

Regional Municipality of Halton

Trafalgar Road (Regional Road 3) Improvements Class Environmental Assessment Study Natural Environment Existing Conditions Report

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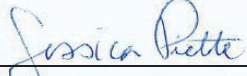
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1. Introduction

AECOM Canada Ltd. (AECOM) was retained by the Regional Municipality of Halton (Halton Region) to conduct a Class Environmental Assessment (Class EA) for the proposed Trafalgar Road Improvements from Cornwall Road to Highway 407, in the Town of Oakville.

The following report uses a combination of existing background data (i.e., extensive desktop review), field data collected in 2009 supplemented with data from 2013 to describe and identify existing aquatic and terrestrial conditions within the study area as well as potential Species at Risk. This includes a revised Natural Heritage Information Centre (NHIC) Database search, Species at Risk Screening as well as aquatic and terrestrial field investigations.

1.1 Study Area

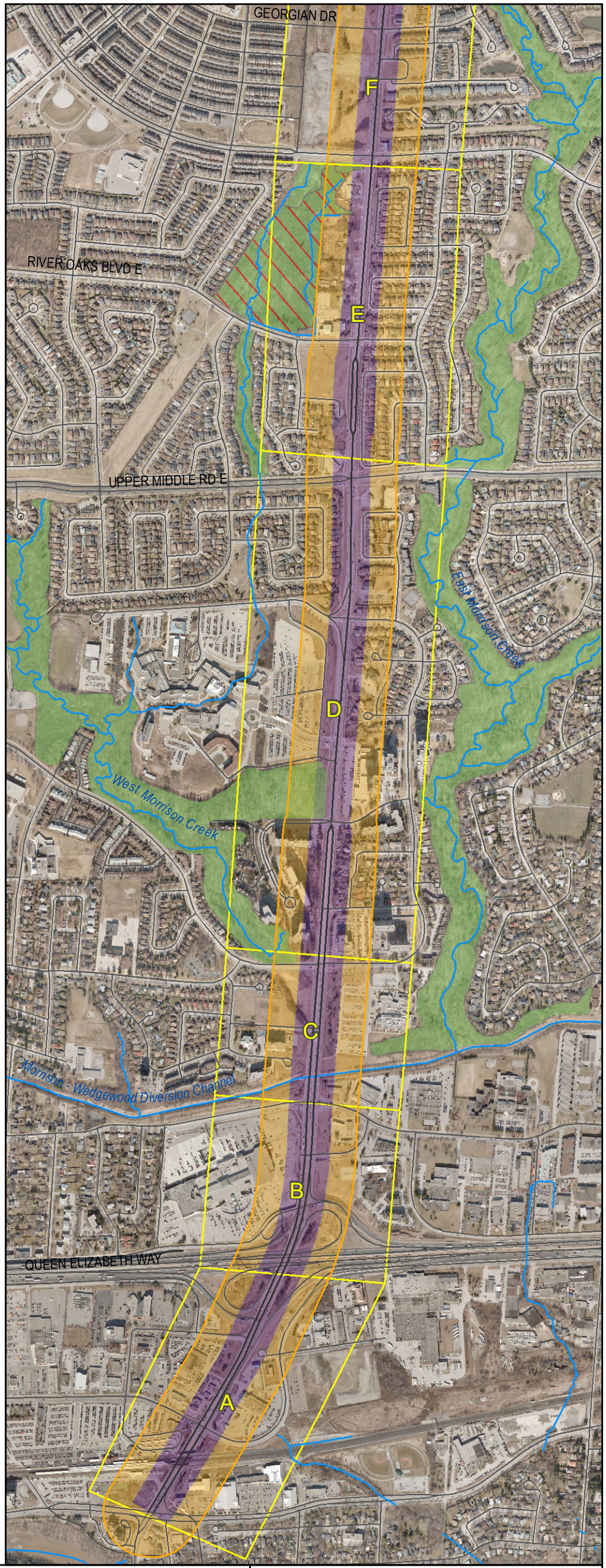
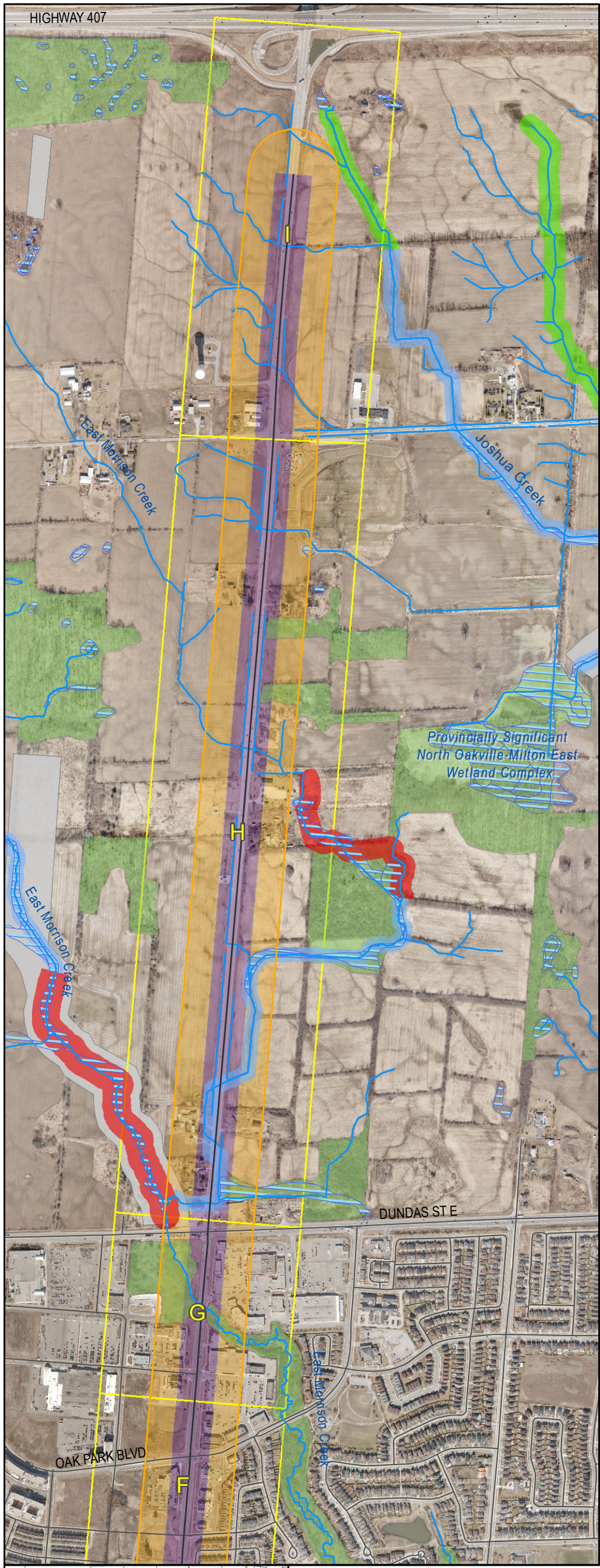
For this assessment study area limits are 120 m to either side of Trafalgar Road, and include two specific areas of investigation labelled as Area of Investigation (AOI) 1, and AOI 2. AOI 1 covers the detailed field investigations undertaken within 50 m on both sides of Trafalgar Road, and AOI 2 consists of all areas outside of AOI 1 up to 120 m. Details regarding AOI 2 were obtained through a desktop review of all available information, including information provided as part of the North Oakville East Secondary Plan (**See Figure 1**).

Figure 1 presents the study area location.

Due to the size of the study area, it was further sub-divided into nine sections along Trafalgar Road to facilitate field investigations and reporting. Sections include:

- Section A** – from Cornwall Road to the QEW,
- Section B** – from QEW to Leighland Avenue,
- Section C** – from Leighland Avenue to White Oaks Boulevard South,
- Section D** – from White Oaks Boulevard South to Upper Middle Road East,
- Section E** – from Upper Middle Road East to Glenashton Drive,
- Section F** – from Glenashton Drive to Oak Park Boulevard,
- Section G** – from Oak Park Boulevard to Dundas Street,
- Section H** – from Dundas Street to Burnhamthorpe Road East,
- Section I** – from Burnhamthorpe Road East to Highway 407.

Within these sections there are twelve culvert crossings which will be impacted by the proposed works. These watercourse crossing locations are shown on **Figure 2**.



Legend

120m Development Buffer	Stream Corridor Constraints High Constraint
Trafalgar Road	High Constraint (Requiring Rehabilitation)
Waterflow	Medium Constraint
Roads	Low Constraint
Study Area Sections	Area of Investigation
Linkages	50m
Provincially Significant Wetlands	120m
Candidate Significant Woodland	
Removed Woodlands	

**Trafalgar Road Improvements
Class EA Study**

Study Area

December 2014	1:12,000	Datum: NAD83 Zone 17 Source: Town of Oakville, OBM
P#: 60119993	V#: 001	

Figure 1

Meters

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Legend

- + MNR Fish Sampling Stations
- Water Crossings (Culverts)
- 120m Development Buffer
- Trafalgar Road
- Waterflow
- Roads
- Floodlines
- Study Area Sections
- Provincially Significant Wetlands

- Hydrologic Feature 'A'
- Hydrologic Feature 'B'
- Watershed

Aquatic Habitats

- Critical
- Important
- Marginal
- None

**Trafalgar Road Improvements
Class EA Study**

Aquatics

December 2014	1:12,000	Datum: NAD83 Zone 17 Source: Town of Oakville, OBM
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AECOM

Figure 2

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2. Methods

The purpose of this report is to identify significant aquatic and terrestrial features as well as identify potential Species at Risk habitat located within the Trafalgar Road study area. This was achieved through a two-step process. First a review of all existing background and agency records was completed. This was followed by the confirmation of existing conditions through field investigations, including detailed field surveys within 50 m of either side of Trafalgar Road (AOI 1).

2.1 Background Review

A review of background information was compiled and reviewed to better understand the existing aquatic and terrestrial environmental conditions within the study area. This included the review of information from:

- the Town of Oakville's Official Plan;
- Halton Region's Official Plan;
- the NHIC Biodiversity Explorer;
- the North Oakville Creeks Subwatershed Study;
- communication with Halton Region Conservation Authority (HRCA);
- communication with the Ministry of Natural Resources (MNR) Aurora District;
- Fisheries and Oceans Canada (DFO);
- Species at Risk Mapping; and
- the Atlas of Breeding Birds of Ontario.

This existing information was also reviewed in order to determine known Species at Risk or Species at Risk habitat occurring within the study area, which was then confirmed through the completion of field investigations.

2.2 Field Investigations

Detailed field assessments were completed within 50 m (AOI 1) of the existing right of way, and focused on both aquatic and terrestrial environments. Beyond the 50 m mark, up to 120 m on either side of Trafalgar Road (AOI 2), information pertaining to the terrestrial and aquatic environments was obtained from the background resources only as previously outlined.

Aquatic Investigations - methods used to describe the aquatic environment were comprised of:

- a) background information review of data and mapping from HRCA; and,
- b) general investigations at each watercourse crossing noting general biophysical parameters and channel diagnostics.

Terrestrial Investigations – methods used to describe the terrestrial environment included:

- a) a combination of Rapid Assessment Ecological Land Classification (ELC) delineation following those guidelines outlined by the MNR (Lee *et al.*, 1998) for the description of vegetation communities over 0.5 ha in size;
- b) documentation of vegetation which occurred within proximity to the proposed right-of-way widening;

- c) the collection of a floral species list. Detailed vegetation surveys were conducted within 50 m (AOI 1) of Trafalgar Road and all other areas up to 120 m (AOI 2) on either side of Trafalgar Road, data was obtained through background review and aerial photography interpretation only; and
- d) An additional field visit was conducted in spring 2014 to collect a species inventory for the woodlot associated with Sheridan College.

Species at Risk Screening – methods used to complete the Species at Risk Screening include the use of several available data sources to help identify potential Species at Risk within the study area. NHIC was first searched using the 1 km square selection layer and supplemented with species at risk data obtained from a lower tier (Regional Municipality of Halton) data search using the spatial boundary tool. The NHIC data was then further supplemented with records obtained from correspondence with MNR, DFO Species at Risk mapping and the Atlas of Breeding Birds of Ontario. Once the list of potential species is finalized preferred habitat characteristics for each species is recorded using the significant wildlife habitat technical guide, Species at Risk registry, Royal Ontario Museum, and individual COSEWIC reports. The list of potential species was then screened for available preferred habitat within the study area through the confirmation of existing conditions completed during field investigations.

3. Background Review

The following is a summary of all information reviewed pertaining to the Trafalgar Road study area including a description of the Federal and Provincial Regulations protecting Species at Risk and a description of Species of Conservation Concern.

3.1 Federal and Provincial Regulations

3.1.1 Federal Species at Risk Act

The *Species at Risk Act* (SARA) is a nationwide regulation. The goal of SARA is to monitor and protect disappearing species; provide recovery strategies for extirpated, endangered or threatened species, as well as to manage species of special concern. SARA is to be consulted when there is a need for permits and scientific/educational activities involving the handling of wildlife (Environment Canada, 2012).

- **Extirpated**
A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild (SARA Registry, 2012).
- **Endangered**
A wildlife species that is facing imminent extirpation or extinction (SARA Registry, 2012).
- **Threatened**
A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction (SARA Registry, 2012).
- **Special Concern**
A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats (SARA Registry, 2012).

3.1.2 Species at Risk in Ontario

The *Endangered Species Act* (ESA) (2007) provides a protection and recovery strategy for Species at Risk in Ontario (SARO). Methods of protection include protection of Species at Risk habitat; support for private and public organizations; recovery of species; and strict enforcement (Ontario, 2012). The ESA regulation applies to Extirpated (EXP), Endangered (END) and Threatened (THR) species. Species of Special Concern (SC) are not protected under the ESA. The following presents those definitions as found on the MNR Species at Risk website defines these categories of species as follows:

- **Extirpated**
A species that no longer exists in the wild in Ontario but still occurs elsewhere.
- **Endangered**
A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's ESA.
- **Threatened**
A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
- **Special Concern**
A species with characteristics that make it sensitive to human activities or natural events.

3.1.3 Provincially Rare (Species of Conservation Concern)

The Provincial, or Subnational, Rank (SRANK) is used by the NHIC as a protection tool for rare species and natural communities. The SRANK is not a legal designation. The status, rarity and urgency of conservation is evaluated by NHIC on a continual basis (NHIC, 2012). The rankings are as follows:

- **S1: Critically Imperiled**
Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- **S2: Imperiled**
Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- **S3: Vulnerable**
Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- **SH: Possibly Extirpated (Historical)**
Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20 to 40 years. A species or community could become NH or SH without such a 20 to 40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
- **S4: Apparently Secure**
Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- **S?: Not Ranked Yet**
Or if following a ranking, Rank Uncertain (e.g., S3?). S? species have not had a rank assigned.

3.2 Natural Heritage Information Centre Database-Biodiversity Explorer

The NHIC Database is an online search engine maintained by the MNR used to collect background information pertaining to rare species occurrences within a given study area. This includes records for species covered under SARA, SARO, as well as Species of Conservation Concern (Provincially rare). **Table 1** lists the records of Species at Risk and provincially significant (Species of Conservation Concern) species found within a 1 km search of the study area.

Table 1. Species at Risk and Provincially Rare Species

English Name	Scientific Name	G-rank	S-rank	COSEWIC	SARO
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	G4	S3	END	END
Eastern Pipistrelle	<i>Pipistrellus subflavus</i>	G5	S3		
Northern Bobwhite	<i>Colinus virginianus</i>	G5	S1	END	END
Northern Map Turtle	<i>Graptemys geographica</i>	G5	S3	SC	SC
Milksnake	<i>Lampropeltis triangulum</i>	G5	S3	SC	SC
Jefferson X Blue-spotted Salamander, Jefferson genome dominates	<i>Ambystoma hybrid pop. 1</i>	GNA	S2		

English Name	Scientific Name	G-rank	S-rank	COSEWIC	SARO
Redside Dace	<i>Clinostomus elongatus</i>	G3G4	S2	END	END
Bloater	<i>Coregonus hoyi</i>	G4	S4	NAR	NAR
Shortnose Cisco	<i>Coregonus reighardi</i>	GH	SH	END	END
Lilypad Clubtail	<i>Arigomphus furcifer</i>	G5	S3		
Northern Hawthorn	<i>Crataegus dissona</i>	G4G5	S3		
Schreber's Wood Aster	<i>Eurybia schreberi</i>	G4	S2S3		
Virginia Lungwort	<i>Mertensia virginica</i>	G5	S3		

Note: G-Rank: Global Status; S-Rank – Provincial Status; COSEWIC – Committee on the Status of Endangered Wildlife in Canada; SARO – Species at Risk in Ontario. END=Endangered; SC = Special Concern; NAR

3.3 Fisheries and Oceans Canada (DFO)

The HRCA Distribution of Fish Species at Risk and the Distribution of Mussel Species at Risk Maps for the study area were reviewed on January 18, 2013. Species identified within our study area include: Lake Sturgeon, Silver Shiner, and Redside Dace, which are known to be within Sixteen Mile Creek. However through correspondence with Jenie Cooper from the DFO, received on February 5th, 2013, no Species at Risk are recorded for our study area.

3.4 Ministry of Natural Resources & Forestry (MNR)

On January 9th, 2013, Melinda Thompson-Black from the Aurora District MNR was contacted requesting information regarding natural heritage features and Species at Risk element occurrences within and/or adjacent to the Trafalgar Road study area.

On January 15th, 2013, the MNR confirmed the presence of seven Species at Risk records for our study area. These include: Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*), Northern Map Turtle (*Graptemys geographica*), Milksnake (*Lampropeltis triangulum*), Snapping Turtle (*Chelydra serpentina*), Eastern Ribbonsnake (*Thamnophis sauritus*), and Canada Warbler (*Wilsonia Canadensis*). MNR also stated butternut (*Juglans cinerea*) has the potential to be located within our study area.

At the request of MNR, an Information Gathering Form (IGF) has been submitted to them for review. Should the MNR have any concerns with potential negative adverse effects to Species at Risk as a result of the widening of Trafalgar Road, a permit may be required under the ESA (2007).

On December 13, 2013 a response received from MNR indicated the need to conduct further surveys for the confirmation of Barn Swallow within the study area.

At the request of the MNR an additional field visit was conducted during the 2014 breeding bird season to survey all of the culverts within the study area for the presence of Barn Swallow.

MNR also indicated the following identified natural heritage features were located within our study area: Oakville-Milton Wetlands and Uplands Candidate Life Science ANSI and the Provincially Significant North Oakville-Milton East Wetland Complex (Refer to Section 2.3.10 of this report for a brief description of these features).

Appendix A presents a copy of all Agency correspondence.

3.5 Atlas of Breeding Birds of Ontario

Formal breeding bird surveys were not completed for the study area; however, the Atlas of Breeding Birds of Ontario provides a tool where existing breeding bird data for 10 km squares can be downloaded. This information can then

be used to target specific breeding birds for the area during detailed design. Square number 17PJ01 generated a total of 91 bird species identified within the project study area. Of the listed species, Barn Swallow (*Hirundo rustica*), Bobolink, Chimney Swift (*Chaetura pelagica*), Eastern Meadowlark, and Whip-poor-will (*Caprimulgus vociferus*) are protected under the ESA (2007).

Appendix B presents a list of birds that are known to be in the area.

3.6 Town of Oakville Official Plan

The Trafalgar Road study area according to the Town of Oakville's Official Plan *Schedule B: Natural Features and Hazard Lands* has several identified areas located within the study area. These include areas identified as valleylands and woodlands. The areas designated as valleyland coincide with the riparian zones for Sixteen Mile Creek, West Morison Creek, and East Morison Creek. Portions of these valleyland areas fall within AOI 1 & 2 of the study area, however the majority of each of these features fall outside of these areas. Portions of one identified woodland falls within AOI 2 of the study area, all others are located well outside the study area.

Permitted uses within areas designated as Natural Areas, according to Section 16 of the Town of Oakville's Official Plan, subject to applicable Conservation Authority policies includes: "essential public works including transportation, utility, watershed management, and flood and erosion control facilities."

3.7 North Oakville East Secondary Plan

The northern portion of the study area north of Dundas Street and East of Trafalgar road falls under the policies set out within the North Oakville East (NOE) Secondary Plan. According to North Oakville West (NOW) and NOE, Land Use Plan portions of two vegetated areas designated as Natural Heritage System Area fall within both Areas of Investigations.

The Natural Heritage and Open Space Systems for NOE is recognized as being functionally part of a larger system intended to extend through all of North Oakville. It is comprised of two components, a Natural Heritage component and an Open Space component. The Natural Heritage component is comprised of the following five key areas as identified by the policies in the Plan:

- Core Preserve Areas,
- Linkage and Optional Linkage Preserve Areas,
- High Constraint Stream Corridor Areas,
- Medium Constraint Stream Corridor Areas, and
- other Hydrological Features.

The Open Space component of the Natural Heritage and Open Space System includes open space areas such as stormwater facilities, cemeteries, public parks and schools. The Open Space component of the System will be designed, where possible, to connect to, and enhance the Natural Heritage component of the System.

The following components of the natural heritage system are located within the Trafalgar Road study area. Areas of Investigations:

- Two **Core Preserve Areas**: These include key natural features or groupings of key natural features, together with required buffers and adjacent lands intended to protect the function of those features and ensure the long term sustainability of the Natural Heritage component of the System within the urban context.

- One **High Constraint Stream Corridor**: This includes certain watercourses and their adjacent riparian areas, including buffers measured from the stable top-of bank or meander belts. These areas are located primarily inside Core and Linkage Preserve Areas, but can also be found outside such areas. They must be protected in their existing locations for hydrological and ecological reasons.
- One **Medium Constraint Stream Corridor**: This includes certain watercourses and adjacent riparian areas, including buffers measured from the stable top-of-bank or meander belts. These areas are located primarily inside Core and Linkage Preserve Areas, but are also found outside such areas. They must be protected for hydrological and ecological reasons. These watercourses may be deepened and/or relocated in accordance with subsection 7.4.7.1 (d).
- Two areas designated as **Other Hydrological Features**: These are known as Hydrologic Features “A” and Hydrologic Features “B” on Figure NOE 3.
- One area, associated with East Morrison Creek is identified as a **Linkage** Feature as shown on Figure NOE 3. These typically include linear habitats either associated with a riparian corridor or other upland habitats which may provide intrinsic habitat function, ecological and human values. These habitats also function in providing movement corridors for resident wildlife (NOCSS, 2006).

Potential permitted uses within these designations according to Section 7.4.7.3 Permitted Uses, Buildings and Structures include:

- Roads and related utilities, which shall:
 - use non-standard cross-sections designed to minimize any impacts on the natural environment;
 - only be permitted to cross the designation in the general area of the road designations shown on Figures NOE2 and NOE4 or as defined through an Environmental Assessment; and,
 - be designed to minimize grading in accordance with the directions established in the North Oakville Creeks Subwatershed Study.
- Provided that such corridors shall:
 - be required as transit routes or utility corridors;
 - be located outside natural features to the maximum extent possible, and where the applicable designation is narrowest and along the edges of applicable designations, wherever possible;
 - provide for the safe movement of species in accordance with the directions established in the North Oakville Creeks Subwatershed Study (NOCSS) in the design and construction of any road or utility;
 - be kept to the minimum width possible; and,
 - be designed to keep any related structures or parts of structures outside the High Constraint Stream Corridor Area designated on Figure NOE3 to the maximum extent possible or as defined through an Environmental Assessment.

3.8 Regional Municipality of Halton Official Plan

Section 132 (2), of the Halton Region’s Official Plan, states that all woodlands greater than 0.5 ha should be considered an important natural heritage feature and candidates for assessment as Significant Woodlands. Portions of six candidate Significant Woodlands fall within AOI 1 & 2 of the study area (see **Figure 1**). All other candidate Significant Woodlands are located outside of our study area.

3.9 East Morrison Creek Subwatershed Study

East Morrison Creek Background

East Morrison Creek is considered a small stream with a drainage basin of approximately 800 ha in size. While East Morrison Creek previously outlet to Lake Ontario, it is now considered a tributary of Sixteen Mile Creek following construction of the Morrison-Wedgewood Diversion Channel. The diversion channel is located approximately 0.5 km north of the QEW and delineates the mouth of East Morrison Creek, diverting its flow west of Sixteen Mile Creek. The diversion channel has also removed any influence of the Lake Ontario Fishery on East Morrison Creek and for the most part the existence of the concrete channel also isolates the stream from any relationship with the East Sixteen Mile Creek Fishery (Cosburn Patterson Wardman Ltd., 1995).

Consultation with the MNR, in June of 1991 identified the East Morrison Creek as a Type 2 or potential coldwater stream. No historic data obtained for East Morrison Creek identifies the creek as supporting cold water fish species, however the potential cold water designation is more than likely based on the presence of Redside Dace in 1984 (Cosburn Patterson Wardman Ltd., 1995).

Fisheries Resources

East Morrison Creek was sampled at three locations in 1993, one at Trafalgar Road near (C7), the second is located at the hydro corridor north of Glenashton Drive, and the third station is located just north of the Diversion Channel. Species observed within Station 1 and 2 included Blacknose Dace, Creek Chub, and Brook Stickleback. Species observed within Station 3 included Blacknose Dace, and Creek Chub (Cosburn Patterson Wardman Ltd., 1995).

A survey completed in 1984 within East Morrison Creek Recorded Common White Sucker and Redside Dace. Surveys completed in 1993 did not observe either of these species despite Station 2 being within the vicinity of the 1984 Redside Dace record (Cosburn Patterson Wardman Ltd., 1995).

As described in the East Morrison Creek Subwatershed Study (EMCSS), despite the MNR having classified the East Morrison Creek as a potential coldwater stream based on the record of Redside Dace, past and present agricultural land use and surrounding urbanization, including the construction of the Wedgewood-Morrison Diversion Channel, severely restricts the habitat potential for the presence of coldwater species within East Morrison Creek (Cosburn Patterson Wardman Ltd., 1995).

It should be noted that through correspondence with the MNR and DFO; neither agency has listed the potential for the occurrence of Redside Dace within the study area. Any mention hereon in of Redside Dace should be considered a historical record.

Terrestrial Data

Comprehensive vegetation surveys were completed throughout the East Morrison Creek Subwatershed using a combination of background review and field investigation techniques. Vegetation features were grouped into four distinct titles: woodlots, valley woodlands, successional woods and hedgerows. The woodlots generally contained a combination of deciduous and mixed wood community types, which were found north of Dundas Street. Valley woodlands were typically found south of Dundas Street, consisting of deciduous upland forest. The valleys were characterized as having steep slopes and sub-mature to mature canopy cover. The successional woods are found throughout the study area and can be described as disturbed communities, sometimes providing habitat for invasive and unwanted species. The hedgerows were typically comprised of mature trees such as sugar maple and basswood as well as buckthorn, hawthorn and white elm (Cosburn Patterson Wardman Ltd., 1995).

The wildlife species which were noted throughout the East Morrison Subwatershed were characterized as tolerant species which do not require extensive range and foraging areas. It was generally common bird species which were observed during field surveys. Species observed which are categorized as area-sensitive include Pileated Woodpecker (*Dryocopus pileatus*), Brown Thrasher (*Toxostoma rufum*), Red-tailed Hawk (*Buteo jamaicensis*), Ruffed Grouse (*Bonasa umbellus*) and American Woodcock (*Scolopax minor*). These species were observed in a combination of deciduous forest and remnant agricultural/rural landscapes (Cosburn Patterson Wardman Ltd., 1995).

Common herpetofaunal species observed during field investigations included American Toad (*Bufo americanus*), Wood Frog (*Rana sylvatica*), Northern Leopard Frog (*Rana pipiens*), Green Frog (*Rana clamitans*) and Redbelly Snake (*Storeria occipitomaculata*). These species were found in a range of habitats including wooded slopes, wooded wet meadow and thicket floodplains, permanent ponds and stream features (Cosburn Patterson Wardman Ltd., 1995).

Mammal species observed during field investigations were generally found in urban/rural fringe habitats. Common species observed included White-tail Deer (*Odocoileus virginianus*) tracks, Raccoon (*Procyon lotor*), Meadow Vole (*Microtus pennsylvanicus*), Red Fox (*Vulpes vulpes*) scat, Black Squirrel (*Sciurus carolinensis*), Gray Squirrel (*Sciurus carolinensis*) and Eastern Cottontail (*Sylvilagus floridanus*) (Cosburn Patterson Wardman Ltd., 1995).

3.10 North Oakville Creeks Subwatershed Study

North Oakville Subwatershed Background

The purpose of this report was to prepare a plan for future urban development in the North Oakville Development Area. The North Oakville Creeks Subwatershed study area is located north/east of the Oakville town limits, south of Dundas street and west of Tremaine road. Included in the subwatershed are the following creeks: Joshua's Creek, Morrison Creek, Munn's Creek, Shannon Creek, Osenego Creek, Fourteen Mile Creek, Glen Oak Creek, Taplow Creek and Sixteen Mile Creek. The land use within this subwatershed includes a mixture of agriculture, recreation, rural and residential (TSH, 2006).

Terrestrial

The natural environment portion of this report was completed through a series of field investigations and desktop review. Upon review of the Terrestrial Survey Map Figure 4E.9.1, the common Ecological Land Classification communities within our study area along Trafalgar road include cultural meadow, cultural thicket, deciduous forest and agricultural lands. Common tree species observed included sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), white ash (*Fraxinus americana*) among several other associate species (TSH, 2006).

Wetland communities were assessed through background studies completed by both MNRF and Natural Resource Solutions Inc., which was comprised of the North Oakville-Milton West and East Wetland Complexes. These wetlands include a combination of swamp, marsh and shallow marsh community types (TSH, 2006).

A wildlife habitat review was completed through a series of background reviews. The North Oakville lands provide habitat for seasonal wildlife concentrations, specialized wildlife habitats, habitat for species of concern and wildlife movement corridors. Common species found within the area include White-tail Deer, Coyote, Red Fox and Raccoon (TSH, 2006).

Bird inventories were collected through a combination of agency consultation and field investigations. A list of bird species had been compiled through Breeding Bird Surveys completed in 2002, 2004, and 2005 along with data from Ontario Breeding Bird Atlas (OBBA). A total of 217 bird species were recorded, with 33 of those species having some level of rarity (TSH, 2006).

Amphibian and Reptile surveys were completed in 2002 and 2003, following the Great Lakes Marsh Monitoring Program Protocol (BSC, 2001). Stations were selected through a series of field reconnaissance, where the presence of wetland communities occurred. A total of 15 Amphibian species and 13 Reptile species were observed during surveys. Two Species of Special Concern were observed within the eastern portion of the study area which include Eastern Milksnake (*Lampropeltis triangulum*) and Eastern Ribbonsnake (*Thamnophis sauritus*) (TSH, 2006).

3.11 Background Review Summary

Upon review of all existing documentation the following presents the known significant features and Species at Risk found within the vicinity of the Trafalgar Road study area.

3.11.1 Identified Aquatic Features

Sixteen Mile Creek

The Sixteen Mile Creek watershed is located at the western end of Lake Ontario within the Halton Region and the City of Mississauga. The main branches of Sixteen Mile Creek are formed in wetlands and forested swamps associated with the Niagara Escarpment. From here the main branches and their tributaries flow southwards through natural, rural, urban and agricultural lands before meeting its confluence with Lake Ontario within the Town of Oakville (Sixteen Mile Creek Monitoring Project, 2005). Sixteen Mile Creek has a capture area of approximately 372 km² and contains nine different sub-watersheds (Dunn, 2005).

East Morrison Creek

This watercourse is located within the Sixteen Mile Creek watershed. The headwaters of East Morrison Creek originate north of Dundas Street as intermittent shallow swales and agricultural drains. The creek flows in a southeasterly direction flowing through residential developments and parkland before ending at the Morrison-Wedgewood Diversion channel north of the QEW West industrial district. The MNRF designated East Morrison Creek as potential coldwater based on historical records of Redside Dace in the watercourse. However, agricultural land use and increasing urbanization may limit the coldwater habitat potential (TSH, 2006).

It should also be noted that through correspondence with the MNRF and DFO, neither agency has listed the potential for the occurrence of Redside Dace within our study area. Any mention hereon in of Redside Dace should be considered a historical record.

West Morrison Creek

West Morrison Creek is located within the Sixteen Mile Creek watershed. The western branch of Morrison Creek originates north of Dundas Street and immediately east of Sixth Line. The majority of this channel is surrounded by residential parcels. In some cases infrastructure and property loss is in jeopardy because of bank and valley wall erosion. The creek flows into the Morrison-Wedgewood Diversion channel immediately north of Leighland Avenue.

3.11.2 Identified Terrestrial Features

North Oakville – Milton East Provincially Significant Wetland complex –

The complex is located within and around the eastern section of the Trafalgar Moraine. The wetland complex is bordered to the north by Highway 407, to the south by Dundas Street, to the west by Sixteen Mile Creek Valley, and to the east by Highway 403. This wetland is comprised of 105 individual wetlands consisting of both swamp and marsh communities covering a total of 34.67 ha. The wetland is significant based upon its high concentration of significant plant species and its rare wetland types.

Identified Candidate Significant Woodlands

There are portions of six candidate significant woodlands found within 120 m of Trafalgar Road totalling approximately 6.4 ha. All other candidate significant woodlands are outside of the 120-m boundary (**see Figure 1 for identified features**).

3.11.3 Species at Risk

Eleven Species at Risk records have been identified as being potentially located within the Trafalgar Road study area according to MNR and DFO. These include:

- Bobolink (*Dolichonyx oryzivorus*)
- Eastern Meadowlark (*Sturnella magna*)
- Northern Map Turtle (*Graptemys geographica*)
- Milksnake (*Lampropeltis triangulum*)
- Snapping Turtle (*Chelydra serpentina*)
- Lake Sturgeon (*Acipenser fulvescens*)
- Silver Shiner (*Notropis photogenis*)
- Redside Dace (Historical) (*Clinostomus elongates*)
- Eastern Ribbonsnake (*Thamnophis sauritus*)
- Canada Warbler (*Wilsonia Canadensis*).

MNR also stated that butternut has the potential to be located within our study area.

4. Field Investigations

Field investigations were completed on September 10, 2009 and consisted of terrestrial and aquatic assessments along the proposed route. A reconnaissance level field survey was completed on February 1st, 2013 to confirm field findings from 2009. The intent of these investigations was to:

- a) identify the natural features that could potentially be affected by widening the existing right-of-way
- b) determine the significance of those features observed
- c) provide input for a preliminary impact assessment; and
- d) determine mitigation measures for those features which require protection

An additional spring field visit was conducted on June 9th, 2014 to collect a plant species inventory within McCraney Valley Park and survey for the presence of Barn Swallow along the entire route.

4.1 Aquatic

4.1.1 September 2009 Field Investigations

2009 Aquatic Findings

Eleven aquatic features occur within the study area. In the northern section of the study area north of Dundas Street, box culverts and corrugated steel pipe (CSP) culverts convey surface water from agricultural fields and are intermittent in nature. Small cyprinids and/or brook stickleback were observed in the culverts south of Burnhamthorpe Road East with sufficient water depth.

South of Dundas Street, East Morrison Creek flows under Trafalgar Road through a 6 m CSP. On both sides of Trafalgar Road, mean wetted width = 1.2 m; mean wetted depth = 0.12 m; mean bankfull width = 6 m and mean bankfull height = 1 m. Substrate consisted of cobbles, silt and boulders and the riparian zone was in a natural state with well-established trees and shrubs. Water temperature was 16.5°C, while air temperature was 26°C. Cyprinids were observed in this section.

A surface water conveyance ditch runs parallel to the west side of Trafalgar Road adjacent to Sheridan College. At the time of the survey, mean wetted width was 1 m and mean wetted depth was 0.03 m. No fish were observed in this system.

Two aquatic features occur between McCraney Street and Leighland Avenue: West Morrison Creek and a large trapezoidal concrete surface water drain called the Morrison-Wedgewood Diversion Channel. West Morrison Creek, now referred to as a tributary to Sixteen Mile Creek via the Morrison-Wedgewood diversion channel (pers. comm. HRCA), flows southeast into an underground system 15 m west of Trafalgar Road where it is then diverted into a concrete surface water drain to the south.

The concrete drain conveys water to the west under Trafalgar Road approximately 40 m north of Leighland Avenue into a lower reach of Sixteen Mile Creek.

Table 2 (at the end of Section 4.2.2) presents a more detailed description of the terrestrial conditions observed.

Figure 2 (refer to Section 1) presents the existing watercourse crossing locations

4.1.2 February 2013 Field Investigations

Aquatic conditions within the study area remained generally the same as reported in 2009 with the exception of a few locations where more detailed information was collected. The supplemental detail consisted mainly of new wetted widths and depths as well as, further description of the associated culverts. These data was collected and added to the east side of Section B, to the east and west sides of Section G, H and I. Details are outlined in **Table 2** (at the end of Section 4.2.2).

With respect to the proposed works, in-water work timing windows restrict work so that no in-water work can be completed between April 1 and June 30 in any given year.

4.2 Terrestrial

4.2.1 September 2009 Field Investigations

The terrestrial features in the study area consisted mainly of planted roadside trees as well as planted trees within several fenced apartment building complexes and strip malls. The dominant species observed included: red pine (*Pinus resinosa*), Norway maple (*Acer platanoides*), honey locust (*Gleditsia triacanthos*), Colorado spruce (*Picea pungens*), Russian olive (*Elaeagnus angustifolia*), sugar maple (*Acer saccharum*) and crab apple (*Malus pumila*). Sections H and I consist of a ditch running along both the east and west sides choked with common reed grass and cattail.

Six woodland/riparian features were identified within 50 m along the study area recognized in the Halton Region's Official Plan as candidate Significant Woodlands according to Section 132 (2). This regulation requires the consideration of all woodlands 0.5 ha or larger to be an important natural heritage feature and candidates for assessment as Significant Woodlands through the completion of an evaluation. These include:

Oak Park: This woodland is located at the corner of Trafalgar Road and Glenashton Drive and is approximately 7.8 ha in size. Approximately 95% of this woodland is concentrated west of the existing buildings located along the road and is at least 100 m from the existing right-of-way. The northern section of Oak Park (0.01 ha) is approximately 18 m from the edge of pavement. Dominant species observed include American elm, Scotch pine, and buckthorn. This woodland has been severely damaged by edge effect from the adjacent buildings. This could explain the abundance of buckthorn near the northern section of the woodland.

McCraney Valley Park: This small woodlot is part of McCraney Valley Park and is located southwest of Upper Middle Road East, on the Sheridan College Campus. It consists of a series of well used trails connected to the College through a small woodlot. Dominant species observed include white oak, red oak, shagbark hickory, bitternut hickory, and sugar maple.

Morrison Valley Trail North: This small feature is linked with the existing watercourse that runs east under Trafalgar Road near Dundas Street. Dominant species observed included: Green ash, black walnut, sugar maple, silver maple, and white oak. This feature is identified within the NOCSS as a Linkage area providing a corridor along East Morrison Creek connecting to a larger woodland just south of Burnhamthorpe Road East. Overall the study area is dominated by agricultural lands making this corridor an important wildlife movement area. As the widening of Trafalgar road will only be widened by only 30 to 50 m on either side of the road, minimal effects to this feature are anticipated and the connection to the both sides of the creek will be maintained still allowing for wildlife to use the corridor.

Two additional woodland features found along Trafalgar Road north of Dundas Street are identified as candidate significant woodlands. These areas are associated with two abandoned house properties. These properties were not accessed for field investigations as they are located on private property; therefore field investigations were completed via roadside investigations. Both can be classified as Mineral Cultural Woodlands as represented by CUW1a and CUW1b on **Figure 3**.

Wetland Community: A small wetland connected to a larger woodland feature is found at the corner of Dundas Street East on the east side of Trafalgar Road. The community is entirely dominated by cattail (*Typha latifolia*).

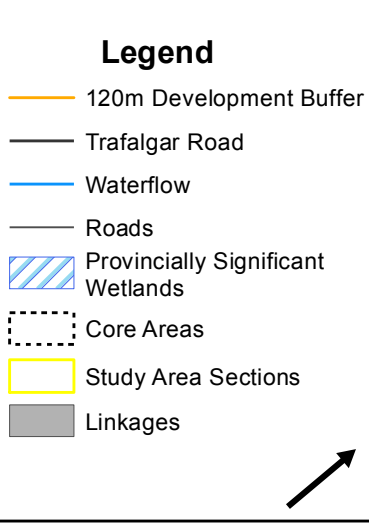
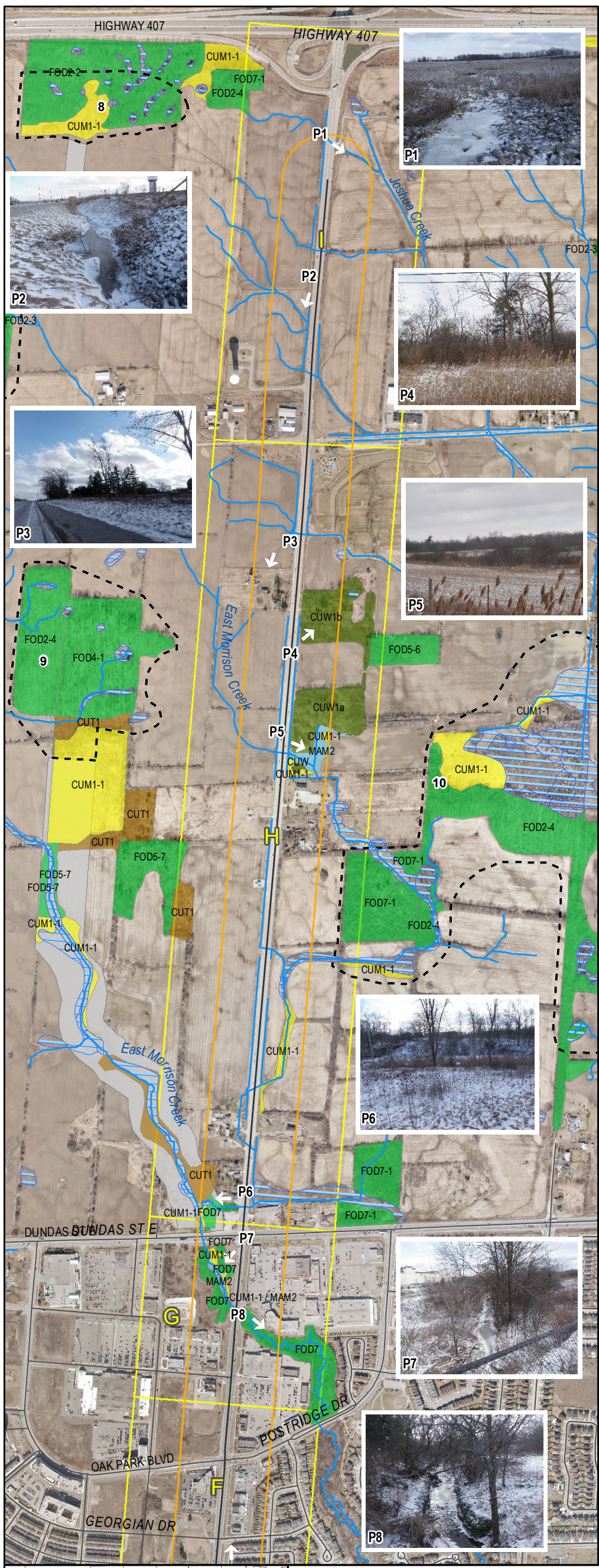
Figure 3 presents the Ecological Land Classification communities within the study area.

4.2.2 February 2013 Field Investigations

Terrestrial conditions within the study remained generally the same as reported in 2009 with the exception of two locations within the study area. They can be described as follows:

- A new GO parking lot has been constructed since the 2009 field investigations were completed within an agricultural field. The lot is located on the east side of Trafalgar Road just south of the Highway 407 off ramp;
- The previously mentioned, Oak Park has been mostly removed to accommodate a new subdivision (see pictures 10-11 on **Figure 3**). A small portion of the woodland feature remains near the intersection of Trafalgar Road and Glenashton Drive, mainly dominated by buckthorn, ash species and American elm.

Appendix C presents a plant species list.



ELC Code	Description
CUM1-1	Dry-Moist Old Field Meadow Type
CUT	Cultural Thicket
CUT1	Mineral Cultural Thicket Ecosite
CUW	Cultural Woodland
CUW1a/b	Mineral Cultural Woodland
FOD24	Dry-Fresh Oak-Hardwood Deciduous Forest Type
FOD4-1	Dry-Fresh Beech Deciduous Forest Type
FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest Type
FOD5-6	Dry-Fresh Sugar Maple-Basswood Deciduous Forest Type
FOD5-7	Dry-Fresh Sugar Maple-Black Cherry Deciduous Forest Type
FOD7	Fresh-Moist Lowland Deciduous Forest Ecosite
FOD7-1	Fresh-Moist White Elm Lowland Deciduous Forest Type
MAM2	Mineral Meadow Marsh Ecosite

**Trafalgar Road Improvements
Class EA Study**

Ecological Land Classifications

April 2015	1:12,000	Datum: NAD83 Zone 17 Source: Town of Oakville, OBM
P#: 60119993	V#: 001	

AECOM

Figure 3

0 205 410 820
Meters

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Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
Section A – East Side	<p><i>Terrestrial Findings:</i> Mainly industrial area with planted roadside trees consisting of honey locust, black walnut, Colorado spruce, red pine, Russian olive, crab apple.</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>	5 m from the road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from 2013 field investigations:</p> <ul style="list-style-type: none"> Small cultural meadow (CUM1-1), with a clump of 7 red pine, and scattered sumac (<i>Rhus hirta</i>) was observed just south of the QEW on-ramp; Species observed within the cultural meadow include: wild carrot (<i>Daucus carota</i>), common burdock (<i>Arctium minus</i>), bird's foot trefoil (<i>Lotus corniculatus</i>), aster species (<i>Symphoricarichum sp.</i>), goldenrod species (<i>Solidago sp.</i>), teasel (<i>Dipsacus fullonum</i>), milkweed (<i>Asclepias syriaca</i>), st-john's wort (<i>Hypericum perforatum</i>), bull thistle (<i>Cirsium vulgare</i>), and grasses. <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>
Section A – West Side	<p><i>Terrestrial Findings:</i> Mainly industrial area with planted roadside trees consisting of honey locust, black walnut, Colorado spruce, red pine, Russian olive, crab apple.</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>			<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from 2013 field investigations:</p> <ul style="list-style-type: none"> Cultural meadow (CUM1-1) community is located south of the QEW on-ramp with scattered shrubs and trees. Species observed include: buckthorn, tartarian honeysuckle, ash species and trembling aspen. <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>
Section B – East Side	<p><i>Terrestrial Findings:</i> Planted roadside trees consisting of red pine, Russian olive, and honey suckle.</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>	4-5 m from the road	Trees located near the on-ramp to the QEW are closer to the road	<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Cultural meadow (CUM1-1) communities are located at north of the QEW. A small clump of approximately 20 red pines are located within the cultural meadow community directly adjacent to the on/off ramp to the QEW. Manicured Lawn is found along the remainder of this section. <p><i>Aquatic Findings:</i> A small dry swale located at the base of the elevated off-ramp was observed, northeast of North Service Road and southeast of Oakville Place Drive. No water was observed. The swale likely collects rainwater and runoff from the adjacent off-ramp.</p> <p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant.</p>
Section B – West Side	<p><i>Terrestrial Findings:</i> Oakville Place occupies most of this stretch and has few roadside planted trees. Including Norway maple, red pine and honey locust.</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>			<p><i>Aquatic Findings:</i> No aquatic features within this section.</p>

Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
Section C – East Side	<p><i>Terrestrial Findings:</i> Not many trees along this stretch, however, those present consist of Russian olive, sugar maple, red pine, and Colorado spruce.</p> <p><i>Aquatic Findings:</i> A large, V-shaped concrete surface water conveyance system flowed in a south direction through Section C. This system would convey surface water from areas such as Iroquois Valley Woods Park and Morrison Valley to Sixteen Mile Creek.</p>		Town Hall property is located within this section.	<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Town of Oakville town hall gardens are located within this section, with an area of manicured lawn and a collection of vegetated islands. These areas should not be impacted by the widening of Trafalgar Road as they are located between 15 to 20 m away from the road. <p><i>Aquatic Findings:</i> A large, V-shaped concrete surface water conveyance system flowed in a south direction through Section C. This system would convey surface water from areas such as Iroquois Valley Woods Park and Morrison Valley to Sixteen Mile Creek. The watercourse has a 1 m wetted width; water was approximately 15 cm deep. The dimensions of the trapezoidal channel are approximately 5 m high by 10 m wide.</p>
Section C – West Side	<p><i>Terrestrial Findings:</i> A small extension of the woodlot present in Section D is located here (Reservoir Park) FOD5: Dry-Fresh Sugar Maple Deciduous Forest Ecosite. Trees include sugar maple, white oak, basswood, and red oak.</p> <p><i>Aquatic Findings:</i> 1) A large, trapezoidal-shaped concrete stormwater conveyance system flowed in a south direction through Section C. This system would convey surface water from areas such as Iroquois Valley Woods Park and Morrison Valley to Sixteen Mile Creek. 2) A diversion channel flows southeast through Reservoir Park and under Trafalgar Road into a sewer system. The edge of the treed riparian zone at the end of the channel is approximately 10 m from the pavement edge of Trafalgar Road.</p>	Located 8 m from the road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Cultural Woodland (CUW1) located adjacent to the intersection of Trafalgar Road and McCraney Road. Species observed include: ash species, maple species, basswood, and sumac Cultural meadow (CUM1-1) community is located adjacent to the CUW1 A narrow band of trees is located adjacent to the cultural meadow community. This community can be classified as a CUW1 with dominant trees including maple species, basswood, white pine, and buckthorn <p><i>Aquatic Findings:</i> <ul style="list-style-type: none"> A large, trapezoidal-shaped concrete stormwater conveyance system flowed in a south direction through Section C. This system would convey surface water from areas such as Iroquois Valley Woods Park and Morrison Valley to Sixteen Mile Creek A diversion channel flows southeast through Reservoir Park and under Trafalgar Road into a sewer system. The edge of the treed riparian zone at the end of the channel is approximately 10 m from the pavement edge of Trafalgar Road </p>

Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
Section D – East Side	<p><i>Terrestrial Findings:</i> Residential and Commercial areas with planted roadside trees. Tree species observed included Colorado spruce, crab apple, white cedar, sugar maple, Russian olive, catalpa, Norway maple, honey locust and Norway spruce.</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>	7-8 m from the road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Approximately 20 trees are located between Lynnwood Drive and Marlborough Court; 10 planted trees are located near Litchfield Road however are approximately 12 m away from Trafalgar Road <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>
Section D – West Side	<p><i>Terrestrial Findings:</i> Located within Sheridan College Campus is a portion of the McCraney Valley Park and associated trails. Vegetation consists of sugar maple, white oak, red oak, bitternut hickory, shagbark hickory and basswood (FOD5: Dry-Fresh Sugar Maple Deciduous Forest Ecosite).</p> <p><i>Aquatic Findings:</i> A surface water conveyance system flowed parallel to Trafalgar Road on the west side beside Sheridan College. The system was approximately 8 m from the pavement edge. This system flowed into McCraney Valley Park and then into a sewer at Marlborough Court. Along Trafalgar Road, this system was wetted but was choked with cattail at the time of the survey. Mean wetted width was 1 m and mean wetted depth was 2.5 cm. No fish were observed.</p>	Trail and park located 15 m from road	Sheridan College Campus parking lots are located near the road. Trails are well used by students of Sheridan College	<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Between McCraney Street and Marlborough Court are approximately 30 trees. Species observed include basswood, red pine, and maple species <p><i>Aquatic Findings:</i> A surface water conveyance system flowed parallel to Trafalgar Road on the west side beside Sheridan College. The system was approximately 8 m from the pavement edge. This system flowed into McCraney Valley Park and then into a sewer at Marlborough Court. Along Trafalgar Road, this system was wetted but was choked with cattail at the time of the survey. Mean wetted width was 1 m and mean wetted depth was 2.5 cm. No fish were observed.</p>
Section E – East Side	<p><i>Terrestrial Findings:</i> Residential area with planted roadside trees. Trees observed included Honey locust, sugar maple, and red pine.</p>	3-7 m from road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Approximately 60 boulevard trees are located within this section, some newly planted
Section E – West Side	<p><i>Aquatic Findings:</i> No aquatic features within this section.</p> <p><i>Terrestrial Findings:</i> Oak Park, approximately 7.8 ha in size, is found at the corner of Glenashon and Trafalgar Road. Dominant species observed include American elm, Scotch pine, and buckthorn (FOD: Deciduous Forest)</p>	Oak Park located 18 m from the road	Only a small portion of this woodland is located near the road. The majority of the woodland extends southwest away from the road.	<p><i>Aquatic Findings:</i> No aquatic features within this section.</p> <p><i>Terrestrial Findings:</i> The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Oak Park has almost entirely been removed for the construction of a subdivision. Only a small portion of the woodland feature remains close to the intersection of Trafalgar Road and Glenashon Drive. Species remaining include buckthorn, American elm, and ash species <p>All other data remains relevant</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>

Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
Section F – East Side	<p><i>Terrestrial Findings:</i> All roadside planted trees. Species observed include red pine, sugar maple, Norway maple, honey locust, and Norway spruce.</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>	10-15 m from the road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant.</p> <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>
Section F – West Side	<p><i>Terrestrial Findings:</i> There are two small patches of trees within an agricultural field. Dominant species observed include American elm, sugar maple and buckthorn.</p>		These patches are approximately 0.08 ha and 0.07 ha in size.	<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Two small patches are cultural thicket communities (CUT1), both dominated by buckthorn A small row of red pine, with buckthorn is located adjacent to the CUT1 patches These communities are located within a cultural meadow (CUM1-1) as opposed to an agricultural field <p><i>Aquatic Findings:</i> No aquatic features within this section.</p>
Section G – East Side	<p><i>Terrestrial Findings:</i> Morrison Valley Trail North is found near Dundas Street. This feature is a small patch of wooded area surrounding the watercourse running east to west. Dominant species observed included green ash and buckthorn (FOD7: Fresh Moist Lowland Deciduous Forest Ecosite)</p> <p>Roadside planted trees included, honey locust, silver maple, Norway spruce and Colorado spruce.</p>	10-12 m from the road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Observed trees are approximately 13 m away from Trafalgar Road Species near Trafalgar Road include: teasel, goldenrod species, aster species, red raspberry honeysuckle and grasses Cattails and reed canary grass are within the creek Manitoba maple, black walnut (<i>Juglans nigra</i>) and American elm (<i>Ulmus americana</i>) was observed as well as other species mentioned in 2009. 11 blue spruce are located just south of East Morrison Creek <p><i>Aquatic Findings:</i> During the 2013 field investigations the following data was added to the 2009 information for the East Morrison Creek crossing:</p> <ul style="list-style-type: none"> Identified C7 on Figure 2 Flowing west to east, steel corrugated culvert with gabion baskets Water depth was approximately 15 cm, wetted width was approximately 1 m Downstream portion flowed through a treed vegetation community Some signs of erosion were present near the culvert Two small clay culverts are located on either side of the larger steel culvert.

Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
Section G – West Side	<p><i>Terrestrial Findings:</i> Majority of west side includes strip malls with roadside planted trees, with the exception of Morrison Valley Trail North located at the corner of Dundas Street and Trafalgar Road. Dominant species found in the Morrison Valley Trail North include black walnut, sugar maple, white oak, American elm, and honey locust (FOD7: Fresh Moist Lowland Deciduous Forest Ecosite). Roadside planted trees include honey locust, sugar maple, Colorado spruce, and linden.</p> <p><i>Aquatic Findings:</i> East Morrison Creek flowed east under Trafalgar Road through a ~ 6 m CSP south of Dundas Street. East of Trafalgar Road, the system had a mean wetted width of 1.2 m, mean wetted depth of 0.12 m, mean bankfull width of 5.5 m and a mean bankfull height of approximately 1 m. Substrate consisted of cobbles, silt and boulders and filamentous algae were also observed. The riparian area was well established with trees and shrubs. Water temperature was 16.5 °C (air temperature = 26 °C). Riparian vegetation consists of a mixture of trees and shrubs along the banks. Cattails and reed canary grass are scattered throughout the channel. For a description of species observed along the riparian corridor please see terrestrial description above.</p>	Most trees are 10-12 m away from the road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Construction was observed at the intersection of Trafalgar Road and Dundas Street A cultural meadow/mineral meadow marsh (CUM1-1/MAM2) mosaic was observed near the culvert. Species observed include teasel, goldenrod species, aster species, and grasses. Scattered American elm was observed throughout this community A small meadow marsh (MAM2) fringe is found directly abutting the creek. Species observed include: cattail, purple loosestrife, reed canary grass, goldenrod species, aster species, and grasses <p><i>Aquatic Findings:</i> During the 2013 field investigations the following data was added to the 2009 information for the East Morrison Creek crossing:</p> <ul style="list-style-type: none"> Identified as C7 on Figure 2 CSP culvert is 3 m wide 1.2 m wetted width Water is 15 cm deep Bank along the south side of West Morrison Creek is much higher than that located on the north side Vegetation found within and on the banks of the watercourse include cattail, common reed grass, purple loosestrife and reed canary grass Due to degradation of the existing culvert conditions, complete replacement is proposed. The proposed culvert will also be extended to allow for appropriate road enhancements.
Section H – East Side	<p><i>Terrestrial Findings:</i> Mostly Active Agricultural Fields with a ditch along both sides. Vegetation includes: common reed grass, cattail, Canada goldenrod, purple loosestrife, wild carrot, and chicory. Two abandoned house properties are located along the east side and are surrounded by a small woodland. Tree species observed included: black walnut weeping willow, paper birch, sugar maple, catalpa, trembling aspen, Norway spruce, and white cedar (FOD: Deciduous Forest).</p>	Most trees are 5 to 10 m from the road		<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant with revisions to ELC codes. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> Mineral Meadow Marsh/ Mineral Shallow Marsh community (MAM2/MAS2) was observed at the intersection of Dundas and Trafalgar Road. This community is part of the Provincially Significant North Oakville Milton East Wetland Complex. Wetland area was dominated by cattail A small cultural woodland (CUW1) associated with a residential property was observed just north of culvert CC. Dominant species observed include ash species, basswood, elm, white pine, white spruce, common buckthorn and honeysuckle; A small mineral meadow marsh (MAM2) dominated by common reed grass was observed associated with culvert C3, on Figure 2 The two abandoned house properties were still present. Both woodland communities can be coded as mineral cultural woodland (CUW1a &b)

Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
Section H – West Side	<p><i>Aquatic Findings:</i> 60 m north of Dundas Street, surface water is conveyed under Trafalgar Road through a box culvert to East Morrison Creek. The channel was dry during the field visit. Approximately 220 m north of Dundas Street the surface water conveyance system flows under Trafalgar Road through a box culvert. The channels were choked with <i>Phragmites</i> sp. and <i>Typha</i> sp. Small-bodied fish were observed in deeper water at the culvert. North of Section G to Highway 407, the aquatic features that were parallel to and cross Trafalgar Road were generally surface water conveyance systems that drain adjacent agricultural fields. These aquatic features were generally choked with <i>Phragmites</i>.</p> <p><i>Terrestrial Findings:</i> Mostly Active Agricultural Fields with a ditch along both sides. Vegetation included: common reed grass, cattail, Canada goldenrod, purple loosestrife, wild carrot, and chicory.</p>			<ul style="list-style-type: none"> Species observed within CUW1a include, ash species, oak species, red pine, weeping willow, buckthorn and honeysuckle Species observed within CUW1b include: ash species, red pine, white pine, scot's pine, maple species, Norway spruce, and cottonwood <p><i>Aquatic Findings:</i> Six culverts were located during the 2013 field investigations within Section H.</p> <ul style="list-style-type: none"> 60 m north of Dundas Street (C6, on Figure 2), surface water is conveyed under Trafalgar Road through a box culvert to East Morrison Creek Water may also be coming from adjacent marsh community to the north Associated with this culvert is a small drainage ditch running parallel to Trafalgar Road. Wetted width was approximately 1.5 m top of bank was 4 m. This feature had a vegetated bottom, and common reed grass, and cattails found growing along the banks Approximately 220 m north of Dundas Street (C5, on Figure 2) the surface water conveyance system flows under Trafalgar Road through a box culvert. Vegetation found within the feature consisted of common reed grass and cattail. Some water was observed within the culvert. Approximately 400 m from Dundas Street (C4, on Figure 2) was a twin concrete culvert, flowing west, with a vegetated bottom. This portion of the creek is also part of the North Oakville Milton East PSW. Further upstream the creek flows through a shrub/treed area before running along Trafalgar Road 700 m north of Dundas Street (CC, on Figure 2) was a small CSP approximately 20 cm wide, 30 cm wetted width, water 5 cm deep. Culvert was choked with common reed grass. 1.2 km north of Dundas Street (C3, on Figure 2) was a concrete box culvert. No water was observed, and was choked with common reed grass. 200 m south of Burnhamthorpe Road (CB, on Figure 2), was a twin concrete box culvert with 5 cm standing water, and choked with common reed grass. <p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant. The following data was added from the 2013 field investigations:</p> <ul style="list-style-type: none"> FOD7 community was observed associated with culvert C6. Dominant species observed include: Manitoba Maple, red pine, ash species, and buckthorn. Planted trees associated with residential properties include: maple species, Norway spruce, ash species, willow species, and honeylocust.

Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
	<p><i>Aquatic Findings:</i> 60 m north of Dundas Street, surface water is conveyed under Trafalgar Road through a box culvert to East Morrison Creek. During the field visit the west channel was wetted and watercress and cyprinids were observed. Approximately 220 m north of Dundas Street the surface water conveyance system flows under Trafalgar Road through a box culvert. The channels were choked with <i>Phragmites</i> sp. and <i>Typha</i> sp. Small-bodied fish were observed in deeper water at the culvert. Three additional box culverts north of this crossing and south of Burnhamthorpe Road conveyed surface water from agricultural fields toward the channel at Dundas Street. These systems were dry at the time of the survey except for small amounts of standing water at the culverts. No fish were observed.</p>			<p>Six culverts were located during the 2013 field investigations within Section H.</p> <ul style="list-style-type: none"> 60 m north of Dundas Street (C6, on Figure 2), surface water is conveyed under Trafalgar Road through a box culvert to East Morrison Creek. Gabion baskets are located on either side of culvert. Water was approximately 20 cm deep with cobble and gravels substrates, wetted width was approximately 1.2 m, and top of bank was approximately 1.2 m. Banks consisted of a combination of gabion baskets as well as some treed areas. Approximately 220 m north of Dundas Street (C5, on Figure 2) the surface water conveyance system flows under Trafalgar Road through a box culvert. Culvert was choked with common reed grass. Approximately 400 m from Dundas Street (C4, on Figure 2) was a twin concrete culvert, no flowing water was observed, choked with reed canary grass and some cattail. 700 m north of Dundas Street (CC, on Figure 2) was a small CSP approximately 20 cm wide, 30 cm wetted width, water 5 cm deep, cobble, and gravel substrates. Choked with common reed grass and reed canary grass. 1.2 km north of Dundas Street (C3, on Figure 2) was a concrete box culvert. No water was observed, and was choked with common reed grass. 200 m south of Burnhamthorpe (CB, on Figure 2) Road, was a twin concrete box culvert with 5 cm standing water, and choked with reed canary grass and cattail. <p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant.</p>
Section I – East Side	<p><i>Terrestrial Findings:</i> Mostly Active Agricultural Fields with a ditch along both sides. Vegetation includes: common reed grass, cattail, Canada goldenrod, purple loosestrife, wild carrot, and chicory.</p> <p><i>Aquatic Findings:</i> North of Burnhamthorpe Road to Highway 407, three 1 m CSP culverts were located 150 and 400 m north of Burnhamthorpe Road and 250 m south of Highway 407. These culverts convey surface water from adjacent agricultural fields. At the time of the field visit the systems were dry and generally choked with <i>Phragmites</i>.</p>			<p><i>Aquatic Findings:</i> North of Burnhamthorpe Road to Highway 407, four 1 m CSP culverts.</p> <ul style="list-style-type: none"> 150 m of Burnhamthorpe Road (C2, on Figure 2) is a small steel corrugate pipe, no water was observed and choked with common reed grass; 400 m north of Burnhamthorpe Road (CA, on Figure 2) was a small CSP, no water was observed. A hay bale was observed within culvert, obstructing water flow. 250 m south of Highway 407 (C1, on Figure 2) are two culverts. The first is located southeast of service road conveying water from agricultural field. Water was 5 cm deep, channel was 40 to 50 cm wide, cobble substrate, and eroded banks. The second is located northwest of service road going under Trafalgar Road. Small CSP with piled stone in front of the culvert.

Table 2. Summary of Field Investigations

Section	2009 Field Investigations	Distance from Road	Other Observations	2013 Field Investigations
Section I – West Side	<p><i>Terrestrial Findings:</i> Mostly Active Agricultural Fields with a ditch along both sides. Vegetation includes: common reed grass, cattail, Canada goldenrod, purple loosestrife, wild carrot, and chicory.</p> <p><i>Aquatic Findings:</i> North of Burnhamthorpe Road to Highway 407, three 1 m CSP culverts were located 150 and 400 m north of Burnhamthorpe Road and 250 m south of Highway 407. These culverts convey surface water from adjacent agricultural fields. At the time of the field visit the systems were generally dry and choked with <i>Phragmites</i>.</p>			<p><i>Terrestrial Findings:</i> 2009 field investigation data remains relevant.</p> <ul style="list-style-type: none"> Newly construction GO parking lot <p><i>Aquatic Findings:</i> 150 m of Burnhamthorpe Road (C2, on Figure 2) is a small CSP, no water was observed and choked with reed canary and cattails</p> <ul style="list-style-type: none"> 400 m north of Burnhamthorpe Road (CA, on Figure 2) was a small CSP; water was frozen at the culvert opening during investigations 250 m south of Highway 407 (C1, on Figure 2) is one CSP conveying water under Trafalgar Road

4.2.3 Spring 2014 Field Visit

Field investigations were conducted on June 9th, 2014 and focused on the collection of a plant species list within McCraney Valley Park, adjacent to Sheridan College, and a survey for the presence of Barn Swallow along the entire study area.

The following section presents the results of this survey.

4.2.3.1 Vegetation Survey

The detailed vegetation survey identified 43 plant species within the study area. 26 species (60%) of the plants identified are native species; while 17 (40%) of plants are non-native species. Of the native plants, 21 are rank S5, one is ranked S4 and none are ranked S1-S3. Four locally significant species were identified in the woodland; Red Pine (*Pinus resinosa*) which is ranked as rare in Halton Region, Shagbark Hickory (*Carya ovata*), Spotted Crane’s-bill (*Geranium maculatum*) and Rough Bedstraw (*Galium asprellum*) all ranked as uncommon. The only species observed along the edge of the woodland was rough bedstraw, all other species were observed within the woodland at least 8 m from the edge.

Three spring ephemeral plants were identified within the study area; Jack-in-the-Pulpit (*Arisaema triphyllum*), White Trillium (*Trillium grandiflorum*), and Trout Lily (*Erythronium americanum*). Jack-in-the-pulpit was widespread and occurred throughout the study area. The other spring ephemeral plants were not commonly occurring and were only found near limit of the study area furthest from Trafalgar Road.

The southern limit of the woodland, as measured from the dripline of trees, is 4.2 m from the current edge of Trafalgar Road. This part of the woodlot is dominated by mature Sugar Maple (*Acer saccharum*) which have large canopies and therefore an extensive dripline. Meanwhile, the northern limit of the woodland, as measured from the dripline of trees, is 8.4 m from Trafalgar Road. This part of the woodlot is dominated by Common Buckthorn and Hawthorn which have much smaller canopies and driplines. The area between the road and the woodlot is currently maintained as a manicured lawn with a concrete sidewalk and bus shelters.

4.2.3.2 Barn Swallow Survey

There are eight watercourse crossings within the project area and all were surveyed for nesting Barn swallows. Results of these surveys are presented in **Table 3**.

Watercourse crossing structures within the study area do not provide suitable habitat for nesting swallows. All watercourse crossing structures were surveyed for nesting Barn Swallows, regardless of their suitability, and no nests or evidence of past nesting were identified. Furthermore no swallows of any species were observed flying or foraging within the vicinity of any of the watercourse crossings.

Table 3. Results of Barn Swallow Survey

Culvert Identifier	Suitability of Habitat	Nests Observed (Y/N)	Barn Swallows Observed (Y/N)
C5, C6	Potentially suitable <ul style="list-style-type: none"> Large concrete box culvert with walls of potentially suitable height to support nesting swallows. However, use as nesting structure is unlikely due to surrounding land use. Channelized creek does not provide mud to build nests although it is recognized that Barn Swallows will travel to suitable collection sites (e.g., adjacent puddles, ditches, edges of farm fields) to collect mud if it is not present within the nesting location. Noise disturbance from Trafalgar Road to breeding birds would be considerable. 	N	N
C7, C4	Less Preferred <ul style="list-style-type: none"> Culvert is made of a corrugated steel pipe (CSP), which is an unsuitable nesting structure for Barn Swallow. Mud nests do not adhere well to CSP and the rounded shape does not provide the overhead ledge the species prefers to nest under. 	N	N
CC	Less Preferred <ul style="list-style-type: none"> A moderately sized concrete box culvert; however, the walls are too low in height to support nesting swallows. Use as nesting structure is unlikely as the noise disturbance from Trafalgar Road to breeding birds would be considerable. 	N	N
C3	Less Preferred <ul style="list-style-type: none"> A moderately sized concrete box culvert; however, walls are too low in height to support nesting swallows. Use as nesting structure is unlikely as the noise disturbance from Trafalgar Road to breeding birds would be considerable. 	N	N
CB	Less Preferred <ul style="list-style-type: none"> Culverts are made of a CSP, which is an unsuitable nesting structure for Barn Swallow. Mud nests do not adhere well to CSP and the rounded shape does not provide the overhead ledge the species prefers to nest under. 	N	N
C2	Less Preferred <ul style="list-style-type: none"> Culvert is made of a CSP, which is an unsuitable nesting structure for Barn Swallow. Mud nests do not adhere well to CSP and the rounded shape does not provide the overhead ledge the species prefers to nest under. 	N	N
CA	Less Preferred <ul style="list-style-type: none"> Culvert is made of a CSP, which is an unsuitable nesting structure for Barn Swallow. Mud nests do not adhere well to CSP and the rounded shape does not provide the overhead ledge that the species prefers to nest under. Furthermore considerable sedimentation has occurred at this location and this culvert has been filled with sediment. 	N	N
C1	Less Preferred <ul style="list-style-type: none"> Culvert is made of a CSP, which is an unsuitable nesting structure for Barn Swallow. Mud nests do not adhere well to CSP and the rounded shape does not provide the overhead ledge that the species prefers to nest under. Furthermore considerable sedimentation has occurred at this location and this culvert has been filled with sediment. 	N	N

4.3 Species at Risk Habitat Screening

In order to better understand which species may be present within the Trafalgar Road study area, a habitat screening of each species listed as Endangered, Threatened and Special Concern identified through background review was completed. This was completed to refine possible candidate species that are more likely to be present within the study area based on preferred habitat characteristics. This screening is based upon a combination of available information:

- a) the presence/absence of suitable preferred habitat identified during site investigations, and
- b) known populations, obtained through range maps, COSEWIC reports, and MNR records.

The results of this assessment are presented below.

The completion of our SAR Screening formed the basis to the IGF that was submitted to the MNRF. Should the MNRF have any concerns with potential negative adverse effects to SAR, as a result of the widening of Trafalgar Road, there may be a need for Mitigation, Compensation and Permitting under the ESA (2007).

Appendix D presents a habitat assessment of species potentially found within the study area.

Based on background information compiled, a total of 22 Species at Risk are identified to potentially be located within the Town of Oakville. Following the aquatic and terrestrial characterization of the study area, through background review and field investigations, a habitat screening was completed to assess whether suitable habitat is present within the study area. It was determined that six species, protected under the ESA, as well as three additional species listed as Special Concern, have suitable habitat present within the study area. A description of each is presented below.

For the species listed below as Special Concern, though they are not legally protected under the ESA, it is important to have regard for these species and their habitats due to their conservation status and to avoid future implications should the species change status under the ESA (2007).

Although suitable habitat is present within the study area, none of the following species were observed during field investigations completed by AECOM.

American Chestnut (*Castanea dentata*), Endangered - The American Chestnut prefers dryer upland deciduous forests with sandy, acidic to neutral soils. In Ontario, it is only found in the Carolinian Zone between Lake Erie and Lake Huron. The species grows alongside red oak, black cherry, sugar maple, American beech and other deciduous tree species. It can be associated with the following ELC codes: FOD1, FOD2, FOD3, FOD4, FOD5. Within the subject study area, this species has potential habitat located within the FOD5 community observed within McCraney Valley Park.

Butternut (*Juglans cinerea*), Endangered – Butternut is found in deciduous forests having rich, moist, and well-drained soils and is often found along streams. The species may also be found on well-drained gravel sites, especially in limestone areas. Butternut is shade intolerant and usually occurs along or near the edge of deciduous woodlots and hedgerows. It can be associated with the following ELC codes: FOD2, FOD5, FOD6, FOD7; mature hedgerows; soil: dry rocky or moist (4, 5, 6) to fresh (2, 3). Within the subject Study Area, suitable habitat for this species is found within the riparian and wooded communities associated with East and West Morrison Creek.

Barn Swallow (*Hirundo rustica*), Threatened – Barn Swallows are often associated with human settlements, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces. They can be associated with the following ELC codes: Forages in TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1. Within the subject study area, suitable habitat for this species is found within the northern portion of the study area where two abandoned buildings and a pond were observed.

Bobolink (*Dolichonyx oryzivorus*), Threatened – They nest primarily in forage crops, particularly hayfields and pastures, dominated by a variety of species such as clover, tall grasses and broadleaved plants; they also occurs in wet prairie, graminoid, peatlands and abandoned fields. Bobolinks generally require tracts of grassland >5 ha. They also can nest in lightly grazed pastures, fallow and abandoned fields and shallow grassy marshes. They can be associated with the following ELC Codes: TPO, TPS, CUM1, MAM2. Within the subject study area, suitable habitat for this species is found within the northern portion of the study area where there are several agricultural fields.

Chimney Swift (*Chaetura pelagica*), Threatened – Chimney Swifts formerly nested in the trunks of large, hollow trees. Today, they mainly use chimneys or abandoned buildings as nesting sites. Species may forage over wide variety of habitats and requires dead trees >30 cm for roosting and possibly nesting. Where these species are observed foraging only, it is not considered significant habitat. Species can be associated with the following ELC codes: Forages in TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1; nest in any communities where buildings with chimneys present. Within the subject study area, suitable habitat for this species is within the East and West Morrison Creek valley areas.

Eastern Meadowlark (*Sturnella magna*), Threatened – Most common in native grasslands, savannah, old fields, hayfields, lightly grazed pastures, weedy meadows, and fields with occasional shrubs. They require a minimum area of grassland of about 5 ha. They can be associated with the following ELC codes: TPO, TPS, CUM1, MAM2, MAS2. Within the subject study area, suitable habitat for this species is found within the northern portion of the study area where there is a mixture of agricultural lands, cultural meadows and cultural thickets.

Milksnake (*Lampropeltis triangulum*), Special Concern - The Milksnake can be found in a range of habitats including rocky outcrops, fields and forest edges. In southern Ontario, it is often found in old farm fields and farm buildings where there is an abundance of mice. The Milksnake hibernates underground, in rotting logs or in the foundations of old buildings. They can be associated with the following ELC codes: CUM, FOD, FOC. Within the subject study area, suitable habitat for this species is found within the northern portion of the study area where there is a mixture of agricultural lands, cultural meadows and cultural thickets.

Eastern Ribbon Snake (*Thamnophis sauritus*), Special Concern – The Eastern Ribbonsnake is usually found close to water, especially in marshes, where it hunts for frogs and small fish. It is a good swimmer, and will dive in shallow water, especially if it is fleeing from a potential predator. At the onset of cold weather, these snakes congregate in underground burrows or rock crevices to hibernate together. They can be associated with the following ELC codes: OAO, MAM, MAS, SW, BO. Within the subject study area, suitable habitat for this species is found within the East and West Morrison Creek valleys areas.

Snapping Turtle (*Chelydra serpentina*), Special Concern - Although Snapping Turtles have been observed in shallow water in almost every kind of freshwater habitat, the preferred habitat of the species is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges, and slow streams, or areas combining several of these wetland habitats. Individual turtles will persist in urbanized water bodies, such as golf course ponds and irrigation canals, but it is unlikely that a population could become established in such habitats. This species may be associated with the following ELC codes: OAO. Within the subject study area, suitable habitat for this species is found within the East and West Morrison Creek.

Please refer to Section 7 below to see appropriate Mitigation Measures and additional field investigations to be completed during detailed design.

5. Assessment of Significance

The features and species found within the study area have been assessed using local, provincial and federal rankings systems outlined by the Halton Region, MNRF, the Federal Species at Risk Act (SARA) and the Ontario Endangered Species at Risk Act (SARO). The following significant features and species listed below were not observed during investigations completed by AECOM, but information was obtained from the NHIC's Biodiversity Explorer, Atlas of Breeding Birds, Correspondence with the MNRF and the completed Species at Risk Screening.

5.1 Federally Significant Features and Species

The following Federally Recognized Species have been identified as potentially occurring within the study area by NHIC and Bird Studies Canada, and deemed to have suitable habitat located on-site through the completion of our Species at Risk Habitat Screening. No Federally ranked Natural Areas were observed within the study area.

- **American chestnut** (*Castanea dentate*) – listed as Endangered, SARA – protected under the *Federal Endangered Species Act*
- **Butternut** (*Juglans cinerea*) – listed as Endangered, SARA - protected under the *Federal Endangered Species Act*
- **Chimney swift** (*Chaetura pelagica*) – listed as Threatened, SARA - protected under the *Federal Endangered Species Act*
- **Eastern Ribbonsnake** (*Thamnophis sauritus*) – listed as Special Concern, SARA
- **Milksnake** (*Lampropeltis triangulum*) – listed as Special Concern, SARA;
- **Snapping Turtle** (*Chelydra serpentina*) – listed as Special Concern, SARA

5.2 Provincially Significant Features and Species

The following Provincially Recognized Feature is located within the study area as documented by the MNRF:

- North Oakville – Milton East Provincially Significant Wetland (PSW) complex

The following Provincially Recognized Species have been identified as potentially occurring by NHIC, MNRF Correspondence and Bird Studies Canada, and deemed to have suitable habitat located within the study area. None of these species were observed during field investigations completed by AECOM.

- **American chestnut** (*Castanea dentate*) – listed as Endangered, SARO - protected under the *Ontario Endangered Species Act*
- **Butternut** (*Juglans cinerea*) – listed as Endangered, SARO - protected under the *Ontario Endangered Species Act*
- **Chimney swift** (*Chaetura pelagica*) – listed as Threatened, SARO - protected under the *Ontario Endangered Species Act*;
- **Barn Swallow** (*Hirundo rustica*) – listed as Threatened, SARO – protected under the *Ontario Endangered Species Act*;
- **Bobolink** (*Dolichonyx oryzivorus*) – listed as Threatened, SARO - protected under the *Ontario Endangered Species Act*;
- **Eastern Meadowlark** (*Sturnella magna*) – listed as Threatened – protected under the *Ontario Endangered Species Act*;

- **Eastern Ribbonsnake** (*Thamnophis sauritus*) – listed as Special Concern, SARO;
- **Northern Myotis** (*Myotis septentrionalis*) – listed as Endangered, SARO;
- **Milksnake** (*Lampropeltis triangulum*) – listed as Special Concern, SARO; and
- **Snapping Turtle** (*Chelydra serpentina*) – listed as Special Concern, SARO.

5.3 Regionally Significant Features and Species

The following Locally Recognized Features are located within the study area as documented by the Halton Region Official Plan:

- Portions of six candidate significant woodlands found within 120 m of Trafalgar Road totalling approximately 6.4 ha including Morrison Valley Trail North, Oak Park, East Morrison Creek, McCraney Valley Park and a Wetland community.

6. Impact Assessment

The following section discusses the predicted impacts to the natural environment as a result of the proposed works. Impacts have been divided into existing, potential short-term, and potential long-term environmental impacts. Existing impacts are those identified within the study area prior to any construction related activities occurring on-site. Whereas, potential short-term and potential long-term environmental impacts, are those impacts anticipated based on the proposed work plan related to the Trafalgar Road improvements.

There are two key stages in development during which potential environmental impacts may occur: (1) *construction stage* and (2) *post-construction stage*. The majority of short-term impacts will be related to the construction stage of the Trafalgar Road improvements. Generally, these impacts will be temporary in nature and can be prevented or minimized through proper construction practices and site inspection, whereas long-term impacts are prevented and mitigated through site design, buffer implementation, best management practices, and environmentally sensitive maintenance.

6.1 Existing Impacts

It is recognized that within southern Ontario there are few, if any, undeveloped areas that have not been disturbed by some level of human activity. Therefore, in order to assess the potential impacts of the proposed works it is necessary to consider existing human-related impacts that are present within the site. Existing impacts should be documented prior to the onset of any construction activities to accurately determine, whether impacts are as a result of construction or as a result of previous activities or events on the subject lands. Some existing impacts may provide an opportunity for the implementation of restoration initiatives as part of the environmental management for the proposed road improvements.

The following existing impacts are noted for the proposed project area:

- **Poor Water Quality within the East and West Morrison Creeks** from urban surface water runoff containing nutrients, road salts, hydrocarbons, and pesticides.
- **Degraded Aquatic Habitat within the East and West Morrison Creeks** due to existing adjacent land uses, such as urbanization which creates surface runoff and therefore allows pollutants from point and non-point sources access to the aquatic environment. Agricultural fields nearby may elevate concentrations of nutrients, fecal coliforms, and sediment loads on the aquatic system.
- **Erosion and Sedimentation** within existing watercourses
- **Edge effects on vegetation communities** have resulted in the colonization of the on-site vegetation communities with invasive weeds and edge inhabiting bird species that often prey on woodland species and diminish core woodland habitat for sensitive bird species.
- **Noise impacts from main road systems and adjacent residential areas** have had a long-term effect on the bird and wildlife species inhabiting the woodlands and wetlands within the subject lands, likely reducing the number of birds frequenting the area. Other local bird species have acclimated to the noise generated.
- **Dust deposition** on vegetation and groundcover within vegetation communities along existing road systems has likely reduced productivity of vegetation along edges.
- **Fragmentation of natural areas** within the study area. Due to development within the study area, natural areas which remain are a fraction of what they historically were in the past where the majority of these areas are isolated amongst an urbanized setting.
- **Morrison Wedgewood Diversion Channel is a barrier to Lake Ontario** resulting in an isolated fish community.

6.2 Short-term Impacts

The potential short-term environmental effects associated with the proposed widening of Trafalgar Road relate primarily to construction activities. Many of the potential short-term impacts are common to various types of infrastructure construction and, therefore, have associated standard mitigation measures.

Potential construction related impacts that are relevant to the proposed project are the following:

- **Disturbance and damage of vegetation along Trafalgar Road** – During construction heavy machinery may damage trees and shrubs within affected areas. This impact can be easily prevented by the installation of protective fencing. An additional disturbance may include dust deposition of vegetation which may interrupt plants' ability to photosynthesize. This impact can be easily mitigated by the use of dust suppressants to reduce or eliminate dust generation.
- **Removal of trees to widen Trafalgar Road** – Tree removal may be required to accommodate the widening of Trafalgar Road. Details will be determined during detailed design.
- **Damage to tree rooting zones** – During grading and construction in areas immediately adjacent to natural heritage features and planted trees, roots may be damaged by machinery and soils may be compacted, thereby affecting the trees' ability to grow and absorb nutrients and water. In order to address root damage, it will be necessary to prune roots of adjacent trees during grading and excavation. To avoid compaction of soils, root zones around trees within natural heritage features will need to be fenced. Most areas will be avoided by restricting construction to areas outside the features.
- **Fill and sediment deposition within watercourses** – Fill and sediment runoff from the active construction area may enter the watercourses on-site (East Morrison Creek, West Morrison Creek, Morrison Wedgewood Diversion Channel). This impact can be easily prevented with the installation of sediment control fencing.
- **Disturbance of fish habitat** – During construction, there is potential for disturbance of fish and fish habitat. Construction activities have the potential to introduce sediment and increase turbidity within the watercourse. The activities may also disturb the west pond banks. These potential impacts can be prevented through appropriate mitigation measures, including but not limited to, the implementation of a proper erosion and sediment control plan and by careful construction techniques. If in-water works are necessary, a *Fisheries Act* Authorization may be required and a fish rescue will be likely. In order to minimize disturbance during critical periods, construction for in-water works will need to be restricted to a period between July 2 and March 30 of any given year. This timing window will allow for all possible species to complete their spawning without construction disturbance.
- **Disturbance of birds and other wildlife** – Construction activities within the subject lands have the potential to disturb breeding birds and other resident wildlife within the study area within portions of the six Candidate Significant Woodlands. A certain degree of disturbance can be avoided by restricting construction activities during the construction day and the breeding period (May 1st to July 31st).
- **Short term, isolated dewatering** of the work area may be necessary during the construction phase. Details of this will be determined during the detailed Design stage of the project. If this isolated dewatering and pump around is not managed properly, there is potential for impacts to occur to the associated watercourse and fish and fish habitat.

6.3 Long-term Impacts

Direct long-term environmental impacts are defined as those impacts that result in the immediate loss of features or functions through the implementation of the proposed development and that have an impact over a long period of time. An example of a direct impact would be the removal of trees or other vegetation in order to clear land for a development.

- **Loss or Potential Disturbance to Vegetation** - Vegetation may be cleared to accommodate the widening of Trafalgar Road. This increases the amount of edge effects, potentially leading to the introduction and increased population of invasive species, thereby decreasing the amount of native species. Details will be determined during detailed design.
- **Damage to peripheral vegetation:** During grading and construction in areas immediately adjacent to identified Natural Areas and planted trees, roots may be damaged by machinery and soils may be compacted, thereby affecting the trees' ability to grow and absorb nutrients and water. In order to address root damage, it will be necessary to prune roots of adjacent trees during grading and excavation. To avoid compaction of soils, root zones around trees within natural heritage features will need to be fenced. Most areas will be avoided by restricting construction to areas outside the features.
- **Introduction of Non-Native Species:** Landscaped areas with flowerbeds and other planted vegetation could introduce non-native and/or invasive plant species into the adjacent vegetation communities, as well as entail the use of pesticides, reducing the natural integrity of these areas.
- **Potential Disruption to Resident Wildlife through Noise:** Noise from increased traffic volumes along Trafalgar Road may have an effect on resident wildlife. To survive, wildlife require environments which allow them to carry out all their life processes; songbirds need to make and hear songs and calls to attract mates and defend their territories; raptors rely on keen eyesight and their hearing to hone in on prey, and carnivorous mammals such as coyotes and foxes rely on their hearing to hunt voles and mice, which can comprise more than 60% of their diet. Noise has been shown to have varying effects that can be extremely species-specific, and can differ between migrating or resident wildlife and different wildlife guilds, depending on the decibel level, length of exposure to the sound, and the sound's source.
- **Potential Disruption to Wildlife through Lighting:** New street lighting north of Dundas Street has the potential to affect biological cycles of resident wildlife.

Research on the effects of increased artificial light exposure on wildlife is still relatively in its infancy, and is generally focused more on the impacts of lighted buildings on migrating birds; that research shows that migrating birds are strongly affected by artificially lighted buildings during their twice-annual migration, often to their detriment when it results in fatal collisions due to offices keeping their lights on at night.

- **Potential Increase of Wildlife Road Mortality:** The proposed road widening will result in an increase in traffic flow within the area, especially within areas in proximity to the six identified Candidate Significant Woodlands and PSW, and will expose resident wildlife to an increase in potential collisions.
- **Potential Disturbance to Significant Identified Woodlands** – Vegetation within the identified Significant Woodlands may be removed in some locations to accommodate the widening of Trafalgar Road. Details will be determined during detailed design. Should this occur, the general mitigation measures outlined below should be followed, and a more detailed mitigation plan for the removal of trees will be created.

6.4 Net Effects

The “net effects” of potential impacts were assessed based on the degree to which recommended mitigation measures can prevent and/or minimize potential environmental effects. In other words, net effects are those that remain after mitigation has been implemented.

The following guidelines were applied during the assignment of net effects from the widening of Trafalgar Road. The impacts were considered relative to the significance and sensitivity of the ecological feature and/or function:

- **NO Net Effect** - indicates no measurable impact to the identified ecological features;
- **LOW Net Effect** - indicates loss of habitat possessing limited potential habitat value, and/or loss of a portion of habitat, which will not result in long-term impact to the remaining habitat, and/or reduction in associated key ecological functions;
- **MEDIUM Net Effect** - indicates loss of habitat possessing moderate potential habitat value, and/or loss of a portion of habitat that may result in long term impact to the remaining habitat, and/or loss of associated key ecological functions; and
- **HIGH Net Effect** - indicates loss of habitat possessing significant potential habitat value, and/or loss of a portion of habitat that may result in long term and potentially critical impact to the remaining habitat, and/or significant loss of associated key ecological functions.

Table 4 provides an outline of the net effects of the proposed development.

6.5 Dundas-Trafalgar Inc. (Minto) Proposed East Morrison Creek Realignment

Several proposed development projects located adjacent to Trafalgar Road are underway simultaneous to the completion of this EA study. The Dundas-Trafalgar Inc. (Minto) and Shieldbay Inc. subdivision northeast of Dundas Street and Trafalgar Road is of specific importance to the Natural Environment Report because it includes the Tributary of East Morrison Creek.

The realignment of the east branch of East Morrison Creek was an opportunity proposed by Minto as a means to accommodate runoff and mitigate impacts to the creek resulting from the redevelopment of the above noted property. The East Branch EIR/FSS reports documenting the Minto proposed creek realignment design and associated impacts were reviewed in relation to the Trafalgar Road ROW and are documented in the *Trafalgar Road Corridor Improvements EA, Cornwall Road to Highway 407 Stormwater Management Report (2014)*.

The Minto creek realignment proposal is known as the ‘Combination Option’. It is being carried forward to detailed design in advance of the Trafalgar Road proposed construction timeline for the ROW north of Dundas Street and must be shown to be feasible by the developer, pending approval by Conservation Halton, the Town of Oakville and Halton Region. The ‘Combination Option’ includes only two watercourse crossings for Trafalgar Road instead of the existing three culvert crossings. The East Morrison Creek Tributary would realign at Crossing C4 towards the west, where it would join the main branch of East Morrison Creek on the west side of Trafalgar Road, and upstream of the existing confluence. Crossing C6 would remain in place for the water features on the east side of Trafalgar Road.

Table 4. Net Effects Table for the Widening of Trafalgar Road

Location	Environmental Component	Indicators	Potential Effects	Mitigation Measures	Net Effects
Widening of Trafalgar Road	Aquatic Environment	Predicted changes in water quality	<ul style="list-style-type: none"> Potential for sediment laden surface runoff and sediment loading from slope into the watercourses during construction 	<ul style="list-style-type: none"> During the construction phase use of Best Management Practices (BMPs) such as, silt fencing, and other erosion and sediment controls could reduce sedimentation. Proper installation and designation of stockpile areas could reduce some of the impact on the surface water runoff. 	<ul style="list-style-type: none"> Low net effect Proper installation of sediment control fencing can prevent deposition of fill and sedimentation. No changes to site drainage.
		Predicted impact on aquatic habitat	<ul style="list-style-type: none"> Potential for sediment laden surface runoff and sediment loading from slope into the watercourses during construction Potential for temporary disturbance or displacement of fish and fish habitat during the replacement of culvert C7 due to in water works Potential for scouring or erosion of banks during pump around technique to isolate work area 	<ul style="list-style-type: none"> During the construction phase use of BMPs such as, silt fencing, and other erosion and sediment controls could reduce stockpile areas (greater than 30 m from any watercourse) could reduce some of the impact on the surface water runoff. Adhere to fisheries timing window of March 15th to July 15th, meaning no construction activities are to take place within that time. Use geotextile at the discharge points to prevent scouring and erosion of the banks. 	<ul style="list-style-type: none"> Low net effect Proper installation of sediment control fencing can prevent deposition of fill and sedimentation. No changes to site drainage.
	Predicted impact on aquatic biota	<ul style="list-style-type: none"> Potential for sediment laden surface runoff and sediment loading from slope into the watercourse during construction Potential for temporary disturbance or displacement of fish and fish habitat during the replacement of culvert C7 due to in water works 	<ul style="list-style-type: none"> During the construction phase use of BMPs such as, silt fencing, and other erosion and sediment controls could reduce stockpile areas (greater than 30 m from any watercourse) could reduce some of the impact on the surface water runoff. Adhere to fisheries timing window of March 15th to July 15th, meaning no construction activities are to take place within that time. 	<ul style="list-style-type: none"> Low net effect Proper installation of sediment control fencing can prevent deposition of fill and sedimentation. No changes to site drainage. 	
Terrestrial Environment	Predicted impact on vegetation communities, Identified Significant Woodlands, PSW, and edge road vegetation	Removal of some vegetation may occur within four of the six identified Candidate Significant Woodlands however preliminary design drawing are showing only minimal removals could potentially occur totalling approximately 0.5 ha of vegetation	<ul style="list-style-type: none"> Loss of vegetation will be compensated through the planting of native trees and shrubs at an accepted ratio as per the Regional Policy for Tree Removal Installation of protective fencing Use of dust suppressants Proper installation of protective fencing, restriction of access and dust suppressants can prevent potential impacts from edge effects. 	<ul style="list-style-type: none"> During the construction phase use of BMPs such as, silt fencing, and other erosion and sediment controls could reduce stockpile areas (greater than 30 m from any watercourse) could reduce some of the impact on the surface water runoff. Adhere to fisheries timing window of March 15th to July 15th, meaning no construction activities are to take place within that time. 	<ul style="list-style-type: none"> Low net effect Proper installation of sediment control fencing can prevent deposition of fill and sedimentation. No changes to site drainage.
		Removal of all edge vegetation within areas adjacent to the right-of-way may be required to accommodate the widening of Trafalgar Road	<ul style="list-style-type: none"> Where removals will occur this will increase in edge effects resulting in an increase in: <ul style="list-style-type: none"> Invasive species; Windthrow; 	<ul style="list-style-type: none"> Loss of vegetation will be compensated through the planting of native trees and shrubs at an accepted ratio as per the Regional Policy for Tree Removal Installation of protective fencing Use of dust suppressants Proper installation of protective fencing, restriction of access and dust suppressants can prevent potential impacts from edge effects. 	<ul style="list-style-type: none"> Low net effect Proper installation of protective fencing, restriction of access and use of dust suppressants can prevent potential impacts. The preliminary design is avoiding the removal of trees within McCraney Valley Park (associated with Sheridan College), however should it be determined during detailed design that trees are to be removed a tree assessment will be conducted in consultation with Conservation Halton. A Tree Preservation Plan shall be prepared during detailed design to determine the

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Table 4. Net Effects Table for the Widening of Trafalgar Road

Location	Environmental Component	Indicators	Potential Effects	Mitigation Measures	Net Effects			
		<ul style="list-style-type: none"> Soil compaction; and Root damage to trees The Provincially Significant North Oakville-Milton East Wetland Complex will not be affected by the widening of Trafalgar Road 			<p>compensational plantings required, as per the <u>Regional Policy for Tree Removal</u>. In addition, a permit from CH will be obtained for any tree removal activities within the CH regulatory limits</p> <ul style="list-style-type: none"> Proper installation of protective fencing, restriction of access and use of dust suppression can prevent potential impacts. It is recommended that all silt fences be keyed in at the low with compost or mulch-filled filter socks along their entire length to create a stronger barrier to the entry of silt and sediment into the watercourses within the vicinity of Trafalgar Road. No changes to site drainage. Revegetation activities will be completed to the satisfaction of CH, and in accordance with the CH's Landscape and Tree Preservation Guidelines, dated 2010 is understood that Native species to the Halton Region, as well as species that are comparable to those removed must be planted. Any new vegetation planted during or post construction should be monitored for a minimum of two years to ensure that the health of the species is maintained. 			
					Predicted impact on wildlife habitat	<ul style="list-style-type: none"> Potential disturbance to breeding birds through construction noise, vibration and potential tree removal Potential disturbance to other wildlife through construction noise, vibration and potential tree and cement slab removal 	<ul style="list-style-type: none"> Construction restriction to periods before and after breeding period (no works between May 1 to July 31). Install tree protection fencing around remaining trees Restriction of construction to 7:00 am to 7:00 pm. 	<ul style="list-style-type: none"> Low to No net effect With the implementation of restrictions to the timing of construction disturbance to birds & wildlife can be avoided
					Predicted impact of project on vegetation and wildlife including rare, threatened or endangered species.	<ul style="list-style-type: none"> No rare species were observed during field investigations 	<ul style="list-style-type: none"> Prior to construction where vegetation is proposed to be removed, the area should be surveyed to determine the presence or absence of Species at Risk identified as potentially located within the study area as per Section 4.3 of this report; If found, any Species at Risk should be transplanted to a suitable location within Study area 	<ul style="list-style-type: none"> No Net Effect

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Table 4. Net Effects Table for the Widening of Trafalgar Road

Location	Environmental Component	Indicators	Potential Effects	Mitigation Measures	Net Effects
	Overall Net Effect				<ul style="list-style-type: none"> Low Net Effect Through the use of appropriate mitigation measures it is not anticipated for the widening of Trafalgar Road to have a significant impact on the natural features within the study area.

7. Mitigation Measures

The potential impacts and mitigation measures described herein are general in nature and appropriate to an EA level of planning. Detailed impact assessment and the provision of detailed recommendations for mitigation and compensation will be provided at the detailed design stage of the proposed works.

As noted in Section 6.5, a realignment of the east branch of East Morrison Creek is proposed by Minto as a means to accommodate runoff and mitigate impacts to the creek resulting from the redevelopment of the land north of Dundas Street. This alternative is being carried forward to detailed design in advance of the widening of Trafalgar Road north of Dundas Street and must be shown to be feasible by the developer, pending approval by Conservation Halton, the Town of Oakville and Halton Region.

Mitigation measures must be used for erosion and sediment control to prohibit sediment from entering the identified Natural Areas during construction. The primary principles associated with sedimentation and erosion protection measures are to:

1. minimize the duration of soil exposure,
2. retain existing vegetation, where feasible,
3. encourage re-vegetation,
4. divert runoff away from exposed soils,
5. keep runoff velocities low, and
6. trap sediment as close to the source as possible.

Sediment and Erosion Control Fencing

- ▶ Details of the type and placement of sediment and erosion control to be used will be outlined in Sediment and Erosion Control Plan to be drafted during Detailed Design.

The Ministry of Natural Resources & Forestry (MNR) is the lead agency for setting timing guidelines for work in and around water. Timing guidelines are applied to protect fish from impacts of works or undertakings in and around water during spawning migrations and other critical life history stages. The application of in-water work timing guidelines is consistent with MNR's responsibility as the lead provincial fisheries management agency.

Construction Mitigation – Fisheries Timing Windows

- ▶ All of the identified watercourses within the vicinity of the proposed works are classified as warm-water, and as such, all in-water construction activities must adhere to watercourse specific timing windows set out by the MNR to avoid critical spawning/migration periods. The restricted activity timing window for the spring spawning period is from April 1st to June 30th. That is, construction activities are restricted to between July 1st and March 31st. In general, construction activities near water or in-water should take place within the low flow period in the late summer months as to avoid or minimize impacts.

During construction adjacent to the identified Candidate Significant Woodlands, heavy equipment could damage peripheral vegetation from contact, excavation and/or soil compaction. Dust coated vegetation can reduce photosynthesis, increase susceptibility to disease and lead to death. It is anticipated that perimeter plants would be most susceptible to such effects. The following recommendations are made to mitigate these potential impacts.

Peripheral Vegetation Protection

- ▶ Prior to heavy machinery working adjacent to identified Candidate Significant Woodlands, a fence barrier for tree protection should be installed outside the drip-line of the significant features to protect any vegetation that is to be retained and is in the vicinity of exposure to damage by machinery.

Dust Suppressant Treatment

- ▶ Dust suppressants during dry periods should be applied to those areas which generate large amounts of dust.
- ▶ Restrict earth movement immediately adjacent to woodlands during periods of high dust generation.

Construction vehicle access should be limited to areas adjacent to identified Candidate Significant Woodlands to prevent soil compaction and/or the initiation of soil erosion events. Construction vehicle re-fuelling stations should be centralized away from natural areas and watercourses. Vehicle washing should be prohibited in areas adjacent to the woodlands. The following recommendations are provided to address these potential sources of impacts.

Controlled Construction Vehicle Access

- ▶ Construction vehicle access should be limited to existing roadways and construction paths, away from the identified Natural Areas and their recommended buffers.
- ▶ For areas immediately adjacent to the identified Candidate Significant Woodlands boundaries, periodic supervision of the construction is recommended.

Construction Vehicle Re-fuelling Stations

- ▶ Re-fuelling stations should be located within a centralized location on-site away from the identified Candidate Significant Woodlands, watercourses and their recommended buffers.
- ▶ Re-fuelling stations should be constructed in a manner to prevent soil and/or surface and groundwater contamination from any leaks or spills.
- ▶ An emergency response kit should be made available at each re-fuelling station in case of a spill.
- ▶ All on-site crew members operating construction vehicles should be appropriately trained in handling a potential spill and have WHMIS Training.
- ▶ All chemical transfer/maintenance should be conducted within the refuelling station areas.

Damage to Rooting Zones During Removals

- ▶ During grading and construction in areas immediately adjacent to identified Candidate Significant Woodlands and planted trees, roots may be damaged by machinery and soils may be compacted, thereby affecting the trees' ability to grow and absorb nutrients and water. In order to address root damage, it will be necessary to prune roots of adjacent trees during grading and excavation. To avoid compaction of soils, root zones around trees within natural heritage features will need to be fenced. Most areas will be avoided by restricting construction to areas outside the features.

Construction activities within the study area have the potential to disturb breeding birds and other resident wildlife within the identified Candidate Significant Woodlands. A certain degree of disturbance can be avoided by the proper scheduling of construction periods. The following mitigation measures are recommended to minimize impacts to wildlife.

Wildlife Habitat Protection and Mitigation Measures

- ▶ A wildlife survey shall be carried out during detailed design, at the appropriate time of year. In addition, a more detailed wildlife observation protocol will be drafted to ensure the appropriate mitigation measures are followed for encounters with wildlife. The following presents some of the standard steps to be followed.
- ▶ Upon the first encounter of any wildlife including SAR (Endangered, Threatened or Special Concern) the following steps are to be taken:
 - Work in the immediate vicinity of the observation is to come to a stop;
 - Should an Ecologist/Biologist not be on-site, one should be contacted immediately;
 - Ecologist/Biologist will notify the District MNRF Biologist within 48 hours of any observation of Endangered and Threatened species and/or immediately for any species going to a wildlife custodian. It should be noted that if the SAR observed has limited or no mobility (e.g., plant, Bobolink nest, Blandings Turtle), then MNRF will be contacted immediately for further direction. In general, if wildlife is observed within the active construction zone, construction shall cease, and the SAR shall be permitted to move at their respective pace.
 - It is not necessary to notify the District MNRF Biologist with observations of Special Concern species (i.e., Snapping Turtle) or general wildlife sightings (i.e., deer, raccoon, etc.).

Breeding Birds and Vegetation Removals

- ▶ A breeding bird survey shall be carried out during detailed design, at the appropriate time of year.
- ▶ Clearing shall only be undertaken if the ecologist is satisfied there are no breeding/nesting pairs within the affected area. Removal of vegetation within the study area can occur between the months of September to April, which is outside of the typical breeding bird period (May 1st to July 31st) within southern Ontario. If removal of vegetation is to occur during the breeding bird window, the Canadian Wildlife Service will be consulted. The area will also be searched by a qualified ecologist for the presence of nesting birds to avoid contravening the Migratory Birds Convention Act.

Construction Mitigation – Noise Disturbance to Resident Wildlife

- ▶ Construction is restricted to periods before and after breeding period (no works May 1 to July 31).
- ▶ Limit construction activity to a period after 7 am and before 7 pm daily.

Species at Risk Protection and Handling

- ▶ Species at Risk (SAR) identified as potentially occurring within the study area (Section 4.3 above) should be surveyed for during detailed design prior to the initiation of construction. A qualified ecologist/biologist or ecologists should conduct a survey of the project work area and areas immediately adjacent to the work areas (10-30 m) for the Species at Risk identified in the EIS document. Where Species at Risk are found, appropriate transplanting (for vegetation species, with the exception of Butternut) and relocation (for reptiles and amphibians) will be undertaken by a qualified professional, in consultation with the MNRF. During detailed design it is recommended for a Species at Risk Survey to be completed. Should any of the species be observed within the construction area, a Transplant and Relocation Plan should be prepared and implemented prior to construction, in consultation with the MNRF. If Butternut is confirmed within the project work area or within 25 m of the work area from site surveys, the MNRF will be contacted for further advice on how to proceed.
- ▶ Any required SAR relocation must be conducted by a qualified SAR Specialist.

8. References

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Southern Region
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Ministry of
Natural Resources

Ministère des
Richesses Naturelles

January 15, 2013

Appendix A

Agency Correspondence

Nicola Lower
Biologist
AECOM
200-50 Sportsworld Crossing Road
Kitchener, ON N2P 0A4
nicola.lower@aecom.com

**Re: MNR Species at Risk Screening Letter
Regional Municipality of Halton
Trafalgar Road Improvements (Cornwall Road to Highway 407)
Town of Oakville, Regional Municipality of Halton**

Dear Ms. Lower,

In a phone conversation on January 9, 2013 Corinne Latimer requested information on natural heritage features and element occurrences occurring on or adjacent to the above mentioned location.

There are Species at Risk recorded for your study area. We have records of Bobolink, Eastern Meadowlark, Northern Map Turtle, Milksnake, Snapping Turtle, Eastern Ribbonsnake, and Canada Warbler. Butternut may also be possible within the study area. Some of these species may receive protection under the *Endangered Species Act 2007* and thus, a permit may be required if the work you are proposing could cause harm to these species or their habitat. Please provide additional information on your proposal to our office, and we will assess it to determine whether a permit under the ESA 2007 is required for the works to proceed.

Natural heritage features recorded for your area include the Oakville-Milton Wetlands and Uplands Candidate Life Science ANSI, and the Provincially Significant North Oakville-Milton East Wetland Complex.

This species at risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any species at risk to the NHIC and to our office. This will assist with updating our database.

If you have any questions or comments, please do not hesitate to contact me at 905-713-7425.

Sincerely,

Melinda Thompson
Species at Risk Biologist
Ontario Ministry of Natural Resources, Aurora District

Subject: FW: SARA Screening for Trafalgar Road Widening Project

From: Cooper, Jenie [<mailto:Jenie.Cooper@dfo-mpo.gc.ca>]
Sent: Tuesday, February 05, 2013 11:41 AM
To: Aitken, Sarah
Cc: Lower, Nicola; jwilson@hrca.on.ca
Subject: Re: SARA Screening for Trafalgar Road Widening Project

Hi Sarah,

There are no SARA species present in the study area, therefore no SARA permit will be required. Please continue to work with the Conservation Authority and MNR on this project.

Best regards,
Jenie

From: Aitken, Sarah [<mailto:Sarah.Aitken@aecom.com>]
Sent: Tuesday, February 05, 2013 11:31 AM
To: Cooper, Jenie
Cc: Lower, Nicola <Nicola.Lower@aecom.com>
Subject: SARA Screening for Trafalgar Road Widening Project

Hi Jenie,

AECOM has been retained by the Regional Municipality of Halton to complete the Environmental Existing Conditions for the Trafalgar Road Widening Project.

The study area is located within the Conservation Halton jurisdiction and the study area lies within the Sixteen Mile Creek Watershed. We understand that West Morrison Creek may contain Redside Dace, however no other SAR have been identified.

At this time we would like to request that DFO please confirm the presence of any SAR within the Trafalgar Road study area to determine if any permitting will be required under the SARA. Any other information DFO may have pertaining to the study area would also be greatly appreciated.

Please let me know if you have any questions.

Thanks,
Sarah

Piette, Jessica

From: Aitken, Sarah
Sent: Monday, May 27, 2013 8:51 PM
To: Piette, Jessica
Subject: FW: SARA Screening for Trafalgar Road Widening Project

Can you please file

From: Cooper, Jenie [<mailto:Jenie.Cooper@dfo-mpo.gc.ca>]
Sent: Tuesday, February 05, 2013 11:41 AM
To: Aitken, Sarah
Cc: Lower, Nicola; jwilson@hrca.on.ca
Subject: Re: SARA Screening for Trafalgar Road Widening Project

Hi Sarah,

There are no SARA species present in the study area, therefore no SARA permit will be required. Please continue to work with the Conservation Authority and MNR on this project.

Best regards,
Jenie

From: Aitken, Sarah [<mailto:Sarah.Aitken@aecom.com>]
Sent: Tuesday, February 05, 2013 11:31 AM
To: Cooper, Jenie
Cc: Lower, Nicola <Nicola.Lower@aecom.com>
Subject: SARA Screening for Trafalgar Road Widening Project

Hi Jenie,

AECOM has been retained by the Regional Municipality of Halton to complete the Environmental Existing Conditions for the Trafalgar Road Widening Project.

The study area is located within the Conservation Halton jurisdiction and the study area lies within the Sixteen Mile Creek Watershed. We understand that West Morrison Creek may contain Redside Dace, however no other SAR have been identified.

At this time we would like to request that DFO please confirm the presence of any SAR within the Trafalgar Road study area to determine if any permitting will be required under the SARA. Any other information DFO may have pertaining to the study area would also be greatly appreciated.

Please let me know if you have any questions.

Thanks,
Sarah

Mirabelli, Maria

From: ESA Aurora (MNR) <ESA.Aurora@ontario.ca>
Sent: Monday, December 30, 2013 3:48 PM
To: Piette, Jessica
Subject: Trafalgar Road Widening - MNR IGF

Hello Jessica,

I'm currently reviewing the IGF submitted for the Trafalgar Road Widening Project.

Can you tell me if a survey for Barn Swallow nests was completed under the bridges and culverts within the study area? If so, what were the results? If not, a nest survey can be completed at any time and does not have to occur during the breeding season.

Also, can you let me know how much the road will be widened on either side of its existing alignment (in metres)?

Thank you and Happy New Year,

Natosha

Natosha Fortini
Assistant Species at Risk Biologist
Ministry of Natural Resources
Aurora District
50 Bloomington Rd.
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905.713.6483
natosha.fortini@ontario.ca

From: Piette, Jessica [<mailto:Jessica.Piette@aecom.com>]
Sent: September 16, 2013 1:34 PM
To: ESA Aurora (MNR)
Cc: Lower, Nicola; Latimer, Corinne; Deman, Jillian
Subject: Information Gathering Form

Good afternoon,

Please find attached our completed IGF form for the Trafalgar Road Widening Project.

Do not hesitate to contact me should there be any questions regarding our submission.

Thank you and have a great day,

Jessica Piette

Appendix B

Atlas of Breeding Bird Species List

Bird Species Listed for Square 17PJ01

Trafalgar Road Improvements

Common Name	Scientific Name	Status						Significant in Region 6 (south-central)	Significant in Region 7 (south)	Conservation Priority - Halton Region	
		Species at Risk (national) ^a	SARA (Species at Risk Act) status	SARA Schedule	Species at Risk (provincial)	Provincially Rare (NHIC breeding season SRANK) ^b	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan			Area-sensitive (OMNR ^c)	Level
Alder Flycatcher	<i>Empidonax albonum</i>									Level 3	Forest
American Black Duck	<i>Anas rubripes</i>									Level 2	Marsh
American Crow	<i>Corvus brachyrhynchos</i>										
American Goldfinch	<i>Carduelis tristis</i>									Level 3	open Country
American Kestrel	<i>Falco sparverius</i>						√			Level 2	open Country
American Redstart	<i>Setophaga ruticilla</i>							A		Level 2	Forest
American Robin	<i>Turdus migratorius</i>										
American Woodcock	<i>Scolopax minor</i>									Level 4	Forest
Baltimore Oriole	<i>Icterus galbula</i>						√				
Bank Swallow	<i>Riparia riparia</i>	THR	No Status		THR		√			Level 2	Open Country
Barn Swallow	<i>Hirundo rustica</i>	THR	No Status		THR					Level 4	Open Country
Belted Kingfisher	<i>Ceryle alcyon</i>						√				
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>						√				
Black-capped Chickadee	<i>Parus atricapillus</i>										
Blue Jay	<i>Cyanocitta cristata</i>										
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>							A		Level 3	Forest
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	No Status		THR		√	A		Level 2	Open Country
Brown Creeper	<i>Certhia americana</i>							A		Level 2	Forest
Brown Thrasher	<i>Toxostoma rufum</i>						√			Level 1	Open Country
Brown-headed Cowbird	<i>Molothrus ater</i>										
Canada Goose	<i>Branta canadensis</i>										
Carolina Wren	<i>Thryothorus ludovicianus</i>										
Cedar Waxwing	<i>Bombycilla cedrorum</i>							S3S4		Level 3	Forest
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>									Level 1	Forest
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	Schedule 1	THR		√				
Chipping Sparrow	<i>Spizella passerina</i>										
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>									Level 3	Open Country
Common Grackle	<i>Quiscalus quiscula</i>									Level 1	Open Country
Common Nighthawk	<i>Chordeiles minor</i>	THR	THR	Schedule 1	THR					Level 3	Forest
Common Yellowthroat	<i>Geothlypis trichas</i>										
Cooper's Hawk	<i>Accipiter cooperi</i>	NAR							A		
Downy Woodpecker	<i>Picoides pubescens</i>										
Eastern Kingbird	<i>Tyrannus tyrannus</i>						√			Level 3	Open Country
Eastern Meadowlark	<i>Sturnella magna</i>						√			Level 3	Open Country
Eastern Phoebe	<i>Sayornis phoebe</i>									Level 3	Forest
Eastern Screech-Owl	<i>Megascops asio</i>	NAR									
Eastern Towhee	<i>Pipilo erythrophthalmus</i>						√			Level 2	Forest
Eastern Wood-Pewee	<i>Contopus virens</i>						√				
European Starling	<i>Sturnus vulgaris</i>										
Field Sparrow	<i>Spizella pusilla</i>						√			Level 3	Open Country

Common Name	Scientific Name	Status						Significant in Region 6 (south-central)	Significant in Region 7 (south)	Conservation Priority - Halton Region	
		Species at Risk (national) ^a	SARA (Species at Risk Act) status	SARA Schedule	Species at Risk (provincial) ^a	Provincially Rare (NHIC breeding season SRANK) ^b	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan			Area-sensitive (OMNR ^c)	Level
Grasshopper Sparrow	<i>Ammodramus saviannarum</i>						√	A	Level 3	Open Country	
Gray Catbird	<i>Dumetella carolinensis</i>								Level 4	Forest	
Great Blue Heron	<i>Ardea herodias</i>										
Great Crested Flycatcher	<i>Myiarchus cineritus</i>										
Great Horned Owl	<i>Bubo virginianus</i>										
Green Heron	<i>Butorides virescens</i>								Level 4	Marsh	
Hairy Woodpecker	<i>Picoides villosus</i>										
Horned Lark	<i>Eremophila alpestris</i>								Level 3	Open Country	
House Finch	<i>Carpodacus mexicanus</i>										
House Sparrow	<i>Passer domesticus</i>										
House Wren	<i>Troglodytes aedon</i>										
Indigo Bunting	<i>Passerina cyanea</i>										
Killdeer	<i>Charadrius vociferus</i>										
Least Flycatcher	<i>Empidonax minimus</i>							A			
Mallard	<i>Anas platyrhynchos</i>										
Mourning Dove	<i>Zenaidura macroura</i>										
Mourning Warbler	<i>Oporornis philladelphia</i>								Level 2	Forest	
Mute Swan	<i>Cygnus olor</i>										
Northern Cardinal	<i>Cardinalis cardinalis</i>						√				
Northern Flicker	<i>Colaptes auratus</i>										
Northern Mockingbird	<i>Mimus polyglottus</i>										
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>								Level 1	Open Country	
Ovenbird	<i>Seiurus aurocapillus</i>								Level 2	Open Country	
Pileated Woodpecker	<i>Dryocopus pileatus</i>								Level 4	Forest	
Pine Warbler	<i>Dendroica pinus</i>								Level 2	Forest	
Purple Martin	<i>Progne subis</i>								Level 2	Marsh	
Red-breasted Nuthatch	<i>Sitta canadensis</i>								Level 3	Forest	
Red-eyed Vireo	<i>Vireo olivaceus</i>								Level 1	Open Country	
Red-tailed Hawk	<i>Buteo jamaicensis</i>								Level 2	Forest	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	NAR							Level 2	Forest	
Rock Pigeon	<i>Columba livia</i>										
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>						√				
Ruby-throated Hummingbird	<i>Archilochus colubris</i>								Level 3	Forest	
Savannah Sparrow	<i>Passerculus sandwichensis</i>						√		Level 1	Open Country	
Scarlet Tanager	<i>Piranga olivacea</i>								Level 2	Forest	
Sharp-shinned Hawk	<i>Accipiter striatus</i>								Level 2	Forest	
Song Sparrow	<i>Melospiza melodia</i>	NAR									
Spotted Sandpiper	<i>Actitis macularia</i>										
Tree Swallow	<i>Tachycineta bicolor</i>								Level 3	Open Country	
Tufted Titmouse	<i>Baeolophus bicolor</i>								Level 3	Forest	

Appendix B-2014-12-09-Breeding Bird List, Trafalgar, Road-60119993

Bird Species Listed for Square 17PJ01

Common Name	Scientific Name	Status						Significant in Region 6 (south-central)	Significant in Region 7 (south)	Conservation Priority - Halton Region					
		Species at Risk (national) ^a	SARA (Species at Risk Act) status	SARA Schedule	Species at Risk (provincial) ^a	Provincially Rare (NHIC breeding season SRANK) ^b	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan			Area-sensitive (OMNR ^c)	Level	Habitat			
Turkey Vulture	<i>Cathartes aura</i>														
Veery	<i>Catherus fuscescens</i>													Level 3	Forest
Vesper Sparrow	<i>Pooecetes gramineus</i>									√				Level 3	Open Country
Warbling Vireo	<i>Vireo gilvus</i>														
Whip-poor-will	<i>Caprimulgus vociferus</i>									√				Level 2	Forest
White-breasted Nuthatch	<i>Sitta carolinensis</i>	THR	THR	Schedule 1	THR										
Willow Flycatcher	<i>Empidonax traillii</i>									√					
Wood Duck	<i>Aix sponsa</i>														
Wood Thrush	<i>Hylocichla ustelina</i>									√				Level 4	Forest
Yellow Warbler	<i>Dendroica petechia</i>													Level 4	Forest
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>													Level 3	Forest

KEY

^a National Species at Risk are those listed by COSEWIC = Committee on the Status of Endangered Wildlife in Canada
^b Provincial Species at Risk are those listed by COSSARO = Committee on the Status of Species at Risk in Ontario
 END = Endangered, THR = Threatened, SC = Special Concern

^b SRANK (from Natural Heritage Information Centre) shown for breeding status if: S1 (Critically Imperiled, often < 5 occurrences), S2 (Imperiled, often < 20 occurrences), S3 (Vulnerable, often 80 or fewer), S3S4 (uncertain between S3 and S4), or T (tracked species) that are S4 or S5; SRANK not shown if: S4 (apparently secure, uncommon), S5 (secure, common).

^c Area-sensitive sources:

^c Ontario Ministry of Natural Resources (OMNR), 2000. Significant Wildlife Habitat Technical Guide (Appendix G), 151 p plus appendices.
^d Ontario Ministry of Natural Resources (OMNR), 1993 (Revised 1994, 2002 draft), Ontario Wetland Evaluation System, Southern Manual, 3rd Edition, NEST Technical Manual TM-002, 173 pp.

Priority species identified in the Partners in Flight Draft Ontario Bird Conservation Region 13 Landbird Conservation Plan. Available at:

Conservation Priority Species obtained from: <http://www.bsc-ecoc.org/conservation/birdlists.html>

Appendix C

Plant Species List

Plant Species List

Trafalgar Road Improvements

BOTANICAL NAME	COMMON NAME	COSYMBOL OF CONSERVATION	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OWNR STATUS	COSEWC STATUS	GLOBAL STATUS	LOCAL STATUS HALT VARGA 2000
GYMNOSPERMS	CONIFERS								
Cupressaceae	Cedar Family								
<i>Thuja occidentalis</i>	Eastern White Cedar	4	-3		S5			G5	X
Pinaceae	Pine Family								
<i>Picea abies</i>	Norway Spruce		5	-1	SE3			G?	X
<i>Picea pungens</i>	Colorado Spruce				SE1			G5	X
<i>Pinus resinosa</i>	Red Pine	8	3		S5			G5	R1
<i>Pinus sylvestris</i>	Scotch Pine		5	-3	SE5			G?	X
DICOTYLEDONS	DICOTS								
Aceraceae	Maple Family								
<i>Acer platanoides</i>	Norway Maple		5	-3	SE5			G?	X
<i>Acer saccharum ssp. saccharum</i>	Sugar Maple	4	3		S5			G5T?	X
Anacardiaceae	Sumac or Cashew Family								
<i>Rhus hirta</i>	Staghorn Sumac	1	5		S5			G5	X
Apiaceae	Carrot or Parsley Family								
<i>Daucus carota</i>	Wild Carrot		5	-2	SE5			G?	X
Asclepiadaceae	Milkweed Family								
<i>Asclepias syriaca</i>	Common Milkweed	0	5		S5			G5	X
Asteraceae	Composite or Aster Family								
<i>Achillea millefolium</i>	Common Burdock		5	-2	SE5			G?T?	X
<i>Cirsium vulgare</i>	Bull Thistle		4	-1	SE5			G5	X
<i>Cichorium intybus</i>	Chicory		5	-1	SE5			G?	X
<i>Symphoricarpos alba</i>	New England Aster	2	-3		S5			G5	X
<i>Symphoricarpos speciosus</i>	Aster species								
<i>Solidago canadensis</i>	Canada Goldenrod	1	3		S5			G5	X
<i>Solidago altissima</i>	Tall Goldenrod	1	3		S5				X
<i>Solidago speciosa</i>	Goldenrod species								
<i>Taraxacum officinale</i>	Common Dandelion		3	-2	SE5			G5	X
Betulaceae	Birch Family								
<i>Betula papyrifera</i>	White Birch		2		S5			G5	X
Biognoniaceae	Biognonia Family								
<i>Catalpa bignonioides</i>	Common Catalpa	3	-1		SE1			G4G5	
Caprifoliaceae	Honeysuckle Family								
<i>Lonicera tatarica</i>	Tartarian Honeysuckle	3	-3		SE5			G?	X
Cornaceae	Dogwood Family								
<i>Cornus stolonifera</i>	Red-osier Dogwood	2	-3		S5			G5	X
Dipsacaceae	Teasel Family								
<i>Dipsacus fullonum</i>	Wild Teasel		5	-1	SE5			G?T?	X

Elaeagnaceae	Oleaster Family								
<i>Elaeagnus angustifolia</i>	Russian Olive								G?
Fabaceae	Pea Family								
<i>Gleditsia triacanthos</i>	Honey Locust	3	0			S2			G5
<i>Lotus corniculatus</i>	Bird's-foot Trefoil		1	-2		SE5			G?
Fagaceae	Beech Family								
<i>Quercus alba</i>	White Oak	6	3			S5			G5
<i>Quercus rubra</i>	Red Oak	6	3			S5			G5
Guttiferae	St. John's-wort Family								
<i>Hypericum perforatum</i>	Common St. John's-wort		5	-3		SE5			G?
Juglandaceae	Walnut Family								
<i>Carya cordiformis</i>	Bitternut hickory	6	0			S5			G5
<i>Carya ovata var. ovata</i>	Shagbark Hickory	6	3			S5			G5
<i>Juglans nigra</i>	Black Walnut	5	3			S4			G5
Lythraceae	Loosestrife Family								
<i>Lythrum salicaria</i>	Purple Loosestrife		-5	-3		SE5			G5
Oleaceae	Olive Family								
<i>Fraxinus americana</i>	White Ash	4	3			S5			G5
<i>Fraxinus pennsylvanica</i>	Red Ash	3	-3			S5			G5
Polygonaceae	Smartweed Family								
<i>Rumex crispus</i>	Curly-leaf Dock		-1	-2		SE5			G?
Rhamnaceae	Buckthorn Family								
<i>Rhamnus cathartica</i>	Common Buckthorn		3	-3		SE5			G?
Rosaceae	Rose Family								
<i>Malus pumila</i>	Common Crabapple		5	-1		SE5			G5
<i>Rubus idaeus ssp. idaeus</i>	Red Raspberry					SE1			G5T5
Salicaceae	Willow Family								
<i>Populus tremuloides</i>	Trembling Aspen	2	0			S5			G5
<i>Salix X rubens</i>	Reddish Willow		-4	-3		SE4			HYB
Tiliaceae	Linden Family								
<i>Tilia americana</i>	American Basswood	4	3			S5			G5
<i>Tilia cordata</i>	Small Leaf Linden					SE1			G?
Ulmaceae	Elm Family								
<i>Ulmus americana</i>	White Elm	3	-2			S5			G5?
MONOCOTYLEDONS	MONOCOTS								
Poaceae	Grass Family								
<i>Phragmites australis</i>	Common Reed	0	-4			S5			G5
<i>Phalaris arundinacea</i>	Reed Canary Grass	0	-4			S5			G5
Typhaceae	Cattail Family								
<i>Typha latifolia</i>	Broad-leaved Cattail	3	-5			S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Plant Species List

Trafalgar Road Improvements

Species Diversity

Total Species:	42	
Native Species:	23	54.76%
Exotic Species	19	45.24%
Total Taxa in Region (List Region, Source)	10000	
% Regional Taxa Recorded	0.42%	
Regionally Significant Species	1	
S1-S3 Species	1	
S4 Species	1	
S5 Species	22	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	3.22
CC 0 to 3	13
CC 4 to 6	9
CC 7 to 8	1
CC 9 to 10	0
lowest sensitivity	56.52%
moderate sensitivity	39.13%
high sensitivity	4.35%
highest sensitivity	0.00%
Floral Quality Index (FQI)	15.43

Presence of Weedy & Invasive Species

mean weediness	-2.00
weediness = -1	7
low potential invasiveness	36.84%
weediness = -2	5
moderate potential invasiveness	26.32%
weediness = -3	7
high potential invasiveness	36.84%

Presence of Wetland Species

average wetness value	1.65
upland	11
facultative upland	17
facultative	5
facultative wetland	8
obligate wetland	2
	26.19%
	40.48%
	11.90%
	19.05%
	4.76%

Appendix D

Species at Risk Habitat Assessment



Species at Risk Screening

Regional Municipality of Halton - Trafalgar Road Improvements



Common Name	Scientific Name	Preferred Habitat (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Habitat Present within the Study Area (Y/N)
Endangered					
American Chestnut	<i>Castanea dentata</i>	The American Chestnut prefers dryer upland deciduous forests with sandy, acidic to neutral soils. In Ontario, it is only found in the Carolinian Zone between Lake Erie and Lake Huron. The species grows alongside Red Oak, Black Cherry, Sugar Maple, American Beech and other deciduous tree species. Can be associated with the following ELC codes: FOD1, FOD2, FOD3, FOD4, FOD5 Soil: dry sandy (MR = 0, 1, 2).	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool 	In Canada, it was restricted primarily to southwestern Ontario's Carolinian Forest Zone, where it was a relatively widespread and dominant species in some areas. Today, less than 200 trees of any size remain in the province.	Yes – Potential suitable habitat is present within the FOD5 community within McCraney Valley Park. Species was not observed during AECOM field investigations.
Butternut	<i>Juglans cinerea</i>	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges. Can be associated with the following ELC codes: FOD2, FOD5, FOD6, FOD7; mature hedgerows; Soil: dry rocky or moist (4, 5, 6) to fresh (2, 3).	<ul style="list-style-type: none"> MNR Aurora District correspondence 	Butternut can be found throughout central and eastern North America. In Canada, Butternut occurs in Ontario, Quebec and New Brunswick. In Ontario, this species is found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	Yes – Potential suitable habitat for butternut does exist within the study area. Several of the woodland/riparian communities provide appropriate habitat conditions. This species is widespread throughout Ontario. Species was not observed during AECOM

Common Name	Scientific Name	Preferred Habitat (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Habitat Present within the Study Area (Y/N)
Eastern Flowering Dogwood	<i>Cornus florida</i>	Borders of woodlands and sunny openings; grows around edges and hedgerows. Understorey species in semi open dry oak-hickory to mesic maple-beech deciduous or mixed forests. Grows in sandy soil, more or less clayey. If present, likely to be planted specimens. Planted individuals are protected by the ESA. Flowers May; fruits mature fall. Can be associated with the following ELC codes: FOM1, FOM2, FOM3, FOD1, FOD2, FOD5, FOD6, CUW ; Soil: dry (0) to fresh (1,2,3).	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool 	The range of Eastern Flowering Dogwood in Ontario is limited to the Carolinian Zone, a narrow band in southwestern Ontario, extending from the south eastern shore of Lake Huron, south eastward to the west end of Lake Ontario.	No – Potential suitable habitat is not present within the study area.
Henslow's Sparrow	<i>Ammodramus henslowii</i>	This species prefers large, fallow, grassy areas with ground mats of dead vegetation, dense herbaceous vegetation, ground litter and some song perches. Can also be found in neglected weedy fields, wet meadows, cultivated uplands. This species requires a moderate amount of moisture, as well as a tract of grasslands >40 ha, but usually in areas >100 ha. Can be associated with the following ELC codes: CUM1-1, MAM, CUW .	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool 	The species has experienced a serious decline in Ontario and no definite evidence of breeding has been reported in the province for several years.	No – Potential suitable habitat is not present within the study area. The required large tracts of grasslands are not present within the site.
Northern Bobwhite	<i>Colinus virginianus</i>	Requires open edge habitats that provide a mixture of grasslands, croplands and thickets. In	<ul style="list-style-type: none"> NHIC – City of Oakville Search, 	The Northern Bobwhite is near its northern range limit in southern	No – Potential suitable habitat is not present

29/08/2013

Common Name	Scientific Name	Preferred Habitat (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Habitat Present within the Study Area (Y/N)
Northern Myotis (formerly Northern Long-eared Bat)	<i>Myotis septentrionalis</i>	summer, uses grasslands to nests and feed. From summer to fall, requires croplands for feeding, dusting and roosting. Uses dense thickets for shelter and rest throughout the year, and for feeding during fall and winter. These three habitat types must be sufficiently interspersed to be in close proximity to the others. CUM1, CUT1, TPO, TPS, CUS1.	<ul style="list-style-type: none"> using Spatial Boundary Tool NHIC – Map Interface 1km search for study area 	Ontario. This bird benefited greatly when the original forests were cleared and it expanded its range significantly in Ontario. At its peak over a century ago, its range in Ontario extended north to Georgian Bay and east to Kingston. This range has steadily retracted and now includes only the southwest corner of the province, mostly on Walpole Island, and possibly a few scattered locations nearby. Isolated sightings away from this area are usually a result of introductions or birds escaping from captivity.	No – Potential suitable habitat is not found within the study area. Not all habitat requirements are found within close proximity to one another within the study area.
Redside Dace	<i>Clinostomus elongatus</i>	Northern long-eared bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines.	<ul style="list-style-type: none"> NHIC – Map Interface 1km search for study area 	The northern long-eared bat is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon. This bat is found in all Canadian provinces as well as the Yukon and Northwest Territories.	No – Potential suitable habitat is not found within the study area.

29/08/2013

Common Name	Scientific Name	Preferred Habitat (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (© Queen's Printer for Ontario, 2013 - Ontario Species at Risk Website ; Significant Wildlife Habitat Technical Guide; Species at Risk Registry & Ontario's Biodiversity - ROM)	Habitat Present within the Study Area (Y/N)
Shorthead Cisco	<i>Coregonus reighardi</i>	In Ontario, the Shorthead Cisco lives in the deep, cold water of the Great Lakes, usually at depths between 22 to 110 metres . It has been found at depths reaching 144 metres! This species eats mostly freshwater shrimp.	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool NHIC – Map Interface 1km search for study area 	The Shorthead Cisco was once found in Lakes Huron, Michigan and Ontario, but it has been extirpated from Lakes Michigan and Ontario.	No – Potential suitable habitat is not present within the study area. All watercourses which cross Trafalgar Road are not deep enough to provide adequate habitat. According to range maps, this species is not found within the region.
Threatened					
Barn Swallow	<i>Hirundo rustica</i>	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from	<ul style="list-style-type: none"> Atlas of Breeding Birds of Ontario Search squares 17PJ01 	Found throughout Ontario.	Yes – Potential suitable habitat is present within the study area. Two abandoned buildings are located on the east side of Trafalgar road within section H of the study

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Bobolink	<i>Dolichonyx oryzivorus</i>	Nests primarily in forage crops, particularly hayfields and pastures , dominated by a variety of species such as clover, tall grasses and broadleaved plants; also occurs in wet prairie, graminoid, peatlands and abandoned fields; generally requires tracts of grassland >5 ha . Also nests in lightly grazed pastures, fallow and abandoned fields and shallow grassy marshes. Can be associated with the following ELC Codes: TPO, TPS, CUM1, MAM2	<ul style="list-style-type: none"> MNR Aurora District correspondence Atlas of Breeding Birds of Ontario Search squares 17PJ01 	In Ontario, Bobolink is widely distributed throughout most of the province south of the boreal forest. It could also potentially be found in the north where suitable habitat exists.	Yes – Potential suitable habitat is present within the study area. The agricultural lands within the northern portion of the study area provide adequate nesting habitat for this species. Range maps suggest this species is found throughout many places in Ontario south of the boreal forest.

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Chimney Swift	<i>Chaetura pelagica</i>	Formerly nested in the trunks of large, hollow trees. Today, mainly use chimneys or abandoned buildings as nesting sites. May forage over wide variety of habitats. It requires dead trees >30 cm for roosting and possibly nesting. Where swifts observed foraging only, is not Significant habitat. Can be associated with the following ELC codes: Forages in TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1 ; nest in any communities where buildings with chimneys present.	<ul style="list-style-type: none"> Atlas of Breeding Birds of Ontario Search squares 17PJ01 	In Ontario, the Chimney Swift is most widely distributed in the Carolinian zone in the south and southwest portions of the province, however has been detected throughout most of the province south of the 49th parallel.	Species was not observed during AECOM field investigations. Yes – Suitable habitat is present within the study area. The agricultural lands within the northern portion of the study area as well as the two abandoned buildings are located in Section H provide adequate habitat for this species. Range maps suggest that this species is most commonly found in the Carolinian zone, however no known records have been reported for our study area.
Dense Blazing Star	<i>Liatris spicata</i>	Species is found mainly in moist prairies, savannahs, dune swales and abandoned fields in coarse sand or sandy loam soils. It does not	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial 	In Ontario, it is found in small, isolated populations near Windsor, on Walpole Island in the St. Clair	Species was not observed during AECOM field investigations. No – Suitable habitat is not present within the study area. This species

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Eastern Musk Turtle	<i>Sternotherus odoratus</i>	tolerate shade and is thus usually found in areas that have been disturbed by fire, flooding, drought or grazing. Can be associated with the following ELC codes: TPO2, TPS2, CUM, CUS .	Boundary Tool	River, and at sites in Kent, Lambton, Middlesex, and Elgin Counties.	prefers tall grass prairies which were not located during investigations. According to range maps this species has not been located within the Halton Region.
Eastern Meadowlark	<i>Sturnella magna</i>	Require water > 1 m deep; slow moving water of lakes, streams, marshes and ponds and soft earth to bury into for hibernation; eggs laid in debris or under stumps at water's edge and exposed to direct sunlight. Can be associated with the following ELC Codes: MAM3, MAS2, MAS3, OAO, SA . Most common in native grasslands, savannah, old fields, hayfields, lightly grazed pastures, weedy meadows, fields with occasional shrubs. Minimum area of grassland required is about 5 ha. Can be associated with the following ELC codes: TPO, TPS, CUM1, MAM2, MAS2	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool 	In Ontario, it is now largely confined to Georgian Bay and the southern edge of the Precambrian Shield. It can be locally abundant.	No – Suitable habitat is not present within the study area. Through investigations of all the watercourses, depths do not meet the requirement for this species.
			<ul style="list-style-type: none"> MNR Aurora District correspondence Atlas of Breeding Birds of Ontario Search squares 17PJ01 	In Ontario, the Eastern Meadowlark's current breeding range extends from the southwestern part of the province more or less continuously north to include southern Algoma, Sudbury and Nipissing districts. It also occurs in a northern pocket of agricultural lands associated with the Little Clay Belt in Timiskaming District.	Yes – Suitable habitat is present within the study area. The agricultural lands within the north end of Trafalgar Road provide agricultural communities adequate for foraging. Species was not observed during AECOM

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Lake Sturgeon	<i>Acipenser fulvescens</i> pop. 3	Lake Sturgeon are bottom-dwelling fish found in large rivers and lakes over clay, mud, sand and gravel, at depths generally between 5 and 10 m, sometimes greater. Preferred water temperature range 15-17°C	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool 	In Canada, Lake Sturgeon occur in rivers around southern Hudson Bay, in the Great Lakes, and in inland lakes and rivers from Alberta to Quebec. In Canada, eight designable units have been identified for Lake Sturgeon based on genetic and bio-geographical distinctions. Within the Great Lakes, Western (Upper) St. Lawrence designable unit (DUB), this species has been identified as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). There are 63 known existing populations in the Great Lakes and Western St. Lawrence basin (DUB); however, only 20 are known to spawn successfully, and only four populations are considered to be large.	No – Potential Suitable habitat is not present within the Trafalgar Road study area.
Special Concern					
Canada Warbler	<i>Wilsonia canadensis</i>	The Canada Warbler breeds in a variety of wet deciduous and coniferous forests that have a dense, well developed, shrub layer.	<ul style="list-style-type: none"> MNR Aurora District correspondence 	The Canada Warbler only breeds in North America and about 80% of its known breeding range occur in Canada. Its primary breeding range	No – Potential Suitable habitat is not found within the study area.

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Common Nighthawk	<i>Chordeiles minor</i>	This species can be associated with the following ELC communities: FOC3, FOC4, FOM6, FOM7, FOM8, FOD6, FOD7, FOD8, FOD9, SWC, SWM and SWD . A well-developed shrub layer within these communities is required. The Common Nighthawk nests in a wide range of open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can be associated with the following ELC codes: SD, BB, RB, CUM, MAM, FOM, FOC	<ul style="list-style-type: none"> Birds of Ontario Search squares 17PJ01 	is in the Boreal Shield, extending north into the Hudson Plains and south into the Mixedwood Plains. Although the Canada Warbler breeds at low densities across its range, in Ontario, it is most abundant along the Southern Shield. In Ontario, the Common Nighthawk can be found throughout the province except for the coastal regions of James Bay and Hudson Bay.	No – Suitable habitat is not present within the study area. Due to the urbanized conditions throughout the area, and sparse vegetated communities it is likely the species is not in the area.
Milksnake	<i>Lampropeltis triangulum</i>	The Milksnake can be found in a range of habitats including rocky outcrops, fields and forest edges. In southern Ontario, it is often found in old farm fields and farm buildings where there is an abundance of mice. The Milksnake hibernates underground, in rotting logs or in the foundations of old buildings. Can be associated with the following ELC	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool NHIC – Map Interface 1km search for study area MNR Aurora District correspondence 	In Ontario, Milksnakes are widespread and locally common within the southern portion of the province, and ranges as far north as Lake Nipissing and Sault Ste. Marie.	Yes – Suitable habitat is present within the study area. Riparian vegetation along East Morrison Creek provides suitable foraging opportunities. Abundant cultural meadow communities throughout the study area

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Northern Map Turtle	<i>Graptemys geographica</i>	Species inhabits large bodies of water with soft bottoms, and aquatic vegetation. Can be found basking on logs or rocks as well as beaches and grassy edges. Usually uses soft soil or clean dry sand for nest sites, and may nest at some distance from water. Its home range size is larger for females (about 70 ha) than males (about 30 ha) and includes hibernation, basking, nesting and feeding areas. Their aquatic corridors (e.g. stream) are required for movement. Species is not readily observed. Can be associated with the following ELC codes: OAO, SA	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool NHIC – Map Interface 1km search for study area MNR Aurora District correspondance 	In southern Ontario, the Northern Map Turtle is found primarily on the shores of Georgian Bay, Lake St. Clair, Lake Erie and Lake Ontario. It can also be found along larger rivers including the Thames, Grand and Ottawa.	are also valuable. According to range maps this species is widespread throughout the province. Species was not observed during AECOM field investigations.
Snapping Turtle	<i>Chelydra serpentina</i>	Although Snapping Turtles have been observed in shallow water in almost every kind of	<ul style="list-style-type: none"> MNR Aurora District correspondance 	In Canada Snapping Turtle can be found from Saskatchewan to Nova	Yes – Suitable habitat is present within the study

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Silver Shiner	<i>Notropis photogenis</i>	freshwater habitat, the preferred habitat of the species is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges, and slow streams, or areas combining several of these wetland habitats. Individual turtles will persist in urbanized water bodies, such as golf course ponds and irrigation canals, but it is unlikely that a population could become established in such habitats. This species may be associated with the following ELC codes: OAO .	<ul style="list-style-type: none"> NHIC – City of Oakville Search, using Spatial Boundary Tool 	Scotia. In Ontario it is primarily limited to the southern portion.	area. East Morrison creek provides adequate habitat for this species including slow moving water and dense aquatic vegetation. In the northern portion of the study area an offline open pond feature was observed. According to range maps, this species is widespread throughout Ontario. Species was not observed during AECOM field investigations.
		Silver Shiner can be found in moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients. Stream widths at capture sites in an Ontario study mostly ranged from 30 to 100 m. Most capture sites were in deep swift riffles and faster currents of pools below the riffles. Stream substrate at capture sites was of gravel, pebble, cobble, boulder, sand, mud and clay; probably the type of substrate is not very important. The species may avoid areas with submersed vegetation. Stream sections where the water		In Ontario, it is found in the Thames and Grand Rivers, and it has been recently reported in Bronte Creek and Sixteen Mile Creek which flow into Lake Ontario.	No – Suitable habitat is not present within the study area. All the watercourses which flow through this site do not present large, deep and fast flowing characteristics. According to the range maps, this species has been found in Sixteen Mile Creek which is in close proximity

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Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	It is most frequently found along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting. Can be associated with the following ELC codes: OAO, MAM, MAS, SW, BO.	<ul style="list-style-type: none"> MNR Aurora District correspondance 	In Canada, there are two populations: the Great Lakes population of southern Ontario that is part of the main range of the species in the United States; and the separate Atlantic population in Nova Scotia. The distribution of the Great Lakes population roughly follows the southern edge of the Canadian Shield, with the most persistent sightings over time coming from the Georgian Bay region, particularly Bruce County. The snake has probably always been rare in Ontario.	Yes – Potential suitable habitat is present within the study area within the vegetated banks of East Morrison Creek. The box culverts provide suitable basking conditions for reptile species. Species was not observed during AECOM field investigations.