



NATURAL ENVIRONMENT REPORT
Cawthra Road Improvements
South Service Road to Eastgate Parkway
Regional Municipality of Peel
March 2020



RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.



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SUBJECT: Natural Environment Report
Cawthra Road Improvements, South Service Road to Eastgate Parkway
City of Mississauga, Regional Municipality of Peel

RiverStone Environmental Solutions Inc. is pleased to provide you with the attached report. A summary of the key results and recommendations are provided at the beginning of the report. Detailed descriptions of the work completed, and the findings are provided in the subsequent sections.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

RiverStone Environmental Solutions Inc.

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REPORT SUMMARY

<p>Type of Study Natural Environment Report</p>	<p>Date March 4, 2020</p>
<p>Location Cawthra Road, South Service Road to Eastgate Parkway</p>	<p>Application Detailed Design</p>
<p>Approval Authorities Regional Municipality of Peel Credit Valley Conservation Toronto and Region Conservation Authority</p>	<p>Proponent Regional Municipality of Peel</p>
<p><u>Report Summary</u> The purpose of this study was to characterize the terrestrial, wetland, and aquatic resources for lands and waterbodies adjacent to Cawthra Road between South Service Road and Eastgate Parkway in the City of Mississauga. The proposed road improvements principally consist of resurfacing, widenings at intersections to accommodate turning lanes and upgrading of sections of sidewalks. Based on a detailed review of a variety of background information sources, and the results of several site investigations and field surveys carried out by RiverStone 2018-2019, it was determined that a small number of features and species of conservation interest occurred within or adjacent to the project works area. To assist Credit Valley Conservation and Toronto Region Conservation with their review of the proposed road improvements and associated works, the potential impacts on the identified significant natural features and species were evaluated. The recommendations contained within Section 4 of this report (below) are intended to mitigate potential negative impacts on the identified features and species.</p>	

RECOMMENDATIONS

Provincially Significant Wetlands

- **Sediment fencing be installed at the limit of grading in all areas adjacent to the wetland communities within the study area.**
- **All sediment and erosion control measures should be consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.**
- **Appropriate sediment and erosion control measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any wetland community. These measures shall be in place prior to the onset of site preparation.**
- **When native soil is exposed sediment and erosion control works, in the form of heavy-duty sediment fencing, be positioned along the edge of the areas to be developed, graded, and otherwise disturbed.**
- **Sediment fencing must be constructed of heavy material and solid posts and be properly installed (trenched in) to maintain its integrity during inclement weather events.**

- **Additional sediment fencing and appropriate control measures must be available on site so that any breach can be immediately repaired.**
- **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
- **An onsite supervisor should be responsible for daily inspections of the sediment and erosion control measures and record the time and date of inspections, the status of the mitigation measures, and any repairs undertaken.**
- **All stockpiled aggregates should be stored in a location that will prevent the movement of sediment laden runoff into the wetland community.**
- **All stockpiled topsoil/overburden should be stabilized as quickly as possible to minimize the potential for runoff.**
- **Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks.**
- **Machinery must be refueled, washed, and serviced a minimum of 30 m from wetlands.**
- **Locate all fuel and other potentially deleterious substances a minimum of 30 m from wetlands. Minimize fuels and chemicals stored onsite and ensure a spills management plan and the associated spill response equipment is always available on-site for implementation in the event of a spill of deleterious material.**
- **Temporary storage locations of aggregate/fill material should be located no less than 30 m from wetlands. This material is to be contained by heavy-duty sediment fencing.**
- **Offloading of construction and aggregate/fill materials should be completed during fair weather conditions.**

Species of Conservation Interest

- **Barrier fencing be installed between areas of active construction and Cawthra Woods. Fencing is to be entrenched to minimize the potential for Jefferson Salamanders to circumvent the barrier.**
- **If a Jefferson Salamander is encountered within the works zone during any stage of construction, all activities that may harm any individuals should temporarily cease. A qualified biologist and/or Ministry of Environment Conservation and Parks specialist should then be contacted immediately for direction on how to proceed.**

Significant Wildlife Habitat

- **The cultural meadow communities located at the northern extent of the study area be excluded from development and site alteration. Additionally, this area should not be used for equipment and material storage or staging.**
- **Development and site alteration be excluded from the area known as Cawthra Woods.**

Additional Recommendations

- **Following completion of the project works any disturbed and/or exposed soil should be stabilized and revegetated via a native seed mixture suitable to site conditions. The seed mix should be consistent with Credit Valley Conservation's *Plant Selection Guidelines* (May 2015).**
- **Prior to applying the seed mix, prepare the areas to be seeded by eliminating uneven areas and low spots, removing weeds to the extent achievable, and removing branches and stones in excess of 50 mm.**
- **In areas of slopes greater than 3:1, jute mat, Bonded Fibre Matrix or equivalent shall be laid on top of the seed mix to further stabilize disturbed soils in these areas. Where slopes are less than 3:1, seeding and mulch should be used to stabilize disturbed soils.**
- **Tree removal should be completed outside of the primary breeding bird nesting window (no tree removal between April 1 and August 31). If development and site alteration is going to occur during this period, a nest survey should be conducted by a qualified avian biologist prior to commencement of construction activities to identify and locate active nests of migratory bird species covered by the Act. If a nest is located or evidence of breeding noted, then a mitigation plan should be developed to address any potential impacts on migratory birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.**
- **Any tree removal is to be completed outside of the primary maternal roosting period for woodland bats (no tree removal between April 1 and October 15).**

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1 BACKGROUND

RiverStone Environmental Solutions Inc. (hereafter, “RiverStone”) was retained by IBI Group on behalf of the Regional Municipality of Peel (hereafter, “the Region”) to prepare a Natural Environment Report (NER) as part of the Environmental Assessment process for improvements to Cawthra Road between South Service Road to Eastgate Parkway. Cawthra Road is a major north-south arterial road under the jurisdiction of the Region. The section of Cawthra Road to be improved is approximately 5.6 km in length and traverses both residential and commercial developments. The proposed road improvements principally consist of resurfacing, widenings at intersections to accommodate turning lanes and upgrading of active transportation infrastructure.

The Project Area is defined herein as the right-of-way (ROW) of Cawthra Road and the ROW of side streets that share intersections with Cawthra Road; this area generally contains the proposed area of temporary or permanent disturbance. The study area includes the Project Area and a 120 m zone representing adjacent lands. Both the Project Area and study area are shown on **Figure 1**. Overall, the study area is situated within a landscape predominantly dominated by residential and commercial uses. The natural heritage information and recommendations contained within this NER rely on data collected during site investigations completed by RiverStone 2018-2019 and in reports collected during background review.

This NER has been prepared to address the requirements of Credit Valley Conservation (CVC) Authority and Toronto Region Conservation Authority (TRCA) in relation to works within a regulated area per O. Reg. 160/06 (CVC) and O.Reg. 166/06 (TRCA) pursuant to the *Conservation Authorities Act, 1990*. The approximate boundary of CVC/TRCA jurisdiction within this project site is the intersection of Cawthra Rd. and Burnhamthorpe Rd. (TRCA to the north, CVC to the south). The impact assessment herein is based on 30% design drawings. In addition to addressing CVC and TRCA regulatory requirements, this report is guided by other relevant natural heritage policies that may have bearing on project design and implementation, including those contained within the *Endangered Species Act (ESA)*.

2 APPROACH AND METHODS

The approach and methods used to carry out this NER are detailed in this section. Broadly speaking, this includes:

1. Gathering background biophysical information for the study area to become familiar with existing natural feature mapping and records of features and species of conservation interest prior to the site investigations.
2. Conducting site investigations to field-verify the presence or absence of significant natural features identified during background information gathering, and to identify any additional significant features (if present).
3. Determining whether implementation of the proposed road improvements will cause negative impacts to any significant natural features within the study areas, and to identify ways in which such negative impacts (where present) can be mitigated via avoidance, minimization, and/or compensation measures.
4. Determining whether the proposed road improvements address CVC’s regulation (O. Reg. 160/06) and TRCA’s regulation (O. Reg. 166/06) and requirements under Section 28 of the *Conservation Authorities Act, 1990* as well as requirements under the provincial *Endangered Species Act, 2007*.

2.1 Information Sources Used to Assess Site Conditions

Information pertaining to the natural features and functions of the study area was obtained from the following sources:

- **City of Mississauga Official Plan** (office consolidation August 1, 2018) and related schedules for natural feature mapping, including:
 - Schedule 1 – Urban System
 - Schedule 1a – Urban System - Green System
 - Schedule 3 – Natural System
 - Schedule 4 – Parks and Open Spaces
 - Schedule 10 – Land Use Designations
- **Regional Municipality of Peel Official Plan** (October 2014 office consolidation) for natural feature mapping, including:
 - Schedule A – Core Areas of the Greenlands System in Peel Region
 - Schedule D – Regional Structure
 - Schedule D3 – Greenbelt Plan Area Land Use Designations
- **Credit Valley Conservation (CVC) Interactive Mapping** to identify potential features of conservation interest within and adjacent to the Site (accessed November 21, 2018, at http://www.creditvalleyca.ca/regmap-files/CVC_ScreeningTool_20160111_final.html).
- **Toronto Region Conservation Authority (TRCA) Mapping** to identify potential features of conservation interest within and adjacent to the Site (accessed November 21, 2018).
- **Ministry of Natural Resources and Forestry (MNR) Aurora District Information Request** for occurrences of species at risk and natural heritage features within or adjacent to the study area (request submitted on October 25, 2018. Response provided January 22, 2019 See **Appendix 5**).
- **MNR Natural Areas Mapping and Natural Heritage Information Centre (NHIC) database** regarding information on occurrences of species at risk (SAR), provincially tracked species, and natural heritage features within or adjacent to the study area (squares: 17PJ0930, 17PJ0929, 17PJ1129, 17PJ1128, 17PJ1228, 17PJ1227, 17PJ1327, 17PJ1426, 17PJ1326; accessed October 25, 2018, at: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
- **Species at Risk range maps** (accessed at: <http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/246809.html>).
- **Ontario Breeding Bird Atlas (OBBA) database and the Atlas of the Breeding Birds of Ontario, 2001–2005** (Cadman et al. 2007) regarding birds that were documented to be breeding within or adjacent to the study area between 2001–2005 (squares: 17PJ12 and 17PJ13; accessed at: <http://www.birdsontario.org/atlas/squareinfo.jsp>).
- **Ontario Reptile and Amphibian Atlas** database regarding reptile and amphibian records within or adjacent to the study area (squares: 17PJ12; accessed October 25, 2018, at: http://www.ontarioinsects.org/herpatlas/herp_online.html).

- **Ontario Butterfly Atlas** database regarding butterflies recorded within or adjacent to the study area (square: 17NJ12 and 17PJ13; accessed October 25, 2018, at: http://www.ontarioinsects.org/atlas_online.htm).
- **Atlas of the Mammals of Ontario** (Dobbyn 1994) regarding mammals recorded within or adjacent to the study area.
- **Aquatic Species at Risk Maps** mapping generated by Fisheries and Oceans Canada (Map 10; accessed October 25, 2018, at: <http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm>).
- **Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2** (Henson and Brodribb (2005) regarding terrestrial biodiversity within Ecodistrict 6E-7 (Uxbridge).
- **Great Lakes Conservation Blueprint for Aquatic Biodiversity, Volume 2** (Phair et al. (2005) regarding aquatic biodiversity within tertiary watershed 2HB (Credit River – 16 Mile Creek).
- **Physiography of Southern Ontario** (Chapman and Putnam 2007) for information pertaining to the physiography and soils within and adjacent to the study area.
- **Soil Survey of Peel County** (Hoffman and Richards 1953) for information pertaining to soils in the study area.
- **Digital Ontario Base Maps** (OBMs; 1:10,000)
- **Historical and Current Aerial Photographs** of the study area.
- **Site investigations** by RiverStone staff (see **Section 2.2**).

2.2 Site Investigations

The background biophysical information gathered as outlined in **Section 2.1** helped direct field data collection activities associated with site investigations carried out by Riverstone staff. Due to proposed construction activities being confined within the existing Cawthra Road right-of-way (ROW) or manicured adjacent lands, permission to access properties outside the Cawthra Road ROW were not acquired by IBI Group. All relevant biophysical information for the study area was therefore assembled exclusively from observations within the Cawthra Road ROW or from background sources. The natural features and functions with recognized conservation status occurring within and adjacent to the study area are limited by extensive manicured lands within the Cawthra Road ROW and adjacent lands are primarily residential.

The site features were assessed in the fall of 2018 and through spring and summer 2019 by W. Barbour (Ecologist) and C. Mann (Ecologist). Onsite assessments included a general walk-through of the study area as well as more intensive work in targeted areas identified through air photography interpretation as being more natural and having higher potential for significant species (see below). Within the study area, targeted surveys were primarily focused on forested lands, wetlands, and naturally occurring trees. Features of interest were photographed, and all information collected was catalogued for future reference.

Evidence for the presence of a species or use of an area was determined from visual and/or auditory observation (e.g., song, call) and observation of nests, tracks, burrows, browse, skins, and scats (where applicable). General vegetation assessment included verifying mapping outlined in the City of

Mississauga Natural Areas Survey (2012) and gathering information regarding the likelihood that plant species of conservation interest may be present (for example, most rare plants have strong affinities for specific ecological communities). Additionally, if a potentially rare plant not in flower was encountered, then a second site visit would have been conducted during the appropriate season for flowering or fruiting to confirm identification. This approach acceptably minimizes the risk that rare plant species would have gone undetected.

Natural features of interest (e.g., SAR habitat, vegetation community boundaries) were verified in the field with a tablet with highly accurate built in GPS. Features of interest were photographed, and all information collected was catalogued for future reference. Photos representative of onsite conditions are provided in **Appendix 1**.

2.2.1 Terrain, Drainage, and Soils

The geophysical setting of the study area was determined via a review of existing topographic mapping, soils mapping, geological mapping, and aerial photographs.

2.2.2 Fish and Aquatic Habitat

Fish and aquatic habitat conditions are typically assessed based on background information sources and at all drainage features within the study area in general accordance with the Ontario Stream Assessment Protocol (OSAP) (Stanfield 2010). In the case of Cawthra Rd., no watercourses were identified during the 2018 and 2019 onsite investigations. Vegetation Communities
Vegetation communities in the study area were verified and updated from City of Mississauga Natural Areas Survey mapping using Ecological Land Classification (ELC) methods (Lee et al., 1998). ELC methods define ecological units or communities based on bedrock, climate (temperature, precipitation), physiography (soils, slope, aspect), and corresponding vegetation. Use of the system permits biologists and other land managers to use a common language to describe vegetation communities, which in turn facilitates the identification of communities likely to support features or functions of conservation interest. The ELC system is an organizational framework that can be applied at different scales. The ecological units most useful for site-specific evaluations are ecosites and vegetation types (also known as ecoelements). Vegetation types are the finest level of resolution in the ELC system and are recurring patterns found in the plant species assemblages that are associated with a particular ecosite (Lee et al. 1998). Plant nomenclature is generally consistent with the Southern Ontario Vascular Plant Species List, Third Edition (Bradley 2013). All observations of vegetation were from within the Cawthra Road ROW.

2.2.3 Anuran Calling Surveys

Calling anuran surveys were conducted in accordance with the Marsh Monitoring Program for Surveying Amphibians (Bird Studies Canada 2009). This protocol involves the completion of three (3) surveys, once per month between April and June, from approximately 30 minutes after sunset until midnight. Appropriate weather conditions include no or very light precipitation and wind speed ≤ 3 on the Beaufort wind scale. As the site is located within the southern region, each of the three (3) surveys should occur during the second half of the month (i.e., April 15-30, May 15-31, and June 15-30). A total of eight (8) anuran calling stations were established and situated systematically to cover potentially significant anuran breeding habitats, particularly those that could occur adjacent to proposed areas of disturbance (**Figure 2**). Each station was surveyed for a minimum duration of three (3) minutes. Anurans encountered were also recorded incidentally during other field activities on-site.

Results of targeted surveys are discussed further in **Section 3.5** and provided in **Appendix 2** with survey locations identified on **Figure 2**.

2.2.4 Breeding Bird Surveys

Two (2) rounds of breeding bird surveys were conducted in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (Bird Studies Canada et al. 2001). Surveys were conducted based on the appropriate season (May 24–July 10), time of day (between dawn and 5 hours after dawn), and weather conditions (no rain, wind speed ≤ 3 on the Beaufort Wind Scale). A total of four (4) breeding bird stations were established and situated systematically to cover potentially significant bird habitats, particularly those that could occur adjacent to proposed areas of disturbance (Figure 3). Each station was surveyed for a minimum duration of 10 minutes. Birds were also recorded incidentally in transit between stations during the breeding bird survey, and incidentally during other field activities on-site. Results of targeted surveys are discussed further in **Section 3.5** and provided in **Appendix 2**.

2.2.5 Features of Conservation Interest Designated by Relevant Approval Authorities

“Features of conservation interest” represent natural heritage features and habitats that have recognized status within the relevant planning jurisdiction in which a development application is proposed. For the purposes of identifying features that warrant consideration during design and implementation of the proposed road improvements, features of conservation concern include:

- Wetlands, including identified, evaluated, and Provincially Significant Wetlands
- Habitat of Species of Conservation Interest (e.g., Endangered, Threatened, Special Concern).
- Fish Habitat
- Areas of Natural and Scientific Interest (ANSI)
- Significant Valleylands
- Significant Woodlands
- Significant Wildlife Habitat

The presence/absence of the above features of conservation interest was ascertained primarily by reviewing existing background information (per **Section 2.1**) and municipal Official Plans (and related schedules) for the City of Mississauga and Regional Municipality of Peel. More detailed assessments for the presence of wetlands, fish habitat, and species of conservation concern habitat took place during the on-site investigations.

2.2.6 Natural Features and Functions of Conservation Interest

2.2.6.1 Habitat-based Approach

RiverStone’s primary approach to site assessment is habitat-based. This means that our field investigations first focus on evaluating the potential for features within an area of interest to function as habitat for species considered potentially present, rather than searching for live specimens. An area is considered potential habitat if it satisfies a number of criteria, usually specific to a species, but occasionally characteristic of a broader group (e.g., several turtles of conservation interest use sandy shorelines for nesting, numerous fish species use areas of aquatic vegetation for nursery habitat). Physical attributes of a site that can be used as indicators of its potential to function as habitat for a

species include structural characteristics (e.g., physical dimensions of rock fragments or trees, water depth), ecological community (e.g., meadow marsh, rock barren, coldwater stream), and structural connectivity to other habitat features required by the species. Species-specific habitat preferences and/or affinities are determined from status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007), published and unpublished documents, and direct experience.

In instances where habitat features are such that either (i) a species presence cannot be easily determined through an assessment of habitat feature alone, or (ii) habitat features are such that they suggest a species may be present in an area where development is proposed and impacts are likely, RiverStone adds an additional level of assessment by completing further species-specific observations (e.g., Whip-poor-will call surveys, Massasauga hibernation/gestation surveys, etc.) in accordance with industry standard methods and protocols.

2.2.6.2 Species of Conservation Interest

As described in **Section 2.2.6.1**, RiverStone’s approach to site assessment is primarily habitat-based. For the purposes of identifying species that warrant consideration during design and implementation of the project, we have defined “species of conservation interest” to include the following:

- Species designated as Endangered, Threatened, or Special Concern under O. Reg. 230/08 of the provincial *Endangered Species Act, 2007*. These species are considered within the local Official Plan and Provincial Policy Statement as “SAR”.
- Species designated Provincially Rare (i.e., S1, S2, or S3) by the Natural Heritage Information Centre (NHIC) of the MNR.
- Species designated Locally Rare (i.e., L1, L2, or L3) by CVC.

The assessment included a thorough review of available information, communication with MNR, site visit, and assessment of findings. The results of these assessments are provided in **Section 3.5** below and in **Appendix 3**.

2.3 Impact Assessment and Mitigation Measures

In order to carry out a defensible ecological assessment of potential impacts associated with implementation of the proposed development, RiverStone employs the following general approach:

1. *Predict* impacts to existing biophysical features and functions on site based on the proposed development plan (from construction to post-completion), including both direct (e.g., vegetation clearance, etc.) and indirect (e.g., light pollution, encroachment post-development), impacts.
2. *Evaluate the significance* of predicted impacts to existing biophysical features and functions based on their spatial extent, magnitude, timing, frequency (how often), and duration (how long).
3. *Assess the probability or likelihood* that the predicted impacts will occur at the level of significance expected (i.e., high, medium, low probability).

4. Where the potential for negative impacts exists, ecologically meaningful *mitigation measures* are offered to avoid such impacts first, and where impacts cannot be fully avoided to minimize and/or compensate such impacts as appropriate.

Given that the existing Cawthra Road ROW is primarily manicured with landscape trees and the adjacent areas are primarily residential, the baseline against which impacts were assessed was adjusted to give consideration of alterations to the landscape and local drainage pattern.

2.4 Applicable Conservation Authority Policies

Based on the impact assessment provided in **Section 4.2** a review of the proposed project works in the context of relevant CVC policies is offered in **Section 5**. This includes O. Reg. 160/06 (CVC, O. Reg. 166/06 (TRCA), CVC's *Watershed Planning and Regulation Policies* (CVC 2010), CVC's *Fish and Wildlife Crossing Guidelines* and CVC's *Low Impact Development Road Retrofits (Road Right-of-way)*.

3 BIOPHYSICAL FEATURES AND FUNCTIONS

3.1 Landscape Setting and Land-uses

The study area is situated within a landscape that is currently dominated by residential and commercial development to the east and west of Cawthra Road. Within residential neighbourhoods, fencing has been installed along most of the residential properties in an effort likely to curb sound and add privacy. Within the Cawthra Road ROW sidewalks and a grassed strip runs along the majority of the study area. In the north portion of the study area, in the vicinity of Eastgate Parkway, more natural areas of cultural meadow and Common Reed (*Phragmites australis ssp. australis*) dominated marsh are present. In the south portion of the study area Cawthra Woods, consisting of deciduous forest, occupies the southeast corner of the property.

3.2 Bedrock and Surficial Geology

Material underlying the study area and adjacent lands consists of Upper Ordovician aged (i.e., approximately 460-445 million year old) red to maroon shales of the Queenston Formation (Armstrong and Dodge 2007). Interbedded within the layers of shale are red siltstone, siltstone, and green/light grey shale. The Queenston Formation outcrops below the Niagara Escarpment, and readily erodes to create clayey soils with a deep red hue (Bond and Telford 1976, Armstrong and Dodge 2007).

Surficial geological mapping indicates the study area was once covered by the body of water known as Lake Iroquois. The retreat of Lake Iroquois has left behind the Iroquois plain, a slightly sloping plain covered with a variety of stratified sands, red shale, grey shale and delta sands.

3.3 Drainage and Surface Water Features

3.3.1 General Watershed Conditions

Drainage within the study area is principally influenced by topography, land cover, and grade changes along Cawthra Road. Overall, drainage within the study area consists of roadside curbs and stormwater drains with limited ditching present. In the north portion of the study area, roadside ditching to the east and west of Cawthra Road direct flow north into Common Reed dominated marshes. Additional roadside ditches are located in the northwest and southwest corners of the intersection at Eastgate

Parkway and Cawthra Road. These ditches consist of manicured mowed grass and collect overland runoff with no apparent direction of flow. Any surface water drainage along Cawthra Road flows in a predominantly southeast direction. There are no watercourses documented nor were any observed during site investigations within the study area.

3.3.2 Aquatic Characterization of the Drainage Features within the Study Area

During RiverStone's 2018 and 2019 field surveys, no aquatic features (e.g., watercourses) that had the potential to function as fish habitat were observed. Drainage features were limited and consisted primarily of manicured roadside ditches; these features did not discharge into any downstream receivers within a distance that would be impacted by the proposed development.

3.4 Vegetation Communities

The study area is largely composed of anthropogenic lands within the Cawthra Road ROW consisting of mowed lawn and landscape trees. Existing residential and commercial development extends primarily beyond the ROW. RiverStone characterized natural features occurring within the study area on October 12 and 22, 2018. Communities within the ROW and adjacent to the ROW were characterized based on observations from the ROW, aerial photographs and background information sources (see **Section 2.1**). Note that given the extent of development within the study area, only areas containing natural vegetation communities have been mapped (**Figure 2**).

- Mineral Marsh (MAM2): This community is located in a number of drainage ditches in proximity to the Eastgate Parkway and Cawthra Road intersection. This community is dominated by Common Reed with Narrow-leaved Cattail (*Typha angustifolia*) present. The community forms part of the roadside drainage system.
- Dry-Fresh Deciduous Forest (FOD4): Located beyond the Cawthra Road ROW, in proximity to a cultural meadow community is a Dry-Fresh Deciduous forest (FOD4) community. This community is comprised of a mixture of Bebb's Willow (*Salix bebbiana*), Crack Willow (*Salix fragilis*), and Trembling Aspen (*Populus tremuloides*).
- Fresh-Moist Sugar Maple Hardwood Deciduous Forest (FOD6-5): In the south portion of the study area, south of the Queen Elizabeth Way and east of Cawthra Road is the Cawthra Woods. This is a 22.46 ha woodland with Fresh-Moist Sugar Maple-Hardwood-Deciduous forest (FOD6-5) occupying the north portion of the forest. According to the City of Mississauga Natural Areas Survey (2012), Cawthra Woods provide habitat for 362 floral and 82 faunal species within the two vegetation communities. The following species have been documented in the north portion of the Cawthra Woods, Sugar Maple (*Acer saccharum*), Green Ash (*Fraxinus pennsylvanica*), Red Maple (*Acer rubrum*), American Elm (*Ulmus americana*), American Beech (*Fagus grandifolia*), American Basswood (*Tilia americana*), Black Cherry (*Prunus serotina*), Silver Maple (*Acer saccharinum*), Choke Cherry (*Prunus virginiana*), Mapleleaf Viburnum (*Viburnum acerifolium*), White Trillium (*Trillium grandiflorum*), Red Trillium (*Trillium erectum*), Wild Leek (*Allium tricoccum*), False Solomon's Seal (*Maianthemum racemosum*) and Yellow Trout Lily (*Erythronium americanum*).
- Cultural Meadow (CUM1): This community is located on the north, east, south and west corners of the Eastgate Parkway and Cawthra Road intersection and dominated by a goldenrod species (*Solidago sp.*) with Reed Canary Grass (*Phalaris arundinacea*) and additional pasture grasses.

Additional trees are located within the Cawthra Road ROW and on adjacent manicured lawns. These tree species have been documented in the Tree Inventory report prepared under a separate cover.

3.5 Results of Targeted Surveys

Based on the protocol described in **Section 2.2.3** three (3) anuran call surveys should occur during the second half of the month (i.e., April 15-30, May 15-31, and June 15-30). A total of eight (8) anuran calling stations were established and situated systematically to cover potentially significant anuran breeding habitats, particularly those that could occur adjacent to proposed areas of disturbance (**Figure 2**). Spring 2019 was colder than usual, and temperature is an important factor driving anuran calling behaviour. Consequently, surveys were conducted later in the timing windows above to hit the desired temperature ranges. Because no anurans were detected in surveys within the study area, additional anuran call stations were added on the greater landscape in areas with similar features most likely to contain calling anurans in case noise was keeping anurans present from calling. High background noise and general traffic was determined to likely be contributing factors to the absence of calling anurans in targeted surveys within the study area. Additional survey locations targeting features on quieter/less-busy streets with similar aquatic habitat (stations A7 and A8) were added but also failed to detect calling anurans which suggests the anthropogenic factors in the urban setting may be too stressful (e.g. noise, predators, run-off, roadkill, etc.) for anurans on the greater landscape. Breeding Bird Surveys were conducted following the protocol described in **Section 2.2.4** without any adjustments in the field. A list of species detected in the study area in addition to the results of targeted surveys are provided in **Appendix 2**.

3.6 Natural Features of Conservation Interest

Based on the biophysical information collected during background information gathering (per **Section 2.1**) and the site information collected by RiverStone 2018-2019 (per **Section 2.2**), the following features of conservation interest were identified within the study area. Note that given the extent of anthropogenic development within the study area, only portions of the study area containing Features of Conservation Interest are shown on **Figure 2**.

3.6.1 Provincially Significant Wetlands

Located in the extreme south portion of the study area is the Cawthra Woods. This deciduous forest community contains wetlands used by Jefferson Salamander and therefore the entire woodland feature has been classified as a Provincially Significant Wetland (PSW).

3.6.2 Species of Conservation Interest

The results of RiverStone's desktop, habitat-based assessments for species of conservation interest is provided in **Appendix 3**. A preliminary screening of background biophysical information identified several species with potential to be present within the study area based on existing records and/or range maps. This initial species list was refined to include those species that have the potential within the study area or were confirmed through background information gathering.

Per the results of **Appendix 3**, one (1) species of conservation interest has been confirmed to be within the study area however, does not have the potential to be impacted by the proposed improvements to Cawthra Road, which are identified below in **Table 1**.

Table 1. Species of Conservation Interest with the potential to be impacted by the proposed improvements to Cawthra Rd.

Species	Status per the <i>Endangered Species Act</i> (O. Reg. 230/08)	Documented locations and/or potential habitat on or adjacent to the project area
Jefferson's Complex Salamander (<i>Ambystoma spp.</i>)	Endangered	Based on information outlined in the City of Mississauga Natural Areas Survey information sheet for Cawthra Woods, studies conducted in 1999 confirmed the presence of a healthy population of salamanders in the Jefferson's complex within Cawthra Woods.

3.6.3 Significant Natural Areas

Based on a review of background information sources, Cawthra Woods is identified as a regional Area of Natural and Scientific Interest and part of the Natural Heritage System. No other areas have been confirmed as Life Science or Earth Science Areas of Natural and Scientific Interest (ANSI) within the study area.

3.6.4 Significant Woodlands

Based on a Schedule 3 (Natural System) of the City of Mississauga Official Plan there are Significant Natural Areas located within study area. Cawthra Woods (PSW, Significant Natural Area) is located in the extreme south portion of the study area and proposed construction activities are not anticipated to impact Cawthra Woods. Beyond the extreme north portion of the study area, a Significant Natural Area and Special Management Area is mapped. These areas are beyond Eastgate Parkway and the newly constructed LRT station and are not anticipated to be impacted by the proposed construction. Portions of both these mapped natural features, likely meet the definition of Significant Woodland.

3.6.5 Significant Valleylands

Based on a review of Schedule 3 (Natural System) of the City of Mississauga Official Plan, no Significant Valleylands are present within the study area.

3.6.6 Significant Wildlife Habitat

The following sections contain the results of the impact assessment and recommendations for avoidance and minimization of potential impacts to the ecological form and function of candidate Significant Wildlife Habitats (SWH) identified during the initial stages of RiverStone's SWH assessment. Details of the initial stages of the assessment are provided in **Appendix 4**.

3.6.7 Seasonal Concentration Areas of Animals

3.6.7.1 *Waterfowl Stopover and Staging Areas (Terrestrial)*

Waterfowl stopover and staging areas providing important habitat for migrating waterfowl. Typically, stopover and staging areas for waterfowl are associated with cultural meadows or fields where annual spring flowing from meltwater or runoff collect. Within the northern portion of the study area is an area of cultural meadow community. No waterfowl were detected during targeted breeding bird surveys (**Appendix 2**); however, this habitat function is associated with early spring (March-April) rather than the peak breeding window (June) associated with the type of bird study used in this report. While it was not possible to determine if the meadow community is flooded during the spring due to

the timing of the onsite assessments, this area may provide stopover or staging habitat for migrating waterfowl.

3.6.7.2 *Bat Maternal Colonies*

While the study area does contain a number of trees, these individual trees are not in any great density and as such have a low likelihood of use as roosting habitat by maternal colonies of bats. The Cawthra Woods located at the southern extent of the study area contains a high density of trees and has the potential to contain snag or cavity trees; these trees are sought out by female bats for roosting during the rearing of young.

3.6.8 Specialized Habitats for Wildlife

3.6.8.1 *Amphibian Breeding Habitat (Woodland)*

Numerous species of salamander as well as anurans seek out vernal pools in early spring for breeding. The study area generally lacks vernal pools within woodland communities with the exception of Cawthra Woods. Formal surveys for breeding amphibians were completed and failed to detect calling anurans (**Appendix 2**) however Salamanders still have the potential to occur within Cawthra Woods as this community has a high likelihood of providing breeding habitat for salamanders.

4 IMPACT ASSESSMENT AND RECOMMENDATIONS

4.1 Proposed Road Improvements

The general works area (i.e., total area of disturbance capturing the road widening and other associated activities) is shown on **Figure 3**. Note that given the extent of anthropogenic development within the study area, only development within proximity to features of conservation interest have been shown on **Figure 3**. The project works principally consist of resurfacing, and widenings at intersections to accommodate turning lanes and upgrading of sections of sidewalks.

4.2 Impact Assessment

Based on the results of the assessments detailed in **Section 3** of this report, features of conservation interest have been identified within the study area. The following impact assessment provides an evaluation of the potential for the proposed road improvements to result in negative impacts to the natural environment and/or significant natural features. Impacts to individual trees have been assessed in a Tree Inventory Report prepared under a separate cover.

Where the potential for impacts are identified, recommendations are provided for incorporation into project design. Recommendations are provided to avoid, where possible, or mitigate potential impacts to reduce the likelihood of the proposed activities from resulting in negative impacts. Our determination of whether the risk of potential impacts on a specific feature is acceptable relies upon the relevant policies and legislation, as well as our assessment of the significance or quality of the respective natural feature.

4.2.1 Provincially Significant Wetlands

As previously stated, Cawthra Woods, located at the southern extent of the study area contains a Provincially Significant Wetland. Based on the proposed improvements to Cawthra Rd, no construction activities are proposed or anticipated within or directly adjacent Cawthra Woods (**Figure**

3). No impacts are anticipated to Cawthra Woods or the PSW within that feature. To minimize potential indirect impacts to wetlands and surface water features in proximity to proposed activities RiverStone recommends that:

- **Sediment fencing be installed at the limit of grading in all areas adjacent to the wetland communities within the study area.**
- **All sediment and erosion control measures should be consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.**
- **Appropriate sediment and erosion control measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any wetland community. These measures shall be in place prior to the onset of site preparation.**
- **When native soil is exposed sediment and erosion control works, in the form of heavy-duty sediment fencing, be positioned along the edge of the areas to be developed, graded, and otherwise disturbed.**
- **Sediment fencing must be constructed of heavy material and solid posts and be properly installed (trenched in) to maintain its integrity during inclement weather events.**
- **Additional sediment fencing and appropriate control measures must be available on site so that any breach can be immediately repaired.**
- **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
- **An onsite supervisor should be responsible for daily inspections of the sediment and erosion control measures and record the time and date of inspections, the status of the mitigation measures, and any repairs undertaken.**
- **All stockpiled aggregates should be stored in a location that will prevent the movement of sediment laden runoff into the wetland community.**
- **All stockpiled topsoil/overburden should be stabilized as quickly as possible to minimize the potential for runoff.**
- **Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks.**
- **Machinery must be refueled, washed, and serviced a minimum of 30 m from wetlands.**
- **Locate all fuel and other potentially deleterious substances a minimum of 30 m from wetlands. Minimize fuels and chemicals stored onsite and ensure a spills management plan and the associated spill response equipment is always available on-site for implementation in the event of a spill of deleterious material.**
- **Temporary storage locations of aggregate/fill material should be located no less than 30 m from wetlands. This material is to be contained by heavy-duty sediment fencing.**
- **Offloading of construction and aggregate/fill materials should be completed during fair weather conditions.**

4.2.2 Species of Conservation Interest

As outlined in **Section 3.6.2** and **Appendix 3**, one (1) *Endangered* species has the potential to be located within the study area: Jefferson Salamander. Jefferson Salamanders are typically found in loose, moist soil under logs or in leaf litter. This species moves to woodland ponds in the spring to breed, attaching clusters of eggs to vegetation below the water surface. Within the study area, only the area known as Cawthra Woods has been identified as containing habitat for Jefferson Salamander. While Cawthra Woods and the ecological features within this community are not anticipated to be impacted as a result of the proposed improvements to Cawthra Road, RiverStone recommends the following to ensure that individual Jefferson Salamanders are not impacted:

- **Barrier fencing be installed between areas of active construction and Cawthra Woods. Fencing is to be entrenched to minimize the potential for Jefferson Salamanders to circumvent the barrier.**
- **If a Jefferson Salamander is encountered within the works zone during any stage of construction, all activities that may harm any individuals should temporarily cease. A qualified biologist and/or Ministry of Environment Conservation and Parks (MECP) specialist should then be contacted immediately for direction on how to proceed.**

4.2.3 Significant Wildlife Habitat

4.2.3.1 *Seasonal Concentration Areas of Animals*

Waterfowl Stopover and Staging Areas (Terrestrial)

As previously stated, the northern portion of the study area contains an area of cultural meadow. While it was not possible to determine if the meadow community is flooded during the spring due to the timing of the onsite assessments, this area may provide stopover or staging habitat for migrating waterfowl. In order to protect the ecological function of this area, RiverStone recommends that:

- **The cultural meadow communities located at the northern extent of the study area be excluded from development and site alteration. Additionally, this area should not be used for equipment and material storage or staging.**

Bat Maternal Colonies

Cawthra Woods has the potential to provide maternal roosting habitat for bats. In order to protect the ecological function of this area, RiverStone recommends that:

- **Development and site alteration be excluded from the area known as Cawthra Woods.**

4.2.3.2 *Specialized Habitats for Wildlife*

Amphibian Breeding Habitat (Woodland)

As previously stated, Cawthra Woods, located at the southern extent of the study area has the potential of providing woodland breeding habitat for salamanders. Based on the location of Cawthra Woods and its proximity to the proposed improvements along Cawthra Rd, RiverStone is of the opinion that the ecological form and function of the vernal pools within Cawthra Woods and ability to function as woodland amphibian breeding habitat will not be negatively impacted. In order to protect the ecological function of this area, RiverStone recommends that:

- **Development and site alteration be excluded from the area known as Cawthra Woods.**

4.2.3.3 Habitat for Species of Conservation Concern (not including Endangered and Threatened Species)

Marsh Bird Breeding Habitat

The City of Mississauga Natural Areas Survey indicates wetland communities occur beyond the study area to the north. These wetland communities have the potential to provide breeding habitat for marsh birds. While no negative impacts to the ecological form and function of breeding habitat for marsh birds is anticipated as a result of the proposed development and site alteration, adherence to the recommendations provided above for indirect effects to wetlands will ensure that the existing ecological function of the wetland communities will be maintained.

4.2.4 Additional Recommendations

The proposed improvements to Cawthra Rd will result in the removal or modification of vegetation. Consequently, the ecological function of these areas may be impacted. Impacts to trees are addressed in the Tree Inventory Report prepared by RiverStone under a separate cover. To minimize the potential to impacts to vegetation, vegetation communities and wildlife potentially using vegetation within the study area in general, RiverStone recommends the following:

- **Following completion of the project works any disturbed and/or exposed soil should be stabilized and revegetated via a native seed mixture suitable to site conditions. The seed mix should be consistent with CVC's *Plant Selection Guidelines* (May 2015).**
- **Prior to applying the seed mix, prepare the areas to be seeded by eliminating uneven areas and low spots, removing weeds to the extent achievable, and removing branches and stones in excess of 50 mm.**
- **In areas of slopes greater than 3:1, jute mat, Bonded Fibre Matrix or equivalent shall be laid on top of the seed mix to further stabilize disturbed soils in these areas. Where slopes are less than 3:1, seeding and mulch should be used to stabilize disturbed soils.**
- **Tree removal should be completed outside of the primary breeding bird nesting window (no tree removal between April 1 and August 31). If development and site alteration is going to occur during this period, a nest survey should be conducted by a qualified avian biologist prior to commencement of construction activities to identify and locate active nests of migratory bird species covered by the Act. If a nest is located or evidence of breeding noted, then a mitigation plan should be developed to address any potential impacts on migratory birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.**

Although RiverStone did not identify any trees for removal that have the potential to function as habitat for bats, MECP recommended that no trees be removed between April 1 and October 15 to limit the potential for harm to bats. To this end, RiverStone recommends that:

- **Any tree removal is to be completed outside of the primary maternal roosting period for woodland bats (no tree removal between April 1 and October 15).**

5 CONSERVATION AUTHORITY REGULATION AND POLICIES

The intent of this *Natural Environment Report* is to provide CVC and TRCA with sufficient information to consider a permit for works within their regulated area adjacent to Cawthra Road. The following sections indicate how the proposed works relate to O. Reg. 160/06 and O.Reg 166/06.

5.1 General Requirements of O. Reg. 160/06 and 166/06

CVC and TRCA’s regulatory jurisdiction extends to areas within and adjacent to valley and stream corridors, the Lake Ontario shoreline, hazard lands (i.e., floodplains), watercourses, and wetlands as provided under O. Reg. 160/06 and 166/06 of the *Conservation Authorities Act, 1990*. According to the Regulation Mapping provided on the conservation authorities websites, CVC’s regulatory jurisdiction within the Project Area is limited to the area known as Cawthra Woods and its associated wetland communities located at the southern extent of this area (**Figure 3**); the remaining portion of the project area falls into the TRCA jurisdiction.

Pursuant to s. 3 of O. Reg. 160/06 and 166/06, permission to undertake “development” within a regulated area must be expressly granted by CVC/TRCA. “Development” as defined under s. 28(25) of the *Conservation Authorities Act* means the following:

- (a) *the construction, reconstruction, erection or placing of a building or structure of any kind,*
- (b) *any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,*
- (c) *site grading, or*
- (d) *the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere;*

In addition to regulating development, CVC/TRCA also regulates (under s. 5 of O. Reg. 160/06 and 166/06) the straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, or watercourse, or changing or interfering in any way with a wetland.

The proposed road improvements considered herein constitute “development” within a Conservation Authority regulated area (e.g., temporary placement of material, etc.). Given the above, the proposed works require a permit from CVC and TRCA to proceed.

5.2 TRCA Regulation Tests

To assist TRCA’s review, RiverStone has provided an assessment of conformity of the proposed works (i.e., road improvements) with relevant policies in Sections 7 and 8 of TRCA’s *Living City Policies*. The most relevant policies are:

- Policy 7.4.4: General Policies for Infrastructure
- Policy 8.4: General Regulation Policies
- Policy 8.9: Infrastructure Policies

5.2.1.1 Policy 7.4.4.1: General Policies for Infrastructure

Section 7.4.4.1.2 of TRCA's policies address activities related to transportation infrastructure, specifically the crossing of valley and stream corridors and road widening. As per TRCA policies outlined therein, watercourse crossings are required to result in no upstream or downstream impacts to flooding or erosion, ensure safe conveyance of flood flows, be located to avoid natural hazards, and maintain the ecological functions of the valley or stream corridor crossings (e.g., aquatic or terrestrial habitat and connectivity). Note that portions of Policy 7.4.4.1.2 that deal with geomorphology or stormwater management will be addressed by others where required.

5.2.1.2 Policy 8.4: General Regulation Policies

General policies that apply to all activities within TRCA's regulated areas are outlined in Policy 8.4. As per Policy 8.4.1, development, interference, or alteration within regulated areas is prohibited without permission from TRCA. The relevant tests that must be met to satisfy TRCA are outlined in clauses a) through o) of Policy 8.4.5. Providing that RiverStone's recommendations for protecting features of conservation interest outlined in **Section 4** are implemented in full during detailed design, it is RiverStone's opinion that the proposed works are consistent with Policy 8.4.5 for the following reasons:

- the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the proposed works;
- negative or adverse hydrological or ecological impacts on natural features and functions will be avoided to the extent possible;
- intrusions on natural features, areas and systems contributing to the conservation of land, including areas providing ecological functions and hydrologic functions, will be avoided to the extent possible; and
- pollution, sedimentation and erosion during construction and post-construction are to be minimized using best management practices.

5.2.1.3 Policy 8.9: Infrastructure Policies

TRCA's transportation infrastructure policies are relevant to the proposed works, which involve improvements to the existing road. Policy 8.9.6 states that development, alteration, and interference associated with transportation infrastructure works that cross valley and stream corridors may be permitted if it can be demonstrated to the satisfaction of TRCA that (clause e):

- e) the ecological and hydrological functions of the valley and or stream corridor are maintained by considering the following in accordance with TRCA Standards:*
- i. the physical characteristics and geomorphic processes of the watercourse;*
 - ii. aquatic and terrestrial habitat;*
 - iii. valley or stream corridor form;*
 - iv. aquatic and terrestrial wildlife passage; and*
 - v. pedestrian passage (e.g. trails).*

Provided that RiverStone's recommendations outlined in **Section 4** are incorporated into the detailed design, the ecological functions of natural heritage features within the study area will be maintained or enhanced from implementation to post completion of the proposed works.

5.3 CVC Regulation Tests

In order to secure a permit from CVC to work within a regulated area and/or interfere with a watercourse, several tests apply. Under s. 3(1) of O. Reg. 160/06, permission to develop within a regulated area may be granted if it is the opinion of CVC that the *control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development*. The permitting process is further clarified in CVC's *Watershed Planning and Regulation Policies* (CVC 2010), particularly Section 7.2.6 (Infrastructure Policies).

CVC's Both Conservation Authorities infrastructure policies recognize that "*certain types of interference or development related to infrastructure by their nature must be located within hazardous land, watercourses, wetlands and natural features*". Policies 7.2.6 a(i)(a) through (k) provide a set of criteria infrastructure projects should be consistent with to provide eligibility for a permit, including that the works must be constructed in a manner to prevent unacceptable increases in flood and erosion hazard, and be consistent with CVC standards.

Provided that RiverStone's recommendations for protecting features of conservation interest outlined in **Section 4** are implemented in full, we believe the ecological functions of the study area will be maintained from implementation to post completion of the proposed works. In preparing our impact assessment and recommendations, RiverStone also reviewed CVC's *Fish and Wildlife Crossing Guidelines* (Apr. 28, 2017) and *Plant Selection Guidelines* (May 2015) and incorporated their standards/recommendations herein (where relevant).

6 CONCLUSIONS

The preceding report provides the results of RiverStone's assessment of terrestrial, wetland, and aquatic resources, where applicable, for lands and waterbodies adjacent to the Cawthra Road improvement area between South Service Road to Eastgate Parkway. Incorporation of the recommendations provided herein on the design drawings will minimize the potential for impacts to the natural environment (e.g., vegetation communities, wildlife, etc.) and features of conservation interest (e.g., PSW,) within the Project Area during project implementation.

7 REFERENCES

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Figure 1. General Location of the Project and Study Areas.



Legend

Planning Boundaries

- Project Area
- Study Area

Orthorectified aerial photo - BingMaps

Scale	RS Project No.	Date Last Updated	By
1:20,000	2016-008	Dec 4, 2018	GC

0 300 600 Metres

Figure 1. General Location of Project and Study Areas. Cawthra Road (Eastgate Pkwy. to South Service Rd.)

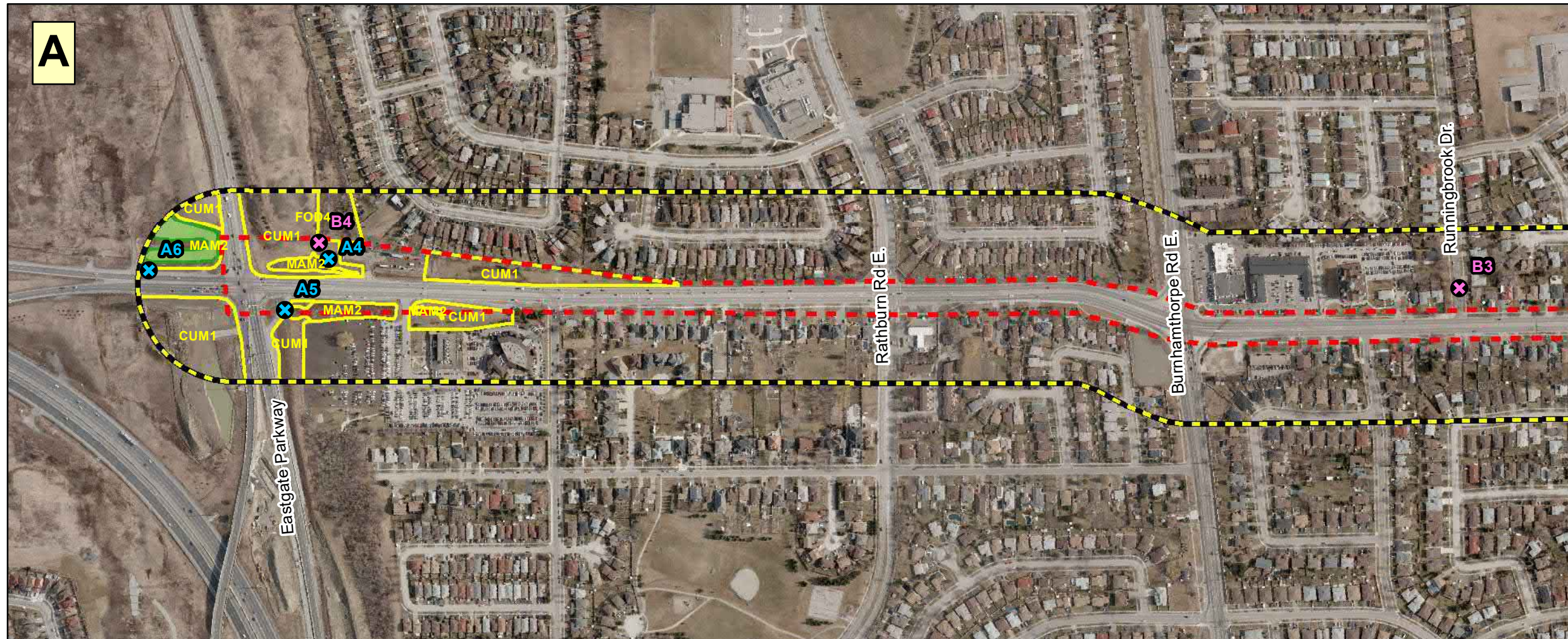
Inset: General Location of Project and Study Areas.

Prepared for Regional Municipality of Peel

Disclaimers:

- the scale text on this figure (e.g., 1:1000) is based on a 11x17" print. If this figure has been printed on a different page size, then only the scale bar is accurate.
- figure should not be used in place of a professional survey

Figure 2. Biophysical Features and Functions.



Legend

Planning Boundaries

- Project Area
- Study Area

Features with Recognized High Natural Heritage Value - Identified by the Province or the Relevant Approval Authorities

- Cawthra Woods
- Provincially Significant Wetlands (MNRF)
- Non-evaluated Wetlands (MNRF)

Biophysical Features+Functions-RiverStone

Ecological Communities

- CUM1: Cultural Meadow
- FOD4: Dry-Fresh Deciduous Forest
- FOD6-5: Fresh-Moist Sugar Maple Hardwood Deciduous Forest
- MAM2: Mineral Marsh

Survey Location

- Amphibian Station
- Breeding Bird Station

Orthorectified aerial photo - BingMaps

Scale	RS Project No.	Date Last Updated	By
1:6,826	2016-008	Aug 6, 2019	GC

0 100 200 Metres

Figure 2. Biophysical Features, Functions and Survey Locations. Cawthra Road (Eastgate Pkwy. to South Service Rd.)

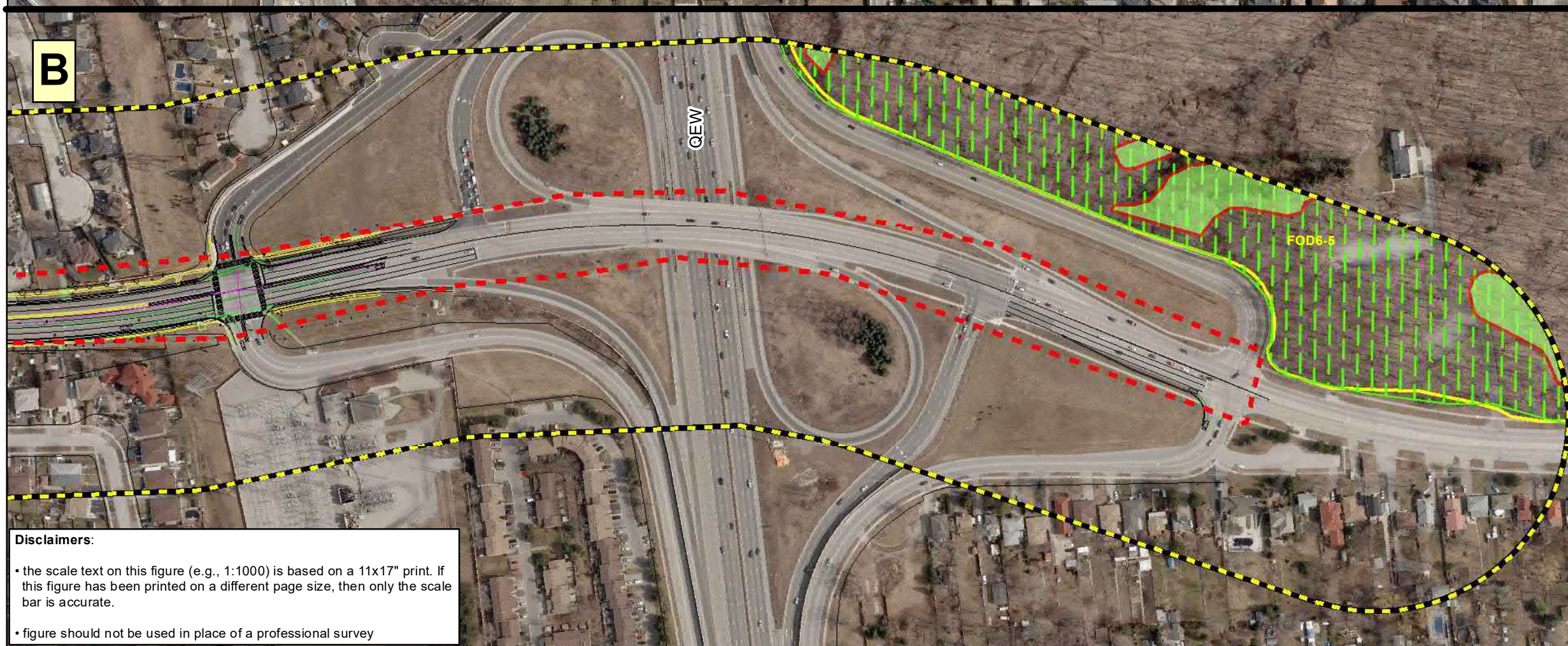
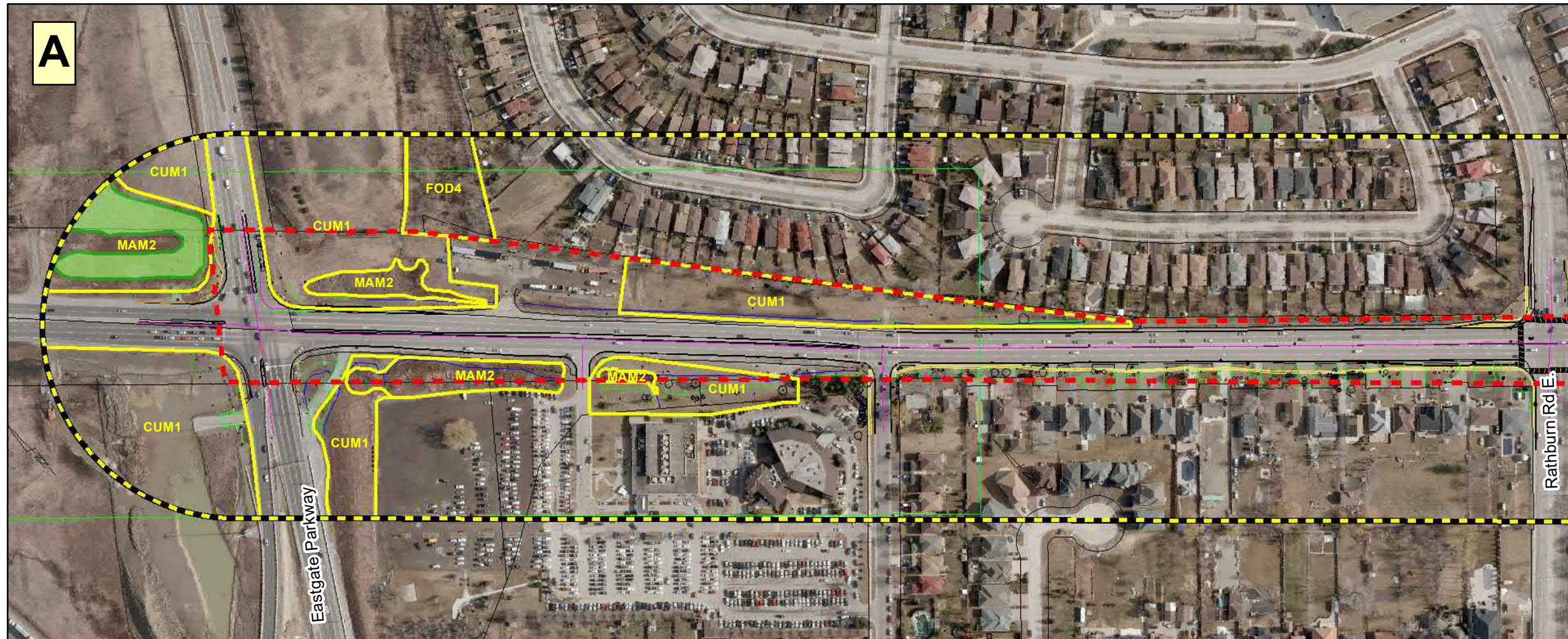
Inset: General Location of Figure Details.

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Figure 3. Proposed Road Improvement Area overlaid with Features of Conservation Interest.



Legend

Planning Boundaries

- Project (Red dashed line)
- Study (Yellow dashed line)

Features with Recognized High Natural Heritage Value - Identified by the Province or the Relevant Approval Authorities

- Cawthra Woods (Green hatched area)
- Provincially Significant Wetlands (MNRF) (Red outline)
- Non-evaluated Wetlands (MNRF) (Green outline)

Biophysical Features+Functions-

Ecological Communities

- CUM1: Cultural Meadow (Yellow circle)
- FOD4: Dry-Fresh Deciduous Forest (Yellow circle)
- FOD6-5: Fresh-Moist Sugar Maple Hardwood Deciduous Forest (Yellow circle)
- MAM2: Mineral Marsh (Yellow circle)

Orthorectified aerial photo - BingMaps

Scale	RS Project No.	Date Last Updated	By
1:3,000	2016-008	Aug 6, 2019	GC

0 40 80 Metres

Figure 3. Proposed Development Cawthra Road (Eastgate Pkwy. to South Service Rd.)

Inset: General Location of Figure Details.

Prepared for Regional Municipality of Peel

Disclaimers:

- the scale text on this figure (e.g., 1:1000) is based on a 11x17" print. If this figure has been printed on a different page size, then only the scale bar is accurate.
- figure should not be used in place of a professional survey

Appendix 1. Representative Photographs





Photo 1. Wetland communities located at northern extent of project area (Oct 22, 2018).



Photo 2. Wetland communities located at northern extent of project area (Oct 22, 2018).



Photo 3. Roadside ditches with no direct connection to watercourses or fish habitat at northern extent of project area (Oct 22, 2018).



Photo 4. Roadside ditches dominated by Common Reed at northern extent of project area (Oct 22, 2018).



Photo 5. Extensive commercial and residential development within project area (Oct 12, 2018).



Photo 6. Extensive commercial development within project area (Oct 12, 2018).



Photo 7. Limited areas of greenspace within project area (Oct 12, 2018).



Photo 8. Limited areas of greenspace within project area (Oct 12, 2018).



Photo 9. Limited areas of greenspace within Cawthra Right of Way (Oct 12, 2018).



Photo 10. Limited areas of greenspace within Cawthra Right of Way (Oct 12, 2018).



Photo 11. Cawthra Woods located at southern extent of project area (Oct 12, 2018).



Photo 12. Edge of Cawthra Woods located at southern extent of project area (Oct 12, 2018).

Appendix 2. Wildlife Species Recorded During Targeted Surveys and/or Incidentally



Appendix 2. Results of Breeding Bird Surveys completed by RiverStone in (2019).

Common Name	Scientific Name	Breeding Bird Stations ¹							
		B1		B2		B3		B4	
		06-18	06-30	06-18	06-30	06-18	06-30	06-18	06-30
American Crow	<i>Corvus brachyrhynchos</i>		O						
American Goldfinch	<i>Spinus tristis</i>							O	O
American Robin	<i>Turdus migratorius</i>	O			O	O	O		
Black-capped Chickadee	<i>Poecile atricapillus</i>		O			O			
Blue Jay	<i>Cyanocitta cristata</i>		O			O			
Chipping Sparrow	<i>Spizella passerina</i>	O	O						
Common Yellowthroat	<i>Geothlypis trichas</i>	O	O						
Downy Woodpecker	<i>Picoides pubescens</i>	O							
European Starling	<i>Sturnus vulgaris</i>			O	O	O	O		
Grasshopper Sparrow	<i>Ammodramus savannarum</i>							O	O
Gray Catbird	<i>Dumetella carolinensis</i>							O	O
House Finch	<i>Haemorhous mexicanus</i>		O	O				O	
House Sparrow	<i>Passer domesticus</i>	O	O	O				O	
House Wren	<i>Troglodytes aedon</i>	O							
Mourning Dove	<i>Zenaida macroura</i>		O			O		O	
Northern Cardinal	<i>Cardinalis cardinalis</i>	O	O			O		O	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	O	O	O				O	O
Red-eyed-vireo	<i>Vireo olivaceus</i>	O	O						
Red-breasted Nuthatch	<i>Sitta canadensis</i>			O					
Ring-billed Gull	<i>Larus delawarensis</i>			O	O				O
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	O					O	O	O
Scarlet Tanager	<i>Piranga olivacea</i>	O							
Song Sparrow	<i>Melospiza melodia</i>	O	O	O		O		O	O
Tree Swallow	<i>Tachycineta bicolor</i>							O	
Turkey Vulture	<i>Cathartes aura</i>								O
Yellow Warbler	<i>Setophaga petechia</i>							O	O

¹ Locations of anuran calling stations are shown on **Figure 2**

¹ Co = Confirmed Breeding; Pr = Probable Breeding; Po = Possible Breeding; O = Observed (no evidence of breeding)

June 18, 2019: 1.5 h; 16-21 degrees C; cloud cover 40-70%; Wind Speed=0-1 (Beaufort Scale)

June 30, 2019: 1.5 h; 17-27 degrees C; cloud cover 15%; Wind Speed=2 (Beaufort Scale)

Appendix 2. Results of Anuran Calling Surveys completed by RiverStone in (2019).

Station ID (A1-8)¹	ELC Community Surveyed	Survey #1 – April 25, 2019	Survey #2 – May 15, 2019	Survey #3 – June 27, 2019	Comments³
1	Cawthra Woods	No calling anurans.	No calling anurans.	No calling anurans.	<p>Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 0-1 Cloud Cover (%) 70 Precipitation None/Dry Start Time 21:45 Background Noise Code 3</p> <p>Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 1 Cloud Cover (%) 0 Precipitation Damp/Haze/Fog Start Time 21:05 Background Noise Code 4</p> <p>Survey #3: Air Temp. Start (°C) 24 Beaufort Wind 0 Cloud Cover (%) 0 Precipitation Humid Start Time 21:40 Background Noise Code 4</p>
2	Cawthra Woods	No calling anurans.	No calling anurans.	No calling anurans.	<p>Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 1 Cloud Cover (%) 70 Precipitation None/Dry Start Time 21:51 Background Noise Code 4</p> <p>Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 1 Cloud Cover (%) 40 Precipitation Damp/Haze/Fog Start Time 21:11 Background Noise Code 3</p> <p>Survey #3: Air Temp. Start (°C) 24 Beaufort Wind 0</p>

Station ID (A1-8) ¹	ELC Community Surveyed	Survey #1 – April 25, 2019	Survey #2 – May 15, 2019	Survey #3 – June 27, 2019	Comments ³
					Cloud Cover (%) 0 Precipitation Humid Start Time 21:48 Background Noise Code 4
3	Cawthra Woods	No calling anurans.	No calling anurans.	No calling anurans.	Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 1 Cloud Cover (%) 70 Precipitation None/Dry Start Time 21:58 Background Noise Code 4 Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 1 Cloud Cover (%) 20 Precipitation Damp/Haze/Fog Start Time 21:18 Background Noise Code 3 To 4 Survey #3: Air Temp. Start (°C) 24 Beaufort Wind 1 Cloud Cover (%) 20 Precipitation Humid Start Time 21:56 Background Noise Code 4
4	Phragmites and Reed Canary Grass Marshes at 403	No calling anurans.	No calling anurans.	No calling anurans.	Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 2 Cloud Cover (%) 90 Precipitation None/Dry Start Time 21:20 Background Noise Code 3 Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 0 Cloud Cover (%) 40 Precipitation None/Dry Start Time 21:55 Background Noise Code 4

Station ID (A1-8) ¹	ELC Community Surveyed	Survey #1 – April 25, 2019	Survey #2 – May 15, 2019	Survey #3 – June 27, 2019	Comments ³
					<p>Survey #3: Air Temp. Start (°C) 21 Beaufort Wind 0 Cloud Cover (%) 40 Precipitation Humid Start Time 22:31 Background Noise Code 4</p>
5	Phragmites and Reed Canary Grass Marshes at 403	No calling anurans.	No calling anurans.	No calling anurans.	<p>Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 2 Cloud Cover (%) 90 Precipitation None/Dry Start Time 21:28 Background Noise Code 3</p> <p>Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 1 Cloud Cover (%) 50 Precipitation Damp/Haze/Fog Start Time 22:14 Background Noise Code 4</p> <p>Survey #3: Air Temp. Start (°C) 21 Beaufort Wind 1 Cloud Cover (%) 50 Precipitation Humid Start Time 22:37 Background Noise Code 4</p>
6	Phragmites and Reed Canary Grass Marshes at 403	No calling anurans.	No calling anurans.	No calling anurans.	<p>Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 2 Cloud Cover (%) 90 Precipitation None/Dry Start Time 21:43 Background Noise Code 3</p> <p>Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 1 Cloud Cover (%) 50</p>

Station ID (A1-8) ¹	ELC Community Surveyed	Survey #1 – April 25, 2019	Survey #2 – May 15, 2019	Survey #3 – June 27, 2019	Comments ³
					Precipitation Damp/Haze/Fog Start Time 22:03 Background Noise Code 3 Survey #3: Air Temp. Start (°C) 21 Beaufort Wind 1 Cloud Cover (%) 50 Precipitation Humid Start Time 22:45 Background Noise Code 4
7	Greater Landscape noise/traffic control site	No calling anurans.	No calling anurans.	No calling anurans.	Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 2 Cloud Cover (%) 90 Precipitation None/Dry Start Time 22:00 Background Noise Code 3 Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 1 Cloud Cover (%) 50 Precipitation Damp/Haze/Fog Start Time 21:44 Background Noise Code 3 Survey #3: Air Temp. Start (°C) 23 Beaufort Wind 0 Cloud Cover (%) 50 Precipitation Humid Start Time 22:13 Background Noise Code 3
8	Greater Landscape noise/traffic control site	No calling anurans.	No calling anurans.	No calling anurans.	Survey #1: Air Temp. Start (°C) 8 Beaufort Wind 2 Cloud Cover (%) 90 Precipitation None/Dry Start Time 22:13 Background Noise Code 3

Station ID (A1-8) ¹	ELC Community Surveyed	Survey #1 – April 25, 2019	Survey #2 – May 15, 2019	Survey #3 – June 27, 2019	Comments ³
					<p>Survey #2: Air Temp. Start (°C) 13 Beaufort Wind 1 Cloud Cover (%) 50 Precipitation Damp/Haze/Fog Start Time 21:47 Background Noise Code 3</p> <p>Survey #3: Air Temp. Start (°C) 23 Beaufort Wind 0 Cloud Cover (%) 50 Precipitation Humid Start Time 22:16 Background Noise Code 3</p>

¹ Locations of anuran calling stations are shown on **Figure 2**

² **No Calling Anurans** = No individuals heard; **Call Code 1** = Individuals can be counted; calls not simultaneous; **Call Code 2** = Calls distinguishable; some simultaneous calling; **Call Code 3** = Full chorus; calls continuous and overlapping. Second number after the call code indicates the estimated number of individuals calling; no estimate of individuals is provided for Call Code 3.

³ **Background Noise Code 0** = No appreciable effect (e.g., owl calling); **Background Noise Code 1** = Slightly affecting sampling (e.g., distant traffic, dog barking, car passing); **Background Noise Code 2** = Moderately affecting sampling (e.g., distant traffic, 2-5 cars passing); **Background Noise Code 3** = Seriously affecting sampling (e.g., continuous traffic nearby, 6-10 cars passing); **Background Noise Code 4** = Profoundly affecting sampling (e.g., continuous traffic passing, construction noise);

Appendix 3. Assessment of Species of Conservation Interest



Habitat-based Approach

Properly assessing whether an area is likely to contain species of conservation concern for the purposes of determining whether a proposed development is likely to have a negative impact is becoming more difficult as the number of listed species increases. Approaches that depend solely on documenting the presence of individuals of a species in an area almost always underrepresent the biodiversity actually present because of the difficulty of observing species that are usually rare and well camouflaged. Given these difficulties, and the importance of protecting habitats of Endangered and Threatened species, RiverStone's primary approach to site assessment is habitat-based. This means that our field investigations focus on *evaluating the potential for features within an area of interest to function as habitat for species considered potentially present, rather than searching for live specimens*. An area is considered potential habitat if it satisfies a number of criteria, usually specific to a species, but occasionally characteristic of a broader group (e.g., several turtles use sandy shorelines for nesting, multiple bat species use dead or dying trees for roosting habitat). Physical attributes of a site that can be used as indicators of its potential to function as habitat for a species include structural characteristics (e.g., physical dimensions of rock fragments or trees, water depth), ecological community (e.g., meadow marsh, rock barren), and structural connectivity to other habitat features required by the species. Species-specific habitat preferences and/or affinities are determined from status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007), published and unpublished documents, and direct experience.

Table 1 provides RiverStone's desktop screening and on-site assessment for species of conservation interest. RiverStone measures species- and feature-specific distances from the boundaries of proposed lots or development area(s)—rather than from the boundary of the significant natural heritage feature—and refers to this area as *adjoining lands* (AL). Evaluating the likelihood of species' presence and the potential for negative impacts using this approach ensures that the Adjacent Lands test of the PPS will be met.

For the purposes of RiverStone's assessment, the *study area* as shown in **Figure 1** is referred to as the Area of Interest (AOI) and the Project Area representing the adjoining lands (AL).

Common Name ¹	Scientific Name	Step 1 (Desktop): Rationale for considering	Step 2 (Desktop): Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from aerial photography and other information sources indicate that potential habitat or communities might be present?		Step 3 (On Site): Potential and/or confirmed habitat documented during on-site assessment		Step 4: Is there potential for the species, its habitat, or ecological community to be negatively impacted by the activities that would be permissible within the AOI?
			Area of Interest (AOI)	Adjoining Lands (AL)	Area of Interest (AOI)	Adjoining Lands (AL)	
Endangered & Threatened (Provincially): status from Species at Risk in Ontario List (O Reg 230/08); updated January 2019							
Blanding's Turtle	<i>Emydoidea blandingii</i>	Ont. Reptile and Amphibian Atlas	NO, suitable wetland and/or aquatic communities are absent.	NO, suitable wetland and/or aquatic communities are absent.	NO, suitable wetland and/or aquatic communities are absent.	NO, suitable wetland and/or aquatic communities are absent.	NO, see steps 2 and 3.
Bobolink	<i>Dolichonyx oryzivorus</i>	OBBA	NO, suitable grassland or agricultural communities are absent.	YES, suitable grassland or agricultural communities are present.	NO, suitable grassland or agricultural communities are absent. Not detected in Breeding Bird Surveys (Appendix 2).	NO, suitable grassland or agricultural communities are absent. Cultural meadow areas to the north of Eastgate Parkway are not anticipated to be impacted during construction.	NO, see step 3.
Chimney Swift	<i>Chaetura pelagica</i>	OBBA	NO, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting are absent.	NO, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting are absent.	NO, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting are absent. Not detected in Breeding Bird Surveys (Appendix 2).	NO, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting are absent.	NO, see steps 2 and 3.
Barn Owl	<i>Tyto alba</i>	OBBA	NO, farm fields, pastures and meadows that would provide suitable habitat for Barn Owl is not present within the study area.	NO, farm fields, pastures and meadows that would provide suitable habitat for Barn Owl is not present within the study area.	NO, farm fields, pastures and meadows that would provide suitable habitat for Barn Owl is not present within the study area. Not detected in Breeding Bird Surveys (Appendix 2).	NO, farm fields, pastures and meadows that would provide suitable habitat for Barn Owl is not present within the study area.	NO, see steps 2 and 3.
Barn Swallow	<i>Hirundo rustica</i>	NHIC Databases	YES, man-made or natural structures suitable for nesting may be present.	YES, man-made or natural structures suitable for nesting may be present.	NO, nests were not observed on man-made or natural structures, no structures are anticipated to be impacted in the study area. Not detected in Breeding Bird Surveys (Appendix 2).	NO, nests were not observed on man-made or natural structures, no structures are anticipated to be impacted in the study area	NO, see step 3.
Cerulean Warbler	<i>Setophaga cerulea</i>	OBBA	NO, suitable human made structures such as barn and abandoned building, along with natural cavities or holes in cliff faces or trees are absent.	NO, suitable human made structures such as barn and abandoned building, along with natural cavities or holes in cliff faces or trees are absent.	NO, suitable human made structures such as barn and abandoned building, along with natural cavities or holes in cliff faces or trees are absent. Not detected in Breeding Bird Surveys (Appendix 2).	NO, suitable human made structures such as barn and abandoned building, along with natural cavities or holes in cliff faces or trees are absent.	NO, see steps 2 and 3.
Bank Swallow	<i>Riparia riparia</i>	OBBA	NO, man-made or natural structures suitable for nesting are absent.	YES, man-made or natural structures suitable for nesting may be present.	NO, man-made or natural structures suitable for nesting are absent. Not detected in Breeding Bird Surveys (Appendix 2).	NO, there are man-made stock pile of gravel material at a commercial site within the study area however, due to constant activity at the site, unlikely to be used for nesting. Commercial area not anticipated to be impacted.	NO, see step 3.
Butternut	<i>Juglans cinerea</i>	City of Mississauga Natural Areas Survey	YES, difficult to rule out without on-site assessment.	YES, difficult to rule out without on-site assessment.	NO, species was not observed.	NO, species was not observed.	NO, see step 3.
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	City of Mississauga Natural Areas Survey	YES, this species has been documented within Cawthra Woods, in the south portion of the study area.	YES, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	YES, this species has been documented within Cawthra Woods, in the south portion of the study area.	POSSIBLE.
Mottled Duskywing	<i>Erynnis martialis</i>	Butterfly Atlas.	NO, species requires open barrens, sandy patches along woodlands and alvars. Appropriate habitat is missing.	NO, species requires open barrens, sandy patches along woodlands and alvars. Appropriate habitat is missing.	NO, species requires open barrens, sandy patches along woodlands and alvars. Appropriate habitat is missing.	NO, species requires open barrens, sandy patches along woodlands and alvars. Appropriate habitat is missing.	NO, see steps 2 and 3.

¹Shaded rows denote species or communities for which negative impacts have been deemed possible.

Common Name ¹	Scientific Name	Step 1 (Desktop): Rationale for considering	Step 2 (Desktop): Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from aerial photography and other information sources indicate that potential habitat or communities might be present?		Step 3 (On Site): Potential and/or confirmed habitat documented during on-site assessment		Step 4: Is there potential for the species, its habitat, or ecological community to be negatively impacted by the activities that would be permissible within the AOI?
			Area of Interest (AOI)	Adjoining Lands (AL)	Area of Interest (AOI)	Adjoining Lands (AL)	
Special Concern (Provincially): status from Species at Risk in Ontario List (O Reg 230/08); updated July 2018							
Snapping Turtle	<i>Chelydra serpentina</i>	Ont. Reptile and Amphibian Atlas	NO, suitable wetland and/or aquatic communities are absent.	NO, suitable wetland and/or aquatic communities are absent.	NO, suitable wetland and/or aquatic communities are absent.	NO, suitable wetland and/or aquatic communities are absent.	NO, see steps 2 and 3.
Common Nighthawk	<i>Chordeiles minor</i>	OBBA	YES, man-made or natural structures suitable for nesting may be present.	YES, man-made or natural structures suitable for nesting may be present.	NO, suitable breeding habitat for this species is absent.	YES, anthropogenic openings that may provide potential habitat is present.	NO, potential habitat is absent and it is very unlikely that species would move through AOI to reach areas of suitable habitat (i.e., the AOI is not situated between areas of potential habitat).
Grasshopper Sparrow	<i>Ammodramus savannarum</i>		NO, suitable grassland or agricultural communities are absent.	YES, suitable grassland or agricultural communities are present.	YES, Species was detected in targeted surveys in the field along the 403 at the north of the subject property (Appendix 2).	NO, suitable grassland or agricultural communities are absent. Cultural meadow areas to the north of Eastgate Parkway are not anticipated to be impacted during construction.	NO, although detected in surveys as using the field adjacent to where work is proposed. The form and function of this cultural meadow will be unaffected by the proposed activities.
Wood Thrush	<i>Hylocichla mustelina</i>	OBBA	NO, areas with well-developed understorey within deciduous and/or mixed forest are absent.	YES, areas with well-developed understorey within deciduous and/or mixed forest may be present beyond the north portion of the project area and within Cawthra Woods.	NO, areas with well-developed understorey within deciduous and/or mixed forest are absent. Not detected in Breeding Bird Surveys (Appendix 2).	POSSIBLE, species may be present within the woodland communities beyond the north project limit or in the south portion of the study area within Cawthra Woods.	NO, potential habitat is absent from the AOI and it is very unlikely that species would move through AOI to reach areas of suitable habitat (i.e., the AOI is not situated between areas of potential habitat).
Eastern Wood Pewee	<i>Contopus virens</i>	OBBA	NO, areas of deciduous or mixed forest of varying sizes are absent.	YES, areas of deciduous or mixed forest may be present.	NO, potential habitat is absent and it is very unlikely that species would move through AOI to reach areas of suitable habitat (i.e., the AOI is not situated between areas of potential habitat). Not detected in Breeding Bird Surveys (Appendix 2).	NO, potential habitat is absent and it is very unlikely that species would move through AOI to reach areas of suitable habitat (i.e., the AOI is not situated between areas of potential habitat).	NO, see step 3.
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	OBBA	YES, suitably-sized grassland or agricultural fields (e.g., hayfields) may be present.	YES, suitably-sized grassland or agricultural fields (e.g., hayfields) may be present.	NO, suitable breeding habitat absent from the Project Area (agricultural fields mostly corn/soy). Species not documented during bird survey.	NO, suitable breeding habitat absent from the Study Area (agricultural fields mostly corn/soy). Species not documented during bird survey.	NO, see step 3.
Monarch	<i>Danaus plexippus</i>	Ont. Butterfly Atlas	YES, both natural and anthropogenic open areas could provide suitable breeding and foraging habitat.	YES, both natural and anthropogenic open areas could provide suitable breeding and foraging habitat.	NO, Common Milkweed absent, and no general foraging opportunities are available within the proposed construction area.	YES, both natural and anthropogenic open areas could provide suitable breeding and foraging habitat.	NO, areas of impact are unlikely to result in significant impacts to oviposition sites or foraging habitat given the widespread availability of such habitat in the wider landscape.
Northern Map Turtle	<i>Graptemys geographica</i>	Ont. Reptile and Amphibian Atlas	NO, rivers and lakes that provide habitat for this species is absent from study area.	NO, rivers and lakes that provide habitat for this species is absent from study area.	NO, rivers and lakes that provide habitat for this species is absent from study area.	NO, rivers and lakes that provide habitat for this species is absent from study area.	NO, see step 3.
West Virginia White	<i>Pieris virginiensis</i>	Ont. Butterfly Atlas	NO, requires moist, deciduous woodlands with toothwort present.	NO, requires moist, deciduous woodlands with toothwort present.	NO, requires moist, deciduous woodlands with toothwort present.	YES, woodland in the far north of the project area and within Cawthra Woods in the extreme south portion of the study area may provide appropriate habitat.	NO, construction activities are not anticipated to occur within woodland features in the north or south portions of the study area.
Peregrine Falcon	<i>Falco peregrinus</i>	OBBA	NO, areas of steep slopes are absent.	NO, areas of steep slopes are absent.	NO, areas of steep slopes are absent. Not detected in Breeding Bird Surveys (Appendix 2).	NO, areas of steep slopes are absent.	NO, see steps 2 and 3.
Locally Rare Species (City of Mississauga): Noted in the City of Mississauga Natural Areas Survey (2012)							

¹Shaded rows denote species or communities for which negative impacts have been deemed possible.

Common Name ¹	Scientific Name	Step 1 (Desktop): Rationale for considering	Step 2 (Desktop): Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from aerial photography and other information sources indicate that potential habitat or communities might be present?		Step 3 (On Site): Potential and/or confirmed habitat documented during on-site assessment		Step 4: Is there potential for the species, its habitat, or ecological community to be negatively impacted by the activities that would be permissible within the AOI?
			Area of Interest (AOI)	Adjoining Lands (AL)	Area of Interest (AOI)	Adjoining Lands (AL)	
Halberd-leaf Saltbush	<i>Atriplex patula</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Asa Gray Sedge	<i>Carex grayi</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Spreading Sedge	<i>Carex laxiculmis</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Finely-nerved Sedge	<i>Carex leptonevia</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Stout Wood Grass	<i>Cinna arundinacea</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Baltic Rush	<i>Juncus balticus</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Wood Millet	<i>Millium effusum</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Woodland Pea	<i>Poa alsodes</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Rufous bulrush	<i>Scirpus pendulus</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Long-spurred Violet	<i>Viola rostrata</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Marsh Speedwell	<i>Veronica scutellata</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.

¹Shaded rows denote species or communities for which negative impacts have been deemed possible.

Common Name ¹	Scientific Name	Step 1 (Desktop): Rationale for considering	Step 2 (Desktop): Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from aerial photography and other information sources indicate that potential habitat or communities might be present?		Step 3 (On Site): Potential and/or confirmed habitat documented during on-site assessment		Step 4: Is there potential for the species, its habitat, or ecological community to be negatively impacted by the activities that would be permissible within the AOI?
			Area of Interest (AOI)	Adjoining Lands (AL)	Area of Interest (AOI)	Adjoining Lands (AL)	
Skunk Current	<i>Ribes glandulosum</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within Cawthra Woods, in the south portion of the study area.	NO, see step 3.
Longhair Sedge	<i>Carex comosa</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of a study area.	NO, see step 3.
Knotsheath Sedge	<i>Carex retrorsa</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.
Upright Sedge	<i>Carex Stricta</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.
Small Enchanter's Nightshade	<i>Circaea alpina</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.
Umbellate Basterd Toadflax	<i>Comandra umbellata</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.
Bulbet Bladder Fern	<i>Cystopteris bulbifera</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.
Catchweed Bedstraw	<i>Galium aparine</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.
Canada Moonseed	<i>Menispermum canadense</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.
Rough Goldenrod	<i>Solidaga rugosa ssp.rugosa</i>	City of Mississauga Natural Areas Survey	Yes, this species has been documented within vegetation communities to the north of the study area.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, habitat for this species is beyond the scope of construction and will not be impacted.	Yes, this species has been documented within vegetation communities to the north of the study area.	NO, see step 3.

¹Shaded rows denote species or communities for which negative impacts have been deemed possible.

Appendix 4. Assessment of Significant Wildlife Habitat



Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Seasonal Concentration Areas of Animals			
Waterfowl Stopover and Staging Areas (Terrestrial)	<p>Fields with sheet water during Spring (mid March to May)</p> <p>Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.</p> <p>Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.</p>	<p>CUM1, CUT1</p> <p>Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.</p>	<p>YES, Cultural Meadow in the extreme north portion of the study area may provide potential habitat. While it was not observed to be serving as this habitat type during Breeding Bird Surveys (Appendix 2), this habitat function is associated with earlier spring and therefore cannot be ruled out as potentially occurring with this study.</p>
Waterfowl Stopover and Staging Areas (Aquatic)	<p>Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration.</p> <p>Sewage treatment Ponds and storm water Ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify.</p> <p>These habitats have an abundance food supply (mostly aquatic invertebrates and vegetation in shallow water)</p>	<p>MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7</p>	<p>NO, the assessment area does not contain any open water features.</p>
Shorebird Migratory Stopover Areas	<p>Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats.</p> <p>Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October.</p> <p>Sewage treatment ponds and storm water ponds do not qualify as a SWH.</p>	<p>BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1, MAM2, MAM3, MAM4, MAM5</p>	<p>NO, the assessment area does not contain any open water features.</p>
Raptor Wintering Areas	<p>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.</p> <p>Raptor wintering sites (hawk/owl) need to be >20 ha with a combination of forest and upland.</p> <p>Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands</p> <p>Field area of the habitat is to be wind swept with limited snow depth or accumulation.</p> <p>Eagle sites have open water, large trees and snags available for roosting.</p>	<p><u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW.</p> <p><u>Bald Eagle:</u> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).</p>	<p>NO, while the assessment area contains forest/woodland ecosites, meadow/field ecosites are not present adjacent to these forest communities suggesting winter feeding and roosting areas for raptors are not present.</p>
Bat Hibernacula	<p>Hibernacula may be found in caves, mine shafts, underground foundations and Karsts.</p> <p>Active mine sites are not SWH.</p> <p>The locations of bat hibernacula are relatively poorly known.</p>	<p>Bat Hibernacula may be found in these ecosites: CCR1, CCR2, CCA1, CCA2.</p> <p>(Note: buildings are not considered to be SWH).</p>	<p>NO, the assessment area does not contain steep slopes, rock crevices, caves, and mine shafts suitable for use as hibernation.</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (January 2015)

Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Bat Maternity Colonies	<p>Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).</p> <p>Maternity roosts are not found in caves and mines in Ontario</p> <p>Maternity colonies located in Mature (dominant trees > 80yrs old) deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees</p> <p>Female Bats prefer wildlife trees (snags) in early stages of decay, class 1-3 .</p> <p>Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.</p>	<p>Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD, FOM, SWD, SWM.</p>	<p>YES, the forest communities located to the north of the study and within Cawthra Woods, have the potential to contain mature trees containing snags that could be used for maternity colonies.</p>
Turtle Wintering Areas	<p>For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates.</p> <p>Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen</p> <p>Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.</p>	<p>Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO.</p> <p>Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as overwintering habitat.</p>	<p>NO, the study area does not contain any aquatic or wetland features suitable for Turtle Wintering areas .</p>
Reptile Hibernaculum	<p>For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.</p> <p>Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line</p> <p>Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.</p> <p>Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlying granite bedrock with fissures.</p>	<p>For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.</p> <p>Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.</p>	<p>NO, the study area does not contain steep slopes, and piles of loose rock and reas of rock crevices that may provide suitable hibernation habitat for snakes.</p>
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	<p>Any site or areas with exposed soil banks, sandy hills, borrow pits, steep slopes, and sand piles that are undisturbed or naturally eroding that is not a licensed/permited aggregate area.</p> <p>Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles.</p> <p>Does not include a licensed/permited Mineral Aggregate Operation.</p>	<p>Eroding banks, sandy hills, borrow pits, steep slopes, sand piles or cliff faces.</p> <p>Habitat found in the following ecosites: CUM1, CUT1, CUS1, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1.</p>	<p>NO, the study area does not contain eroding banks, sandy hills, borrow pits, steep slopes, opportunities for bank and cliff nesting avian species are not present.</p>

Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	<p>Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.</p> <p>Most nests in trees are 11 to 15 m from ground, near the top of the tree.</p>	<p>SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1.</p>	<p>NO, the study area does not contain appropriate habitat for Colonially-Nesting breeding habitat.</p>
Colonially - Nesting Bird Breeding Habitat (Ground)	<p>Nesting colonies of gulls and terns are on islands or peninsulas (natural or artificial) associated with open water, marshy areas, lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Brewers Blackbird colonies are found loosely on the ground or in low bushes in close proximity to streams and irrigation ditches within farmlands.</p>	<p>Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6, MAS1 – 3, CUM, CUT, CUS</p>	<p>NO, open fields in close proximity to watercourses are not present within the study area.</p>
Migratory Butterfly Stopover Areas	<p>A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario.</p> <p>The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south.</p> <p>The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat.</p> <p>Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes.</p>	<p>Combination of ELC Community Series; need to have present one Community Series from each landclass:</p> <p><u>Field:</u> CUM, CUT, CUS</p> <p><u>Forest:</u> FOC, FOD, FOM, CUP</p> <p>Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.</p>	<p>NO, even with limited amounts of meadow communities (i.e., CUM) adjacent Deciduous Forest (FOD) communities are located beyond the north portion of the study area. The close proximity to the 403 and additional heavily used roads would likely make for unsuitable for use as Butterfly Stopover habitat.</p>
Landbird Migratory Stopover Areas	<p>Woodlots need to be > 10 ha in size and within 5 km of Lake Ontario. If multiple woodlands are located along the shoreline of those woodlands <2 km from Lake Ontario are more significant.</p> <p>Sites have a variety of habitats; forest, grassland and wetland complexes.</p> <p>The largest sites are more significant.</p> <p>Woodlots and forest fragments are important habitats to migrating birds, these features location along the shore and located within 5 km of Lake Ontario are Candidate SWH.</p>	<p>All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.</p>	<p>YES, The City of Mississauga Natural Areas Survey Fact Sheet (2016) indicates that Cawthra Woods (LV7) is a known Migratory Stopover.</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (January 2015)

Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
<p>Deer Winter Congregation Areas</p>	<p>Woodlots will typically be >100 ha in size. Woodlots <100 ha may be considered as significant based on MNRF studies or assessment.</p> <p>Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands.</p> <p>If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule.</p> <p>Large woodlots > 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha.</p> <p>Woodlots with high densities of deer due to artificial feeding are not significant.</p>	<p>All Forested Ecosites with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.</p> <p>Conifer plantations much smaller than 50 ha may also be used.</p>	<p>NO, deer wintering area has not been identified on the assessment area and adjacent lands by the Ministry of Natural Resources and Forestry.</p>

Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Rare Vegetation Communities			
Cliffs and Talus Slopes	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT	NO , the study area does contain steep rock faces that may be best characterized as cliffs or talus slopes.
Sand Barren	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	ELC Ecosites: SBO1, SBS1, SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always < 60%.	NO , communities characterized by exposed sand were not documented in the assessment area or adjacent lands.
Alvar	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars may be complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2 Five Alvar Indicator Species: 1) Carex crawei, 2) Panicum philadelphicum, 3) Eleocharis compressa, 4) Scutellaria parvula, 5) Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 6E	NO , alvar communities were not documented in the study area or adjacent lands.
Old Growth Forest	Old Growth forests are characterized by exhibiting the greatest number of old-growth characteristics, such as mature forest with large trees that has been undisturbed. Heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Forest Community Series: FOD, FOC, FOM, SWD, SWC, SWM	NO , based on background information, no old growth communities are documented within the study area or adjacent lands.
Savannah	A Savannah is a tallgrass prairie habitat that has tree cover between 25–60%.	TPS1, TPS2, TPW1, TPW2, CUS2	NO , communities dominated by prairie species were not documented in the assessment area or adjacent lands.
Tallgrass Prairie	Tallgrass Prairie is an open vegetation with less than < 25% tree cover, and dominated by prairie species, including grasses.	TPO1, TPO2	NO , communities dominated by Tallgrass Prairie species were not documented in the assessment area or adjacent lands.
Other Rare Vegetation Community	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M. The OMNRF/NHIC will have up to date listing for rare vegetation communities.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the Significant Wildlife Habitat Technical Guide. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	NO , based on background information, no rare communities have been documented in the study area or adjacent lands.
Specialized Habitats for Wildlife			
Waterfowl Nesting Area	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. Upland areas should be at least 120 m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. Wood Ducks, Bufflehead, Common Goldeneye and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 Note: includes adjacency to provincially Significant Wetlands	NO , based on background information Waterfowl Nesting Areas have been documented in the study area or adjacent lands.

Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</p> <p>Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy.</p> <p>Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).</p>	<p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.</p>	<p>NO, forest communities directly adjacent riparian areas of rivers, lakes, ponds or appropriate wetlands documented in the assessment area or adjacent lands. Species were not observed in targetted Breeding Bird Surveys (Appendix 2)</p>
Woodland Raptor Nesting Habitat	<p>All natural or conifer plantation woodland/forest stands >30ha with >4ha of interior habitat. Interior habitat determined with a 200m buffer.</p> <p>In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.</p>	<p>May be found in all forested ELC Ecosites.</p> <p>May also be found in SWC, SWM, SWD and CUP3.</p>	<p>NO, even through forest communities to the north Cawthra Wodds in the south portion of the study area provide sufficient size. Interior forest habitat is lacking. Species were not observed in targetted Breeding Bird Surveys (Appendix 2)</p>
Turtle Nesting Areas	<p>Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.</p> <p>For an area to function as a turtle nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.</p> <p>Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</p>	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1</p>	<p>NO, eventhough MAS1 community is located beyond the north study limit, the high number of roads and lack of open gravel or sandy areas beyond road shoulders are lacking.</p>
Seeps and Springs	<p>Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system.</p> <p>Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.</p>	<p>Seeps/Springs are areas where groundwater comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.</p>	<p>NO, forest communities with a component of meadow, field or pasture is lacking within the study area.</p>
Amphibian Breeding Habitat (Woodland)	<p>Presence of a wetland or pond >500 m² (about 25 m diameter) within or adjacent (within 120m) to a woodland (no minimum size). The wetland, lake or pond and surrounding forest, would be the Candidate SWH. Some small wetlands may not be mapped and may be important breeding pools for amphibians.</p> <p>Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.</p>	<p>All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD</p> <p>Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.</p>	<p>YES, the City of Mississauga Natural Areas Survey, indicates that breeding habitat for Jefferson Salamander is present within the Cawthra Woods. No anurans were heard calling in these features in targetted surveys (Appendix 2) however salamanders may still be present</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (January 2015)

Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Amphibian Breeding Habitat (Wetlands)	<p>Wetlands and pools (including vernal pools) >500 m² (about 25 m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats.</p> <p>Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.</p> <p>Bullfrogs require permanent water bodies with abundant emergent vegetation.</p>	<p>ELC Community Classes SW, MA, FE, BO, OA and SA.</p> <p>Typically these wetland ecosites will be isolated (>120 m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g., Bull Frog) may be adjacent to woodlands.</p>	<p>No, while the City of Mississauga Natural Areas Survey, indicates wetland communities beyond the study area to the north. No calling anurans were observed in targeted surveys (Appendix 2)</p>
Area-Sensitive Bird Breeding Habitat	<p>Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. Interior forest habitat is at least 200 m from forest edge habitat.</p>	<p>All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD.</p>	<p>NO, even though forest communities are present to the north of the study area and Cawthra Woods is located in the south portion of the study area, interior forest is not present.</p>
Habitat for Species of Conservation Concern (not including Endangered or Threatened Species)			
Marsh Bird Breeding Habitat	<p>Nesting occurs in wetlands.</p> <p>All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present.</p> <p>For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.</p>	<p>MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1.</p> <p>For Green Heron: All SW, MA and CUM1 sites.</p>	<p>NO, the City of Mississauga Natural Areas Survey, indicates wetland communities beyond the study area to the north are present however the associated species were not detected during targeted surveys (Appendix 2).</p>
Open Country Bird Breeding Habitat	<p>Large grassland areas (includes natural and cultural fields and meadows) >30 ha Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years).</p> <p>Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.</p> <p>The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</p>	<p>CUM1, CUM2</p>	<p>NO, large grasslands are not present within the study area. Although one indicator species (Grasshopper Sparrow within the CUM1 at the north of the study area along the south side of the 403 east of the study area) was detected during Breeding Bird Surveys (Appendix 2), none of the other indicator species (Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow, Short-eared Owl) were detected.</p>

Ecoregion 7E	Candidate Significant Wildlife Habitat	ELC Ecosites	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate SHW might be present?
Shrub/Early Successional Bird Breeding Habitat	<p>Large field areas succeeding to shrub and thicket habitats >30 ha in size.</p> <p>Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or livestock pasturing in the last 5 years).</p> <p>Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species.</p> <p>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or lightly grazed pasturelands.</p>	<p>CUT1, CUT2, CUS1, CUS2, CUW1, CUW2.</p> <p>Patches of shrub ecosites can be complexed into a larger habitat for some bird species.</p>	<p>NO, large fields with successional shrub and thicket habitats area not present within the study area. Species associated with this SWH type were not detected in Breeding Bird Surveys (Appendix 2).</p>
Terrestrial Crayfish	<p>Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish.</p> <p>Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water.</p> <p>Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed.</p>	<p>MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM, CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.</p>	<p>YES, wet meadow and marsh features are present to the north of the study area that may provide habitat for Terrestrial Crayfish.</p>
Special Concern and Rare Wildlife Species	<p>When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or Provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites</p>	<p>All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species.</p> <p>All plant and animal element occurrences (EO) within a 1 or 10 km grid.</p> <p>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy</p>	<p>See Appendix 3 Table 1</p>
Animal Movement Corridors			
Amphibian Movement Corridors	<p>Movement corridors between breeding habitat and summer habitat.</p> <p>Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat –Wetland) of this Schedule.</p>	<p>Corridors may be found in all ecosites associated with water.</p> <p>Corridors will be determined based on identifying the significant breeding habitat for these species (see above).</p>	<p>NO, abundant roads, commercial and residential communities restrict the movement of amphibians within the study area. No anurans were detected in targeted surveys (Appendix 2).</p>
Deer Movement Corridors	<p>Corridors may be found in all forested ecosites.</p> <p>A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.</p>	<p>Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH (see above).</p> <p>A deer wintering habitat identified by the Ministry of Natural Resources and Forestry as SWH will have corridors that the deer use during fall migration and spring dispersion.</p> <p>Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).</p>	<p>NO, Deer wintering area has not been identified on the assessment area and adjacent lands by OMNRF. Deer were not detected within the study area during site visits (Appendix 2).</p>

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (January 2015)

Appendix 5. MNRF Information Request



Glenn Cunnington

From: ESA Aurora (MNRF) <ESA.Aurora@ontario.ca>
Sent: January-22-19 11:44
To: Will Barbour
Cc: Glenn Cunnington; Heaton, Mark (MNRF)
Subject: RE: Information request Cawthra Rd Mississauga
Attachments: CITY_OF_MISSISSAUGA.XLSX; InfoRequestGuide_2018-12-18-FINAL.PDF

Natural Heritage Information Request Response

Thank you for your request for information on natural heritage features. In order to provide the most efficient service possible, the attached *Natural Heritage Information Request Guide* has been developed to assist you with accessing natural heritage data and values from convenient online sources.

It remains the proponent's responsibility to complete a preliminary screening for each project, to obtain available information from multiple sources, to conduct any necessary field studies, and to consider any potential environmental impacts that may result from an activity. We wish to emphasize the need for the proponents of development activities to complete screenings prior to contacting the Ministry or other agencies for more detailed technical information and advice.

The Ministry continues to work on updating data housed by Lands Information Ontario and the Natural Heritage Information Centre, and ensuring this information is accessible through online resources. Species at risk data is regularly being updated. In order to ensure access to reliable and up to date information, the attached list provides a summary of species at risk that have been observed, or may potentially be present, at a geographic township / municipal level.

This information will assist in scoping the necessary field assessments for an area if development or site alteration is proposed. This information is not meant to circumvent the responsibility of the proponent to undertake species and / or habitat surveys. Surveys or additional site level assessment are often required to confirm presence or absence of natural heritage features and values. Environmental consulting firms have the professional and technical expertise to assess sites for natural heritage features and can gauge the potential for such features to exist.

Absence or lack of information for a given geographic area does not necessarily mean the absence of natural heritage features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. In addition, new species may be listed and new natural heritage features may be defined over time. For these reasons, the Ministry cannot provide a definitive statement on the presence, absence or condition of natural heritage features in all parts of Ontario.

Please note that there are records of Jefferson Salamander, Butternut, and Chimney Swift in Cawthra Woods (southeast corner of Cawthra Road and QEW) and should be considered during project planning. Additionally, Cawthra Woods is a Regional Life Science ANSI. please consider appropriate mitigation for these features. Mark Heaton can be contacted if you require additional advice.

Thank you for your inquiry.

Emily

From: Will Barbour <will@rsenviro.ca>
Sent: October 25, 2018 10:58 AM
To: ESA Aurora (MNRF) <ESA.Aurora@ontario.ca>
Cc: Glenn Cunnington <glenn@rsenviro.ca>; 216-008 IBI Cawthra Road <216-008@rsenviro.ca>
Subject: Information request Cawthra Rd Mississauga

To: Management Biologist in charge of processing Natural Heritage information requests.

Please see attached Information Request Form and Map Image

Thank you,

Will

William Barbour MSc, Ecologist
RiverStone Environmental Solutions Inc.
47 Quebec Street, Bracebridge, ON P1L 2A5
Office [705.645.9887](tel:705.645.9887) ext. 208 | Fax [888.857.4979](tel:888.857.4979) | Cell [905.452.4303](tel:905.452.4303)
Southern Ontario Toll Free 1.866.776.7160

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