or site alteration within those portions of the subject property encumbered by the above noted natural features, namely the PSW, Hydro Marsh, and the adjacent regulated areas; will need permits pursuant to Ontario Regulation 166/06 under the *Conservation Authorities Act*.

Mitigation measures have been recommended to address any potential negative impacts on the natural features, including natural feature protection and buffering, low impact development techniques, timing windows, and erosion and sediment controls during construction.

Report prepared by:
Beacon Environmental

Jesse Harnden, B.Sc., ISA
Ecologist

Report prepared by:
Beacon Environmental

Taco den Haas, M.Sc.
Aquatic Ecologist

Report reviewed by:
Beacon Environmental

Kristi L. Quinn, B.E.S
Principal, Senior Environmental Planner

11. References

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Appendix A

Terms of Reference

January 10, 2019 BEL 216450

Elyssa Elton
Senior Planning Ecologist, Planning and Development
Toronto and Region Conservation Authority
101 Exchange Avenue
Vaughan, ON L4K 5R6

Re: Terms of Reference for an Environmental Impact Study– 591 Liverpool Road, City of Pickering, Regional Municipality of Durham, Ontario

Dear Ms. Elton:

Beacon Environmental Limited (Beacon) has been retained by Pickering Harbour Company Ltd. to prepare an Environmental Impact Study (EIS) for the proposed residential development for the property located at 591 Liverpool Road in the City of Pickering, Durham Region (herein referred to as subject property). The subject property is located on the east side of Liverpool Road at the south terminus. As part of the Environmental Impact Study (EIS), Beacon has prepared this Terms of Reference (ToR) to outline the field investigations to be undertaken, and the content of the EIS report, to support the proposed development.

The following represents our proposed ToR to undertake the EIS as discussed in the field on September 13, 2017.

Background Review

The subject property is approximately 2.4 ha (6.0 acres) and is currently operating as Frenchman's Bay Marina and municipal parking. The subject property is designated as Natural Area and Marina Area in the City of Pickering's Official Plan (2017). The property fronts onto a bay known as 'Hydro Marsh' which is connected to Frenchman's Bay and Frenchman's Bay Provincially Significant Coastal Wetland Complex (PSW) is located to the east and south.

The EIS will include review of documentation for the subwatershed and summarize for context.

Field Investigations

Based on the known conditions on the subject property the following field investigations were completed to identify existing natural heritage features on the subject property in the 2017 field season (April-October).

Amphibian Surveys (April to June)
Breeding amphibian surveys were completed according to Environment Canada's Marsh Monitoring Program protocol and consisted of three auditory surveys undertaken during the prime breeding period to record calling males that are present.

Breeding Birds (June)
These surveys consisted of three early morning visits that were conducted in June, a minimum of seven days apart, during suitable weather.

Flora and Vegetation Communities (May – August)
Vegetation units on the subject property were described and mapped on current, colour ortho-photography of the lands using the Ecological Land Classification system for southern Ontario (Lee *et al*. 1998). This is the standard method used for describing vegetation communities in southern Ontario. At the same time as vegetation community mapping was undertaken, a floral inventory occurred which consisted of a compilation of a list of plants observed on the property.

Aquatic Habitat Assessment (October)
The nearshore aquatic habitat was assessed using a canoe. Characteristics of the nearshore habitat were documented form the shoreline to a maximum depth of approximately 1 m. Observations were made in regards to the substrate, depth, presence of aquatic macrophytes, shoreline vegetation, signs of recent erosion, presence of man made structures or other anthropogenic influences.

Species at Risk (May – August)
A general habitat assessment for species at risk, identified as potentially occurring on the site during desktop review and SAR screening through MNRF, was undertaken during the field investigations outlined above.

Feature Staking (September)
Feature staking was conducted with staff from the Ministry of Natural Resources and Forestry (Steve Varga) and Toronto Region Conservation Authority (Elyssa Elton and Gretel Green) for the limits of the PSW and top of bank on September 13, 2017. Members of the consulting team were also present as well as a land surveyor. The limit of the top of bank was not staked in the field but agreed by all parties to be concurrent with the existing chain link fence.

Incidental Wildlife Observations
Any species seen on the site during field investigations will be recorded as an incidental observation for the purposes of EIS.

Reporting

Environmental Impact Study Report
An EIS report will be produced following completion of field investigations and once a final development plan has been produced. Preparation of the report will be an iterative process that will resolve issues related to vegetation removal and mitigation requirements.

The EIS report will identify:

- Existing site conditions;
- An impact assessment relative to the proposed development;
- Identification of opportunities and mitigation measures for the proposed development;
- Bird strike mitigation measures;
- A discussion of net impacts on the existing natural heritage features on and adjacent to the site; and
- Relevant policy as it pertains to this proposed development.

I trust that this ToR satisfies the TRCA's requirements with regards to the EIS in support of the proposed development on subject property. Should you have any questions or points for discussion, please do not hesitate to contact me at (705) 243-7251 ext. 402.

Prepared by:
Beacon Environmental

Jesse Harnden, B.Sc., ISA
Ecologist

Reviewed by:
Beacon Environmental

Kristi L. Quinn, B.E.S
Senior Planning Ecologist

cc. Ms. Melinda Holland, The Biglieri Group
Mr. Harold Hough, Pickering Harbour Company Limited

From: Elyssa Elton
To: Jesse Harnden
Cc: Kristi Quinn; "Melinda Holland"; Steve Heuchert
Subject: RE: 591 Liverpool Road - Terms of Reference for EIS
Date: January 10, 2019 2:22:11 PM

Email confirmation is sufficient for me.

Elyssa Elton, B.Sc. MES
Senior Ecologist, Planning
Planning and Policy | Planning and Development

T: 416.661.6600 ext. 5701
E: eelton@trca.on.ca
A: 101 Exchange Avenue, Vaughan

Toronto and Region Conservation Authority (TRCA) | trca.ca

From: Jesse Harnden <jharnden@beaconenviro.com>
To: "'Elyssa Elton'" <eelton@trca.on.ca>
Cc: Kristi Quinn <kquinn@beaconenviro.com>, "'Melinda Holland'" <mholland@thebiglierigroup.com>, Steve Heuchert <sheuchert@trca.on.ca>
Date: 01/10/2019 02:16 PM
Subject: RE: 591 Liverpool Road - Terms of Reference for EIS

Hi Elyssa,

Thank you very much for your prompt response! The items you added below will be included in the EIS. Do you need the Terms of Reference revised and re-submitted or is email confirmation sufficient?

Sincerely,

Jesse Harnden, B.Sc., ISA / Ecologist
BEACON Environmental
305 Reid Street, Peterborough, ON K9J 3R2
T) 705.243.7251 x402 C) 905.375.9514
www.beaconenviro.com

From: Elyssa Elton <eelton@trca.on.ca>
Sent: January 10, 2019 2:14 PM
To: Jesse Harnden <jharnden@beaconenviro.com>
Cc: Kristi Quinn <kquinn@beaconenviro.com>; 'Melinda Holland' <mholland@thebiglierigroup.com>; Steve Heuchert <sheuchert@trca.on.ca>
Subject: Re: 591 Liverpool Road - Terms of Reference for EIS

Hi Jesse,
I would just make sure you explicitly add that natural feature buffers will be discussed in the report and that figures will be provided showing the staked lines (and any other applicable natural feature limit) and the extent of the buffers.

Thanks!
Elyssa

Elyssa Elton, B.Sc. MES
Senior Ecologist, Planning
Planning and Policy | Planning and Development

T: 416.661.6600 ext. 5701
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A: 101 Exchange Avenue, Vaughan

Toronto and Region Conservation Authority (TRCA) | trca.ca

From: Jesse Harnden <jharnden@beaconenviro.com>
To: "'Elyssa Elton'" <eelton@trca.on.ca>
Cc: Kristi Quinn <kquinn@beaconenviro.com>, "'Melinda Holland'" <mholland@thebiglierigroup.com>
Date: 01/10/2019 10:12 AM
Subject: 591 Liverpool Road - Terms of Reference for EIS

Hi Elyssa,

We are preparing an Environmental Impact Study (EIS) for the property located at 591 Liverpool Road, in the City of Pickering. Please find attached the Terms of Reference for completion of the EIS. I know a bit of time has passed since we last discussed this project, but if you could please review the attached and confirm your acceptance it would be greatly appreciated.

Sincerely,

Jesse Harnden, B.Sc., ISA / Ecologist
BEACON Environmental
305 Reid Street, Peterborough, ON K9J 3R2
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[attachment "2019-01-10_ToR 591 Liverpool Rd 216450_FINAL.pdf" deleted by Elyssa Elton/TRCA]

Appendix B

MNRF Correspondence

Ministry of
Natural Resources
and Forestry
Aurora District Office
50 Bloomington Road
Aurora, Ontario L4G 0L8

Ministère des
Richesses naturelles
et des Forets

Telephone: (905) 713-7400
Facsimile: (905) 713-7361

Ontario

November 22, 2017

Jesse Harnden
Beacon Environmental Limited
705-243-7251
jharnden@beaconenviro.com

Re: Request for Information for 591 Liverpool Road,
City of Pickering, Regional Municipality of Durham

Dear Jesse,

In your email dated July 31, 2017 you requested information on Species at Risk occurring on or adjacent to the above mentioned location. There are Species at Risk recorded on or adjacent to your study area. As of the date of this letter, MNRF has records of:

- AMERICAN EEL (Endangered)
- BUTTERNUT (Endangered)
- BANK SWALLOW (Threatened)
- BARN SWALLOW (Threatened)
- BLANDING'S TURTLE (Threatened)
- CHIMNEY SWIFT (Threatened)
- LAKE STURGEON (Threatened)
- LEAST BITTERN (Threatened)
- BLACK TERN (Special Concern)
- NORTHERN MAP TURTLE (Special Concern)
- PEREGRINE FALCON (Special Concern)
- SNAPPING TURTLE (Special Concern)

Additionally, the species listed below have the potential to occur in your study area and may require further assessment or field studies to determine presence:

- EASTERN SMALL-FOOTED MYOTIS (Endangered)
- LITTLE BROWN MYOTIS (Endangered)
- NORTHERN MYOTIS (Endangered)
- TRI-COLOURED BAT (Endangered)

The species listed above may receive protection under the *Endangered Species Act, 2007* (ESA) and thus, an approval from MNRF may be required if the work you are proposing could cause harm to these species or their habitats. If the Species at Risk in Ontario List is amended, additional species may be listed and protected under the ESA or the status and protection levels of currently listed species may change.

We require more detailed information on the proposed project in order to assess the impacts of the works on Species at Risk. *When project details have been determined*, please fill out an Information Gathering Form (IGF) for any *threatened* or *endangered* species listed in the provided letter and submit it to our office (to ESA.Aurora@ontario.ca). The IGF can be found here (along with its associated guide). Please include detailed descriptions of the undertakings such as proposed timing and phasing of the project and details on what is required at each phase.

All sections and tables should be filled out in their entirety – incomplete forms will be returned and may delay the review process. Any applicable supplemental information that will assist with the review process should also be submitted with the IGF (e.g. field survey results, site plan/drawings, ELC mapping, etc.). Please note that forms are reviewed in the order in which they are received by MNRF and we will contact you with our response once the review is complete.

Absence of information provided by MNRF for a given geographic area, or lack of current information for a given area or element, does not categorically mean the absence of sensitive species or features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. For these reasons, the MNRF cannot provide a definitive statement on the presence, absence or condition of biological elements in any part of Ontario.

This Species at Risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any Species at Risk to our office. This will assist with updating our database and facilitate early consultation regarding your project.

If you have any questions or comments, please do not hesitate to contact ESA.aurora@ontario.ca .

Sincerely,

Tessa Molina
Wildlife Technician
Ontario Ministry of Natural Resources and Forestry | Aurora District

Appendix C

Breeding Birds

Appendix C

Breeding Birds

Common Name	Scientific Name	Status						Breeding Pairs/ Territories
		National Species at Risk COSEWICa	Species at Risk in Ontario Listing a	Provincial breeding season SRANK [b]	TRCA Status d	Regional Status	Area-sensitive (OMNR)c	
Least Bittern	*Ixobrychus exilis*	THR	THR	S4	L2		A	1
Mourning Dove	*Zenaida macroura*			S5	L5			1
Belted Kingfisher	*Ceryle alcyon*			S4	L4			1
Willow Flycatcher	*Empidonax traillii*			S5	L4			1
N. Rough-winged Swallow	*Stelgidopteryx serripennis*			S4	L4			1
Barn Swallow	*Hirundo rustica*	THR	THR	S4	L4			2
Marsh Wren	*Cistothorus palustris*			S4	L3			1
American Robin	*Turdus migratorius*			S5	L5			1
European Starling	*Sturnus vulgaris*			SE	L+			2
Yellow Warbler	*Setophaga petechia*			S5	L5			1
Song Sparrow	*Melospiza melodia*			S5	L5			3
Swamp Sparrow	*Melospiza georgiana*			S5	L4			1
Red-winged Blackbird	*Agelaius phoeniceus*			S4	L5			4
Common Grackle	*Quiscalus quiscula*			S5	L5			1
House Finch	*Haemorhous mexicanus*			SNA	L+			1
House Sparrow	*Passer domesticus*			SNA	L+			2

KEY
a COSEWIC = Committee on the Status of Endangered Wildlife in Canada
a Species at Risk in Ontario List (as applies to ESA) as designated by COSSARO (Committee on the Status of Species at Risk in Ontario)
END = Endangered, THR = Threatened, SC = Special Concern

[b] SRANK (from Natural Heritage Information Centre) for breeding status if:
S1 (Critically Imperiled), S2 (Imperiled),S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure)
SNA (Not applicable…'because the species is not a suitable target for conservation activities'; includes non-native species)

c Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.

d Toronto and Region Conservation Authority L rank (Dec 2010):
L1 to L3 Regional species of concern from highest to lowest; L4 Urban concern; L5 Secure through region; L+ Non-native

Appendix D

Plant List

Appendix D

Plant List

New Scientific Name (FOIBIS 2008)	Common Name (FOIBIS)	Origin	COSEWIC (Sep 2007)	COSSARO (Sep 2009)	S-RANK (200_)	DURHAM (Varga 2005)	TRCA RANKS (20__)
Acer saccharum var. saccharum	Sugar Maple	N			S5		L5
Acer x freemanii	Freeman's Maple	N			S5		L4
Alisma plantago-aquatica	Broad-leaved Water-plantain	I			S5		L5
Rhus hirta	Staghorn Sumac	N			S5		L5
Cicuta bulbifera	Bulb-bearing Water-hemlock	N			S5		L4
Daucus carota	Queen Anne's Lace	I			SNA		L+
Asclepias syriaca	Common Milkweed	N			S5		L5
Cynanchum rossicum	European Swallow-wort	I			SNA		L+
Ambrosia artemisiifolia	Annual Ragweed	N			S5		L5
Arctium minus	Lesser Burdock	I			SNA		L+
Bidens frondosa	Devil's Beggar's Ticks	N			S5		L5
Cichorium intybus	Chicory	I			SNA		L+
Cirsium arvense	Creeping Thistle	I			SNA		L+
Euthamia graminifolia	Grass-leaved Goldenrod	N			S5		L5
Solidago canadensis var. scabra	Tall Goldenrod	N			S5		L5
Sonchus arvensis ssp. arvensis	Field Sowthistle	I			SNA		L+
Symphyotrichum lanceolatum ssp. lanceolatum	Panicled Aster	N			S5		L5
Symphyotrichum novae-angliae	New England Aster	N			S5		L5
Tussilago farfara	Colt's Foot	I			SNA		L+
Impatiens capensis	Spotted Jewel-weed	N			S5		L5
Alnus glutinosa	European Black Alder	I			SNA		L+
Alliaria petiolata	Garlic Mustard	I			SNA		L+
Lonicera tatarica	Tartarian Honeysuckle	I			SNA		L+

New Scientific Name (FOIBIS 2008)	Common Name (FOIBIS)	Origin	COSEWIC (Sep 2007)	COSSARO (Sep 2009)	S-RANK (200_)	DURHAM (Varga 2005)	TRCA RANKS (20__)
Sambucus nigra ssp. canadensis	Common Elderberry	N			S5		L5
Hypericum perforatum	St. John's-wort	I			SNA		L+
Calystegia sp.	Bindweed Species						
Cornus sericea ssp. sericea	Red-osier Dogwood	N			S5		L5
Hippophae rhamnoides	Sea Buckthorn	N/A					L+
Lotus corniculatus	Bird's-foot Trefoil	I			SNA		L+
Melilotus alba	White Sweet Clover	I			SNA		L+
Vicia cracca	Tufted Vetch	I			SNA		L+
Quercus macrocarpa	Bur Oak	N			S5	U	L4
Quercus rubra	Northern Red Oak	N			S5		L4
Myriophyllum sp.	Water-milfoil Species						
Hydrocharis morsus-ranae	Common Frogbit	I			SNA		L+
Iris pseudacorus	Yellow Iris	I			SNA		L+
Lycopus americanus	American Bugleweed	N			S5		L4
Mentha arvensis	Corn Mint	N			S5		L5
Lemna minor	Lesser Duckweed	N			S5		L5
Lemna sp.	Duckweed Species						
Lythrum salicaria	Slender-spike Loosestrife	I			SNA		L+
Nymphaea odorata ssp. odorata	Fragrant White Water-lily	N			S5		L2
Fraxinus pennsylvanica	Green Ash	N			S5		L5
Picea abies	Norway Spruce	I			SNA		L+
Picea pungens	Colorado Spruce				SNA		L+
Pinus strobus	Eastern White Pine	N			S5		L4
Plantago major	Nipple-seed Plantain	I			SNA		L+
Phragmites australis ssp. australis	European Common Reed	I			SNA		L+
Persicaria amphibia	Water Smartweed	N			S5		L4
Polygonum persicaria	Lady's Thumb	I			SNA		L+
Rumex crispus	Curly Dock	I			SNA		L+
Rhamnus cathartica	Buckthorn	I			SNA		L+
Geum sp.	Avens Species						

New Scientific Name (FOIBIS 2008)	Common Name (FOIBIS)	Origin	COSEWIC (Sep 2007)	COSSARO (Sep 2009)	S-RANK (200_)	DURHAM (Varga 2005)	TRCA RANKS (20__)
Potentilla recta	Sulphur Cinquefoil	I			SNA		L+
Prunus virginiana var. virginiana	Choke Cherry	N			S5		L5
Rosa multiflora	Rambler Rose	I			SNA		L+
Rubus idaeus ssp. idaeus	Red Raspberry	I			SNA		
Galium palustre	Marsh Bedstraw	N			S5		L5
Salix discolor	Pussy Willow	N			S5		L4
Salix exigua	Sandbar Willow	N			S5		L5
Salix fragilis	Crack Willow	I			SNA		L+
Linaria vulgaris	Butter-and-eggs	I			SNA		L+
Solanum dulcamara	Climbing Nightshade	I			SNA		L+
Sparganium eurycarpum	Large Bur-reed	N			S5	U	L3
Typha angustifolia	Narrow-leaved Cattail	N			S5		L+
Typha latifolia	Broad-leaf Cattail	N			S5		L4
Typha x glauca	Blue Cattail	N			S4?		L+
Verbena hastata	Blue Vervain	N			S5		L5
Vitis riparia	Riverbank Grape	N			S5		L5