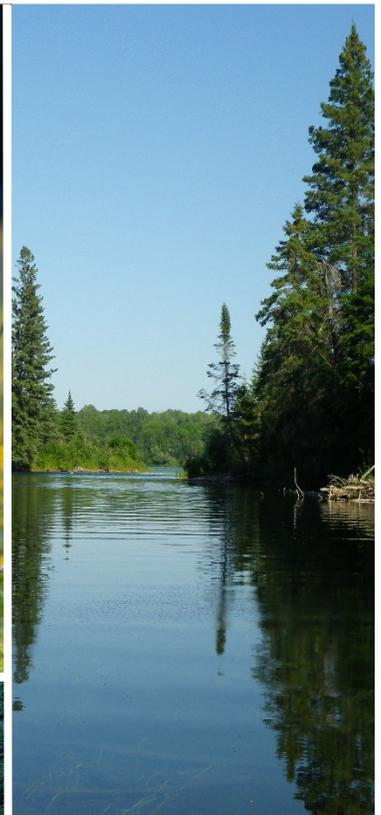
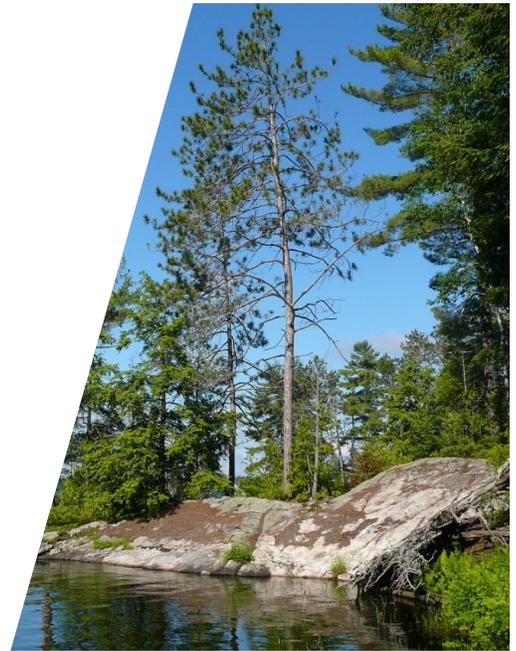




Environmental Impact Study

16 Fire Route 94A
Pigeon Lake
Municipality of Trent Lakes
County of Peterborough

11923811 Canada Inc.



Executive Summary

GHD was retained by 11923811 Canada Inc. to complete an EIS for the redevelopment and rezoning of this former resort commercial property to construct a new single-family cottage. The location of which is described as Part of Lot 16, Concession 13 in the Municipality of Trent Lakes, Peterborough County. Street address at #16 Fire Route 94A. Several guiding policies were applicable in this project including the Migratory Birds Convention Act, Endangered Species Act, Provincial Policy Statement (2020), Growth Plan for the Greater Golden Horseshoe (2017), The Township of Galway-Cavendish & Harvey Official Plan (2010) and the County of Peterborough Official Plan (2014).

The main focus of the EIS report was to confirm the extent of any wetland and woodlands, to assess the ecological functions and natural features, to determine if Species at Risk are present and develop appropriate buffers and mitigation measures to prevent/minimize impacts on the development and construction of these features.

GHD biologists attended the site on May 29th and June 16th, 2020 to complete two breeding bird surveys, document vegetation and complete an Ecological Land Classification (ELC) and to search for Species at Risk (SAR) and their habitats. After compiling the data collected, GHD identified no federally, provincially, or regionally significant plant or wildlife species on the site. Additionally, no sensitive vegetation communities were found in the study area.

One unevaluated wetland community was identified adjacent to the subject property in the littoral zone in Pigeon Lake. One probable Significant Wildlife Habitat (SWH) specifically turtle wintering habitat was identified off the south shore of the property.

The construction will occur within the previously disturbed area and will use the existing laneway for access to the site. Minimal tree clearing and limbing will be required. The new cottage is to be constructed no closer than the existing cottage foundation, or greater distance if possible. A Waterloo biofilter septic system is to be located at the base of the peninsula, at more than 30 metres from the shoreline of Pigeon Lake. Five of the 10 existing cabins are to be restored while the other 5 will be removed.

Based on our analysis no negative impacts are anticipated on the functions of identified natural heritage features provided the client follows recommendations outlined in Sections 5 and 7. GHD's recommendations have been made to address potential impacts to natural heritage features and/or their functions.

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1. Introduction

1.1 Background

GHD has been retained by 11923811 Canada Inc. to complete an Environmental Impact Study (EIS) for a proposed cottage at 16 Fire Route 94A on Part Lot 16, Con 13, Municipality of Trent Lakes and County of Peterborough.

The main trigger for the EIS, was the proximity of the redevelopment to the shoreline of Pigeon Lake. The development application for the site requires the completion of an EIS, as per the Municipality of Trent Lakes Official Plan.

1.2 Location and Study Area

The property is an irregular shape and comprises of approximately 0.65 hectares with approximately 300 meters of frontage (Figure 1.1). The property is located on a small peninsula and is directly bounded by Pigeon Lake to the east, west and south and an existing residential lot to the north. It is located on the west side of Pigeon Lake and is within the Canadian Shield geological formation. This location falls within Ecoregion 6E. The study area includes the subject property and Pigeon Lake surrounding it.

1.3 Study Rationale

This section identifies federal, provincial, and other regulatory legislation, policies, official plans (OP) and OP amendments that are applicable and relevant to the study area and the immediate vicinity. This includes policies that triggered the study. These documents may identify natural features, Species at Risk and other habitat as well as other features relevant to this study.

1.3.1 Federal Legislation

Migratory Birds Convention Act

The purpose of the Migratory Birds Convention Act (MBCA 1994) is to implement the Convention by protecting and conserving migratory birds, as populations and individual birds, and their nests.

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

Fisheries Act

The purpose of the Fisheries Act, Fish and Fish Habitat Program is to help conserve and protect fisheries and aquatic ecosystems. Specifically, the fish and fish habitat protection provisions are intended to prevent projects taking place in and around fish habitat from causing the death of fish or the harmful alteration, disruption or destruction of fish habitat. In addition, the Act administers relevant provision of the Species at Risk Act.

If death of fish or the harmful alteration, disruption or destruction of fish habitat are likely to result from a project, an authorization is required from the Minister of Fisheries, Oceans and the Canadian Coast Guard as per Paragraph 34.4(2)(b) or 35(2)(b) of the Fisheries Act Regulations.

1.3.2 Provincial Legislation

Endangered Species Act, 2007

The purpose of the Ontario Endangered Species Act (ESA 2007) is to:

1. To identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge.
2. To protect species that are at risk and their habitats, and to promote the recovery of species that are at risk.
3. To promote stewardship activities to assist in the protection and recovery of species that are at risk. 2007, c. 6, s. 1.

The ESA clearly defines the five classifications of species status as *extinct*, *extirpated*, *endangered*, *threatened*, or *special concern*, and provides guidelines on the process of species status determination.

General habitat protection is afforded to all species listed as endangered or threatened. General habitat descriptions are technical, science-based documents that have been developed for some of the species that are most likely to be affected by human activity. Further information including a Recovery Strategy or Management Plan is required for each listed species, on a timeline dictated by the species status.

Provincial Policy Statement 2020

The Provincial Policy Statement, enacted May 1st, 2020 (PPS) is the statement of the Ontario government's policies on land use planning. It applies province-wide (in the province of Ontario) and provides provincial policy direction on land use planning. Municipalities use the PPS to develop their official plans and to guide and inform decisions on other planning matters. The PPS is issued under Section 3 of the Planning Act and all decisions affecting land use planning matters 'shall be consistent with' the Provincial Policy Statement (Government of Ontario, 2020).

Portions of Sections 2.1.5-2.1.8 of the Provincial Policy Statement (PPS 2020) apply to this project.

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 7E¹;*
- b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)¹.*
- d) significant wildlife habitat;*

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.

2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

Growth Plan for the Greater Golden Horseshoe, 2019

A Place to Grow: Growth Plan for the Greater Golden Horseshoe, came into effect on May 16, 2019, replacing the Growth Plan for the Greater Golden Horseshoe, 2006 (OMMAH, 2017). The recent revisions include minor changes to the natural heritage system policies and removing the provincial NHS mapping layers.

The 2019 Growth Plan for the Greater Golden Horseshoe is a long-term plan that works with the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan to provide a framework for growth management in the region (OMMAH, 2019).

The subject property is not within an urban settlement area; however it is within ecoregion 6E therefore all policies apply. Features and areas, including significant wetlands, significant coastal wetlands, other coastal wetlands in Ecoregions 5E, 6E and 7E, fish habitat, significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St Mary's River,), habitat of endangered species and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest. (PPS, 2019).

1.3.3 Local and Other Regulatory Bodies

County of Peterborough Official Plan (Consolidated to July 2019)

The County of Peterborough Official Plan has not designated the area with specific zoning (Peterborough County-Public GIS, 2019).

The County of Peterborough requires the completion of an Environmental Impact Assessment as per section 4.1.3.1 as stated below:

4.1.3.1. Development and site alterations within provincially significant wetlands and in significant portions of the habitat of endangered and threatened species is not permitted. However, with the exception of the Oak Ridges Moraine Policy, development or site alteration such as filling, grading and excavating may be permitted within or adjacent to the remaining natural heritage features listed in Section 4.1 of this Plan, provided that it has been demonstrated by an Environmental impact assessment that there will be no negative impacts on the natural features or ecological functions for which the area is identified.

In addition, Section 4.1.3.4 of the Official Plan indicates that development and site alteration will be prohibited from significant wetlands and significant portions of the habitat of endangered and threatened species. It also indicates that development and site alteration will not be permitted in fish habitat except in accordance with provincial and federal requirements. However section 4.1.3.4 also states the following:

Local plans may permit development and site alteration in:

- significant woodlands south and east of the Canadian Shield;
- significant valleylands south and east of the Canadian Shield;
- significant wildlife habitat; and;
- significant areas of natural and scientific interest;

Municipality of Trent Lakes Official Plan (Consolidated to July 2019)

The Municipality of Trent Lakes requires the completion of an Environmental Impact Study as per section 5.1.10.3 as stated below:

b) Where determined by the Municipality, in consultation with the local Conservation Authority, the Ministry of Natural Resources or the County of Peterborough, the Municipality shall require the developer to prepare an Environmental Impact Study (EIS) as part of any proposal for development or site alteration, where potential exists for a negative impact on the natural environmental features, functions and/or adjacent lands.

and

c) The shorelines of the Kawartha Lakes are identified as a significant natural feature within the Township. Special measures should be considered when the Municipality is reviewing development proposals along the shoreline to minimize potential negative impacts on the water quality of the Lakes. These may include measures such as development setbacks, maintaining the natural vegetation and physical characteristics of the shoreline, and effective stormwater management.

1.4 Other Resources Referenced

Prior to field surveys, background information for the study area and surrounding lands from a variety of sources were reviewed to provide context for the setting and sensitivity of the site. Background information sources include:

1.4.1 Data Sources

- Aerial imagery
- OMNRF Land Information Ontario (LIO) database mapping and Natural Heritage Information Centre (NHIC) Make a Map tool (2018)
- Ontario Breeding Bird Atlas data (Bird Studies Canada, 2007)
- Nature Count data (Bird Studies Canada, 2020)
- Ontario Ministry of Natural Resources Aquatic Resource Area, Fish Species List (OMNR, 2012);
- Department of Fisheries and Oceans (DFO) Aquatic Species at Risk Mapping (DFO, 2019)

1.4.2 Literature and Resources

- Natural Heritage Reference Manual (MNRF, 2010)
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. Peterborough, 38pp. (OMNRF, 2015)

1.5 Description of Development

The proposed development is for the removal of 5 existing (decrepit) cabins and the renovation and improvements to, another 5 existing cabins. In addition, a new build of a single-family cottage on the

property will also take place. A Waterloo biofilter septic system will be constructed at the base on the peninsula in land from the shoreline. The existing driveway off Fire Route 94A will be utilized for access to the site. (Figure 1.1).

1.6 Scope of Report

The main focus of this EIS report is to confirm the extent of any natural heritage features; assess the ecological functions and natural features, Species at Risk, and develop appropriate buffers and mitigation measures to prevent/minimize impacts of the development and construction on these features.

2. Study Methods

2.1 General Approach

Our approach to preparation of the EIS will consist of three distinct phases. The first phase includes the collection and review of available background information about the study site. Some of the sources of information compiled are: recent aerial photography, key natural features GIS mapping from the County of Peterborough and the Ontario Ministry of Natural Resources and Forestry (OMNRF), Department of Fisheries and Oceans (DFO) and Official Plan schedules from the Township and County.

Our second phase consisted of site visits in 2020 (June-July) by our terrestrial and aquatic biologists to perform the following tasks:

- Delineate natural features such as wetlands, seepage areas, watercourses, woodlands and sensitive habitats;
- Conduct surveys for breeding birds;
- Survey for significant trees or rare plants;
- Make incidental observations of amphibians, snakes and other wildlife;
- Assess wildlife habitat including wildlife linkages;
- Ascertain whether the habitat of threatened or endangered species is present or absent;
- Examine the composition of the woodland, and particularly any higher quality forest communities;
- Assess the ecological functions of the woodland;
- Assess existing aquatic/shoreline habitat and fish habitat, surface water quality.

The final phase consisted of preparation of the EIS report. This included a review of the development plan, impact assessment and recommendations. Recommendations on the location of the building envelope, septic bed location, buffers/setbacks from the shoreline and natural features and mitigation measures were also included.

2.2 Site Study Methodology

2.2.1 Physical Site Characteristics

Site characteristics were assessed during our field visits. This included general documentation of existing disturbances, age of vegetation cover, access lanes, topography and natural features.

2.2.2 Biophysical Inventory

2.2.2.1 Vegetation

ELC Survey Method

All vegetation encountered in the study area was inventoried during the site visit. Delineation and classification of the vegetation community types was based on the Ecological Land Classification for Southern Ontario (Lee et al., 1998). General notes on disturbance, topography, soil types, soil moisture and state of each community were also compiled. Wetland boundaries were confirmed in the field following the methodologies in the Ontario Wetland Evaluation System Southern Manual, Third Edition (OMNR, 2013 and updates, version 3.2)

Rare, significant or unusual species were searched for. Species significance or rarity on a national, provincial, regional and local level was based on published literature and standard status lists. These included SARA (2019), COSEWIC (2019), COSSARO (2018), Ontario Endangered Species Act (2008), Gartner Lee (1978) and Varga et al. (2000)

2.2.2.2 Birds

Breeding Bird Survey BBS Survey

Bird surveys were conducted following the protocols of the Ontario Breeding Bird Atlas (OBBA) point count methodologies. Two surveys were conducted in the peak season (April 15th-August 15th) approximately 10-15 days apart. All birds seen or heard within the five-minute station period were documented and breeding evidence codes recorded. Surveys were conducted in the early morning. Survey station was established within the central portion of the property and at the northwestern corner of the study area. The location of the survey station is shown on Figure 1.1

Area Searches

Area searches for birds were conducted while completing other surveys on site. Breeding evidence was noted when possible for each species recorded.

2.2.2.3 Other Wildlife

Incidental Observations

Incidental observations of any other wildlife (e.g., amphibians, reptiles and mammals) encountered while surveyors were on site were recorded. Documentation included notes about the species, location and type of observation (e.g., direct sightings and indirect evidence such as calls, tracks, scat, burrows, dens and browse).

2.2.2.4 Wetlands

Wetland boundaries were determined by GHD biologists certified to conduct wetland evaluations under the Ontario Wetland Evaluation System for Southern Ontario, Third Edition, version 3.3 (OMNR, 2014). Biologists first reviewed recent aerial photographs and available wetland mapping, including MNRF GIS database layers. Subsequently, they walked the entire property, checking plant

species, soil type and soil moisture. The boundary of any wetlands found were then delineated in the field using a handheld GPS unit.

2.2.2.5 Woodlands

Significant woodlands area an environmental feature listed under Section 5.1.10.1 (Natural Environmental Features) of the Township of Galway-Cavendish and Harvey Official Plan, which was adopted by the Municipality of Trent Lakes under OPA No.46. However, the Official Plan did not recognize those features and they are not mapped at this time (Section 5.1.10.2 e) Township of Galway-Cavendish and Harvey Official Plan). Woodlands were confirmed on site and their boundaries and functions assessed.

2.2.2.6 Significant Wildlife Habitat (SWH)

SWH Site Assessment

The identification of Significant Wildlife Habitat is completed in several stages. As part of the background review, natural areas in the study area are examined along with aerial photography. A candidate list of SWH criteria/feature is determined. During the field visits searches for evidence of those identified candidate features are conducted and the features assessed.

After the field inventories, GHD biologists analyze the information collected and determine which SWH features were confirmed based on the habitats on site and on the Ecological Land Classification communities present on the subject property, using the criteria for Significant Wildlife Habitat in Ecoregion 6E (2015).

2.2.2.7 Fish and Aquatic Habitat

Aquatic Habitat

Aquatic habitat assessments were conducted using standardized provincial aquatic protocols (OSAP, MTO). Aquatic habitat was quantified and characterized based on local substrate composition, riparian habitat, percent in-water cover and unique features. Assessments were completed by canoe transects and shoreline visual assessments. Water depths were recorded using a hand-held sonar throughout the entire study area.

Surface water quality was collected by GHD biologists during assessments. Measured parameters included dissolved oxygen (mg/L), conductivity (us/cm), total dissolved solids (mg/L) and water temperature (°C) using a handled YSI Pro2030 System. The pH was recorded with a handheld waterproof pH meter and turbidity was recorded with a handheld LaMotte 2020.

Fish Community

Due to the presence of existing fish community data GHD did not conduct fish community sampling. A fish species list was obtained from the Ontario Ministry of Natural Resources and Forestry (OMNR, 2012).

3. Survey Results

3.1 Physical Site Characteristics

The site was irregular in shape and was approximately 0.65 hectares in size with access from 16 Fire Route 94A. This property is currently vacant with several old structures on it including vacant cottages that were formerly utilized as a cabin rental resort. The topography of the site was relatively flat and is adjacent to Pigeon Lake through means of a peninsula. The majority of the property contained abandoned vacant cottages with light tree cover and Pigeon Lake abutting on the east, west, and south sides. The shoreline was rocky with a defined bank.

3.2 Biological Inventories

3.2.1 Vegetation

3.2.1.1 Level of Effort

Vegetation communities within the study area were delineated by GHD biologists following the methodologies described in Section 2.2.2.1. The level of effort and environmental conditions have been summarized in Table 3.1.

Table 3.1 Vegetation Surveys – Level of Effort and Environmental Conditions

Survey Date	Survey Type	Weather	Start Time	Effort (person hrs.)
May 29, 2020	ELC, wetland delineation, rare species search	18°C, Beaufort wind-2, Cloud cover-5, no precipitation	6:45 am	4 hrs

3.2.1.2 ELC Code Descriptions

Two vegetation communities were identified within the study area. Each of the communities is described below and illustrated on Figure 1.1.

A total of 54 plant species were identified during field surveys. The dominant plant species in each community are described below and a complete plant list is found in Appendix I-A.

Community 1 Unmaintained Area (ELC Code: No code)

The entire upland area of the property made up Community 1. This naturally regenerating area held a large variety of plant species with staghorn sumac (*Rhus typhina*) as the dominant woody species. The site has overgrown since the former resort was abandoned. Eastern white pine (*Pinus strobus*), white birch (*Betula papyrifera*), American elm (*Ulmus americana*) and red oak (*Quercus rubra*) were four of the eight species of trees found growing on this peninsula. Several shrub species were observed within the site and included red-osier dogwood (*Cornus stolonifera*), choke cherry (*Prunus virginiana*) and European buckthorn (*Rhamnus cathartica*). Some small areas of exposed bedrock were present here and were surrounded by a variety of herbaceous species that included sensitive fern (*Onoclea sensibilis*), wild columbine (*Aquilegia canadensis*), black bindweed (*Polygonum convolvulus*), and western poison ivy (*Rhus rydbergii*).



Photo 1. (Community 1: May 29, 2020)

Community 2 Open Water Aquatic Type (ELC Code: OAO)

Community 2 was identified as the immediate shoreline and the adjacent lake waters. Much of the shoreline was exposed rock outcrop and boulder sized rocks. Some shrubs such as narrow-leaved meadowsweet (*Spirea alba*) and red-osier dogwood were found along the shoreline areas in small patches. The littoral zone was sparsely vegetated but included bullhead pond lily (*Nuphar variegata*), Eurasian watermilfoil (*Myriophyllum spicatum*), and Canada waterweed (*Elodea canadensis*).



Photo 2. (Community 2: May 29, 2020)

3.2.2 Birds

3.2.2.1 Level of Effort

Breeding birds were identified within the study area by GHD biologists according to the methodologies outlined in Section 2.2.2.2. A summary of the level of effort and environmental conditions has been provided in Table 3.2.

Table 3.2 Bird Surveys – Level of Effort and Environmental Conditions

Survey Date	Survey Type	Weather	Start Time	Effort (person hrs)
May 29, 2020	Breeding Bird Survey	19 C, Beaufort Wind-1, Cloud cover -50%, no precipitation	0705	1.0
June 16, 2020	Breeding Bird Survey	12 C, Beaufort wind-0	0640	1.0

3.2.2.2 Breeding Bird Surveys

A total 33 of breeding bird species were identified during breeding bird surveys on May 29th and June 16th, 2020 (Appendix II-A). A number of common species typical of mixed forest habitat were detected at the two stations established on the property (Figure 1.1). Species recorded during surveys included blue jay (*Cyanocitta cristata*), northern flicker (*Colaptes auratus*), red-eyed vireo (*Vireo olivaceus*) and American redstart (*Setophaga ruticilla*). Birds adapted to open shrub habitat were also present here and included gray catbird (*Dumetella carolinensis*), brown thrasher (*Taxostoma rufum*) and chestnut-sided warbler (*Dendroica pensylvanica*).

3.2.2.3 Area Searches

No additional bird species were identified on site in addition to those found during the breeding bird surveys. A summary of the birds identified during all surveys can be found in Appendix II-B.

3.2.3 Other Wildlife

GHD biologists also kept records of mammal and herpetofauna (amphibians and reptiles) species encountered during their visits to the subject property. Red squirrel (*Sciurus vulgaris*) and eastern chipmunk (*Tamias striatus*) were the only mammal species encountered on the site.

Five northern map turtles (*Graptemys geographica*) were observed basking on a small island just off the south shore the site.

3.2.4 Significant Wildlife Habitat

During our SWH candidate review the following were identified as potential SWH: area sensitive bird breeding; waterfowl stopover and staging areas (aquatic); bat maternity colonies; turtle wintering area; and bald eagle and osprey nesting, foraging and perching habitat.

3.2.5 Wetlands

One wetland community (Community 2) was identified on the subject property (Figure 1.1). The characteristics of this wetland are described in Sections 3.2.1.2 and 4.1.

3.2.6 Woodlands

The property was primarily a regenerating cultural thicket with a few large trees. It did not meet the criteria as significant woodland according to the Significant Woodland Evaluation Criteria and Standards in Table 7-2 of MNR's Natural Heritage Reference Manual (MNR, 2005).

3.2.7 Fish and Aquatic Habitat

3.2.7.1 Introduction and Level of Effort

The fish and aquatic habitat were assessed on July 10th, 2020 on the subject property which is located on a peninsula extending into Pigeon Lake. Surveys were conducted following the methodologies outlined in Section 2.2.2.7. The level of effort and environmental conditions have been provided in Table 3.3.

Table 3.3 Fish and Aquatic Habitat – Level of Effort and Environmental Conditions

Survey Date	Survey Type	Weather	Start Time	Effort
July 10th 2020	Fish and Aquatic Habitat Assessment and Surface Water Quality	5% cloud cover, BWS 0-1, no precipitation, air temperature 28.8 °C and water temperature 28.3 °C.	08:00am	3.5 (x 2 staff)
*Note: BWS Beaufort wind scale (Government of Canada, 2017).				

3.2.7.2 Aquatic Habitat Assessments

The study area was classified into two habitat zones both located on the shoreline of Pigeon Lake surrounding the subject property. Habitat zones are determined and differentiated based on presence of barriers, substrate composition, riparian habitat, percent in-water cover and unique features. The habitat zone locations have been illustrated in Figure 1.1 and attributes have been provided in Table 3.4. Habitat zones were similar in form and function with the following differential points; substrate composition and in-water cover. Habitat Zone 1 and 2 both had low canopy cover, covering 0-24% of the water’s surface and low overhead cover consisting of shrubs, trees, woody debris and non-woody vegetation. Refer to Section 3.2.1 Vegetation Communities for full riparian vegetation details. Biologists noted that there were no watercourses present on the subject property.

Habitat Zone 1 was a 396 m section of the shoreline of Pigeon Lake which wraps around the subject property and includes the shoreline of the two islands also off the east side of the peninsula. Assessments extended out 10m into the littoral habitat (Figure 1.1). The in-water substrate was mostly composed of boulder, bedrock, gravel and sand. Algae was not present in this habitat zone. The average depth was 0.95 m, In-water cover was composed of submergent vegetation and boulders with some small and large woody debris. (Table 3.4).



Photo 3: Habitat Zone 1, photo showing Pigeon Lake and riparian habitat, photo facing northeast. (Photo Date: July 10th 2020).

Habitat Zone 2 was a 36 m section of the shoreline of Pigeon Lake on the east side of the peninsula and extended 10 m into the open littoral habitat (Figure 1.1). The in-water substrate was mostly composed of fine organics, with some silt and sand. Algae was not present in this habitat zone. The average depth was 0.56m, the in-water cover for this habitat zone was dominated by emergent vegetation, submergent vegetation and some large and small woody debris (Table 3.4).



Photo 4: Habitat Zone 2, photo showing Pigeon Lake and riparian habitat, photo facing northeast. (Photo Date: July 10th 2020).

Table 3.4 Aquatic Habitat Zone Description

Habitat Zone	Substrate Composition (%)	Percent Instream Cover	Percent Canopy Cover (%)	Overhead Cover	Average Water Depth (m)	Average Wetted Width (m)	Zone Length (m)
01	20% bedrock 30% boulder 20% gravel 20% sand	10% large woody debris 10% small woody debris 30% submergent vegetation 20% boulders	0-24	5% trees 5% shrubs 5% woody debris 5% non-woody vegetation	0.95	0-10	396
02	90% fine organics 5% sand 5% silt	5% large woody debris 5% small woody debris 30% submergent vegetation 60% emergent vegetation	0-24	5% trees 5% shrubs 5% woody debris 5% non-woody vegetation	0.56	0-10	36

Surface water quality was collected in Habitat Zone 1 (Figure 1.1) approximately 0.4 m below the surface of the water. A summary of results and information on the parameter specifics has been provided in Table 3.5.

Table 3.5 Surface Water Quality Results

Water Quality Parameters	Sample Number	Accepted Parameter Range
	1	
Date (dd/mm/yy)	10/07/20	N/A
Time (hh:mm)	09:30	N/A
Weather Conditions	Clear, slight cloud, sunny, no precipitation	N/A
Sample Depth (m)	0.4	N/A
Air Temperature (°C)	28.8	N/A
Water Temperature	28.3	N/A
Dissolved Oxygen (mg/L)	6.3	5-8
Total Dissolved Solids (mg/L)	144.30	N/A
Conductivity (SPC-us/cm)	222.5	N/A
Salinity (ppt)	0.10	N/A
pH	8.35	6.5-8.5**
Turbidity (NTU)	4.14	Normal**
Phosphorus (ppb)	54	10-50 ppb*

Note: BWS=Beaufort wind scale (Government of Canada, 2017), N/A= not applicable and/or specific guidelines not available. *lowest acceptable range for warm water biota (Canadian Council of Ministers of the Environment, 2002). ** Provincial Water Quality Objectives (PWQO) (Energy, 1994).

3.2.7.3 Fish Community

As discussed in Section 2.2.2.3, fish community sampling was not conducted by GHD staff. Existing fish community for the study area was obtained from MNR (OMNR, 2012) and is discussed in Section 4.1.5.

4. Discussion and Analysis

4.1 Species and Communities

4.1.1 Vegetation

One of the plants identified during the ELC surveys was considered significant on a national, provincial or regional level (SARA, 2019; COSSARO, 2018; Riley, 1989) (Appendix I-B). Lily-of-the-valley (*Convallaria majalis*) is considered regionally rare by Riley (1989). This species has long been planted as a garden plant and is now quite common in much of the region. GHD biologists do not consider this garden escapee as significant.

Additionally, no rare vegetation or sensitive communities were identified on the property.

4.1.2 Birds

None of the bird species detected during GHD's breeding bird surveys were considered to be significant on a national (COSEWIC, 2019) or provincial level (COSSARO, 2018),

Area sensitive species are bird species that require a minimum hectareage of suitable contiguous habitat to successfully breed. None of the bird species observed during GHD surveys fall into this category (Appendix II-B).

The Ontario Breeding Bird Atlas (OBBA) records for the 10 km x 10 km square that overlaps the property (17QK03) include nineteen (19) bird species that are considered significant at the federal or provincial level (SARA 2019; COSSARO, 2018). These records are for: least bittern (Threatened), black tern (Special Concern provincially), common nighthawk (Special Concern), eastern whip-poor-will (Threatened), chimney swift (Threatened), red-headed woodpecker (Special Concern provincially, Threatened federally), olive-sided flycatcher (Special Concern), eastern wood-pewee (Special Concern), loggerhead shrike (Endangered), bank swallow (Threatened), barn swallow (Threatened), wood thrush (Special Concern provincially, Threatened federally), golden-winged warbler (Special Concern provincially, Threatened federally), cerulean warbler (Threatened provincially, Endangered federally), Canada warbler (Special Concern provincially, Threatened federally), grasshopper sparrow (Special Concern), bobolink (Threatened), eastern meadowlark (Threatened) and evening grosbeak (Special Concern). Many of these records were associated with larger natural features outside of the immediate study area. GHD biologists did not detect any of the noted bird species on the subject property during their site visits. Suitable habitat may be present for barn swallows in the abandoned buildings on site, in particular the abandoned cottage on the southern point.

4.1.3 Other Wildlife

- c) *The shorelines of the Kawartha Lakes are identified as a significant natural feature within the Township. Special measures should be considered when the Municipality is reviewing development proposals along the shoreline to minimize potential negative impacts on the water quality of the Lakes. These may include measures such as development setbacks,*

maintaining the natural vegetation and physical characteristics of the shoreline, and effective stormwater management.

Northern map turtles are found in lakes, shorelines and wetlands. They bask on logs, muskrat push-ups, stumps and shorelines.

4.1.4 Fish and Aquatic Habitat

4.1.4.1 Aquatic Habitat

Pigeon Lake provides direct fish habitat within the subject study area to the fish community. Specifically, the habitat provides sources of hydrological connections, cover and feeding habitat, breeding areas, nutrients and sediments and food supply to fish. These attributes are important for the sustainability of the warm water fish community of Pigeon Lake.

Fish habitat in Ontario is managed federally by the Minister of Fisheries and Oceans Canada and therefore, the Fisheries Act applies to the subject lands. No critical habitat for Aquatic Species at Risk (DFO, 2019) or sensitive spawning habitat was identified within the study area (OMNR, 2012).

As discussed in Section 3.2.4 the substrate in Pigeon Lake varies but was dominated by a mixture of fine organics, boulder, gravel and sand, and during the time of assessments the water colour was clear.

4.1.4.2 Fish Community

The fish community has been provided in Appendix III to provide context for fish habitat value and was obtained from the OMNRF (OMNR, 2012). Generally, Pigeon Lake supports sport and bait fish species that prefer warm water thermal regimes. Cumulatively, 32 fish species have been documented in the lake and are composed of the following families; *Catostomidae*, *Centrarchidae*, *Cottidae*, *Cyprinidae*, *Esocidae*, *Fundulidae*, *Gasterosteidae*, *Ictaluridae*, *Lotidae*, *Percidae*, *Percopsidae*, *Salmonidae* and *Umbridae*.

The fish community found in Pigeon Lake are common and widely distributed throughout southern Ontario (Appendix III).

4.2 Natural Features

4.2.1 Area of Natural and Scientific Interest

No provincially significant life science Area of Natural and Scientific Interest (ANSI) were identified within 120m of the subject property.

4.2.2 Significant Wildlife Habitat

In the Provincial Policy Statement (2020) wildlife habitat is defined as, "... areas of the natural environment where plants, animals, and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations." These documents also state, "specific wildlife habitats of concern may include areas where the species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory and non-migratory species."

Significant Wildlife Habitat often occurs within other natural heritage features and areas covered by Policy 2.1 of the Provincial Policy statement (e.g., significant wetlands). Therefore, it has been suggested that identification and evaluation of significant wildlife habitat is best undertaken after other natural heritage features have been identified (Natural Heritage Reference Manual, 2010).

GHD biologists analyzed the information collected from the ecological communities on the subject property using the criteria for Significant Wildlife Habitat in Ecoregion 6E (2015) and confirmed none of the candidate SWH existed on the property. A summary of the habitat criteria is found in Table 4.1.

Table 4.1 List of Candidate SWH and Confirmation of Habitat on Site

Specialized Wildlife Habitat Criteria	Candidate and Confirmed Habitat Criteria	Found-Yes	Found-No
Area Sensitive Bird Species	Interior forest habitat is at least 200m from forest edge habitat Presence of nesting or breeding pairs of 3 or more of the listed wildlife specie		No, habitat did not meet criteria for these species and none were found during breeding bird surveys.
Waterfowl Stopover and Staging Areas (Aquatic)	Ponds, marshes, lakes, bays, coastal inlets and watercourses used during migration An abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) Aggregations of 100 or more listed species for 7 days, results in >700 waterfowl use days		No, criteria was not confirmed as migration surveys were not conducted.
Bat Maternity Colonies	Maternity colonies found within tree cavities, vegetation and buildings Within mature deciduous or mixed forests stands with >10 ha large diameter wildlife trees (>25cm dbh)		No, no cavities or snags identified during field investigations.
Turtle Wintering Area	For most turtles, wintering areas are in the same general area as their core habitat Water has to be deep enough not to freeze Permanent water bodies, large wetlands Presence of 5 over-wintering Midland painted turtles One or more Northern map turtle or snapping turtle	Probable-criteria was not confirmed however shallower waters along the south-shoreline might provide suitable overwintering habitat	
Bald Eagle and Osprey Nesting, foraging and perching habitat	Nests are associated with lakes, ponds, river or wetlands along forested shorelines, islands or on structures over water Confirm on or more active osprey or bald eagle nests in an area		No active osprey or bald eagle nests observed in the area. Site lacked large trees for nesting or perching.

4.2.3 Woodland

NHIC mapping shows the property does not contain woodland. The subject property was dominated primarily by shrubs with a few mature trees located throughout. This site is not considered significant woodland because it is not part of a larger contiguous woodland that is defined in the natural heritage system. The wooded areas on site and at the larger landscape level were assessed based on the criteria defined in the Natural Heritage Reference Manual (MNRF, 2005). The main criteria is the percent forest cover in the municipality. The County calculation for woodland cover is approximately 30%. The Township or County of Peterborough has not completed an exercise to delineate and define significant woodland, at this time. According to the manual for a value between 30-60%, any woodland greater than 50 ha is considered significant. The subject property does not meet these criteria.

4.2.4 Wetlands

One wetland community was identified adjacent to the subject property, Community 2. This community was the open water aquatic portion of Pigeon Lake. The extent of this wetland could not be determined. However, it was expected to encompass the offshore waters up to the 2 metre depth and the edges of the bays and islands where shoreline wetland plants are present. This wetland has not been evaluated by the MNRF under the Ontario Wetland Evaluation System and therefore was not provincially recognized.

5. Impact Assessment and Recommendations

The following section provides a description of the predicted impacts that may result from the proposed development. It also identifies mitigation measures to be implemented to avoid and/or minimize adverse effects to the natural environment features within or near the project. A full list of mitigation measures has been provided in Section 7.0. A summary of the impact assessment and recommendations is depicted in Table 5.1.

5.1 Wetland

The wetland in adjacent Pigeon Lake has not been evaluated by MNRF. No impacts are predicted on the shoreline wetland from the redevelopment of the site.

5.2 Vegetation

The resort property has been abandoned for several years. As such there are areas of weedy growth, unmaintained areas and overgrowth of trees and shrubs. In addition, wind/storm damage has resulted some large trees and branches being broken off or falling over completely. Removal of those damaged trees and/or trimming is permitted. This would not have a significant impact on the vegetation cover or the wildlife use of those trees and overgrown areas. Removal of the abandoned cottage buildings will also provide an opportunity to restore the grounds and establish vegetation on those areas. The use of native plantings is encouraged on this property.

5.3 Significant Wildlife

Northern map turtles were present along the shoreline and the small islets. This species will not be impacted by the proposed redevelopment. No shoreline works are proposed that will affect the basking habitat, overwintering habitat, or foraging habitat for this species.

5.4 Significant Wildlife Habitat

One probable (not confirmed) SWH was identified within the study area, turtle wintering area.

The building envelope proposed will be located in a previously disturbed area and the current driveway will remain in place. No anticipated impacts will be associated with the proposed building envelope. The shores of Pigeon Lake and the adjacent wetland (Community 2) will continue provide suitable overwintering habitat for turtles. These areas have water that is deep enough not to freeze to the bottom and are part of permanent water bodies. The overwintering of turtles could not be confirmed. However, GHD assumed, based on the habitat present and the observation of five basking map turtles nearby, that it is probable that winter hibernation habitat is present here.

5.5 Fish and Aquatic Habitat

The shoreline of Pigeon Lake provides direct fish habitat to the fish community. Any future development will avoid all in-water work and any new dwelling (cottages/houses, septic, garage) locations will not exceed the pre-existing cottage locations to protect the natural feature form and function.

The new cottage is to be constructed partially within the existing footprint of the southern abandoned cottage at the tip of the peninsula. A 30 metre (100 foot) setback is required from the shoreline of the lake. However as this is a peninsula is less than 35 metres across at the narrowest point, that setback is not possible.

The construction of a new cottage on the same footprint as the existing abandoned cottage is recommended for the building envelope. This is less than 5 metres from the water at the tip. Constructing not closer to the shoreline than the existing foundation is key. Any decks would need to be constructed so as not to include piers or works closer to the shoreline. Building back (north) from the existing foundation is possible but will still be within 10-15 metres of the east and west shorelines. It is recommended that the footprint maximize the buffer from both shorelines to limit potential impacts and construction related impacts.

The septic system is to be constructed as far from the shoreline as possible. It is recommended that this be located at the base of the peninsula, northern end. This will place the septic system approximately 30 metres from the east and west shorelines. Septic beds can have more of an impact on water quality, so maximizing the setback is important to protecting the water quality of Pigeon Lake.

A detailed sediment and erosion control plan must approved by the Municipality prior to any construction and be prepared for all construction activities to ensure disturbed soils are not transported off-site into the negatively impacting aquatic life, fish and fish habitat. This includes some temporary silt fence on the east side of the peninsula where the driveway is located to prevent sediment from running off that surface untreated into the lake.

To protect Pigeon Lake and to ensure the project complies with the PPS and Fisheries Act, recommendations have been provided in Section 7.0 for incorporation into the final site plan.

No significant impacts to fish or fish habitat are anticipated from future redevelopment provided mitigation measures and recommendations are implemented as outlined in this report.

Table 5.1 Impact Assessment and Recommendation Summary

Feature or Function	Impact to Feature or Function	Mitigation	Residual Effect
Unevaluated Wetland	None	None	None
Vegetation	Removal of some hazard trees	None	None
Significant Wildlife – Northern map turtle	None	None	None
Significant Wildlife Habitat-Turtle Wintering Area	None	None	None
Fish and Aquatic Habitat-Pigeon Lake	No anticipated impacts	<ul style="list-style-type: none"> -Future development (including septic systems) will not exceed the closest point of the existing cottage. -Silt fencing installed around perimeter of development envelope and detailed SEC plan. -No in-water work - Development must comply with DFO Measures to Protect Fish and Fish Habitat. - Final design to be assessed by professional biologist. -docking be located on the east side of the point with a floating dock preferred. 	None

6. Policies and Legislative Compliance

The following section describes how the proposed development will be in conformance with the relevant federal, provincial and other regulatory legislation, policies, official plans and OP amendments that are applicable and relevant to the study area and the immediate vicinity.

6.1 Federal Legislation

Migratory Birds Convention Act

The core breeding period in Ontario for migratory birds under the MBCA for Bird Conservation Region 13 (i.e., the one the subject property lies within) extends from April 15th to August 15th (Environment and Climate Change Canada, 2014). As such clearing of trees and other vegetation for the development cannot occur during this timing window.

Fisheries Act

The project will comply with the Fisheries Act protective provisions of the Fisheries Act by implementing the *DFO Measures to Protect Fish and Fish Habitat* and avoiding all work in and around water. All project undertaking will: prevent the death of fish, maintain riparian vegetation, carry out work on land only, maintain fish passage, ensuring property sediment control, and preventing entry of deleterious substances in water.

In the future if the site plans include any work near or in-water they shall comply with the Fisheries Act and be reviewed by a professional biologists and DFO staff.

6.2 Provincial Legislation

Endangered Species Act

No provincially endangered or threatened (COSSARO, 2018) species were identified on the subject property therefore the project complies.

Planning Act and Provincial Policy Statement, 2017

Section 5 of this ESA report contains recommendations that would allow the proposed development to proceed in a manner consistent with the Provincial Policy Statement (PPS).

Growth Plan for the Greater Golden Horseshoe, 2017

As the subject property is within ecoregion 6E, significant woodland is covered under this policy. The proposed building envelope is not located within a significant woodland, as such the project is in compliance with the Growth Plan for the Greater Golden Horseshoe.

6.3 Local and Other Regulatory Bodies

County of Peterborough

The County of Peterborough Official Plan designates the subject property as rural The County of Peterborough Official Plan indicates that most of the property is designated as Seasonal Residential and Rural with some Environmental Constraint area (Peterborough County-Public GIS, 2019). The

proposed development will include two additional single family dwellings. The dwellings and the severance will be outside of the Environmental Constraints area as designated by the Peterborough County GIS. The EIS addresses any impacts that may occur as a result of the proposed development. The proposed development is in compliance with the Peterborough County Official Plan.

Municipality of Trent Lakes Official Plan (Consolidated to July 2019)

- c) *The shorelines of the Kawartha Lakes are identified as a significant natural feature within the Township. Special measures should be considered when the Municipality is reviewing development proposals along the shoreline to minimize potential negative impacts on the water quality of the Lakes. These may include measures such as development setbacks, maintaining the natural vegetation and physical characteristics of the shoreline, and effective stormwater management.*

The EIS includes recommendations regarding setbacks from the lakeshore, mitigation measures and protection of natural features, as well as the water quality of Pigeon Lake.

7. Summary of Recommendations

7.1 General Recommendations

- 1) Prior to any site preparation activities (tree clearing, soil removal, grading, placement of fill) erosion and sediment control measures must be installed along all edges of the construction envelope to ensure sediment laden runoff does not enter interfere with the adjacent lake. The silt fence should be inspected and maintained throughout the construction phase and remain in place until the exposed soils are stabilized and re-vegetated.
- 2) Obtain relevant permits from the County of Peterborough and Municipality.
- 3) Tree clearing occur outside of the breeding bird timing window (April 15th -August 15th).
- 4) The new cottage is not to be constructed any closer to the water than the current foundation of the southernmost building.
- 5) No development, grading, fill or building envelopes are to intrude into this buffer, which shall be left in natural self-sustaining vegetation indigenous to the study area.
- 6) Client to obtain relevant permits from the County of Peterborough and Municipality.
- 7) The construction envelopes must be clearly defined and delineated, and a line staked and clearly marked in the field prior to any construction activities occurring on the site.
- 8) Minimize tree and limb clearing, when possible.
- 9) Any future development will avoid all in-water work and any new dwelling (cottages/houses, septic) locations will not exceed the pre-existing cottage to protect the natural feature form and function.
- 10) Final site plan should be reviewed by a professional biologist. If the site plans include any near or in-water works (i.e. docks, boathouses etc.) additional permitting requirements may

be required by Trent-Severn Water Way (PCA), the Ontario Ministry of Natural Resources and Forestry (MNRF) and the Department of Fisheries and Oceans (DFO).

7.2 Sediment and Erosion Control

- 1) A heavy-duty reinforced silt fence will be installed and maintained along development envelope boundary. This line should be surveyed and staked in the field prior to any site preparation activities.
- 2) All sediment and erosion control products will be selected for the site based on the manufacturer's product specifications. Product installation and maintenance will follow the manufactures guidelines.
- 3) All sediment and erosion control measures shall be inspected daily during the construction phase and periodically afterwards to ensure they are functioning properly. The sediment and erosion control measures must be maintained and upgraded as required. Sediment fence shall be checked regularly to ensure they are maintained and working properly. Accumulated silt and debris will be removed from the fence and site after every precipitation event.
- 4) Construction will be undertaken during normal weather conditions, to the extent possible, and will avoid large precipitation events to minimize the risk of sedimentation off-site.
- 5) In the event that sediment and erosion control measures are not functioning, the construction supervisor shall order the work to be stopped. No further work shall be carried out until the construction methods and/or the sediment control plan is adjusted to address the sediment/erosion problem(s). Such occurrences should be document by the site inspector and provided to a qualified biologist.

7.3 Fish and Fish Habitat (DFO measures to protect fish and fish habitat)

- 1) No work in or near water to avoid killing fish by means other than fishing.
- 2) Any new development (cottages/houses, septic, garage) locations will not exceed the preexisting cottage locations. The existing buffer will maintain riparian vegetation between areas of land activity and the high watermark of the shoreline.
- 3) No use of explosives in or near water.
- 4) Respect MNRF fish timing windows to protect fish.
- 5) Should work conditions change such that it is possible that fish or fish habitat may potentially be negatively impacted, all works shall cease until the problem has been corrected or authorization has been obtained from the appropriate authorities.
- 6) Maintain riparian vegetation.
- 7) Carry out all works and activities by avoiding all work in or near water. No placement of fill or the temporary or permanent structures below the high-water mark.
- 8) No disturbance of bank material or building structures in the area than may result in erosion or scouring.

- 9) Always maintain fish passage.
- 10) Prevent soil compaction using mats and pads.
- 11) The Project Manager/Contractor shall not allow any deleterious substances as defined in the Canadian Fisheries Act (such as silt), caused by the work, to enter or re-enter the watercourse or lake. See Sediment and Erosion Control.
- 12) If any future development plans include work near or in water, it is recommended that the project be reviewed by the Department of Fisheries and Oceans (DFO) to ensure it complies with the Fisheries Act.

7.4 Concrete Leachate

- 1) Concrete leachate is alkaline and highly toxic to fish and aquatic life. Measures will be taken to prevent any incidence of concrete or concrete leachate from entering any waterbody.
- 2) Ensure that all works involving the use of concrete, cement, mortars, and other Portland cement or lime-containing construction materials (concrete) will not deposit, directly or indirectly, sediments, debris, concrete, concrete fines, wash or contact water into any waterbody.
- 3) All concrete, sealants or other compounds used for this project shall be utilized according to the appropriate Product Technical Data Sheet, stating guidelines and methods for proper use, and provided by the manufacturer of the product.

7.5 Operation of Machinery

- 1) Check heavy equipment, machinery and tools prior to entering the work site to ensure they are clean, free of leaks, invasive species and noxious weeds.
- 2) All heavy equipment, machinery, and tools required for the work will be regularly inspected and maintained to avoid leakage of fuels and liquids, and will be stored in a manner that prevents any deleterious substance from entering the soil, or nearby any waterbody.
- 3) All heavy equipment, machinery, and tools used or maintained for the purpose of this project will be operated in a manner that prevents any deleterious substance from entering soil, or nearby any waterbody.
- 4) Vehicle and equipment refuelling and/or maintenance shall be conducted within a defined staging area 30 m from any waterbody. If 30 m is not achievable a portable spill containment berm may be used. Portable spill containment berms can be rented by companies such as Wise Environmental Solution Inc. (W.I.S.E, 2017).
- 5) Machinery will not enter any waterbody.

7.6 Refueling and Spill Response

- 1) Construction should be undertaken during normal weather conditions, to the extent possible, and the project shall be designed to appropriate specifications to withstand variable weather conditions.
- 2) Vehicle and equipment refueling shall be conducted on impermeable pads/pans within a defined staging area.
- 3) An emergency spill kit shall be kept at the site in case of fluid leaks or spills from machinery, kit shall be employed immediately should a spill occur. Once a spill (regardless of severity) has been identified, it is the responsibility of the Site Supervisor to ensure that MOE is notified through the Ontario Spill Action Center at 1-800-268-6060, all provincial and federal regulations are to be adhered to. Maintain an adequate supply of clean up materials (spill kits, MSDS, absorbents, containers, caution signs/tape, etc.) readily available on-site.
- 4) Maintain an adequate supply of clean-up materials on-site. Construction crews should be fully trained in their use to ensure timely and effective responses to spill incidents.
- 5) Refueling and maintenance of equipment shall be conducted off slopes and away from water bodies on impermeable pads to allow full containment of spills at a recommended distance of a minimum of 30 meters from the waterway.
- 6) Materials classified as potential contaminants (e.g. paint, primers, gas, oil, degreasers, grout, or other chemicals) will be used a minimum of 30 m from the watercourse

8. Conclusion

GHD has prepared this Environmental Impact Study to address potential environmental issues associated with an application to develop this property

Based on our analysis, there will be no significant impacts anticipated on the features identified on the site, including wetland and significant wildlife habitat. Negative impact on the functions of identified natural heritage features can be minimized by following the recommendations in Sections 5 and 7. GHD's recommendations have been made to address potential impacts to natural heritage features and/or their functions.

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All of which is Respectfully Submitted,

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about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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Appendices

Appendix I-A Plant Species by Community

APPENDIX I - A Plant Species by Community

Families and genera for the plant species found in this appendix are listed in taxonomic order. The species are listed alphabetically by scientific name within each genus.

Three standard reference works were used for the botanical nomenclature and taxonomy (Newmaster et. al., 1998; Gleason and Cronquist 1991; Voss 1980; 1985). Other published works for botanical names included; ferns (Cody and Britton 1989); grasses (Dore and McNeill 1980); orchids (Whiting and Catling 1986); shrubs (Soper and Heimburger 1982) and trees (Farrar 1995).

Total: Number of communities where plant species was recorded

X : Plant species recorded

Common Name	Scientific Name	Total	COMMUNITY NUMBER	
			1	2
HORSETAIL FAMILY	EQUISETACEAE			
field horsetail	<i>Equisetum arvense</i>	1	X	
WOOD FERN FAMILY	DRYOPTERIDACEAE			
sensitive fern	<i>Onoclea sensibilis</i>	1	X	
PINE FAMILY	PINACEAE			
white spruce	<i>Picea glauca</i>	1	X	
eastern white pine	<i>Pinus strobus</i>	1	X	
CYPRESS FAMILY	CUPRESSACEAE			
eastern red cedar	<i>Juniperus virginiana</i>	1	X	
eastern white cedar	<i>Thuja occidentalis</i>	1	X	
WATER-LILY FAMILY	NYMPHACEAE			
bullhead pond-lily	<i>Nuphar variegata</i>	1		X
BUTTERCUP FAMILY	RANUNCULACEAE			
wild columbine	<i>Aquilegia canadensis</i>	1	X	
tall buttercup	<i>Ranunculus acris</i>	1	X	
ELM FAMILY	ULMACEAE			
American elm	<i>Ulmus americana</i>	1	X	
BEECH FAMILY	FAGACEAE			
red oak	<i>Quercus rubra</i>	1	X	
BIRCH FAMILY	BETULACEAE			
speckled alder	<i>Alnus rugosa</i>	1	X	
white birch	<i>Betula papyrifera</i>	1	X	
PINK FAMILY	CARYOPHYLLACEAE			
mouse-eared chickweed	<i>Cerastium fontanum</i>	1	X	
common chickweed	<i>Stellaria media</i>	1		X

Common Name	Scientific Name	Total	COMMUNITY NUMBER	
			1	2
BUCKWHEAT FAMILY	POLYGONACEAE			
black bindweed	<i>Polygonum convolvulus</i>	1	X	
WILLOW FAMILY	SALICACEAE			
balsam poplar	<i>Populus balsamifera</i>	1	X	
GOOSEBERRY FAMILY	GROSSULARIACEAE			
prickly gooseberry	<i>Ribes cynosbati</i>	1	X	
ORPINE FAMILY	CRASSULACEAE			
mossy stonecrop	<i>Sedum acre</i>	1	X	
ROSE FAMILY	ROSACEAE			
woodland strawberry	<i>Fragaria vesca</i>	1	X	
choke cherry	<i>Prunus virginiana</i>	1	X	
rugosa rose	<i>Rosa rugosa</i>	1	X	
wild red raspberry	<i>Rubus idaeus</i>	1	X	
PEA FAMILY	FABACEAE			
black medick	<i>Medicago lupulina</i>	1	X	
red clover	<i>Trifolium pratense</i>	1	X	
white clover	<i>Trifolium repens</i>	1	X	
cow vetch	<i>Vicia cracca</i>	1	X	
WATER-MILFOIL FAMILY	HALORAGACEAE			
Eurasian water-milfoil	<i>Myriophyllum spicatum</i>	1		X
DOGWOOD FAMILY	CORNACEAE			
red-osier dogwood	<i>Cornus stolonifera</i>	2	X	X
SPURGE FAMILY	EUPHORBIACEAE			
cypress spurge	<i>Euphorbia cyparissias</i>	1	X	
BUCKTHORN FAMILY	RHAMNACEAE			
European buckthorn	<i>Rhamnus cathartica</i>	1	X	
GRAPE FAMILY	VITACEAE			
Virginia creeper	<i>Parthenocissus inserta</i>	1	X	
wild grape	<i>Vitis riparia</i>	1	X	
MAPLE FAMILY	ACERACEAE			
silver maple	<i>Acer saccharinum</i>	1	X	
CASHEW FAMILY	ANACARDIACEAE			
western poison-ivy	<i>Rhus rydbergii</i>	1	X	
staghorn sumac	<i>Rhus typhina</i>	1	X	
CARROT FAMILY	APIACEAE			
Queen-Anne's lace	<i>Daucus carota</i>	1	X	
MILKWEED FAMILY	ASCLEPIADACEAE			
common milkweed	<i>Asclepias syriaca</i>	1	X	
PLANTAIN FAMILY	PLANTAGINACEAE			
narrow-leaved plantain	<i>Plantago lanceolata</i>	1	X	
OLIVE FAMILY	OLEACEAE			
white ash	<i>Fraxinus americana</i>	1	X	

Common Name	Scientific Name	Total	COMMUNITY NUMBER	
			1	2
FIGWORT FAMILY	SCROPHULARIACEAE			
butter-and-eggs	<i>Linaria vulgaris</i>	1	X	
MADDER FAMILY	RUBIACEAE			
cleavers	<i>Galium aparine</i>	1	X	
HONEYSUCKLE FAMILY	CAPRIFOLIACEAE			
tartarian honeysuckle	<i>Lonicera tatarica</i>	1	X	
ASTER FAMILY	ASTERACEAE			
common yarrow	<i>Achillea millefolium</i>	1	X	
large-leaved aster	<i>Eurybia macrophylla</i>	1	X	
Canada goldenrod	<i>Solidago canadensis</i>	1	X	
heart-leaved aster	<i>Symphyotrichum cordifolium</i>	1	X	
common dandelion	<i>Taraxacum officinale</i>	1	X	
FROG'S-BIT FAMILY	HYDROCHARITACEAE			
Canada waterweed	<i>Elodea canadensis</i>	1		X
PONDWEED FAMILY	POTAMOGETONACEAE			
curly-leaved pondweed	<i>Potamogeton crispus</i>	1		X
GRASS FAMILY	POACEAE			
orchard grass	<i>Dactylis glomerata</i>	1	X	
fowl manna grass	<i>Glyceria striata</i>	1	X	
LILY FAMILY	LILIACEAE			
lily-of-the-valley	<i>Convallaria majalis L.</i>	1	X	
Canada mayflower	<i>Maianthemum canadense</i>	1	X	
Total Number of Plant Specie	54		49	6

**Number of Plant
Species Per Community**

Appendix I-B

Plant Species by Community

APPENDIX I - B List of Significant Plant Species

Plant species observed by NEA with significant status on national, provincial and relevant regional lists are listed with status codes and where applicable the most current year of publication. Three standard reference works were used for the botanical nomenclature and taxonomy (Newmaster et. al., 1998; Gleason and Cronquist 1991; Voss 1980; 1985). Other published works for botanical names included; ferns (Cody and Britton 1989); grasses (Dore and McNeill 1980); orchids (Whiting and Catling 1986); shrubs (Soper and Heimbürger 1982) and trees (Farrar 1995).

NATIONAL RANKING	Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Government of Canada Species at Risk Act (SARA), SCHEDULE 1 (Subsections 2(1), 42(2) and 68(2)), Government of Can	
PROVINCIAL RANKING	Species at Risk in Ontario (COSSARO), Government of Ontario Provincial Rank (SRANK), Natural Heritage Information Center, Government of Ont	
REGIONAL RANKING	Riley, Simcoe	Riley, 1989, Simcoe

STATUS CODES	COSEWIC	END * - Endangered Species	*Year of Status Publication included in Code
	COSSARO	THR * - Threatened Species	
	SARA	SC * - Species of Concern	
	SRANK	S1 - Extremely Rare	Other national or provincial codes not listed
		S2 - Very Rare	
		S3 - Rare to Uncommon	
	Regional Lists	R - Rare native species	Other Regional codes not listed
		RS -Regional significant	
		EXP - Extirpated native species	

Common Name	Scientific Name	NATIONAL RANKINGS		PROVINCIAL RANKINGS		REGIONAL RANKINGS				
		COSEWIC	SARA	COSSARO	SRank	Riley, Simcoe				
lily-of-the-valley	Convallaria majalis L.					R				
Plants with Ranking	Total: 1	Status List Total	0	0	0	1	0	0	0	0

Appendix II-A Bird Status Report by Station

APPENDIX II-A Bird Status Report by Station

Bird species observed by GHD within each survey station are listed in the order followed the American Ornithologists' Union (AOU) Check-list of North American birds (7th edition, 1999, 47th Supplement). Common and scientific nomenclature are based on those used by AOU. Breeding status and breeding evidence code are listed when observed. Any significant status for a species on national and provincial lists is displayed as well as those from relevant regional lists.

List Status :	END - endangered	A wildlife species facing imminent extirpation or extinction.
	END-R -endangered regulated	A wildlife species facing imminent extirpation or extinction in Ontario which has been regulated under Ontario's Endangered Species Act (ESA).
	THR - threatened	A wildlife species likely to become endangered if limiting factors are not reversed.
	SC - special concern	A wildlife species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.
	YES - Area Sensitive	A wildlife species that requires large areas of suitable habitat in order to sustain their population numbers.
	* Other status levels are not displayed	

List Sources:	COSEWIC	The Committee on the Status of Endangered Wildlife in Canada, May 2018.
	COSSARO	The Committee on the Status of Endangered Wildlife in Canada, May 2018.
	SARA	The Committee on the Status of Species at Risk in Ontario, June 2018.
	Area Sensitive	Species At Risk Act, Schedule 1, Government of Canada, 2018. Significant Wildlife Technical Guide, Appendix C, OMNR, Oct. 2000
	Region 6	Southern Ontario Wetland Evaluation Appendix 11B, Version 3.2, March 2013

Breeding Status: (Observed By NEA)	B -species observed in breeding season in suitable habitat with some evidence of breeding (confirmed, probable or possible as per Ontario Breeding Bird Atlas, 2002).
	F -species observed in breeding season but no evidence of breeding or suitable nest sites available on the study site (includes flyovers, migrants and foraging colonial breeders).
	M -species observed outside of breeding season for that species and in area outside of the known breeding range for that species.

**Breeding Evidence Code:
(Observed By NEA)**

OBSERVED

X -species observed in its breeding season (no evidence of breeding).

POSSIBLE BREEDING

H -species observed in its breeding season in suitable nesting habitat

S -singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat

PROBABLE BREEDING

P -pair observed in their breeding season in suitable nesting habitat

T -permanent territory presumed through registration of territorial song on at least 2days,
a week or more apart, at the same place

D -courtship or display between a male and a female or 2 males, including courtship feeding or copulation

V -visiting probable nest site

A -agitated behaviour or anxiety calls of an adult

B -brood patch on adult female or cloacal protuberance on adult male

N -nest-building or excavation of nest hole

CONFIRMED BREEDING

DD -distraction display or injury feigning

NU -used nest or egg shell found (occupied or laid within the period of study)

FY -recently fledged young or downy young, including young incapable of sustained flight

AE -adults leaving or entering nest site in circumstances indicating occupied nest

FS -adult carrying fecal sac

CF -adult carrying food for young

NE -nest containing eggs

NY -nest with young seen or heard

SOURCE: Ontario Breeding Bird Atlas March 2001

Station No.: 1

AOU Code	Common Name	Scientific Name	Observed Breeding Status	Breed Evidence Code	COSEWIC	COSSARO	SARA	Area Sensitive	Region 6
COLO	Common Loon	<i>Gavia immer</i>	B	H				No	
DCCO	Double-crested Cormoran	<i>Phalacrocorax auritus</i>	B	X				No	
HEGU	Herring Gull	<i>Larus argentatus</i>	B	None				No	
RTHU	Ruby-throated Hummingb	<i>Archilochus colubris</i>	B	H				No	
LEFL	Least Flycatcher	<i>Empidonax minimus</i>	B	S				No	
EAPH	Eastern Phoebe	<i>Sayornis phoebe</i>	B	H				No	
GCFL	Great Crested Flycatcher	<i>Myiarchus crinitus</i>	B	H				No	
EAKI	Eastern Kingbird	<i>Tyrannus tyrannus</i>	B	P				No	
WAVI	Warbling Vireo	<i>Vireo gilvus</i>	B	S				No	
REVI	Red-eyed Vireo	<i>Vireo olivaceus</i>	B	P				No	
AMCR	American Crow	<i>Corvus brachyrhynchos</i>	B	H				No	
BCCH	Black-capped Chickadee	<i>Poecile atricapillus</i>	B	P				No	
HOWR	House Wren	<i>Troglodytes aedon</i>	B	S				No	
AMRO	American Robin	<i>Turdus migratorius</i>	B	S				No	
GRCA	Gray Catbird	<i>Dumetella carolinensis</i>	B	S				No	
BRTH	Brown Thrasher	<i>Toxostoma rufum</i>	B	S				No	
YEWA	Yellow Warbler	<i>Dendroica petechia</i>	B	S				No	
CSWA	Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	B	S				No	
BPWA	Blackpoll Warbler	<i>Dendroica striata</i>	B	None				No	
AMRE	American Redstart	<i>Setophaga ruticilla</i>	B	S				No	
CHSP	Chipping Sparrow	<i>Spizella passerina</i>	B	P				No	
SOSP	Song Sparrow	<i>Melospiza melodia</i>	B	P				No	
RWBL	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	B	S				No	
COGR	Common Grackle	<i>Quiscalus quiscula</i>	B	X				No	
BAOR	Baltimore Oriole	<i>Icterus galbula</i>	B	P				No	
PUFI	Purple Finch	<i>Carpodacus purpureus</i>	B	None				No	

AMGO	American Goldfinch	<i>Carduelis tristis</i>	B	P				No		
No. of Species Observed in Station:	27	No. of Breeding Species Observed in Station:	27		0	0	0	0	0	0

Station No.: 2

AOU Code	Common Name	Scientific Name	Observed Breeding Status	Breed Evidence Code	COSEWIC	COSSARO	SARA	Area Sensitive	Region 6	
MODO	Mourning Dove	<i>Zenaida macroura</i>	B	H				No		
NOFL	Northern Flicker	<i>Colaptes auratus</i>	B	H				No		
LEFL	Least Flycatcher	<i>Empidonax minimus</i>	B	S				No		
GCFL	Great Crested Flycatcher	<i>Myiarchus crinitus</i>	B	S				No		
EAKI	Eastern Kingbird	<i>Tyrannus tyrannus</i>	B	P				No		
REVI	Red-eyed Vireo	<i>Vireo olivaceus</i>	B	S				No		
BLJY	Blue Jay	<i>Cyanocitta cristata</i>	B	X				No		
CORA	Common Raven	<i>Corvus corax</i>	B	X				No		
TRSW	Tree Swallow	<i>Tachycineta bicolor</i>	B	X				No		
HOWR	House Wren	<i>Troglodytes aedon</i>	B	S				No		
AMRO	American Robin	<i>Turdus migratorius</i>	B	S				No		
GRCA	Gray Catbird	<i>Dumetella carolinensis</i>	B	P				No		
EUST	European Starling	<i>Sturnus vulgaris</i>	B	CF				No		
YEWA	Yellow Warbler	<i>Dendroica petechia</i>	B	S				No		
SOSP	Song Sparrow	<i>Melospiza melodia</i>	B	S				No		
RWBL	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	B	S				No		
COGR	Common Grackle	<i>Quiscalus quiscula</i>	B	X				No		
AMGO	American Goldfinch	<i>Carduelis tristis</i>	B	X				No		
No. of Species Observed in Station:	18	No. of Breeding Species Observed in Station:	18		0	0	0	0	0	0

TOTAL BIRD SPECIES OBSERVED DURING STATION SURVEYS: 33

Appendix II-B Bird Status Report - Comprehensive

APPENDIX II - B

Bird Status Report - Comprehensive

Bird species observed by GHD are listed in the order followed the American Ornithologists' Union (AOU) Check-list of North American birds (7th edition, 1999, 47th Supplement). Common and scientific nomenclature are based on those used by AOU. Breeding status and breeding evidence code are listed when observed. Any significant status for a species on national and provincial lists is displayed as well as those from relevant regional lists.

List Status :	END - endangered	A wildlife species facing imminent extirpation or extinction.
	END-R -endangered regulated	A wildlife species facing imminent extirpation or extinction in Ontario which has been regulated under Ontario's Endangered Species Act (ESA).
	THR - threatened	A wildlife species likely to become endangered if limiting factors are not reversed.
	SC - special concern	A wildlife species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.
	YES - Area Sensitive	A wildlife species that requires large areas of suitable habitat in order to sustain their population numbers.

* Other status levels are not displayed

List Sources:	COSEWIC	The Committee on the Status of Endangered Wildlife in Canada, May 2018.
	COSSARO	The Committee on the Status of Species at Risk in Ontario, June 2018.
	SARA	Species At Risk Act, Schedule 1, Government of Canada, 2018.
	Area Sensitive	Significant Wildlife Technical Guide, Appendix C, OMNR, Oct. 2000
	Region 6	Southern Ontario Wetland Evaluation Appendix 11B, Version 3.2, March 2013

Breeding Status: (Observed By NEA)	B	-species observed in breeding season in suitable habitat with some evidence of breeding (confirmed, probable or possible as per Ontario Breeding Bird Atlas, 2002).
	F	-species observed in breeding season but no evidence of breeding or suitable nest sites available on the study site (includes flyovers, migrants and foraging colonial breeders).
	M	-species observed outside of breeding season for that species and in area outside of the known breeding range for that species.

**Breeding Evidence Code:
(Observed By NEA)**

OBSERVED

X -species observed in its breeding season (no evidence of breeding).

POSSIBLE BREEDING

H -species observed in its breeding season in suitable nesting habitat

S -singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat

PROBABLE BREEDING

P -pair observed in their breeding season in suitable nesting habitat

T -permanent territory presumed through registration of territorial song on at least 2days,
a week or more apart, at the same place

D -courtship or display between a male and a female or 2 males, including courtship feeding or copulation

V -visiting probable nest site

A -agitated behaviour or anxiety calls of an adult

B -brood patch on adult female or cloacal protuberance on adult male

N -nest-building or excavation of nest hole

CONFIRMED BREEDING

DD -distraction display or injury feigning

NU -used nest or egg shell found (occupied or laid within the period of study)

FY -recently fledged young or downy young, including young incapable of sustained flight

AE -adults leaving or entering nest site in circumstances indicating occupied nest

FS -adult carrying fecal sac

CF -adult carrying food for young

NE -nest containing eggs

NY -nest with young seen or heard

SOURCE: Ontario Breeding Bird Atlas March 2001

AOU Code	Common Name	Scientific Name	Observed Breeding Status	Breed Evidence Code	COSEWIC	COSSARO	SARA	Area Sensitive	Region 6
COLO	Common Loon	<i>Gavia immer</i>	B	H				No	
DCCO	Double-crested Cormorant	<i>Phalacrocorax auritus</i>	B	X				No	
HEGU	Herring Gull	<i>Larus argentatus</i>	B	None				No	
MODO	Mourning Dove	<i>Zenaida macroura</i>	B	H				No	
RTHU	Ruby-throated Hummingbird	<i>Archilochus colubris</i>	B	H				No	
NOFL	Northern Flicker	<i>Colaptes auratus</i>	B	H				No	
LEFL	Least Flycatcher	<i>Empidonax minimus</i>	B	S				No	
EAPH	Eastern Phoebe	<i>Sayornis phoebe</i>	B	H				No	
GCFL	Great Crested Flycatcher	<i>Myiarchus crinitus</i>	B	S				No	
EAKI	Eastern Kingbird	<i>Tyrannus tyrannus</i>	B	P				No	
WAVI	Warbling Vireo	<i>Vireo gilvus</i>	B	S				No	
REVI	Red-eyed Vireo	<i>Vireo olivaceus</i>	B	P				No	
BLJY	Blue Jay	<i>Cyanocitta cristata</i>	B	X				No	
AMCR	American Crow	<i>Corvus brachyrhynchos</i>	B	H				No	
CORA	Common Raven	<i>Corvus corax</i>	B	X				No	
TRSW	Tree Swallow	<i>Tachycineta bicolor</i>	B	X				No	
BCCH	Black-capped Chickadee	<i>Poecile atricapillus</i>	B	P				No	
HOWR	House Wren	<i>Troglodytes aedon</i>	B	S				No	
AMRO	American Robin	<i>Turdus migratorius</i>	B	S				No	
GRCA	Gray Catbird	<i>Dumetella carolinensis</i>	B	P				No	
BRTH	Brown Thrasher	<i>Toxostoma rufum</i>	B	S				No	
EUST	European Starling	<i>Sturnus vulgaris</i>	B	CF				No	
YEWA	Yellow Warbler	<i>Dendroica petechia</i>	B	S				No	
CSWA	Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	B	S				No	
BPWA	Blackpoll Warbler	<i>Dendroica striata</i>	B	None				No	
AMRE	American Redstart	<i>Setophaga ruticilla</i>	B	S				No	
CHSP	Chipping Sparrow	<i>Spizella passerina</i>	B	P				No	

SOSP	Song Sparrow	<i>Melospiza melodia</i>	B	P				No		
RWBL	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	B	S				No		
COGR	Common Grackle	<i>Quiscalus quiscula</i>	B	X				No		
BAOR	Baltimore Oriole	<i>Icterus galbula</i>	B	P				No		
PUFI	Purple Finch	<i>Carpodacus purpureus</i>	B	None				No		
AMGO	American Goldfinch	<i>Carduelis tristis</i>	B	P				No		
TOTAL SPECIES OBSERVED:	33	BREEDING SPECIES OBSERVED:	33		0	0	0	0	0	0

Appendix III

Fish Species List for Pigeon Lake

Appendix III

Fish Species List for Pigeon Lake

Family	Common Name	Scientific Name	Thermal Regime	Spawning Season
<i>Catostomidae</i>	White Sucker	<i>Catostomus commersonii</i>	Coolwater	Spring (April-June)
<i>Centrarchidae</i>	Black Crappie	<i>Pomoxis nigromaculatus</i>	Coolwater	Spring (May-June)
	Bluegill	<i>Lepomis macrochirus</i>	Warmwater	Summer (June-August)
	Largemouth Bass	<i>Micropterus salmoides</i>	Warmwater	Spring (May-June)
	Pumpkinseed	<i>Lepomis gibbosus</i>	Warmwater	Spring-summer (May-August)
	Rock Bass	<i>Ambloplites rupestris</i>	Coolwater	Spring (May-June)
	Smallmouth Bass	<i>Micropterus dolomieu</i>	Coolwater	Spring (May-June)
<i>Cottidae</i>	Mottled Sculpin	<i>Cottus bairdii</i>	Coolwater	Spring (April-May)
<i>Cyprinidae</i>	Blackchin Shiner	<i>Notropis heterodon</i>	Coolwater	Summer (June-August)
	Bluntnose Minnow	<i>Pimephales notatus</i>	Warmwater	Summer (June-August)
	Brassy Minnow	<i>Hybognathus hankinsoni</i>	Coolwater	Spring-Summer (May-July)
	Common Carp	<i>Cyprinus carpio</i>	Warmwater	Spring-summer (May-August)
	Creek Chub	<i>Semotilus atromaculatus</i>	Coolwater	Spring (May-June)
	Emerald Shiner	<i>Notropis atherinoides</i>	Coolwater	Summer (June-August)
	Fallfish	<i>Semotilus corporalis</i>	Coolwater	Spring (May-June)
	Fathead Minnow	<i>Pimephales promelas</i>	Warmwater	Spring (May-August)
	Golden Shiner	<i>Notemigonus crysoleucas</i>	Coolwater	Summer (June-August)
	Northern Redbelly Dace	<i>Chrosomus eos</i>	Coolwater	Spring-summer (May-July)
	Spottail Shiner	<i>Notropis hudsonius</i>	Coolwater	Spring (May-June)
<i>Esocidae</i>	Muskellunge	<i>Esox masquinongy</i>	Warmwater	Spring (April-May)
<i>Fundulidae</i>	Banded Killifish	<i>Fundulus diaphanus</i>	Coolwater	Summer (June-August)

Family	Common Name	Scientific Name	Thermal Regime	Spawning Season
<i>Gasterosteidae</i>	Brook Stickleback	<i>Culaea inconstans</i>	Coolwater	Spring-summer (May-July)
<i>Ictaluridae</i>	Brown Bullhead	<i>Ameiurus nebulosus</i>	Warmwater	Spring (May-June)
<i>Lotidae</i>	Burbot	<i>Lota lota</i>	Coldwater	Winter (January-March)
<i>Percidae</i>	Iowa Darter	<i>Etheostoma exile</i>	Coolwater	Spring (April-June)
	Johnny Darter	<i>Etheostoma nigrum</i>	Coolwater	Spring (May-June)
	Logperch	<i>Percina caprodes</i>	Warmwater	Spring (May-June)
	Walleye	<i>Sander vitreus</i>	Coolwater	Spring (April-June)
	Yellow Perch	<i>Perca flavescens</i>	Coolwater	Spring (April-May)
<i>Percopsidae</i>	Trout-Perch	<i>Percopsis omiscomaycus</i>	Coldwater	Spring-summer (May-August)
<i>Salmonidae</i>	Lake Herring	<i>Coregonus artedi</i>	Coldwater	Fall (November-December)
<i>Umbridae</i>	Central Mudminnow	<i>Umbra limi</i>	Coolwater	Spring (April-May)

Note: Fish species listed under OMNR 2012 obtained from the Aquatic Resource Area Survey (OMNR, 2012). Fish species spawning season obtained from the *Ontario Freshwater Fishes Life History Database* (Eakins, 2019).

Appendix IV Concept Plan



A) 40.5m²

B) 43.9m²

C) 41.1m²

D) 41.5m²

E) 51.3m²

F) 42.0m²

G) 41.2m²

H) 46.1m²

I) 18.1m²

Concept Plan

County of Peterborough

Legend

-  Subject Property
-  Waterline (June 12, 2020)
-  Existing Building
-  Proposed Removed Cottage
-  Proposed Cottage (2028 sqft)
-  Proposed Waterloo Biofilter Septic System
-  Proposed Wet Slip Boathouse 794 sq ft
-  Floodline 246.82m
-  Anchor
-  Utility Pole

sqft to be removed = 2138.79 sqft
 sqft to be added = 2000 sqft
 Measurements estimated from Topological Survey
 Units are in metres (m) unless specified



Drawn By	AKulesza
Checked By	LPronk
Map Date	August 2020
Project Number	85099
Created In	AutoCAD Civil 3D 2019



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