DILLON CONSULTING

ADA HOMES

Environmental Impact Study

435 Big Bay Point Road

October 2018 – 17-5599

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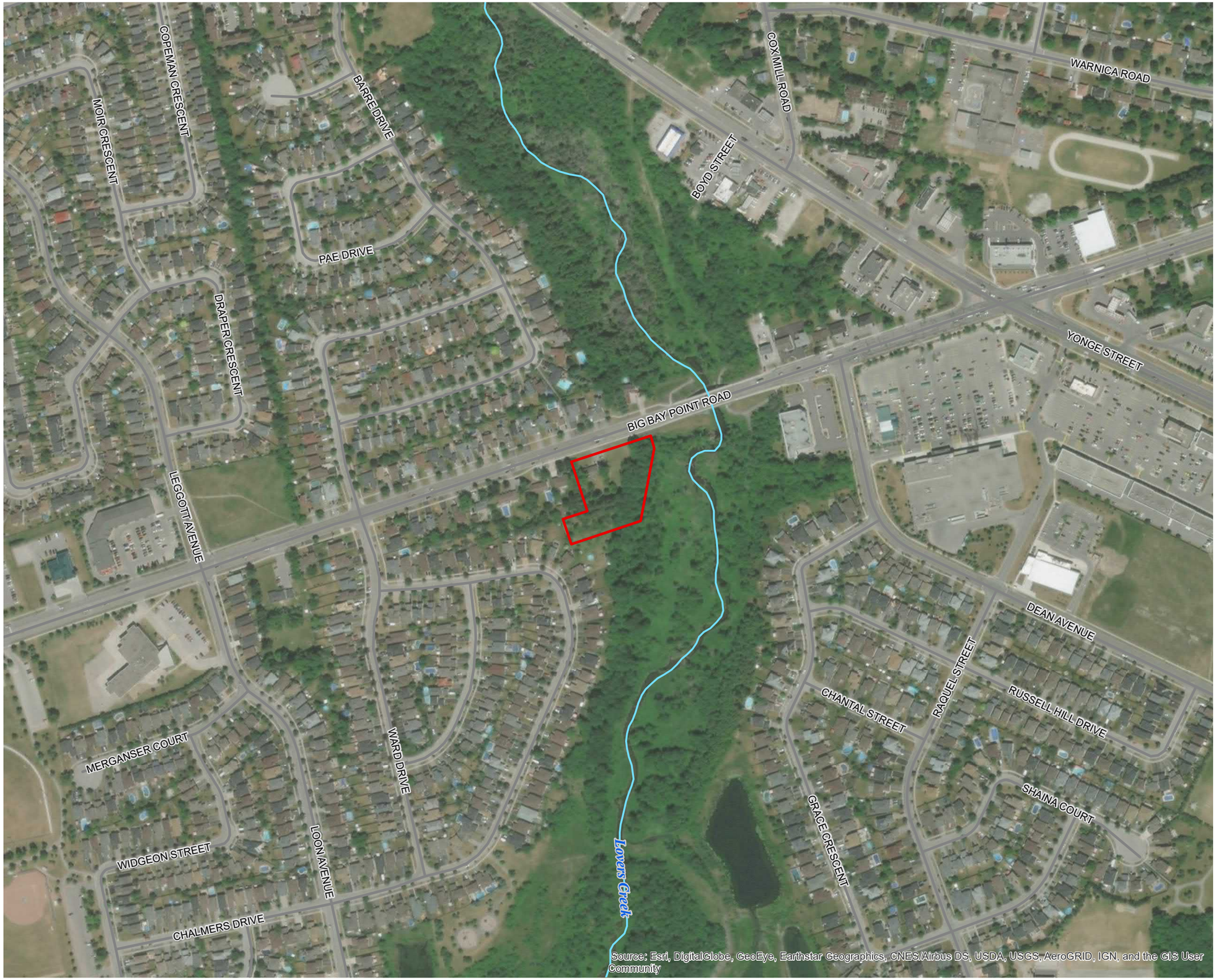
1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by ADA Homes to complete an Environmental Impact Study (EIS) in support of an application for proposed residential development at 435 Big Bay Point Road, City of Barrie, Simcoe County, fronting on Big Bay Point Road to the northwest (the "Study Area") (Figure 1).

The purpose of the EIS is to document existing conditions of the natural environment; determine the potential limits of development; evaluate the potential for environmental impacts associated with the proposed development; and recommend mitigation, restoration, and enhancement measures to preserve and/or restore natural features. The EIS has been prepared in general accordance with the policies of the Lake Simcoe Region Conservation Authority (LSRCA), following the Terms of Reference (TOR) established in consultation with the LSRCA and agreed to through correspondence between Dillon and LSRCA on June 8, 2017 (see Appendix A).



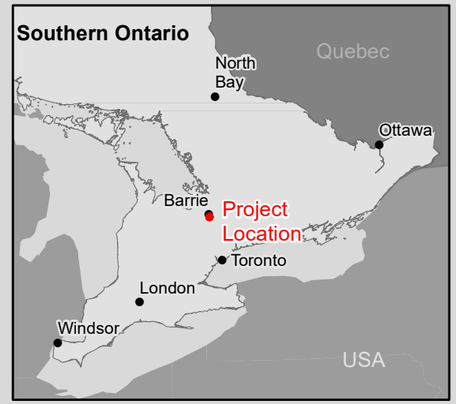
435 BIG BAY POINT ROAD

ENVIRONMENTAL IMPACT STUDY

STUDY AREA

FIGURE 1

Study Area
Road
Watercourse



0 25 50 100 m

SCALE 1:4,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: WM
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5599
STATUS: DRAFT
DATE: 2018-04-06

FILE LOCATION: \\dillon.ca\DILLON_DFS\Ottawa\Ottawa CAD\CAD\2017\175599 - 435 Big Bay Point\F1_StudyArea.mxd

2.0 Planning Context

The following sections have been prepared to identify the applicable land use planning policies related to the natural environment. Various regulatory agencies and legislative authorities have established a number of policies with the purpose of protecting ecological features and functions as outlined below. Table 1 lists the relevant policies and legislation that apply to the protection of natural heritage features within the City of Barrie; as well as supporting guidance documents and resources consulted respective to each policy. This table also includes additional background information sources used to help identify and define natural heritage features within the province of Ontario, and Eco-region 6E specifically. This section is not intended to constitute a complete land use planning assessment as it focuses on the relevant environmental policies and regulations. The documents referenced below can be read in their entirety for a more detailed understanding of the land use policy framework applicable to the Study Area.

Table 1: Policies, Legislation and Background Resources Searched

POLICY	GUIDELINES AND SUPPORTING DOCUMENTS
Province of Ontario	
Planning Act, 1990: Provincial Policy Statement (2014)	Policies within Section 2.1 related to natural heritage features
	Ministry of Natural Resources and Forestry (MNRF) Midhurst District Main Contact: Graham Findlay, Management Biologist · Records received from MNRF Midhurst District relating to natural features and wildlife species
	MNRF Natural Heritage Information Centre (NHIC) Square #17PK0611, 17PK0612, 17PK0711* · Species of Conservation Concern · Species at Risk · Natural heritage features
	Ecological Land Classification for Southern Ontario, Second Approximation, 2008
	Natural Heritage Reference Manual, Second Edition, March 2010
	Ontario Wetland Evaluation System, Southern Manual, Third Edition, 2014
	MNRF Significant Wildlife Habitat Technical Guide (2000) · Significant Wildlife Habitat Eco-region 6E Criterion Schedules, 2015
	Fisheries and Oceans Canada (DFO) · Ontario South West Map (Map 4 of 34) (July 2017)
	Federal Species at Risk Public Registry, accessed September 2017
	Ontario Breeding Birds Atlas (OBBA) Square #17PK01
	Ontario Reptile and Amphibian Atlas - online data accessed September 2017
	Ontario Butterfly Atlas - online data accessed September 2017
	Atlas of the Mammals of Ontario, 1994
Endangered Species Act	MNRF Species at Risk in Ontario (SARO) List (O.Reg. 230/08), September 2017

POLICY	GUIDELINES AND SUPPORTING DOCUMENTS
(2007)	MNRF Midhurst District Main Contact: Graham Findlay, Management Biologist · Received SAR occurrence records
	MNRF NHIC Square #17PK0611, 17PK0612, 17PK0711* · SAR occurrence records
	OBBA Square #17PK01
	Ontario Reptile and Amphibian Atlas - online data accessed September 2017
City of Barrie	
City of Barrie Official Plan (2017)	Schedules A and H
County of Simcoe	
Simcoe County Official Plan (2016)	Schedule 5.1
Conservation Authority	
Conservation Authorities Act, 1990: Ontario Regulation 179/06	Lake Simcoe Region Conservation Authority (LSRCA) · Floodplain mapping · Barrie, Lovers and Hewitt's Creeks Subwatersheds, 2016

*No NHIC square overlaps with the Study Area. Accessed the adjacent NHIC squares as a result.

Policies within each document that relate to the natural environment and apply to the Study Area are outlined in subsequent sections.

2.1 Provincial Policy Statement, 2014

The Provincial Policy Statement, 2014 (PPS) provides overall policy direction on matters of provincial interest related to land use planning and development in Ontario. The PPS sets forth a vision for Ontario's land use planning system by managing and directing land use to achieve efficient development and land use patterns, wise use and management of resources, and protecting public health and safety. This report deals specifically with Policy 2.1, Natural Heritage, and Policy 2.2, Water, which provides for the protection and management of natural heritage and water resources, which include the following:

- significant wetlands;
- significant coastal wetlands;
- significant woodlands;
- significant valleylands;
- significant wildlife habitat;
- significant areas of natural and scientific interest (ANSIs);
- fish habitat;
- sensitive surface water features; and,
- sensitive ground water features.

The PPS defines "significant" to mean:

- in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time;
- in regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources; and,
- in regard to other features and areas in policy in 2.1, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system".

The PPS defines "sensitive" to mean:

- in regard to surface water features and ground water features, means areas that are particularly susceptible to impacts from activities or events, including, but not limited to, water withdrawals, and additions of pollutants.

Potential significance of natural heritage features may be evaluated based on size, age, presence of rare or sensitive species, species diversity, and linkage functions, taking into consideration factors such as adjacent land use and degree of disturbance. Criteria for determining significance follow guidance outlined in the Natural Heritage Reference Manual (MNRF, 2010) and the Significant Wildlife Habitat Technical Guide Eco-Region 6E Criterion Schedules (MNRF, 2015), where applicable.

Significance of natural features identified within the Study Area is further discussed in Section 5.0 of this report.

2.2 Lake Simcoe Protection Plan, 2009

The Lake Simcoe Protection Plan (LSPP) was established under the *Lake Simcoe Protection Act*, 2008, with the purpose of protecting and restoring the ecological health of the Lake Simcoe Watershed (LSPP, 2009). The LSPP includes key natural heritage feature and key hydrologic feature policies pertaining to development and site alteration. Under the LSPP, key natural heritage features are defined as *wetlands*, *significant woodlands*, *significant valleylands* and natural areas abutting Lake Simcoe. Key hydrologic features are defined as *wetlands*, *permanent* and *intermittent streams*, and *lakes* other than Lake Simcoe.

Designation of lands (i.e., outside of existing settlement areas or within settlement areas), determines which LSPP key natural heritage/hydrologic feature policies apply. Under the LSPP, Settlement Areas are

defined as urban areas and settlement areas where development is concentrated and lands are designated in municipal official plans for development over the long term. Given the Study Area falls within the settlement area boundary of the City of Barrie Official Plan (OP) (Schedule A) and the Simcoe County Official Plan (Schedule 5.1), the following "Settlement Area" policies apply:

6.33-DP An application for development or site alteration shall, where applicable:

a. *increase or improve fish habitat in streams, lakes and wetlands, and any adjacent riparian areas;*
b. *include landscaping and habitat restoration that increase the ability of native plants and animals to use valleyland or riparian areas as wildlife habitat and movement corridors;*
c. *seek to avoid, minimize and/or mitigate impacts associated with the quality and quantity of urban run-off into receiving streams, lakes, and wetlands; and,*
d. *establish or increase the extent and width of a vegetation protection zone adjacent to Lake Simcoe to a minimum of 30 metres where feasible.*

6.34-DP Where, through an application for development or site alteration, a buffer is required to be established as a result of the application of the PPS, the buffer shall be composed of and maintained as natural self-sustaining vegetation.

These policies will be considered further in Section 8 and 9 of this report.

2.3 Endangered Species Act, 2007

In June 2008, the *Endangered Species Act*, 2007 (ESA) came into effect in Ontario. The purpose of the ESA is to identify Species at Risk (SAR) based on the best available scientific information; to protect SAR and their habitats, to promote the recovery of SAR; and to promote stewardship activities to assist in the protection and recovery of SAR in Ontario. There are two applicable regulations under the ESA; *Ontario Regulation 230/08* (the SARO List); and, *Ontario Regulation 242/08* (General). These regulations serve to identify which species and habitat receive protection and provide direction on the current implementation of the ESA by the MNRF.

The potential for SAR and SAR habitat to be present within the Study Area is discussed further in Section 3.3.6.

2.4 City of Barrie Official Plan, 2018

The City of Barrie Official Plan (OP) was approved in April 2010 and amendments were approved current to January 2018. It is intended that this OP will serve as the basis for land use and development goals, objectives, and policies for the guidance of public and private development decisions within the City of Barrie. This OP, as amended not only conforms to the policies of the PPS but also conforms to the County of Simcoe OP, which came into effect in 1999.

The Study Area falls within areas designated as Residential, Open Space, an Environmental Protection Area (EPA) and a Natural Heritage Resource (Level 2) (Schedule A, Schedule H) (refer to Appendix B). As described in Section 3.5.2.4 of the City of Barrie OP, "*Level 2 resources represent significant components of the Natural Heritage Resource network. The features and function of these areas should be retained, however, there is potential for development if no negative impact can be demonstrated or mitigated".* Level 2 resources are significant components of the Natural Heritage Resource network within the City and include significant valleylands, provincially significant life science Areas of Natural and Scientific Interest, significant wildlife habitat, watercourses, minimum vegetation protection zones and connectivity linkages, and woodlands greater than 4 hectares and less than 10 hectares (Schedule H).

The City of Barrie OP Section 4.7 policies apply with respect to land use within EPAs. Notably, policy 4.7.2.2(b) states that "*No buildings or structures shall be permitted in [EPAs] other than those necessary for flood or erosion control or for conservation purposes as approved by the City in consultation with applicable agencies…*". In addition, as per policy 4.7.2.3(d) an amendment to the EPA designation shall only be considered where the results of an environmental study clearly demonstrate that there will be no negative impacts on the natural features or ecological function for which the EPA has been identified with the exception of provincially significant wetlands (PSWs) and habitat of threatenend and endangered species. With respect to development on lands adjacent to EPAs; policy 4.7.2.4(a) provides that development and/or site alteration may be permitted if it has been demonstrated through an EIS that it will not negatively impact the natural features or ecological functions for which the area is identified and that the diversity of natural features in the area and the natural connections between them should be maintained and improved where possible. Lands considered adjacent to EPAs are defined under policy 4.7.2.4(b), and range from 120 meters (m) to 30 m depending on the EPA natural feature(s) (e.g., PSW, significant woodlands, fish habitat) present.

2.5 Simcoe County Official Plan, 2016

The County of Simcoe Official Plan (OP), adopted in 2008, provides the broad policy for the sixteen towns and townships that comprise the County of Simcoe. The policy seeks to balance the diverse economic, social and environmental demands in this region and assist in growth management. The OP is implemented through local municipal official plans, with Provincial Plans prevailing in case of conflict between Provincial Plans and the County of Simcoe OP or local municipal OP's (County of Simcoe, 2008).

The Study Area is designated as Settlement on Schedule 5.1 of the County of Simcoe OP (Appendix B). As per the County's OP, local municipal OP's are referred to for specific land use designations within Settlement areas.

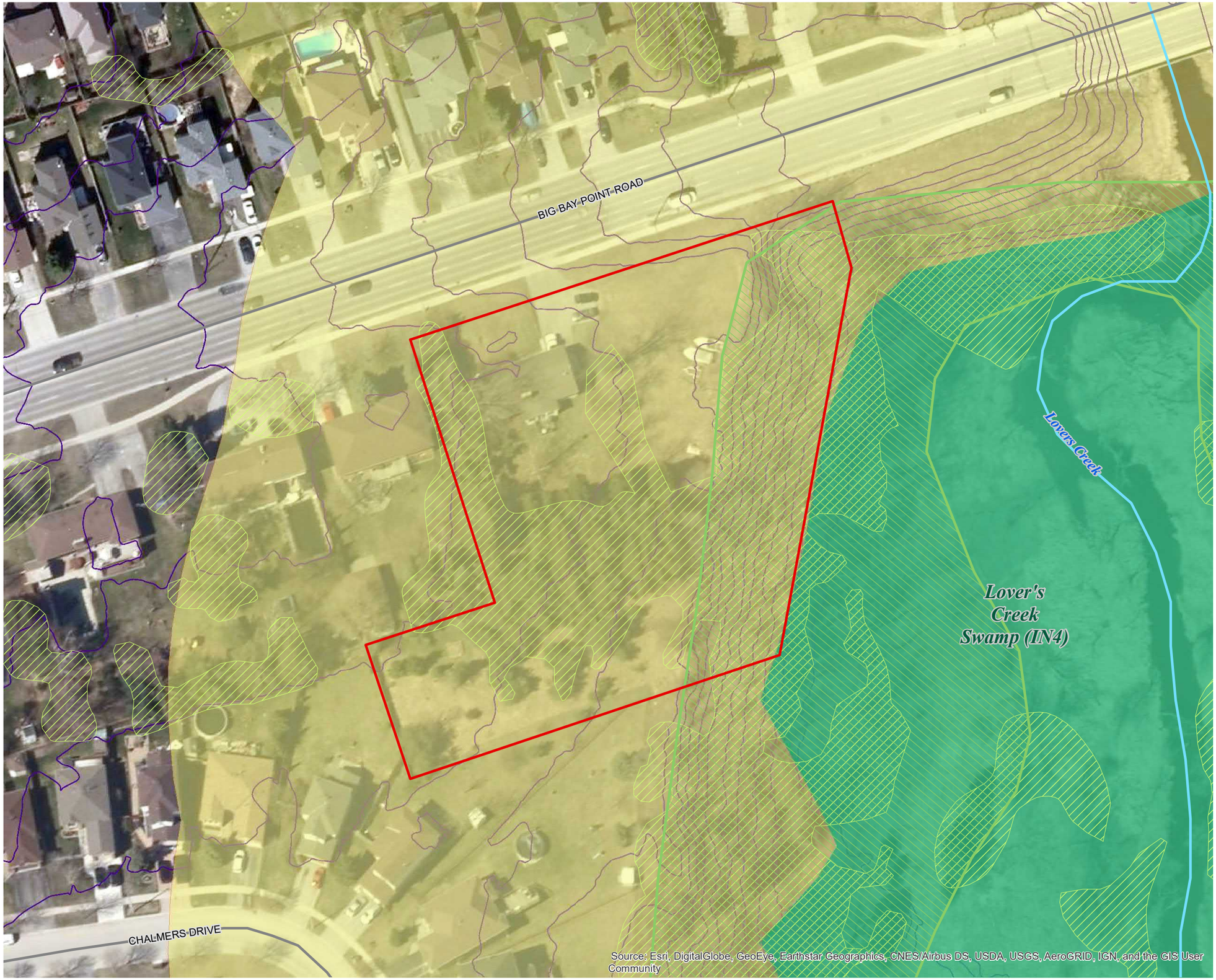
2.6 Lake Simcoe Region Conservation Authority (Ontario Regulation 179/06)

In accordance with Section 28 of the Conservation Authorities Act, 1990, the LSRCA is authorized to implement and enforce the Development, Interference with Wetlands and Alterations to Shorelines and

Watercourses Regulations (Ontario Regulation 179/06). Section 2(1) of this Regulation lists areas within LSRCA's jurisdiction where development is prohibited without proper permissions from the LSRCA. Such area includes, but are not limited to, river or stream valleys, hazardous lands, and wetlands, including areas within 120 metres of all provincially significant wetlands.

In participating in the review of applications under the *Planning Act*, LSRCA ensures that applicants and approval authorities are aware of any Section 28 Regulation requirements under the *Conservation Authorities Act*, where applicable. Further, LSRCA provides input to the County of Simcoe with respect to natural heritage features, such as significant woodlands, wetlands, and endangered species and their habitats (LSRCA, 2016).

Portions of the Study Area fall within the LSRCA's Regulated Area (see Figure 2).



435 BIG BAY POINT ROAD

ENVIRONMENTAL IMPACT STUDY

LAND USE PLANNING AND AGENCY DESIGNATIONS

FIGURE 2

- Study Area
- Road
- Watercourse
- Wooded Area (MNRF)
- Wooded Area (City of Barrie)
- Provincially Significant Wetland
- Regulation Limit (approx.)
- Contour 2016

0 5 10 20 m

SCALE 1:750

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, LSRCA, CITY OF BARRIE

MAP CREATED BY: LK
MAP CHECKED BY: WM
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5599

STATUS: DRAFT

DATE: 2018-04-06

FILE LOCATION: \\dillon.ca\DILLON_DFS\Ottawa\Ottawa CAD\CAD\2017\175599 - 435 Big Bay Point\F2_LUPlan_AgencyDesignations.mxd

3.0 Results of Background Review

The following sections provide a brief summary of the existing environmental conditions within the Study Area. This information provides the background information upon which the EIS was based.

3.1 Aquatic Environment

3.1.1 Watershed Summary

The property lies within the Lover's Creek subwatershed, which forms part of the larger Lake Simcoe watershed, flowing along the western portion of Lake Simcoe (LSRCA, 2016). The Lover's Creek subwatershed is 59.9 square kilometres and comprises 2.3% of the Lake Simcoe watershed. Lover's Creek is the only named stream within this subwatershed. The headwater portions of this creek are channelized and flow north towards Lake Simcoe. This subwatershed is within the Town of Innisfil and the City of Barrie.

The largest land uses in the Lover's Creek subwatershed are natural heritage features (35%) and intensive and non-intensive agriculture (34%) (LSRCA, 2016). There are also other land uses with much smaller percentages including urban, manicured open spaces, golf courses, and rural development.

3.1.2 Fish Habitat

As stated within the subwatershed study, fisheries data has been collected within the Lover's Creek since 1975 (LSRCA, 2016). The most recent sampling was conducted by the LSRCA from 1990 to present day, yielding a total of 30 species included in Table 2, below.

Table 2: Fish Species Identified in LSRCA Present Day Surveys

SCIENTIFIC NAME	COMMON NAME	SARA	ESA	S-RANK[1]
Ambloplites rupestris	Rock Bass	---	---	S5
Ameiurus nebulosus	Brown Bullhead	---	---	S5
Catostomus commersoni	White Sucker	---	---	S5
Cottus bairdi	Mottled Sculpin	---	---	S5
Cottus cognatus	Slimy Sculpin	---	---	S5
Culaea inconstans	Brook Stickleback	---	---	S5
Etheostoma caeruleum	Rainbow Darter	---	---	S4
Etheostoma exile	Iowa Darter	---	---	S5
Hybognathus hankinsoni	Brassy Minnow	---	---	S5
Lepomis gibbosus	Pumpkinseed	---	---	S5
Luxilus cornutus	Common Shiner	---	---	S5
Margariscus margarita	Pearl Dace	---	---	S5

SCIENTIFIC NAME	COMMON NAME	SARA	ESA	S-RANK[1]
Micropterus dolomieu	Smallmouth Bass	---	---	S5
Micropterus salmoides	Largemouth Bass	---	---	S5
Nocomis biguttatus	Hornyhead Chub	---	---	S4
Nocomis micropogon	River Chub	---	---	S4
Notropis atherinoides	Emerald Shiner	---	---	S5
Notropis heterodon	Blackchin Shiner	---	---	S4
Notropis heterolepis	Blacknose Shiner	---	---	S5
Notropis photogenis	Silver Shiner	---	THR	S2S3
Notropis rubellus	Rosyface Shiner	---	---	S4
Oncorhynchus mykiss	Rainbow Trout	---	---	SNA
Phoxinus eos	Northern Redbelly Dace	---	---	S5
Pimephales notatus	Bluntnose Minnow	---	---	S5
Pimephales promelas	Fathead Minnow	---	---	S5
Rhinichthys atratulus	Blacknose Dace	---	---	S5
Rhinichthys cataractae	Longnose Dace	---	---	S5
Salvelinus fontinalis fontinalis	Brook Trout	---	---	S5
Semotilus atromaculatus	Creek Chub	---	---	S5
Umbra limi	Central Mudminnow	---	---	S5

[1]S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common. --- denotes no information or not applicable.

Background MNRF mapping indicates that no watercourses are present within the Study Area (Figure 1). As a result, suitable fish habitat likely does not exist within the Study Area.

3.2 Terrestrial Environment

As mentioned in Section 2.1, natural heritage features as defined under the PPS require consideration within the EIS, and are discussed in subsequent sections. Note that consideration of fish habitat and habitat for *endangered* and *threatened* species has been included in Section 3.1, and Section 5.1, respectively.

3.3 Landforms, Soils, and Geology

A review of the Soil Survey of Simcoe County (Hoffman and Wicklund, 1962) indicates that the general area consists of smooth, moderately to steeply sloping hills, comprised of light grey, calcareous, loam and sandy till. Overburden deposits in the area consist of loam and sand till units. More specifically, soils within the City of Barrie generally exhibit the characteristics of the Grey-Brown Podzolic Great Soil Group. These soils can be susceptible to sheet erosion particularity in steeply sloping areas. Based on a review of the geotechnical investigation and evaluation of the slope stability and erosion hazard limit of Lover's Creek ravine conducted by Peto MacCallum Ltd. (June 2017), the overburden geology consists of

a 180-220 mm layer of sandy topsoil underlain by a 1.4-15.7 m layer of silty sand till (PEL, 2018). The slope present along the eastern side of the property descending to Lover's Creek is predominately comprised of glacial till (PEL, 2018).

According to the Barrie Creeks, Lover's Creek and Hewitt's Creek Subwatershed Plan (LSRCA, 2012), this area is a direct result of the deposition and erosion of the quarternary sediments (overburden) during glacial and post-glacial events. The Study Area is part of the Peterborough Drumlin Field, which extends south of Kempenfelt Bay down to the Oak Ridges Moraine, encompassing the southeastern portion of the Barrie Creeks subwatershed, and the majority of the Lover's and Hewitt's Creek subwatershed (Chapman and Putnam, 1984). This region is typically characterized by numerous drumlins of 20 to 75 m in width and 100 to 450 m in length that rise up from the surrounding till plain. Drumlins are oval shaped hills with smooth convex contours that are composed of a stone-rich, slightly silty to silty fine to medium grained sand till. Mapping within the subwatershed plan indicate that the soils in the Study Area are sandy loam with moderate infiltration rates (LSRCA, 2012).

A desktop review of the Study Area indicates that the property is comprised of woodland/wetland to the east and residential land with manicured grass and scattered trees to the north. The Study Area is bounded by Big Bay Point Road to the north, residences to the west, and woodland/wetland to the east. The topography within the Study Area consists of gently rolling hills.

A review of aerial photos indicates that the Study Area property has not changed since 2009 (Google Earth).

3.3.1 Wetlands

Wetlands within the Study Area are considered southern wetlands based on their location south of the northern limit of Ecoregions 5E, 6E, and 7E as shown in Figure 1 of the PPS, 2014. The Lover's Creek Swamp (IN4) PSW is adjacent to, but outside, the eastern portion of the Study Area. The Lover's Creek Swamp (IN4) PSW originates north of the Study Area in Lake Simcoe, extending down to 6th Line.

The Lover's Creek Swamp (IN4) PSW consists of a complex of wetlands that include swamp wetland types (MNRF, 2017). The wetland is located within the west central portion of the Lake Simcoe watershed and is 5,990 ha in size (LSRCA, 2012). The wetland covers a mix of agriculture, urban, and natural heritage features in the City of Barrie (LSRCA, 2016). The Lover's Creek subwatershed is composed of 13.5% wetland (LSRCA, 2016). Wetland units within the Lover's Creek subwatershed are linked by woodlands, hedgerows, riparian habitat, and fields (LSRCA, 2016). Wildlife movements occur between the wetlands within the complex and to and from the surrounding uplands. For example, woodland frogs move from their upland forests to breed in the wetlands in the complex, including species such as Wood Frog (*Lithobates sylvaticus*) and Spring Peeper (*Pseudacris crucifer*).

No other wetland units were identified within the Study Area.

3.3.2 Woodlands

The City of Barrie and MNRF mapping identify woodlands within the Study Area (Figure 2).

The significance of woodlands within the Study Area will be discussed further in Section 5.2.4.

3.3.3 Valleylands

No significant valleylands were identified within or adjacent to the Study Area.

3.3.4 Areas of Natural and Scientific Interest

No significant ANSIs were identified within or adjacent to the Study Area.

3.3.5 Significant Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (MNRF, 2000) defines Species of Conservation Concern as globally, as globally, nationally, provincially, regionally, or locally rare (S-Rank of S2 or S3); as well as species listed as endangered or threatened federally; but do not include SAR (listed as endangered or threatened under the ESA, 2007). The Species of Conservation Concern listed in Table 3 have been identified with the potential to occur within or adjacent to the Study Area. These species have been considered in determining the potential for Significant Wildlife Habitat (SWH) within the Study Area, as defined by the Eco-region 6E Criterion Schedules (MNRF, 2015).

Table 3: Species of Conservation Concern with potential to occur within the Study Area

SCIENTIFIC NAME	COMMON NAME	SARA	ESA	SRANK[1]	INFO SOURCE[2]
Vascular Plants					
Chenopodium foggii	Fogg's Goosefoot	---	---	S2	MNRF
Birds					
Chordeiles minor	Common Nighthawk	THR	SC	S4B	OBBA
Contopus cooperi	Olive-sided Flycatcher	THR	SC	S4B	MNRF
Contopus virens	Eastern Wood-pewee	---	SC	S4B	OBBA
Haliaeetus leucocephalus	Bald Eagle	---	SC	S2N,S4B	CBC
Hylocichla mustelina	Wood Thrush	---	SC	S4B	OBBA
Melanerpes erythrocephalus	Red-headed Woodpecker	THR	SC	S4B	OBBA
Vermivora chrysoptera	Golden-winged Warbler	THR	SC	S4B	MNRF
Herpetozoa					
Chelydra serpentina	Snapping Turtle	SC	SC	S3	MNRF
Graptemys geographica	Northern Map Turtle	SC	SC	S3	ON
Pseudacris triseriata pop. 1	Western Chorus Frog (Great Lakes/ St. Lawrence- Canadian	THR	SC	S3	ON

SCIENTIFIC NAME	COMMON NAME	SARA	ESA	SRANK[1]	INFO SOURCE[2]
	Shield Population)				
Lepidoptera					
Danaus plexippus	Monarch	SC	SC	S2N, S4B	MNRF,TEA

[1]S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common. [2]Information sources include: MNRF = Ministry of Natural Resources and Forestry; OBBA = Ontario Breeding Bird Atlas; CBC = Christmas Bird Count; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; TEA = Toronto Entomologists' Association; --- denotes no information or not applicable.

As a result of the background review, the following SWH types, as defined in the Eco-region 6E Criterion Schedules (MNRF, 2015), may be present within or adjacent to the Study Area:

- Bat maternity colonies;
- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat;
- Amphibian breeding habitat (woodlands); and,
- Special concern and rare wildlife species.

Significance of wildlife habitat within the Study Area is discussed further in Section 4.2.4 and Section 5.2.5.

3.3.6 Species at Risk

A number of SAR listed as *endangered* and *threatened* under the ESA have been identified with potential to occur within the vicinity of the Study Area (see Table 4).

Table 4: Species at Risk with potential to occur within the Study Area

SCIENTIFIC NAME	COMMON NAME	SARA	ESA	S-RANK[1]	INFO SOURCE[2]
Vascular Plants					
Juglans cinerea	Butternut	END	END	S3?	MNRF
Birds					
Chaetura pelagica	Chimney Swift	THR	THR	S4B,S4N	OBBA
Hirundo rustica	Barn Swallow	---	THR	S4B	OBBA
Riparia riparia	Bank Swallow	---	THR	S4B	OBBA
Sturnella magna	Eastern Meadowlark	---	THR	S4B	OBBA
Mammals					
Myotis lucifugus	Little Brown Myotis	END	END	S4	MNRF, OMA
Myotis septentrionalis	Northern Myotis	END	END	S3	MNRF, OMA
Herpetozoa					
Emydoidea blandingii	Blanding's Turtle	THR	THR	S3	ON

[1]S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common. [2]Information sources include: MNRF = Ministry of Natural Resources and Forestry; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; OMA = Ontario Mammals Atlas --- denotes no information or not applicable.

3.3.6.1 Species at Risk Habitat

An information request was submitted to the MNRF Midhurst District Office in order to obtain SAR records to help narrow our focus on potential SAR and/or SAR habitat within the Study Area (Appendix C). The MNRF identified the following *endangered* and *threatened* species:

- Butternut;
- Barn Swallow;
- Little Brown Myotis; and,
- Northern Myotis.

These species are discussed further in Section 5.2.6.

3.3.7 Incidental Wildlife

A review of aerial photos and local knowledge suggests that there are several common wildlife species found within the general area with potential to occur in the Study Area.

Incidental wildlife occurrences are discussed further in Section 5.2.7.

4.0 Field Work Methodology

The results of the background review were used to assist in scoping the 2017 field program. Fieldwork conducted for the EIS occurred between April 2017 and August 2017 when weather conditions and timing were deemed suitable based on the survey protocols being implemented (Table 5). Fieldwork consisted of Ecological Land Classification (ELC) of vegetation communities, botanical surveys, aquatic surveys, breeding bird surveys, and amphibian breeding surveys. Any incidental wildlife observations made during the surveys were also documented. The following sub-sections outline the survey methodologies used in the EIS.

Table 5: Dates and Times of Field Surveys

DATE (2017)	WEATHER CONDITIONS	AIR TEMP (°C)	PURPOSE OF VISIT
April 23	Mostly clear, light breeze, no precipitation	8.0	Amphibian Survey # 1, Incidental Wildlife
May 18	Clear, light breeze, no precipitation	19.0	Amphibian Survey # 2, Incidental Wildlife
June 7	Clear, light breeze, no precipitation	14.0	Breeding Bird Survey #1, Incidental Wildlife
June 29	Clear, no precipitation	19.0	Amphibian Survey # 3, Incidental Wildlife
June 18	Mostly clear, light precipitation	18.0	Breeding Bird Survey #2, Incidental Wildlife
July 13	Light precipitation	16.0	ELC, Incidental Wildlife
August 10	Partially clear, no precipitation	26.0	Wetland Staking, Incidental Wildlife

4.1 Aquatic Assessment

An aquatic assessment was conducted in conjunction with the detailed ELC survey in July 2017.

The results of aquatic surveys are discussed in Section 5.1.

4.2 Terrestrial Assessments

4.2.1 Ecological Land Classification

Vegetation communities were assessed using ELC as a first step to identify and assess potential natural heritage features within the Study Area. During the field investigations, vegetation was characterized using the ELC System for Southern Ontario (Lee et al., 1998) in order to classify and map ecological communities to the vegetation level. The ecological community boundaries were determined through the review of aerial photography and then further refined through on site vegetation and tree surveys. In addition to the vegetation survey, a basic soil assessment was conducted to identify the soil moisture class within the ecosystem.

The ELC protocol recommends that a vegetation community be a minimum of 0.5 ha in size before it is defined. Based on the composition of vegetation communities within the Study Area, patches of vegetation less than 0.5 ha or disturbed/planted vegetation were described, provided they clearly fit within an ELC vegetation type.

Results of the ELC survey are included in Section 5.2.1.

4.2.2 Vegetation Inventory

Summer botanical surveys were completed in conjunction with the detailed ELC surveys in July 2017. Surveys consisted of wandering transects and/or area searches to determine the presence, richness, and abundance of floral species within the Study Area. Species nomenclature is based on the Ontario Plant List (Newmaster et al., 1998).

Results of the botanical surveys are discussed in Section 5.2.2.

4.2.3 Wetlands

The wetland boundary was staked with MNRF in attendance in August of 2017. In addition, the boundaries of wetland units within the Study Area were delineated using the *Ontario Wetland Evaluation System* (MNRF 2013) by a certified OWES evaluator in conjunction with ELC surveys. The wetland boundaries staked with MNRF in attendance in 2017 has been used in determining appropriate buffers from the proposed development in accordance with policies (refer to Section 9.1).

The Lover's Creek Swamp (IN4) PSW was evaluated by MNRF and therefore does not require any further evaluation. The wetland designation is PSW and is therefore protected under the policy of the PPS.

Further details on wetlands within the Study Area are discussed in Section 5.2.3.

4.2.4 Significant Wildlife Habitat

Based on the presence of the Lover's Creek Swamp (IN4) PSW adjacent to the Study Area (with the buffer for the PSW within the Study Area), both breeding bird surveys and amphibian breeding surveys were conducted to establish baseline conditions, and to determine whether significant wildlife habitat exists within the Study Area. Due to the size of the woodland, there is potential for woodland area-sensitive bird breeding habitat in addition to potential amphibian breeding habitat (woodlands), as defined in the *Eco-region 6E Criterion Schedules* (MNRF, 2015).

4.2.4.1 Breeding Bird Survey

Diurnal breeding bird surveys conducted within the Study Area followed the methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman et al., 2007), and were completed in June of 2017 (two surveys). Specifically, surveys consisted of point counts generally conducted between dawn and five hours after sunrise that were used to establish quantitative estimates of bird abundance in

suitable habitat types within the Study Area. During the surveys evidence of breeding behaviour was recorded which generally includes, but is not limited to, males singing, nest building, egg incubation, territorial defence, carrying food, and feeding their young.

One breeding bird point count monitoring station was surveyed within the Study Area, as shown in Figure 3. Results of breeding bird studies within the Study Area are included in Section 5.2.5.1.

4.2.4.2 Amphibian Breeding Survey

Amphibian monitoring followed the Marsh Monitoring Program protocol (Bird Studies Canada, 2009). In accordance with the protocol, three different surveys were conducted between April 1 and June 30, with at least two weeks between each survey. Surveys began at least one half hour after sunset during evenings with a minimum night temperature of 5ºC, 10ºC, and 17ºC for each of the three respective surveys.

The calling activity of individuals estimated to be within 100 m of the observation point were documented. All individuals beyond 100 m were recorded as outside the count circle, and calling activity was not recorded. Calling activity was then ranked using one of the three abundance code categories:

Code 1: Calls not simultaneous, number of individual can be accurately counted;
Code 2: Some calls simultaneous, number of individuals can be reliably estimated; and,
Code 3: Calls continuous and overlapping, number of individuals cannot be estimated.

In areas where appropriate habitat exists vernal pools were also visually examined for egg masses and amphibian larvae in conjunction with other field surveys. These searches occurred between April and June when amphibians were concentrated around suitable breeding habitat. One amphibian monitoring station was surveyed within the Study Area, as shown in Figure 3.

Results of amphibian breeding studies within the Study Area are included in Section 5.2.5.2.

4.2.5 Species at Risk

Surveys for Butternut were completed in conjunction with ELC surveys within the Study Area. Since no specific habitat for SAR birds identified by the MNRF is present within the Study Area, general surveys for Chimney Swift, Barn Swallow, Bank Swallow, and Eastern Meadowlark were completed in conjunction with diurnal breeding bird surveys outlined above.

Since the core woodland area associated with the Lover's Creek ravine and PSW will be protected and with no vegetation removal proposed, specific snag/cavity trees density searches were not conducted in those areas. The trees within the proposed development area were surveyed during ELC and vegetation inventory to identify possible snags and/or cavity trees suitable for bat maternity roosting.

435 BIG BAY POINT ROAD

ENVIRONMENTAL IMPACT STUDY

SITE INVESTIGATION RESULTS

FIGURE 3

- Study Area
- Butternut
- Amphibian Breeding Habitat Survey
- Breeding Bird Survey Location
- Road
- Watercourse
- Wetland Boundary Delineation (Dillon 2017)
- Provincially Significant Wetland
- Wooded Area (MNRF)
- Candidate Significant Widlife Habitat for Bat Maternity Colonies
- Significant Woodlands *
- Potential SAR Bat Habitat

Ecological Land Classification

1. FODM5-1: Dry-Fresh Sugar Maple Deciduous Forest
2. FOCM6-3: Dry-Fresh Scots Pine Naturalized Coniferous Plantation
3. CVR_3: Single Family Residential

* Partially contributed to by MNRF Wooded Area

0 5 10 20 m

SCALE 1:750

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF BARRIE

MAP CREATED BY: LK
MAP CHECKED BY: WM
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5599
STATUS: DRAFT
DATE: 2018-10-26

FILE LOCATION: \\dillon.ca\DILLON_DFS\Ottawa\Ottawa CAD\CAD\2017\175599 - 435 Big Bay Point\F3_SiteInvestigation_Oct2018.mxd

Since the PSW and watercourse will be protected and no vegetation removal will occur within the PSW, specific turtle area searches were not conducted in those areas. Any incidental turtle observations were recorded during surveys within the Study Area.

Results relating to SAR within the Study Area have been included in Section 5.2.6.

4.2.6 Incidental Wildlife

A general wildlife assessment was completed within the Study Area through incidental observations while on site. Any incidental observations of wildlife were noted, as well as other wildlife evidence such as dens, tracks, and scat. For each observation, notes, and when possible, photos were taken. These observations helped to determine potential ecological functions, linkages, etc. within the Study Area.

Results relating to incidental wildlife within the Study Area have been included in Section 5.2.7.

5.0 Results of Biophysical Inventory

A biophysical inventory of natural features within the Study Area was completed in accordance with the methods detailed in Section 4.0. The analysis of data collected from secondary source information and during field studies in 2017, was used to evaluate the significance of natural heritage features within the Study Area.

5.1 Aquatic Assessment

An aquatic assessment was conducted in conjunction with the detailed ELC survey in July 2017. No aquatic habitat exists within the Study Area.

Potential impacts to Lover's Creek are addressed in Section 8.1.1.

5.2 Terrestrial Environment

5.2.1 Ecological Land Classification

A total of three ecological communities were observed within the Study Area during the ELC survey, two of which are considered natural vegetation communities. The location, type, and boundaries of these communities are delineated in Figure 3. All vegetation communities surveyed within the Study Area are considered common in Ontario. Table 6 outlines the communities documented during ELC surveys and summarizes the dominant vegetation cover. Reference photos for each of the plant communities observed can be found in Appendix D.

Natural communities (e.g., woodland, plantation) within the Study Area have been disturbed due to anthropogenic uses (i.e., residential) and contain invasive species. The majority of lands within the proposed development area consist of mowed grass associated with the existing residential property. These areas have been depicted in Figure 3.

Table 6: Ecological Land Classification

ELC CODE	CLASSIFICATION	TOTAL AREA WITHIN STUDY AREA (HA)	VEGETATION	COMMENTS	PHOTO APPENDIX D
FODM 5-1	Dry-Fresh Sugar Maple Deciduous Forest	0.22	The canopy and sub-canopy consists of Sugar Maple (*Acer saccharum*) as the dominant species with rare American Elm (*Ulmus americana*), Wild Black Cherry (*Prunus serotina*), Black Walnut (*Juglans cinerea*), American Basswood (*Tilia americana*), and hawthorn sp. A Butternut was also observed within this community. Shrub species present include Common Buckthorn (*Rhamnus cathartica*) as occasional. Herbaceous species present consist of Virginia Creeper (*Parthenocissus quinquefolia*) as the abundant species.	This community is located along the eastern border of the Study Area. This community also contains slight noise levels in the northern portion near the Big Bay Point Road.	1
FOCM 6-3	Dry-Fresh Scotts Pine Naturalized Coniferous Plantation	0.24	The canopy consists of Scotch Pine (*Pinus sylvestris*) as the abundant species. The sub-canopy consists of Scotch Pine (*Pinus sylvestris*) and Common Buckthorn (*Rhamnus cathartica*) as the dominant species. Shrub species present include Common Buckthorn (*Rhamnus cathartica*) as occasional. Herbaceous species present consists of Orchard Grass (*Dactylis glomerata*) as abundant and Awnless Brome (*Bromus inermis*) and Wild Carrot (*Daucus carota)* as occasional.	This community is location in the southwestern portion of the Study Area, and is comprised of rows of planted Scotch Pine. It is assumed that these trees were planted by the landowner as a visual barrier to the development to the south.	2
CVR_3	Single Family Residential	0.24	Mown grass with American Elm trees. Single family dwelling. To the south of property is meadow disturbed by plantation (FOCM6-3).	This community is located in the northwestern portion of the Study Area.	3

5.2.2 Vegetation

A total of 48 plant species were documented during 2017 field studies. Of the 48 species, 46% are listed as native species considered to be common (S4) to very common (S5) in the province of Ontario; with one species listed as vulnerable in Ontario (S3), Butternut was observed within the Lover's Creek ravine. Approximately 38% are listed as introduced species; therefore, a status ranking is not applicable as the species is not a suitable target for conservation activities (SE or SNA rank).

The Co-efficient of Conservatism (CC) provides additional information on the nature of the vegetation communities within the Study Area. The CC values range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape that is relatively unaltered or is in a pre-settlement condition. For example, a CC of 0 is given to plants such as Manitoba Maple that demonstrate little fidelity to any remnant natural community, i.e., may be found almost anywhere. Similarly, a CC of 10 is applied to plants like Shrubby Cinquefoil (*Potentilla fructicosa*) that are almost always restricted to a pre-settlement remnant, i.e., a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no CC values have been applied to these species.

Of the 48 species identified within the Study Area, two have a CC value of 7 or greater; American Mountain-ash (8) and Cup Plant (9). The mean CC value for the site was 3.71 out of a possible 10, indicating an altered landscape. This is typical of an urban environment as compared to naturally occurring environments. A full list of the vegetation species observed within the Study Area has been included in Appendix E.

Potential impacts related to vegetation within the Study Area are included in Section 8.1.3.

5.2.3 Wetlands

The wetland community boundaries previously mapped by the MNRF were updated in 2017, and the wetland boundary adjacent to the Study Area was staked by the MNRF and Dillon in 2017 using protocols outlined in the OWES manual (MNRF 2013) by an MNRF certified wetland evaluator. The Lover's Creek Swamp (IN4) PSW is located entirely outside of the Study Area. The PSW riparian zone is located on a steep valley slope, which transitions into a meadow marsh community at the bottom of the slope. Vegetation observed within the PSW during the 2017 ELC survey include Reed Canary Grass (*Phalaris arundinacea*), Spotted Joe Pye Weed (*Eutrochium maculatum var. maculatum*), Spotted Jewelweed (*Impatiens capensis*), Virgin's Bower (Clematis virginiana), and Black Ash (*Fraxinus nigra*).

Potential impacts related to the PSW community adjacent to the Study Area are included in Section 8.0.

5.2.4 Woodlands

As described in Section 5.2.1, a Dry-Fresh Sugar Maple Deciduous Forest (FODM5-1) and Dry-Fresh Scots Pine Naturalized Coniferous Plantation (FOCM6-3) community were observed within the Study Area during the ELC surveys in 2017. These woodland communities are referred to as Woodland "A" and Woodland "B" respectively (Figure 3). The woodlands were further investigated through Dillon ELC and botanical surveys in 2017.

The Simcoe County OP policy 3.8.14 defers to local municipalities to determine whether a woodland is a significant woodland within a settlement area based on criteria established within the local OP. The Study Area is located within a settlement area; therefore, the policies of the City of Barrie OP apply with respect to woodland significance. Under the City of Barrie OP policy 4.7.2.6 (b), significant woodlands

are generally defined as "*a contiguous wooded area, of no less than 0.2 ha, irrespective of ownership, maturity, composition, and density in accordance with the City's Tree Preservation By-law*".

Given Woodland A and B are contiguous to the ravine wooded area which is greater than 0.2 ha, under the City of Barrie OP Woodland A and Woodland B are both considered significant (Figure 3).

Under Section 4.7.2.6 of the City's OP, *"development and site alteration shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on the natural features and ecological functions*." Woodland A forms part of the core natural wooded ravine of Lover's Creek and corresponds to the MNRF woodland layer; whereas Woodland B consists of a naturalized coniferous plantation dominated by invasive Scotch Pine (*Pinus sylvestris*). It is assumed that the landowner planted these trees as a visual barrier to the development to the south and the area has since began to naturalize. Despite being widely naturalized in Ontario, Scotch Pine still has invasive characteristics and is a vector or reservoir for some insect pests and diseases to valued tree species (Marinich and Powell, 2017). Scotch Pine are capable of outcompeting native species including trees, wildflowers, and grasses and have invaded many sensitive ecosystems in Ontario (Marinich and Powell, 2017).

A Tree Inventory and Preservation Plan (TIPP) Report was prepared by Kuntz Forestry Consulting Inc. (Kuntz) in May of 2017. Refer to the TIPP for further information about tree species within the Study Area.

Potential impacts related to the significant woodlands within the Study Area are included in Section 8.0.

5.2.5 Significant Wildlife Habitat

Based on the criteria in the Ecoregion 6E Criterion Schedules (MNRF, 2015), bat maternity colonies considered SWH are found in the following ELC forest communities: FOD, FOM, SWD, and SWM. Based on this criteria, Significant Woodland A (FODM5-1) is considered Candidate SWH for Bat Maternity Colonies (Figure 3). Significant Woodland B does not meet the criteria to be considered SWH for Bat Maternity Colonies given it is a Naturalized Coniferous Plantation (FOC) community and primarily consists of early successional trees (young growth).

The results of the field surveys as they apply to avian and amphibian SWH are detailed below.

5.2.5.1 Breeding Bird Survey

A total of 14 bird species were observed during breeding bird surveys in 2017 (Table 7). Of the 14 species observed, none are considered area sensitive, and all are considered common and secure (S4) to very common (S5) in the province of Ontario based on the provincial conservation rankings assigned by the NHIC.

Table 7: Breeding Bird Survey Results

SCIENTIFIC NAME	COMMON NAME	GRANK[1]	SRANK[2]	SARA[3]	ESA[4]	BREEDING EVIDENCE[1]	ABUNDANCE ON PROPERTY
Cardinalis cardinalis	Northern Cardinal	G5	S5	---	---	S	4
Carduelis tristis	American Goldfinch	G5	S5B	---	---	Flyover/S	5
Corvus brachyrhynchos	American Crow	G5	S5B	---	---	H/S	6
Geothlypis trichas	Common Yellowthroat	G5	S5B	---	---	S	2
Larus delawarensis	Ring-billed Gull	G5	S5B,S4N	---	---	Flyover	1
Melospiza melodia	Song Sparrow	G5	S5B	---	---	S	6
Myiarchus crinitus	Great Crested Flycatcher	G5	S4B	---	---	S	2
Poecile atricapillus	Black-capped Chickadee	G5	S5	---	---	S	2
Quiscalus quiscula	Common Grackle	G5	S5B	---	---	X	2
Setophaga ruticilla	American Redstart	G5	S5B	---	---	S	2
Troglodytes aedon	House Wren	G5	S5B	---	---	S	3
Turdus migratorius	American Robin	G5	S5B	---	---	S	3
Vireo olivaceus	Red-eyed Vireo	G5	S5B	---	---	S	3
Vireo philadelphicus	Philadelphia Vireo	G5	S5B	---	---	S	1

Breeding Bird Codes from Breeding Bird Atlas of Ontario (Cadman *et al.* 2007)

Observed

X Species observed in its breeding season (no breeding evidence)

Possible

H Species observed in its breeding season in suitable nesting habitat

S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season

Probable

P Pair observed in suitable nesting habitat in nesting season

T Permanent territory presumed through registration of territorial song, or the occurrence of an adult bird, at the same place, in breeding habitat, on at least two days a week or more apart, during its breeding season.

D Courtship or display, including interaction between a male and a female or two 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, except by a wren or a woodpecker

Confirmed

NB Nest-building or excavation of nest hole by a species other than a wren or a woodpecker

DD Distraction display or injury feigning

NU Used nest or egg shells found (occupied or laid within the period of the survey)

FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight

AE Adult leaving or entering nest sites 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

5.2.5.2 Amphibian Survey

Potential amphibian breeding habitat was identified within woodland and wetland eco-sites. In accordance with the Ecoregion 6E Criterion Schedule (MNRF, 2015), the Study Area was considered under amphibian breeding woodland habitat, as potential amphibian breeding is located within the woodland boundary. In order for amphibian breeding habitats to be significant, they must contain one or more of the listed newt/salamander species; at least two or more of the listed frog/toad species with at least 20 individuals (adults or egg masses) of each species; or at least two of the listed frog/toad species with Call Code 3.

A total of two American Toads (*Anaxyrus americanus*), were heard calling during the three amphibian breeding surveys conducted in 2017. No egg masses or other evidence of amphibian breeding were observed within woodland communities within the Study Area during field surveys in 2017. As American Toad is not a listed species under amphibian breeding woodland habitat within the Ecoregion 6E Criterion Schedule (MNRF, 2015). Therefore, no significant amphibian breeding habitat is present within the Study Area.

5.2.6 Species at Risk

As mentioned, during vegetation and ELC surveys, one Butternut tree was identified within the Study Area (Figure 3). The tree is located within the southeastern portion of the Study Area in the Lover's Creek ravine (see Photo 4 in Appendix D).

Trees within the residential portion of the Study Area were also assessed for potential bat maternity roosts for SAR bats during ELC and vegetation surveys in 2017. In accordance with the MNRF Midhurst District Maternity Roost Surveys Treed Habitats (April 2017) protocol, ELC forest communities (including Deciduous Forests (FOD) and Coniferous Forests (FOC)) with snags/ cavity trees over 25 cm diameter-at-breast-height (DBH) may provide suitable maternity roosting habitat for SAR bats. The Dry-Fresh Sugar Maple Deciduous Forest (FODM5-1) and Dry-Fresh Scots Pine Naturalized Coniferous Plantation (FOCM6-3) communities within the Study Area are therefore considered potential SAR bats due to the presence of trees with a DBH greater than 25 cm; although Significant Woodland B largely consists of early successional trees (young growth) (Figure 3). Further consultation with the MNRF Midhurst District may be required with respect to the potential for SAR bats within the Study Area.

No other SAR or SAR habitat was identified within the Study Area during 2017 field surveys.

Potential impacts related to SAR are addressed further in Section 8.1.4.

5.2.7 Incidental Wildlife

Incidental wildlife species observed within the Study Area are listed in Table 8. All of the species listed below are considered common and secure in Ontario (S5).

Table 8: Incidental Wildlife Observations

SCIENTIFIC NAME	COMMON NAME	SRANK[2]	SARA[3]	ESA[4]	EVIDENCE
BIRDS					
Passerina cyanea	Indigo Bunting	S4B	---	---	Heard
Bombycilla cedrorum	Cedar Waxwing	S5B	---	---	Heard, Visual observation
Turdus migratorius	American Robin	S5B	---	---	Heard, Visual observation

1. Subnational (Provincial) Rank (Source: MNRF National Heritage Information Centre website, 2007)
2. Federal Species at Risk Act (Source: SARA Public Registry, 2007)
3. Provincial Endangered Species Act (Source: MNRF website, 2007

Potential impacts related to wildlife within the Study Area are included in Section 8.1.4.

6.0 Ecological Function

Natural features within and adjacent to the Study Area were analyzed to determine their ecological function. At the larger landscape scale, the Study Area exists adjacent to the Lover's Creek Swamp (IN4) PSW situated to the east of the Study Area. As stated in Section 3.3.1, the Lover's Creek Swamp (IN4) PSW consists of a complex of wetlands that include swamp wetland types (MNRF, 2017). The wetland is located within the west central portion of the Lake Simcoe watershed and is 5,990 ha in size (LSRCA, 2016). The wetland covers a mix of agriculture, urban, and natural heritage features in the City of Barrie (LSRCA, 2016).

The Lover's Creek Swamp (IN4) PSW is not located within the Study Area. General ecological functions of natural features within the Study Area include prevention of erosion and runoff, facilitating hydrological and nutrient cycling, and improving localized soil, water, and air quality; as well as providing a linkage corridor (Lover's Creek ravine). Within the proposed development area, treed areas provide limited cover, foraging, refuge, and nesting habitat for urban terrestrial wildlife.

6.1 Aquatic and Terrestrial Habitat Function

The Lover's Creek Swamp (IN4) PSW as a whole, provides important habitat for wildlife. Aquatic and terrestrial habitat functions within the Study Area, however, are limited due to current adjacent land uses and anthropogenic disturbances. During field surveys completed in 2017 it was determined that no specific SWH was present within the Study Area; however, there is potential for the Significant Woodland to provide SWH for Bat Maternity Colonies and treed areas throughout the Study Area to provide habitat to SAR bats.

A total of three amphibian breeding surveys were conducted throughout the breeding season in 2017, during which time only American Toads were heard calling. As amphibians are indicators of habitat health, the absence of amphibians within suitable potential habitats is indicative of poor water quality likely due to the disturbed nature of the Study Area and anthropogenic disturbances associated with the residential developments. The remaining areas of the Study Area, and the majority of the proposed development area provide minimal ecological function for plant and wildlife species as a result of the existing residence and mowed lawn.

6.2 Connectivity and Linkage Function

The Lover's Creek Swamp (IN4) PSW is situated in the midst of a major north-south creek and wetland system originating in Kempenfelt Bay of Lake Simcoe. As a result, there are wildlife connections beyond the Lover's Creek Swamp (IN4) PSW to wetlands and forests upstream to Innisfil, and downstream to Lake Simcoe.

The natural deciduous woodlands within the Study Area are connected to the Lover's Creek Swamp (IN4) PSW via surface water flow. As described in Section 2.4, lands within and adjacent to the Study Area (associated with the deciduous woodlands and adjacent PSW) are designated as an EPA under the City of Barrie OP (Schedule H). The City of Barrie OP goals for EPAs include the identification of natural connections between significant natural features which shall be maintained and improved as environmental corridors and ecological linkages where possible (2017).

Although, the potential for important connectivity and linkage functions of the deciduous woodlands and PSW within the larger landscape are limited due to interruption by roadways (e.g., Big Bay Point Road, Yonge Street, Mapleview Drive East) and abutting existing neighbourhoods and urban and agricultural land use; the connectivity and linkage and dispersal functions of the core woodland corridor will be preserved and enhanced as part of the proposed development, with establishment of vegetated buffers along the core woodland (Woodland A) edge.

7.0 Description of Proposed Development

The proposed 435 Big Bay Point Road project is approximately 0.45 ha and consists of 22 residential properties, a new road, and playground (Figure 4).

Access to the residential development is proposed via a road off of Big Bay Point Road.

Construction of the proposed development would include the removal of trees and vegetation from the development area, construction of dwellings, placement of hardscape (driveways, sidewalks) and underground servicing for stormwater and sanitary water. Landscaping may include, but is not limited to, the installation of patios, fencing, sod, and tree plantings. The potential impacts of the development and the recommended mitigation measures will be discussed in Sections 8and 9.

435 BIG BAY POINT ROAD

ENVIRONMENTAL IMPACT STUDY

PROPOSED DEVELOPMENT PLAN

FIGURE 4

- Study Area
- Road
- Watercourse
- Drip Line
- Drip Line/ Top of Bank Buffer (approx. 6m)
- Proposed Development Plan
- Top of Bank
- Wetland Boundary Delineation (Dillon 2017)
- Wetland Buffer (30 m)
- Playground
- Residential
- Road
- Pathway / Drive / Parking

0 5 10 20 m

SCALE 1:750

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, LSRCA

MAP CREATED BY: LK
MAP CHECKED BY: WM
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5599

STATUS: DRAFT

DATE: 2018-10-29

FILE LOCATION: \\dillon.ca\DILLON_DFS\Ottawa\Ottawa CAD\CAD\2017\175599 - 435 Big Bay Point\F4_ProposedDevelopment_October2018.mxd

8.0 Impact Assessment

8.1 Direct Impacts

Direct impacts are those that are immediately evident as a result of a development. Typically, the adverse effects of direct impacts are most evident during the site preparation and construction phase of a development. Potential direct impacts of the proposed residential development include the following:

- Diversion of surface water flows;
- Erosion and sedimentation into adjacent natural features (Significant Woodland A and PSW);
- Tree and vegetation removal (Significant Woodland B); and,
- Loss of/ disturbance to wildlife and wildlife habitat.

The proposed site plan and potential environmental impacts of development are shown in Figure 5.

8.1.1 Diversion of Surface Water Flows

The potential impacts of changes to land use and land cover can include changes to groundwater infiltration, run off, stream flow regime, water quality, stream channel erosion, and wildlife habitat. More specifically, changes may include:

- Direct "footprint" effects such as the loss of natural land cover or destruction of built heritage features; and,
- Indirect "flow related" effects such as increased frequency of high stream flows, accelerated stream channel erosion and deterioration of water quality.

In addition, alteration to changes in flow and/or water quality regimes within the Study Area as a result of development activities have potential to impact the PSW and downstream reaches of Lover's Creek if left unmitigated. To ensure that wetland functions are maintained, it is, therefore, important to maintain water quality, quantity and seasonal duration to the wetlands (MNRF, 2015).

Refer to Section 9.1 and Section 9.2 for mitigation measures related to surface flows.

8.1.2 Erosion and Sedimentation of Natural Features

Construction activity, especially operations involving the handling of earthen material, dramatically increases the availability of sediment for erosion and transport by surface drainage. In order to mitigate the adverse environmental impacts caused by the release of sediment-laden runoff into receiving watercourses, measures for erosion and sediment control are required for construction sites. This is an extremely important component of land development that plays a large role in the protection of downstream watercourses and aquatic habitat.

435 BIG BAY POINT ROAD

ENVIRONMENTAL IMPACT STUDY

POTENTIAL IMPACTS

FIGURE 5

- Study Area
- Butternut
- Watercourse
- Road
- Consolidated Dripline / Top of Bank
- Drip Line
- Drip Line / Top of Bank Buffer (approx. 6m)
- Top of Bank
- Proposed Development Plan
- Playground
- Residential
- Road
- Pathway / Drive / Parking
- Provincially Significant Wetland
- Significant Woodlands
- Vegetation Removal (approx. 0.22 ha)

0 5 10 20 m

SCALE 1:750

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, LSRCA

MAP CREATED BY: LK
MAP CHECKED BY: WM
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 17-5599

STATUS: DRAFT

DATE: 2018-10-29

FILE LOCATION: \\dillon.ca\DILLON_DFS\Ottawa\Ottawa CAD\CAD\2017\175599 - 435 Big Bay Point\F5_Impacts.mxd

As a result, control measures must be selected that are appropriate for the erosion potential of the site, and it is important that they be implemented and modified on a staged basis to reflect the site activities. Furthermore, their effectiveness decreases with sediment loading and therefore, inspection and maintenance is required.

The Study Area currently slopes gently from west to the east towards Lover's Creek ravine, with elevations across the Study Area ranging from between 250.80 m ASL at the northwest corner of the Study Area to 239.41 m ASL at the southeast corner within the ravine (PEL, 2018). The Functional Servicing Report (FSR) and Storm Water Management Report (SWM) Report prepared by Pinestone Engineering Ltd. (PEL) in 2018 for the proposed development includes a Conceptual Grading Plan. Potential impacts to natural features may include, but are not limited to:

- Reduced water quality and degradation of downstream wetland and aquatic habitat (e.g., surface water flow into the Lover's Creek Swamp PSW Complex adjacent to the Study Area); and,
- Disturbance to or loss of additional vegetation due to the deposition of dust and/or overland mobilization of soil.

Refer to Section 9.2 for mitigation measures related to erosion and sedimentation within the Study Area.

8.1.3 Tree and Vegetation Removal

The proposed development plan indicates tree and ground vegetation removal limited to the development area as shown on Figure 5 to facilitate grading and construction of the development.

Based on the TIPP prepared by Kuntz (2017), the removal of 82 trees will be required to accommodate the proposed development. In addition, the removal of one tree is recommended due to their condition. It is anticipated the remaining 37 trees can be saved provided appropriate tree protection measures are followed throughout construction (Kuntz, 2017). The TIPP provides additional detail on individual trees to be removed and recommendations for tree protection.

Compensation plantings for tree removals will be established in consultation with the City and LSRCA.

Tree removal will result in a reduction of tree cover, marginal wildlife habitat loss, and alteration of soil conditions. On a site level, the impacts of tree and vegetation removal may include:

- Direct loss of trees (Significant Woodland B);
- Negative edge effects include altered soil conditions and water availability;
- Alteration of microclimate;
- Loss of native seed banks; and,

- Physical injury, root damage, and compaction of trees not intended for removal that may result from construction operations.

Within the larger landscape, given that the Significant Woodland B is comprised of a naturalized coniferous plantation dominated by invasive Scotch Pine (*Pinus sylvestris*), removal of this woodland is not anticipated to have a negative impact on the natural features and ecological functions of the adjacent EPA, which spans from Kempenfelt Bay to Lockhart Road. Furthermore, the core natural woodland (Significant Woodland A) as well as its connectivity, linkage and dispersal functions will be preserved and enhanced as part of the proposed development, with establishment of vegetated buffers along the core woodland edge.

One Butternut tree was identified within the development area during Dillon field surveys and the Kuntz tree inventory (identified as Tree BN480). As the tree is located within the Lover's Creek ravine, below the top of bank, impacts of development are not anticipated with the implementation of standard best management practices and mitigation measures (erosion and sediment control, etc.).

Refer to Section 9.4 and 9.5 for mitigation and enhancement opportunities.

8.1.4 Loss of and/or Disturbance to Wildlife

Habitat for flora and fauna may be impacted due to vegetation clearing within the proposed development area. However, the Significant Woodland A, identified as Candidate Significant Wildlife Habitat for Bat Maternity Colonies, will not be disturbed and a buffer will be put in place to protect this feature. Further consultation with the MNRF Midhurst District may be required to address potential impacts to SAR bats within the Significant Woodland B development area; however, limited impacts to potential bat species within the development area are anticipated, given the anthropogenic disturbance within the Study Area and the presence of more suitable bat habitat within the adjacent Significant Woodland A and PSW.

Habitat for flora and fauna may be impacted by construction in the following ways:

- Displacement, injury, or death resulting from contact with heavy equipment during clearing and grading activities;
- Disturbance to wildlife as a result of noise associated with construction activities, particularly during breeding periods; and,
- Loss of general wildlife habitat.

Accordingly, wildlife impact mitigation measures have been recommended for the development area and are included in Section 9.6.

8.2 Indirect Impacts

Indirect impacts are those that do not always manifest in the core development area but in the lands adjacent to the development. Indirect impacts can begin in the construction phase; however, they can continue post-construction. Potential indirect impacts of the proposed development include anthropogenic disturbance and colonization of non-native and/or invasive species.

8.2.1 Anthropogenic disturbance

Disturbance to local wildlife communities due to indirect impacts on the lands adjacent to the proposed development could result if left unmitigated. Noise, light, vibration and human presence are indirect impacts that can adversely influence the population size and breeding success of local wildlife. These effects are more pronounced when new development is introduced in non-urban areas. Lands within the development area are already disturbed with adjacent residential areas. Therefore, development of this small area is not anticipated to cause a negative impact to surrounding natural areas.

8.2.2 Colonization of Non-native and/or Invasive Species

Physical site disturbance may increase the likelihood that non-native and/or invasive flora species will be introduced to the surrounding vegetation communities. Invasive flora can establish in disturbed sites more efficiently than native flora and can then encroach into adjacent undisturbed areas. This type of colonization is currently occurring within the buffer area. Site visits determined that vegetation present within the buffer area and within the plantation development area consists of invasive species including Garlic Mustard (*Alliaria petiolata*), Tartarian Honeysuckle (*Lonicera tatarica*), and Common Buckthorn (*Rhamnus cathartica*).

Mitigation measures related to control of invasive species are addressed in Section 9.3 and 9.5.

9.0 Mitigation and Opportunities for Enhancement

Mitigation involves the avoidance or minimization of developmental impacts through good design, construction practices and/or restoration and enhancement activities. The feasibility of mitigation options has been evaluated based on the natural features within and adjacent to the Study Area. The impact assessment highlighted four potential direct impacts, which include diversion of surface water flows, erosion and sedimentation of natural features, tree and vegetation removal, and potential loss of wildlife and wildlife habitat.

A variety of mitigation techniques can be used to minimize or eliminate the above-mentioned impacts. These measures include enhancement of the buffer area through a Landscaping and Planting Plan, a Stormwater Management Plan, Erosion and Sediment Control Plan and an Environmental Monitoring Plan. Each mitigation measure is introduced below. Detailed mitigation measures will be finalized in consultation with the LSRCA and City of Barrie as part of the preliminary and Detailed Design of the development.

9.1 Integrated Stormwater Management Plan and Low Impact Design

An FSR and SWM Report has been prepared by PEL that includes information on the Study Area's existing drainage and a SWM plan for the proposed development. Based on the SWM Report, a 525 mm diameter storm sewer exists along the frontage of the Study Area on Big Bay Point Road and conveys drainage easterly towards Lover's Creek. Drainage from the storm sewer system then flows north and outlets to the Lover's Creek storm water management facility.

As described in the SWM Report, post-development flow quantity control will be provided by utilizing inground chambers located in the north east corner of the Study Area. The majority of the site impervious areas, including driveways and rooftops, and will be controlled with an orifice restriction installed downstream of the underground chambers at a proposed storm manhole, which will outlet to the existing 525 mm diameter storm sewer located on Big Bay Point Road and ultimately discharge to Lover's Creek. The western portion of the Study Area will be directed to a proposed catchbasin located west of the proposed entrance.

In addition, an enhanced swale complete with a perforated underdrain will be used to collect and convey runoff to the proposed storm sewer system. Grassed swales will be used to collect and convey runoff to proposed sand filters to be construted along the western development limit. Due to the condition of the underlying soils, both sand filters will require underdrains. The underdrain servicing the filter located in the southeast corner of the property will discharge directly to Lover's Creek ravine. The underdrain for the filter located in the northeast corner of the Study Area will discharge into a proposed

storm manhole. As a result of the measures described above, post development drainage patterns will generally match pre-development conditions (PEL, 2018).

As described in the SWM Report, the Lake Simcoe Phospohorus Off-Setting policy requires that all new development control 100% of the phosphorus (P) from leaving a property. The proposed approach to mitigate P within the Study Area includes: installation of a JellyFish treatment unit capable of removing 59% P; construction of various LID practices, as mentioned above, including enhanced swales and sand filters capable of removing 45% P; and construction of an inground storage system capable of removing 25% P. Through the implementation of LIDs and best efforts, it is anticipated that 80% removal can be achieved onsite (PEL, 2018).

Refer to the Functional Servicing and Stormwater Management Report (PEL, 2018) for further details.

9.2 Erosion and Sediment Control Plan

As outlined in the FSR prepared by PEL, 2018, sedimentation and erosion control (ESC) measures are required during construction and until such a time that site development has been completed, and the driveway and parking area has been resurfaced. The use of various siltation control measures will be implemented to protect the adjacent properties and receiving waterbodies from migrating sediments. These works include but may not be limited to:

- Installation of siltation fencing along the permiter of the development area;
- Filter cloth/silt sack placement over drains; and,
- Installation of vehicle tracking mud mats at the entrance to the site.

Prior to carrying out site grading the siltation barriers and mud mats shall be in place. Any onsite storm sewer works will not be permitted to outlet to the municipal sewers until the site has been stabilized. Other ESC measures may be required during grading to minimize silt migration from the site. The measures will need to be removed, replaced and relocated as required during the construction period until the site works have been completed and vegetation established. During construction, all stockpiled material will be placed up-gradient of the siltation controls. Sediment and erosion controls devices will be detailed at the site plan stage once the site plan has been finalized (PEL, 2018).

9.3 Natural Heritage Feature Buffers

The development area will be limited to the boundaries shown in Figure 5, with a buffer generally greater than 30 m from the Lover's Creek Swamp (IN4) PSW. In addition, a buffer of 6 m from the Significant Woodland A was established by the City and the proponent (Figure 5).

9.4 Tree Protection Measures

The proposed development will require the removal of trees and other vegetation and may impact trees recommended for preservation. As a result, the following measures as outlined in the TIPP (Kuntz, 2017) pre-construction, during and post-construction are recommended:

- Tree protection barriers and fencing should be erected. All tree protection measures should follow the guidelines as set out in the tree preservation plan notes and the tree preservation fencing detail.
- No construction activity including surface treatments, excavations of any kind, storage of materials or vehicles are permitted within the tree protection zone (TPZ) at any time during or after construction.
- Branches and roots that extend beyond prescribed tree protection zones that require pruning must be pruned by a qualified Arborist or another tree professional. All pruning of tree roots and branches must be in accordance with Good Arboricultural Standards.
- Site visits, pre, during and post construction is recommended by either a certified consulting arborist (I.S.A.) or registered professional forester (R.P.F.) to ensure proper utilization of tree protection barriers. Trees should also be inspected for damage incurred during construction to ensure appropriate pruning or other measures are implemented.

Refer to Figure 1 of the TIPP for general Tree Protection Plan Notes and the tree preservation fence detail.

9.5 Landscaping and Planting Plan

The proposed development plan will require the removal of select trees within the residential portion of the Study Area. Compensation plantings of trees are generally based on the number of removals required to facilitate construction of the development. The exact number of compensation plantings and locations is to be determined through detailed design and in consultation with the City and LSRCA. The preliminary proposed plantings include:

- A mix of native deciduous and coniferous trees and shrubs throughout the development and buffer area;
- Sodding within the residential portions of the development; and,
- A native seed mix recommended by suppliers for enhancement within buffer area.

9.6 Wildlife Impact Mitigation Plan

Strategies to mitigate impacts for general wildlife prior to and during construction are proposed. These may include (but are not limited to):

- Clearing trees and vegetation outside the breeding bird season (April 1st to August 31st). Should any clearing be required during the breeding bird season, nest searches conducted by a qualified

person must be completed 48 hours prior to clearing activities. If nests are found, work within 10 m of the tree should cease until the nest has fledged. If no nests are present, clearing may occur. This is in accordance with the federal *Migratory Birds Convention Act*;

- Tree clearing should occur outside of the bat active window (May through October) to avoid potential impacts to SAR bats;
- Schedule vegetation clearing and grading activities to avoid disturbance to breeding amphibians and other sensitive wildlife species where possible;
- Where possible, maximize the distance of construction equipment used from the woodland edge to avoid disturbing wildlife;
- Limit the use of lighting where possible. Avoid light effects entering the woodland (eliminate light trespass) where possible;
- Installation of wildlife exclusion fencing and escape routes, which direct wildlife away from the construction area and to more suitable habitat (e.g., woodland/PSW corridor);
- Visual monitoring for wildlife species and avoidance where encountered if possible;
- If necessary, have a qualified biologist monitor construction in the areas of potential wildlife habitat. If wildlife are found within the construction area they will be relocated to an area outside of the development into an area of appropriate habitat, as necessary;
- Construction crews working on site should be educated on local wildlife and take appropriate measures for avoiding wildlife; and,
- Should an animal be injured or found injured during construction, they should be transported to an appropriate wildlife rehabilitation center.

9.7 Environmental Monitoring Plan

The Environmental Monitoring Plan (EMP) will be carried out through the duration of construction activities on-site to ensure that the erosion and sediment control measures operate effectively and to monitor the potential impact, if any, upon the natural environment. The duration of construction is defined as the period of time from the beginning of earthworks until the site is stabilized. Site stabilization is defined as the point in time when the roads have been paved, buildings have been built, lawns have been sodded, and restoration plantings have been completed.

The EMP would consist of monitoring the erosion and sediment measures and the restoration/compensation plantings. Erosion and sediment control measures would be regularly monitored, and they will require periodic cleaning (e.g., removal of accumulated silt), maintenance and/or re-construction. Inspections of all of the erosion and sediment controls on the construction site should be undertaken by a certified sediment and erosion control monitor. If damaged control measures are found, they should be repaired and/or replaced promptly. Site inspection staff and construction managers should refer to the *Erosion and Sediment Control Inspection Guide* (2008) prepared by the Greater Golden Horseshoe Area Conservation Authorities. This guide provides information related to the inspection reporting, problem response and proper installation techniques.

The EMP will be implemented during active construction periods in the development area with the following frequency:

- On a bi-weekly basis; and/or,
- After every 10 mm or greater rainfall event.

Restoration planting and protected vegetation areas will require periodic monitoring to ensure that they are not impacted by adjacent development. Should any impacts be observed, necessary steps will be taken to ensure that the impacted vegetation is either restored or replaced.

10.0 Summary

This EIS was prepared for the proposed development located at 435 Big Bay Point Road in the City of Barrie. The findings of the biophysical inventory, which consisted of secondary source reviews and comprehensive field studies, are presented in this EIS. The EIS has been prepared in general accordance with the policies of the LSCRA, following the TOR established in consultation with the LSRCA and agreed to through correspondence between Dillon and LSRCA on June 8, 2017.

A large portion of the Study Area consists of mowed grass connected to existing residences, with an area of deciduous forest to the east and a coniferous plantation to the south. The deciduous forest is within the buffer area of the Lover's Creek Swamp (IN4) PSW that is located outside of the Study Area to the east. A total of 14 common bird species were observed during field studies, none of which are considered SAR of Species of Conservation Concern. In addition, two American Toads where the only amphibians observed during amphibian surveys. Therefore, no SWH for birds, amphibians, or other species was confirmed within the Study Area. However, due to the presence of mature trees, there is potential for SWH for Bat Maternity colonies to be present within the Significant Woodland, and potential for SAR bats to be utilizing other treed areas within the the Study Area. A total of 48 plant species were observed, including Butternut, a SAR protected under the ESA (2007); however, due to the location of the tree within the Lover's Creek ravine, no impact to the individual are anticipated. At the landscape scale, natural features within the Study Area connect to features on adjacent properties (e.g., Lover's Creek Swamp (IN4) PSW).

The proposed development will require the removal of trees. Potential impacts of development may include diversion of surface water flows, sedimentation of adjacent significant natural features, tree and vegetation removal, and loss of and/or disturbance to wildlife habitat. These impacts will be avoided or minimized by implementing the mitigation, restoration, and management measures described in this report. To ensure maintenance of existing surface water run-off patterns, a SWM plan has been developed as part of the Functional and Servicing Report to maintain existing surface water run-off patterns. In addition, an Erosion and Sediment Control Plan and Landscaping and Planting Plan will be developed at Detailed Design to address potential impacts to the natural features located in proximity to the proposed development. Lastly, an Environmental Monitoring Plan is recommended during construction to monitor impacts on the natural environment and ensure mitigation measures are implemented.

Appendix A

Terms of Reference

MEMO

TO: Kate Lillie, Lake Simcoe and Region Conservation Authority

FROM: Allen Benson, Dillon Consulting Limited

cc: Andrew Adamek, ADA Homes
Darren Vella, Innovative Planning Solutions

DATE: May 11, 2017

SUBJECT: Environmental Impact Study Terms of Reference for the ADA Homes property located at 435 Big Bay Point Road in the City of Barrie.

OUR FILE: 15-5599

Introduction

Dillon Consulting Limited (Dillon) has been retained by ADA Homes to undertake environmental studies for a proposed residential development at 435 Big Bay Point Road in the City of Barrie (referred to herein as the Study Area), depicted in **Figure 1** (attached). As such, ADA Homes and Dillon are taking a pro-active approach to environmental-first planning and undertaking the appropriate environmental studies that are required to complete an Environmental Impact Study (EIS) and utilizing the results in the planning of this property.

In keeping with the general policies of the Lake Simcoe Conservation Authority (LSRCA), we have prepared the following Terms of Reference (TOR). Below, we present the TOR in a check-list format to ensure that the required work and/or studies are known and agreed to prior to the commencement of work, to facilitate a stream-lined and timely review process.

Terms of Reference

General Policies

☒ The EIS must be undertaken by a qualified professional in environmental or related sciences to the satisfaction of the LSRCA.

☒ A visit to the site may be required by the LSRCA prior to, during, or upon receipt of the EIS.

☒ The staking of significant natural features (i.e., woodlands, etc.) by the LSRCA may be required. Staking will generally occur between the end of May and the end of October. Any staking that occurs outside of this time may require a confirmatory visit between May and October.

Existing Conditions

☒ The existing conditions of the Study Area must be clearly described and clearly mapped on aerial photographs.

☒ The description must include the zoning and all designations of all Official Plan(s) (OP) on the Study Area. This includes any land use designations from other municipal planning documents, such as Secondary Plans.

☒ Land use designations from any other applicable planning documents (i.e., Lake Simcoe Protection Plan, Greenbelt Plan) must be clearly described and the limits identified in the mapping.

☒ The EIS shall identify the components of the Natural Heritage System (NHS) (should it be located within the Study Area). The boundaries of the NHS shall be confirmed in the field by the proponent, mapped on a figure in the report and approved by the LSRCA and the planning authority.

☒ All designated environmental features (i.e., NHS or natural features identified in the OPs) must be identified in the mapping and described in the report. These features include provincial or regional Areas of Natural and Scientific Interest (ANSIs), Provincially and Locally Significant Wetlands (PSWs and LSWs), Environmentally Significant Areas (ESAs), Significant Wildlife Habitat, Significant Valleylands, unevaluated wetlands, etc.

☒ The vegetation communities must be identified using the Ecological Land Classification (ELC) system to vegetation type, where possible. The communities must be identified in the mapping, using the appropriate ELC codes, as well as described in the text. As a component of the ELC, a plant list must be included in the report. The list must include an analysis for the presence of federal, provincial, regional and/or watershed rare, threatened or endangered species. This should include information from the MNRF district office and NHIC.

☒ A single-season (summer) plant survey is required and must be included in the report. The list must include an analysis for the presence of federal, provincial, regional and/or watershed rare, threatened or endangered species. This should include information from the MNRF district office and NHIC.

☒ The EIS requires breeding bird surveys. The surveys must be conducted during the breeding bird season at an appropriate time of day in appropriate weather conditions and by a qualified professional. A minimum of two surveys are required and they must follow generally accepted scientific protocols, not necessarily atlasing methods. A list of the breeding birds must be included in the report. The list must include an analysis for the presence of federal or provincial rare, threatened or endangered species. Watershed rarity status shall be determined in conjunction with the LSRCA.

☒ The EIS requires amphibian breeding surveys. The surveys must be conducted during the breeding amphibian season and by a qualified professional. For calling amphibians a minimum of three surveys are required. These surveys must span the full amphibian breeding season to ensure that the peak periods of activity for early and late breeding species are accounted for. For non-calling amphibians, appropriate methodology must be used. A list of the breeding amphibians must be included in the report. The list must include an analysis for the presence of federal, provincial, threatened or endangered species. Watershed rarity status shall be determined in conjunction with the LSCRA.

☒ A fisheries habitat assessment shall be provided due to the presence of suitable fish habitat. Existing data regarding fish species shall be obtained from LSCRA and/or the MNRF and used for the fisheries assessment. The assessment shall include a description of watercourses or other fish habitat on and/or adjacent to the Study Area.

☐ The fisheries assessment will include community sampling through electrofishing and/or netting during the appropriate season, under a collection permit issued by the MNRF.

Note: Fish community sampling is not proposed. An information request was submitted to MNRF on May 3, 2017 requesting fisheries sampling information; and, at this time we kindly request any fisheries data relevant to the Study Area from LSRCA be provided.

☒ All incidental wildlife observed shall be reported on and listed in the report. The list must include an analysis for the presence of federal or provincial rare, threatened or endangered species. Watershed rarity status shall be determined in conjunction with the LSRCA.

☒ A functional assessment of the Study Area describing the ecology of the natural heritage features and functions (including components of the NHS) within and adjacent to the Study Area should be provided. The functional assessment may include ecological function, wetland functions, natural heritage features and landscapes, benefits of importance to humans, and corridors and linkages, as required.

☐ Where the NHS has identified a stream linkage or potential proximity linkage on or adjacent to the property, the EIS must identify the location, width and proposed vegetation composition of the linkage.

☒ Mapping (at a minimum) shall consist of the following:

a) All mapping must have a title, figure number, north arrow, legend and scale or scale bar.
b) A site location map that provides the regional or watershed context of the Study Area.
c) The extent of the NHS and its components must be clearly demarcated on an air photo base, if applicable.
d) The locations of all watercourses and waterbodies and an indication of their flow.
e) Vegetation communities must be delineated and identified using ELC.
f) The location of any rare, threatened or endangered species and/or populations shall be identified, if appropriate.

g) The location of any important wildlife features (i.e., hibernacula, den, stick nest, etc.) shall be identified.

Evaluation of the Ecological Impacts

☒ An assessment of the potential impacts to the features and functions of natural areas and natural heritage features (including the NHS and Linkages areas etc.) shall be identified and discussed.

☒ An assessment of the potential impact on wildlife at a local, watershed and provincial (if applicable) level shall be provided using the Ecoregion 6E criterion schedules (MNRF, 2015).

☒ In the case of significant natural features (as confirmed through field studies), the EIS must demonstrate that there is no development or site alteration within the feature with the exception of uses as specified in the OP and/or prior approvals. The EIS must determine appropriate buffers from significant natural features.

☒ If applicable, where natural features or natural vegetation communities are proposed for removal, the quantity of removal shall also be included.

Recommendations and Mitigation Measures

☒ Avoidance of any NHS feature is the preferred approach to mitigation unless otherwise specified in the OP and/or prior approvals.

☒ Determine adequate buffers through the identification of the critical function and protection zones of any identified natural areas or natural heritage features.

☒ Where avoidance of a feature is not feasible or possible, mitigation approaches/techniques must be provided. These may include edge management plans, buffer plantings, fencing, low impact designs (LID), etc.

☒ In cases where a Linkage area has been identified on a property, the EIS must demonstrate how it will be integrated into the proposed development plan.

☒ Recommendations for Best Management Practices during construction should be provided. This may include silt fencing, tree protection, fencing, identification of timing or seasonal constraints to construction or restoration, etc.

☒ Mitigation for negative impacts on the natural features or their ecological functions (or to achieve no net negative impact) may include, at the discretion of the planning authority in conjunction with the Conservation Authority, approaches to replace lost areas or functions. If acceptable, replacement shall, to the extent possible, occur within the same subwatershed as

the proposed development or site alteration. The appropriate amount of replacement will be determined through discussions with the Conservation Authority and the planning authority and will be agreed to by all parties in writing.

☒ If monitoring is required, the details of a monitoring program must be agreed to in writing by the Authority, planning authority and other parties.

Conclusions

The EIS must demonstrate the following:

☒ Conformity with the policies and requirements of the City of Pickering and the Region of Durham Official Plans.

☒ Conformity with the policies and requirements of other applicable planning documents (i.e., Lake Simcoe Protection Plan, Greenbelt Plan, etc.).

☒ Conformity with the requirements of the LSRCA.

Species at Risk

Should any Species at Risk or their habitat be identified during the EIS process and confirmed in the field, the MNRF will be notified and we will address any Species at Risk requirements as outlined in the *Endangered Species Act, 2007* under separate cover with MNRF. The LSRCA will be informed of MNRF approvals that are required.

Information Request

At this time we are requesting any of the following background information, if available:

- Watercourse/drain classifications and thermal stream classifications;
- Fish community information;
- Natural environment studies in and/or adjacent to the subject property;
- Regionally or locally significant/rare flora, fauna, vegetation communities;
- Any additional natural environment data you may have for the indicated area; and,
- GIS Mapping
    - Regulation limits,
    - Floodplain mapping.

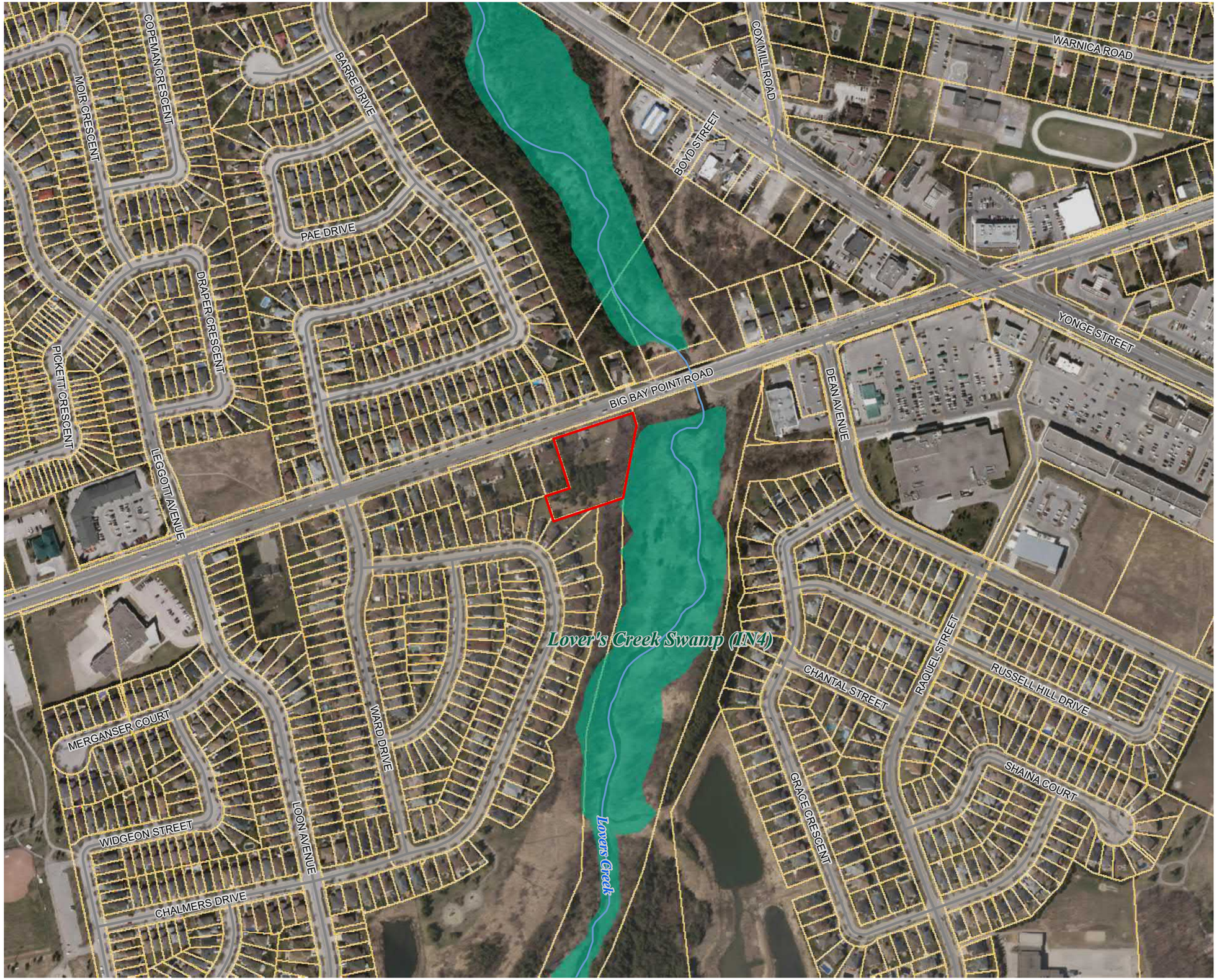
We would to thank you for your time in establishing these Terms of Reference with us and look forward to working together with you on this and other projects as we move forward.

Please let me know if you have any questions.

Yours sincerely,

DILLON CONSULTING LIMITED

Allen Benson, B.Sc. (Hons), LEED AP
Associate
Project Manager



435 BIG BAY POINT ROAD

PROJECT LOCATION

FIGURE 1

- Project Location
- Roads
- Watercourse
- Provincially Significant Wetland
- Ownership Parcel Fabric

0 25 50 100 Metres

SCALE 1:4,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, County of Simcoe

MAP CREATED BY: LK
MAP CHECKED BY: WM
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

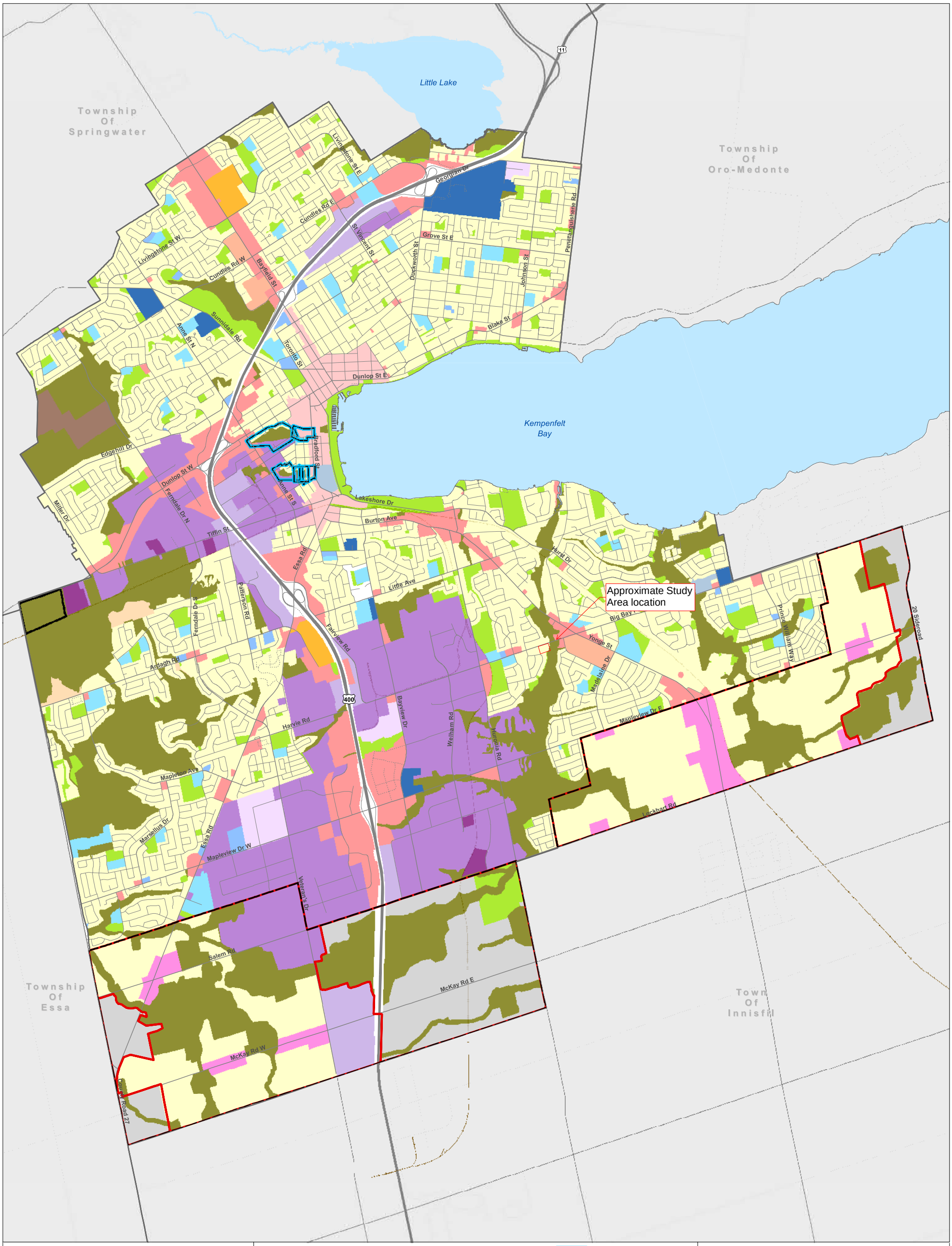
STATUS: DRAFT

DATE: 2017-04-18

FILE LOCATION: \\dillon.ca\DILLON_DFS\Ottawa\Ottawa CAD\CAD\2017\435 Big Bay Point Road\ProjectLocation.mxd

Appendix B

Official Plan Schedules



OFFICIAL PLAN

Schedule A
Land Use

Office Consolidation
January 2018

- Residential
- City Centre
- General Commercial
- Community Centre Commercial
- Regional Centre Commercial
- Mixed Use Nodes and Corridors
- Business Park
- Highway 400 Industrial
- General Industrial
- Restricted Industrial
- Institutional
- Educational Institutional
- Major Institutional
- Open Space
- Environmental Protection Area
- Special Rural Area
- Water Treatment Centre
- Waste Management Facility
- Future Urban
- Waste Disposal Area - Non decision per section 4.7.2.8
- City Boundary
- Application Before the Ontario Municipal Board (OMB)
- SecondaryPlanBoundary
- Settlement Area Boundary

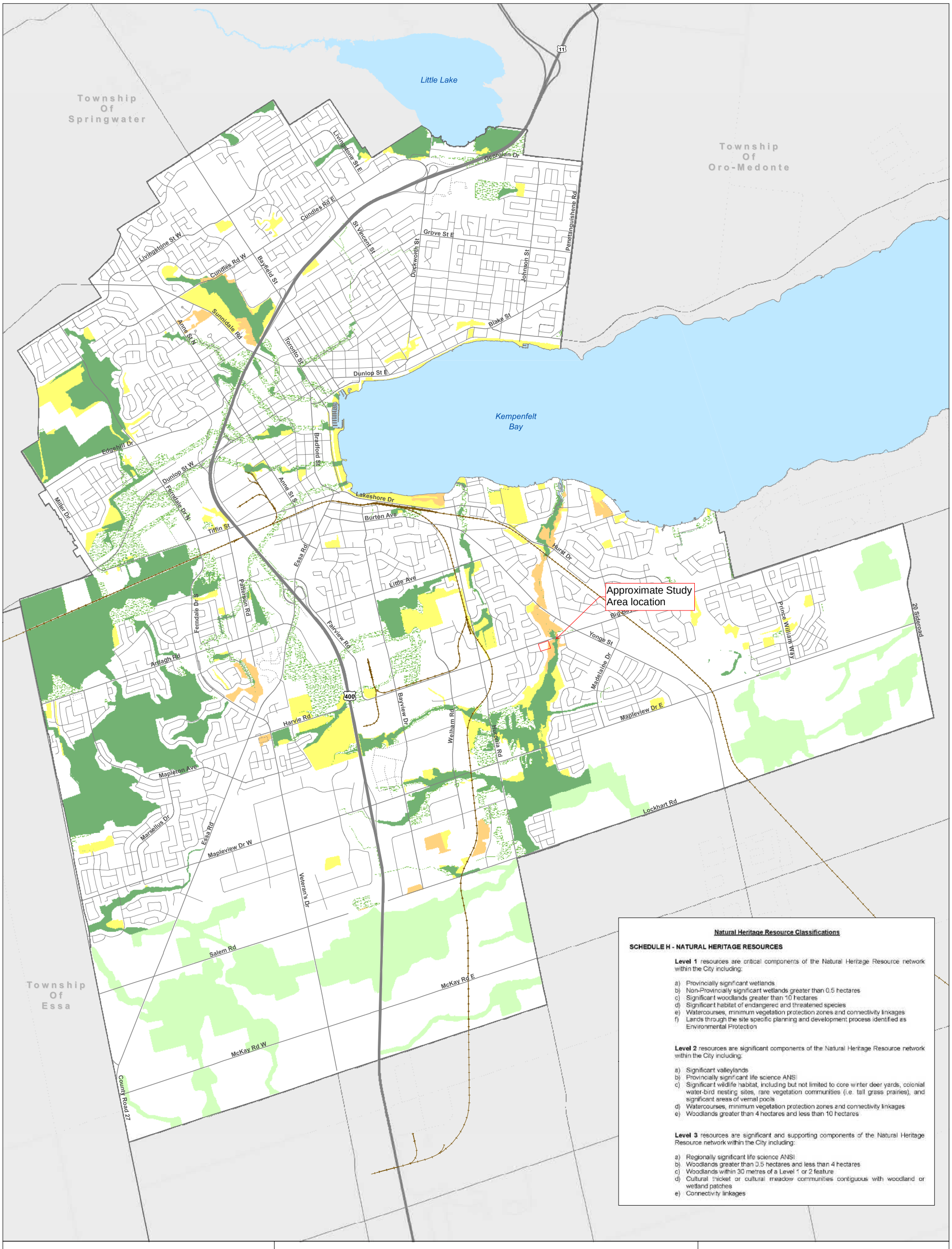
Barrie

1:20,000

0 0.5 1 2 km

N

GIS Branch 4/27/2018



Natural Heritage Resource Classifications

SCHEDULE H - NATURAL HERITAGE RESOURCES

Level 1 resources are critical components of the Natural Heritage Resource network within the City including:

a) Provincially significant wetlands
b) Non-Provincially significant wetlands greater than 0.5 hectares
c) Significant woodlands greater than 10 hectares
d) Significant habitat of endangered and threatened species
e) Watercourses, minimum vegetation protection zones and connectivity linkages
f) Lands through the site specific planning and development process identified as Environmental Protection

Level 2 resources are significant components of the Natural Heritage Resource network within the City including:

a) Significant valleylands
b) Provincially significant life science ANSI
c) Significant wildlife habitat, including but not limited to core winter deer yards, colonial water-bird nesting sites, rare vegetation communities (i.e. tall grass prairies), and significant areas of vernal pools
d) Watercourses, minimum vegetation protection zones and connectivity linkages
e) Woodlands greater than 4 hectares and less than 10 hectares

Level 3 resources are significant and supporting components of the Natural Heritage Resource network within the City including:

a) Regionally significant life science ANSI
b) Woodlands greater than 0.5 hectares and less than 4 hectares
c) Woodlands within 30 metres of a Level 1 or 2 feature
d) Cultural thicket or cultural meadow communities contiguous with woodland or wetland patches
e) Connectivity linkages

OFFICIAL PLAN
Schedule H
Natural Heritage Resources
Office Consolidation
January 2018

Level 1

Level 1 with Existing Development Designation Subject to 3.5.2.4 d

Level 2

Level 3

Natural Heritage System Salem and Hewitt's Secondary Plan Areas

Barrie

1:20,000

0 0.5 1 2 km

N

GIS Branch 4/27/2018

SCHEDULE 5.1

To the County of Simcoe Official Plan

LAND USE DESIGNATIONS

COUNTY OF SIMCOE — For the Greater Good

Designations

- Settlements
- Greenlands
- Agricultural
- Rural
- Strategic Settlement Employment Areas and Economic Employment Districts
- Lands not subject to this plan
- Settlement Area Boundary Under Appeal
- Portion of Settlement Boundary Area Under Appeal
- (1) General Location of Site-Specific Appeals
- Lands Subject to Non-Decision

Reference Data

- Settlement Area Boundary
- Built Boundaries
- Special Development Area: Big Bay Point

Greenbelt Plan - Protected Countryside
(Refer to Schedule 5.3.3 For Details)

Niagara Escarpment Plan Area
(Refer to Schedule 5.3.1 For Details)

Oak Ridges Moraine Conservation Plan Area
(Refer to Schedule 5.3.2 For Details)

- Provincial Highway
- County Road
- Trans Canada Pipeline
- Lake Simcoe Protection Plan - Watershed Boundary

** Greenbelt Plan – Protected Countryside, Oak Ridges Moraine Conservation Plan Area and Niagara Escarpment Plan Area are included within the Greenbelt Plan Area*

This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan. - Revised November 25, 2008

Approved by OMB Order dated December 29, 2016

Printed: 2017/01/03

For land use designations refer to South of Division Road Secondary Plan in the Township of Severn Official Plan and refer to Section 3.7.13 of this Plan

Refer to Schedule 5.1a and Section 3.14 Special Development Area: Big Bay Point

Information outside Simcoe County is shown on this schedule for illustrative purposes to display inter-regional linkages

N W E S

1:250,000

0 5 10 Km

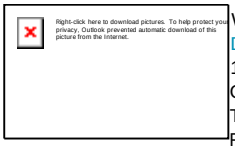
GEOGRAPHICAL INFORMATION SYSTEMS

Georgian Bay
BEAUSOLEIL FIRST NATION
North Bay
South Bay
Gloucester Pool
MUSKOKA DISTRICT
Severn Falls
Port Severn
Little Lake
Sparrow Lake
SEVERN
PENETANGUISHENE
Severn Sound
Penetanguishene
Penetang Harbour
Toanche
Lafontaine
Port McNicoll
Victoria Harbour
Hogg Bay
Midland Bay
Midland
Sturgeon Bay
Waubaushene
Matchedash Bay
Hession Bay
North River
Severn River
Washago
Lake St. George
West Shore
Cooper's Falls
CITY OF KAWARTHA LAKES
RAMARA
Orillia
Lake Couchiching
Lake Simcoe
Coldwater
Perkinsfield
TAY
TINY
Wyebridge
Moonstone
Warminster
Marchmont/ Bass Lake
CHIPPEWAS OF RAMA FIRST NATION
Ardtrea
Longford Mills
Sebright
Dalrymple Lake
Udney
Atherley-Uptergrove
Lagoon City
Brechin
Gamebridge
DURHAM REGION
Wyevale
Waverley
Orr Lake
Nottawasaga Bay
Prices Corners
Bass Lake
Jarratt
Forest Hom
Rigby
Sugarbush
East Oro
Horseshoe Valley
Edgar
Hawkestone
Oro Station
Guthrie
ORO-MEDONTE
Hillsdale
Elmvale
Craighurst
Phelpston
Mart Lake
WASAGA BEACH
SPRINGWATER
COLLINGWOOD
Collingwood
Wasaga Beach
Clarks Lake
Batteaux
Nottawa
Stayner
Sunnidale Corners
Anten Mills
Minesing
Midhurst
Snow Valley
Centre Vespra
Kempenfelt Bay
Shanty Bay
BARRIE
Stroud
Alcona
Lefroy/ Belle Ewart
Churchill
Gilford
INNISFIL
Dunedin
Duntroon
Singhampton
Glen Huron
CLEARVIEW
Old Sunnidale
New Lowell
Brentwood
Creemore
Avening
Glencairn
Mad River
Pine River
Utopia
Angus
Ivy
Thornton
CFB BORDEN
Lisle
Baxter
Colwell
ESSA
Cookstown
Everett
Boyne River
Alliston
Rosemont
Nottawasaga River
ADJALA-TOSORONTIO
NEW TECUMSETH
Newton Robinson
Bradford
Bond Head
BRADFORD WEST GWILLIMBURY
Beeton
Loretto
Hockley
Colgan
Tottenham
DUFFERIN COUNTY
GREY COUNTY
YORK REGION
PEEL REGION

Appendix C

MNRF Correspondence

From: Moore, Whitney
Sent: September 6, 2017 10:33 AM
To: 175599; Christina Carter
Subject: Fwd: Information Request 435 Big Bay Point Road



Whitney Moore B.Sc. (Hons.)
Dillon Consulting Limited
177 Colonnade Rd South, Suite 101
Ottawa, Ontario, K2E 7J4
T - 613.745.2213 ext. 3040
F - 613.745.3491
M - 613.797.1235
WMoore@dillon.ca
www.dillon.ca

Please consider the environment before printing this email

---------- Forwarded message ----------
From: **Findlay, Graham (MNRF)** <graham.findlay@ontario.ca>
Date: Mon, Jul 10, 2017 at 3:30 PM
Subject: RE: Information Request 435 Big Bay Point Road
To: "Moore, Whitney" <wmoore@dillon.ca>

Hi Whitney I apologize for the delayed response to your request, please consider the following …

The province has centralized and made publicly available digital data that lends to inform data needs such as the information requests we receive. Going forward your requirements can largely be met through the use of the following data sources and reference documents.

Digital data for natural heritage features (e.g. wetland and ANSI mapping, fish community data) can be obtained through Land Information Ontario and/or through the Make a Map: Natural Heritage Areas tool through LIO at …

Land Information Ontario: https://www.ontario.ca/page/land-information-ontario

Make a Map: Natural Heritage Areas: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US. NHIC data is also available through this interactive map tool.

Other resources to consider,

"Atlas of the Breeding Birds of Ontario"

"Ontario Reptile and Amphibian Atlas"

As you are likely aware the species at risk records found in the NHIC database are not exhaustive and are based on known occurrences only. As a result, although there may be no record (or confirmation) of a species at risk on site it does not mean that they are not present if appropriate habitat exists. Due diligence is therefore still required and would include an appropriate consideration of what species could be present based on available habitat at the location noted above. Your field work should inform you on what species on the SARO list could possibly be encountered based on available habitats in the area of the study and the possible survey methodologies required during your site assessments.

Threatened and endangered species and their habitat are protected under the Endangered Species Act (ESA). Avoidance and mitigation measures may need to be considered for the project. The proponent should be aware that approvals under the ESA may be required for this project. Additional information on Species at Risk including guides, resources, permits, authorizations and overall benefit information can be obtained at:

https://www.ontario.ca/page/species-risk

A brief review of aerial photography suggests species that could potentially be encountered based on possible habitats could include (but may not be limited to) – butternut (endangered), monarch butterfly (special concern), endangered species of bats, barn swallow (T), golden-winged warbler (SC), olive-sided flycatcher (SC).

Evaluating for other natural heritage values for example candidate significant wildlife habitats (SWH) will be informed by direction in the Natural Heritage Reference Manual, the Significant Wildlife Habitat Technical Guide and SWH Criteria Schedule for Ecoregion 6E. Similarly to SAR occurrence reports, that mapping for natural heritage features might not be available is not indicative they are not on site, rather the assessments to identify them have not been done. Your field work will inform your review of the property for natural heritage features and functions.

Do contact me with any further questions.

Regards,

Graham Findlay

Management Biologist

Huronia Resources Management Team,

Midhurst, MNRF

Appendix D

ELC Photos

Details	Photos
Photo 1: Dry-Fresh Sugar Maple Deciduous Forest (FODM5-1) July 13, 2017	
Photo 2: Dry-Fresh Scotts Pine Naturalized Coniferous Plantation (FOCM6-3) July 13, 2017	

Details	Photos
Photo 3: Single Family Residential (CVR_3) July 13, 2017	
Photo 4: Butternut observed in Dry-Fresh Sugar Maple Deciduous Forest (FODM5-1) community.	

Appendix E

Vegetation Inventory

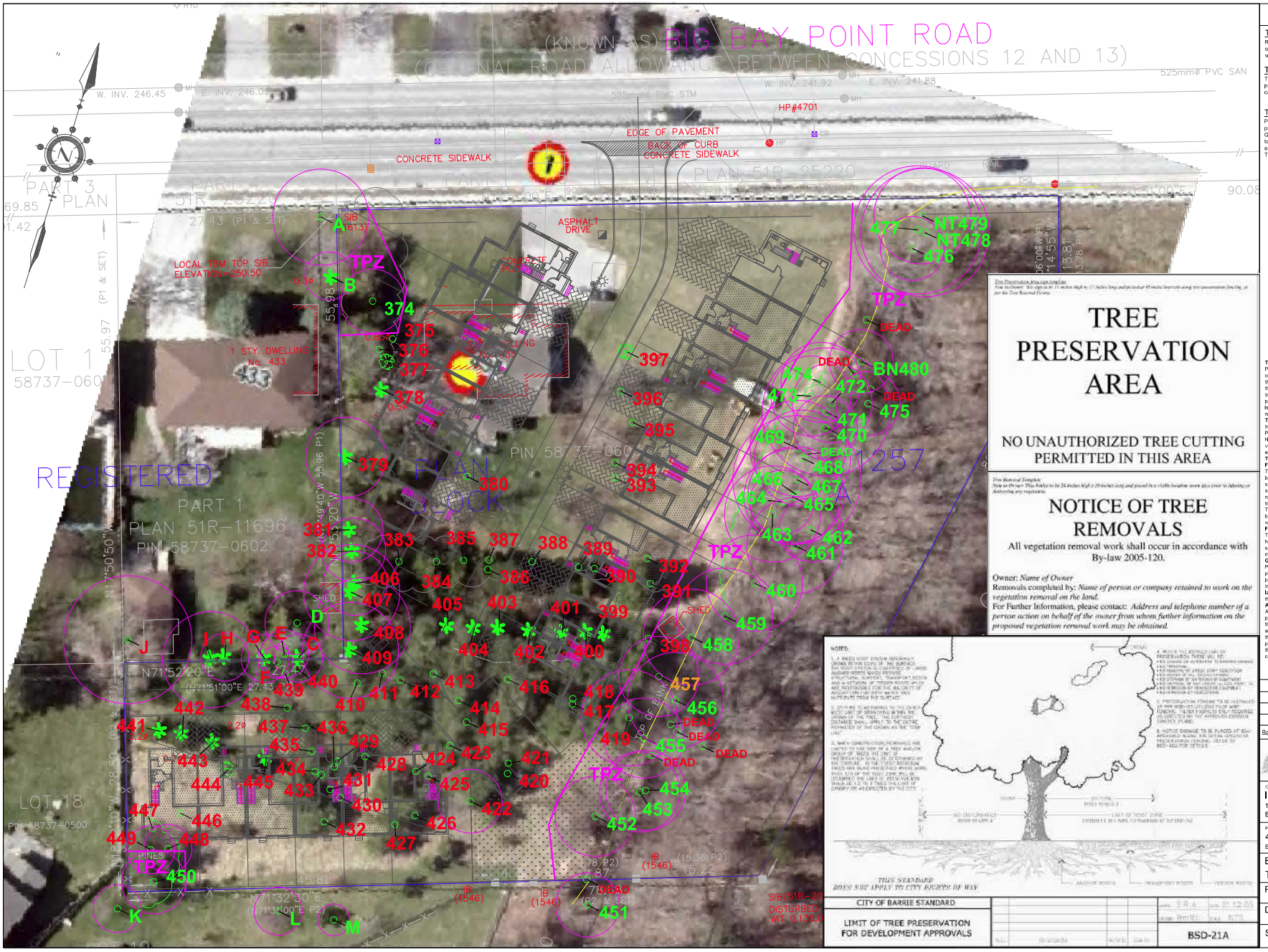
SCIENTIFIC NAME	COMMON NAMES	SRANK[1]	SARA[2]	ESA[3]	COEFFICIENT CONSERVATION	COEFFICIENT WETNESS	INTRODUCED (I) /NATIVE (N)
Acer negundo	Manitoba Maple	S5	---	---	0	-2	I
Acer rubrum	Red Maple	S5	---	---	4	0	N
Acer saccharum	Sugar Maple	S5	---	---	4	3	N
Alliaria petiolata	Garlic Mustard	SNA	---	---	---	0	I
Arctium minus	Common Burdock	SNA	---	---	---	5	N
Asclepias syriaca	Common Milkweed	S5	---	---	0	5	N
Aster sp.	---	---	---	---	---	---	---
Bromus inermis	Awnless Brome	SNA	---	---	---	5	I
Circaea canadensis	Broad-leaved Enchanter's Nightshade	S5	---	---	3	3	N
Cirsium vulgare	Bull Thistle	SNA	---	---	---	4	N
Cornus alternifolia	Alternate-leaved Dogwood	S5	---	---	6	5	N
Crataegus sp.	---	---	---	---	---	---	---
Dactylis glomerata	Orchard Grass	SNA	---	---	---	3	I
Daucus carota	Wild Carrot	SNA	---	---	---	5	I
Elymus repens	Creeping Wildrye	SNA	---	---	---	3	I
Erigeron philadelphicus	Philadelphia Fleabane	S5	---	---	1	-3	N
Fraxinus americana	White Ash	S4	---	---	4	3	N
Geranium robertianum	Herb-Robert	S5	---	---	---	5	I
Geum sp.	---	---	---	---	---	---	---
Impatiens capensis	Spotted Jewelweed	S5	---	---	4	-3	N
Juglans cinerea	Butternut	S3?	END	END	6	2	N
Leucanthemum vulgare	Oxeye Daisy	SNA	---	---	---	5	I
Lonicera tatarica	Tartarian Honeysuckle	SNA	---	---	---	3	I
Lotus corniculatus	Garden Bird's-foot Trefoil	SNA	---	---	---	1	N

SCIENTIFIC NAME	COMMON NAMES	SRANK[1]	SARA[2]	ESA[3]	COEFFICIENT CONSERVATION	COEFFICIENT WETNESS	INTRODUCED (I) /NATIVE (N)
Maianthemum canadense	Wild Lily-of-the-valley	S5	---	---	5	0	N
Parthenocissus inserta	Thicket Creeper	S5	---	---	3	3	N
Phleum pratense	Common Timothy	SNA	---	---	---	3	N
Picea pungens	Blue Spruce	SNA	---	---	---	---	N
Pinus sylvestris	Scotch Pine	SNA	---	---	---	5	I
Poa pratensis ssp. *agassizensis*	Agassiz's Bluegrass	SU	---	---	---	---	I
Potentilla recta	Sulphur Cinquefoil	SNA	---	---	---	5	N
Prunella vulgaris ssp. *lanceolata*	Self-heal	S5	---	---	5	5	N
Prunus serotina	Wild Black Cherry	S5	---	---	3	3	N
Prunus virginiana	Choke Cherry	S5	---	---	2	1	N
Quercus macrocarpa	Bur Oak	S5	---	---	5	1	N
Rhamnus cathartica	Common Buckthorn	SNA	---	---	---	3	I
Ribes sp.	---	---	---	---	---	---	---
Rubus idaeus ssp. *idaeus*	Common Red Raspberry	SNA	---	---	---	5	N
Silphium perfoliatum	Cup Plant	S2	---	---	9	-2	N
Solidago canadensis var. *canadensis*	Canada Goldenrod	S5	---	---	1	3	N
Sorbus americana	American Mountain-ash	S5	---	---	8	-1	N
Taraxacum officinale	Common Dandelion	SNA	---	---	---	3	N
Thalictrum pubescens	Tall Meadow-rue	S5	---	---	5	-2	N
Thuja occidentalis	Eastern White Cedar	S5	---	---	4	-3	N
Tilia americana	American Basswood	S5	---	---	4	3	N
Ulmus americana	American Elm	S5	---	---	3	-2	N
Vinca minor	Periwinkle	SNA	---	---	---	5	I

SCIENTIFIC NAME	COMMON NAMES	SRANK[1]	SARA[2]	ESA[3]	COEFFICIENT CONSERVATION	COEFFICIENT WETNESS	INTRODUCED (I) /NATIVE (N)
Vitis riparia	Riverbank Grape	S5	---	---	0	-2	N

Appendix F

Tree Inventory and Preservation Plan Report



LEGEND

Tree Inventory

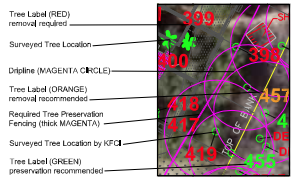
Refer to Table 1 of report dated 16 May 2017. Trees greater than 10cm DBH on and within six metres of the proposed development, and trees of all sizes within the road right-of-way were included in the inventory.

Tree Removals

The removal of Trees 375-449, C, and E-J is required to accommodate the proposed development. The removal of 457 is recommended due to its condition. Required tree removals are indicated with RED Labels.

Tree Preservation

Preservation of remaining trees will be possible with appropriate tree protection measures. Trees identified for preservation are indicated with GREEN labels. Tree protection measures will have to be implemented prior to the construction phase (earth works). Minimum tree preservation zones and required tree preservation fencing is indicated in MAGENTA. Refer to Tree Protection Plan Notes for preservation details.



TREE PRESERVATION AREA

NO UNAUTHORIZED TREE CUTTING PERMITTED IN THIS AREA

NOTICE OF TREE REMOVALS

All vegetation removal work shall occur in accordance with By-law 2005-120.

Owner: *Name of Owner*
Removals completed by: *Name of person or company retained to work on the vegetation removal on the land.*
For Further Information, please contact: *Address and telephone number of a person action on behalf of the owner from whom further information on the proposed vegetation removal work may be obtained.*

TREE PROTECTION PLAN NOTES

Prior to site disturbance the owner must confirm that no migratory birds are making use of the site for nesting. The owner must ensure that the works are in conformance with the Migratory Bird Convention Act and that no migratory bird nests will be impacted by the proposed work. It is the applicants' responsibility to discuss potential tree injury of trees on shared property lines with their neighbours. Should such trees be injured to the point of instability or death the applicant may be held responsible for removal and such issues would be dealt with in civil court or through negotiation. The applicant would be required to replace such trees to the satisfaction of the City of Barrie.

TREE PROTECTION ZONE: No construction activity including grade changes, surface treatments or excavations of any kind is permitted within the area identified on the Tree Protection Plan or Site Plan as a Tree Protection Zone (TPZ). No root cutting is permitted. No storage of materials or fill is permitted within the TPZ. No movement or storage of vehicles or equipment is permitted within the TPZ. Grade changes are not permitted within established TPZ. The area(s) identified as a TPZ must remain undisturbed at all times.

TREE PROTECTION BARRIERS:

For City-owned Trees:
Tree protection barriers for trees situated on the City road allowance where visibility must be maintained, can be 1.2m (4ft.) high and consist of chain link, or orange plastic web snow fencing on a 2" x 4" wood frame. All supports and bracing used to secure the barrier should be located outside the TPZ. All supports and bracing should minimize damage to roots outside the TPZ. Where some fill or excavate has to be temporarily located near a tree protection barrier, plywood must be used to ensure no material enters the TPZ. If the TPZ needs to be reduced to facilitate construction access, the tree protection barrier must be maintained at a lesser distance and the exposed TPZ protected with plywood and wood chips. This must first be approved by the City of Barrie.

For trees on private property situated on or adjacent to construction sites:
Tree protection barriers must be installed around trees to be protected using plywood clad hoarding or an equivalent approved by the City of Barrie. All supports and bracing to safely secure the barrier should be outside the TPZ. All such supports and bracing should minimize damage to roots outside the TPZ.

General Note:
Prior to the commencement of any site activity the tree protection barriers specified on this plan must be installed and written notice provided to the City of Barrie. Established tree protection zones must not be used as construction access, storage or staging areas. The tree protection barriers must remain in effective condition until all site activities including landscaping are complete. Written notice must be provided to the City of Barrie prior to the removal of the tree protection barriers.

ARBORICULTURAL WORK:
Any roots or branches which extend beyond the TPZ indicated on this plan which require pruning, must be pruned by a qualified Arborist or other tree professional as approved by the City of Barrie. All pruning of tree roots and branches must be in accordance with good arboricultural standards. Roots located outside the TPZ that have received approval from the City of Barrie to be pruned must first be exposed by hand digging or by using a low pressure hydro vac method. This will allow a proper pruning cut and minimize tearing of the roots. The Arborist/tree professional retained to carry out crown or root pruning must contact the City of Barrie no less than 48 hours prior to conducting any specified work.

CITY OF BARRIE STANDARD

LIMIT OF TREE PRESERVATION FOR DEVELOPMENT APPROVALS

BSD-21A

No.	Issue/Revisions	Date	By
1	Report Submission	16 May 17	KH

Base Data: Dino Astri Surveying Ltd., (topo); the City of Barrie (raster)

KUNTZ FORESTRY CONSULTING Inc.
540 Lakeshore Road West
PO Box 1267, Jakeshore W PO
Oakville ON L6K 6S0
t: 905 827 7877 f: 905 845 8791
e: consult@kuntzforestry.ca
web: www.kuntzforestry.ca

Client
Innovative Planning Solutions
150 Dunlop Street East, Suite 201
Barrie, Ontario L4M 6H1

Property
435 Big Bay Point Road
Barrie, Ontario

Existing Conditions, Proposed Site Plan
Tree Inventory and Preservation Plan

Project	P1507	Figure
Date	16 May 2017	1
Scale	1:450	

Tree Inventory and Preservation Plan Report
435 Big Bay Point Road
Barrie, Ontario

prepared for

Innovative Planning Solutions
150 Dunlop Street East, Suite 201
Barrie, ON L4M 1B2

prepared by

KUNTZ
FORESTRY
CONSULTING Inc.

146 Lakeshore Road West
PO Box 1267 Lakeshore W PO
Oakville ON L6K 0B3
t: 289.837.1871 f: 866.693.6390
e: consult@kuntzforestry.ca

16 May 2017

KUNTZ FORESTRY CONSULTING INC Project P1507

Introduction

Kuntz Forestry Consulting Inc. was retained by Innovative Planning Solutions to complete a Tree Inventory and Preservation Plan Report in support of a development application for a property located at 435 Big Bay Point Road in Barrie, Ontario. The subject property is located on the south side of Big Bay Point Road and the east side of Huronia Road.

The work plan for this tree preservation study included the following:

- Prepare inventory of the tree resources over 10cm on and within six metres of the proposed development and trees of all sizes within the road right-of-way;
- Screen the area within 50m of the proposed development for Butternut;
- Evaluate potential tree saving opportunities based on the proposed development plans; and
- Document the findings in a Tree Inventory and Preservation Plan Report.

Tree resources were assessed utilizing the following parameters:

Tree # - number assigned to tree that corresponds to Figure 1.
Species - common and botanical names provided in the inventory table.
DBH - diameter (centimetres) at breast height, measured at 1.4 m above the ground.
Condition - condition of tree considering trunk integrity, crown structure, and crown vigour. Condition ratings include poor (P), fair (F) and good (G).
Comments - additional relevant detail.

The results of the evaluation are provided below.

Methodology

Trees measuring over 10cm DBH on and within six metres of the proposed development were identified to be included in the tree inventory. Trees were located using a handheld GPS unit (Trimble GeoExplorer® 6000 series) accurate to ±1m. Trees located on the subject property were tagged using numbers 774-480. Trees on the neighbouring properties were identified with letters A-M. One Butternut tree was identified with the prefix BN. Refer to Table 1 for the results of the tree inventory and Figure 1 for the location of the trees.

Existing Site Conditions

The subject property is currently occupied by a detached dwelling and a paved driveway. Tree resources exist in the form of landscape trees and natural feature trees. A woodlot exists on the east side of the subject property. Refer to Figure 1 for the existing site conditions.

Tree Resources

The tree inventory was conducted on 3 May 2017. The inventory documented 120 trees on and within six metres of the proposed development. Refer to Table 1 for the full tree inventory and Figure 1 for the location of trees reported in the tree inventory.

Tree resources included in the inventory are comprised of Balsam Fir (*Abies balsamea*), Manitoba Maple (*Acer negundo*), Norway Maple (*Acer platanoides*), Red Maple (*Acer rubrum*), Silver Maple (*Acer saccharinum*), Sugar Maple (*Acer saccharum*), White Birch (*Betula papyrifera*), Green Ash (*Fraxinus pennsylvanica*), Butternut (*Juglans cinerea*), Apple Species (*Malus spp*.), White Spruce (*Picea glauca*), Colorado Blue Spruce (*Picea pungens*), White Pine (*Pinus strobus*), Scots Pine (*Pinus sylvestris*), Black Cherry (*Prunus serotina*), Chokecherry (*Prunus virginiana*), Bur Oak (*Quercus macrocarpa*), Red Oak (*Quercus rubra*), Mountain Ash Species (*Sorbus spp*.), Eastern White Cedar (*Thuja occidentalis*), White Elm (*Ulmus americana*).

Proposed Development

The proposed development includes the demolition of the existing dwelling and the construction of townhouses with associated parking and a parkette in the southeast corner of the property. The existing woodlot on the east side of the subject property will be retained and conveyed to public ownership. Refer to Figure 1 for the proposed development.

Discussion

The following sections provide a discussion and analysis of development impacts and tree preservation relative to the proposed development and existing conditions.

Development Impacts/Tree Removals

The removal of Trees 375-449, C, and E-J is required to accommodate the proposed development. In addition, the removal of Trees 457 is recommended due to the condition of the tree and its hazard potential. Refer to Figure 1 for the locations of tree removals.

Trees C and E-J are located within neighbouring properties; written permission from these property owners is required prior to their removal.

Tree Preservation

Preservation of Trees 374, 450-456, 458-480, A, B, D, and K-M will be possible with the use of appropriate tree protection measures as indicated on Figure 1. Tree protection measures will have to be implemented prior to the proposed works to ensure tree resources designated for retention are not impacted by the development. Refer to Figure 1 for the location of required tree preservation fencing, general Tree Protection Plan Notes, and the tree preservation fence detail.

Minor encroachment into the dripline of Trees 458, 467, 469, 471, 473, and 474 will be required to accommodate the proposed development. Given that encroachment is limited to a very small area, long-term adverse effects are not anticipated to those trees.

Butternut

Tree BN480 is Butternut and is protected under the federal government's Endangered Species Act (MNR, 2007). This tree is listed as an endangered species as per the COSEWIC list and until permission has been granted, the tree must be protected 25m

from its base. The proposed development is within this limit. As such, a formal assessment will be completed and reported to the OMNR. The tree will be assessed as retainable, non-retainable, or archivable. If an audit is not requested by the OMNR within 30 days, work is permitted within its vicinity if it is identified as non-retainable. If identified as a retainable or archivable tree, additional compensation measures may be required. Refer to Table 1 for the inventory information of Tree BN480.

Summary and Recommendations

Kuntz Forestry Consulting Inc. was retained by Innovative Planning Solutions to complete a Tree Inventory and Preservation Plan in support of a development application for the property located at 435 Big Bay Point Road in Barrie, Ontario. A tree inventory was conducted and reviewed in the context of the proposed work.

The findings of the study indicate a total of 120 trees on and within six metres of the subject property. The removal of 82 trees will be required to accommodate the proposed development. The removal of one tree is recommended due to their condition. The remaining 37 trees can be saved provided appropriate tree protection measures are followed throughout construction.

The following recommendations are suggested to minimize impacts to trees identified for preservation. Refer to Figure 1 for general Tree Protection Plan Notes and the tree preservation fence detail.

- Tree protection barriers and fencing should be erected at locations as prescribed on Figure 1. All tree protection measures should follow the guidelines as set out in the tree preservation plan notes and the tree preservation fencing detail.

- No construction activity including surface treatments, excavations of any kind, storage of materials or vehicles, unless specifically outlined above, is permitted within the area identified on Figure 1 as a tree protection zone (TPZ) at any time during or after construction.

- Branches and roots that extend beyond prescribed tree protection zones that require pruning must be pruned by a qualified Arborist or other tree professional. All pruning of tree roots and branches must be in accordance with Good Arboricultural Standards.

- Site visits, pre, during and post construction is recommended by either a certified consulting arborist (I.S.A.) or registered professional forester (R.P.F.) to ensure proper utilization of tree protection barriers. Trees should also be inspected for damage incurred during construction to ensure appropriate pruning or other measures are implemented.

Respectfully Submitted,
Kuntz Forestry Consulting Inc.

Kaho Hayashi

Kaho Hayashi, B.Sc., M.Sc.F.
Associate Forest Ecologist
ISA Certified Arborist #ON-2153A

Table 1. Tree Inventory

Location: 435 Big Bay Point Road, Barrie Date: 3 May 2017 Surveyors: KH

Tag #	Common Name	Scientific Name	DBH	TI	CS	CV	CDB	DL	Comments	Remove
374	Eastern White Cedar	*Thuja occidentalis*	12-25 (ave 18)	F/G	G	G		4	Union at base (4 stems)	
375	Scots Pine	*Pinus sylvestris*	34	F/G	F	P/F	20	3	Crook (L), sparse crown (H), grape vine competition (M)	X
376	Eastern White Cedar	*Thuja occidentalis*	~15	F/G	G	G		2	Co-dominance at 2m with included bark (M)	X
377	Silver Maple	*Acer saccharinum*	~75, 70	F	F/G	F/G		12	Union at 0.5m with included bark (L), bow (M), broken branches (L), epicormic branches (M)	X
378	Scots Pine	*Pinus sylvestris*	42	F/G	P/F	P/F	25	8	Crook (L), asymmetrical crown (H), dead branches (L)	X
379	Scots Pine	*Pinus sylvestris*	46	G	P/F	P/F	30	5	Crook (L), sparse crown (M), broken branches (L), dead branches (L)	X
380	White Birch	*Betula papyrifera*	~30, 30	P	F	F		6	Union at 0.5m with included bark (L), stem wounds (H), lost leader at 2m and 6m	X
381	Scots Pine	*Pinus sylvestris*	34.5	F/G	F/G	F/G		4	Asymmetrical crown (M), crook (L)	X
382	Scots Pine	*Pinus sylvestris*	44	F/G	G	G		4	Lean (L) to east, asymmetrical crown (L)	X
383	Eastern White Cedar	*Thuja occidentalis*	12-22 (ave 16)	F/G	G	G		3	Union at base (5 stems)	X
384	Eastern White Cedar	*Thuja occidentalis*	15-25 (ave 20)	F/G	G	G		3	Union at base (4 stems)	X
385	Eastern White Cedar	*Thuja occidentalis*	15-22 (ave 18)	F/G	G	G		3	Union at 0.8m (4 stems)	X
386	Mountain Ash Species	*Sorbus spp.*	22	F	F/G	F/G		3	Lean (L), crook (L), seam (L)	X
387	Eastern White Cedar	*Thuja occidentalis*	7-20 (ave 15)	F/G	G	G		3	Union at base (3 stems)	X
388	Balsam Fir	*Abies balsamea*	38.5	F/G	G	F	10	3	Co-dominance at 2m, dead leaders	X
389	Balsam Fir	*Abies balsamea*	30	P/F	P/F	P/F	15	3	Lost leader	X
390	Eastern White Cedar	*Thuja occidentalis*	10-20 (ave 15)	F/G	G	G		3	Union at base (3 stems)	X
391	Eastern White Cedar	*Thuja occidentalis*	5-25 (ave 22)	F/G	G	G		4	Union at base (7 stems)	X
392	Manitoba Maple	*Acer negundo*	16.5, 12	F	F/G	G		5	Union at 0.8m with included bark (M), bow (L), asymmetrical crown (M)	X
393	Chokecherry	*Prunus virginiana*	11.5	F/G	F/G	G		3	Asymmetrical crown (M), lean (L)	X
394	Chokecherry	*Prunus virginiana*	11	F/G	F/G	G		3	Sweep (L), asymmetrical crown (M)	X
395	Manitoba Maple	*Acer negundo*	10	F	G	G		4	Lean (L), crook (L), asymmetrical crown (L)	X
396	Manitoba Maple	*Acer negundo*	5-20 (ave 15)	F	G	G		5	Union at base (4 stems), crook (M), asymmetrical crown (L)	X
397	White Elm	*Ulmus americana*	52	G	G	F/G		8		X
398	Scots Pine	*Pinus sylvestris*	42	G	G	G		6		X
399	Scots Pine	*Pinus sylvestris*	41	F/G	G	F/G		5	Crook (L)	X
400	Scots Pine	*Pinus sylvestris*	38	G	F/G	G		4	Asymmetrical crown (M)	X
401	Scots Pine	*Pinus sylvestris*	36	G	F/G	G		5	Asymmetrical crown (M)	X
402	Scots Pine	*Pinus sylvestris*	33.5	G	F/G	G		5	Asymmetrical crown (M)	X
403	Scots Pine	*Pinus sylvestris*	42	F/G	G	G		6	Crook (M)	X
404	Scots Pine	*Pinus sylvestris*	47	F/G	G	G		6	Co-dominance at 2m with included bark (M)	X
405	Scots Pine	*Pinus sylvestris*	34	G	F/G	G		6	Asymmetrical crown (M)	X
406	Scots Pine	*Pinus sylvestris*	33.5	F/G	G	G		4	Crook (L), sweep (L)	X
407	Scots Pine	*Pinus sylvestris*	43	F/G	F/G	G		6	Lean (L), crook (L), asymmetrical crown (M)	X
408	Scots Pine	*Pinus sylvestris*	35.5	G	G	G		6		X
409	Scots Pine	*Pinus sylvestris*	41	F/G	G	G		6	Co-dominance at 4m, crook (L), asymmetrical crown (L)	X
410	Scots Pine	*Pinus sylvestris*	46	F/G	F	F/G		6	Bow (L), asymmetrical crown (H), crook (L)	X
411	Scots Pine	*Pinus sylvestris*	50, 15.5	F/G	F/G	G		5	Union at base, crook (L), asymmetrical crown (M)	X
412	Scots Pine	*Pinus sylvestris*	42.5	F	F	P/F	30	5	Lean (L), union at 3m with included bark (L), smaller stem almost dead	X
413	Scots Pine	*Pinus sylvestris*	25	F	F	F/G		5	Cook (H), asymmetrical crown (H), union at 1.7m but smaller stem lost	X
414	Scots Pine	*Pinus sylvestris*	50.5	F/G	G	G		6	Co-dominance in crown	X
415	Scots Pine	*Pinus sylvestris*	35	F/G	F/G	G		4	Asymmetrical crown (M), sweep (L), crook (L)	X
416	Scots Pine	*Pinus sylvestris*	46, 36	F/G	G	G		6	Union at base	X
417	Scots Pine	*Pinus sylvestris*	41	G	G	G		5		X
418	Scots Pine	*Pinus sylvestris*	37.5	G	F/G	F/G		5	Asymmetrical crown (M)	X
419	Scots Pine	*Pinus sylvestris*	44.5	G	F/G	G		6	Asymmetrical crown (H)	X

420	Scots Pine	*Pinus sylvestris*	11	G	G	G		2		X
421	Scots Pine	*Pinus sylvestris*	12.5	F/G	G	G		2	Union at 2m	X
422	White Elm	*Ulmus americana*	26.5	F/G	G	G		4	Co-dominance in crown	X
423	Scots Pine	*Pinus sylvestris*	10.5	G	G	F	5	2		X
424	Scots Pine	*Pinus sylvestris*	15.5	G	G	G		2		X
425	Scots Pine	*Pinus sylvestris*	13.5	F/G	G	G		2	Bow (L)	X
426	Scots Pine	*Pinus sylvestris*	13	F/G	G	G		2	Lean (VL)	X
427	Scots Pine	*Pinus sylvestris*	15	G	G	G		2		X
428	Scots Pine	*Pinus sylvestris*	15.5	G	G	G		3		X
429	Scots Pine	*Pinus sylvestris*	11	F/G	G	G		2	Lean (L)	X
430	Scots Pine	*Pinus sylvestris*	11	G	G	G		2		X
431	Scots Pine	*Pinus sylvestris*	11.5	G	G	G		2		X
432	Scots Pine	*Pinus sylvestris*	13-Jan	G	G	G		2		X
433	Scots Pine	*Pinus sylvestris*	14.5	G	G	G		2		X
434	Scots Pine	*Pinus sylvestris*	16	F/G	F/G	F/G		3	Lean (L), asymmetrical crown (M)	X
435	Scots Pine	*Pinus sylvestris*	10	G	G	G		2		X
436	Scots Pine	*Pinus sylvestris*	12.5, 12, 11	F/G	G	G		2	Union at base (3 stems)	X
437	Scots Pine	*Pinus sylvestris*	12.5	G	G	F/G		2	Sparse crown (L)	X
438	Scots Pine	*Pinus sylvestris*	13	F/G	G	G		2	Crook (L)	X
439	Scots Pine	*Pinus sylvestris*	12	F/G	G	F/G		3	Lean (L), sparse crown (L)	X
440	Red Oak	*Quercus rubra*	20.5	G	G	G		5		X
441	White Spruce	*Picea glauca*	13	G	G	G		3		X
442	White Spruce	*Picea glauca*	~18	G	G	G		3		X
443	White Spruce	*Picea glauca*	11	G	G	G		2		X
444	Bur Oak	*Quercus macrocarpa*	17	G	G	G		4		X
445	White Spruce	*Picea glauca*	14.5, 5	F/G	G	G		3	Union at base	X
446	Red Maple	*Acer rubrum*	17.5, 11	F/G	G	G		4	Union at base	X
447	Scots Pine	*Pinus sylvestris*	20	F/G	G	G		3	Crook (L)	X
448	Scots Pine	*Pinus sylvestris*	~15	G	G	G		3	Grape vine competition (M)	X
449	Scots Pine	*Pinus sylvestris*	~18	F/G	G	F/G		3	Co-dominance at 1.8m, sparse crown (L)	X
450	Scots Pine	*Pinus sylvestris*	~20, 20	F	G	G		4	Co-dominance at 1.2m, crook (M)	
451	Black Cherry	*Prunus serotina*	23.5	F/G	G	F/G		4	Crook (L), broken branches (L), grape vine competition (M)	
452	White Elm	*Ulmus americana*	30.5	F/G	G	F/G		5	Crook (L), union at 2m, grape vine competition (M)	
453	Sugar Maple	*Acer saccharum*	17	G	G	G		5		
454	Sugar Maple	*Acer saccharum*	13	F/G	F/G	F/G		5	Co-dominance at 2m, asymmetrical crown (M)	
455	Sugar Maple	*Acer saccharum*	15	G	F/G	G		5	Asymmetrical crown (M)	
456	Sugar Maple	*Acer saccharum*	40	F/G	G	G		6	Co-dominance at 4m with included bark (M)	
457	Sugar Maple	*Acer saccharum*	43	P	G	F/G		5	Stem wounds (H) at base, hollow stem ==> possible hazard	X (recommended)
458	Sugar Maple	*Acer saccharum*	47.5	G	F/G	G		6	Asymmetrical crown (M)	
459	Sugar Maple	*Acer saccharum*	36	G	G	G		6		
460	Sugar Maple	*Acer saccharum*	39.5	G	G	G		6		
461	Sugar Maple	*Acer saccharum*	33	G	F/G	G		6	Asymmetrical crown (M)	
462	Sugar Maple	*Acer saccharum*	27.5	G	G	G		4		
463	Sugar Maple	*Acer saccharum*	28.5	F/G	F/G	G		6	Co-dominance at 1.7m with included bark (M), grape vine competition (M)	
464	Sugar Maple	*Acer saccharum*	13	G	F/G	G		4	Asymmetrical crown (M)	
465	Sugar Maple	*Acer saccharum*	14	P/F	F	F		6	Union at 1m but 1 stem dead, bow (L) to west, grape vine competition (M)	
466	Sugar Maple	*Acer saccharum*	33, 24	F/G	G	G		6	Union at base and 3m with included bark (L)	
467	Black Cherry	*Prunus serotina*	36	F	F/G	F		8	Bow (M) to west, broken branches (M), grape vine competition (H)	
468	Sugar Maple	*Acer saccharum*	28.5	F/G	F/G	G		6	Co-dominance in crown, asymmetrical crown (M)	
469	Sugar Maple	*Acer saccharum*	~40, 20	F/G	G	G		6	Union at base	
470	Sugar Maple	*Acer saccharum*	~25, 16	P/F	F	F		4	Union at base but smaller stem dead, stem wounds (M), asymmetrical crown (M)	
471	Black Cherry	*Prunus serotina*	45.5	F/G	F/G	F/G		8	Bow (L) to north, dead branches (L)	
472	Sugar Maple	*Acer saccharum*	16	G	G	G		5	Asymmetrical crown (L), understory tree	
473	Sugar Maple	*Acer saccharum*	12	G	F/G	G		5	Asymmetrical crown (M)	
474	Sugar Maple	*Acer saccharum*	18	G	F/G	G		5	Asymmetrical crown (M)	
475	Sugar Maple	*Acer saccharum*	20.5	G	G	G		4	Asymmetrical crown (L)	
476	Green Ash	*Fraxinus pennsylvanica*	12	F	F/G	F/G		4	Bow (M) to west, crook (L), asymmetrical crown (M)	
477	Sugar Maple	*Acer saccharum*	~30, 20	F/G	F/G	G		8	Union at base, asymmetrical crown (M)	
NT478	Sugar Maple	*Acer saccharum*	~35	G	F/G	G		8	Asymmetrical crown (M)	
NT479	Sugar Maple	*Acer saccharum*	~30, 20	F	F/G	G		6	Union at base, broken branches (L), asymmetrical crown (M)	
BN480	Butternut	*Juglans cinerea*	~30	P	F/G	P/F		4	Cankers (M), lower branches dead, grape vine competition (H)	

A	Norway Maple	*Acer platanoides*	~30	G	G	F/G		6		
B	Colorado Blue Spruce	*Picea pungens*	~30	F/G	G	G		3	Union at 2m	
C	Balsam Fir	*Abies balsamea*	~18	G	G	G		3		X
D	Balsam Fir	*Abies balsamea*	~20	F/G	F/G	G		4	Lean (VL), asymmetrical crown (M)	
E	Balsam Fir	*Abies balsamea*	20	G	G	G		3		X
F	Scots Pine	*Pinus sylvestris*	15	F/G	G	F		2	Crook (L), sparse crown (M)	X
G	Scots Pine	*Pinus sylvestris*	18	F/G	F/G	F/G		3	Crook (M), asymmetrical crown (M)	X
H	Scots Pine	*Pinus sylvestris*	20	F/G	F/G	F/G		3	Crook (L), asymmetrical crown (M)	X
I	White Pine	*Pinus strobus*	~25	G	G	F/G		6	Chlorosis (L)	X
J	Manitoba maple	*Acer negundo*	60	F	G	F/G		8	Union at 2m with included bark (L), pruning wounds (M), epicormic branches (H)	X
K	Norway Maple	*Acer platanoides*	~14	G	G	G		3		
L	Apple Species	*Malus spp.*	~15	F	G	G		3	Lean (M)	
M	Scots Pine	*Pinus sylvestris*	~10	G	G	G		2		

Codes		
DBH	Diameter at Breast Height	*(cm)*
TI	Trunk Integrity	*(G, F, P)*
CS	Crown Structure	*(G, F, P)*
CV	Crown Vigor	*(G, F, P)*
CDB	Crown dieback	*%*
DL	Dripline	*(m)*
~ = Estimate, (VL) = very light, (L) = light, (M) = moderate, (H) = heavy		

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