



**Natural Heritage Evaluation
Lockhart Innisfil Investments Limited
And Lockhart Innisfil Investments (II) Limited
South Part of Lot 13 & 14, Concession 11
City of Barrie**

Prepared for:
Lockhart Innisfil Investments Limited
And
Lockhart Innisfil Investments (II) Limited

Prepared by:
Azimuth Environmental
Consulting, Inc.

July 2019

AEC 11-076g



Environmental Assessments & Approvals

July 30, 2019

AEC 11-076g

Lockhart Innisfil Investments Ltd.
c/o Matson, McConnell Ltd.
2430A Bloor Street West
Toronto ON
M6S 1P9

Attention: Chris Matson and Rick McConnell

**Re: Natural Heritage Evaluation (Lockhart Innisfil Investments Limited and
Lockhart Innisfil Investments (II) Limited)
South Part of Lot 13 & 14, Concession 11
City of Barrie**

Dear Messrs. Matson and McConnell,

Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to provide a Natural Heritage Evaluation (NHE) for a proposed residential subdivision at the location described above, a component of the Hewitt's Secondary Plan area. The property contains lands identified within the City of Barrie's Natural Heritage System which has triggered the need for the NHE. The Natural Core Area, a component of the Natural Heritage System, has been approved by Ontario's Municipal Board. The NHE forms a portion of the submission requirements to acquire the draft plan approval for the proposed development.

This report summarizes investigations undertaken in 2014-2018. This study documents the natural environmental features present and provides an assessment of the potential for the presence of habitats of Endangered or Threatened species/Species at Risk, Significant Wildlife Habitat and other significant natural heritage features for the property and adjacent lands. The purpose of this NHE is to identify and confirm natural features and functions within the study area, assess impacts of the proposed residential subdivision to the identified significant natural heritage features and to confirm that the proposed buffers are adequate to protect the identified features within the Natural Core Area. Mitigation measures are proposed for areas where potential impacts are identified.



Assuming appropriate mitigation measures and recommendations are implemented, the proposed development is not expected to impact negatively any identified significant natural heritage features.

If you have any questions or require additional information, please do not hesitate to contact the undersigned.

Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

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Terrestrial Ecologist

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1.0 INTRODUCTION

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by Matson, McConnell Ltd. on behalf of Lockhart Innisfil Investments Limited and Lockhart Innisfil Investments (II) Limited to prepare a Natural Heritage Evaluation (NHE) for a property located on the south part of Lot 13 & 14, Concession 11, City of Barrie (City). A map illustrating the property limits in the context of the Hewitt's Secondary Plan Area is shown on Figure 1. The proposed development is part of a larger overall development that extends onto adjacent lands within the Secondary Plan Area. It is our understanding that this NHE is a component of submission to the City seeking draft plan approval for the proposed subdivision development. The Lake Simcoe Region Conservation Authority (LSRCA) has requested that a NHE be undertaken due to the presence of lands regulated by LSRCA as well as the presence of lands identified as Natural Core Area within the Official Plan for the City (Appendix A). The Natural Core Areas are components of the Natural Heritage System that has been approved by Ontario's Municipal Board (now known as the Local Planning Area Tribunal). The NHE is also a requirement according to the Lake Simcoe Protection Plan.

A review of background information in combination with field surveys undertaken during the 2014-2018 seasons were carried out to identify significant features on and adjacent to the subject lands.

This NHE identifies significant natural heritage features following provincial guidance documents and assesses potential impacts to those natural heritage features. The NHE also assess the proposed buffers to determine if they are adequate to protect the identified features within the Natural Core Area. Azimuth has consulted with the Ministry of Natural Resources and Forestry (MNRF) for matters related to Species at Risk, drainage features, and local environmental features located within the study area limits. A Terms of Reference for this NHE was circulated to the LSRCA prior to the completion of the 2014 field studies and an updated Terms of Reference was circulated in 2018 prior to the completion of this NHE report (Appendix B).

2.0 PLANNING CONTEXT

2.1 Federal *Fisheries Act*

On November 25, 2013, amendments to the *Fisheries Act*, 1985 came into effect, which focused the *Fisheries Act*, 1985 on protecting the productivity of recreational, commercial and Aboriginal fisheries. Projects are required to avoid causing 'serious harm to fish' unless authorized by Fisheries and Oceans Canada (DFO). Projects include those being conducted in or near waterbodies that support a commercial, recreational or



Aboriginal fishery. During the design and construction phases of projects, efforts should be made to protect fish and fish habitat in order to comply with the *Fisheries Act*.

Under the current DFO review process, projects are to be evaluated under the Self-Assessment process to determine whether a project has the potential to result in 'serious harm to fish', and whether DFO review is required to obtain either a Letter of Advice or Authorization.

On February 6, 2018, the federal government announced that the *Fisheries Act* will be overhauled, through Bill C-68. Once approved, Bill C-68 will supersede the 2012 *Fisheries Act*, and will change aspects of the approvals process currently being followed. At this point in time, those changes remain unclear.

The property contains one watercourse that functions as fish habitat and drainage features that were assessed for this NHE. It is advised that at the time of development, that the status of Bill C-68 be confirmed, to reaffirm the process of fisheries review for this development in cooperation with professional ecologists to determine if recommendations for reviewing projects under the *Act*, as provided herein, require updating accordingly.

2.2 Provincial Policy Statement

The Provincial Policy Statement (MMAH, 2014) outlines policies related to natural heritage features (Section 2.1) and water resources (Section 2.2). Ontario's *Planning Act*, 1990 requires that planning decisions shall be consistent with the Provincial Policy Statement. According to the Provincial Policy Statement, development and site alteration shall not be permitted in:

- *Significant wetlands* in Ecoregions 5E, 6E and 7E; and
- *Significant coastal wetlands*.

Similarly, Section 2.1.5 of the Provincial Policy Statement states that, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted within:

- a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E; and 7E;
- b) *significant woodlands* in Ecoregions 6E; and 7E;
- c) *significant valleylands* in Ecoregions 6E; and 7E;
- d) *significant wildlife habitat*;
- e) *significant areas of natural and scientific interest*; and
- f) *coastal wetlands* in Ecoregions 5E, 6E; and 7E that are not subject to policy 2.1.4(b)



Section 2.1.6 of the Provincial Policy Statement asserts that development and site alteration is not permitted in fish habitat except in accordance with federal and provincial requirements.

Section 2.1.7 of the Provincial Policy Statement states that development and site alteration shall not be permitted in habitat of Threatened and Endangered species, except in accordance with provincial and federal requirements.

Furthermore, under Section 2.1.8 of the Provincial Policy Statement, no development and site alteration will be permitted on lands adjacent to natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated there will be no negative impacts on the natural features and ecological functions.

The term development, as defined in the Provincial Policy Statement, refers to the creation of a new lot, a change in land use or the construction of buildings and structures, requiring approval under the *Planning Act*.

It is ultimately the responsibility of the Province and/or the Municipality to designate areas identified within Section 2.1.4 of the Provincial Policy Statement as significant. Through the development and creation of the Hewitt's Secondary Plan, a component of the City of Barrie Official Plan, the Natural Heritage System has been defined within the Hewitt's Secondary Plan Area. The Natural Heritage System was identified within a Natural Heritage System report prepared by Natural Resource Solutions Inc. Using a combination of field studies, the review of published background studies, and analysis of the applicable provincial natural heritage planning policies and guidelines (*e.g.*, Provincial Policy Statement, Lake Simcoe Protection Plan, Natural Heritage Guidelines) Natural Resource Solutions Inc. developed the Natural Heritage System. Components of the Natural Heritage System, in general, are large contiguous tracts of natural features that contain a variety of significant features including Significant Woodland, Significant Wetland, cultural meadow and thicket communities contiguous within the Natural Heritage System and watercourses. The staking of the features within the Natural Core Area features took place in July 2015 for all the participating landowners in the Hewitt's Secondary Plan Area. The staking was undertaken with staff from the LSRCA, Natural Resources Solutions Inc., the City, Azimuth, R.J. Burnside, The Jones Consulting Group and the affected landowners. The feature limits were defined, agreed to by all parties and staked. Each stake location was georeferenced and the final survey of the features was circulated to all participants. The buffer width, as approved by the Ontario Municipal Board, was added to the feature limit to define the development limit for the preparation



of the draft plans of subdivision. Therefore, our assessment will identify the significant features as approved by the province, the City and the LSRCA. For completeness, an assessment of Candidate Significant Wildlife Habitat has been conducted within this NHE. **The study area is located within Ecoregion 6E.** The Natural Heritage Reference Manual (OMNR, 2010) and Ecoregion 6E Significant Wildlife Habitat Criterion Schedule were used to identify natural heritage features applicable to the property and adjacent lands.

2.3 Ontario's *Endangered Species Act*

Ontario's *Endangered Species Act*, 2007 (ESA) provides regulatory protection to Endangered and Threatened species prohibiting harassment, harm and/or killing of individuals and destruction of their habitats. Habitat is broadly characterized within the ESA as the area prescribed by a regulation as the habitat of the species or an area on which the species depends, directly or indirectly, to carry on its life processes including reproduction, rearing of young, hibernation, migration or feeding.

The various schedules of the ESA included under Ontario Regulation (O. Reg.) 230/08 identify Species at Risk in Ontario. These include species listed as Extirpated, Endangered, Threatened and Special Concern. As noted above, only species listed as Endangered and Threatened receive protection from harm and destruction to habitat on which they depend. Species designated as Special Concern may receive protection under the Significant Wildlife Habitat provisions of the Provincial Policy Statement.

2.4 Growth Plan for the Greater Golden Horseshoe

The City of Barrie is within an identified Urban Growth Centre. Urban Growth Centres will be the focal areas for investment, commercial, recreational, cultural and entertainment uses. They will accommodate and support a transit network, will serve as a high-density major employment centre, and will accommodate significant population as per Section 2.2.3 of the Growth Plan for the Greater Golden Horseshoe (2019). The Growth Plan's Natural Heritage System excludes land within settlement areas. Therefore, the policies related to the Natural Heritage System and features associated with the natural heritage system (*i.e.* key natural heritage features and key hydrologic features) are not applicable within the City of Barrie.

2.5 Lake Simcoe Protection Plan

The Lake Simcoe Protection Plan (LSPP; MOECC, 2009) was developed to protect and restore the ecological health of the Lake Simcoe watershed. The LSPP identifies Key Natural Heritage Features and Key Hydrologic Features within the natural heritage system. Key Natural Heritage Features include *wetlands, significant woodlands,*



significant valleylands, and natural areas abutting Lake Simcoe. Key Hydrologic Features include *wetlands, permanent and intermittent streams*, and *lakes* other than Lake Simcoe. The NHE is required under the Lake Simcoe Protection Plan to assess the adequacy of the buffers approved by the Ontario Municipal Board to protect the features and functions of the Natural Core Areas.

2.6 City of Barrie, Hewitt's Secondary Plan

The property and adjacent lands are designated by the City of Barrie Official Plan (OP; 2018), within the Hewitt's Secondary Plan as Residential Area in the eastern and western portions of the property and Natural Heritage System in the northern, southern and central portions of the property (Schedule 9A; Appendix A). Further, Schedule 9B (Appendix A) illustrates a Natural Core Area that aligns with the Natural Heritage System boundaries depicted in Schedule 9A.

Policies related to the proposed residential land use as per the Schedule 9A/9B designations above apply as follows within the OP:

Section 9.3.4 – Natural Heritage System Components (Permitted Uses, Buildings, and Structures):

“Development or site alteration shall be prohibited within the Natural Heritage System...”

Section 9.5.7 of the OP describes land use policies within the Residential Area designation, permissive of various types of residential subdivision development.

2.7 Lake Simcoe Region Conservation Authority

The property is within the jurisdiction of LSRCA and portions of the property are regulated (Appendix B) due to the presence of wetland and a Tributary of Lovers Creek that runs through the property. As such, portions of the property are subject to O. Reg. 176/06, Regulation of *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Approvals will need to be obtained from the LSRCA prior to any site alteration or development within the regulation limit.

3.0 STUDY APPROACH

3.1 Study Area

The property is located north of Lockhart Road in the southwest portion of the Hewitt's Secondary Plan Area, depicted in its regional context in Figure 1. For the purposes of this NHE the term “property” refers to the defined property limits shown on Figure 1



through Figure 3. The term “adjacent lands” refers to those areas located outside (lands within approximately 120m) of the property boundary. The term “study area” refers to the combined property and adjacent lands.

Development within the Hewitt’s Secondary Plan Area has been divided into Phases and will be developed in sequential order. The property contains lands which are included in Phase II of the Hewitt’s Secondary Plan Area which are slated for development as soon as all approvals are in place (Figure 1).

3.2 Existing Data Sources

A review of background documents provided information on site characteristics, habitat, wildlife, rare species and communities, and general cultural/historic aspects of the property. Data was gathered from the following documents:

- Aerial images (Google, VuMap);
- Atlas of the Breeding Birds of Ontario [website]
- City of Barrie Official Plan (2018) and maps;
- Atlas of the Mammals of Ontario (Dobbyn, 1994);
- MNRF’s Natural Heritage Information Centre Make-A-Map: Natural Heritage Areas application [website];
- MNRF’s Species at Risk Ontario list [website];
- Hewitt’s Secondary Plan Area Subwatershed Impact Study Lovers, Hewitt’s and Sandy Cove Creeks (Burnside, 2016);
- Natural Heritage Characterization Report (Natural Resource Solutions Inc. and Dougan & Associates, 2012);
- Natural Heritage Systems Report (Natural Resource Solutions Inc., 2012);
- Simcoe County Interactive Maps [website]; and
- Ontario Nature – Ontario Reptile and Amphibian Atlas [website].

3.3 Background Studies

The property is located within the Hewitt’s Secondary Plan Area. Natural Resource Solutions Inc. was retained by the City to prepare a Natural Heritage Characterization report as technical input to the Secondary Plan for the Barrie Annexed Lands. The purpose of the Natural Heritage Characterization Report was to define the natural environmental features that should be retained as environmental protection in public ownership to protect, preserve and enhance the natural environment. The focus of the Natural Heritage Characterization was the protection of the key ecological features and functions within the Secondary Plan Area and to ensure their preservation in the long-term within the urban lands, while recognizing and maintaining linkages between and among natural area features. Natural Resource Solutions Inc. and Dougan & Associates undertook field studies in 2011 and 2012 to characterize the natural heritage features



within the Secondary Plan Area. This field study combined with the review of published background studies and analysis of the applicable provincial natural heritage planning policies and guidelines (*e.g.*, Provincial Policy Statement, LSPP, Natural Heritage Guidelines), Natural Resource Solutions Inc. developed their approach to defining the Natural Heritage System. Throughout the planning process Natural Resource Solutions Inc. undertook consultation with the LSRCA, MNRF and the public, incorporating their comments and concerns into the development of the approach to defining the Natural Heritage System.

3.4 Information Gathering Form

Based on preliminary discussions with the MNRF in 2016, it is our understanding that the MNRF wanted to establish an approach to Species at Risk for the entire Hewitt's Secondary Plan Area to ensure a consistent methodology was established for all landowners. Based on this information, it was determined that the best method to convey the Species at Risk information to the MNRF was through an Information Gathering Form for the entire Hewitt's Secondary Plan Area. Therefore, an Information Gathering Form was submitted (December, 2016) with the relevant information to initiate discussions with the MNRF to ensure that the proposed works could proceed in compliance with Ontario's *ESA*. Azimuth met with MNRF staff on September 28, 2017 to discuss our general approach in dealing with Species at Risk within the Hewitt's Secondary Plan Area (Appendix C). Formal comments from MNRF were received (October 25, 2017) for each of the properties for which information was submitted (Appendix C). A follow-up meeting was held with MNRF staff on April 25, 2018 to discuss Species at Risk issues within the overall planning area.

4.0 METHODOLOGY AND SURVEYS

Azimuth undertook the following activities for this study to satisfy the requirements of the LSRCA as outlined in the Terms of Reference (Appendix B).

A combination of field investigations and review of background information was used to fulfill the objectives of the NHE. In brief, Azimuth has undertaken the following activities, which are expanded upon in their respective sections:

- Searched for rare species observation records for the property and surrounding lands;
- Conducted three evening amphibian call surveys (Completed April 28, May 19 and June 29, 2014);
- Conducted dawn breeding bird surveys (Completed June 2, 6, 18 and 21, 2014);
- Identified the vegetation communities, using protocols of the Ecological Land Classification for Southern Ontario;



- Conducted reconnaissance surveys of vascular plants on the property during the spring, summer and fall (Completed 2014-2016);
- Attended the site in 2018 (spring) to confirm the aquatic conditions of the property;
- Conducted a Species at Risk Screening for the property utilizing background information, habitat assessments and field data collected for the property. Note: Consultation with the MNRF was initiated in 2016 and is ongoing. Azimuth continues to work with MNRF with respect to Species at Risk to ensure consistency with Ontario's *ESA*.
- Overlaid environmental features on aerial photography so that the relationship between the natural heritage features and functions, and buffer setbacks could be assessed;
- Assessed the potential direct, indirect and cumulative impacts of the proposed development plan on the sensitive or significant environmental features as described above;
- Assessed whether the development has the potential to impact upon fisheries resources, and if works can be self assessed as per DFO's Projects Near Water criteria, or whether project review is required by DFO;
- Developed an avoidance, mitigation and restoration strategy; and
- Assessed conformity with the applicable policies of the City, LSRCA and Province.

As per the Terms of Reference (Appendix B), with the exception of the additional aquatic assessment undertaken in 2018, the 2014 data was utilized within this NHE report. The conditions of the property have not changed since our original 2014 studies (as confirmed during our 2018 site visit) therefore; this data remains relevant and appropriate.

4.1 Vegetation Community Mapping and Surveys

The Ecological Land Classification for Southern Ontario (Lee *et al.*, 1998) was used to classify vegetation communities. Azimuth reviewed the Ecological Land Classification data that was prepared by Natural Resource Solutions Inc. to inform our mapping. Table 1 contains a description of the vegetation communities.

A total of four surveys (May 19, June 6, August 27 and October 28, 2014) were carried out to confirm vegetation community types and plant species composition. Site assessment was focused during ELC work to ensure that appropriate effort was made to detect any federally or provincially designated species, notably Species at Risk as identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and by the Committee on the Status of Species at Risk in Ontario. Table 2 contains a list of the vascular plants found on the property.



4.2 Wildlife Surveys

4.2.1 General

Observations of wildlife were recorded during all field investigations. Potential Significant Wildlife Habitat functions were evaluated according to provincial criteria outlined in the Ecoregion 6E Criterion Schedule (MNR, 2015).

4.2.2 Birds

Dawn breeding bird surveys were conducted on the property (June 2, 6, 18 and 21, 2014). These surveys were based on a combined point count (5 minute duration) and roving survey methodology based on the Ontario Breeding Bird Atlas *Guide for Participants* (OBBA, 2001). Point count/bird survey stations were established as shown on Figure 2 and all bird species seen or heard were recorded. Breeding evidence was assessed based on the criteria of the OBBA (2001). Table 3 contains a list of species detected and survey conditions, sample timing, weather conditions, etc..

Eastern Whip-poor-will

Specific surveys for Eastern Whip-poor-will were conducted on May 16 and June 15, 2014 at the point station depicted on Figure 2. Surveys were conducted as per guidelines outlined in the *Survey Protocol for Eastern Whip-poor-will (*Caprimulgus vociferus*) in Ontario* (MNR, 2014). Survey sampling duration was 10 minutes. Weather conditions for each survey date are provided below:

- May 16, 2014 (temperature 4°C, Beaufort Wind Scale 1, no precipitation, no cloud cover, survey time: 22:40 – 22:50, surveyors: Lisa Moran and Brad Baker);
- June 15, 2014 (temperature: 17°C, Beaufort Wind Scale 1, no precipitation, 5% cloud cover, survey time: 21:35 – 21:45, surveyors: Lisa Moran).

4.2.3 Reptile and Amphibians

Evening calling amphibian surveys were conducted on April 28, May 19 and June 29, 2014 at three amphibian survey stations as shown on Figure 2 following the protocols of Bird Studies Canada's Marsh Monitoring Program (2008). Sampling duration was five minutes (three minutes to record species/call intensity plus 2 minutes to listen for additional species). Weather conditions and results of the surveys are reported in Table 4.

At each amphibian survey station, frogs and toads heard vocalizing were identified to species. Calling intensity by species was recorded as: Call Code 1 (individuals can be counted/calls not simultaneous); Code 2 (calls distinguishable/some simultaneous



calling); and Code 3 (full chorus/calls continuous and overlapping, cannot count individuals).

4.3 Fish and Fish Habitat

Fish and fish habitat surveys were completed on October 25, 2017 and May 29, 2018 to characterize the watercourse on the property.

The Barrie Creeks, Lovers Creek, and Hewitt's Creek Subwatershed Plan (LSRCA, 2012) was also reviewed to gather background data and assist with determining the fish community present on the property.

4.4 Significant Natural Heritage Feature Staking

The staking of the features within the Natural Core Area took place in July 2015 for all the participating landowners in the Hewitt's Secondary Plan Area, including the property. Staking was undertaken with staff from LSRCA, Natural Resource Solutions Inc., the City, Azimuth, R.J. Burnside & Associates, The Jones Consulting Group and landowners with properties within the Secondary Plan Area that contained Natural Core Areas. The significant natural heritage features within the Natural Core Area limits were defined and staked (Figure 2). The AutoCAD file of the surveyed limits was transferred to all participants for review. All parties endorsed the Natural Heritage System limits.

4.5 Species at Risk

The Species at Risk screening included an analysis of the habitat requirements of species listed in O. Reg. 230/08 which occur in Simcoe County to identify those having potential to occur in the study area based on habitats present (Table 5). The MNRF was contacted as a part of the Natural Heritage Characterization report and highlighted several species that have the potential to occur within the general area. These species have been incorporated into our assessment.

5.0 EXISTING CONDITIONS

5.1 Land Use

5.1.1 On-site Land Use

The land use on the property is largely composed of agricultural lands dominated by row-crops. Hedgerows divide the agricultural lands. Natural heritage features occur within the central portion of the property. These areas are composed of Lovers Creek Swamp Provincially Significant Wetland (PSW), forest/woodland communities and a Tributary to Lovers Creek (Figure 2). The lands outside the Natural Core Area have been approved by the City and province for residential development under the Hewitt's Secondary Plan. There are currently two silos present on the property that were



associated with farmsteads that were removed from the property over 30 years ago. There are no other structures.

5.1.2 Adjacent Land Use

Lands to the north of the property are within the Natural Core Area and are a part of the City's Natural Heritage System. These lands are composed of a mosaic of woodland, wetland and a watercourse. Agricultural lands to the north of the property limits have been approved for residential development (Lockmaple Innisfil Investments Ltd.). Lands to the east and west of the property are part of the Hewitt's Secondary Plan Area, are currently undeveloped and are in agricultural production but have also been approved for residential development. Outside of the City limits to the south of Lockhart Road, agricultural and rural residential lands dominate the landscape.

5.2 Vegetation Communities and Plants

Seven distinct vegetation communities are present on the property as depicted on Figure 2 and outlined in Table 1. Associate plant species for each of the vegetation communities are reported in Table 2. Three species that are considered to be rare within the Lake Simcoe Watershed (regionally rare) were documented on-site including Arrow-leaved Aster, Woodland Horsetail and Northern Bedstraw. These regionally rare species were observed within the Mineral Cultural Woodland (CUW1) within the Natural Core Area (Figure 2). None of the species documented are of federal or provincial conservation concern.

A survey for Butternut, listed as Endangered under the *ESA*, was completed in conjunction with Azimuth's field investigations. There were no Butternuts observed on the property.

5.2.1 Wetland Habitat

A portion of the Lovers Creek Swamp PSW occurs on the property and within the study area (Appendix C). Several wetland communities have been identified within the limits of the PSW (Figure 2). These wetland features are located within the limits of the City's Natural Core Area. The outermost limits of the Natural Core Area were established and approved in consultation with LSRCA according to the protocol discussed in Section 4.4 of this report.

5.2.2 Forest and Woodland

Coniferous forest, cultural woodland and treed swamp communities are present on the property and within the study area. The forest and woodland areas are located within the



Natural Core Area. The outermost limits of the core woodland were staked according to the protocol discussed in Section 4.4 of this report.

5.3 Wildlife

5.3.1 Mammals

Mammal species utilizing the property included: American Red Squirrel (*Tamiasciurus hudsonicus*, S5), Eastern Chipmunk (*Tamias striatus*, S5), Eastern Cottontail (*Sylvilagus floridanus*, S5), Eastern Grey Squirrel (*Sciurus carolinensis*, S5), Northern Raccoon (*Procyon lotor*, S5), Coyote (*Canis latrans*, S5) and White-tailed Deer (*Odocoileus virginianus*, S5).

None of the species observed or listed above are of federal or provincial conservation concern.

5.3.2 Birds

A total of thirty-six bird species were detected during Azimuth's studies, twenty-five of which have shown possible - probable breeding evidence, as reported in Table 3.

Three area-sensitive species - Eastern Meadowlark, Savannah Sparrow and White-breasted Nuthatch, were recorded on the property.

Nocturnal bird surveys detected no Whip-poor-will or Common Nighthawk.

Species at Risk birds observed on the property include Eastern Meadowlark (Threatened), Barn Swallow (Threatened), Eastern Wood-pewee (Special Concern) and Wood Thrush (Special Concern). These species are discussed in Section 6.

5.3.3 Reptiles and Amphibians

Three evening calling amphibian surveys were conducted on-site. Three survey stations were established in proximity to the wetland habitat (Figure 2). Table 4 lists the dates, weather conditions and species documented during amphibian surveys. Amphibian activity was documented at Survey Station 1 and 2 only. Western Chorus Frog was heard calling at a Call Level Code of 2 at both of these locations during the early spring survey (April 28, 2014). A full chorus (Call Level Code 3) was not heard from any species. Of the identified species, only Western Chorus Frog (S3) has been identified as a rare species within the Province. The remainder of the species observed are not of federal, provincial or regional conservation concern.



5.4 Aquatic Habitat and Fisheries

The property contains a Tributary of Lovers Creek, and two drainage ditches. A third drainage ditch is located immediately south of the property and is included in this assessment. The drainage ditches (A, B and C) are depicted on Figure 2 and site photographs in Appendix D. Each are discussed below.

5.4.1 Tributary of Lovers Creek

A Tributary of Lovers Creek traverses the property in a general north/northwest from the south side of Lockhart Road. The Tributary receives flows from a meadow marsh/thicket swamp on the property, and from roadside drainage and wetland habitat on the south side of Lockhart Road (Figure 2). At Lockhart Road the channel has been historically straightened, with minimal shading and flow (algae noted). Northward, the Tributary becomes more naturalized, flowing within a deciduous swamp and conifer forested corridor before entering the Lovers Creek PSW at the north property boundary. North of the property, the Tributary ultimately discharges to the main branch of Lovers Creek in the PSW (approximately 1km downstream), before crossing Maplevue Drive in the City of Barrie.

The watercourse on the property conveys permanent, year round flow. In the central portion of the property the channel, on average, had a bankfull width of 2.0m and bankfull depth of 0.49m. Minimum water levels noted during the low flow period (May 29, 2018) were approximately 0.10m, with deeper pools approaching 0.45m.

Water temperatures were recorded on May 29, 2018 using a handheld temperature probe (Hanna). At the southern, upstream limit at Lockhart Road, the water temperature was 23.9 °C (air temperature = 27°C), and decreased to 21.0°C and 22.8°C (same air temperature) in the central portion of the property. A groundwater seep was noted at, and approximately 75m upstream of the narrowest point of the woodlot (Figure 2), and at this location, the water temperature decreased to 15 °C. Watercress (*Nasturtium sp.*) an emergent aquatic plant adapted to coldwater inputs, was frequently noted, and a likely indicator of groundwater inputs to the system. Given measured coldwater conditions and prevalence of Watercress, it is anticipated that coldwater contributions from groundwater upwelling to the creek occur on the property. Lovers Creek is known to host Brook Trout (*Salvelinus fontinalis*) among other coldwater adapted fish species; therefore the coldwater inputs would contribute to some degree, in the maintenance of the coldwater thermal regime in the Lovers Creek. Temperatures increased to 23.7 °C (air temperature = 27°C) at the northern property limit.

As indicated by minnows observed throughout the creek, as well as a few sunfish by the Lockhart Road culvert that are likely from the pond feature upstream (on the south side



of the road; Figure 2), the Tributary is considered fish habitat under the Federal *Fisheries Act*, and functions as a permanently flowing, coldwater system, with important functions in proximity to the Lovers Creek PSW.

Riparian shading was generally high provided by both tree and herbaceous meadow marsh cover both on and downstream of the property.

5.4.2 Drainage Ditch A

A 2.5m wide manmade ditch conveys runoff from east to west in the eastern half of the property (Figure 2). It appears to receive flow from a tile drain on the adjacent lands (to the east), and discharges runoff to the central woodlot. The ditch was vegetated and dry during both site visits, and is not connected to the Tributary. The feature can be seen on aerial mapping but is not mapped as a drainage feature (LSRCA, 2018; MNRF, 2017). The feature is not considered fish habitat (neither direct nor indirect as it is not connected to the Tributary of Lovers Creek), and is not considered further as an aquatic feature in this NHE.

5.4.3 Drainage Ditch B

A 2.2m wide ditch runs in an east-west direction through the meadow marsh between the trail/access road at the southern end of the property and the Tributary of Lovers Creek (Figure 2). This feature is man-made, and dominated by terrestrial vegetation with little channel definition. It functions to convey seasonal runoff, with connectivity to the watercourse. Minnows were observed in the first 5m of this feature; however, it is considered to be of low aquatic habitat quality, and provides some limited, seasonal function for fish.

5.4.4 Drainage Ditch C

A roadside ditch on the south side of Lockhart Road enters the Tributary of Lovers Creek through a 900m corrugated steel pipe (CSP) culvert. This ditch is approximately 2.5m wide, with an average water depth of 0.16m during the May 29, 2018 site visit. Water enters this ditch feature through roadside runoff, and contributions from a pond feature approximately 200m upstream of the CSP culvert, and adjacent wetland habitat on the south side of Lockhart Road that makes up part of the Lovers Creek Swamp PSW. Unidentified minnow species were observed throughout this ditch feature. Drainage Ditch C was assessed in order to help determine the aquatic conditions on the property.

5.5 Species at Risk

Species at Risk with potential to occur in the planning area and their preferred habitats were assessed to determine whether there is potentially suitable habitat within the study



area for these species (Table 5). The habitat assessment indicated that the following species have the potential to occur within the study area:

- Bat Species (Little Brown Myotis, Northern Myotis, Tri-colored Bat; Endangered) – Potential habitat in vegetation communities providing mature trees
- Barn Swallow (Threatened) – Observed
- Blanding’s Turtle (Threatened) – Potential habitat within the study area
- Eastern Meadowlark (Threatened) – Observed
- Eastern Musk Turtle (Special Concern) – Potential habitat within the study area
- Eastern Ribbonsnake (Special Concern) – Potential habitat within the study area
- Eastern Wood-pewee (Special Concern) – Observed
- Snapping Turtle (Special Concern) – Potential habitat within the study area
- Wood Thrush (Special Concern) – Observed

Currently, only species designated as Endangered or Threatened are afforded protection (including habitat) according to Ontario’s *ESA*. Species designated as Special Concern are not protected under Ontario’s *ESA*, although their habitat may qualify as Significant Wildlife Habitat as per the Provincial Planning Policy. The assessment for potential Significant Wildlife Habitat can be found within Section 6.4.

6.0 SIGNIFICANT NATURAL HERITAGE FEATURES

6.1 Significant Wetland

The Provincial Policy Statement affords ultimate responsibility for the designation of natural features as “significant” to the Municipality and/or the Province. The Lovers Creek Swamp PSW extends onto the property (Appendix C). Other wetland habitat has been identified within the Natural Core Area. As such, these wetland types associated with the Natural Core Area and Lovers Creek Swamp PSW are considered Significant Wetland.

6.2 Significant Woodlands

Forested communities are associated with the Natural Core Area and Lovers Creek Swamp PSW (Figure 2).

6.3 Significant Valleyland

There are no valleyland features located within the study area according to the City of Barrie OP, or standards presented in the Natural Heritage Reference Manual. The Tributary of Lovers Creek is present within a relatively flat bottomland basin (Figure 2), and lacks the well-defined valley morphology and landform prominence required to be considered Candidate Significant Valleyland.



6.4 Significant Wildlife Habitat

Table 6 provides an assessment of the potential for Significant Wildlife Habitat in the study area. This table utilizes the criteria outlined within MNRF's Significant Wildlife Habitat Technical Guide (2000) and the accompanying Ecoregion 6E Criteria Schedules (MNRF, 2015). Based on this assessment and data collected to date, our findings indicate that the following could be considered Significant Wildlife Habitat within the study area:

- Seasonal Concentration Areas of Animals;
 - Bat Maternity Colonies;
 - Turtle Wintering Areas;
 - Reptile Hibernaculum;
- Special Habitats of Wildlife Considered Significant Wildlife Habitat;
 - Seeps and Springs;
- Habitat for Species of Conservation Concern (Not Including Endangered or Threatened Species);
 - Special Concern and Rare Wildlife Species.

6.4.1 Seasonal Concentrations of Areas of Animals

Bat Maternity Colonies

The deciduous forest/swamp communities on the property within the Natural Core Area have potential to function as bat maternity habitat. Thus, the function of potential Bat Maternity Colonies Significant Wildlife Habitat will be considered in the Impact Assessment.

Turtle Wintering Areas

While no turtles or evidence of turtles were documented during field investigations, Lovers Creek Swamp PSW within the Natural Core Area has potential to function as overwintering habitat for turtles. Thus, potential Turtle Wintering Areas Significant Wildlife Habitat will be considered in the Impact Assessment.

Reptile Hibernaculum

While no snakes or evidence of snakes were documented during field investigations, potential hibernaculum habitat is present within the wetland communities within Lovers Creek Swamp PSW within the Natural Core Area. As such, Reptile Hibernaculum Significant Wildlife Habitat will be considered in the Impact Assessment.



6.4.2 Specialized Habitat for Wildlife

Seeps and Springs

Groundwater seeps were present within the Natural Core Area and were noted along the Tributary of Lovers Creek within the Natural Core Area (Figure 2). These seeps would function to contribute coldwater inputs to the Tributary of Lovers Creek.

6.4.3 Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Special Concern and Rare Wildlife Species

Eastern Musk Turtle

The Eastern Musk Turtle prefer shallow water with abundant floating and submerged vegetation. This species may nest in decaying vegetation matter, rotting wood, in sand or in the walls of Muskrat and Beaver lodges (COSEWIC, 2012).

Potentially suitable habitat for Eastern Musk Turtle has been identified within the wetland communities that are part of Lovers Creek Swamp PSW where standing water may persist. This may be associated with wetland habitat located on adjacent lands as there is no suitable habitat on the property itself. Impacts to the function of the wetland as potential habitat for Eastern Musk Turtle are considered in the Impact Assessment.

Eastern Ribbonsnake

Eastern Ribbonsnakes are semi-aquatic and typically found in wetlands with flowing and standing water including marshes, bogs, ponds, lake shorelines, *etc.* Hibernation occurs in underground hibernaculum typically within wetlands although snakes have been found to use upland forest habitat as well (COSEWIC, 2012).

Potential habitat for Eastern Ribbonsnake exists in the wetland communities that are part of Lovers Creek Swamp PSW. Impacts to the function of these communities as potential habitat for Eastern Ribbonsnake are considered in the Impact Assessment.

Eastern Wood-pewee

Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation (COSEWIC, 2012).

Eastern Wood-pewee was detected as an incidental observation only on May 19, 2014 prior to the breeding bird season (Table 3, Figure 2). As such, no breeding evidence for Eastern Wood-pewee was collected on the property. Therefore, there is no Significant Wildlife Habitat on the property for Eastern Wood-pewee.



Snapping Turtle

Snapping Turtle prefer slow-moving water with a soft mud bottom and dense aquatic vegetation, however, this species can be found in almost every kind of freshwater habitat (COSEWIC, 2008).

Potential habitat for Snapping Turtle exists in the wetland communities that are part of Lovers Creek Swamp PSW where standing water may persist which may associated with wetland habitat located on adjacent lands as there is no suitable habitat on the property itself. Impacts to the function of these communities as potential habitat for Snapping Turtle are considered in the Impact Assessment.

Wood Thrush

The Wood Thrush is found in moist, deciduous hardwood or mixed stands, often previously disturbed with a dense deciduous undergrowth and with tall trees for singing perches (COSEWIC, 2012).

This species was documented within the deciduous swamp (SWD7-1; point count station 1) during one of Azimuth's dawn breeding surveys on June 6, 2014 (Table 3, Figure 2). The results of Azimuth's surveys suggest "possible breeding" but no evidence of confirmed or probable breeding. Therefore, there is no SWH on the property for Wood Thrush.

6.5 Area of Natural and Scientific Interest

There are no Areas of Natural and Scientific Interest on or adjacent to the property (Appendix C).

6.6 Aquatic Habitat and Fisheries

The first order Tributary of Lovers Creek through the central portion of the property sustains permanent flow, and functions as direct fish habitat.

Coldwater species, including Brook Trout and Mottled Sculpin, have been found in Lovers Creek, with cool and coldwater species noted as occurring at Mapleview Drive, north of the property (LSRCA, 2012). Based on site conditions and background information, it can be reasonably concluded that the Tributary of Lovers Creek on the property provides cool/coldwater habitat, and should be managed accordingly (cool/coldwater management objectives).

Drainage Ditch B contained a small area of standing water at its connection to the Tributary of Lovers Creek. Minnows were observed within this wetted area, which may



represent permanent habitat (for small fish, at least a portion of which are anticipated to be escapees from the pond on the south side of Lockhart Road). Due to the ditch being manmade and historically altered, this section with fish is considered to be of marginal habitat quality. Upstream of this point, the feature functions to convey seasonal runoff from the small MAM2-2 wetland at the south limit of the property, and is not believed to host fish (Figure 2).

Drainage Ditch C, located to the south (upstream) of the property, is also considered to be direct, seasonal or permanent fish habitat.

6.7 Potential Habitat for Threatened and Endangered Species

6.7.1 Bat Species

Little Brown Myotis and Northern Myotis use a wide variety of habitats for summer roosting including rock crevices, buildings, bridges, caves, mines, and large snags (>25cm DBH) in the early stages of decay. Tri-colored Bat also establishes maternity roosts in treed areas, specifically within live or dead foliage (MNRFF, 2015), but is rarely found to utilize anthropogenic structures.

As per MNRFF guidelines, the best candidate roost trees are selected according to the following criteria:

- Tallest snag/cavity tree;
- Exhibits cavities or crevices;
- Has the largest DBH (>25cm DBH);
- Is within the highest density of snags (*e.g.* clusters of snags);
- Has a large amount of loose, peeling bark;
- Cavity or crevice is high in snag/cavity tree (>10m);
- Canopy is more open; and,
- Exhibits early stages of decay (*i.e.* decay class 1-3).

Potential maternity roost habitat for Endangered bat species occur within the treed communities on-site. Impacts to the function of the forests as bat maternity roosting habitat for Endangered bats are considered in the Impact Assessment.

6.7.2 Barn Swallow

Barn Swallow typically nest along ledges and walls of man-made structures such as buildings, barns, boathouses, cliffs or caves (COSEWIC, 2010).



Barn Swallow was documented foraging in proximity to point count station 6 during Azimuth's second breeding bird survey (June 18, 2014). Potential nesting habitat for Barn Swallow exists on the silo structures within the study area, however, no nests were identified during Azimuth's field investigations. Therefore, Barn Swallow will not be discussed in the Impact Assessment. Notwithstanding, care is recommended while working in areas where these species have the potential to occur. As such, the silos should be surveyed for Barn Swallow nests prior to building demolition (Section 9.0).

6.7.3 Blanding's Turtle

Blanding's Turtle is an aquatic turtle that occurs in a variety of wetland habitats including 'marsh, swamps, ponds, fens, bogs, slow-flowing streams, shallow bays of lakes or rivers, as well as graminoid shallow marsh and slough forest habitat that are adjacent to larger marsh complexes' (MNRF, 2013).

According to the MNRF online Natural Heritage Information Centre database, there are no known occurrences of Blanding's Turtle within 2km of the study area and thus, no areas of habitat as defined in the ESA are present within the study area. Notwithstanding, Blanding's Turtle habitat, including nesting, basking and overwintering habitat, has the potential to occur within Lovers Creek Swamp PSW within the study area.

6.7.4 Eastern Meadowlark

Eastern Meadowlark is a grassland bird that prefers large tracts of grassland (5ha minimum) with a large core area (areal extent of grassland >25m from the edge of a patch).

Eastern Meadowlark was documented on one occasion during Azimuth's dawn breeding bird surveys in 2014. A singing male was observed perched in a tree within the agricultural field along the southern limits of the property on June 2, 2014 (adjacent point count station 6; Figure 2). A male observed on one date suggests "possible breeding" within the study area. MNRF requires evidence of confirmed or probable breeding in order to deem an area as Eastern Meadowlark habitat. Azimuth visited this portion of the property an additional three times during the breeding season [June 6 (while surveying adjacent SWT), June 18 and June 21 (while surveying adjacent SWT), 2014] and it was not detected during any of those surveys. Therefore, Eastern Meadowlark will not be discussed in the Impact Assessment

6.8 Significant Natural Heritage Features Summary

The results of our field surveys and review of background information have confirmed or indicate the potential for the following significant natural heritage features and functions to be located on or adjacent to the study area:



- Wetland;
- Potential Significant Wildlife Habitat;
 - Seasonal Concentration Areas of Animals;
 - Bat Maternity Colonies
 - Turtle Wintering Areas
 - Reptile Hibernaculum
 - Special Habitats of Wildlife Considered Significant Wildlife Habitat;
 - Seeps and Springs
 - Habitat for Species of Conservation Concern (Not Including Endangered or Threatened Species);
 - Special Concern and Rare Wildlife Species;
 - Eastern Musk Turtle;
 - Eastern Ribbonsnake;
 - Snapping Turtle;
- Fish Habitat;
- Potential Habitat for Endangered and Threatened Species;
 - Blanding's Turtle; and
 - Endangered Bats.

7.0 PROPOSED DEVELOPMENT

The proposed development consists primarily of residential use. The subdivision will include a connection to Thicketwood Ave and Fenchurch Manor with an internal road network. Mixed Use is proposed within the southwest corner of the property. A crossing over the Tributary of Lovers Creek is proposed to allow vehicular access between the two portions of the property (Figure 3). The crossing of the Tributary of Lovers Creek is a Collector Road as per the approved City of Barrie Secondary Plan, Background Studies & Infrastructure Master Plans – Intensification & Annexed Lands (Genivar, 2014).

Four blocks of land adjacent the environmental buffers have been established for Stormwater Management (SWM) facilities for the treatment of stormwater runoff. Drainage patterns will generally follow existing conditions, with all development area drainage to be directed through the proposed SWM facility before it discharges to the wetland/watercourse. As per the Hewitt's Secondary Plan Area Subwatershed Impact Study: Lovers Hewitt's and Sandy Cove Creeks, it is understood that where storm water management facilities are located adjacent to a 30m buffer within the City's Natural Heritage System, some encroachment to the buffer may be permitted. Within the first 15m of the buffer adjacent to development, transition grading and integrated maintenance



(i.e. access/pedestrian trails) may be permitted if no significant vegetation exists. No grading works are permitted in the remaining 15m of the buffer adjacent to the natural heritage feature, with the exception of SWM Facility outfalls where required (R.J. Burnside & Associates Limited, 2016).

The remainder of the lands consist of City Natural Core Area lands which will be protected (Appendix A).

The proposed development will be serviced with municipal water and sewer.

8.0 IMPACT ASSESSMENT

8.1 Wetland

The Lovers Creek Swamp PSW is included within the Natural Core Area (Appendix C). There is no development proposed within the limits of the Lovers Creek Swamp PSW. As a result there will be no direct impacts associated with the Significant Wetland. A self-sustaining vegetated buffer of 30m will remain adjacent to all wetland features within the Natural Core Area.

As per direction provided by LSRCa, a feature-based water balance will be required prior to final plan approval and any major site alteration to determine if any indirect impacts will result from the proposed development.

Minor tree removals may be required to facilitate the construction of a 2-lane crossing to connect the two areas of the planned subdivision. From an ecological perspective, the location of the proposed tributary crossing is optimal as this represents the narrowest point within the Natural Core Area and thus will minimize any potential impacts to the wetland provided that adequate mitigation measures are in place. Once the details of the bridge crossing are known, further assessment will be required in order to ensure no impacts to the function of the Natural Core Areas.

8.1.1 Buffer Analysis

A 30 m buffer adjacent to the Significant Wetland within the Natural Core Area will remain post-development.

The 30m buffer will be vegetated with native self-sustaining vegetation and will provide a screen to the wetland features that will act as a barrier to noise and light associated with the development. The vegetated 30m buffer to the wetland community will also help to prevent access and encroachment into the wetland itself.



The wetland buffer will aid in the attenuation of any excess nutrients and pollutants including sediments that may migrate towards the wetland community, and improve the water quality and clarity within the wetland itself (Boyd, 2001). As discussed further below, a 30m buffer is more than sufficient to maintain the quality of water by filtering excess sediment/nutrients/pollutants from the surface water runoff. The buffering lands will input leaf litter and other matter from the vegetation into the system that will provide food for wildlife lower on the food chain (Boyd, 2001).

As depicted on Figure 3, the proposed SWM Facilities will be constructed on adjacent lands buffering the Natural Core Area. This includes areas that are in proximity to wetland habitat. The Stormwater Management Facilities will serve as additional intervening land between the Natural Core Area and the residential development.

As per the Hewitt's Secondary Plan Area Subwatershed Impact Study (Burnside, 2016), within the first 15m, some encroachment to the Significant Wetland buffer may be permitted provided that no significant vegetation exists (*i.e.* if the buffer is predominantly agricultural field under existing conditions). At the locations of the proposed Stormwater Management Facilities, the lands within the Natural Heritage System buffering the Significant Wetland are currently cultivated. The potential use within the first 15m of the buffer adjacent to the development for grading and integrated maintenance related to the storm water pond facilities will continue to provide sufficient setback to the Natural Core Area to protect critical root zone while allowing for some site alteration in the form of transition grading, periodic maintenance access or pedestrian use. Each of these potential uses within the first 15m of the Natural Heritage System buffer are considered to be low/no impact activities.

Provided that conformance is demonstrated for environmental considerations and mitigation described below (Section 9), we anticipate no negative ecological impacts to the Significant Wetland feature or functions will result from the proposed development.

8.2 Significant Woodlands

The Significant Woodland on the property is contained within the Natural Core Area. No vegetation clearance will occur within the limits of the woodland with the exception of a small area located at the southern portion of this feature which will be the location of the collector road crossing that is required to connect the two areas of the planned subdivision. Further, a 5m buffer has been approved adjacent to the Cultural Woodland and a 30m buffer has been approved adjacent to the remainder of the woodland feature. These setbacks will mitigate potential indirect impacts from the proposed development.



Through consultation with LSRCA, it was determined that a 5m buffer adjacent to the Cultural Woodland (CUW) community (Figure 2 and 3) was acceptable provided the agreed upon compensation was implemented following earthworks on the Lockhart lands (Appendix B). The 5m buffer was established and approved during the Secondary Plan process and through subsequent consultation with LSRCA.

8.2.1 Buffer Analysis

A 30m setback from the dripline of the forested and forested swamp communities will ensure protection of the critical root zone for the trees within the forested communities (*i.e.* FOC and SWD; Figure 2). This zone is essential in order to maintain the health of the tree. According to Johnson (1999), the critical root zone can be estimated through measuring the tree's Diameter Breast Height (DBH) in inches. This number is then multiplied by 1 or 1.5 for sensitive or tolerant species respectively. The resulting number is the number of feet that should be left undisturbed from the base of the tree. In general, the trees located within the study area largely range from whip size to 50cm with limited potential for some to be greater than 50 cm. Therefore a 30m setback would be sufficient to ensure protection of the critical rooting zone.

Currently, active agricultural lands dominate the landscape outside of the Natural Core Area. The 30m buffer adjacent to the forested and forested swamp communities within the Natural Core Area will contain self-sustaining vegetation that will provide a screen to the natural heritage features and act as a barrier to noise and light associated with the development. The 30m buffer will also help to prevent access and encroachment into the Natural Core Area.

As per the Hewitt's Secondary Plan Area Subwatershed Impact Study (Burnside, 2016), within the first 15m of the Natural Heritage System buffer, some encroachment to the buffer may be permitted provided that no significant vegetation exists (*i.e.* if the buffer is predominantly agricultural field under existing conditions). At the location of the proposed Stormwater Management Facilities, the lands buffering the Natural Heritage System are currently composed of agricultural lands. The potential use within the first 15m of the buffer adjacent to the development for grading and integrated maintenance related to the storm water pond facilities will continue to provide sufficient setback to the Natural Core Area to protect critical root zone while allowing for some in the form of transition grading, periodic maintenance access or pedestrian use. Each of these potential uses within the first 15m of the Natural Heritage System and Natural Core Area buffer are low/no impact activities.

A 5m naturalized buffer will remain adjacent to the hedgerow to the east of the Cultural Woodland (CUW) community. The existing Cultural Woodland was determined not to



require a substantive buffer to maintain its function. Therefore, a buffer of 5m from the dripline of the hedgerow was applied and agreed upon with the City of Barrie and LSRCA. This setback will ensure protection of the trees within the hedgerow and is consistent with City of Barrie standards for Tree Preservation (Appendix A).

As depicted on Figure 3, the storm water pond facility will be constructed adjacent to the lands buffering the Natural Core Area. The storm water pond facility will act as an additional intervening land use between the Natural Core Area and the residential development that will help to further prevent access into the natural areas.

Provided that conformance is demonstrated for environmental considerations and mitigation described below (Section 8), we anticipate no negative ecological impacts to the Significant Woodland feature or functions will result from the proposed development.

8.3 Significant Wildlife Habitat

8.3.1 Seasonal Concentration Areas of Animals;

Bat Maternity Colonies

There is no proposed development within the deciduous forest/swamp communities on the property as these areas are contained within the Natural Core Area. Thus, any potential function associated with bat maternity roost habitat will be maintained post development.

Turtle Wintering Areas

There is no proposed development within the Lovers Creek Swamp PSW as this feature is contained within the Natural Core Area. Thus, any potential function associated with turtle wintering habitat will be maintained post development.

Reptile Hibernaculum

There is no proposed development within the Lovers Creek Swamp PSW as this feature is contained within the Natural Core Area. Thus, any potential function associated with reptile hibernacula will be maintained post development.

8.3.2 Special Habitats of Wildlife Considered Significant Wildlife Habitat;

Seeps and Springs

Groundwater seeps were identified within the Natural Core Area and along the Tributary of Lovers Creek. These areas will be retained post development within the Natural Core Area. As indicated above, a feature-based water balance will be required prior to final plan approval and any major site alteration to determine if any indirect impacts will result from the proposed development.



8.3.3 Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Special Concern and Rare Wildlife Species

Eastern Musk Turtle, Eastern Ribbonsnake and Snapping Turtle

Potential habitat for Eastern Musk Turtle, Eastern Ribbonsnake and Snapping Turtle has been identified within Lovers Creek Swamp PSW. The wetland communities are all contained within the area that will be retained post development as a Natural Core Area. As such, the proposed development will not negatively impact the potential habitat for these Special Concern reptile species. Notwithstanding, it is recommended that mitigation measures as described in Section 9.0 are adhered to.

8.4 Fish Habitat

The lands proposed for development are 30m from the limit of the Natural Core Area as shown on Figure 3, on lands that are currently farmed. Development lands do not require the clearing of riparian vegetation associated with the Tributary, and is not expected to result in the alteration of fish habitat conditions within the Natural Core Area. The only area of disturbance will be limited to the requirement to install one culvert in order to maintain south to northward flow under a new proposed collector road, required to connect the east and west development lands.

In accordance with DFO's Projects Near Water review process, new culverts proposed, where a crossing doesn't currently exist, is a project activity that is anticipated to require submission to DFO for review under a Request for Review. Structure design should consider minimizing impact to the extent possible on the Tributary through minimizing culvert length, spanning the bankfull channel width, embedment or open bottom structure. In this case, if the culvert can be designed with minimal residual effect on fish habitat, then DFO is anticipated to conclude that a Letter of Advice approval is sufficient. For a culvert of this size, with no requirement for channel realignment or resulting channel losses, it is anticipated that an authorization would not be required under the current Fisheries review process.

The development proposal identifies four blocks for stormwater management as shown on Figure 3. SWM design will occur as a component of the Stormwater Management Plan and Functional Servicing Plan, which will identify design criteria, outfall location and strategy for ultimately discharging flows to the receiver body, the Tributary of Lovers Creek. Design will need to satisfy the SWM Guidelines of the LSRCA, to ensure that the SWM plan satisfies environmental criteria of the Ministry of Environment, Conservation and Parks SWM manual, LSRCA development policies, Provincial Policy Statement and LSPP. SWM review should occur in detail design in order to confirm



potential environmental impacts, mitigation requirements, and permitting. Should SWM discharge or outfall structures be proposed in or near water, it should be reviewed by a qualified fisheries ecologist to confirm if a DFO Self Assessment is required.

Drainage Ditch B will remain within the Natural Core Area, within the Natural Heritage System (Figure 3). Development is not anticipated to alter this feature.

Drainage Ditch C, on adjacent lands, will not be impacted by the proposed development. Proposed development is located on the north side of Lockhart Road.

A feature-based water balance will be required prior to final plan approval and any major site alteration to determine if any indirect impacts will result from the proposed development, this will include an assessment of potential impacts to the Tributary and Drainage Ditch B. Baseflow contributions to the Tributary should be maintained post-development in order to sustain the temperature profile of the Tributary.

8.5 Potential Habitat for Threatened and Endangered Species

8.5.1 Bat Species

The forest communities on the property are all contained within the City's Natural Core Area, thus, surveys to map potential bat maternity roost trees were not completed as this habitat will be retained post-development. Only minor tree removals may be required to facilitate the construction of the collector road across the Tributary of Lovers Creek. As such, mitigation measures are recommended to avoid incidental contravention of the ESA. Therefore, the proposed development is not expected to negatively impact the potential habitat for Endangered bat species on the property and no potential contraventions of Section 10 of the ESA are expected to result provided the recommended mitigation measures are adhered to.

8.5.2 Blanding's Turtle

Lovers Creek Swamp PSW may provide habitat for this species, as there is standing water that may persist year round. The wetland communities on-site will be retained post development as these areas have been designated as part of the City's Natural Core Area. As such, the proposed development is not expected to negatively impact the potential habitat for Blanding's Turtle within the study area and no potential contraventions of Section 10 of the ESA are expected to result. Notwithstanding, mitigation is proposed below to avoid accidental contraventions of Section 9 of the ESA.

Should individuals be identified on the site in the future, or new information becomes available indicating that the MNRF has records of Blanding's Turtle within 2 km of the study area, additional review of potential for impact to Blanding's Turtle is recommended



prior to moving forward with any future development to avoid contraventions under the ESA.

9.0 RECOMMENDATIONS

9.1 Significant Wetland

9.1.1 Setback

A 30m setback will be maintained from the Significant Wetland within the Natural Core Area. This buffer should be delineated with a fence post-development.

As highlighted within the Hewitt's Secondary Plan Area Subwatershed Impact Study: Lovers Hewitt's and Sandy Cove Creeks (2016), encroachment into the first 15m of the buffer (adjacent to the development) may be permitted for only limited use associated with the Stormwater Management Facility and should not extend beyond the location of the Stormwater Management Facility.

9.1.2 General

Wetland communities and the Tributary of Lovers Creek are to be protected at all times from any excavated and erodible soils. This can be accomplished through the use of properly placed, installed and maintained sediment controls [sediment barriers, flow checks (straw or rock), enviobags, *etc.*]. All equipment should be stored, serviced and refuelled more than 30m away from the wetland and watercourse.

9.2 Significant Woodland

A 30m setback will be maintained from the forest and forested swamp communities within the Natural Core Area. This buffer should be delineated with a fence post-development.

As highlighted within the Hewitt's Secondary Plan Area Subwatershed Impact Study: Lovers Hewitt's and Sandy Cove Creeks (2016), encroachment into the first 15m of the buffer (adjacent to the development) may be permitted for only limited use associated with the Stormwater Management Facility and should not extend beyond the location of the Stormwater Management Facility.

As agreed upon with LSRCA, a 5m setback from the staked feature limit will be maintained from the hedgerow to the east of the Cultural Woodland Community (CUW1; Figure 2).



9.3 Species at Risk

9.3.1 General Species at Risk Recommendations

This report is intended as a point in time assessment of the potential to impact Species at Risk; not to provide long term “clearance” for Species at Risk. While there is no expectation that the assessment should change significantly, it is the responsibility of the proponent to ensure that they are not in contravention of the *ESA* at the time that site works are undertaken. A review of the assessment provided in this report by a qualified person should be sufficient to provide appropriate advice at the time of the onset of future site works.

9.3.2 Barn Swallow

A search should be conducted for Barn Swallow nests prior to any site alteration or construction (*i.e.* demolition) of the surfaces of all existing structures (*i.e.* silos). If a Barn Swallow nest is encountered, appropriate steps as per Ontario Regulation 242/08 should be followed, to ensure compliance with the *ESA*.

9.3.3 Endangered Bat Species

Construction activities involving tree removal should be restricted from occurring between **April 1 to October 31**. This will ensure that no bats actively roosting in trees will be killed or harmed as a result of clearing activities.

9.4 Migratory Breeding Birds

Activities involving the removal of vegetation should be restricted from occurring during the breeding season. Migratory birds, nests, and eggs are protected by the *Migratory Birds Convention Act* and the *Fish and Wildlife Conservation Act*, 1997. Environment Canada outlines dates when activities in any region have potential to impact nests at the Environment Canada Website (http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_03). In Zones C1 and C2 vegetation clearing and building demolition should be avoided between **April 1st through August 30th** of any given year. If work requires that vegetation clearing and building demolition is required between these dates screening by an ecologist with knowledge of bird species present in the area could be undertaken to ensure that the vegetation and silos have been confirmed to be free of nests prior to clearing.

9.5 Fish and Fish Habitat

To protect fish habitat during site development, all in-water work is prohibited from October 1 to May 31 in accordance with the coldwater fisheries timing window (LSRCA, 2012). Near water work can occur outside this timing however mitigation measures are necessary to avoid causing serious harm to fish under the Federal *Fisheries Act*.



9.5.1 Restoration

It is recommended that, where possible, the lands within the 30m setback on the western side of Lovers Creek (until the northern extent of the western cropland section is reached), should be restored with native seed and/or plantings to enhance or create a riparian buffer that will better protect the creek from runoff. Additional erosion controls should also be implemented on any exposed soils. The southern section of the Tributary of Lovers Creek on the property, which has little existing riparian vegetation, would also benefit from dogwood and willow live stakes by the western streambank to help establish shrub cover amongst the band of grasses that currently grow there.

9.6 Sediment and Erosion Controls

The development plan will require a detailed ESC plan for all stages of development to ensure that the watercourse, the natural heritage core areas and buffer zone are protected at all times.

9.7 Operations

All maintenance activities required during future construction should be conducted at least 30 m away from natural areas including woodlands and wetlands to prevent accidental spillage of deleterious substances that may harm natural environments.

10.0 CONCLUSIONS

Based upon our analysis, it is concluded that the environmental conditions will not limit the implementation of the proposed development through incorporation of the environmental protection measures and criteria as described throughout this report.

The buffer width, as approved by the Ontario Municipal Board, was added to the feature limit to define the development limit for the preparation of the draft plans of subdivision. Therefore, our assessment has assessed the significant features as approved by the province, the City and the LSRCA.

Our findings are summarized as follows:

1. The confirmed Natural Heritage System and associated buffers depicted within the NHE are consistent with the development limits approved by the City of Barrie, LSRCA and the Ontario Municipal Board.



2. An analysis of the proposed buffers has been undertaken and it has been determined that the proposed buffers adjacent to the Significant Natural Heritage Features within the Natural Core Area are sufficient to protect the overall form and ecological functions for which the Natural Heritage System has been identified.
3. Our impact assessment has given full consideration to the habitat requirements of all Species at Risk assumed and/or documented to occur in the area and results indicate the proposed development will not result in negative direct or indirect impacts to habitat of Species at Risk providing conformance is demonstrated to mitigation measures described in Section 9.
4. The proposed works are not expected to negatively impact the ecological functions of Significant Woodland, Significant Wetland, or Candidate Significant Wildlife Habitat outlined in Section 6 if the appropriate mitigation measures outlined in Section 9 are followed.
5. DFO review is anticipated to be required for any structure crossing on the Tributary of Lovers Creek.
6. A feature-based water balance will be required at detail design stage to determine if any indirect impacts will result from the proposed development.

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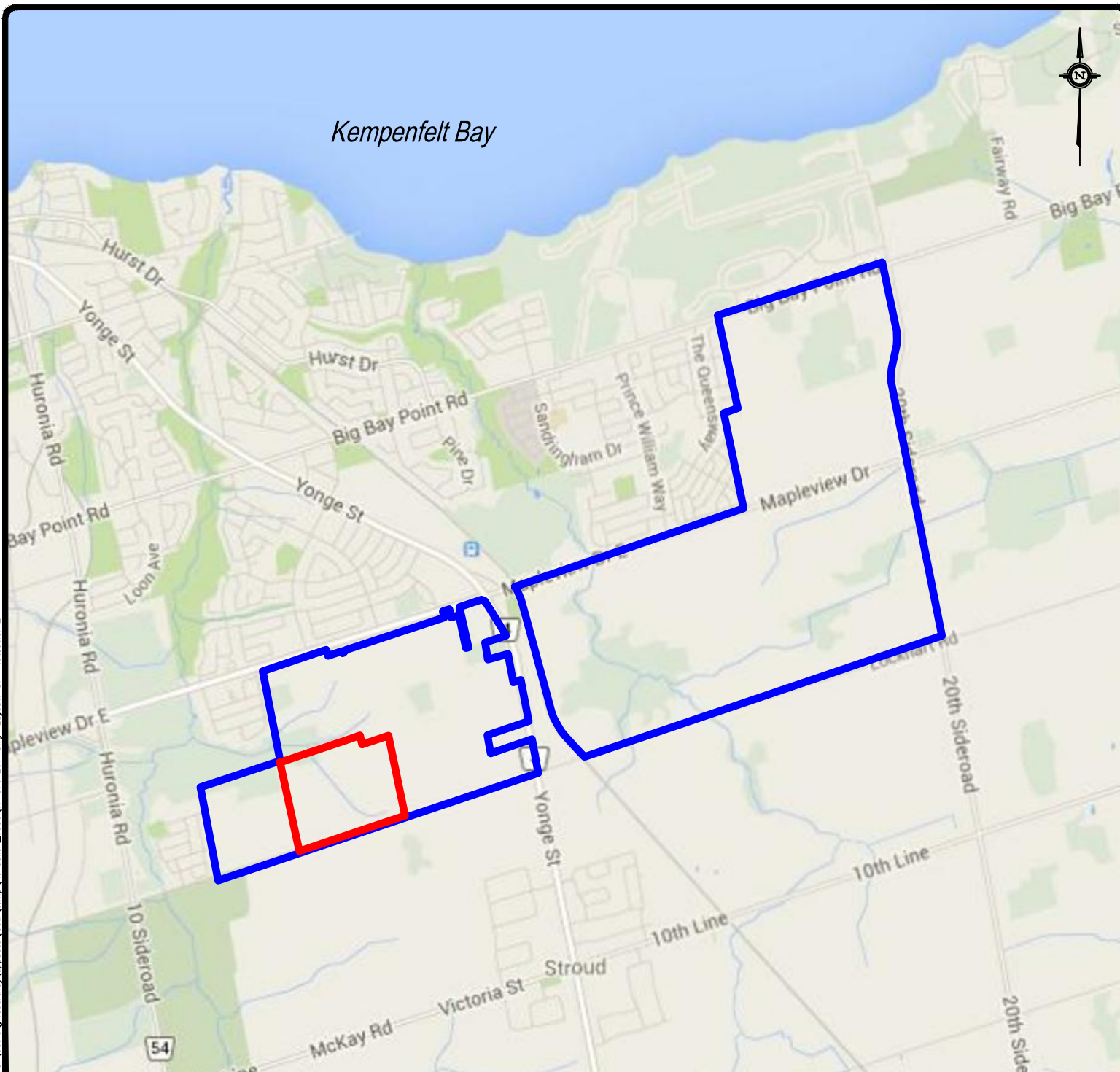
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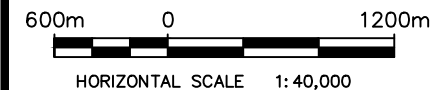
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LEGEND:

- Approx. Property Boundary
- Hewitt's Secondary Plan Area



AZIMUTH ENVIRONMENTAL CONSULTING, INC.

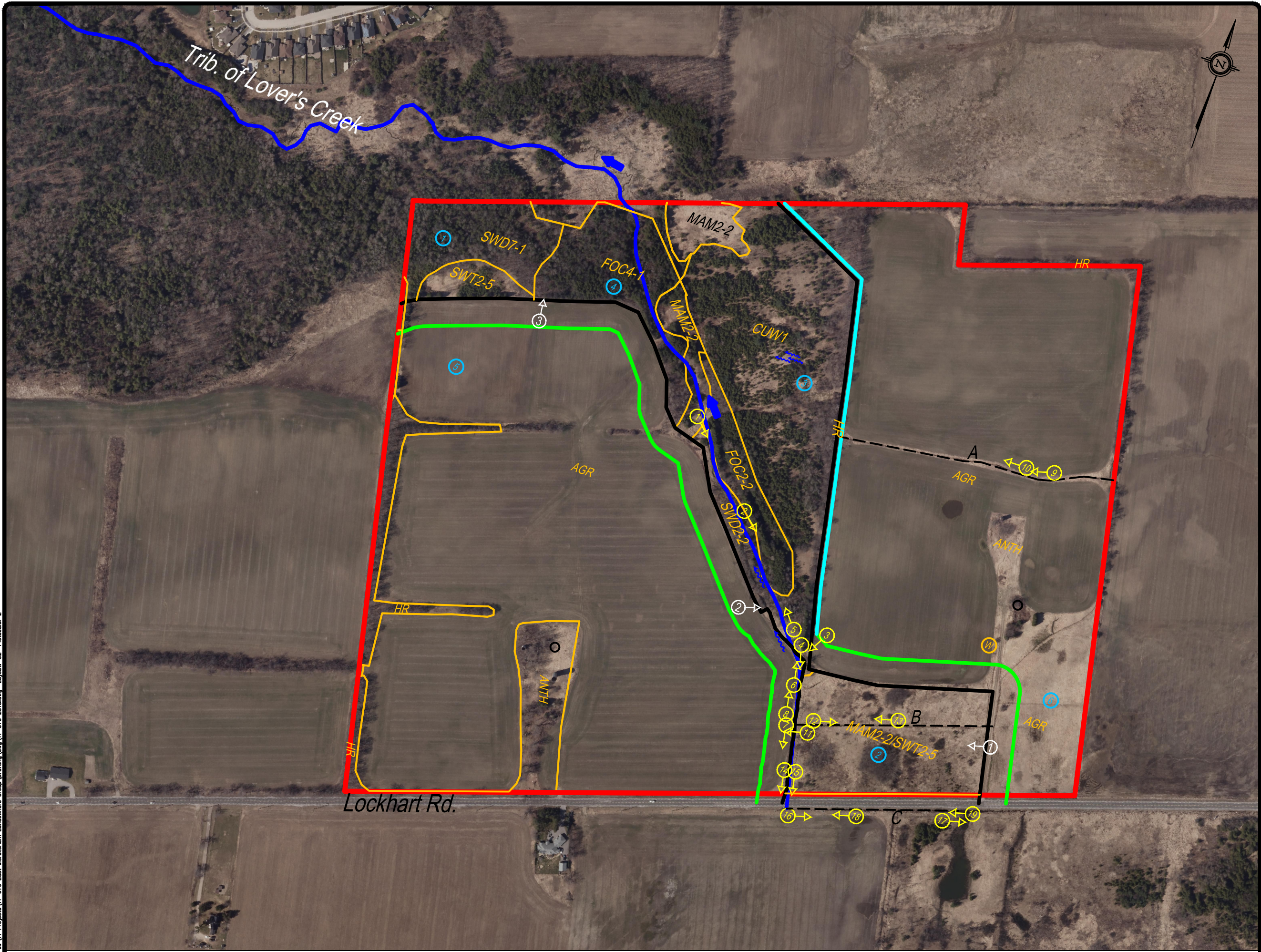
Study Area Location

Lockhart Innisfil

Hewitt's Secondary Plan
 Barrie, ON

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PROJECT NO.: 11-076g	
REFERENCE: Google Maps	

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LEGEND:

- Property Boundary/Study Area
- Watercourse
- Drainage Ditch
- Direction of Flow
- Groundwater Seeps
- Amphibian Survey Stations (white)
- Photo Stations and Direction
- Bird Survey Stations
- Whip-poor-will Survey Station
- Silo
- Significant Natural Heritage Feature
- 30m Buffer to Significant Natural Heritage Feature (Natural Core Area)
- 5m Buffer to Significant Natural Heritage Feature (Natural Core Area)
- Vegetation Communities

CUW1 Mineral Cultural Woodland Type
FOC2-2 Dry-Fresh White Cedar Deciduous Forest Type
FOC4-1 Fresh-Moist White Cedar Coniferous Forest Type
HR Hedgerow
MAM2-2 Reed Canary Grass Mineral Meadow Marsh Type
SWD2-2 Green Ash Mineral Deciduous Swamp Type
SWD7-1 White Birch-Poplar Organic Deciduous Swamp Type
SWT2-5 Red-osier Mineral Thicket Swamp Type

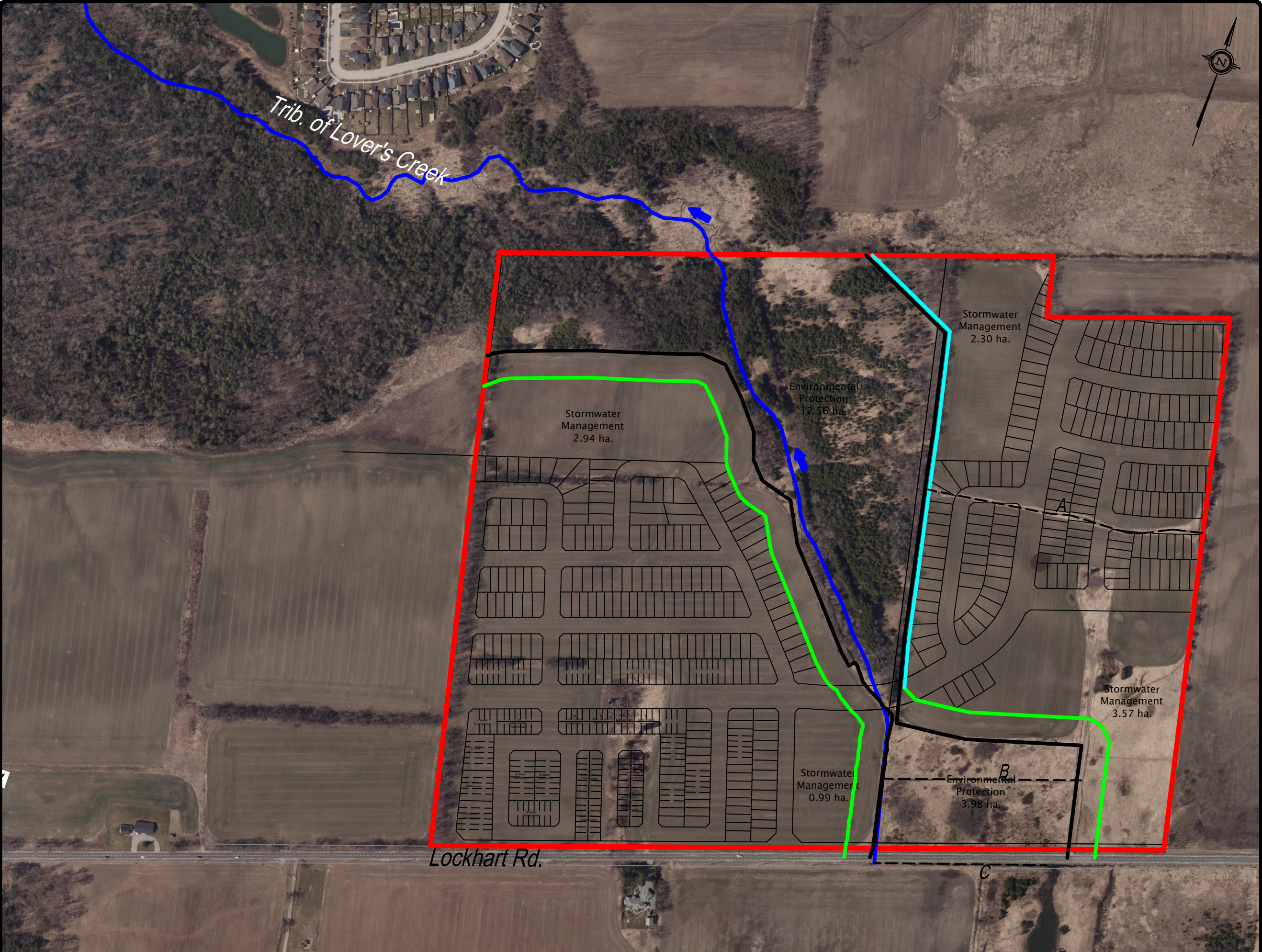
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Environmental Features

Lockhart Innisfil Investments Ltd.
Hewitt's Secondary Plan, Barrie, ON

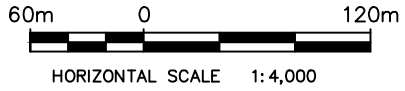
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REFERENCE:	First Base Solutions	

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LEGEND:

- Property Boundary/Study Area
- Watercourse
- Drainage Ditch
- Significant Natural Heritage Feature
- 30m Buffer to Significant Natural Heritage Feature (Natural Core Area)
- 5m Buffer to Significant Natural Heritage Feature (Natural Core Area)



Proposed Development

Lockhart Innisfil Investments Ltd.
Hewitt's Secondary Plan, Barrie, ON

DATE ISSUED:	October 2017	Figure No. 3
CREATED BY:	JLM	
PROJECT NO.:	11-076g	
REFERENCE:	First Base Solutions	

Table 1. Ecological Land Classification.

Ecological Land Classification						
System	Community Class	Community Series	Ecosite	Vegetation Type	Composition	Ground Cover
Wetland	MA, Marsh	MAM, Meadow Marsh	MAM2, Mineral Meadow Marsh	MAM2-2, Reed-canary Grass Graminoid Mineral Meadow Marsh	Scattered shrub-sized willow species, Red-osier Dogwood , Eastern White Cedar, Green Ash, Scotch Pine and Trembling Aspen	Dominated by Reed-canary Grass, with occasional forb species, such as Grass-leaved Goldenrod, Swamp Aster, Spotted Joe Pye-weed and Marsh Marigold
Wetland	SW, Swamp	SWT, Thicket Swamp	SWT2, Mineral Thicket Swamp	SWT2-5, Red-Osier Mineral Thicket Swamp	Dominated by Red-osier Dogwood, with abundance of White Cedar. Occurrence of Speckled Alder and Alternate-leaved Dogwood	Occurrence of Reed Canary Grass, Dark-green Bulrush, and other graminoids
Wetland	SW, Swamp	SWD, Deciduous Swamp	SWD2, Ash Mineral Deciduous Swamp	SWD2-2, Green Ash Mineral Deciduous Swamp Type	Co-dominated by Green Ash and Crack Willow. Occurrence of Manitoba Maple, Black Cherry, White Cedar, Crabapple, Red-osier Dogwood, Trembling Aspen, Honeysuckle, Altenated-leaf Dogwood, Paper Birch, Nanyberry	Abundance of Swamp Currant. Occurrence of Meadow Horsetail, Chokecherry, Sensitive Fern, Raspberry, Strawberry, marsh Marigold, Jewellweed and Garlic Mustard
Wetland	SW, Swamp	SWD, Deciduous Swamp	SWD7, Birch-Poplar Organic Deciduous Swamp	SWD7-1, White Birch-Poplar Organic Deciduous Swamp	Canopy co-dominated by Balsam Poplar and Green Ash, with occurrence of White Birch and Silver Maple.Understory dominated by White Cedar, with occurrence of Balsam Fir and Round-leaf Dogwood	Occasional Woodland Sedge, Canada Mayflower, wood fern species, horsetail, Herb-robert. Rare occurrence of Sensitive Fern and Cinamon Fern
Terrestrial	FO, Forest	FOC, Coniferous Forest	FOC2, Dry-Fresh Cedar Coniferous Forest	FOC2-2, Dry-Fresh White Cedar Coniferous Forest	Very dense White Cedar stand.	Little to no understory, sparce ferns
Terrestrial	FO, Forest	FOC, Coniferous Forest	FOC4, Fresh-Moist White Cedar Coniferous Forest	FOC4-1, Fresh-Moist White Cedar Coniferous Forest	Dense patch of White Cedar, with no understory	Scattered ferns
Terrestrial	CU, Cultural	CUW, Cultural Woodland	CUW1, Mineral Cultural Woodland	CUW1	Canopy dominated by White Cedar and occasional Scotch Pine. Occurrence of Trembling Aspen, Black Cherry, White Birch, Red-osier Dogwood and Pussy Willow	Abundance of Tall Goldenrod and Grass-leaved Goldenrod. Occasional New England Aster, Panicked Aster, Milkweed, Wild Strawberry and Reed Canary Grass

Table 2. Vascular Plants List.

										Conservation Rank ^C			
Family	Scientific Name ^A	Common Name	SWT2-5	SWD2-2	SWD7-1	MAM2-2	FOC2-2	FOC4-1	CUW1	LSRCA	S-Rank	G-Rank	ESA
Aceraceae	<i>Acer negundo</i>	Manitoba Maple		X		X			X	+	S5	G5	
Aceraceae	<i>Acer saccharinum</i>	Silver Maple			X						S5	G5	
Aceraceae	<i>Acer saccharum</i>	Sugar Maple							X		S5	G5	
Anacardiaceae	<i>Rhus typhina</i>	Staghorn Sumac							X		S5	G5	
Apiaceae	<i>Daucus carota</i>	Wild Carrot							X	+	SNA	GNR	
Araceae	<i>Arisaema triphyllum</i>	Jack-in-the-pulpit			X						S5	G5	
Asclepiadaceae	<i>Asclepias incarnata</i>	Swamp Milkweed				X					S5	G5	
Asclepiadaceae	<i>Asclepias syriaca</i>	Common Milkweed							X		S5	G5	
Asteraceae	<i>Arctium minus</i>	Common Burdock							X	+	SNA	GNR	
Asteraceae	<i>Cirsium vulgare</i>	Bull Thistle							X	+	SNA	GNR	
Asteraceae	<i>Eupatorium perfoliatum</i>	Common Boneset				X					S5	G5	
Asteraceae	<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod				X			X		S5	G5	
Asteraceae	<i>Eutrochium sp.</i>	Joe Pye Weed				X			X				
Asteraceae	<i>Hieracium lachenalii</i>	Common Hawkweed							X	+	SNA	GNR	
Asteraceae	<i>Inula helenium</i>	Elecampane							X	+	SNA	GNR	
Asteraceae	<i>Onopordum acanthium</i>	Scotch Cotton-thistle							X		SNA	GNR	
Asteraceae	<i>Solidago altissima</i>	Eastern Late Goldenrod							X		S5	GNR	
Asteraceae	<i>Solidago canadensis</i>	Canada Goldenrod							X		S5	G5T5	
Asteraceae	<i>Sonchus oleraceus</i>	Common Sow-thistle							X		SNA	GNR	
Asteraceae	<i>Symphyotrichum lanceolatum</i>	Panicled Aster							X		S5	G5T5	
Asteraceae	<i>Symphyotrichum lateriflorum</i>	Starved Aster							X		S5	G5	
Asteraceae	<i>Symphyotrichum novae-angliae</i>	New England Aster				X			X		S5	G5	
Asteraceae	<i>Symphyotrichum puniceum</i>	Swamp Aster				X			X		S5	G5	
Asteraceae	<i>Symphyotrichum urophyllum</i>	Arrow-leaved Aster							X	W	S4	G4G5	
Asteraceae	<i>Taraxacum officinale</i>	Common Dandelion	X						X	+	SNA	G5	
Asteraceae	<i>Tussilago farfara</i>	Colt's-foot							X	+	SNA	GNR	
Balsaminaceae	<i>Impatiens capensis</i>	Spotted Jewelweed		X							S5	G5	
Betulaceae	<i>Alnus incana</i>	Speckled Alder	X								S5	G5	
Betulaceae	<i>Betula papyrifera</i>	Paper Birch		X	X				X		S5	G5	
Brassicaceae	<i>Alliaria petiolata</i>	Garlic Mustard		X						+	SNA	GNR	
Brassicaceae	<i>Cardamine diphylla</i>	Two-leaved Toothwort			X				X		S5	G5	
Caprifoliaceae	<i>Lonicera canadensis</i>	Canada Fly Honeysuckle							X		S5	G5	
Caprifoliaceae	<i>Lonicera tatarica</i>	Tartarian Honeysuckle		X					X	+	SNA	GNR	
Caprifoliaceae	<i>Sambucus racemosa</i>	Red Elderberry							X		S5	G5	
Caprifoliaceae	<i>Viburnum lentago</i>	Nannyberry		X							S5	G5	
Caprifoliaceae	<i>Viburnum opulus</i>	Highbush Cranberry							X	+	S5	GNR	
Cornaceae	<i>Cornus alternifolia</i>	Alternate-leaved Dogwood		X							S5	G5	
Cornaceae	<i>Cornus stolonifera</i>	Red-osier Dogwood	X	X		X			X		S5	G5	
Cupressaceae	<i>Thuja occidentalis</i>	Eastern White Cedar	X	X	X	X	X	X	X		S5	G5	
Cyperaceae	<i>Carex sp.</i>	Sedge	X										
Cyperaceae	<i>Scirpus atrovirens</i>	Dark-green Bulrush	X								S5	G5?	
Dryopteridaceae	<i>Onoclea sensibilis</i>	Sensitive Fern		X	X						S5	G5	

Table 2. Vascular Plants List.

										Conservation Rank ^C			
Family	Scientific Name ^A	Common Name	SWT2-5	SWD2-2	SWD7-1	MAM2-2	FOC2-2	FOC4-1	CUW1	LSRCA	S-Rank	G-Rank	ESA
Equisetaceae	<i>Equisitum sp.</i>	Horsetail		X	X								
Equisetaceae	<i>Equisetum arvense</i>	Field Horsetail		X					X		S5	G5	
Equisetaceae	<i>Equisetum sylvaticum</i>	Woodland Horsetail							X	W	S5	G5	
Fabaceae	<i>Trifolium dubium</i>	Suckling Clover							X		SNA	GNR	
Geraniaceae	<i>Geranium robertianum</i>	Herb-Robert							X		S5	G5	
Grossulariaceae	<i>Ribes americanum</i>	Wild Black Currant			X				X		S5	G5	
Grossulariaceae	<i>Ribes triste</i>	Swamp Red Currant		X							S5	G5	
Lamiaceae	<i>Lycopus americanus</i>	American Water-horehound		X		X					S5	G5	
Lamiaceae	<i>Prunella vulgaris</i>	Heal-all							X	(+)			
Liliaceae	<i>Clintonia borealis</i>	Blue Bead-lily							X		S5	G5	
Liliaceae	<i>Erythronium americanum</i>	Yellow Trout-lily							X		S5	G5	
Liliaceae	<i>Trillium grandiflorum</i>	White Trillium							X		S5	G5	
Oleaceae	<i>Fraxinus americana</i>	White Ash							X		S4	G5	
Oleaceae	<i>Fraxinus nigra</i>	Black Ash		X							S4	G5	
Oleaceae	<i>Fraxinus pennsylvanica</i>	Green Ash		X	X	X			X		S4	G5	
Pinaceae	<i>Abies balsamea</i>	Balsam Fir			X				X	+	S5	G5	
Pinaceae	<i>Pinus sylvestris</i>	Scotch Pine				X			X		SNA	GNR	
Poaceae	<i>Bromus inermis</i>	Awnless Brome							X	+	SNA	G5TNR	
Poaceae	<i>Dactylis glomerata</i>	Orchard Grass							X	+	SNA	GNR	
Poaceae	<i>Phalaris arundinacea</i>	Reed Canary Grass	X			X			X	(+)	S5	G5	
Poaceae	<i>Phleum pratense</i>	Common Timothy							X	+	SNA	GNR	
Rhamnaceae	<i>Frangula alnus</i>	Glossy Buckthorn							X	+	SNA	GNR	
Ranunculaceae	<i>Caltha palustris</i>	Yellow Marsh Marigold		X	X	X					S5	G5	
Ranunculaceae	<i>Clematis virginiana</i>	Virginia Virgin's-bower							X		S5	G5	
Rosaceae	<i>Agrimonia eupatoria</i>	European Agrimony							X		SNA	GNR	
Rosaceae	<i>Amelanchier laevis</i>	Smooth Serviceberry							X		S5	G4G5Q	
Rosaceae	<i>Fragaria virginiana</i>	Wild Strawberry		X					X		S5	G5	
Rosaceae	<i>Malus coronaria</i>	Sweet Crabapple		X							S4	G5	
Rosaceae	<i>Malus pumila</i>	Common Apple							X	+	SNA	G5	
Rosaceae	<i>Prunus serotina</i>	Wild Black Cherry		X					X		S5	G5	
Rosaceae	<i>Prunus virginiana</i>	Choke Cherry		X							S5	G5	
Rosaceae	<i>Rosa sp.</i>	Rose							X				
Rosaceae	<i>Rubus idaeus</i>	Common Red Raspberry		X					X	+	SNA	G5T5	
Rubiaceae	<i>Galium boreale</i>	Northern Bedstraw							X	W	S5	G5	
Salicaceae	<i>Populus balsamifera</i>	Balsam Poplar			X						S5	G5	
Salicaceae	<i>Populus tremuloides</i>	Trembling Aspen		X		X			X		S5	G5	
Salicaceae	<i>Salix bebbiana</i>	Bebb's Willow				X					S5	G5	
Salicaceae	<i>Salix discolor</i>	Pussy Willow				X			X		S5	G5	
Salicaceae	<i>Salix euxina</i>	Crack Willow		X						+	SNA	GNR	
Salicaceae	<i>Salix petiolaris</i>	Meadow Willow							X		S5	G5	
Salicaceae	<i>Salix sp.</i>	Willow				X							
Tiliaceae	<i>Tilia americana</i>	American Basswood							X		S5	G5	

Table 2. Vascular Plants List.

										Conservation Rank ^C			
Family	Scientific Name ^A	Common Name	SWT2-5	SWD2-2	SWD7-1	MAM2-2	FOC2-2	FOC4-1	CUW1	LSRCA	S-Rank	G-Rank	ESA
Typhaceae	<i>Typha latifolia</i>	Broad-leaved Cattail	X								S5	G5	
Ulmaceae	<i>Ulmus americana</i>	American Elm	X						X		S5	G5?	
Vitaceae	<i>Parthenocissus quinquefolia</i>	Virginia Creeper	X								S4?	G5	
Vitaceae	<i>Vitis riparia</i>	Riverbank Grape				X			X		S5	G5	

^A Nomenclature based on Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC),

^B ELC Codes based on Ecological Land Classification for Southern Ontario manual (Lee *et al.* 1998, Lee 2009). See Figure 2.

^C Conservation Rankings:

LSRCA - W (Rare in the Lake Simcoe Watershed), + (Non-native), (+) (Invasive)

S-rank = Sub-national/provincial scale (from 1-5); S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common; NA – Not Applicable because not a suitable conservation target

G-Rank = Global scale (from 1-5); G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 – Secure/Common; NR – Not Ranked, T – Intraspecific Taxon/Trinomial (*e.g.* subspecies)

ESA - EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern)

ESA Blank Cell = Species Not at Risk Provincially

Table 3. Bird Species List.

FamilyScientific NameEnglish Common Name ^A			Breeding Bird Survey Data (2014)												
			Point Count Stations ^{B,C,D}						Incidental ^E	Breeding Evidence ^F	Area-sensitive? ^G				
			1 ^{2,4}	2 ^{2,4}	3 ^{1,3}	4 ^{1,3}	5 ⁴	6 ^{1,3}				S RANK	G RANK	SARO	
Alcedinidae	<i>Megaceryle alcyon</i>	Belted Kingfisher							,H		No	No	S4B	G5	
Anatidae	<i>Anas platyrhynchos</i>	Mallard								X	No	No	S5	G5	
Ardeidae	<i>Butorides virescens</i>	Green Heron		,H							Po	No	S4B	G5	
Cardinalidae	<i>Cardinalis cardinalis</i>	Northern Cardinal				,S					Po	No	S5	G5	
Cardinalidae	<i>Passerina cyanea</i>	Indigo Bunting			,S			,S		X	Po	No	S4B	G5	
Charadriidae	<i>Charadrius vociferus</i>	Killdeer							,S	X	Po	No	S5B,S5N	G5	
Corvidae	<i>Corvus brachyrhynchos</i>	American Crow	H,	H,H	,H	,H				X	Po	No	S5B	G5	
Corvidae	<i>Cyanocitta cristata</i>	Blue Jay			S,S					X	Pr	No	S5	G5	
Emberizidae	<i>Melospiza melodia</i>	Song Sparrow		S,S	,S				S,S	X	Pr	No	S5B	G5	
Emberizidae	<i>Passerculus sandwichensis</i>	Savannah Sparrow								X	No	Yes	S4B	G5	
Emberizidae	<i>Poocetes gramineus</i>	Vesper Sparrow						,S			Po	No	S4B	G5	
Fringillidae	<i>Carduelis tristis</i>	American Goldfinch		S,S	,H			,S	,S	X	Pr	No	S5B	G5	
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow							,Foraging		Po	No	S4B	G5	THR
Hirundinidae	<i>Tachycineta bicolor</i>	Tree Swallow							,H		Po	No	S4B	G5	
Icteridae	<i>Agelaius phoeniceus</i>	Red-winged Blackbird		P,H					S,P	X	Pr	No	S4	G5	
Icteridae	<i>Molothrus ater</i>	Brown-headed Cowbird						,S	S,	X	Po	No	S4B	G5	
Icteridae	<i>Sturnella magna</i>	Eastern Meadowlark							S,	X	Po	Yes	S4B	G5	THR
Laridae	<i>Larus delawarensis</i>	Ring-billed Gull							H,		Po	No	S5B,S4N	G5	
Mimidae	<i>Dumetella carolinensis</i>	Gray Catbird							,S	X	Po	No	S4B	G5	
Paridae	<i>Poecile atricapillus</i>	Black-capped Chickadee	,S		S,					X	Po	No	S5	G5	
Parulidae	<i>Geothlypis trichas</i>	Common Yellowthroat		S,S	S,			,S	S,		Pr	No	S5B	G5	
Parulidae	<i>Setophaga petechia</i>	Yellow Warbler		S,S					S,	X	Pr	No	S5B	G5	
Parulidae	<i>Setophaga ruticilla</i>	American Redstart								X	No	No	S5B	G5	
Phasianidae	<i>Meleagris gallopavo</i>	Wild Turkey							H,	X	Po	No	S5	G5	
Picidae	<i>Colaptes auratus</i>	Northern Flicker			S,						Po	No	S4B	G5	
Picidae	<i>Picoides pubescens</i>	Downy Woodpecker	,S								Po	No	S5	G5	
Sittidae	<i>Sitta carolinensis</i>	White-breasted Nuthatch						,S		X	Po	Yes	S5	G5	
Troglodytidae	<i>Troglodytes aedon</i>	House Wren	,S		S,				,S	X	Po	No	S5B	G5	
Turdidae	<i>Hylocichla mustelina</i>	Wood Thrush	S,								Po	No	S4B	G5	SC
Turdidae	<i>Turdus migratorius</i>	American Robin		,H						X	Po	No	S5B	G5	
Tyrannidae	<i>Contopus virens</i>	Eastern Wood-pewee								X	No	No	S4B	G5	SC
Tyrannidae	<i>Empidonax alnorum</i>	Alder Flycatcher		S,	S,						Po	No	S5B	G5	
Tyrannidae	<i>Empidonax traillii</i>	Willow Flycatcher		S,S							Pr	No	S5B	G5	
Tyrannidae	<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S,S		S,	S,S	,S			X	Pr	No	S4B	G5	
Vireonidae	<i>Vireo gilvus</i>	Warbling Vireo			,S					X	Po	No	S5B	G5	
Vireonidae	<i>Vireo olivaceus</i>	Red-eyed Vireo	S,S		,S	S,				X	Pr	No	S5B	G5	

^ANomenclature based on Ontario Ministry of Natural Resources (OMNR), Natural Heritage Information Centre (NHIC) database - <http://nhic.mnr.gov.on.ca/MNR/nhic/species.cfm>.

^BSurveys Conditions:

¹June 02, 2014; Start Time 0702hr/ End Time 0755hr; Temperature Start +10°C/Temperature End +18°C; Wind B2 S; Cloud Cover 0%; Precipitation Nil; Observer L. Moran

²June 06, 2014; Start Time 0755hr/ End Time 0844hr; Temperature Start +11°C/Temperature End +14°C; Wind B2-B3 W; Cloud Cover 0%; Precipitation Nil; Observer L. Moran

³June 18, 2014; Start Time 0711hr/ End Time 0957hr; Temperature +16°C; Wind B1; Cloud Cover 100%; Precipitation Nil; Observer L. Moran

⁴June 21, 2014; Start Time 0711hr/ End Time 0830hr; Temperature +15°C; Wind B0-B1; Cloud Cover 70%; Precipitation Nil; Observer L. Moran

^CBreeding Evidence Codes: Entry examples **S,S** - Singing Male detected during first survey and second survey; **S**, Singing male detected during first survey only; **,S** Singing male detected during second survey only

^DOBBA Breeding Evidence Codes:

OBSERVED

FO - Fly Over

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 present, or breeding calls heard, in suitable nesting habitat in nesting season.

PROBABLE

P -Pair observed in suitable nesting habitat in nesting season.

T - Permanent territory presumed through registration of territorial behaviour (e.g. song) on at least two days, a week or more apart, at the same place.

A - Agitated behaviour or anxiety calls of an adult.

N - Nest building or excavation of nest hole.

^ESpecies detected outside of formal breeding bird surveys.

^FBreeding Assessment

Y - Breeding confirmed on or adjacent to property

Pr - Probably breeding on or adjacent to property

Po - Possibly breeding on or adjacent to property

N - Species observed but no evidence of breeding on or adjacent to property.

^GAccording to Appendix G of Significant Wildlife Habitat Technical Guide (2000)

^HConservation Rank - from OMNRF, NHIC and SARO Lists 2014

RCC - Regional Conservation Concern according to Ontario Partners in Flight (2008)*

S-rank - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common

G-Rank - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure

SARO - EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern)

Table 4. Amphibian Species List.

			Survey Stations ^{A,B,C} (Code - Est.#) ^D				Conservation Ranks ^E		
Family	Scientific Name	Common Name	1	2	3	Outside Stations (Incidental)	Provincial Status	G-Rank	S-Rank
Hylidae	<i>Hyla versicolor</i>	Gray Treefrog	1-2 ^C	1-4 ^C				G5	S5
Hylidae	<i>Pseudacris crucifer</i>	Spring Peeper	2-2 ^A , 1-1 ^B	2-6 ^A		2-3 ^A , 1-2 ^B		G5	S5
Hylidae	<i>Pseudacris triseriata</i>	Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield Population)	2-6 ^A	2-3 ^A		1-1 ^B	NAR	G5TNR	S3
Ranidae	<i>Lithobates sylvaticus</i>	Wood Frog	2-5 ^A					G5	S5
Ranidae	<i>Rana clamitans</i>	Green Frog	1-8 ^C					G5	S5

Observation Conditions
^AApril 28, 2014; Start Time 2157hrs/End Time 2215hrs; Temperature +8°C; Wind B2 SE; Cloud Cover 20%; Precipitation Nil; Observer L. Moran
^BMay 19, 2014; Start Time 2328hrs/End Time 2340hrs; Temperature +12°C; Wind B1 NW; Cloud Cover Nil; Precipitation Nil; Observer L. Moran
^CJune 29, 2014; Start Time 0012hrs/End Time 0030hrs; Temperature +21°C; Wind B0; Cloud Cover 0%; Precipitation Nil; Observer BAC

^DCodes (according to Marsh Monitoring Protocol)
Code 1: individual calls do not overlap and calling individuals can be discretely counted;
Code 2: calls of individuals sometimes overlap, but numbers of individuals can still be estimated;
Code 3: overlap among calls seems continuous (full chorus), and a count estimate is impossible;

^EConservation Rank - from OMNRF, NHIC and SAR Lists 2014
Provincial Rank (S-rank) - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common
Global Rank (G-Rank) - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure
SARO - EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern)

Table 5. Species at Risk Habitat Summary and Assessment.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species ¹	Assessment
Restricted Species	<i>Not Applicable</i>	END	END	Broadly speaking, this species is associated with hardwood deciduous vegetation units ESA Protection: Species and regulated habitat protection	This species was not documented during Azimuth's field investigations.
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SC	No status	Nests are typically found near the shoreline of lakes or large rivers, often on forested islands (Cadman <i>et al.</i> , 2007). ESA Protection: N/A	Habitat is not representative of key habitat - no lakes or large rivers within study area. Species not expected to be present on or adjacent to the property.
Bank Swallow	<i>Riparia riparia</i>	THR	No status	Nests in burrows excavated in natural and human-made settings with vertical sand and silt faces. Commonly found in sand or gravel pits, road cuts, lakeshore bluffs, and along riverbanks (COSEWIC, 2013c). ESA Protection: Species and general habitat protection	Species not expected to be present within the study area. Habitat is not representative of key habitat.
Barn Swallow	<i>Hirundo rustica</i>	THR	No status	Ledges and walls of man-made structures such as buildings, barns, boathouses, garages, culverts and bridges. Also nest in caves, holes, crevices and cliff ledges (COSEWIC, 2011d). ESA Protection: Species and general habitat protection	Barn Swallow were observed foraging over the wetland communities near point station 6 during the second breeding bird survey only (June 18, 2014). A search of the silos revealed that no nests were present during the 2014 breeding season. While the proposed development is not expected to negatively impact Barn Swallow or their nesting habitat, care is recommended while working in areas where this species have potential to occur.
Black Tern	<i>Chlidonias niger</i>	SC	No status	Colonial nesters typically found within marshes. Its preferred nesting habitat is a hemi-marsh (<i>i.e.</i> a wetland with 50:50 open water and emergent vegetation). Nests are usually built on an upturned cattail root, floating vegetation mat or patch of mud (Cadman <i>et al.</i> , 2007). ESA Protection: N/A	Species not expected to be present within the study area. Habitat is not representative of key habitat.
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR	THR	Blanding's Turtles are a primarily aquatic species that prefer wetland habitats, lakes, ponds, slow-moving streams, etc., however they may utilize upland areas to search for suitable basking and nesting sites. In general, preferred wetland sites are eutrophic and characterized by clear, shallow water, with organic substrates and high density of aquatic vegetation (COSEWIC, 2005a). ESA Protection: Species and general habitat protection	Potentially suitable habitat for Blanding's Turtle exists within the wetland communities that are part of Lover's Creek Swamp PSW offsite, but within the study area.
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	No Status	Nests primarily in forage crops (<i>e.g.</i> hayfields and pastures) dominated by a variety of species such as clover, Timothy, Kentucky Bluegrass, tall grass, and broadleaved plants. Also occurs in wet prairie, graminoid peatlands, and abandoned fields dominated by tall grasses. Does not generally occupy fields of row crops (<i>e.g.</i> corn, soybeans, wheat) or short-grass prairie. Sensitive to habitat size and has lower reproductive success in small habitat fragments (COSEWIC, 2010b). ESA Protection: Species and general habitat protection	Minimum area requirements to support breeding habitat for the species have been reported to range from 5ha to 30ha (MNRF, 2013). Habitat within the study area is not representative of key habitat. No Bobolink were observed during Azimuth's field investigations.
Broad Beech Fern	<i>Phyopteris hexagonoptera</i>	SC	SC	Rich soils in deciduous forests, such as Maple-Beech forests (MNRF, 2016). ESA Protection: N/A	Broad Beech Fern was not documented during Azimuth's field investigations.

Table 5. Species at Risk Habitat Summary and Assessment.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species ¹	Assessment
Butternut	<i>Juglans cinerea</i>	END	END	Commonly found in riparian habitats, but is also found in rich, moist, well-drained loams, and well-drained gravels. Butternut is intolerant of shade (COSEWIC, 2003b). ESA Protection: Species and general habitat protection	Butternut was not documented during Azimuth's field investigations.
Cerulean Warbler	<i>Dendroica cerulea</i>	THR	SC	Associated with large tracts of mature deciduous forest with tall trees and an open understory. Found in both wet bottomland forests and upland areas (COSEWIC, 2010a). ESA Protection: Species and general habitat protection	Habitat present within the study area is not representative of key habitat for this species. Records for this species within Simcoe County are likely associated with Minesing Swamp. Cerulean Warbler was not documented during Azimuth's field investigations.
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	Nests primarily in chimneys though some populations (<i>i.e.</i> in rural northern areas) may nest in cavity trees (COSEWIC, 2007h). Recent changes in chimney design may be a significant factor in recent declines in numbers (Cadman <i>et al.</i> , 2007). ESA Protection: Species and general habitat protection	No suitable nesting habitat present for this species (<i>i.e.</i> no chimney structures). No Chimney Swift were observed during Azimuth's field investigations.
Common Five-lined Skink (Southern Shield population)	<i>Plestiodon fasciatus</i>	SC	SC	Southern Shield population -rocky outcrops embedded in a matrix of coniferous and deciduous forest, and individuals in these populations seek refuge under rocks overlaid on open bedrock (COSEWIC, 2007a). ESA Protection: N/A	Potentially suitable habitat is present within the Natural Heritage Core Area, although typical habitat (<i>i.e.</i> rock outcrops) is not present. This species is typically associated with habitat to the north of Barrie along the Canadian Shield. Based on the extremely low potential for presence, Common Five-lined Skink is not considered in the Impact Assessment.
Common Nighthawk	<i>Chordeiles minor</i>	SC	THR	Open habitats including sand dunes, beaches recently logged/burned over areas, forest clearings, short grass prairies, pastures, open forests, bogs, marshes, lakeshores, gravel roads, mine tailings, quarries, and other open relatively clear areas (COSEWIC, 2007d). ESA Protection: N/A	While potentially suitable habitat is present within the study area, this species was not observed during Azimuth's field investigations. Surveys were completed at dawn and in the evening when this species tends to be most active.
Eastern Meadowlark	<i>Sturnella magna</i>	THR	No status	Most common in grassland, pastures, savannahs, as well as anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses, restored surface mines, <i>etc.</i> Occasionally nest in row crop fields such as corn and soybean, but there are considered low-quality habitat. Large tracts of grassland are preferred over smaller fragments and the minimum area required is estimated at 5ha (COSEWIC, 2011c). ESA Protection: Species and general habitat protection	Eastern Meadowlark was documented on one occasion during Azimuth's dawn breeding bird surveys in 2014. A singing male was observed perched in a tree within the agricultural field along the southern limits of the property on June 2, 2014 (point count station 6; Figure 2). A male observed on one date suggests "possible breeding" within the study area. MNRF requires that confirmed or probable breeding is confirmed in order to deem an area as Eastern Meadowlark habitat. Azimuth visited this portion of the property an additional three times during the breeding season [June 6 (while surveying adjacent SWT), June 18 and June 21 (while surveying adjacent SWT), 2014] and it was concluded that this species was not utilizing the study area as habitat. Therefore, Eastern Meadowlark will not be discussed further in this assessment.

Table 5. Species at Risk Habitat Summary and Assessment.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species ¹	Assessment
Eastern Musk Turtle	<i>Sternotherus oderatus</i>	SC	THR	Inhabit littoral zones of waterways such as rivers, lakes, bays, streams, ponds, canals, and swamps with slow to no current and soft bottoms. During the active season they prefer shallow water (<2m) with abundant vegetation. Most are found close to shore and do not venture onto land except to nest or access adjacent wetlands (COSEWIC, 2012b). ESA Protection: N/A	Potentially suitable habitat for MuskTurtle exists within the wetland communities that are part of Lover's Creek Swamp PSW offsite, but within the study area.
Eastern Prairie Fringed-orchid	<i>Platanthera leucophaea</i>	END	END	It is a species primarily of mesic prairies, fens and old fields (COSEWIC, 2003a). ESA Protection: Species and general habitat protection	Locations of Prairie Fringed-orchid are well documented and are restricted to approximately 20 small populations within prairie habitat or fens within Ontario. No fen or prairie habitat present on the property. No Eastern Prairie Fringed-orchid was observed during Azimuth's vegetation surveys.
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	SC	SC	Found in wetland habitats with both flowing and standing water such as marshes, bogs, fens, ponds, lake shorelines and wet meadows. Most sightings occur near the water's edge (COSEWIC, 2012c). ESA Protection: N/A	Potentially suitable habitat for Eastern Ribbonsnake is present on-site. Wetland features with potential to be used as habitat are contained within the Lovers Creek Swamp PSW.
Eastern Small-footed Myotis	<i>Myotis Llebii</i>	END	END	Generally occurs in mountainous or rocky regions as well as in buildings, on the face of rock bluffs and beneath slabs of rock and stones. Hibernation is typically confined to caves and old mines (Best and Jennings, 1997). ESA Protection: Species and general habitat protection	Eastern Small-footed Myotis is not expected to be present on or adjacent to study area. Property is not located within a mountainous or rocky region with boulders, stones and rocks. No caves present. No suitable habitat for the species.
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	THR	THR	Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances, are preferred nesting habitats (COSEWIC, 2009a). ESA Protection: Species and general habitat protection	Potential habitat for Eastern Whip-poor-will was identified within the open woodland community present on the property. Species specific surveys were completed and Eastern Whip-poor-will was not found to be utilizing the property.
Eastern Wood-pewee	<i>Contopus virens</i>	SC	No status	Mostly in mature and intermediate-age deciduous and mixed forests having an open understory. It is often associated with forests dominated by Sugar Maple and oak. Usually associated with forest clearings and edges within the vicinity of its nest (COSEWIC, 2012e). ESA Protection: N/A	While potential habitat for Eastern Wood-pewee was observed within the forest communities on the property, this species was documented as an incidental observation only prior to the breeding bird season. Eastern Wood-pewee was not observed during Azimuth's breeding bird surveys. Thus, this species will not be considered in the Impact Assessment.
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	SC	THR	Areas of early successional scrub surrounded by mature forests including dry uplands, swamp forests, and marshes (COSEWIC, 2006a). ESA Protection: N/A	While potential habitat for Golden-winged Warbler is present within the thicket swamp community, this species was not documented during Azimuth's breeding bird surveys.
Grasshopper Sparrow <i>pratensis</i> subspecies	<i>Ammodramus savannarum pratensis</i>	SC	No status	Typically breeds in large human-created grasslands (≥5 ha), such as pastures and hayfields, and natural prairies, such as alvars, characterized by well-drained, often poor soil dominated by low, sparse perennial herbaceous vegetation (COSEWIC, 2013d). ESA Protection: N/A	Habitat on-site is not representative of ideal habitat for the species. Grasshopper Sparrow requires tracts of grassland that are greater than 10 hectares (ha) (MNR, 2000). The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) reports similar habitat requirements with a suitable habitat area that is at least 5ha in size (COSEWIC, 2013). Grasshopper Sparrow was not observed during breeding bird surveys.

Table 5. Species at Risk Habitat Summary and Assessment.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species ¹	Assessment
Hart's-tongue Fern	<i>Asplenium scolopendrium</i> var. <i>americanum</i>	SC	SC	Grows on calcareous rocks in deep shade on slopes in deciduous forest. Most occurrences are in maple-beech forest (MNRF, 2016).	Hart's-tongue Fern was not documented during Azimuth's field investigations.
Henslow's Sparrow	<i>Ammodramus henslowii</i>	END	END	Requires grassland habitat and occurs more frequently and at higher densities in large patches of suitable habitat. Nests in tallgrass prairie, wet meadow, and marsh habitats as well as agricultural grasslands, lightly grazed pasture and grasslands on reclaimed surface mines (COSEWIC, 2011a). ESA Protection: Species and general habitat protection	Where regional populations are low, as is currently the case in Ontario, unbroken patches of grassland of at least 30ha and perhaps in excess of 100ha are believed to be required to support Henslow's Sparrow populations. (MNRF, 2013). There is no potentially suitable habitat for this species on the property. Henslow's Sparrow was not observed during breeding bird surveys.
Hine's Emerald	<i>Somatochlora hineana</i>	END	No status	Restricted to calcareous wetlands (marshes, sedge meadows, and fens) dominated by graminoid vegetation and fed primarily by groundwater from intermittent seeps (COSEWIC, 2011e). ESA Protection: Species and general habitat protection	Based on MNRF surveying, Hine's Emerald has not been identified near the study area. In Ontario, this species has only been documented in and around Minesing wetland (MNRF, 2018).
King Rail	<i>Rallus elegans</i>	END	END	Wide variety of freshwater marsh habitat types with cattails. Large marshes, especially those that contain a range of water level conditions and a mosaic of habitats, are preferred (COSEWIC, 2011b). ESA Protection: Species and general habitat protection	No suitable marsh habitat is present on the property or adjacent lands.
Least Bittern	<i>Ixobrychus exilis</i>	THR	THR	Breed strictly in marshes of emergents (usually cattails) that have relatively stable water levels and interspersed areas of open water (COSEWIC, 2009b). ESA Protection: Species and general habitat protection	No suitable marsh habitat is present on the property or adjacent lands.
Little Brown Myotis	<i>Myotis lucifugus</i>	END	END	Forests and regularly aging human structures as maternity roost sites. Regularly associated with attics of older buildings and barns for summer maternity roost colonies. Overwintering sites are characteristically mines or caves, but can often include buildings (MNRF, 2014) (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Potentially suitable habitat for Little Brown Myotis has been identified within the treed communities on-site.
Loggerhead Shrike	<i>Lanius ludovicianus</i>	END	END (<i>mirgrans</i> subspecies)	Breeding habitat characterized by open areas dominated by grasses and/or forbs, interspersed with scattered shrubs or small trees and bare ground. Suitable habitat includes pasture, old fields, prairie, savannah, pinyon-juniper woodland, shrub-steppe and alvar (COSEWIC, 2014a). ESA Protection: Species and general habitat protection	No suitable habitat is present on or adjacent to the property. Loggerhead Shrike was not documented during Azimuth's breeding bird surveys.
Louisiana Waterthrush	<i>Parkesia motacilla</i>	THR	SC	Occupies specialized habitat, showing a strong preferences for nesting and wintering along relatively pristine headwater streams and wetlands situated in large tracts of mature forest. Prefers running water, but also inhabits heavily wooded swamps and vernal or semi-permanent pools (COSEWIC, 2015a). ESA Protection: N/A	Species not expected to be present within the study area. Habitat is not representative of key habitat.
Massasauga (Great Lakes - St. Lawrence population)	<i>Sistrurus catenatus</i>	THR	THR	In Georgian Bay, Massasauga use bedrock barrens, conifer swamps, beaver meadows, fens, bogs, and shoreline habitats. On the upper Bruce Peninsula, forested habitats are used during hibernation and open, wetland, and edge habitat with canopy closure <50% in mid-late summer (COSEWIC, 2012a). ESA Protection: Species and general habitat protection	In Ontario, Massasauga is primarily found along the eastern side of Georgian Bay and on the Bruce Peninsula. Therefore, there is no expectation that Massasauga are present within the study area.

Table 5. Species at Risk Habitat Summary and Assessment.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species ¹	Assessment
Monarch	<i>Danaus plexippus</i>	SC	SC	Breeding habitat is confined to sites where milkweeds, the sole food of caterpillars, grow. Milkweeds grow in a variety of environments, including meadows in farmlands, along roadsides and in ditches, open wetlands, dry sandy areas, short and tall grass prairie, river banks, irrigation ditches, arid valleys, and south-facing hills (COSEWIC, 2010c). ESA Protection: N/A	No significant areas of Milkweed were identified on the property. Thus, Monarch will not be considered in the Impact Assessment.
Northern Myotis	<i>Myotis septentrionalis</i>	END	END	Maternity roost sites are generally located within deciduous and mixed forests and focused in snags including loose bark and cavities of trees. Overwintering sites are characteristically mines or caves (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Potentially suitable habitat for Northern Myotis has been identified within the treed communities on-site.
Northern Map Turtle	<i>Graptemys geographica</i>	SC	SC	Inhabits rivers and lakes where it basks on emergent rocks, banks, logs and fallen trees. Prefer shallow, soft-bottomed aquatic habitats with exposed objects for basking (COSEWIC, 2012d). ESA Protection: N/A	Species not expected to be present on or adjacent to the property. There is no open water habitat (<i>i.e.</i> lakes or rivers) present on or adjacent to the property.
Peregrine Falcon	<i>Falco peregrinus</i>	SC	SC (<i>anatum/tundrius</i>)	Most nest on cliff ledges or crevices, but some will use tall buildings or bridges near good foraging areas. Nests are typically close to bodies of water (COSEWIC, 2007e). ESA Protection: N/A	Habitat is not representative of key habitat as there are no cliffs or tall buildings present on the property. Peregrine Falcon is not expected to be present on or adjacent to the property.
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	SC	THR	Occurs in open deciduous forests, particularly those dominated by oak and beech, grasslands, forest edges, orchards, pastures along rivers and roads, urban parks, golf courses, cemeteries, beaver ponds and timber stands that have been treated with herbicides (COSEWIC, 2007f). ESA Protection: N/A	While potential habitat for Red-headed Woodpecker exists within the treed communities within the study area, this species was not documented during Azimuth's breeding bird surveys.
Rusty-patched Bumble Bee	<i>Bombus affinis</i>	END	END	Found in a wide variety of habitats including mixed farmland, sand dunes, marshes, urban and wooded areas (COSEWIC, 2010d). ESA Protection: Species and general habitat protection	Based on MNRF surveying, Rusty-patched Bumble Bee has not been identified near the study area. The only sightings of this species in Ontario since 2002 have been at The Pinery Provincial Park (MNRF, 2016). Unless the species is identified in the area, Rusty-patched Bumble Bee will not be considered in this NHE.
Snapping Turtle	<i>Chelydra serpentina</i>	SC	SC	Habitat is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these wetland habitats (COSEWIC, 2008a). ESA Protection: N/A	Potentially suitable habitat for Snapping Turtle exists within the wetland communities that are part of Lover's Creek Swamp PSW offsite, but within the study area.
Tri-colored Bat	<i>Perimyotis subflavus</i>	END	END	Maternity roost sites include forests and modified landscapes (barns or human-made structures). Overwintering sites include mines and caves (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Potentially suitable habitat for Tri-colored Bat has been identified within the treed communities on-site.
Wood Thrush	<i>Hylocichla mustelina</i>	SC	No status	Found in moist, deciduous hardwood or mixed stands, often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches (COSEWIC, 2012f). ESA Protection: N/A	While potentially suitable habitat for Wood Thrush exists within the forest communities within the study area, this species was not documented during Azimuth's breeding bird surveys.

Table 5. Species at Risk Habitat Summary and Assessment.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species ¹	Assessment
Yellow Rail	<i>Coturnicops noveboracensis</i>	SC	SC	Nest in wet marshy areas of short grass-like vegetation. The habitat must remain wet throughout the breeding season (COSEWIC, 2009c). ESA Protection: N/A	No suitable marsh habitat is present on the property or adjacent lands.

¹ Habitat as outlined within the MNRF's Species at Risk in Ontario website files (<https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>), or Species Specific COSEWIC Reports referenced in this document.

Table 6. Significant Wildlife Habitat Assessment (Ecoregion 6E Criterion Schedule)

Table 6.1 Seasonal Concentrations of Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Terrestrial) Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid-March to May). - Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. - Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. <u>Information Sources</u> - Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. - Reports and other information available from Conservation Authorities - Sites documented through waterfowl planning processes (<i>e.g.</i> EHJV implementation plan) - Field Naturalist Clubs - Ducks Unlimited Canada - Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” - Any mixed species aggregations of 100 or more individuals required. - The flooded field ecosite habitat plus a 100-300m radius area, dependant on local site conditions and adjacent land use is the significant wildlife habitat. - Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). - SWHMiST Index #7 provides development effects and mitigation measures.	While open agricultural fields are present within the study area, these fields do not experience seasonal flooding. Thus, the study area is not candidate for identification as significant habitat for Waterfowl Stopover and Staging Areas (Terrestrial).
Waterfowl Stopover and Staging Areas (Aquatic) Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	- Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. - These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> - Environment Canada - Naturalist clubs often are aware of staging/stopover areas - OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. - Sites documented through waterfowl planning processes (<i>e.g.</i> EHJV implementation plan) - Ducks Unlimited projects - Element occurrence specification by Nature Serve: http://www.natureserve.org - Natural Heritage Information Centre (NHIC) Waterfowl Concentration Areas	Studies carried out and verified presence of: - Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. - Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. - The combined area of the ELC ecosites and a 100m radius area is the SWH. - Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). - SWHMiST Index #7 provides development effects and mitigation measures.	While SWD2 and SWD7 habitats are present within the study area, no open waterbodies (<i>i.e.</i> ponds, marshes, bays, <i>etc.</i>) exist within these wetland communities. Thus, the study area is not candidate for identification as significant habitat for Waterfowl Stopover and Staging Areas (Aquatic).

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Shorebird Migratory Stopover Area Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird’s Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	- Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. - Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. - Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> - Western hemisphere shorebird reserve network - Canadian Wildlife Service (CWS) Ontario Shorebird Survey - Bird Studies Canada - Ontario Nature - Local birders and naturalist clubs - Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: - Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) - Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. - The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #8 provides development effects and mitigation measures.	Shoreline habitat suitable for supporting large aggregates of migrating shorebirds is not present within the study area. Thus, the study area is not candidate for identification as significant habitat for Shoreline Migratory Stopover.
Raptor Wintering Area Rationale: Sites used by multiple species of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. <u>Bald Eagle:</u> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	- The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. - Raptor wintering sites (hawk/owl) need to be > 20 ha with a combination of forest and upland. - Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. - Field area of the habitat is to be windswept with limited snow depth or accumulation. - Eagle sites have open water, large trees and snags available for roosting. <u>Information Sources:</u> - OMNRF Ecologist or Biologist Field Naturalist Clubs - Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area - Data from Bird Studies Canada - Results of Christmas Bird Counts Reports and other information available from Conservation Authorities.	Studies confirm the use of these habitats by: - One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. - To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. - The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #10 and #11 provides development effects and mitigation measures.	Habitat within study area is not representative of key habitat. While forest communities are present in the landscape, open fields on-site and on surrounding lands are primarily used for agricultural purposes. No idle/fallow open fields occur within the study area. Thus, the property and adjacent lands are not candidate for identification as a significant habitat for wintering raptors.

Table 6 (AEC11-076G)

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bat Hibernacula Rationale: Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	- Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. - Active mine sites should not be considered as SWH - The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - Natural Heritage Information Center (NHIC) Bat Hibernaculum Ministry of Northern - Development and Mines for location of mine shafts. - Clubs that explore caves (<i>e.g.</i> Sierra Club) - University Biology Departments with bat experts.	- All sites with confirmed hibernating bats are SWH. - The habitat area includes a 200m radius around the entrance of the hibernaculum, for most development types and 1000m for wind farms - Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects. - SWHMiST Index #1 provides development effects and mitigation measures.	No caves, mine shafts, underground foundations or Karst is present on or adjacent to the study area.
Bat Maternity Colonies Rationale: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	- Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). - Maternity roosts are not found in caves and mines in Ontario. - Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees. - Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. - Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred. <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - University Biology Departments with bat experts.	- Maternity Colonies with confirmed use by; >10 Big Brown Bats >5 Adult Female Silver-haired Bats - The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. - Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #12 provides development effects and mitigation measures.	The forest communities on-site have potential to function as bat maternity roost habitat.
Turtle Wintering Areas Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	- For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. - Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. - Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> - EIS studies carried out by Conservation Authorities. - Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. - OMNRF Ecologist or Biologist - Field Naturalist clubs - Natural Heritage Information Center (NHIC)	- Presence of 5 over-wintering Midland Painted Turtles is significant. - One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. - The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. - Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) - Congregation of turtles is more common where wintering areas are limited and therefore significant - SWHMiST Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Lover’s Creek Swamp PSW within the Natural Core Area has potential to function as overwintering habitat for turtles, particularly within areas where standing water persists year round. Potentially suitable conditions may be present within the study area on adjacent lands.

Table 6 (AEC11-076G)

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Reptile Hibernaculum Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	- For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. - Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. - Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. - Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures. Information Sources - In spring, local residents or landowners may have observed the emergence of snakes on their property (<i>e.g.</i> old dug wells). - Reports and other information available from Conservation Authorities. - Field Naturalists clubs - University herpetologists - Natural Heritage Information Center (NHIC) - OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: - Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. - Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (<i>e.g.</i> foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) <u>Note:</u> If there are Special Concern Species present, then site is SWH <u>Note:</u> Sites for hibernation possess specific habitat parameters (<i>e.g.</i> temperature, humidity, <i>etc.</i>) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (<i>e.g.</i> mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH. - SWHMiST Index #13 provides development effects and mitigation measures for snake hibernacula. - Presence of any active hibernaculum for skink is significant. - SWHMiST Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	While no obvious features that could potentially provide reptile hibernaculum were observed (<i>i.e.</i>, rock piles, old stones fences, <i>etc.</i>), the wetland communities within Lover’s Creek Swamp PSW may provide suitable habitat for this function.
Colonially -Nesting Bird Breeding Habitat (Bank and Cliff) Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	- Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. - Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. - Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources - Reports and other information available from Conservation Authorities. - Ontario Breeding Bird Atlas - Bird Studies Canada; <i>NatureCounts</i> http://www.birdscanada.org/birdmon/ - Field Naturalist Clubs.	Studies confirming: - Presence of 1 or more nesting sites with 8or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. - A colony identified as SWH will include a 50m radius habitat area from the peripheral nests. - Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #4 provides development effects and mitigation measures.	No eroding banks or fill piles located on or adjacent to study area. None of the listed species observed during breeding bird surveys.

Table 6 (AEC11-076G)

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs) Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	- Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. - Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> - Ontario Breeding Bird Atlas, colonial nest records. - Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). - Natural Heritage Information Center (NHIC) Mixed Wader Nesting Colony - Aerial photographs can help identify large heronries. - Reports and other information available from CAs. - MNRF District Offices - Local naturalist clubs	Studies confirming: - Presence of 5 or more active nests of Great Blue Heron or other listed species. - The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH. - Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. - SWHMiST Index #5 provides development effects and mitigation measures.	While one Green Heron was observed within the southern meadow marsh/thicket swamp community, the property is not expected to function as colonially-nesting bird breeding habitat. No nests were identified during Azimuth’s field investigation.
Colonially-Nesting Bird Breeding Habitat (Ground) Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer’s Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer’s Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	- Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. - Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> - Ontario Breeding Bird Atlas , rare/colonial species records. - Canadian Wildlife Service - Reports and other information available from CAs. - Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area - MNRF District Offices - Field Naturalist clubs	Studies confirming: - Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. - Presence of 5 or more pairs for Brewer’s Blackbird. - Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. - The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH. - Studies would be done during May/June when actively nesting. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #6 provides development effects and mitigation measures.	No rocky islands or peninsulas are present within the study area and no nests were documented during field investigations.

Table 6 (AEC11-076G)

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Migratory Butterfly Stopover Areas <u>Rationale:</u> Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: <u>Field:</u> CUM CUT CUS <u>Forest:</u> FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes. <u>Information Sources</u> • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral’s is to be considered significant. • SWHMiST Index #16 provides development effects and mitigation measures.	The study area is not located within 5km of Lake Ontario. No further evaluation undertaken.
Landbird Migratory Stopover Areas <u>Rationale:</u> Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds. Canadian Wildlife Service Ontario website. All migratory songbirds. Canadian Wildlife Service Ontario website:	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha in size and within 5 km of Lake Ontario. • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant. • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant. • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH . <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #9 provides development effects.	The study area is not located within 5km of Lake Ontario. No further evaluation undertaken.

Table 6 (AEC11-076G)

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Yarding Areas Rationale: Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in “yards” to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2 CUP3 FOD3 CUT	- Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. - The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. - OMNRF determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual”. - Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: - Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. - Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). - Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. - If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST Index #2 provides development effects and mitigation measures.	MNRF mapping does not indicate the presence of a deer yard within proximity to the study area (Appendix C). No further assessment was completed.
Deer Winter Congregation Areas Rationale: Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	- Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. - Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands . - If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. - Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. - Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> - MNRF District Offices - LIO/NRVIS	Studies confirm: - Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. - Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. - Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer density survey. - If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST Index #2 provides development effects and mitigation measures.	Discussed in Deer Yarding Areas.

Table 6 (AEC11-076G)

Table 6.2.1 Rare Vegetation Communities

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Cliffs and Talus Slopes Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> - The Niagara Escarpment Commission has detailed information on location of these habitats. - OMNRF District - Natural Heritage Information Center (NHIC) has location information available on their website - Field Naturalist clubs - Conservation Authorities	- Confirm any ELC Vegetation Type for Cliffs or Talus Slopes - SWHMiST Index #21 provides development effects and mitigation measures.	No cliffs or talus slopes are present within the study area.
Sand Barren Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.	A sand barren area >0.5ha in size. <u>Information Sources</u> - MNRF Districts - Natural Heritage Information Center (NHIC) has location information available on their website. - Field Naturalist clubs - Conservation Authorities	- Confirm any ELC Vegetation Type for Sand Barrens - Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.) - SWHMiST Index #20 provides development effects and mitigation measures.	No sand barrens are present within the study area.
Alvar Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Species: 1) <i>Carex crawei</i> 2) <i>Panicum philadelphicum</i> 3) <i>Eleocharis compressa</i> 4) <i>Scutellaria parvula</i> 5) <i>Trichostema brachiatum</i> These indicator species are very specific to Alvars within Ecoregion 6E.	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.	An Alvar site > 0.5 ha in size. <u>Information Sources</u> - Alvars of Ontario (2000), Federation of Ontario Naturalists. - Ontario Nature – Conserving Great Lakes Alvars. - Natural Heritage Information Center (NHIC) has location information available on their website - OMNRF Districts - Field Naturalist clubs - Conservation Authorities	- Field studies that identify four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. - Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). - The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. - SWHMiST Index #17 provides development effects and mitigation measures.	No alvars are present within the study area.

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Old Growth Forest Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest. <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Districts. • Field Naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species are >140 years old, then the area containing these trees is Significant Wildlife Habitat. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present). • The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest area containing the old growth characteristics. • SWHMiST Index #23 provides development effects and mitigation measures.	While forests occur in the study area, these communities do not represent Old Growth Forests. The majority of the trees within the study area have a DBH < 50cm. Further, the wooded area is significantly < 30ha.
Savannah Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • SWHMiST Index #18 provides development effects and mitigation measures.	No savannah habitat is present within the study area.
Tallgrass Prairie Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • SWHMiST Index #19 provides development effects and mitigation measures.	No tallgrass prairie habitat is present within the study area.
Other Rare Vegetation Communities Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M The OMNRF/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST Index #37 provides development effects and mitigation measures.	No rare vegetation communities are present within the study area.

Table 6 (AEC11-076G)

Table 6.2.2 Specialized Habitat for Wildlife

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Nesting Area Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. - Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. - Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> - Ducks Unlimited staff may know the locations of particularly productive nesting sites. - OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. - Reports and other information available from Conservation Authorities.	Studies confirmed: - Presence of 3 or more nesting pairs for listed species excluding Mallards, or; - Presence of 10 or more nesting pairs for listed species including Mallards. - Any active nesting site of an American Black Duck is considered significant. - Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. - SWHMiST Index #25 provides development effects and mitigation measures.	While potential for this habitat function is identified on the property due to the presence of MAM, SWD and SWT communities, the defining criteria have not been met for the study area. Bird surveys were undertaken at appropriate times of the year in June 2014. Only Mallard was identified during the assessment for the NHE. Further, wetlands present on the property do not consist of pond features.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat Rationale: Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. - Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. - Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> - Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. - MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. - Nature Counts, Ontario Nest Records Scheme data. - OMNRF Districts - Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented - Reports and other information available from Conservation Authorities. - Field Naturalists clubs	Studies confirm the use of these nests by: - One or more active Osprey or Bald Eagle nests in an area. - Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. - For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. - For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. - To be significant a site must be used annually. When found inactive, the site must be known to be inactive for > 3 years or suspected of not being used for >5 years before being considered not significant. - Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #26 provides development effects and mitigation measures.	No Osprey or Bald Eagles or their nests were identified during Azimuth’s field investigations. To be considered significant a site would have to be used annually. There is no expectation that Bald Eagle or Osprey are currently using the site as nesting or perching habitat.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Woodland Raptor Nesting Habitat <u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper’s Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer - Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers Hawk nest along forest edges sometimes on peninsulas or small off-shore islands. - In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> - OMNRF Districts. - Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. - Check data from Bird Studies Canada. - Reports and other information available from Conservation Authorities.	Studies confirm: - Presence of 1 or more active nests from species list is considered significant. - Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH . (The 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest). - Barred Owl – A 200m radius around the nest is the SWH. - Broad-winged Hawk and Coopers Hawk– A 100m radius around the nest is the SWH. - Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. - Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial. (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. - SWHMiST Index #27 provides development effects and mitigation measures.	Potential for this habitat function is identified within the study area due to the presence of forested vegetation communities. None of the listed wildlife species were documented during Azimuth’s field investigations and no stick nests were observed. Thus, woodland raptor nesting habitat will not be considered in the Impact Assessment.
Turtle Nesting Areas <u>Rationale:</u> These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern Species</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	- Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. - For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. - Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> - Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). - Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. - Natural Heritage Information Center (NHIC) - Field Naturalist clubs	Studies confirm: - Presence of 5 or more nesting Midland Painted Turtles. - One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. - The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. - Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. - Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. - SWHMiST Index #28 provides development effects and mitigation measures for turtle nesting habitat.	There are no obvious areas of exposed sand/gravel soil within or adjacent to wetland habitat. Thus, turtle nesting habitat will not be considered in the Impact Assessment.

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Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Seeps and Springs Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. - Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. <u>Information Sources</u> - Topographical Map - Thermography - Hydrological surveys conducted by Conservation Authorities and MOE. - Field Naturalists clubs and landowners. - Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: - Presence of a site with 2 or more seeps/springs should be considered SWH. - The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. - SWHMiST Index #30 provides development effects and mitigation measures.	Groundwater seeps were noted within the Natural Core Area and along the Tributary of Lovers Creek.
Amphibian Breeding Habitat (Woodland). Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	- Presence of a wetland, pond or woodland pool (including vernal pools) >500m² (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. - Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. <u>Information Sources</u> - Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records. - Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. - OMNRF District - OMNRF wetland evaluations - Field Naturalist clubs - Canadian Wildlife Service - Amphibian Road Call Survey - Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; - Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. - A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. - The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. - SWHMiST Index #14 provides development effects and mitigation measures.	Although Gray Treefrog, Spring Peeper, Western Chorus Frog and Wood Frog were documented during evening calling amphibian surveys in 2014, none of these species were heard calling at a Call Level Code of 3. Therefore, there is no expectation for the study area to function as significant woodland habitat for breeding amphibians.

Table 6 (AEC11-076G)

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Breeding Habitat (Wetlands) Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (<i>e.g.</i> Bull Frog) may be adjacent to woodlands.	- Wetlands>500m² (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. - Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. - Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> - Ontario Herpetofaunal Summary Atlas (or other similar atlases) - Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. - OMNRF Districts and wetland evaluations - Reports and other information available from Conservation Authorities	Studies confirm: - Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. - The ELC ecosite wetland area and the shoreline are the SWH. - A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. - If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST Index #15 provides development effects and mitigation measures.	Although Gray Treefrog, Western Chorus Frog and Green Frog were documented during evening calling amphibian surveys in 2014, none of these species were heard calling at a Call Level Code of 3. Therefore, there is no expectation for the study area to function as significant wetland habitat for breeding amphibians.
Woodland Area-Sensitive Bird Breeding Habitat Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. - Interior forest habitat is at least 200 m from forest edge habitat. <u>Information Sources</u> - Local bird clubs. - Canadian Wildlife Service (CWS) for the location of forest bird monitoring. - Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. - Reports and other information available from Conservation Authorities.	Studies confirm: - Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. - Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. - Conduct field investigations in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #34 provides development effects and mitigation measures.	While forests are present within the study area, these communities are significantly <30ha. Further, of the listed wildlife species, only Red-breasted Nuthatch was documented during Azimuth’s bird breeding surveys. Therefore, there is no expectation for the study area to function as significant habitat for woodland area-sensitive breeding birds.

Table 6.3 Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Marsh Breeding Bird Habitat Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	- Nesting occurs in wetlands. - All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. - For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> - OMNRF District and wetland evaluations. - Field Naturalist clubs - Natural Heritage Information Center (NHIC) Records. - Reports and other information available from Conservation Authorities. - Ontario Breeding Bird Atlas	Studies confirm: - Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species. - Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. - Area of the ELC ecosite is the SWH. - Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #35 provides development effects and mitigation measures.	While wetland habitat is present within the study area, there is no expectation for the property to function as significant marsh breeding bird habitat due to the lack of suitable conditions (<i>i.e.</i> shallow water/ponds). Of the listed wildlife species, one Green Heron was observed on one occasion, suggesting possible breeding (not probable or confirmed breeding). Thus, the criteria has not been met for this function.
Open Country Bird Breeding Habitat Sources Defining Criteria Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha. - Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (<i>i.e.</i> no row cropping or intensive hay or livestock pasturing in the last 5 years). - Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. - The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. <u>Information Sources</u> - Agricultural land classification maps, Ministry of Agriculture. - Local bird clubs. - Ontario Breeding Bird Atlas - Reports and other information available from Conservation Authorities.	Field Studies confirm: - Presence of nesting or breeding of 2 or more of the listed species. - A field with 1 or more breeding Short-eared Owls is to be considered SWH. - The area of SWH is the contiguous ELC ecosite field areas. - Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #32 provides development effects and mitigation measures.	No grassland habitat occurs within the study area. Open areas on and adjacent to the property consist primarily of active agricultural lands. Thus, due to the absence of suitable grassland habitat within the study area, there is no expectation for the property to function as significant breeding habitat for open country birds.
Shrub/Early Successional Bird Breeding Habitat Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats>10ha in size. - Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (<i>i.e.</i> no row-cropping, haying or live-stock pasturing in the last 5 years). - Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. - Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> - Agricultural land classification maps, Ministry of Agriculture. - Local bird clubs - Ontario Breeding Bird Atlas - Reports and other information available from Conservation Authorities.	Field Studies confirm: - Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. - A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. - The area of the SWH is the contiguous ELC ecosite field/thicket area. - Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. - SWHMiST Index #33 provides development effects and mitigation measures.	The shrub and thicket communities present on-site are significantly <10ha in size. Further, of the listed wildlife species, only Willow Flycatcher was documented during Azimuth’s breeding bird surveys. Thus, there is no expectation for the property to function as significant breeding habitat for shrub/early successional birds.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Terrestrial Crayfish <u>Rationale:</u> Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish; <i>(Fallicambarus fodiens)</i> Devil Crayfish or Meadow Crayfish; <i>(Cambarus Diogenes)</i>	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. - Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. - Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. <u>Information Sources</u> - Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998.	Studies Confirm: - Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. - Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. - Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. - SWHMiST Index #36 provides development effects and mitigation measures.	No chimneys documented on the property.
Special Concern and Rare Wildlife Species <u>Rationale:</u> These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites <u>Information Sources</u> - Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. - NHIC Website “Get Information” : http://nhic.mnr.gov.on.ca - Ontario Breeding Bird Atlas - Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: - Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. - The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species <i>e.g.</i> specific nesting habitat or foraging habitat. - SWHMiST Index #37 provides development effects and mitigation measures.	Habitat for species of special concern with potential to occur on-site are considered within the NHE.

Table 6 (AEC11-076G)

Table 6.4 Animal Movement Corridors

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Movement Corridors Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	Movement corridors between breeding habitat and summer habitat. - Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat –Wetland) of this Schedule. <u>Information Sources</u> - MNRF District Office - Natural Heritage Information Center (NHIC) - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs	- Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. - Corridors should consist of native vegetation, with several layers of vegetation. - Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. - Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m. - Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. - SWHMiST Index #40 provides development effects and mitigation measures.	The study area does not function as SWH for Amphibian Breeding Habitat (Wetland) and thus, the property will not be assessed as an Amphibian Movement Corridor.
Deer Movement Corridors Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule. - A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion. - Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> - MNRF District Office - Natural Heritage Information Center (NHIC). - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs	- Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. - Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. - Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. - Shorter corridors are more significant than longer corridors. - SWHMiST Index #39 provides development effects and mitigation measures.	The study area does not function as SWH for Deer Yarding Area and thus, the property will not be assessed as a Deer Movement Corridor.

Table 6.5 Exceptions for EcoRegion 6E

EcoDistrict	Wildlife Habitat and Species	Candidate			Confirmed SWH	Assessment
		Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E-14 <u>Rationale:</u> The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bears.	Mast Producing Areas Black Bear	All Forested habitat represented by ELC Community Series: FOM FOD	- Black bears require forested habitat that provides cover, winter hibernation sites, and mast-producing tree species. - Forested habitats need to be large enough to provide cover and protection for black bears.	Woodland ecosites >30ha with mast-producing tree species, either soft (cherry) or hard (oak and beech). <u>Information Sources</u> Important forest habitat for black bears may be identified by OMNRF.	All woodlands > 30ha with a 50%composition of these ELC Vegetation Types are considered significant: FOM1-1 FOM2-1 FOM3-1 FOD1-1 FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5 SWHMiST Index #3 provides development effects and mitigation measures.	The study area is not located on the Bruce Peninsula. No further evaluation undertaken.
6E- 17 <u>Rationale:</u> Sharp-tailed grouse only occur on Manitoulin Island in Eco-region 6E, Leks are an important habitat to maintain their population	Lek Sharp-tailed Grouse	CUM CUS CUT	- The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography. - Leks are typically a grassy field/meadow >15ha with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated.	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland. - Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying) - Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting <u>Information Sources</u> - OMNRF district office - Bird watching clubs - Local landowners - Ontario Breeding Bird Atlas	Studies confirming lek habitat are to be completed from late March to June. - Any site confirmed with sharp-tailed grouse courtship activities is considered significant - The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the lek habitat - SWHMiST Index #32 provides development effects and mitigation measures	The study area is not located on Manitoulin Island. No further evaluation undertaken.



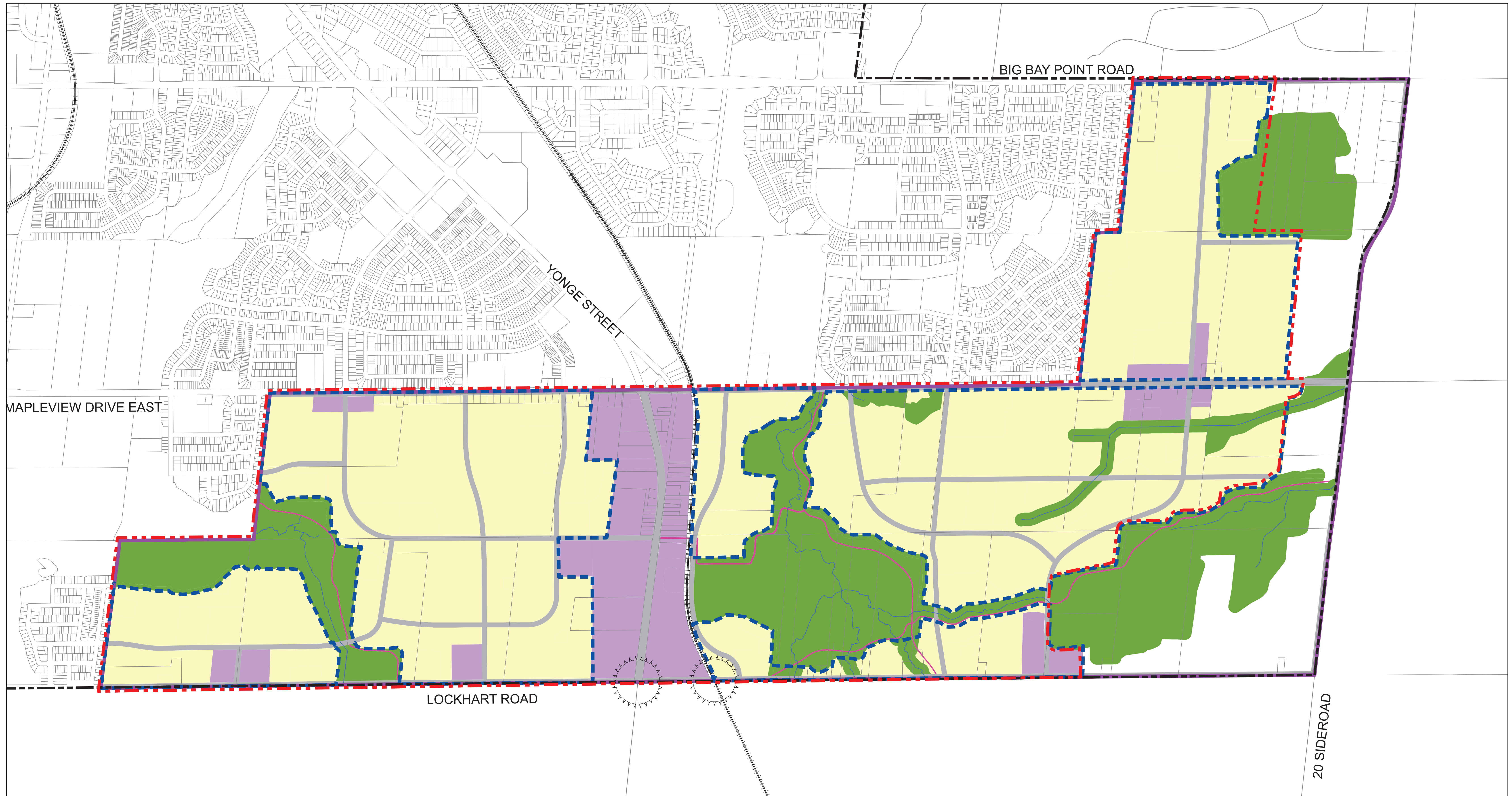
APPENDICES

- Appendix A: Municipal Background Information**
 - Appendix B: Lake Simcoe Region Conservation Authority Information**
 - Appendix C: Provincial Background Information**
 - Appendix D: Fish/Fish Habitat Assessment Photographs**
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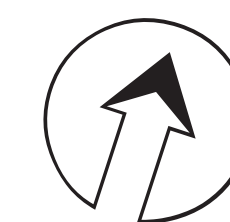


APPENDIX A

Municipal Background Information



- | | | |
|--------------------------|-----------------------------|-------------------------------|
| City Boundary | Stream | Natural Heritage System |
| Secondary Plan Boundary | Existing and Proposed Roads | Special Rural Area |
| Settlement Area Boundary | Pathway System | Residential Area |
| Residential District | Gateways | Mixed Use Nodes and Corridors |
| Existing Parcel Fabric | | |
| Railway | | |

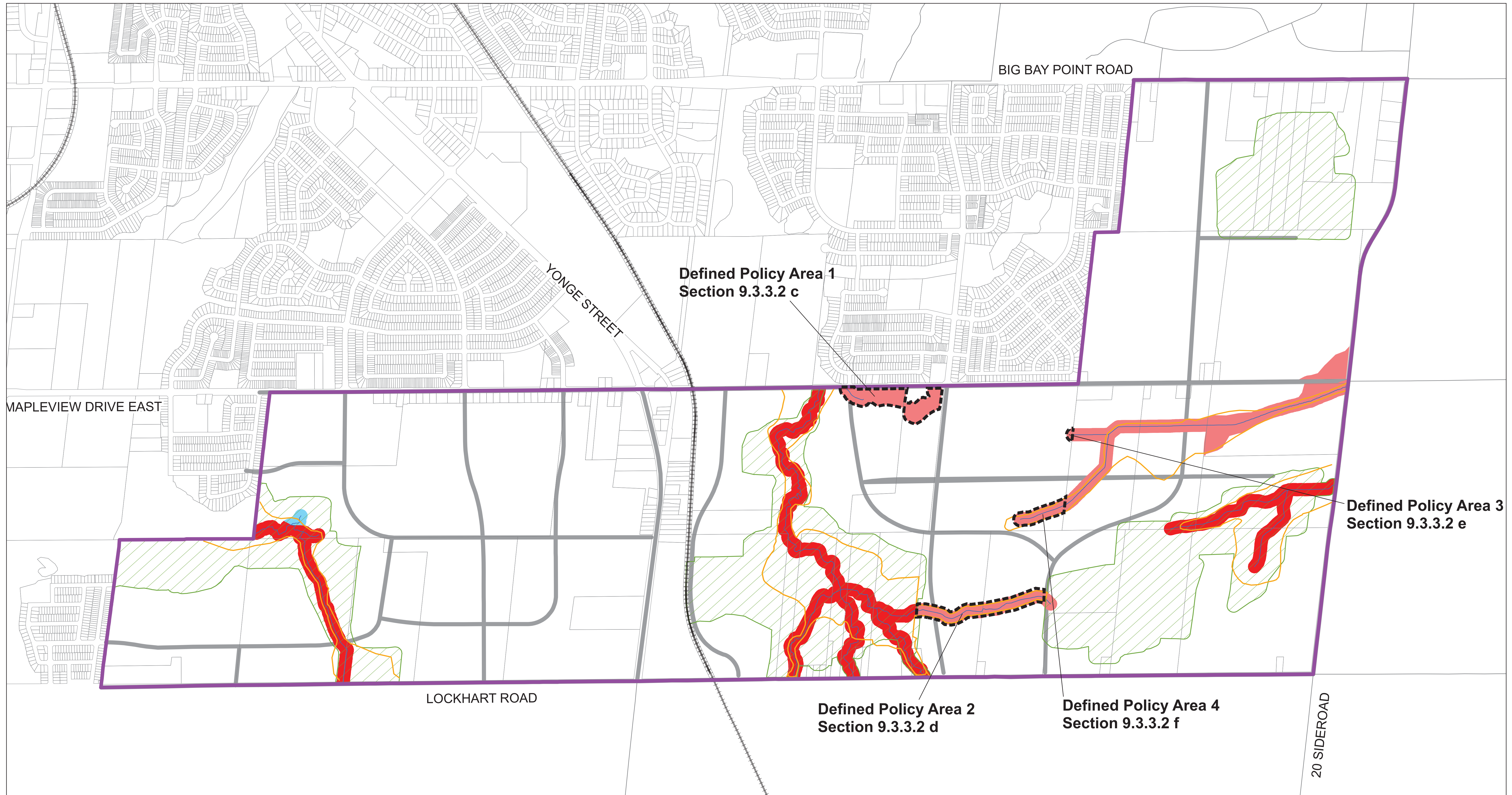


0 0.25 0.5 1 km

Schedule 9A
Community Structure

City of Barrie
Hewitt's Secondary Plan

May 2016



- Secondary Plan Boundary
- Existing Parcel Fabric
- Railway
- Stream
- Existing and Proposed Roads

- Natural Core Area
- Natural Linkage Area

- High Constraint Stream Corridor Area
- High (S) Constraint Stream Corridor Area - Special
- Medium Constraint Stream Corridor Area
- Regulatory Floodplain

- Defined Policy Area



NOTES:

1. A TREE'S ROOT SYSTEM GENERALLY GROWS WITHIN 60cm OF THE SURFACE. THE ROOT SYSTEM IS COMPRISED OF LARGE ANCHOR ROOTS WHICH PROVIDE STRUCTURAL SUPPORT, TRANSPORT ROOTS AND A NETWORK OF FEEDER ROOTS WHICH ARE RESPONSIBLE FOR THE MAJORITY OF ABSORPTION FOR BOTH WATER AND NUTRIENTS FROM THE SURFACE.

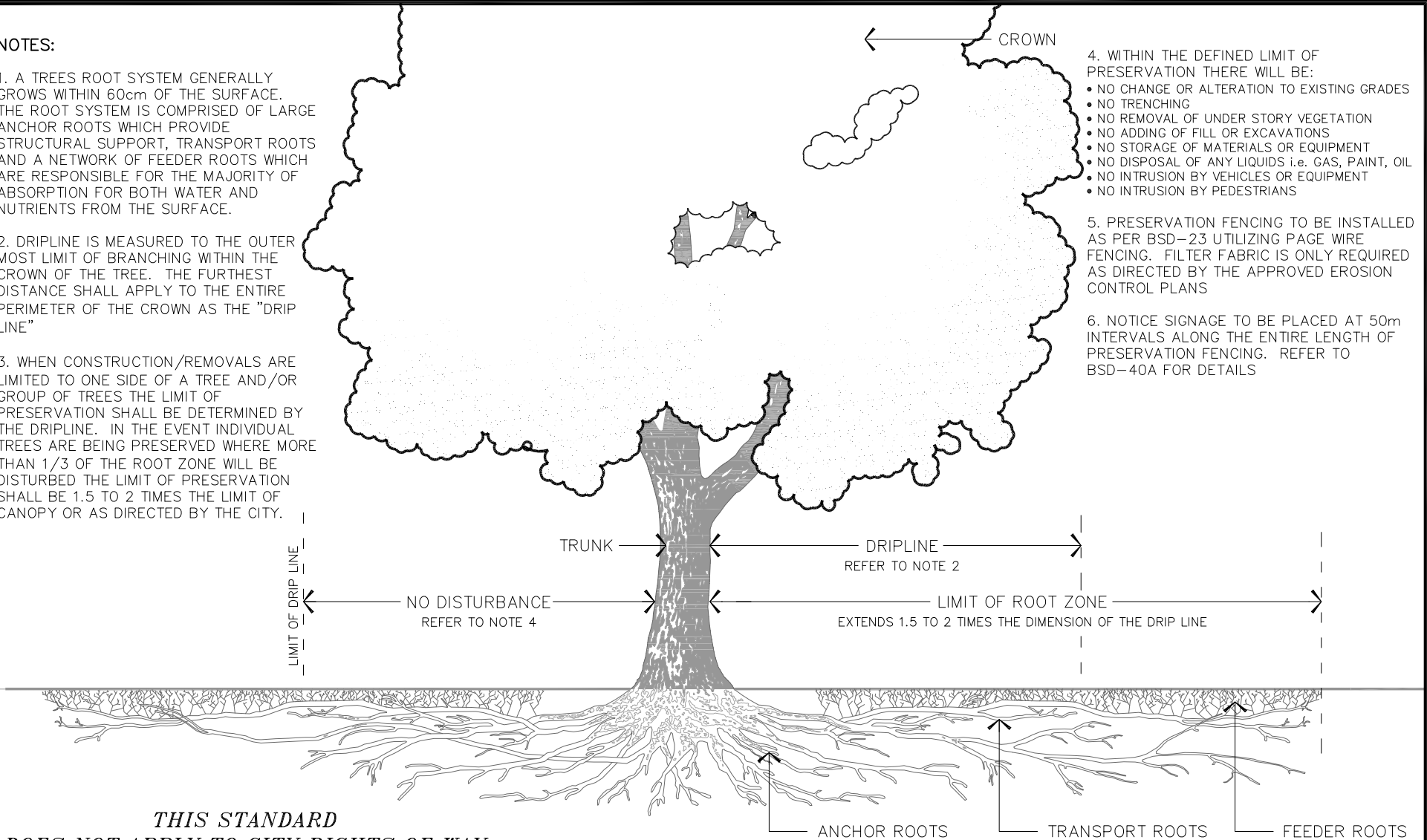
2. DRIPLINE IS MEASURED TO THE OUTER MOST LIMIT OF BRANCHING WITHIN THE CROWN OF THE TREE. THE FURTHEST DISTANCE SHALL APPLY TO THE ENTIRE PERIMETER OF THE CROWN AS THE "DRIP LINE"

3. WHEN CONSTRUCTION/REMOVALS ARE LIMITED TO ONE SIDE OF A TREE AND/OR GROUP OF TREES THE LIMIT OF PRESERVATION SHALL BE DETERMINED BY THE DRIPLINE. IN THE EVENT INDIVIDUAL TREES ARE BEING PRESERVED WHERE MORE THAN 1/3 OF THE ROOT ZONE WILL BE DISTURBED THE LIMIT OF PRESERVATION SHALL BE 1.5 TO 2 TIMES THE LIMIT OF CANOPY OR AS DIRECTED BY THE CITY.

4. WITHIN THE DEFINED LIMIT OF PRESERVATION THERE WILL BE:
- NO CHANGE OR ALTERATION TO EXISTING GRADES
 - NO TRENCHING
 - NO REMOVAL OF UNDER STORY VEGETATION
 - NO ADDING OF FILL OR EXCAVATIONS
 - NO STORAGE OF MATERIALS OR EQUIPMENT
 - NO DISPOSAL OF ANY LIQUIDS i.e. GAS, PAINT, OIL
 - NO INTRUSION BY VEHICLES OR EQUIPMENT
 - NO INTRUSION BY PEDESTRIANS

5. PRESERVATION FENCING TO BE INSTALLED AS PER BSD-23 UTILIZING PAGE WIRE FENCING. FILTER FABRIC IS ONLY REQUIRED AS DIRECTED BY THE APPROVED EROSION CONTROL PLANS

6. NOTICE SIGNAGE TO BE PLACED AT 50m INTERVALS ALONG THE ENTIRE LENGTH OF PRESERVATION FENCING. REFER TO BSD-40A FOR DETAILS



**THIS STANDARD
DOES NOT APPLY TO CITY RIGHTS OF WAY**

CITY OF BARRIE STANDARD					APR'D: S.R.A.	DATE: 01.12.05
LIMIT OF TREE PRESERVATION FOR DEVELOPMENT APPROVALS					DRAWN: WmMc	SCALE: NTS
	NO.	REVISION	APR'D	DATE	BSD-21A	



APPENDIX B

Lake Simcoe Region Conservation Authority Information

Lisa Moran

From: Lisa Moran
Sent: June-07-18 6:37 AM
To: 'Shauna Fernandes'
Cc: 'm.bessey@lsrca.on.ca'; 'c.burgess@lsrca.on.ca'; 'Andrew.Gameiro@barrie.ca'; 'Chris Matson'; 'Ray Duhamel'; 'Paul Neals'; 'McConnell Rick'
Subject: Lockhart Innisfil Investments Ltd. - Scoped NHE Terms of Reference
Attachments: 11-076 2014-G1.pdf; 11-076 2014-G2.pdf

Good Morning Shauna,

Azimuth has been retained to complete a Scoped Natural Heritage Evaluation (NHE) for properties located on the South Part of Lot 13 & 14, Concession 11, City of Barrie (Hewitt's Secondary Plan Area) (Figure 1).

It is our understanding that a Scoped NHE is required under the Lake Simcoe Protection Plan (LSPP) because the property is located in proximity to a Key Natural Heritage Feature and/or Key Hydrologic Feature as defined in the Hewitt's Secondary Plan (*i.e.* Natural Core Area according to the Hewitt's Secondary Plan) (Figure 2).

The staking of the Natural Core Area on the subject property took place in July 2015 for all the participating landowners in the Hewitt's Secondary Plan Area. The staking was undertaken with staff from the Lake Simcoe Region Conservation Authority (LSRCA), Natural Resource Solutions Inc., the City of Barrie, Azimuth, R.J. Burnside, The Jones Consulting Group and the affected landowners. The feature limits were defined, agreed to by all parties and staked. Each stake location was georeferenced and the final survey of the features was circulated to all participants. The buffer width was approved in writing by all parties who attended the July 2015 staking, then approved as part of the Secondary Plan process, and was added to the feature limit to define the development limit for the preparation of the draft plans of subdivision. Therefore, the purpose of our assessment will confirm the significant features as approved by the City and LSRCA and confirm the appropriateness of the approved buffer widths. For completeness, an assessment of Candidate Significant Wildlife Habitat (SWH) will also be included within the NHE.

Based on this information, the following outlines the activities we would undertake in preparation of the Scoped NHE:

- Search for existing rare species observation records for the property and surrounding lands;
- Conduct three evening amphibian call surveys (Completed April 28, May 19 and June 29, 2014);
- Conduct dawn breeding bird surveys (Completed June 2, 6, 18 and 21, 2014);
- Identify the vegetation communities, using protocols of the Ecological Land Classification (ELC) for Southern Ontario;
- Conduct reconnaissance surveys of vascular plants on the property during the spring, summer and fall (Completed 2014-2016);
- Attend the site in 2018 (spring) to confirm the aquatic conditions of the property;
- Conduct a Species at Risk Screening for the property utilizing available background information, habitat assessments and field data collected for the property. Note: Consultation with the Ministry of Natural Resources and Forestry (MNRF) was initiated in 2016 and is ongoing. Azimuth will continue

to work with MNRF to ensure that there is no contravention with Ontario's Endangered Species Act. Development is subject to the *Endangered Species Act* at the time of application;

- Overlay identified environmental features on aerial photography so that the relationship between the natural heritage features and functions can be assessed relative and an assessment of the sufficiency of the approved buffers can be undertaken;
- Assess the potential direct, indirect and cumulative impacts of the proposed conceptual development plan on the sensitive or significant environmental features as described above;
- Assess whether the proposed works meet the Self-Assessment criteria under the Federal Fisheries Act, or whether submission to the Department of Fisheries and Oceans through a Request for Review is required for the crossing of Lover's Creek;
- Recommend and develop an appropriate avoidance, mitigation and/or restoration strategy. Mitigation plans can include relocation of any regionally rare species, if applicable;
- Demonstrate conformity with the applicable policies of the City, LSRCA and Province; and
- Prepare one Scoped NHE report for circulation to approval agencies.

A feature-based water balance will be required to demonstrate that pre to post ecological and hydrological functions will be maintained or improved. This will not be included within the Scoped NHE and will be provided at detailed design stage.

We are not proposing to do any additional vegetation, breeding bird or amphibian surveys since the habitat conditions are the same as historically present on the site. The above proposed TOR is consistent with the other Scoped NHE reports that have already been completed and approved within the Hewitt's SPA. If you could please review the proposed TOR and provide comment on its suitability, it would be appreciated. We would also like to take this opportunity to request any background information that you may have related to this property that may be beneficial to us in completing the Scoped NHE.

Thank you for your attention to this matter. Please feel free to contact me if you have any questions or wish to discuss.

Lisa Moran

Terrestrial Ecologist

Azimuth Environmental Consulting, Inc

642 Welham Road

Barrie, ON, L4N 9A1

ph: (705) 721-8451 ext 202

cell: (705) 331-1479

lisa@azimuthenvironmental.com

www.azimuthenvironmental.com

*Providing services in **hydrogeology, terrestrial and aquatic ecology & environmental engineering***

Lisa Moran

From: Lisa Moran
Sent: May-12-14 11:41 AM
To: A.Brown@lsrca.on.ca
Subject: Terms of Reference - Four properties within the City of Barrie east annex lands
Attachments: Environmental Features.pdf; Study Area Locations.pdf

Hi Ashlea,

We have been retained to complete a Natural Heritage Evaluation for four properties within the East Annexed Lands within the City of Barrie (see attached maps):

1. Crisdawn Construction – Mapleview Property (North Part of Lot 16 and 17, Concession 11) and Lockhart Property (South Part of Lot 18 and 19, Concession 11)
2. BEMP Holdings – South Part of Lot 12, Concession 11
3. Lockhart Innisfil Investments – South Part Lot 13, Concession 11
4. Lockmaple Innisfil Investments – North Part Lot 13 and 14, Concession 11

It is our understanding that a NHE is required under the Lake Simcoe Protection Act because these properties are in proximity to a Key Natural Heritage Feature and/or Key Hydrologic Feature as defined in the Hewitt's Secondary Plan. The purpose of the NHE will be to define the development limit and assess the impact of the proposed development on the Key Natural Heritage Feature/Key Hydrologic Feature.

The following outlines the activities we would undertake in preparation of the Natural Heritage Evaluations for each property:

- Contact the LSRCA, City of Barrie and the Ontario Ministry of Natural Resources (OMNR), as required, to determine the required scope of work for the NHE and to obtain available background information;
- Search for existing rare species observation records for the property and surrounding lands;
- Conduct three evening anuran amphibian surveys (April – June 2014);
- Conduct two dawn breeding bird survey (June 2014);
- Identify the vegetation communities, using protocols of the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998. Ecological land classification for southern Ontario: first approximation and its applications. SCSS Field Guide FG-02)
- Conduct reconnaissance surveys of vascular plants on the properties during the spring, summer and fall of 2014 to provide the three season plant survey;
- Searches for salamanders via log and rock rolling while conducting plant and wildlife surveys, (if appropriate habitat present);
- Conduct a Species at Risk Screening for the property utilizing available background information and 2014 field data;
- Overlay identified environmental features on the current aerial photography so that the relationship between the natural heritage features, functions, wildlife habitat and corridors of the property can be assessed relative to the site plans developed for the property;
- Assess the potential direct, indirect and cumulative impacts of the proposed conceptual development plan on the sensitive or significant environmental features as described above;
- Incorporate the findings of the Subwatershed Study being undertaken by Burnside & Associates to assess if the hydrology of the features will be affected;

- Evaluate the extent which development can be accommodated in proximity to the natural heritage features without negative impact;
- Recommend and develop an appropriate avoidance, mitigation and/or restoration strategies to address the potential environmental impacts;
- Recommend boundaries and vegetative buffers to protect the natural heritage features;
- Determine the need for an environmental monitoring plan (construction and post-construction) to monitor potential effects;
- Demonstrate conformity with the applicable policies of the City of Barrie and the LSRCA, 2014 PPS and the Endangered Species Act; and
- Prepare one NHE report for each property for circulation to approval agencies.

If you could please review the proposed Terms of Reference and provide comment on its suitability as it related to the subject properties.

Thank you for your attention to this matter. Please feel free to contact me if you have any questions or wish to discuss further.

Regards,

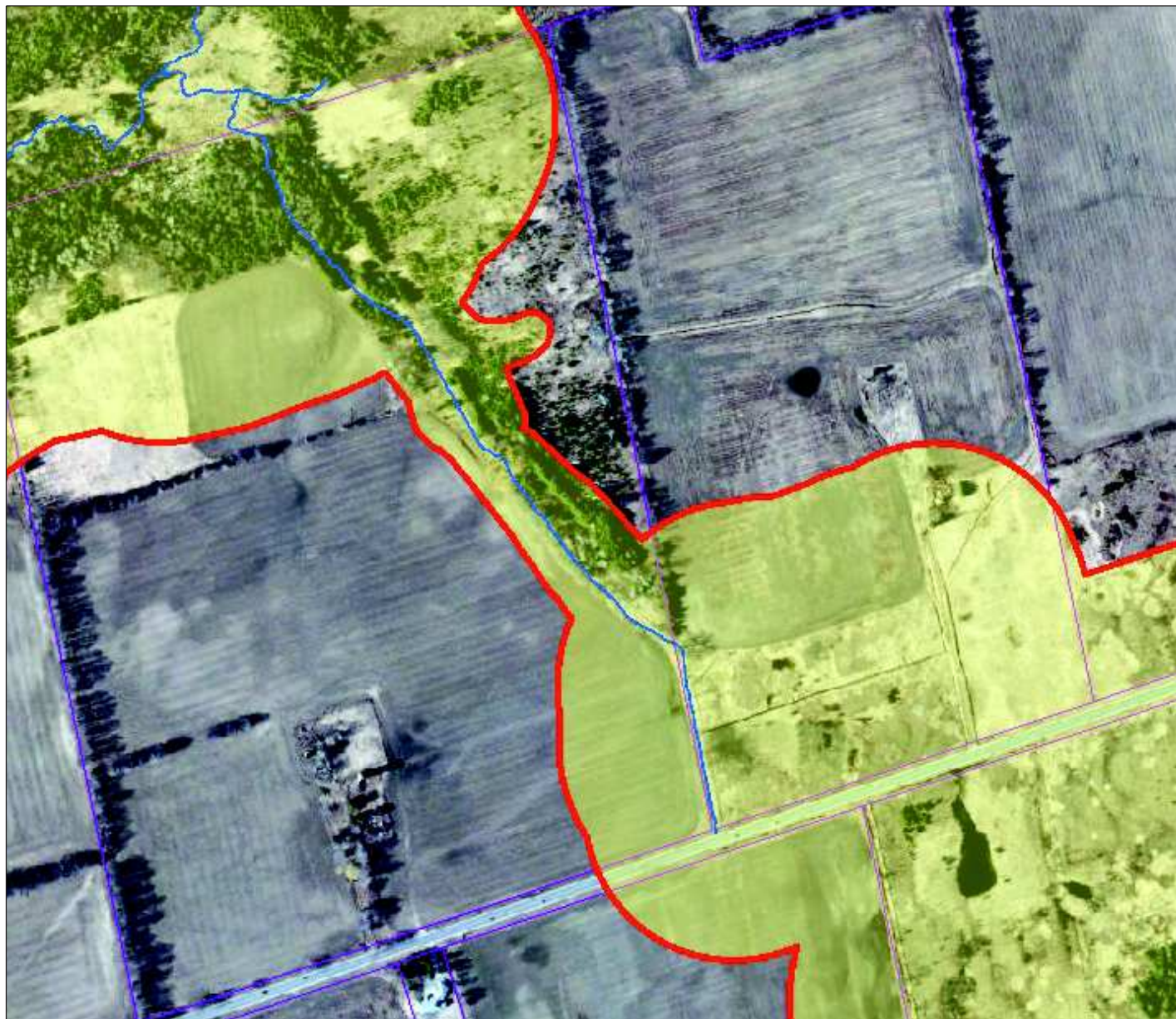
Lisa Moran, B.Sc.Env.
Terrestrial Ecologist

Azimuth Environmental Inc.
 85 Bayfield Street, Suite 400
 Barrie ON L4M 3A7
 (705) 721-8451 ext. 202
 Fax: (705) 721-8926

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering



Lake Simcoe Region
conservation authority



Features

- Watercourse
- Regulation Boundary
- Regulation Area
- Assessment Parcel
- LSRCA Boundary
- Lake Simcoe
- Lake Couchiching
- Local Road

Printed On:
7/12/2016

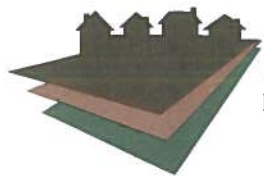


NAD_1983_UTM_Zone_17N
Mapped By:

This product was produced by the Lake Simcoe Region Conservation Authority and some information depicted on this map may have been compiled from various sources. While every effort has been made to accurately depict the information, data/mapping errors may exist. This map has been produced for illustrative purposes only. LSRCA GIS Services DRAFT printed 2015. © LAKE SIMCOE REGION CONSERVATION AUTHORITY, 2015. All Rights Reserved. The following data sets of Assessment Parcel, Roads, Upper & Lower Tier Municipalities are © Queens Printer for Ontario, 2015. Reproduced with Permission. The Current Regulation Limit and Boundary data sets are derived products from several datasets, one being MNR Wetlands © Queens Printer for Ontario, 2015. Reproduced with Permission. Orthophotography 2002, 2007, 2008, 2009. © J.D. Barnes Limited.

Scale 1: 5,000





MATSON, McCONNELL LTD.
LAND MANAGEMENT GROUP

November 27, 2017

Lake Simcoe and Region Conservation Authority
120 Bayview Parkway
Newmarket, ON
L3Y 3W3

Attention: Mr. Charles Burgess
Manager, Planning

Dear Charles,

**Re: Lockmaple Innisfil Investments Limited,
and Lockhart Innisfil Investments Limited**

Further to our meeting on November 24, 2017, please consider this letter as our confirmation that Lockmaple Innisfil Investments Limited will contribute \$65,000 in ecological off-setting plantings, as compensation for the removal of the Lockmaple isolated feature and the Lockhart vegetation protection zone remaining as currently identified on the approved Conformity Plan West of Yonge Street.

Subject to confirmation from the LSRCA, the ecological off-setting plantings will be located generally in the Lockhart vegetation protection zone, and will be completed immediately following the earthworks program related to the Lockhart lands.

Yours very truly,
MATSON, McCONNELL LTD.

Christopher S. Matson, B.E.S.

(chris/2017/barrie/24nov.lsrca)

cc: Melinda Bessey – LSRCA
Paul Neals – Orion Environmental Solutions



APPENDIX C

Provincial Background Information

Hewitt's and Salem Secondary Plan
Approach To Species At Risk Discussion
Minutes of Meeting

Meeting Date/Time: September 28, 2017 at 10:00 a.m.

Meeting Location: Midhurst District Office Trillium Room

Attendees: Graham Findlay, MNRF Management Ecologist
Megan Eplett, MNRF Management Ecologist
John Almond, MNRF Resources Operations Supervisor
Ken Mott, MNRF District Planner
Brad Allan, MNRF Resource Management Supervisor
Michael Michalski, Michael Michalski Associates
Lisa Moran, Azimuth Environmental
Brad Baker, Azimuth Environmental
David Cunningham, D.G. Cunningham & Associates
Paul Neals, Orion Environmental Solutions

The following is a summary of the issues discussed and commitments made by all parties to move the SAR approval process forward for the Hewitt's and Salem Secondary Plan. Please review and provide any comments you may have to ensure the minutes fully document the discussion.

1. Introduction and Purpose of the Meeting

- Purpose of the meeting is to obtain MNRF comments on the Information Gathering Form (IGF) submissions for Hewitt's and Salem and determine the next steps to address SAR for the Phase 1 lands

2. Natural Heritage System

- The process for establishing the Natural Heritage System (NHS) was explained to MNRF. NHS used the Natural Heritage Manual and applicable provincial policy as a guideline to assess the significance of the natural heritage features present
- NHS undertook field work in 2011 and 2012 to assess the natural heritage features in the study area. This data was used to evaluate features and

functions, assess the impact of the proposed development and determine the features to be retained based on their ecological significance post development and the applicable natural heritage policies.

- The NHS was approved through the Ontario Municipal Board and it has been incorporated into the City of Barrie Official Plan, approved January 2017.
- Features that were excluded from the NHS (e.g., isolated woodlots) will be assessed in detail for the applicable draft plan submission to address Species at Risk (SAR), but there is no expectation that these studies will result in any isolated features being included in the NHS. SAR issues would be dealt with through compensation measures or permitting, if required.
- MNRF stated the isolated or outlier features have species and habitat protection for SAR regardless of the NHS assessment process. Salem's consultants (Michael/David) will be providing MNRF with their historical information on the two outliers in the southern part of the Salem secondary plan that are part of the recent draft plan submission.
- Draft plans for the Phase 1 lands have been submitted.
- Natural Heritage Evaluations in support of the draft plans have been submitted to City of Barrie and Lake Simcoe Conservation Authority and Nottawasaga Valley Conservation Authority.

3. Information Gathering Form Submissions

- MNRF indicated the IGF lacked sufficient detail on the field work and its relation to the draft plan for them to formally comment on the findings and the associated SAR approvals that may be required.
- It was explained the IGF was submitted prior to the development of the draft plans in an effort to move the process forward, although it should be noted that plans were submitted with the IGF forms for the Hewitt's lands. Each IGF for the Hewitt's lands included a key map, site map including ELC communities and locations of known SAR and a development plan. The IGF for the Salem lands included a key map, site map with ELC and locations of known SAR.
- The purpose of the IGF submission was to initiate discussions with MNRF to determine if sufficient data had been collected to date, determine whether additional studies were required and to establish one approach to SAR for both secondary plan areas to help advance the approval process. This would also give the Phase 2 and 3 proponents a process/document they can follow to obtain SAR approvals.

- It was confirmed that any future work in Phases 2 and 3 would require regard for the most current SAR listings.
- M. Eplett (Salem Lands) stated the IGF submissions should have included detailed mapping on species locations, the extent of habitat protection area in accordance with the provincial regulations/guidelines and the proposed measures to mitigate impacts and obtain approvals. Without this detail they cannot comment on specific properties and what is required for SAR approvals.
- G. Findlay (Hewitt's Land) indicated that information related to Butternut and SAR bats was lacking but he was able to comment on the IGF for each individual property.
- Consultants to provide MNRF with the priority for completion of their review for each of the draft plans.
- Consultants indicated that Phase 1 lands were first priority.
- MNRF will submit their comments on the IGF's with two weeks, providing comment on the information required to assess the species and the associated approvals.
- MNRF indicated the supporting information to the IGF for each draft plan should include mapping showing locations where SAR was observed and habitat limits, adjacent land use and potential habitat for the species, implications of the proposed development on the species and proposed actions required for compliance under ESA.
- Details of surveys completed in support of the EIS reports were included within the IGF Form. Additional information regarding the bat surveys is forthcoming.
- Azimuth is to prepare a draft example figure of the SAR mapping for MNRF review to ensure adequate detail is done in EIS submission.
- The SAR impacts should be assessed for each property but also include an assessment of the habitat in the surrounding landscape.
- MNRF told us if we do not receive any response to future submissions within 30 days we are to contact the individual Management Biologist and copy John Almond, MNRF Resources Operations Supervisor. MNRF is working to improve their response times.
- Midhurst is working on a new Background Information Request Form in an effort to help expedite the process, which will be issued Oct 1, 2017.
- MNRF stated any trails in the NHS or buffer need to have regard for the SAR. We indicated it is the City of Barrie's responsibility to define the trails and we recommended MNRF contact them to participate on that committee. We will provide the planner contact to MNRF for the individual draft plans.

4. Approach to Individual SAR

- Concerns were expressed by the consultants over the length of the review process and the difficulty in working with the SAR evaluation processes (e.g., bats)
- MNRF staff indicated the District Offices have no ability to alter the SAR evaluation processes even if they feel modifications are warranted to reflect the environmental conditions found in their District. MNRF head office establish the guidelines and they have no ability to alter them. All SAR assessments will be assessed having regard for the MNRF provincial guidelines and suggesting alternative approaches to the evaluation other than those is the approved guidelines is pointless.
- Any change to the SAR guidelines must be done with MNRF head office and must be initiated by them. Midhurst District will not initiate or participate in that discussion.
- ESA permits if required will take 6 – 12 months after Midhurst District staff confirm the application is complete. If the preliminary indication is a permit will be required start the process immediately. Provincial election in 2018 could dominate the Minister's schedule which could delay the signing of permits, hence the urgency to start the process.
- Bobolink/Eastern Meadowlark have a permit exemption for areas up to 30ha in size. Compensating habitat needs to be provided.
- MNRF has no jurisdiction over species of Special Concern beyond application of the timing window for tree removal or other works.

5. Next Steps

- Azimuth to provide example of SAR mapping of field data and habitat protection areas for MNRF comment to ensure future EIS has adequate data.
- Paul Neals to provide City of Barrie contact for trails to MNRF (completed).

Prepared by: Paul Neals

**Ministry of Natural
Resources and Forestry**

Midhurst District Office
2284 Nursery Road
Midhurst, ON L9X 1N8
Tel: 705-725-7530
Fax: 705-725-7584

**Ministère des Richesses naturelles
et des Forêts**

Bureau de district Midhurst
2284, rue Nursery
Midhurst, ON L9X 1N8
Tél: 705-725-7530
Téléc: 705-725-7584



October 25, 2017

Azimuth Environmental Consulting, Inc
642 Welham Road
Barrie, Ontario,
L4N 9A1

Attention: Lisa Moran, Terrestrial Ecologist

Subject: Information Gathering Form – Hewitt's Creek Secondary Planning Area, Barrie

Ms. Moran the Ministry of Natural Resources and Forestry (MNRF) has reviewed the Information Gathering Form submitted in support of the review process of the proposed developments within the Hewitt's Creek Secondary Planning Area in the City of Barrie.

The Information Gathering Form (IGF) is intended to provide the details of site evaluations in support of the MNRF determining if a proposed activity might cause a contravention of Section 9 and/or Section 10 of the *Endangered Species Act, 2007* (ESA). The information provided in Tables 2, 3 and 4 of the IGF generally lacked the detail necessary to fully support the MNRF's assessment of the biological inventory work and conclusions made.

Specific evaluation reports (e.g. Butternut Health Assessment report) are referenced as sources for site specific data. Summary of the evaluations and results should be available directly in the IGF. The directions within the IGF document indicate relevant information from source documents can be cut and pasted into the Tables.

The IGF presents ecological assessments for properties involving three Phases of development within the Hewitt's Creek secondary planning area. Table 1 of the IGF summarizes target dates related to implementation stages of the proposed three phases of development – e.g. earthworks proposed in 2018, 2020 and 2022 for Phases 1, 2 and 3 respectively. The IGF summarizes the preliminary SAR surveys completed on all properties regardless of the intended phase of construction within the planning area. Many of the surveys completed date back to 2012-2014. Given the potential lag in time since the initial SAR surveys and implementation of construction activities in later phases, as well as the potential for additional species being designated threatened or endangered on the Species At Risk in Ontario (SARO) list clarification is required related to what follow-up surveys for SAR and/or habitats identified in the present IGF, and for how species added to the SARO list will be addressed.

The explanations in Table 4 concerning interpretation of how protected SAR may be positively or negatively affected should more clearly detail how and to what extent SAR species or habitats will be affected. Similarly, the proposed compensations should more clearly detail what measures and under what direction of the ESA and its regulations the proposed compensations are recommended.

Conceptual site plans were provided for most properties discussed in the IGF, there was a general lack of discussion concerning the presence of SAR or their habitats as that relates to the proposed development footprints provided. For example, should the protective buffer around a butternut tree overlap the proposed development footprint, the IGF should clearly address if a contravention of Sections 9 and 10 of the ESA might occur, and how potential impact can be avoided or might be addressed.

Keeping the above points in mind the following provides comments specific to the individual properties addressed in the IGF.

PHASE 1 Properties

BEMP Holdings 2

Butternut

- MNRF habitat protection guidance (see attached) for butternut is a 50m radius buffer around each butternut regardless of size. The protective buffer should be presented in the maps for the BEMP Holdings 2 property. Identified habitats should be evaluated for direct or indirect impacts from development.
- Regarding the butternut trees identified in the hedgerow along the BEMP2/Lockmaple shared boundary consideration of the butternut trees is required from a BEMP Holdings 2 perspective given the protected habitat zone overlaps onto the BEMP2 property. Given the location of the noted butternut trees and associated habitats (within the 50m buffers) BEMP2 would be non-compliant with the ESA should construction activities proceed within the 50m protection zone prior to the Lockmaple development removing the trees as indicated in the IGF per the O.Reg. 242/08 Exemptions Requiring Notice To Be Given On Registry – Exemption 23.7 for butternut.

Lockmaple Innisfil Investments Inc.

Butternut

- Tables 2 and 3 reference a Butternut Health Assessment (BHA) report had been submitted to MNRF, details of the trees assessed in the BHA report should be provided in the tables (e.g. health category of the trees).
- The 50m protective buffer around each butternut tree should be presented in the maps of the IGF. Identified habitats should be evaluated for direct or indirect impacts from development.
- Clarify the explanations in Table 4 per the comments above.

SAR Bats

- Tables 2 and 3 identify ELC forest community FOD5-8 had been surveyed for bat maternity roost habitat, referencing an Azimuth 2012 report. A summary of the survey methods and results should be provided in the Table 3 and Figure 2 (e.g. sample plot locations, a summary of the cavity trees enumerated).
- It is concluded that SAR bat habitat was absent. The survey protocol used does not address potential habitat from a Species at Risk (SAR) bats and ESA perspective. Based on the available information it cannot be determine if SAR bat habitats will be damaged or destroyed by the proposed activity. We recommend the woodlands be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015 (attached). Potential habitats should be evaluated for direct and indirect impacts of development.

Rainsong Land Development

SAR Bats

- Table 2 does not indicate SAR bat habitat surveys had been completed, however Table 3 indicates potential summer bat maternity roost habitat may be on site. We recommend the woodland communities be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

Chrisdawn Construction (Phase 1 – north part and Phase 3 – south part)

Butternut

- Table 3 and Figure 2 identify three butternut trees in a forest unit (FOM7-2? This is not clear in Figure 2) in the Phase 1 lands. The supplemental mapping you provided on October 18, 2017 provided the 50m protection zone around each butternut tree. Although helpful to visualize the protection zones against the conceptual site plan an explanation regarding potential impacts to butternut habitat from development and implications under the ESA is required.

SAR Birds

- Table 3 indicates barn swallows were documented foraging during breeding bird surveys over both of the Phases 1 and 3 study areas; and nests were found on a house at the north end of Phase 1 study area. Supplemental mapping noted 2017 survey locations and results. This additional information should be provided in clearer detail within the appropriate sections of the IGF.
- Anthropogenic structures are identified in the south end of the Phase 3 study area, it is not clear that surveys for barn swallow nests at those locations have been completed. We recommend that prior to demolition of any buildings they be re-evaluated for SAR and habitats (e.g. barn swallows).

SAR Bats

- Table 2 does not indicate SAR bat habitat surveys had been completed, however Table 3 indicates forest and forest swamp habitats are on site, noting potential summer bat maternity roost habitat

may be present. We recommend the woodland communities be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

- There are a number of anthropogenic structures on the Phases 1 and 3 study areas. Tables 2 and 3 do not indicate any buildings were evaluated for the presence of SAR bats maternity roost habitat/function. Prior to demolition we recommend all buildings be evaluated at the appropriate season for the presence of SAR bat maternity roosts.

Blanding's Turtle

- A Blanding's turtle was confirmed in 2017 on a property north of the Chrisdawn properties, on the north side of Maplevue Drive. Recognizing the IGF was submitted to this office prior to that turtle's occurrence confirmation the IGF should address the potential for Blanding's turtles or their habitats to be present. We recommend the IGF evaluate the potential for Blanding's turtle and their habitats to be present on site (e.g. potential nesting habitat in the ELC community noted as Disturbed in Figure 2). Potential habitats should be evaluated for direct and indirect impacts of development.

LM Barrie Holdings Inc. – 2121191 Ontario Inc.

Butternut

- Table 3 indicates the presence of five butternut trees in the forest community FOD5-8 (NW corner of property). The 50m radius protection zone around each of the identified butternut should be shown on Figure 2 for the property. An evaluation of the proposed activity and potential for impacts to butternut habitat should be provided in order to determine potential ESA authorization requirements.

SAR Bats

- Table 3 indicates there are unconfirmed potential summer bat maternity roost habitats on site. Clarify why SAR bat habitats have not been evaluated. Are any potential habitats at risk of direct or indirect impacts from development?

Blue Sky Private Equity Inc.

Butternut

- Table 3 indicates a butternut was on site during the 2014 site surveys; however it was no longer present in 2016. Table 4 indicates the butternut was mistakenly removed. Clarify the explanations in Table 4 per the comment above.

SAR Bats

- Table 2 does not indicate SAR bat habitat surveys had been completed, however Table 3 indicates forest habitat is on site, and notes potential summer bat maternity roost habitat may be present. We recommend the woodland communities be evaluated for potential SAR bat maternity roost

habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

- Clarification is required concerning the ELC CUW1 community north of the forest community FOD5-2, and perhaps it should be included within the recommended bat habitat survey areas.

PHASE 2 Properties

BEMP Holdings 1

Butternut

- The 2014 surveys identified one butternut in the north end ELC mixed swamp community (SWM6-1). The 50m radius protection zone around the identified butternut should be shown on Figure 2 for the BEMP Holdings 1 property. An evaluation of the proposed activity and potential for impacts to butternut habitat should be provided in order to determine potential ESA authorization requirements.
- This property is in Phase 2 of the planning area development; clarify what additional surveys to confirm the presence of additional butternut on site might be necessary (e.g. potential regeneration of butternut over time). An evaluation of potential impacts to butternut habitat (i.e. the 50m protection zone) would be required at that time.

SAR Bats

- No surveys are noted for SAR bat maternity roost habitat on this property. Table 3 indicates SAR bat habitats are unconfirmed on site, however potential bat maternity habitat (summer) exist in forest communities FOD5-1, SWC3-1, SWM6-1 and SWD 7-1.
- The noted woodlands should be evaluated for potential SAR bat maternity roost habitat using the survey approach outlined in the MNRF Technical Note for SAR Bats in Ontario, 2015. Potential habitats should be evaluated for direct and indirect impacts of development.

Lockhart Innisfil Investments Inc.

SAR Birds

- Table 3 notes an eastern meadowlark (threatened species) was documented during breeding bird surveys in 2014. Table 4 provides no discussion concerning the presence of meadowlark on site as that relates to the proposed development. The potential negative impact to the area it was found relative to the proposed site plan could be noted; and relating recommended follow-up surveys prior to the implementation of Phase 2 of the Secondary Plan.
- Potential summer nesting (silo on site) and foraging habitats were noted for barn swallow (threatened); one foraging barn swallow was observed during 2014 breeding bird surveys. We recommend that prior to demolition the silo be re-evaluation for species and habitats.

SAR Bats

- Table 3 indicates there are unconfirmed potential summer bat maternity roost habitats on site. Clarify why SAR bat habitats have not been evaluated. Are any such habitats at risk of impacts from development?

PHASE 3 Properties

Finger Lakes Estates Inc.

SAR Bats

- Table 3 indicates there are unconfirmed potential summer bat maternity roost habitats on site. Clarify why SAR bat habitats have not been evaluated. Are any such habitats at risk of impacts from development?

Chrisdawn-Phase 3 - property is addressed above.

Should you have any questions contact the undersigned at this office.

Yours truly,



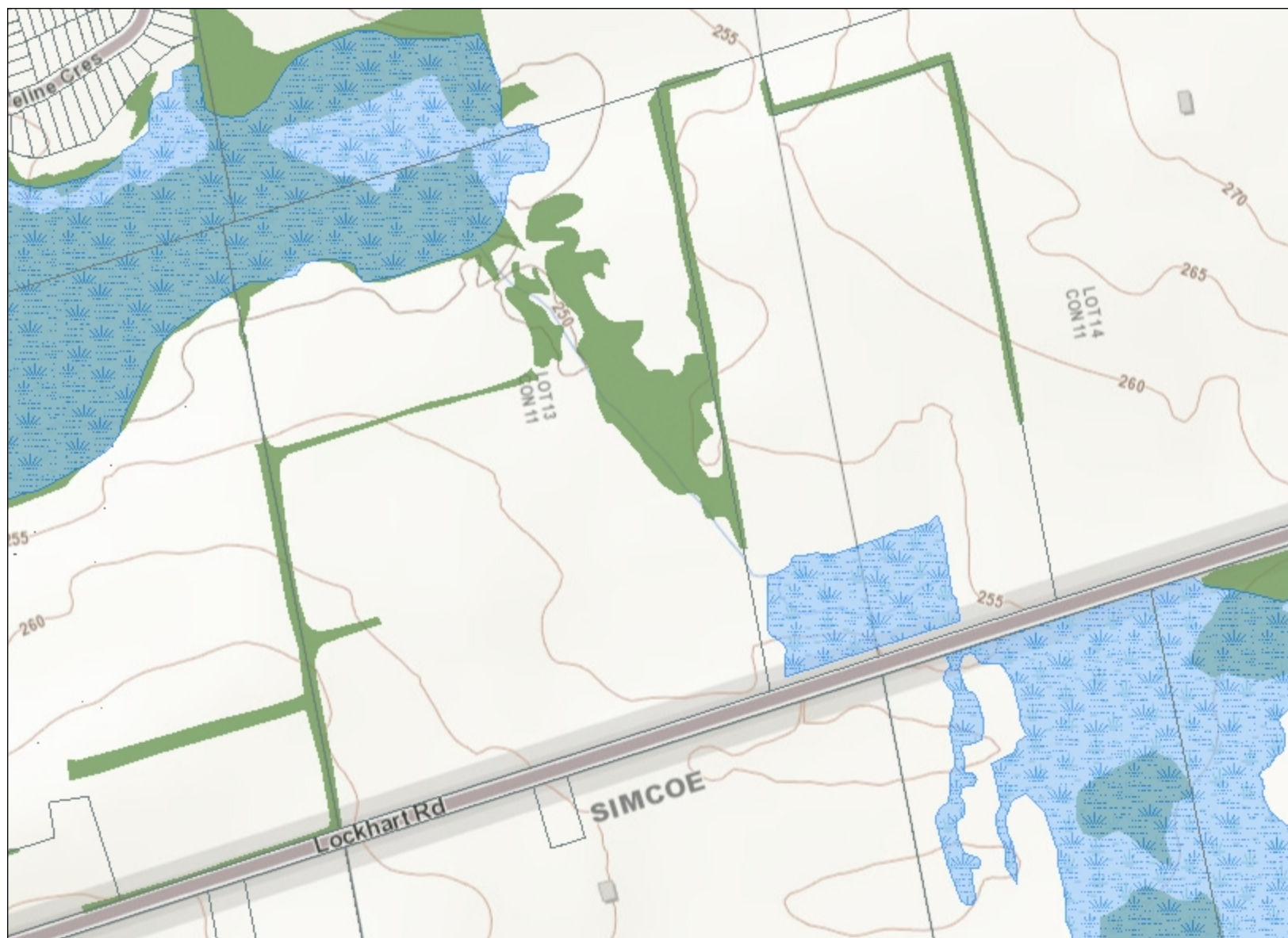
Graham Findlay
Management Biologist
Huron Resource Management Team,
Midhurst District

c.c. Mr. Paul Neals, Orion Environmental Solutions



11-076g Natural Heritage Features

Notes: Enter map notes



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion
- Wetland**
 - Provincially Significant Wetland Evaluated
 - Non - Provincially Significant Wetland Evaluated
 - Unevaluated Wetland
- Area of Natural Heritage & Scientific Interest (ANSI)**
 - Provincially Significant Life Science ANSI
 - Provincially Significant Earth Science ANSI
- Greenbelt Plan**
 - Boundary
 - River Valley Connections
- Land Use Designations**
 - Protected Countryside
 - Towns and Villages
 - Hamlets
 - Urban River Valley
 - Specialty Crop Area
- Niagara Escarpment Plan (NEP)**
 - Boundary
 - Parks and Open Space System
- Land Use Designations**
 - Escarpment Natural Area
 - Escarpment Protection Area
 - Escarpment Rural Area
 - Mineral Resource Extraction Area
 - Escarpment Recreation Area
 - Urban Area
 - Minor Urban Centre
- Oak Ridges Moraine Conservation Plan (ORM)**
 - Boundary
- Land Use Designations**
 - Natural Core Area
 - Natural Linkage Area
 - Countryside Area
 - Rural Settlement
 - Palgrave Estates Residential Community
 - Settlement Area

0.5 0 0.23 0.5 Kilometers

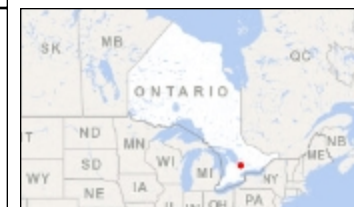
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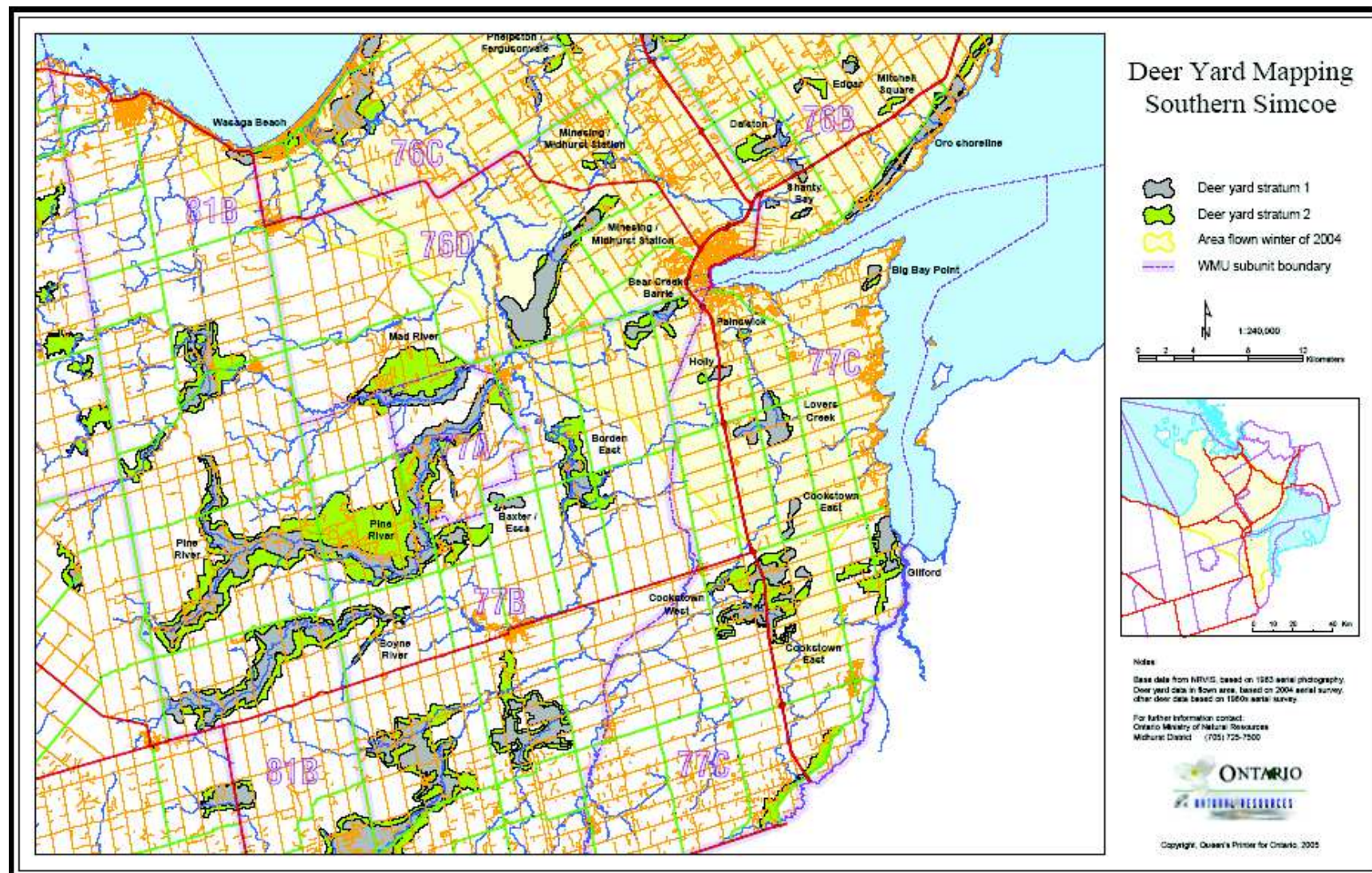


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APPENDIX D

Fish/Fish Habitat Assessment Photographs



**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 1: Tributary of Lover's Creek (facing upstream/ southeast; May 29, 2018).



Photograph 2: Tributary of Lover's Creek (facing upstream/ southeast; May 29, 2018).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 3: Facing west towards creek corridor from east farm field (October 25, 2017)



Photograph 4: Tributary of Lover's Creek (facing upstream/ southeast; October 25, 2017).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 5: Tributary of Lover's Creek (facing downstream/ northwest; October 25, 2017).



Photograph 6 : Tributary of Lover's Creek (facing upstream/ southeast; October 25, 2017).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 7: Tributary of Lover's Creek (facing upstream/ south; May 29, 2018).



Photograph 8: Tributary of Lover's Creek (facing downstream/ northwest; May 29, 2018).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 9: Drainage Ditch A (dry; facing west; October 25, 2017).



Photograph 10: Drainage Ditch A (dry; facing west; May 29, 2018).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 11: Connection of Drainage Ditch B (red arrow) to Tributary of Lovers Creek (blue arrow; facing west; May 28, 2018).



Photograph 12: Drainage Ditch B (facing east; May 29, 2018).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 13: Drainage Ditch B (facing west; May 29, 2018).



Photograph 14: Tributary of Lovers Creek at Lockhart Road CSP culvert outlet (facing south; October 25, 2017).





Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)

Photograph 15: Tributary of Lovers Creek at Lockhart Road CSP culvert outlet (facing south; May 29, 2018).



Photograph 16: Drainage Ditch C on south side of Lockhart Road (facing east from CSP culvert inlet); October 25, 2017).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 17: Drainage Ditch C by pond/ wetland connection (facing east; October 25, 2017).



Photograph 18: Drainage Ditch C on south side of Lockhart Road (facing west towards CSP culvert inlet; May 29, 2018).





**Fish/ Fish Habitat Assessment Photographs
(October 25, 2017 & May 29, 2018)**

Photograph 19: Drainage Ditch C by pond/ wetland connection (facing west; May 29, 2018).

