



November 1, 2022

Mr. Paolo Sacilotto
Project Manager – Planning
Watersand Construction Ltd.
DG Group
20 Floral Parkway, Suite 300
Concord, Ontario L4K 4R1

Re: Watersand Construction Ltd. Phase 2 South Development, 301 McKay Road West, City of Barrie –Environmental Impact Study in Support of Draft Plan of Subdivision; Our File 0922

Dear Paolo:

Michalski Nielsen Associates Limited (MNAL), working in conjunction with Cunningham Environmental Associates (CEA), is pleased to provide you with our Environmental Impact Study in relation to the Draft Plan of Subdivision for Watersand Construction Ltd.'s (Watersand's) Phase 2 South Development, located at 301 McKay Road West, City of Barrie (**Figure 1**). These lands are within the approved Salem Secondary Plan (SSP), and the ownership has been a participating landowner throughout the Secondary Plan process.

1.0 INTRODUCTION

1.1 Background

The Watersand Construction Ltd. Phase 2 South property is located at 301 McKay Road West in the City of Barrie (**Figure 1**). The property is bounded by McKay Road West to the north, generally open lands to the east and west (which are within the Salem Secondary Plan and are anticipated to be developed in the future), and agricultural lands to the south that lie within the Town of Innisfil. The subject property lands cover a total of 32.96 hectares (81.5 acres). The Phase 2 South lands lie within the jurisdictional boundary of the Nottawasaga Valley Conservation Authority (NVCA), with some of the on site and abutting features regulated by NVCA under Ontario Regulation 172/06 (Province of Ontario 2006).

This property lies within the Salem Secondary Plan (Salem Secondary Plan – listed as Parcel 61), as approved through Amendment No. 38 to the City of Barrie Official Plan (City of Barrie 2014). The Salem Secondary Plan lands are bounded by Salem Road and Lockhart Road to the north, Huronia Road to the east, County Road 27 to the west and by a mid-concession line to the south. The southern boundary is also

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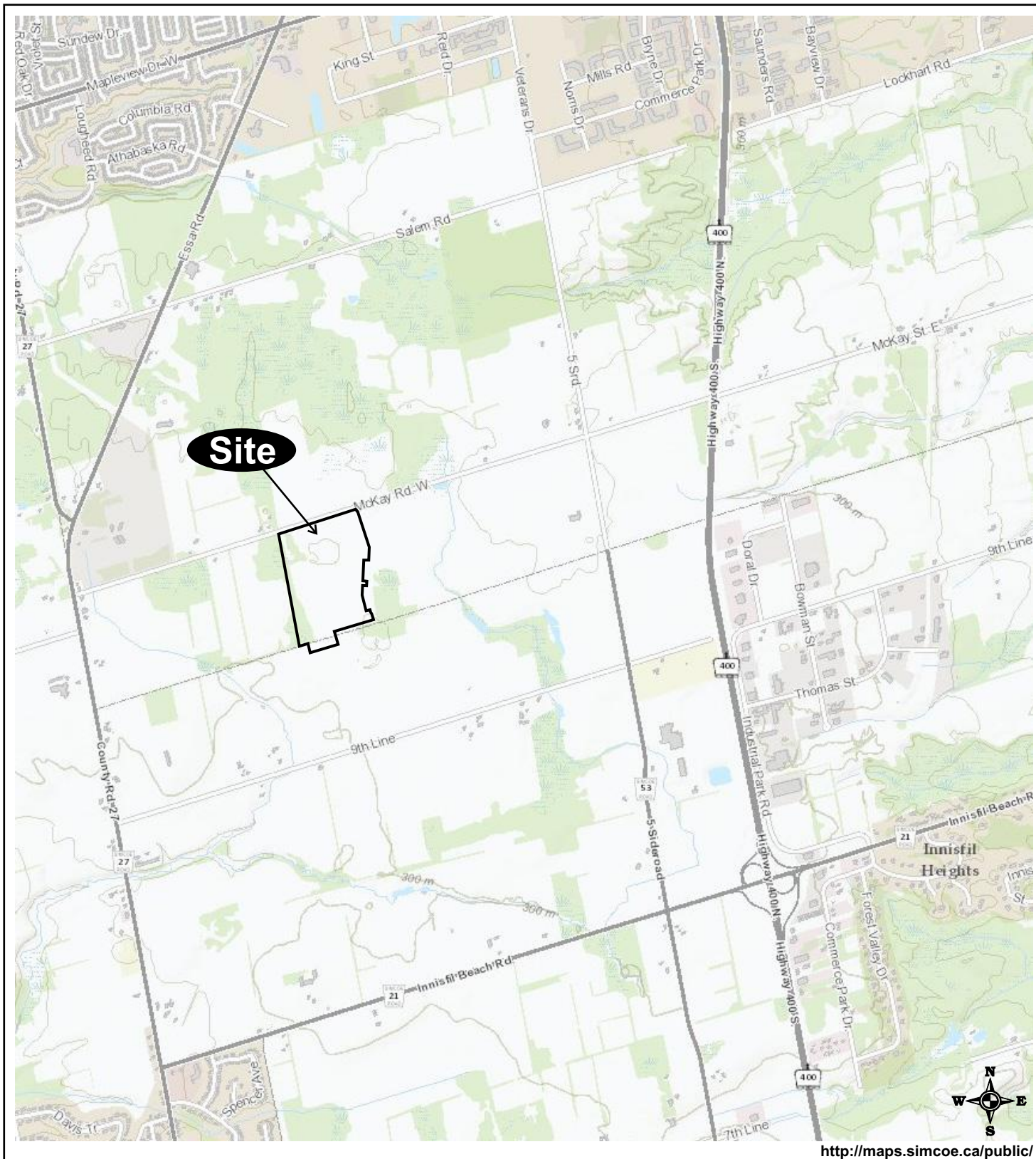


Figure 1. Study Site Location

Watersand Construction Ltd.
Salem Secondary Plan Area
Phase 2 Residential Subdivision
North Half Lot 3, Concession 9
City of Barrie, County of Simcoe



Phase 2 Residential Subdivision

<http://maps.simcoe.ca/public/>

Scale 1:NTS

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the municipal boundary between the City of Barrie and the Town of Innisfil (Schaeffer & Associates Ltd. 2022a).

Our office, working in conjunction with CEA, has been involved in work on your company's behalf in the Salem Secondary Plan Area for many years. As a participating landowner, the lands described as 301 McKay Road West have been extensively examined in the past from a natural features perspective, with that work having included:

- the Natural Heritage Characteristics Report for the City of Barrie's Annexed Lands, prepared for the City of Barrie in April 2012 by NRSI and Dougan & Associates, providing a complete characterization of the natural heritage resources of what is later referenced as the Salem Secondary Plan area;
- the City of Barrie Annexed Lands Natural Heritage System Report, prepared for the City of Barrie in September 2012 by Natural Resource Solutions Inc., which flowed out of the Natural Heritage Characteristics Report. This report identified natural heritage features, including Core Areas and Linkages, within which is later referenced as the Salem Secondary Plan area;
- the creation of the Salem Secondary Plan (Amendment No. 38 to the City of Barrie Official Plan) in June 2014, which identified a natural heritage system for those lands and established the principles by which these lands could be developed in a manner compatible with the protection of the natural heritage system components;
- field staking in 2014 of the natural heritage system that were identified for protection in the Secondary Plan. This staking exercise occurred on the lands of participating landowners and was undertaken by NVCA, in conjunction with landowner representatives, with the identified boundary limits subsequently being surveyed by an Ontario Land Surveyor (OLS);
- the establishment of natural heritage system buffer requirements specific to the Salem Secondary Plan, which are as follows:
 - 30 m from the edge of wetlands and watercourses in the Natural Core Area;
 - 30 m from the dripline of significant woodland features in the Lake Simcoe watershed;
 - 10 m from the dripline of woodland features in the Nottawasaga River watershed;
 - 5 m where the boundary of the Natural Core Area is an existing meadow or thicket.
- the plotting of such boundaries on mapping of the lands of participating landowners, where the boundaries of the natural heritage system had been staked and surveyed;
- the preparation of a Terms of Reference for Subwatershed Impact Studies (SIS Terms of Reference; final version on August 27, 2015), describing workplan requirements on individual properties in

support of Draft Plan submissions. That Terms of Reference specifically acknowledged that the natural heritage system has generally been defined through previous studies and natural heritage system policies in support of secondary plan approval; and

- the completion of a Subwatershed Impact Study for the Salem Annexed Lands, which includes the subject property, by Schaeffers and Associates Limited (Schaeffers) and others in 2017, which established general development patterns, including locations of stormwater management facilities, in keeping with the requirements of protecting the NHS.

The property and its cultural and natural heritage features were reviewed in 2014 by MNAL, in conjunction with CEA. The main purpose of the review undertaken in 2014 was to confirm the extent of the on site and abutting City of Barrie Natural Heritage System (NHS) features, and to stake those boundaries with NVCA staff and an Ontario Land Surveyor (OLS). The review mandate did not include confirming or refining the NHS Ecological Land Classification (ELC) characterizations and labelling, nor did it include any botanical inventories of the feature's inherent plant species, the assessment of Species at Risk (SAR) potential, or the assessment of Significant Wildlife Habitat (SWH) potential. Based on the results of the OLS findings, the Salem Secondary Plan mandated buffers were applied to the NHS features to determine the "Limit of Development" on this parcel. The results of the NHS features staking exercise and application of the mandated buffers is contained in the Subwatershed Impact Study Report, Salem Annexed Lands, City of Barrie (Schaeffers 2017).

1.2 Purpose of this Environmental Impact Study

The Conformity Review of the Zoning By-law Amendment and Draft Plan of Subdivision for this property that was completed by the City of Barrie (April 11, 2022) identified the need for an updated, Site-Specific Environmental Impact Study for those lands. The purpose of that Environmental Impact Study is two-fold:

- update the ecological characteristics of these lands in order to confirm the appropriateness of established development limits; and
- to confirm that the detailed design of proposed development, including its layout, all aspects of site servicing, and intended construction mitigation measures, are consistent with the requirements to ensure long-term protection of the NHS.

With respect to the former, the ecological update is necessary to confirm that the boundaries of the NHS remains accurate, that the protection of SAR and their habitats are appropriately addressed by the protection of those areas that form part of the NHS (i.e., that there is no requirement to protect additional lands in order to address the requirements of the *Endangered Species Act [ESA]*), that buffer dimensions specific to those portions of the NHS within the subject lands are sufficient to protect SAR, and that the identified NHS and associated buffers are appropriate to protect SWH.

Work that has been completed to date in 2022 in support of this EIS is described in **Table 1**.

Table 1. Summary of Field Investigations

Date	Field Investigation(s)	Weather Conditions
April 11, 2022	Amphibian Breeding Survey 1	8° C, 90% cloud cover, 0 km/h wind speed
May 11, 2022	Amphibian Breeding Survey 2	24° C, 25% cloud cover, 5 km/h wind speed
May 21, 2022	Breeding Bird Survey 1	15° C, 60% cloud cover, 4 km/hr wind speed
May 24, 2022	Vegetation Community Boundaries and Floristics	14° C, cloudy
June 11, 2022	Breeding Bird Survey 2	12° C, 90% cloud cover, 11 km/hr wind speed
June 16, 2022	Amphibian Breeding Survey 3, Nightjar Survey	26° C, 70% cloud cover, 14 km/h wind speed (full moon cycle)
July 1, 2022	Breeding Bird Survey 3	20° C, 100% cloud cover, 0 km/hr wind speed
July 13, 2022	Nightjar Survey	16° C, 0% cloud cover, 6 km/hr wind speed (full moon)
July 7, 2022	Butternut Health Assessment	14° C, 0% cloud cover, 3 km/h wind speed
July 8, 2022	Vegetation Community Boundaries and Floristics	15° C, mix of sun and cloud
September 5, 2022	Vegetation Community Boundaries and Floristics	18° C, sunny with and 0% cloud
All Dates	Incidental Wildlife Observations	As Above

1.3 Proposed Development Plan

Proposed development of the Watersand Construction Ltd. Phase 2 South lands recognize and adhere to the Natural Heritage System (NHS) defined by the City of Barrie (NRSI *et al.* 2012, NRSI 2012), with the land uses established and approved through the Salem Secondary Plan Area (City of Barrie 2014). The proposed development plan is shown on **Figure 2** (Schaeffers & Associates Ltd. *et al.* 2017).

The DG Group, along with their planning consultant KLM Planning Partners Inc. (KLM), have been working towards the creation of a 255 residential unit draft Plan of Subdivision, supported by additional technical work, including functional servicing and civil design completed by Schaeffers and by additional ecological work completed by MNAL and CEA.

1.4 Acknowledgements

This report has been prepared with considerable input from Dave Cunningham, Cunningham Environmental Associates, who has been involved on this project for a number of years and completed the vegetation community assessment work contained within this report. Mr. Cunningham also provided valuable input on the planning history associated with both the subject property and the broader Salem Secondary Plan area.

Ecology staff from Palmer have also provided extensive input to this project on matters relating primarily to the targeted wildlife surveys, Species at Risk assessment and Significant Wildlife Habitat assessment.

2.0 METHODOLOGY

2.1 Collection and Review of Background Information

Background information germane to the Watersand Construction Ltd. Phase 2 – Stage 1 property and abutting lands was collected and reviewed (Schaeffers & Associates Ltd *et al.* 2017). Prior to, during and after the site reconnaissance and inventories undertaken in 2014 and updated in 2022, the following data sources and published reports were collected and reviewed:

- **Life Science Areas of Natural and Scientific Interest in Site District 6E-8 – A Review and Assessment of Significant Natural Areas in Site District 6E-8** (Hanna 1984);
- **Natural Heritage Resources of Ontario: Bibliography of Life Science Areas of Natural and Scientific Interest in Ecological Site Regions 6E and 7E, Southern Ontario** (Riley *et al.* 1997);
- **Environmental Evaluation Watersand Property, Town of Innisfil** (Michalski Nielsen Associates Limited 2005);
- **City of Barrie Annexed Lands Natural Characterization Report** (Natural Resource Solutions Inc. *et al.* 2012);

- **City of Barrie Annexed Lands Natural Heritage Evaluation** (Natural Resource Solutions Inc. 2012);
- **Amendment No. 38 to the City of Barrie Official Plan Salem Secondary Plan** (City of Barrie 2014);
- **Terms of Reference for Subwatershed Impact Studies – Barrie Annexed Lands (OPA 38 Salem Secondary Plan & OPA 39 Hewitt’s Secondary Plan** (Schaeffers & Associates Ltd. 2015);
- **Subwatershed Impact Study Report - Salem Annexed Lands, City of Barrie** (Schaeffers & Associates Ltd. 2017);
- **The City of Barrie Official Plan** (City of Barrie 2018);
- **Simcoe County Interactive County Maps (GIS) Orthorectified Coloured Orthophotographs** (County of Simcoe 1989 to 2018);
- **Google Earth Pro Orthorectified Coloured Orthophotographs** (Google Earth Pro July 20, 2009 to June 6, 2017);

In addition to the reports listed above, various databases were searched for on site and off-site flora and fauna records. These websites and databases included the following:

- **Ontario Breeding Bird Atlas 1981-1985 and 2001-2005** (Bird Studies Canada *et al.* 2006);
- **Ministry of Natural Resources and Forestry – Midhurst District Office Information Request Form** (Midhurst District MNRF 2022)
- **Simcoe County GIS Biophysical and Natural Environment Overlays** (County of Simcoe 2022);
- **Natural Heritage Information Centre (NHIC) Internet Database/Biodiversity Explorer** (NHIC 2022); and,
- **Land Information Ontario Make-A-Map** (LIO 2022)

Background information was also garnered to assess the potential for Species at Risk (SAR) and/or Candidate Significant Wildlife Habitat (SWH), based on either species presence and/or habitat types determined from the flora inventories.

In addition to the data sources listed-above, various consultant team reports, tables, draft plans, figures and drawings were reviewed prior to and during preparation of this Scoped EIS, and is inclusive of the following:

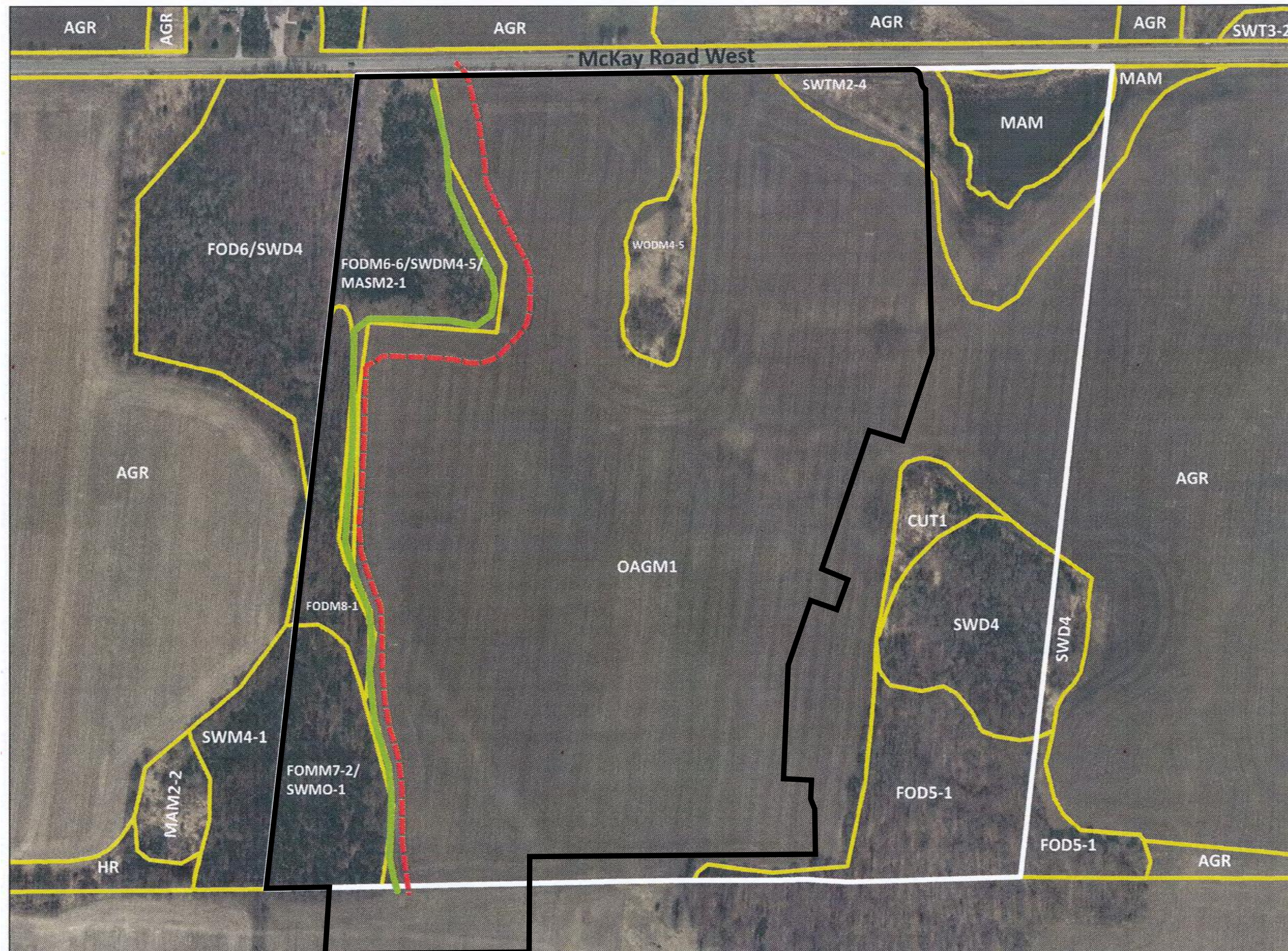
- **Geotechnical Investigation, Proposed Residential Development** (EXP Services Inc. 2017);

- **Conformity Review Planning Comments Zoning By-law Amendment & Plan of Subdivision Conformity Review – 3-1 McKay Road West – 255 Residential Unit Draft Plan of Subdivision** (City of Barrie 2022a);
- **Conformity Review – Zoning By-law Amendment & Draft Plan of Subdivision, 301 McKay Road West, Salem Secondary Plan Area, City of Barrie** (City of Barrie 2022b);
- **Functional Servicing Report – Watersand Construction c/o DG Group Phase 2 Salem Secondary Plan Proposed Residential Development, City of Barrie** (Schaeffers & Associates Ltd. 2022a);
- **Watersand Residential Subdivision Phase 2 Salem Secondary Plan Area – Preliminary Grading and Servicing Plan** (Schaeffers & Associates Ltd. 2022b);
- **Watersand Residential Subdivision Phase 2 Salem Secondary Plan Area – Preliminary Grading and Servicing Plan** (Schaeffers & Associates Ltd. 2022c);
- **Watersand Residential Subdivision Phase 2 Salem Secondary Plan Area – Stage 1 Topsoil Stripping** (Schaeffers & Associates Ltd. 2022d);
- **Watersand Residential Subdivision Phase 2 Salem Secondary Plan Area – Salem Landowners Group SWM Pond “C” Plan** (Schaeffers & Associates Ltd. 2022e);
- **Watersand Residential Subdivision Phase 2 Salem Secondary Plan Area – Salem Landowners Group SWM Pond “C” Sections** (Schaeffers & Associates Ltd. 2022f); and
- **Watersand Construction Ltd. Phase 2 South Lotting Concept** (KLM Planning Partners Inc. 2020).

2.2 Vegetation Communities & Floristics

As outlined in **Section 1**, the NHS features were defined by the City of Barrie through studies undertaken by Natural Resource Solutions Inc. – NRSI (2012) and NRSI and Dougan & Associates (2012). MNAL, in conjunction with CEA, reviewed the extent of the NHS features and other non-NHS features on the property in 2014, with additional confirmation undertaken in 2022. Some adjustments have been undertaken in terms of the characterization of the NHS and non-NHS features, using the updated Ministry of Natural Resources and Forestry (MNRF) Ecological Land Classification (ELC) codes (Lee 2008). In 2014, no botanical inventories were conducted in the NHS and the non-NHS features. Botanical inventories were conducted in the spring, summer and early fall of 2022 to characterize the NHS and other non-NHS features in the proposed development area.

As per the SPP Area policies, the NHS features includes buffers (the greater thereof), defined as within 10 m of the dripline of a wooded feature, 30 m from the centre line of creek, 30 m from a wetland feature edge, or 5 m from a meadow or thicket edge. **Figure 3** shows the extent of the NHS and non-NHS features

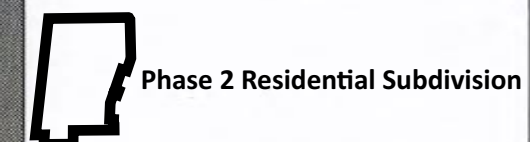


**Parcel 61
Watersand
Construction Limited
301 McKay Road West**

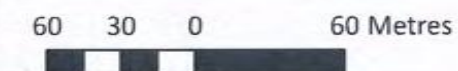
*Staked and Reviewed
By NVCA
2014*

- Limit of Natural Heritage Feature
- - - Buffer
- OAGM1 Vegetation Communities

Figure 3. Vegetation Communities - ELCs



2012 Ortho Imagery



Map Source:

Project Name:	Barrie Properties
Project Number:	5616
Date:	10-Dec-2014
Created By:	K.L.F.
Scale:	1:3,000

NO.	DATE DD/MM/YY	REVISIONS	BY
1	11/09/15	Draft NHS Limits and Buffer	JT
2	19/11/15	Finalize Drawing	JT
3	30/08/16	Vegetation Communities	JT
4	28/10/17	Vegetation Community Boundary Revisions	JT

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on the property, along with the appropriate buffers on each. The Ontario Land Survey (OLS) staking exercise to confirm the NHS and non-NHS boundaries and agreement on the application of the SPP policy buffers was undertaken in 2014 with NVCA staff and reviewed and approved in 2014.

Based on past agreement with the City of Barrie and the NVCA, the identification, mapping and characterization of the vegetation communities on all participant landowners in the Salem Secondary Plan would be founded on the City of Barrie Annexed Lands Natural Heritage Characterization Report (Natural Resource Solutions Inc. *et al.* 2012) and the City of Barrie Annexed Lands Natural Heritage System Report (Natural Resource Solutions Inc. 2012). As the Watersand Construction Ltd (Parcel 61) is a participant landowner, the basis for the vegetation community characterizations was established through the SIS field inventories undertaken on various dates (spring, summer and fall) in 2014 and 2015. Additional data for the identification, characterization confirmation, delineation and inherent species content of each NHS and non-NHS feature were the result of field work conducted for this EIS on May 24, July 8 and September 5, 2022, and supplemented with the field work undertaken in 2014 and 2015.

The NHS and non-NHS characterization and mapping of the vegetation communities were classified in 2012 according to their Ecosite landscape unit community type, following the Ecological Land Classification (ELC) format outlined in **Ecological Land Classification for Southern Ontario: First Approximation and Its Application** (Lee *et al* 1998). CEA has applied the updated ELC codes, with variations where warranted, and as contained in the **Southern Ontario Ecological Land Classification – Vegetation Type List** (Lee 2008). Further characterization, delineation and significance of the vegetation communities was refined, where warranted, based on the **Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario** (Bakowsky 1997).

As defined by the MNRF, an Ecosite, “is a mappable landscape unit defined by a relatively uniform parent material, soil and hydrology, and consequently supports a consistently recurring formation of plant species which develop over time (vegetation chronosequence).” Within each ecosite landscape unit, there are a variety of vegetation types. A vegetation type, “is a part of an ecosite, and represents a specific assemblage of species which generally occur in a site with a more uniform parent material, soils and hydrology, and a more specific stage within a chronosequence.”

The classification of the on site and abutting vegetation communities was characterized based on species composition and physiognomic characteristics. The nomenclature for the flora observed is consistent with and relied on the following authorities:

- Lycopodiaceae to Aspleniaceae. Cody, W. J., and D. F. Britton. 1989. **Fern and Fern Allies of Canada**. Publication 1829/E, Agriculture Canada, Research Branch, Ottawa.
- Taxaceae to Orchidaceae – Voss, E. G. 1972. **Michigan Flora. Part 1: Gymnosperms and Monocots**. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 55.
- Saururaceae to Cornaceae – Voss, E. G. 1985. **Michigan Flora. Part 2: Dicots**. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 59.

- Pyrolaceae to Compositae – Voss, E. G. 1996. **Michigan Flora. Part 3: Dicots**. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 61.
- Newmaster, S. G., A. Lehela, P. W. C. Uhlig, S. McMurray, M. J. Oldham, and Ontario Forest Research Institute. 1998. **Ontario Plant List**. FRI Paper No. 123.
- Bradley, D. J. 2013. **Southern Ontario Vascular Plant Species List**. 3rd Edition. Science & Information Branch Southern Science and Information Section. Ontario Ministry of Natural Resources, Peterborough, Ontario. SIB SSI SR-03, 78 p.

The rarity or significance for vegetation community types and inherent floristics (vascular plants) in each NHS and non-NHS feature was determined from standard status lists, published literature and the NHIC web-site database (NHIC 2022). Sources for flora included Bakowsky (1997), Environment and Climate Change Canada (2022), Committee on the Status of Endangered Wildlife in Canada – COSEWIC (2022), Province of Ontario (2007), Ministry of Natural Resources and Forestry (2022), Oldham and Brinker (2009), Riley *et al.* (1989), and Leslie (2018). Rare plant species on a federal level are listed in the *Species at Risk Act (SARA)*, 2002. On a provincial level, the Species at Risk in Ontario (SARO) list includes those species regulated under the *ESA 2007*, as amended from time to time. The determination for plant species rarity consisted of a straightforward comparison of the plant species recorded on-site with those listed in these source references.

2.2 Amphibian Breeding Survey

Breeding amphibian surveys were conducted on April 11, May 11 and June 16, 2022 in accordance with standard field protocols (Gartshore, et al., 2004; Bird Studies Canada, 2009). Survey locations are shown on **Figure 4** and were selected to ensure all areas potentially providing amphibian breeding habitat were evaluated. Species were identified by call, and an abundance code for each species heard calling was assessed by the following the Amphibian Monitoring protocol:

- Code 0: No calls heard.
- Code 1: Calls not overlapping or simultaneous, number of individual frogs can be counted.
- Code 2: Calls overlapping or simultaneous, number of individuals can still be distinguished, number of individual frogs cannot be counted, but a reliable estimate of numbers can be made based on location and call voices.
- Code 3: Full chorus, calls simultaneous and overlapping, numbers of calling males cannot be reasonably counted or estimated.

2.3 Breeding Bird Surveys

Three breeding bird surveys were conducted on the site in general accordance with the Ontario Breeding Bird Atlas protocols (Bird Studies Canada, 2001). These surveys were undertaken within the peak breeding



LEGEND

- Amphibian Survey Station ¹
- Nightjar Survey Station ¹
- Subject Property

1 - Palmer, 2022



North American Datum 1983
Universal Transverse Mercator Projection Zone 17

Scale: 1:5,500
Page Size: Letter (8.5 x 11 inches)

Drawn: SM
Checked: RA
Date: Oct 11, 2022

Source Notes:
Base imagery (2018) provided by Simcoe County open GIS services.



CLIENT



PROJECT

McKay and Salem (Barrie) - Environmental Review

TITLE

**2022 Field Survey
(301 McKay Rd)**

Palmer™

REF. NO. 16033108-2-2

Figure 4

season for most bird species; the first survey was conducted on May 21, 2022, with the second survey conducted on June 11, 2022 and the third conducted on July 1, 2022. The surveys were carried out between 5:00 a.m. and 10:00 a.m. to coincide with the dawn chorus. The surveyor recorded all bird species seen and heard within and flying over the survey area on each site visit. The number, breeding evidence, and approximate location of each bird or bird group was recorded on mapping of the property.

2.4 Nightjar Surveys

Nightjar surveys were conducted in general accordance with the Canadian Nightjar Survey: Protocol 2022 (Birds Canada, 2022) on June 16 and July 13, 2022. The survey stations were located in areas of the subject property which were deemed to have potentially suitable habitat (**Figure 4**). The surveys were conducted during peak full moon periods. The conditions on the survey nights were clear with low cloud cover and low winds, with the survey completed within the identified timeframe (i.e., start half hour after sunset). Each survey was based on auditory observations and completely for approximately 15 to 30 minutes.

2.5 Species at Risk

Prior to fieldwork, records of Species at Risk (SAR) for the general area were queried through the NHIC database and various online citizen science databases. A general screening for potential SAR habitat opportunities was completed for the subject property. Habitat opportunities for SAR on the site were then assessed by comparing habitat preferences of species deemed to have potential to occur against current site conditions. The locations of all encountered SAR were also recorded.

2.6 Significant Wildlife Habitat

The Significant Wildlife Habitat Criteria for Ecoregion 6E (MNRF 2015) were compared with the habitat attributes of the subject property to determine the potential for candidate SWH.

2.7 Aquatic Habitat Surveys

There are no defined watercourses within this property and therefore was no need for aquatic habitat surveys to have been completed as part of this assessment.

3.0 EXISTING CONDITIONS

3.1 Land Use

At present, there are not structures on the Phase 2 – Stage 1 lands. The majority of the tableland is planted with annual row crops, which over the past years has been planted mainly with soybean (2022) or corn. There are the remnants of a farm lane, farmhouse foundation and well within one of the non-NHS features.

3.2 Topography and Site Drainage

As previously stated, the Phase 2 – Stage 1 lands are predominantly used for agricultural purposes, namely annual row crops and remains undeveloped. The site is 32.96 ha (81.5 ac), with a total development area of 27.32 ha (67.5 ac). A topographic survey was conducted in 2018 by Holding Jones Vanderveen Inc. in July 2018. Topography and site drainage descends southwest towards Thornton Creek, with a relatively flat slope (Schaeffers & Associates Ltd. 2022a). There are no permanent or intermittent watercourses on the property.

3.3 Soil Conditions

According to the Soil Survey of Simcoe County Report (1962), the predominant soil types throughout this area are Tioga and Bondhead Sandy Loams. Both of these soil types are expected to provide “good” drainage and are classified as a Type “B” MTO hydrologic soil group. Geotechnical investigation conducted by EXP indicates that the native soils comprised of sand, silty sand, silty clay, clayey silt, silt, silty sand till, and peat (EXP Services Inc. 2017). The predominant soil type found on the subject site is glacial silty sand till and almost all boreholes encountered a silty sand till deposit. Further details are contained in Schaeffers & Associates Ltd. (2022a).

3.4 Vegetation

3.4.1 Regional Vegetation

The Phase 2 – Stage 1 lands lie within Site District 6E-8, which is part of the large Site Region 6E (Hanna 1984). Site District 6E-8 consists of a wide band extending from south of Lake Simcoe, eastward to the Bay of Quinte, including Lake Scugog, Rice Lake and the southern section of the Kawartha Lakes. Site District 6E-8 is generally described as an area of drumlinized till with local areas of water-lain silt and clay. The majority of the site district is contained within the Peterborough Drumlin Field, a physiographic region typified by drumlinoid hills, drumlin fields and eskers, interrupted by intervening wide river valley basins with muck, spillway and sand deposits (Chapman and Putnam 1984).

Based on a forest classification by Rowe (1972), the subject property lies within the Huron-Ontario Section (L.1) of the Great Lakes-St. Lawrence Forest Region. The original forest cover consisted primarily of hardwoods, such as sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*). Other woody associates include basswood (*Tilia americana*), white ash (*Fraxinus americana*), red ash (*Fraxinus pennsylvanica*), yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), white oak (*Quercus alba*) and bur oak (*Quercus macrocarpa*). Conifers such as eastern hemlock (*Tsuga canadensis*), eastern white pine (*Pinus strobus*), and balsam fir (*Abies balsamea*) are typical within the tolerant hardwood types. Species such as largetooth aspen (*Populus grandidentata*), butternut (*Juglans cinerea*), bitternut hickory (*Carya cordiformis*), hop hornbeam (*Ostrya virginiana*), and black cherry (*Prunus serotina*) are scattered throughout. Species associated with river-bottoms and swamp sites include blue-beech (*Carpinus caroliniana*), silver maple (*Acer saccharinum*), slippery elm (*Ulmus rubra*), rock elm (*Ulmus thomasii*),

and black ash (*Fraxinus nigra*). Eastern white cedar (*Thuja occidentalis*) is ubiquitous to swampy depressions and on old fields.

The original forest cover in many parts of southcentral Ontario has been cleared for settlement and cultivation, and consequently, contiguous, extensive forest tracts are relatively uncommon. Tableland woodland remaining within settlement (urban) areas are usually disturbed and/or in various stages of successional growth.

3.4.2 Site Vegetation Communities

The location and extent of the agricultural, cultural and natural feature communities (ELCs) on the Watersand Construction Ltd (Parcel 61) Phase 2 – Stage 1 property are shown on **Figure 3**. The ELCs on **Figure 3** have been slightly revised to reflect the updated Lee (2008) ELC codes. However, the boundaries of the NHS features and the SSP mandated buffers remain the same as those staked in-situ and with NVCA staff in 2014, reviewed and approved by NVCA staff and surveyed by a qualified OLS. The OLS approved AutoCAD survey formed the basis for the Draft Plan of Subdivision lotting, servicing and road layout to ensure the “limit of development” did not intrude into an NHS feature and/or its buffer, save and except for the SSP approved road crossings through the NHS as shown on the Draft Plan. The 2014 ELC figure is contained in Appendix B16 of the **Subwatershed Impact Study Report** (Schaeffers Consulting Engineers *et al.* 2017).

Table 2 contains a listing of the ELCs identified, along with modified ELC characterization codes as of 2022, based mainly on Lee (2008), with some additions. A total of six features (two cultural, three forest/woodland, and one wetland), comprised of both NHS and non-NHS features, are delineated on the property. Qualitative notes and photographs were recorded for the on-site and abutting off-site features and land uses to the north, south, east and west. The vascular plant species (floristics) were recorded in each vegetation community, particularly the most dominant and typical species during the spring, summer and early fall months.

There are perimeter deciduous hedgerows that border parts of the property, all of which lie within the McKay Road West right-of-way (ROW). Some of the NHS features are comprised mainly of forest/woodland, with small inclusions of other vegetation communities. **Table 2** also contains a summary description of the vegetation community, along with typical inherent woody and groundcover plant species.

The on-site features are as follows:

- Annual Row Crops (OAGM1);
- Dry-Fresh Manitoba Deciduous Woodland (WODM4-5);
- Fresh-Moist Sugar Maple Deciduous Softwood Forest (FODM6-6) with inclusions of Poplar Mineral Deciduous Swamp (SWDM4-5) and small pocket of Forb Mineral Shallow Marsh (MASM2-1);

Table 2. List of ELC Units (Vegetation Communities) Watersand Construction Ltd. Phase 2 Residential Subdivision Lands.

ELC Code	Vegetation Type	Summary Description
Cultural		
OAGM1	Annual Row Crops	- as Illustrated on Figure 3, the tableland planted over the years with agricultural row crops such as soybean (<i>Glycine max</i>) or corn (<i>Zea mays</i>) or ploughed and left fallow - parts of the agricultural tableland lies with portions of the Natural Heritage System (NHS) feature buffers and also lie outside of and abut the proposed Phase 2 Residential Subdivision lands
WODM4-5	Dry-Fresh Manitoba Maple Deciduous Woodland	- a small remnant narrow stand of trees and shrubs which extend off of McKay Road West and dominated by Manitoba maple, and lies outside of the NHS - this feature is characterized as a dry-fresh woodland, and contains parts of the remnant foundation and well of a former farmhouse and laneway - other woody vegetation includes basswood, white ash, white willow, common apple, red-osier dogwood, maple-leaved viburnum, sugar maple, Virginia creeper, common buckthorn, and riverbank grape - typical groundflora includes wild carrot, bird's-foot trefoil, chicory, common ragweed, New England aster, Canada goldenrod, common milkweed, reed canary grass, timothy, yarrow, awnless brome grass, orchard grass, white sweet-clover, common dandelion, red clover, white clover, common burdock, bouncing-bet wild comfrey, and pigweed
Woodland		
FODM6-6/ SWDM4-5/ MASM2-1	Fresh-Moist Sugar Maple Deciduous Softwood Deciduous Forest Poplar Mineral Deciduous Swamp Forb Mineral Shallow Marsh	- this prominent forest feature lies within the NHS and contiguous off-site to the west and is contiguous with other types of forested features to the south and west - small inclusions in this feature include a small open clearing, a copse of poplar treed swamp and pockets of forb meadow marsh and cattail shallow marsh - dominant trees in all three features include sugar maple, trembling aspen, Manitoba maple, white elm, balsam poplar, eastern white cedar, Scots pine, common buckthorn, choke cherry, Bebb's willow, white birch, pussy willow and beaked hazel - typical groundflora in the forested portion includes horseweed, daisy fleabane, heart-leaved aster, scouring-rush, enchanter's nightshade, herb-robert, jack-in-the-pulpit, coltsfoot, deadly nightshade, grass-leave goldenrod - typical groundflora in the treed swamp and shallow marsh features include spotted Joe pye-weed, spotted jewelweed, boneset, reed canary grass, scouring-rush, wild mint, swamp milkweed, purple loosestrife, fringed loosestrife, narrow-leaved cattail, blue flag, water horehound, and nodding lady's tresses

ELC Code	Vegetation Type	Summary Description
FODM8-1	Fresh-Moist Poplar Deciduous Forest	- contiguous with FODM6-6 and contained within the NHS is a narrow, linear stand dominated by trembling aspen, along with large-toothed aspen, balsam poplar, white ash, white birch, choke cherry, white elm, black cherry, red-osier dogwood, nannyberry, and common buckthorn - the groundcover is similar in composition to FODM6-6
FOMM7-2/ SWMO1-1	Fresh-Moist White Cedar – Hardwood Mixed Forest White Cedar – Hardwood Organic Mixed Swamp	- contiguous with FODM8-1 and part of the NHS is a stand comprised mainly of white cedar/hemlock and hardwood mixed forest, with a pocket of white cedar-hardwood organic swamp, which extends off-site to the west - eastern white cedar is dominant, with other woody associates such as trembling aspen, balsam poplar, white elm, white birch, black cherry, red-osier dogwood, alternate-leaved dogwood, riverbank grape, Virginia creeper, choke cherry, and common buckthorn - the cedar swamp portion is dominated by eastern white cedar, along with eastern hemlock, basswood, white birch, white elm, scattered green ash, maple-leaved viburnum, and scattered willow shrubs - typical groundcover species in the forested stand include coltsfoot, deadly nightshade, wild cucumber, herb-robert, enchanter's nightshade, daisy fleabane, woodland strawberry, scouring-rush, tall goldenrod, large-leaved aster and sow-thistle - the swamp inclusion groundcover includes wild mint, water horehound, wild basil, Jakin-the-pulpit, large-leaved aster, spinulose wood-fern, sensitive fern, spotted jewelweed, spotted Joe pye-weed, swamp milkweed, and reed canary grass
Wetland		
SWTM2-4	Red-osier Dogwood – Willow Mineral Thicket Swamp <i>with inclusions of:</i> Forb Mineral Shallow Marsh (MASM2-1) and Horsetail Graminoid Mineral Meadow Marsh (MAMM1-10)	- at the eastern edge of the Phase 2 land abutting McKay Road West is a stand of thicket swamp dominated by red-osier dogwood and willow shrubs with pockets of casual stagnant water (6 cm at various times of the year) - other wetland featured deemed to be inclusion within SWTM2-4 include Forb Mineral Shallow Marsh (MASM2-1) and a narrow outer band of Horsetail Graminoid Mineral Meadow Marsh (MAMM1-10) - this feature is not within the NHS but is regulated by the NVCA - typical woody vegetation in SWTM2-4 includes Bebb's willow, pussy willow, red-osier dogwood, Manitoba maple saplings, Missouri willows, heart-leaved willow, maple-leaved viburnum, meadowsweet, and nannyberry - common groundflora includes reed canary grass, narrow-leaved cattail, spotted jewelweed, sensitive fern, coltsfoot, blue vervain, purple-stemmed aster, purple loosestrife, field horsetail, Canada bluejoint grass, boneset, small-flowered willowherb, beggar-ticks, Bebb's sedge, foxtail sedge, water horehound, deadly nightshade, wild cucumber, pale smartweed, swamp milkweed, and Canada rush

- Fresh-Moist Poplar Deciduous Forest (FODM8-1);
- Fresh-Moist White Cedar – Hardwood Mixed Forest (FOMM7-2) with an inclusion of White Cedar – Hardwood Organic Mixed Swamp (SWMO1-1); and,
- Red-osier Dogwood and Willow Thicket Swamp (SWTM2-4), along with a small pocket of Forb Mineral Shallow Marsh (MASM2-1 and inclusion of a narrow outer band of Horsetail Graminoid Mineral Meadow Marsh (MAMM1-10), all of which are contiguous and extend to the east within the remaining portion of Lot 61, but outside of the proposed development area.

The following sub-sections provide more detailed descriptions of the property features, including their ELC characterization, approximate boundaries and inherent plant species composition in the overstorey, understorey, shrub and groundcover strata, as well as selective photographs where applicable. **Figure 3** shows the NHS staked in-situ (OLS file) vegetation community boundaries and mandated SSP policy buffers, along with revised ELC units for each feature.

Annual Row Crops (OAGM1)

Photograph 1 shows an easterly view of McKay Road West, with part of the property bordering onto its southside. As per **Figure 3**, the majority of the Watersand Construction Ltd proposed Phase 2 Residential Subdivision development area is comprised of annual row crops, with soybean (*Glycine max*) planted in 2022 (**Photographs 2, 3 and 4**). Corn (*Zea mays*) has also been planted in the past as evidenced by remnant corn stalks. The soybean growth in 2022 was patchy compared to other years (**Photograph 5** August 7 2014), allowing for a multitude of invasive grasses and noxious weeds to flourish over the growing seasons.

A list of typical grasses, weeds, and herbaceous forbs in OAGM1 is as follows:

<i>Echinochloa crus-galli</i>	barnyard grass or barnyard millet
<i>Digitaria sanguinalis</i>	large crabgrass
<i>Setaria viridis</i>	green foxtail
<i>Bromus inermis</i>	awnless brome grass
<i>Phleum pratense</i>	timothy
<i>Dactylis glomerata</i>	orchard grass
<i>Hordeum jubatum</i>	foxtail barley
<i>Phalaris arundinacea</i>	reed canary grass
<i>Poa compressa</i>	Canada bluegrass
<i>Equisetum hyemale</i>	scouring-rush horsetail
<i>Equisetum arvense</i>	field horsetail
<i>Equisetum scirpoides</i>	dwarf scouring rush
<i>Cichorium intybus</i>	chicory
<i>Echium vulgare</i>	viper's bugloss
<i>Taraxacum officinale</i>	common dandelion
<i>Chenopodium capitatum</i>	strawberry blite
<i>Amaranthus retroflexus</i>	redroot pigweed



Photograph 1. Eastward view of McKay Road West, with part of Watersand Construction Ltd Phase 2 South Development lands fronting onto the south side



Photograph 2. Southeast view of part of OAGM1 tableland on east side of property with patches of barren soil, planted with soybean (*Glycine max*) and natural regeneration of typical cropland weeds



Photograph 3. East view of part of OAGM1 tableland with patches of barren soil, planted with soybean (*Glycine max*) and natural regeneration of typical cropland weeds, along with remnant corn stalks from previous years



Photograph 4. South view of part of OAGM1 tableland on west side of property with patches of barren soil, planted with soybean (*Glycine max*) and natural regeneration of typical cropland weeds



Photograph 5. South view of OAGM1 on August 7 2014 showing lush annual row crop of soybean (*Glycine max*)



Photograph 6. Southward view of cultural woodland feature WODM4-5, dominated by Manitoba maple and basswood, along with dead/dying white ash, white elm, sugar maple, dogwoods, buckthorn, and honeysuckle



Photograph 7. Inside view of WODM4-5 showing remnant farmhouse foundation, with old well nearby



Photograph 8. Eastward view of west side of WODM4-5, showing inclusions of old field openings of meadow dominated herbaceous forbs, weeds and grasses

<i>Asclepias syriaca</i>	common milkweed
<i>Dysphania graveolens</i>	oak-leaved goosefoot
<i>Tripleurospermum inodorum</i>	scentless camomile
<i>Erigeron annuus</i>	common plantain
<i>Erigeron lanceolatus</i>	English plantain
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium vulgare</i>	bull thistle
<i>Potentilla recta</i>	rough-fruited cinquefoil
<i>Lotus corniculatus</i>	bird's-foot trefoil
<i>Melilotus alba</i>	white sweet-clover
<i>Vitis riparia</i>	riverbank grape
<i>Ambrosia artemisiifolia</i>	common ragweed
<i>Matricaria discoidea</i>	pineapple weed
<i>Conyza canadensis</i>	horseweed
<i>Solidago canadensis</i>	Canada goldenrod
<i>Solidago altissima</i>	tall goldenrod
<i>Rumex crispus</i>	curly dock
<i>Gnaphalium uliginosum</i>	low cudweed
<i>Chrysanthemum leucanthemum</i>	ox-eye daisy
<i>Lobelia inflata</i>	Indian tobacco
<i>Thlapsi arvense</i>	field pennycress
<i>Lepidium campestre</i>	field pepperwort
<i>Symphyotrichum novae-angliae</i>	New England aster
<i>Silene vulgaris</i>	bladder campion
<i>Silene noctiflora</i>	night-flowering catchfly
<i>Verbascum thapsus</i>	common mullein

Dry-Fresh Manitoba Maple Deciduous Woodland (WODM4-5)

Bisecting a portion of OAGM1 along the north property frontage is an elongated narrow woodland feature dominated by deciduous softwoods, along with open patches of old field along its western edge (**Photographs 6 to 8**). This cultural feature is not part of the City of Barrie NHS and is not regulated by the NVCA. There is a remnant farm lane, farmhouse foundation and well within this feature.

The overstory and understorey of this woodland stand is dominated by Manitoba maple and basswood. Other trees include white elm (*Ulmus americana*), white ash (dead and/or dying). Other woody and vine vegetation includes red-osier dogwood (*Cornus stolonifera*), common buckthorn (*Rhamnus cathartica*), staghorn sumac (*Rhus typhina*), choke cherry (*Prunus virginiana*), tartarian honeysuckle (*Lonicera tatarica*), riverbank grape, Virginia creeper (*Parthenocissus inserta*), wild cucumber (*Echinocystis lobata*), and poison ivy (*Toxicodendron radicans*).

Typical groundcover weedy species along with barren soil includes enchanter's nightshade (*Circaea lutetiana*), reed canary grass, garlic mustard (*Alliaria petiolata*), stinging nettle (*Urtica dioica*), daisy fleabane (*Erigeron annuus*), awnless brome grass, quackgrass (*Elymus repens*), wood avens (*Geum urbanum*), tall goldenrod, Canada goldenrod, ox-eye daisy, wild carrot, horseweed, herb-robert (*Geranium*

robertianum), common dandelion, common plantain, red clover (*Trifolium pratense*), and common strawberry (*Fragaria virginiana*).

Fresh-Moist Sugar Maple Deciduous Softwood Deciduous Forest (FODM6-6)/Poplar Mineral Deciduous Swamp (SWDM4-5)/Forb Mineral Shallow Marsh (MASM2-1)

Situated in the northwestern quadrat and along the western property edge is a forest/wetland/old field stand (part of the City NHS), which is contiguous off-site to the west. This feature contains a distinct sugar maple deciduous softwoods section (FODM6-6) bordered by an open field, along with a distinct poplar mineral deciduous swamp (SWDM4-5) along its eastern edge, and a forb mineral shallow marsh (MASM2-1, along with an inclusion of cattail marsh (MASM1-1) along its southern edge. This mosaic of forest/wetland/open field is regulated by NVCA.

Woody and vine vegetation in feature FODM6-6 includes sugar maple, white birch, white ash (dead and/or dying), white elm, red maple, black cherry, white pine (*Pinus strobus*), Scots pine (*Pinus sylvestris*), balsam poplar (*Populus balsamifera*), round-leaved dogwood (*Cornus rugosa*), red-osier dogwood, wild red raspberry (*Rubus idaeus*), Virginia creeper, riverbank grape, poison ivy and a butternut seedling and sapling (**Photograph 9**). The weedy to woodland wildflower/fern groundcover contains enchanter's nightshade, woodland strawberry (*Fragaria vesca*), scouring-rush horsetail, calico aster (*Symphyotrichum lateriflorum*), New England aster, thimbleweed (*Anemone virginiana*), field horsetail, sensitive fern (*Onoclea sensibilis*), spinulose wood-fern (*Dryopteris carthusiana*), common dandelion, herb-robert, wild lily-of-the valley (*Maianthemum canadense*), lady fern (*Athyrium filix-femina*), deadly nightshade (*Solanum dulcamara*), large-leaved aster (*Eurybia macrophylla*) and wild sarsaparilla (*Aralia nudicaulis*).

The treed swamp portion (SWDM4-5) is dominated by trembling aspen, balsam poplar and white elm, with a dense shrub stratum along with vines (**Photograph 10**). Shrubs and vines include pussy willow (*Salix discolor*), heart-leaf willow (*Salix eriocephala*), meadow willow (*Salix petiolaris*), Bebb's willow (*Salix bebbiana*), red-osier dogwood, alternate-leaved dogwood (*Salix alternifolia*), poison ivy, wild cucumber, riverbank grape and Virginia creeper. Groundcover species include deadly nightshade, spotted jewelweed (*Impatiens capensis*), spotted Joe pye-weed (*Eutrochium maculatum*) calico aster, boneset (*Eupatorium perfoliatum*), sensitive fern, lady fern, ostrich fern (*Matteuccia struthiopteris*), fragrant sedge (*Carex gracillima*), woolgrass (*Scirpus cyperinus*), creeping bentgrass (*Agrostis stolonifera*) and swamp milkweed (*Asclepias incarnata*).

At the southern edge of this NHS mosaic is a stand of forb mineral shallow marsh (MASM2-1) with an inclusion of cattail mineral shallow marsh (MASM1-1) (**Photographs 11 and 12**). Scattered shrubs include red-osier dogwood, heartleaf willow, meadow willow, and Bebb's willow. Typical aquatic forbs include woolgrass, fragrant sedge, purple-stemmed aster (*Symphyotrichum puniceum*), retrorse sedge (*Carex retrorsa*), porcupine sedge (*Carex hystericina*), bulb-bearing water hemlock (*Cicuta bulbifera*), purple loosestrife (*Lythrum salicaria*), spotted jewelweed, spotted Joe pye-weed, boneset, deadly nightshade, swamp milkweed, reed canary grass, creeping bent grass, ostrich fern, sensitive fern, lady fern, and narrow-leaved cattail (*Typha angustifolia*).



Photograph 9. West edge of FODM6-6, typical trees such as sugar maple, white birch, white ash, white elm, red maple, black cherry, white pine Scots pine, eastern white cedar, balsam poplar and dogwoods, part of the NHS



Photograph 10. View inside part of SWDM4-5 treed swamp, part of the FODM6-6 mosaic within the NHS and dominated by balsam poplar, trembling aspen, and white elm, with a dense shrub layer of dogwoods and willows



Photograph 11. View of part of mixed forb meadow MASM2-1 containing horsetails, asters, goldenrods, sedges, spotted jewelweed, spotted Joe pye-weed, boneset, deadly nightshade, swamp milkweed, and reed canary grass



Photograph 12. View of part of MASM1-1, an inclusion of narrow-leaved cattails, bordering the south edge of MASM2-1, part of the NHS

Bordering the west edge of FODM6-6 is an open area characterized as old field, with a flat terrain, wet to saturated barren soils, and dominated by typical dry-fresh to fresh moist mixed meadow plant species (**Photograph 13**). Species noted include Indian tobacco, scouring-rush horsetail, field horsetail, dwarf scouring-rush, spreading dogbane (*Apocynum androsaemifolium*), heart-leaved aster (*Syphyotrichum cordifolium*), Viper-s bugloss, Canada goldenrod, tall goldenrod, grass-leaved goldenrod (*Euthamia graminifolia*), late goldenrod (*Solidago gigantea*), English plantain, common plantain, red clover, white clover (*Trifolium arvense*), low hop clover (*Trifolium campestre*), common speedwell (*Veronica officinalis*), horseweed, common ragweed, wild carrot, ox-eye daisy, common mullein, common buttercup (*Ranunculus acris*), perennial sow-thistle (*Sonchus arvensis*), common evening primrose (*Oenothera biennis*), black-eyed Susan (*Rudbeckia hirta*), cow vetch (*Vicia cracca*), awnless brome grass, timothy, orchard grass, wild basil (*Clinopodium vulgare*), mossy stonecrop (c.f. *Sedum acre*), night-flowering catchfly, bladder-wort, and riverbank grape.

Fresh-Moist Poplar Deciduous Forest (FODM8-1)

Situated along the western property boundary is a long, thin wooded stand which extends off-site to the west and is part of the NHS and regulated by the NVCA (**Photographs 14 to 16**). This feature is dominated by balsam poplar and basswood, along with trembling aspen, white elm, red maple white birch and white ash (dead and/or dying). Other trees include white birch, black walnut (*Juglans nigra*), Manitoba maple, eastern white cedar, and one butternut seedling. The shrub and vine stratum includes common buckthorn, staghorn sumac, Virginia creeper, riverbank grape, dog-strangling vine (*Cynanchum rossicum*), wild red raspberry, black raspberry (*Rubus alleghaniensis*), prickly gooseberry (*Ribes cynosbati*), wild cucumber, red-osier dogwood, and alternate-leaved dogwood.

The groundflora contains a combination of typical woodland ferns, wildflowers, and sedges, along a gentle west-facing slope of fresh to moist sandy-loam. The following is list of plant species:

<i>Circaea lutetiana</i>	enchanter's nightshade
<i>Geranium robertianum</i>	herb-robert
<i>Maianthemum canadense</i>	wild lily-of-the-valley
<i>Onoclea sensibilis</i>	sensitive fern
<i>Osmunda claytoniana</i>	interrupted fern
<i>Impatiens capensis</i>	spotted jewelweed
<i>Caulophyllum thalictroides</i>	blue cohosh
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit
<i>Trillium erectum</i>	red trillium
<i>Prenanthes alba</i>	white wild lettuce
<i>Phegopteris connectilis</i>	northern beech fern
<i>Aralia nudicaulis</i>	wild sarsaparilla
<i>Clintonia borealis</i>	bluebead lily
<i>Carex laxiflora</i>	broad loose-flowered sedge
<i>Carex pensylvanica</i>	Pennsylvania sedge
<i>Carex gracillima</i>	fragrant sedge



Photograph 13. Southward view of an open area of old field within FODM6-6, dominated by horsetails, asters, goldenrods, plantains, common dandelion, ragweed, wild carrot, ox-eye daisy, black-eyed Susan and grasses



Photograph 14. South view along east edge of fresh-moist poplar forest (FODM8-1), part of the NHS, dominated by balsam poplar, basswood, trembling aspen, red maple, white birch, Manitoba maple, white cedar and white ash



Photograph 15. View inside FODM8-1 dominated by poplars and basswood, with a groundcover of enchanter's nightshade, herb-robert, wild lily-of-the-valley, sensitive fern, ostrich fern, blue cohosh, wild sarsaparilla, and sedges



Photograph 16. Inside view of FODM8-1 showing a sparse shrub and vine stratum of dogwoods, choke cherry, common buckthorn, wild red raspberry, staghorn sumac, riverbank grape, Virginia creeper and wild cucumber

Fresh-Moist White Cedar-Hardwood Mixed Forest (FOMM7-2)/White Cedar-Hardwood Organic Mixed Swamp (SWMO1-1)

Photographs 17 and 18 show typical views within the FOMM7-2 portion of this NHS feature, situated in the southwest quadrat of the property. This wooded stand on a gentle west-facing slope is dominated by eastern hemlock and eastern white cedar in the overstory. Other tree species include balsam fir (*Abies balsamea*), sugar maple, white ash, white pine, white birch, black cherry (*Prunus serotina*), trembling aspen and scattered beech (*Fagus grandifolia*). The sparse shrub and vine strata contain alternate-leaved dogwood, round-leaved dogwood, choke cherry, common buckthorn, staghorn sumac, wild red raspberry, riverbank grape, Virginia creeper, poison ivy and wild cucumber. The groundcover contains similar species to those found in FODM8-1. This part of the NHS is regulated by the NVCA.

At the base of the slope and part of the same NHS feature is a vegetation community characterized as a white cedar-hardwood organic mixed swamp (SWMO1-1). **Photographs 19 and 20** show aspects of this swamp, which is contiguous off-site to the west. It is part of the NHS and is regulated by the NVCA. The tree cover is a mixture of conifers, hardwoods and softwoods. Trees in the overstory and understory include eastern white cedar, hemlock, balsam fir, Manitoba maple, black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), yellow birch, balsam poplar, and white elm.

Groundcover species include ostrich fern, Jack-in-the-pulpit, spotted jewelweed, lady fern, enchanter's nightshade, deadly nightshade, sensitive fern, herb-robert, creeping bent grass, fragrant sedge, oak fern (*Gymnocarpium dryopteris*), foxtail sedge (*Carex vulpinoidea*), Canada bluejoint grass (*Calamagrostis canadensis*), royal fern (*Osmunda regalis*), interrupted fern, bluebead lily, water horehound (*Lycopus americanus*), fringed loosestrife (*Lycopus ciliata*), purple loosestrife and wild mint (*Mentha arvensis*).

Red-osier Dogwood – Willow Mineral Thicket Swamp (SWTM2-4)/with a small inclusion of: Forb Mineral Shallow Marsh (MASM2-1) and a band of Horsetail Graminoid Mineral Meadow Marsh (MAMM1-10)

Photographs 21 to 24 show aspects of this mosaic of wetland features, which extend off-site to the east, outside of the Phase 2 Residential Subdivision lands, but within the remaining portion of Parcel 61. This mosaic feature is not part of the NHS. Based on a comparison with current NVCA mapping, it does not appear to be regulated at present by the NVCA.

The SWTM2-4 portion is dominated by a dense stratum of willow shrubs such as crack willow, pussy willow, Bebb's willow, meadow willow, and heart-leaved willow. Other woody vegetation includes red-osier dogwood, alternate-leaved dogwood, and white elm.

The wet to saturated mineral hydric soils, along with stagnant ponded water, provide growing conditions for boneset, spotted Joe pye-weed, swamp milkweed, purple loosestrife, small-flowered willowherb (*Epilobium parviflorum*), hairy willowherb (*Epilobium hirsutum*), narrow-leaved cattail, grass-leaved goldenrod (*Euthamia graminifolia*), spiny-leaved sowthistle (*Sonchus oleraceus*), Devil's beggarticks (*Bidens frondosa*), yellow nutsedge (*Cyperus esculentus*), creeping bent grass, porcupine sedge, awl-fruited sedge (*Carex stipata*), foxtail sedge, retrorse sedge, purple-stemmed aster, reed canary grass, deadly



Photograph 17. View inside part of FOMM7-2, part of the NHS, dominated by white cedar and hemlock, with woody associates of sugar maple, white pine, white birch, black cherry, trembling aspen and scattered beech



Photograph 18. Part of FOMM7-2 showing eastern white cedar, beech and white ash, along a sparse to barren groundcover in some parts



Photograph 19. View inside a portion of white cedar-hardwood organic swamp (SWMO1-1), dominated by white cedar and eastern hemlock, with associates of balsam fir, Manitoba maple, black ash, green ash, yellow birch and white elm



Photograph 20. Part of SWMO1-1 treed swamp, part of the NHS, with a groundcover of sensitive fern, ostrich fern, Jack-in-the-pulpit, creeping bent grass, fragrant sedge, awl-fruited sedge, royal fern and fringed loosestrife



Photograph 21. View inside part of red-osier dogwood-willow thicket swamp (SWTM2-4) comprised of dogwood, crack willow, pussy willow, Bebb's willow, meadow willow, heart-leaved willow, and white elm, not part of the NHS



Photograph 22. View of south edge of SWTM2-4 with a groundcover of horsetails, boneset, spotted Joe pye-weed, swamp milkweed, purple loosestrife, small-flowered willowherb, narrow-leaved cattail, and aquatic sedges and grasses



Photograph 23. View of inclusion MASM2-1, part of SWTM2-4 as viewed on June 4, 2015, now overgrown with willow shrubs and dogwoods



Photograph 24. Westward view horsetail graminoid mineral meadow marsh (MAMM1-10) along the south edge of SWTM2-4, dominated by scouring-rush, horsetail, dwarf scouring-rush along with aquatic forbs, grasses and sedges

nightshade, tall goldenrod, Canada goldenrod, and swamp milkweed. There is small inclusion (MASM2-1) which is a remnant of an open shallow water and barren soils area that was dominated by cattails and aquatic forbs in the past (2014), but as of 2022 have become overgrown with willows and dogwoods.

Bordering and contiguous with the southern edge of SWTM2-4 is a narrow band of horsetail graminoid mineral meadow marsh (MAMM1-10) dominated by scouring-rush horsetail, dwarf scoring rush and field horsetail. Other aquatic forbs and grasses and sedges include creeping bent grass, reed canary grass, purple loosestrife, purple-stemmed aster, water horehound, wild mint, boneset, spotted Joe pye-weed, spotted jewelweed, foxtail sedge, awl-fruited sedge, swamp milkweed and yellow nutsedge.

3.4.3 Floristics

Three butternuts (*Juglans cinerea*) were found on site, a sapling and seedling about 10 m west of the dripline edge of NHS feature FODM6-6/SWDM4-5/MASM2-1), and one seedling along the east edge of NHS feature FODM8-1. Butternuts are listed as Endangered (END) in the *Endangered Species Act, 2007*. All three butternuts were assessed following the Ministry of Environment, Conservation and Parks (MECP) Butternut Health Assessment evaluation protocol, by David G. Cunningham – CEA, a certified Butternut Health Assessor (BHA#177). Both the sapling and seedling in FODMM6-6 were assessed as Category 1. A Category 1 butternut tree is defined as affected by Butternut Canker to such an advanced degree that retaining the tree would not support the protection or recovery of Butternut trees in the area in which the tree is located. The other butternut sapling found in NHS feature FODM8-1) was assessed as a Category 2 tree. A Category 2 tree is defined as not affected by Butternut Canker or the Butternut tree is affected by Butternut Canker but the degree to which it is affected is not as advanced as a Category 1 Butternut tree and retaining the tree could support the protection or recovery of Butternut trees in the area in which the tree is located. However, this specimen is only a seedling and will likely over time develop Butternut Canker, as has occurred with the other butternut sapling and seedling found just to the north within the other contiguous NHS forested features. A butternut health assessment has been prepared and will be submitted to the MECP.

No other Endangered (END) or Threatened (THR) Species at Risk (SAR) flora as listed in the current *ESA, 2007* were found or reported on site. The plant species inventories have also not resulted in the finding of any flora listed as Special Concern (SC) species, as listed in the *ESA, 2007*.

3.5 Amphibian Breeding Survey Results

Amphibian breeding surveys were conducted at a total of three locations at the on-site wetland features. Five species of amphibians were recorded during the surveys: Spring Peeper (*Pseudacris crucifer*), Wood Frog (*Lithobates sylvaticus*), American Toad (*Anaxyrus americanus*), Western Chorus Frog (*Pseudacris triseriata*) and Green Frog (*Lithobates clamitans*). A summary of the surveys is provided in **Table 3** and survey station locations are shown on **Figure 4**.

Table 3: Summary of Amphibian Survey Results

Breeding Amphibian Monitoring Stations	Date: April 11	Date: May 11	Date: June 16
Station 1 (301 McKay Road West)	Wood Frog: Code 2-3 Spring Peeper: Code 3 (in two different directions)	American Toad: Code 2-5 Spring Peeper: Code 3	American Toad: Code 1-1 Chorus Frog: Code 3
Station 2 (301 McKay Road West)	No Calls	No Calls	American Toad: Code 1-1 Chorus Frog: Code 3-10 to 20)
Station 3 (301 McKay Road West)	Wood Frog: Code 2-4 Spring Peeper: Code 3 (in two different directions)	Western Chorus Frog: Code 1-2 Spring Peeper: Code 3	Western Chorus Frog: Code 3

Note:

The calling codes are designated according to the Amphibian Road Call Counts (Gartshore *et al.*, 2004).

They are as follows:

- 1 – Individuals of one species can be counted, calls are not overlapping; second number denotes number of individuals.
- 2 – Calls of one species are overlapping; second number denotes estimated number of individuals.
- 3 – Full chorus of one species, calls continuous and overlapping, individuals not distinguishable.

3.6 Breeding Bird Survey Results

Appendix A provides breeding bird survey results for the subject property (31 McKay Road), together with a nearby site within the SSP which was surveyed at the same time for the applicant. A total of 23 bird species were documented on the subject property. The species observed were mainly forest-dependent (F) species and disturbance-tolerant (DT) species. Apart from being often found in human-disturbed habitats, the disturbance-tolerant birds are also generally wide-spread, common, and often found along habitat edges in Southern Ontario. The most frequently observed species in order of abundance were: European Starling (DT) (*Sturnus vulgaris*), Red-eyed Vireo (F) (*Vireo olivaceus*), Red-winged Blackbird (DT) (*Agelaius phoeniceus*) and Song Sparrow (DT) (*Melospiza melodia*).

The Eastern Wood-pewee (*Contopus virens*) is a Special Concern species that was recorded within the Deciduous Forest (FOD) during the first breeding bird survey only.

One area-sensitive species was recorded during the surveys, namely American Redstart (*Setophaga ruticilla*). While not rare, such species are often associated with higher quality habitats and either require large areas of contiguous habitat for breeding or are more productive in larger areas of suitable habitat. The specific habitat requirements vary by species. American Redstart utilize deciduous or mixed forests. One American Redstart was observed during the first breeding bird survey.

No provincially ranked S1 through S3 (Critically Imperiled through to Vulnerable) species, were recorded in the subject property. The Eastern Wood-Pewee was the only avian SAR observed.

3.7 Nightjar Survey Results

Two surveys were conducted at three separate stations within the subject property. The stations were located around the shrubby areas on the property, which were deemed to have potential suitable habitat. Survey station locations are shown on **Figure 4**. There were no nightjar species recorded during the surveys.

3.8 Incidental Wildlife Observations

Incidental observations of the following wildlife species were made during the 2022 field investigations:

- Mammals
 - Grey Squirrel (*Sciurus carolinensis*): observed throughout the subject property.
 - White-tailed Deer (*Odocoileus virginianus*): deer observed in the AGR community, ran in to FOD community.
 - Bats seen flying overhead while at Amphibian Station 5.
- Birds
 - Red-winged Blackbirds (*Agelaius phoeniceus*): observed at Amphibian Station 1

Due to the largely vegetated conditions of the local landscape, it is also expected that other common species typical to the landscape may likely also occur within the subject property. Such species may include Raccoon (*Procyon lotor*) and Coyote (*Canis latrans*).

3.9 Species at Risk

The *ESA* provides protection for species listed as Endangered or Threatened in Ontario, including their habitat. The Species at Risk in Ontario (SARO) List also identifies species of Special Concern that may become Threatened or Endangered in the future. Species of Special Concern and their habitats are not protected under the *ESA*.

Based on a review of the NHIC database as well as knowledge of the general area and experience with SAR in the region, the following ten SAR have been identified as having potential to occur within the vicinity of the subject property.

Birds

- Bobolink (*Dolichonyx oryzivorus*) – Threatened
- Eastern Meadowlark (*Sturnella magna*) – Threatened
- Eastern Wood-pewee (*Contopus virens*) – Special Concern – recorded on the Subject Property
- Wood Thrush (*Hylocichla mustelina*) – Special Concern

Vascular Plants

- Butternut (*Juglans cinerea*) – Endangered (recorded on site)

Insects

- Monarch Butterfly (*Danaus plexippus*) – Special Concern

Mammals

- Eastern Small-footed Myotis (*Myotis leibii*) – Endangered
- Little Brown Myotis (*Myotis lucifugus*) – Endangered
- Northern Myotis (*Myotis septentrionalis*) – Endangered
- Tri-colored Bat (*Perimyotis subflavus*) – Endangered

Through field investigations for potentially suitable habitat and related features, a habitat screening and assessment of on-site habitat suitability was completed for each of these identified species. This assessment can be found in **Appendix B**, providing a detailed description of each species' habitat as well as a discussion of habitat suitability within the subject property and recommendations for mitigation where applicable. Mitigation for relevant species is as follows:

SAR Birds

Breeding bird surveys included specific assessment of the use of agricultural fields by Bobolink and Meadowlark, with no individuals seen or heard calling.

The presence of Eastern Wood-Pewee is not considered significant as it is widespread throughout Southern Ontario in deciduous and mixed forests. Forest areas are generally to be protected and buffered. Where there is to be any tree removals, these must occur outside of the annual breeding window of late April to late August to avoid impacts to nesting individuals of the confirmed and potential SAR species on the property.

SAR Bats

There is suitable habitat for SAR bats in the forested areas on the property. Although such woodland areas are generally to be protected and buffered, any required tree removals must occur outside of the active season for bats of April 1 to September 30.

Monarch Butterfly

Potential habitat is present on the property as milkweed plants were observed, but no Monarch butterflies were recorded.

Butternut

A butternut tree survey was completed on the subject property due to the potential habitat. As documented in Section 3.4.3, two Butternut seedlings and one Butternut sapling have been documented within the communities. One seedling and sapling were assessed by a Certified Butternut Health Assessor as being Category 1, meaning that they have been affected by Butternut Canker to an advanced degree. The remaining seedling, found along the eastern edge of the FODM8-1 woodland community, was assessed as a Category 2 tree, meaning that it has been effected by Butternut Canker but not yet to a degree that makes it unretainable; unfortunately, Butternut Canker is likely to further impact that specimen. Importantly, this seedling is located within a woodland area that is being protected and buffered. A Butternut Health Assessment has been completed and will be submitted to the MECP.

A thorough search of all potentially suitable areas did not identify any additional Butternut specimens.

3.10 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) can be difficult to appropriately determine at the site-specific level, as the assessment must incorporate information from a wide geographic area and consider other factors such as regional resource patterns and landscape effects. To help with site level assessments, the MNRF has developed the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF 2015). The planning authorities have the responsibility to identify Significant Wildlife Habitat.

The Natural Heritage Policies of the Provincial Policy Statement [Subsection 2.1.4 d)] identify four principal components of SWH as described in the *Significant Wildlife Habitat Technical Guide* (MNRF, 2000), including:

- a) Seasonal Concentration Areas of Animals;
- b) Rare Vegetation Communities or Specialized Habitat for Wildlife;
- c) Animal Movement Corridors; and
- d) Habitats for Species of Conservation Concern.

Criteria for the identification of these features provided in the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF, 2015) were used to screen wildlife habitat within the 301 McKay Road property for potential SWH (**Appendix C**). Identified potential candidate and confirmed SWH within this property are summarized as follows:

- **Seasonal Concentration Areas of Animals**
 - Bat Maternity Colonies (CANDIDATE) – The forested areas on the subject property provide potential maternity roosting habitat for bat species.
 - Turtle Wintering Area (CANDIDATE) - Potential habitat occurs in the adjacent marsh community, but turtles weren't recorded during surveys and targeted surveys weren't completed.

- **Specialized Habitat for Wildlife**

- Waterfowl Nesting Areas (CANDIDATE) - Potential habitat is present in the adjacent MAM community.
- Amphibian Breeding Habitat (Woodland) (CONFIRMED) - The swamp communities at amphibian survey station 3 recorded sufficient numbers of Western Chorus Frog, Spring Peeper and Wood Frog during amphibian breeding surveys to be considered significant.
- Amphibian Breeding Habitat (Wetland) (CONFIRMED) – The MAM community where amphibian survey station 1 was conducted recorded sufficient numbers of Spring Peeper and Chorus Frog during amphibians breeding surveys to be considered candidate SWH.

- **Animal Movement Corridors**

- Amphibian movement (CONFIRMED) – Due to the identification of Amphibian Breeding Habitat (Woodland) and Amphibian Breeding Habitat (Wetland).

4.0 RESOURCE SIGNIFICANCE

4.1 Vegetation Communities

Extensive ecological field inventories were conducted previously in 2015 and 2015, with additional field work undertaken in 2022. The previous vegetation inventories were undertaken as part of the City of Barrie SIS (Schaeffers & Associates Ltd. *et al.* 2017). The location and extent of the on-site feature (cultural, woodland/forest, and wetland) are illustrated on **Figure 3**.

Additional relevant data, descriptions and figures were extracted, where appropriate, from NRSI and Dougan & Associates (2012) and NRSI (2012). From these sources, an assessment of the resource significance of the on site and abutting vegetation communities was feasible. In this regard, it is our professional opinion and supported by the data and schedules of the SSP that **none of the vegetation communities on or abutting the property are considered rare or significant on either a Federal, Provincial, or County level.**

The NHS features on and abutting the subject property are considered significant by the City of Barrie and are afforded protection through the policies of the Salem Secondary Plan. It is to be noted there is a non-NHS woodland feature (WODM4-5), as well as a part of a non-NHS wetland feature (SWTM2-4) on the landscape, both of which lie within the proposed Phase 2 South development area. Neither feature is designated as important, rare or significant by the City, but removal of SWTM2 may require at a minimum, an Ontario Regulation 172/06 permit from the NVCA (Province of Ontario 2006). Permits are authorized under the *Conservation Authorities Act* (Province of Ontario 1990), through the “*Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses*.” There are “Other Wetlands”, also known as non- Provincially Significant Wetland (PSW) features, on site (SWDM4-5, MASM2-1, SWMO1-1), all of which are afforded protection through the policies of the Salem Secondary Plan.

4.2 Floristics

From a floristics perspective, none of the plant species found on site are designated or listed as Endangered (END) with the exception of butternut, Threatened (THR), Special Concern (SC), Species of Conservation Interest, NHIC SRank rarities or uncommon on either a Federal, Provincial, County, City or NVCA level based on the status lists described in **Section 2**.

As previously mentioned in **Section 3.4.3**, three butternuts were found on site, consisting of two seedlings and one sapling. Butternuts are listed as Endangered (END) in the *Endangered Species Act, 2007*. All three butternuts were assessed following the Ministry of Environment, Conservation and Parks (MECP) Butternut Health Assessment evaluation protocol, by David G. Cunningham – CEA, a certified Butternut Health Assessor (BHA#177). A butternut health assessment has been prepared and will be submitted to the MECP, as required by legislation.

4.3 Wildlife Species at Risk

A Species at Risk Assessment was completed, involving targeted surveys as appropriate.

Although potential habitat exists for Bobolink and Meadowlark, neither of these species were seen or heard calling during targeted surveys for them.

Two Eastern Wood-Pewee (Special Concern) were heard calling from the deciduous forest community during the first breeding bird survey only. Habitat opportunities for that species are being protected, with a need to ensure any required tree removals occur outside of the period when this species is nesting. There is also habitat potential for Wood Thrush (Special Concern), although this species was not documented during targeted surveys.

The forested communities within the property provide potential bat roosting and maternity habitat, including for species of bats which are Endangered because of massive population declines caused by a fungal disease (declines are not habitat related). Treed habitat for bats is being protected within the property, with a need to ensure any required tree removals occur outside of the period of bat use of trees as maternity/roosting habitat.

Tree removals must be restricted to the period of October 1 to March 31 in order to avoid harm to both birds and bats.

There are milkweed plants within areas of both agricultural field and meadows within the subject property which could support Monarch Butterfly. Some of those areas of milkweed are to be preserved, with an opportunity for additional milkweed to develop within the required buffers from natural heritage features. There are no concerns that such habitat opportunities won't continue to exist within the subject property and adjacent lands subsequent to proposed development.

4.4 Significant Wildlife Habitat

Significant Wildlife Habitat potential was assessed, involving targeted surveys as appropriate.

As previously noted, forested areas of the property provide potential maternity/roosting habitat for bats; those forested areas are to be protected, with any required tree removals to occur outside of the period of bat maternity and roosting use.

An adjacent marsh provides a small amount of potential turtle wintering and waterfowl nesting opportunities, although neither use has been confirmed through our field surveys. While that marsh will not be impacted by this proposed development, it will be removed in concert with adjacent development. Such opportunities are being retained in other lands associated with the SSP natural heritage system.

Amphibian breeding habitat associated with woodland (treed swamp) communities will not be impacted by this proposed development. As previously noted, an adjacent marsh, which also provides amphibian breeding habitat, will be removed in concert with adjacent development. Opportunities for wetland amphibians will remain as part of other features being retained as part of the SSP natural heritage system. The preservation of wetland and woodland habitats within the subject property, and the buffering of such features, will continue to allow for some movement of amphibians between breeding habitat and other areas which they may occupy over a portion of their life stages.

4.5 Other Wildlife Considerations

Breeding bird habitat will generally be maintained subsequent to the development of these lands, given the preservation of treed habitat and most other natural vegetation communities. It is noted that many of the documented bird species are disturbance-tolerant and will continue to thrive within an urbanized setting.

5.0 REVIEW AND COMMENTS ON DEVELOPMENT PLANS

5.1 Overview

A Functional Servicing Report has been prepared for this project by Schaeffers. Michalski Nielsen Associates Limited have reviewed and provided input to that document.

5.2 Development Footprint

We have reviewed the development footprint and are satisfied that this appropriately respects the boundaries of the identified NHS, and allows for the proper implementation of all required buffers. There is a road crossing from east to west through the narrowest portion of the woodland (FODM8-1) on the west property boundary, which is part of the approved SSP and which is further discussed in **Section 5.3**.

There is generally little to no grading requirements beyond the rear yard limits, with the exception of that associated with the road crossing further described in **Section 5.3**

5.3 East-West Road Crossing

A road crossing of the NHS is being proposed to provide connectivity across the Secondary Plan area, with the general location of that road having been approved as part of the SSP. This road crosses through the narrowest portion of a poplar forest, where the forest width is only approximately 40 m. This is a preferred location for such a crossing as it minimizes potential adverse impacts on the woodland that is otherwise to be protected. A concrete box culvert is presently planned to convey intermittent and diffuse drainage which is flowing from north to south through this woodland, and which ultimately feeds into a tributary of Thornton Creek to the southwest, with plans presently including the creation of an engineered channel upstream and downstream of that crossing to direct flows beneath the road. Consultation with City of Barrie and NVCA is required in the final design of this road crossing through the woodland and any associated drainage works. This final design should aim to minimize any channelization of flows within the woodland area, thereby minimizing the overall extent of woodland disruption. It is also very important that the final design of the road crossing through the woodland minimizes the extent of tree removals, with the timing of such tree removals needing to occur between October 1 and March 31 in order to avoid disruption of any potential breeding bird and bat maternity/roosting activities.

5.4 Stormwater Management Facilities

Stormwater from the property is intended to be discharged to a centralized Stormwater Management Pond (Pond C), which is to be located within agricultural lands just south of the Secondary Plan area, within Innisfil lands owned by the DG Group. It will discharge to a tributary of Thornton Creek to the southwest, following the natural direction of drainage from the property. The stormwater management facility has been designed to provide Enhanced (Level 1) water quality protection, to ensure post-development flows do not exceed pre-development flow rates over a variety of storm event sizes up to and including the 100 year storm, to provide safe conveyance of the regional storm, and to provide infiltration which helps satisfy volume control, phosphorus loading reduction and water balance requirements. The design of an outlet which provides protection against erosion in the downgradient tributary to Thornton Creek is to be addressed as part of the later detailed design, with that outlet design being very important given the relatively small size of that receiving watercourse.

5.5 Erosion and Sediment Control

A detailed erosion and sediment control plan has been developed, which includes:

- double row silt fence, with straw bales in between the two rows, around the site perimeter, including the stormwater block, with such fencing to also be installed around the area of temporary topsoil stockpiling on site;
- the additional use of cut off swales, sediment traps and filtrex Silksoxx in conveying stormwater runoff through the property;
- temporary sedimentation basins which include outfall protection and turbidity control; and

- mud mats for access roads.

Michalski Nielsen Associates Limited has reviewed all of the components of this erosion and sediment control plan and believe it appropriately provides for a robust level of protection against off site impacts; it will be very important that the various elements of this plan be certified upon installation, properly monitored over the duration of the works, and repaired immediately whenever any deficiencies are identified.

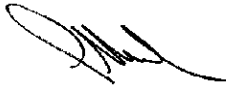
5.6 Other Aspects of Site Servicing

Michalski Nielsen Associates Limited has reviewed other aspects of site servicing, with water and sewer services to be from McKay Road West. Michalski Nielsen Associates Limited has reviewed those components of site servicing and have no concerns that they will interfere with the protection of the NHS within or adjacent to this property.

Yours truly,

MICHALSKI NIELSEN ASSOCIATES LIMITED

Per:



Gord Nielsen, M.Sc.
Ecologist,
President

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APPENDIX A – BREEDING BIRD SURVEY

Appendix A. Breeding Birds of 16033108 301 McKay Rd. West and 259 Salem Rd.								
Common Name	Scientific Name	Status				Number of Pairs/Territories		Notes
		National Species at Risk COSEWIC ^a	Species at Risk in Ontario Listing ^a	Provincial breeding season SRANK ^b	Area-sensitive (OMNR) ^c	301 McKay Rd West	259 Salem Rd	
Hooded Merganser	<i>Lophodytes cucullatus</i>			S5			1	
Red-tailed Hawk	<i>Buteo jamaicensis</i>			S5			1	
Wild Turkey	<i>Meleagris gallopavo</i>			S5			7	
Common Moorhen	<i>Gallinula chloropus</i>			S4		1		
Mourning Dove	<i>Zenaidura macroura</i>			S5			1	
Hairy Woodpecker	<i>Picoides villosus</i>			S5	A		1	
Eastern Wood-Pewee	<i>Contopus virens</i>	SC		S4		2		
Willow Flycatcher	<i>Empidonax traillii</i>			S5		1	1	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			S4		1	2	
Barn Swallow	<i>Hirundo rustica</i>	THR	THR	S4			1	Foraging
Blue Jay	<i>Cyanocitta cristata</i>			S5		1	3	
American Crow	<i>Corvus brachyrhynchos</i>			S5		2		
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5		2		
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S5	A		1	
House Wren	<i>Troglodytes aedon</i>			S5			1	
American Robin	<i>Turdus migratorius</i>			S5		1	3	
European Starling	<i>Sturnus vulgaris</i>			SE		6	13	
Red-eyed Vireo	<i>Myio olivaceus</i>			S5		4	11	
Yellow Warbler	<i>Setophaga petechia</i>			S5		1	2	
Blackpoll Warbler	<i>Setophaga striata</i>			S4		1		Migrant
American Redstart	<i>Setophaga ruticilla</i>			S5	A	1		
Ovenbird	<i>Seiurus aurocapillus</i>			S4	A		3	
Northern Waterthrush	<i>Parkesia noveboracensis</i>			S5			2	
Common Yellowthroat	<i>Geothlypis trichas</i>			S5		1	1	
Northern Cardinal	<i>Cardinalis cardinalis</i>			S5		1	3	
Indigo Bunting	<i>Passerina cyanea</i>			S4			2	
Vesper Sparrow	<i>Poecetes gramineus</i>			S4		1		
Song Sparrow	<i>Melospiza melodia</i>			S5		6	8	
Swamp Sparrow	<i>Melospiza georgiana</i>			S5				
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			S4		8	2	
Common Grackle	<i>Quiscalus quiscula</i>			S5		2	3	
Baltimore Oriole	<i>Icterus galbula</i>			S4		1		
American Goldfinch	<i>Carduelis tristis</i>			S5		2	3	
Field Work Conducted On:	Date	Temp (C)	Wind speed (km/h)	Cloud cover (%)	Start time	End time	Level of effort (h:min)	
Site visit 1	21-May-22	15	4	60	6:10	10:25	4h 15m	
Site visit 2	11-Jun-22	12	11	90	6:10	10:05	3h 55m	
Site visit 3	01-Jul-22	20	0	100	8:10	8:20	0h 10m	
Location 1 -	301 McKay Rd West							
Location 2 -	259 Salem Rd							
Number of Species:		34						
Number of (provincial and national) Species at Risk:		2						
Number of S1 to S3 (provincially rare) Species:		0						
Number of Area-sensitive Species:		4						
Location 1	301 McKay Rd West							
Number of Species:		23						
Number of (provincial and national) Species at Risk:		1						
Number of S1 to S3 (provincially rare) Species:		0						
Number of Regionally Rare Species:		0						
Number of Area-sensitive Species:		1						
Location 2 -	259 Salem Rd							
Number of Species:		27						
Number of (provincial and national) Species at Risk:		2						
Number of S1 to S3 (provincially rare) Species:		0						
Number of Regionally Rare Species:		0						
Number of Area-sensitive Species:		3						
KEY								
a COSEWIC = Committee on the Status of Endangered Wildlife in Canada								
a Species at Risk in Ontario List (as applies to ESA) as designated by COSSARO (Committee on the Status of Species at Risk in Ontario)								
END = Endangered, THR = Threatened, SC = Special Concern								
^b SRANK (from Natural Heritage Information Centre) for breeding status if:								
S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure								
SZB (breeding migrants or vagrants) and SR (reported as breeding, but no persuasive documentation)								
SE (exotic, i.e. non-native)								
c Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices								

APPENDIX B – SPECIES AT RISK SURVEY

Appendix B: Species at Risk Screening.

NAME	SARA STATUS	SARO	COSEWIC	SCHEDULE	S-RANK	HABITAT REQUIREMENTS	SOURCE OF RECORD	POTENTIAL HABITAT PRESENT (Y/N)	RATIONALE	POTENTIAL IMPACTS AND MITIGATION
AVIFAUNA										
Bobolink (<i>Dolichonyx oryzivorus</i>)	THR	THR	THR	1	S4B	The Bobolink is found in grasslands and hayfields, and feeds and nests on the ground. This species is widely distributed across most of Ontario; however, are designated at risk because of rapid population decline over the last 50 years (Ministry of Natural Resources and Forestry, 2014). The historical habitat of the bobolink was tallgrass prairie and other natural open meadow communities; however, as a result of the clearing of native prairies and the post-colonial increase in agriculture, bobolinks are now widely found in hayfields. Due to their reproductive cycle, nesting habits, and use of agricultural areas, bobolink nests and young are particularly vulnerable to loss as a result of common agricultural practices (i.e. first cut hay).	OBBA and NHIC	Y	Potential habitat in the agricultural field, but no individuals recorded during breeding bird surveys.	None.
Eastern Meadowlark (<i>Sturnella magna</i>)	THR	THR	THR	1	S4B	The Eastern Meadowlark is a bird that prefers pastures and hayfields, but is also found to breed in orchards, shrubby fields and human use areas such as airports and roadsides. Eastern meadowlarks can nest from early May to mid-August, in nests that are built on the ground and well-camouflaged with a roof woven from grasses. The decline in population of these species is thought to be at least partially related to habitat destruction and agricultural practices (Ministry of Natural Resources and Forestry, 2014).	OBBA and NHIC	Y	Potential habitat in the agricultural field, but no individuals recorded during breeding bird surveys.	None.
Eastern Wood-Pewee (<i>Contopus virens</i>)	SC	SC	SC	1	S4B	The Eastern Wood-pewee is classified as a species of special concern by COSSARO. Their population has been gradually declining since the mid-1960’s (The Cornell Lab of Ornithology, 2015). The Eastern Wood-pewee is a “flycatcher”, a bird that eats flying insects, that lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It prefers intermediate-age forest stands with little understory vegetation. Threats to the population are largely unknown; however, causes may include loss of habitat due to urban development and decreases in the availability of flying insect prey (Ministry of Natural Resources and Forestry, 2014).	Recorded during breeding bird surveys	Y	Recorded during breeding bird surveys.	The primary mitigation is for the protection of nesting birds. With appropriate mitigation measures (e.g. conduct selective tree removals outside of breeding bird season), no impacts to individuals are anticipated. Tree removals along forest edge areas of the redevelopment shall occur between late August and late April, which is outside of the breeding and nesting season (note: restrictive windows for SAR bats apply)
Wood Thrush (<i>Hylocichla mustelina</i>)	THR	SC	THR	1	S4B	The Wood Thrush is a species of Special Concern because of habitat degradation or destruction by anthropogenic development. The Wood Thrush is a medium-sized songbird, generally rusty-brown on the upper parts with white under parts and large blackish spots on the breast and sides, and about 20 cm long. The Wood Thrush forages for food in leaf litter or on semi-bare ground, including larval and adult insects as well as plant material. They seek moist stands of trees with well-developed undergrowth in large mature deciduous and mixed (conifer-deciduous) forests. The Wood Thrush flies south to Mexico and Central America for the winter (Ministry of Natural Resources and Forestry, 2014).	OBBA and NHIC	Y	Potential habitat in the forested areas on the subject property, but no individuals recorded during breeding bird surveys.	None.

NAME	SARA STATUS	SARO	COSEWIC	SCHEDULE	S-RANK	HABITAT REQUIREMENTS	SOURCE OF RECORD	POTENTIAL HABITAT PRESENT (Y/N)	RATIONALE	POTENTIAL IMPACTS AND MITIGATION
VASCULAR PLANTS										
Butternut (<i>Juglans cinerea</i>)	END	END	END	1	S2?	The butternut is designated as endangered by COSSARO and is tracked by the NHIC as a species at risk. The tree is federally regulated by the Species at Risk Act (2002). Butternut belongs to the walnut family and produces edible nuts which are a preferred food source for wildlife. The range of butternut trees is south of the Canadian Shield on soils derived from calcium rich limestone bedrock. Butternut trees, which at one time were much more common to the south extending to the northern aspect of zone 6E, have been declining due to factors including forest loss and disease. Butternut trees suffer from a highly transmissible fungal disease called butternut canker. Butternut canker is causing very rapid decline in this tree species across its native range. The fungal disease is easily transmitted by wind and is very difficult to prevent. Trees often die within a few years of infection by butternut canker (Ministry of Natural Resource and Forestry, 2014).	Professional Experience	Y	Potential habiat present. Two seedlings and one sapling were identified in woodland areas of the property.	A Butternut Health Assessment is being submitted for identified specimens.
MAMMALS										
Tri-colored Bat (Eastern Pipistrelle) (<i>Perimyotis subflavus</i>)	END	END	END	1	S3?	The eastern pipistrelle is a small bat that is widely distributed in eastern North America and whose range extends north to southern Ontario. The eastern pipistrelle is rare in this region of Ontario which is at the northernmost limit of the natural range for the species. These bats prefer to nest in foliage, tree cavities and woodpecker holes, and are occasionally found in buildings; though this is not their preferred habitat. Winter hibernation takes place in caves, mines and deep crevices. Eastern pipistrelles feed primarily on small insects and prefer an open forest habitat type in proximity to water (University of Michigan Museum of Zoology, 2004).	Professional Experience	Y	Potential habitat in the forested areas on the Subject Property.	Low impacts expected. Mitigation: As SAR bats are typically active between early April and September 30, and hibernate in caves outside of that period, tree removal should be carried out between October 1st to March 31st. This will avoid harm or impacts to individuals. Additional mitigation measures such a the intallation of bat boxes may be needed. Consultation with MECP will be required.
Eastern Small-footed Myotis (<i>Myotis leibii</i>)	No Status	END	No Status	Schedu	S2S3	The eastern small-footed myotis, a bat, are an endangered species threatened by a disease known as white nose syndrome, caused by a fungus from Europe. Eastern small-footed bat’s fur has black roots and shiny light brown tips, giving it a yellowish-brown appearance. Its face mask, ears and wings are black, and its underside is grayish-brown, about 8 cm long in size and weighs 4-5 grams. In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. They change their roosting locations daily and hunt at night for insects to eat, including beetles, mosquitos, moths, and flies. They hibernate in winter, often in caves and abandoned mines. They can be found from south of Georgian Bay to Lake Erie and east to the Pembroke area, and choose colder and drier sites (Ministry of Natural Resources and Forestry, 2014).	Professional Experience	Y	Potential habitat in the forested areas on the Subject Property.	
Little Brown Myotis (<i>Myotis lucifugus</i>)	END	END	END	1	S4	Little brown myotis, a bat, are an endangered species threatened by a disease known as white nose syndrome, caused by a fungus from Europe. Little brown bats have glossy brown fur and usually weigh between four and 11 grams. Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing – an ideal environment for the fungus to grow and flourish. The syndrome affects bats by disrupting their hibernation cycle, so that they use up body fat supplies before the spring when they can once again find food sources (Ministry of Natural Resources and Forestry, 2014).	Professional Experience	Y	Potential habitat in the forested areas on the Subject Property.	

NAME	SARA STATUS	SARO	COSEWIC	SCHEDULE	S-RANK	HABITAT REQUIREMENTS	SOURCE OF RECORD	POTENTIAL HABITAT PRESENT (Y/N)	RATIONALE	POTENTIAL IMPACTS AND MITIGATION
Northern Myotis (<i>Myotis septentrionalis</i>)	END	END	END	1	S3	The northern long-eared myotis, a bat, are an endangered species threatened by a disease known as white nose syndrome, caused by a fungus from Europe. Northern long-eared bats have dull yellow-brown fur with pale grey bellies. They are approximately eight cm long, with a wingspan of about 25 cm, and usually weigh six to nine grams. Northern long-eared bats can be found in boreal forests, roosting under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines (Ministry of Natural Resources and Forestry, 2014).	Professional Experience	Y	Potential habitat in the forested areas on the Subject Property.	
FISH										
N/A										
OTHER										
Monarch Butterfly (<i>Danaus plexippus</i>)	SC	SC	END	1	S2N,S4B	The monarch is an orange and black butterfly with small white spots and is classified as a species of special concern by COSSARO. The monarch relies on milkweed plants as a food source for growing caterpillars, but the adult butterflies forage in diverse habitats for nectar from wildflowers. The greatest threat to the monarch is loss of overwintering habitat in Mexico. Other threats include use of pesticides and herbicides throughout its range (Ministry of Natural Resources and Forestry, 2014).	OBA	Y	Milkweed found throughout the meadow and agricultural areas.	Potential habit is present on the property as milkweed plants were observed, but no Monarch butterflies were recorded. Retain milkweed plants where feasible on the subject property.

Notes:
SC - Special Concern
THR - Threatened
END - Endangered
S1 - Extremely rare in Ontario
S2 - Very rare in Ontario
S3 - Rare to uncommon in Ontario
S4 - Considered to be common in Ontario
S5 - Species is widespread in Ontario
SH - Possibly extirpated
S#S# - Indicates insufficient information exists to assign a single rank.
S#? - Indicates some uncertainty with the classification due to insufficient data.
S#N - Nonbreeding
S#B - Breeding

APPENDIX C – SIGNIFICANT WILDLIFE SCREENING

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional Notes and Species Observations
Seasonal Concentration Areas of Animals					
Waterfowl Stopover and Staging Areas (Terrestrial)	Ducks	CUM + CUT ecosites	Fields with sheet-water flooding mid-March to May	N	Suitable habitat not present on the subject property.
Waterfowl Stopover and Staging Area (Aquatic)	Ducks, Geese	Ponds, Lakes, Inlets, Marshes, Swamps, Shallow Water Ecosites	Sewage & SWM ponds not SWH. Reservoir managed as a large wetland or pond/lake qualifies.	N	Suitable habitat not present on the subject property.
Shorebird Migratory Stopover Area	Shorebirds	Beaches, Dunes, Meadow Marshes	Shorelines. Sewage treatment ponds and storm water ponds not SWH.	N	Suitable habitat not present on the subject property.
Raptor Wintering Area	Eagles, Hawks, Owls	Hawks/Owls: Combination of both Forest and Cultural Ecosites Bald Eagle: Forest or swamp near open water (hunting ground)	Raptors: >20ha, with a combo of forest and upland. Meadow (>15ha) with adjacent woodlands. Eagles: open water, large trees & snags for roosting.	N	Suitable habitat not present on the subject property.
Bat Hibernacula	Big Brown Bat, Tri-coloured Bat	Caves, Crevices, mines, karsts	Buildings and active mine sites not SWH.	N	Suitable habitat not present on the subject property.
Bat Maternity Colonies	Big Brown Bat, Silver-haired Bat	Decidious or mixed forests and swamps.	Mature deciduous and mixed forests with >10/ha cavity trees >25 cm DBH.	Potential	Suitable habitat in the forested communities on the subject property.
Turtle Wintering Area	Turtles (Midland, N. Map, Snapping)	SW, MA, OA, SA, FEO, BOO (requires open waters)	Free water beneath ice. Soft mud substrate. Permanent water bodies, large wetlands, bogs, fens with adequate DO.	Potential	Potential habitat in the marsh community, but turtles weren't recorded during surveys and targeted surveys weren't completed.
Reptile Hibernaculum	Snakes	Snakes: Any ecosite (esp. w/ rocky areas), other than very wet ones. Five-lined Skink: FOD and FOM, FOC1, FOC3 - with rock outcrops	Access below frost line: burrows; rock crevices, piles or slopes, stone fences or foundations. Conifer/shrubby swamps/swales, poor fens, depressions in bedrock w/ accumulations of sphagnum moss or sedge hummock ground cover.	N	Suitable habitat not present on the subject property.
Colonially-nesting Bird Breeding Habitat (Bank and Cliff)	Cliff Swallow, N. Rough-winged Swallow	Banks, sandy hills/piles, pits, slopes, cliff faces, bridge abutments, silos, barns.	Exposed soil banks, not a licensed/permitted aggregate area or new man-made features (2 yrs).	N	Suitable habitat not present on the subject property.

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional Notes and Species Observations
Colonially-nesting Bird Breeding Habitat (Tree/Shrubs)	Great Blue Heron, Black-crowned NightHeron, Great Egret, Green Heron	SWM2, SWM3, SWM5, SWM6, SWD1 to SWD7, FET1	Nests in live or dead standing trees in wetlands, lakes, islands and peninsulas. Shrubs and emergents may be used. Nests in trees are 11 - 15 m from ground, near tree tops.	N	Potential habitat is not present on the subject property, but the associated bird species weren't recorded.
Colonially-nesting Bird Breeding Habitat (Ground)	Herring Gull, Great Black-backed Gull, Little Gull, Ring-billed Gull, Common Tern, Caspian Tern, Brewer’s Blackbird	Gulls/Terns: Rocky island or peninsula in lake or river. Brewer’s Blackbird: close to watercourses in open fields or pastures with scattered trees or shrubs.	Gulls/Terns: islands or peninsulas with open water or marshy areas. Brewers Blackbird colonies: on the ground in low bushes close to streams and irrigation ditches.	N	Suitable habitat not present on the subject property.
Migratory Butterfly Stopover Area	Painted Lady, Red Admiral, Special Concern: Monarch	Combination of open (CU) and forested (FO) ecosites (need one from each).	≥10 ha, located within 5 km of Lake Ontario. Undisturbed sites, with preferred nectar species.	N	Suitable habitat not present on the subject property.
Landbird Migratory Stopover Areas	All migratory songbirds. All migrant raptor species.	Forest (FO) and Swamp (SW) ecosites	Woodlots >10 ha within 5 km of Lake Ontario. If multiple woodlands are along the shoreline, those <2 km from L. Ontario are more significant.	N	Suitable habitat not present on the subject property.
Deer Yarding Areas	White-tailed Deer	Mixed or Conifer ecosites	Determined by MNRF - no studies	N	Suitable habitat not present on the subject property.
Deer Winter Congregation Areas	White-tailed Deer	Mixed or Conifer ecosites	Determined by MNRF - no studies	N	Suitable habitat not present on the subject property.
Rare Vegetation Communities					
Cliffs and Talus Slopes		TAO, TAS, CLO, CLS, TAT, CLT e.g., Niagara Escarpment (contact NEC)	Cliff: near vertical bedrock >3m Talus Slope: coarse rock rubble at the base of a cliff	N	Suitable habitat not present on the subject property.
Sand Barren		SBO1, SBS1, SBT1	Sand Barrens >0.5 ha. Vegetation can vary from patchy and barren to tree covered, but <60%. <50% vegetation cover are exotic species.	N	Suitable habitat not present on the subject property.
Alvar	<i>Carex crawei</i> , <i>Panicum philadelphicum</i> , <i>Eleocharis compressa</i> , <i>Scutellaria parvula</i> , <i>Trichostema brachiatum</i> , Loggerhead Shrike	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2	Alvar >0.5 ha. Need 4 of the 5 Alvar Inidicator Spp. <50% vegetation cover are exotic species.	N	Suitable habitat not present on the subject property.

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional Notes and Species Observations
Old Growth Forest	Trees >140 yrs; heavy mortality = gaps. Multi-layer canopy, lots of snags and downed logs	FOD, FOC, FOM, SWD, SWC, SWM	Woodland areas ≥30 ha with a ≥10 ha interior habitat, assuming a 100 m buffer at edge of forest.	N	Suitable habitat not present on the subject property.
Savannah	Prairie Grasses w/ trees	TPS1, TPS2, TPW1, TPW2, CUS2	A Savannah is a <u>tallgrass prairie</u> habitat that has tree cover of 25 – 60%. <50% cover of exotic species.	N	Suitable habitat not present on the subject property.
Tallgrass Prairie	Prairies Grasses dominate	TPO1, TPO2	An <u>open Tallgrass Prairie</u> habitat has < 25% tree cover. Less than 50% cover of exotic species.	N	Suitable habitat not present on the subject property.
Other Rare Vegetation Communities		Provincially Rare S1 - S3 veg. comm. are listed in Appendix M of SWHTG.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	N	Suitable habitat not present on the subject property.
Specialized Habitat for Wildlife					
Waterfowl Nesting Area	Ducks	Upland habitats adjacent to: MAS1 to MAS3, SAS1, SAM1, SAF1, MAM1 to MAM6, SWT1, SWT2, SWD1 to SWD4 (>0.5 ha open water wetlands, alone or collectively).	Extends 120 m from a wetland or wetland complex. Upland areas should be at least 120 m wide. Wood Ducks and Hooded Mergansers use cavity trees (>40 cm dbh).	Potential	Potential habitat is present in the MAM community.
Bald Eagle & Osprey Nesting, Foraging and Perching Habitat	Osprey, Bald Eagle	FOD, FOM, FOC, SWD, SWM, SWC directly adjacent to riparian areas	Nesting areas are associated with waterbodies along forested shorelines, islands, or on structures over water.	N	Suitable habitat not present on the subject property.
Woodland Raptor Nesting Habitat	Barred Owl. Hawks: N. Goshawk, Cooper's, Sharp-shinned, Red-shouldered, Broad-winged.	Forests (FO), swamps (SW), and conifer plantations	>30 ha with > 10 ha interior habitat.	N	Potential habitat present, but the forested areas on the subject property are below the forest size criteria.
Turtle Nesting Areas	Midland Painted Turtle Special Concern: Snapping Turtle, Northern Map Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within: MAS1 to MAS3, SAS1, SAM1, SAF1, BOO1	Nest sites within open sunny areas with soil suitable for digging. Sand and gravel beaches.	N	Suitable habitat not present on the subject property.
Seeps and Springs	Wild Turkey, Ruffed Grouse, Spruce Grouse, White-tailed Deer, Salamander spp.	Seeps/Springs are areas where ground water comes to the surface.	Any forested area within the headwaters of a stream/river system. (2 or more confirms SWH type).	N	Suitable habitat not present on the subject property.
Amphibian Breeding Habitat (Woodland)	Woodland Frogs and Salamanders	FOC, FOM, FOD, SWC, SWM, SWD	Open water wetlands, pond or woodland pool of >500 m ² within or adjacent to wooded areas. Permanent ponds or holding water until mid-July preferred.	Y	Suitable habitat is present on the subject property and three of the associated species were recorded.

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional Notes and Species Observations
Amphibian Breeding Habitat (Wetlands)	Toads, Frogs, and Salamanders	SW, MA, FE, BO, OA and SA. Typically isolated (>120m) from woodland ecosites, however larger wetlands may be adjacent to	Open water wetland ecosites >500m ² isolated from woodland ecosites with high species diversity. Permanent water with abundant vegetation for bullfrogs.	Y	Suitable habitat is present on the subject property and two of the associated species were recorded.
Woodland Area-Sensitive Bird Breeding Habitat	Birds (area-sensitive species)	FOC, FOM, FOD, SWC, SWM, SWD	Large mature (>60 years) forest stands/woodlots >30 ha. Interior forest habitat >200m from forest edge.	N	The woodland size <30 ha, and no associated area-sensitive bird species recorded, so it has not been considered SWH.
Habitat of Species of Conservation Concern					
Marsh Bird Breeding Habitat	Wetland Birds	MAM1 to MAM6, SAS1, SAM1, SAF1, FEO1, BOO1 Green Heron: SW, MA and CUM1	Wetlands with shallow water and emergent vegetation. Gr. Heron @ edges of these types w/ woody cover.	N	Suitable habitat is prsent, but insufficient numbers of wetland birds were recorded.
Open Country Bird Breeding Habitat	Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, N. Harrier, Savannah Sparrow, Short-eared Owl (SC)	CUM1, CUM2	Grassland/meadow >30 ha. Not being actively used for farming. Habitat established for 5 years or more.	N	Suitable habitat not present on the subject property.
Shrub/Early Successional Bird Breeding Habitat	Brown Thrasher + Clay-coloured Sparrow (indicators) , Field Sparrow, Black-billed Cuckoo, E. Towhee, Willow Flycatcher, Yellow-breasted Chat, Golden-winged Warbler	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2	Large field areas succeeding to shrub and thicket habitats > 10 ha. Areas not actively used for farming in the last 5 years.	N	Suitable habitat not present on the subject property. CUT1 community does not meet the size criteria.
Terrestrial Crayfish	Chimney or Digger Crayfish; Devil Crayfish or Meadow Crayfish	MAM1 to MAM6, MAS1 to MAS3, SWD, SWT, SWM. CUM1 sites with inclusions of the aforementioned.	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish (typc. protected by wetland setbacks).	N	Potential habitat is present on the subject property, but no chimneys were recorded during surveys on the property.
Special Concern and Rare Wildlife Species	Any species of concern or rare wildlife species	Any ELC code.	Presence of species of concern or rare wildlife species.	N	2 pairs of Eastern Wood-pewee were recorded during breeding bird surveys. Presence of two pairs of Eastern Wood-Pewee is not sufficient to warrant SWH status.
Animal Movement Corridors					

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional Notes and Species Observations
Amphibians	Amphibians	all ecosites assoc. w/ water	When Breeding Habitat - wetland confirmed	Y	Candidate habitat as breeding habitat - wetland is confirmed from amphibian breeding surveys.
Deer Movement	White-tailed Deer	all forested ecosites	When Deer Wintering Habitat confirmed	N	Suitable habitat not present on the subject property.
Exceptions for Ecoregion 6E					
Mast Producing: 6E-14	Black Bear	Forested Ecosites	>30 ha w/ mast producing species: Cherry (berries), Oak, Beech (nuts).	N	Suitable habitat not present on the subject property.
Leks: 6E-17	Sharp-tailed Grouse	CUM, CUS, CUT	Grassland/meadow >15 ha adjacent to shrublands, >30 ha adjacent to woodlands. Low agricultural intensity.	N	Suitable habitat not present on the subject property.