Regional Road 25 Class Environmental Assessment – Natural Environment Report

FINAL REPORT

Prepared for:
Region of Halton

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Sign-off Sheet

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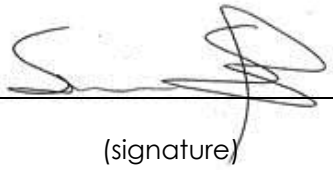
Prepared by 

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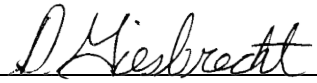
Prepared by 

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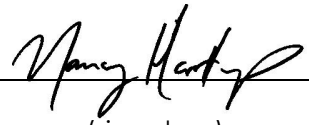
Reviewed by 

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1.0 INTRODUCTION

The Regional Municipality of Halton (the Region) is undertaking a Schedule 'C' Municipal Class Environmental Assessment (MCEA) to identify a preferred alternative that would address the need for anticipated road improvements to meet capacity needs on Regional Road 25 (RR25) from Steeles Avenue to 5 Side Road. Road improvements include widening of the road from four to six lanes, improvements at intersections, and the addition of multi-use pathways and on-road bike lanes in both directions.

In support of the MCEA Study, Stantec Consulting Ltd. (Stantec)conducted a natural heritage assessment to characterize the significance and sensitivity of the natural features in the study area. The results of the assessment are summarized in this report, including a description of the existing aquatic and terrestrial conditions within the study area, identification of potential impacts of the project on these natural features, and recommendations for mitigation.

The study area includes RR25 from Steeles Avenue to 5 Side Road and adjacent lands within 120 m of the Right-of-Way (ROW) on both sides (**Figure 1, Appendix A**).

1.1 OBJECTIVES

The purpose of this Natural Heritage Assessment Report was to:

- summarize the existing natural heritage features and applicable policies within the study area
- evaluate the significance and sensitivity of natural heritage features and species
- identify constraints associated with the proposed road improvements
- provides recommendations to mitigate the potential impacts

2.0 NATURAL HERITAGE POLICY CONSIDERATIONS

2.1 FEDERAL CONTEXT

2.1.1 Migratory Birds Convention Act

The federal *Migratory Birds Convention Act, 1994* (MBCA) is intended to conserve and protect migratory birds and their nests (S.4). Section 6 of the Migratory Bird Regulations (C.R.C., c. 1035) prohibits the disturbance, destruction or taking of a nest, egg, or nest shelter of a migratory bird. Clearing of vegetation during the nesting season or work on a structure that supports nesting birds may result in the inadvertent harming or disturbance of nests, which is a contravention of the MBCA.

2.1.2 Fisheries Act

The *Fisheries Act* prohibits projects causing serious harm to fish unless authorized by the Minister of Fisheries, Oceans, and the Canadian Coast Guard. This applies to activities in or near waterbodies that support fish that are part of, or that support, a commercial, recreational, or Aboriginal (CRA) fishery. If there is risk of serious harm to fish, a Request for Project Review should be submitted to Fisheries and Oceans Canada (DFO) for their review and to determine if the project requires authorization under the *Fisheries Act*.

2.1.3 Species at Risk Act

The *Species at Risk Act* (SARA) prohibits the killing, harming, harassing, capturing, or taking of an individual of a species that is listed as an extirpated, endangered or threatened species in Schedule 1 of the act. It also prohibits the damage or destruction of the habitat of a species that is listed as endangered or threatened, or extirpated species provided that a recovery strategy has recommended the reintroduction of the extirpated into the wild in Canada. Permits for prohibited activities may be issued under Section 73 of SARA.

2.2 PROVINCIAL CONTEXT

2.2.1 Endangered Species Act

The provincial *Endangered Species Act, 2007* (ESA) prohibits the killing, harming, harassing, capturing, or taking of a living member of a species listed as Threatened, Endangered or Extirpated on the Species at Risk in Ontario (SARO) list (O. Reg 230/08) (S. 9), and damage to habitat of protected species (S. 10). Permits for prohibited activities may be issued under S. 17(2) of the ESA.

O. Reg 242/08 of the ESA establishes, among other things, the Species at Risk Registry (the Registry), which allows proponents to register limited prescribed activities that might otherwise contravene the ESA. O. Reg 242/08 provides a regulatory framework for the registry process, which exempts activities that meet a defined set of criteria, as outlined within the regulation, from the ESA S.17(2) permit process. Not all species or activities are eligible for the Registry.

3.0 BACKGROUND REVIEW

3.1 METHODS

Background data applicable to the study area were obtained through review of existing documents and information available online. The following background resources were reviewed:

- Halton Region Official Plan (Halton Region 2009)
- Natural Heritage Information Centre (NHIC) database (MNRF 2017a)
- Land Information Ontario (LIO) natural heritage mapping (MNRF 2017b)
- DFO aquatic species at risk mapping (DFO 2017)
- Ontario Breeding Bird Atlas (Cadman et al. 2007)
- Ontario Mammal Atlas (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2017)
- Natural Heritage Reference Manual for Natural Heritage policies of the Provincial Policy Statement, 2005. Second Edition (MNR 2010)
- Significant Wildlife Habitat Technical Guideline (MNR 2000)
- Long Term Environmental Monitoring Program - Grindstone Creek, Sixteen Mile Creek and Supplemental Monitoring (Conservation Halton 2013)

Agencies were consulted to request natural heritage information for the study area, including Conservation Halton (CH), and Ministry of Natural Resources and Forestry (MNRF). The requests included records of species at risk and provincially rare species, vegetation community classification, CH Regulation mapping and fish community data. CH provided a detailed Environmental Assessment checklist to Stantec. A response has not yet been received from MNRF. Agency correspondence is included in **Appendix B**.

For this assessment, species at risk were defined as species that are listed as Special Concern, Threatened, Endangered or Extirpated on SARO, on Schedule 1 of SARA or recommended as Special Concern, Threatened, Endangered or Extirpated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Provincially rare species were defined as species that are ranked S1, S2 or S3 by the NHIC (**see Section 4.1.4**).

3.2 RESULTS

3.2.1 Landscape Context

The study area is located in the Niagara section of the Deciduous Forest Region (Rowe 1972). This area is also known as the Carolinian Forest. The extreme southern tip of Ontario represents the maximum northern limit of Carolinian Forest. Forests in this region are dominated by broadleaved trees including sugar maple, American beech, basswood, red maple, red oak, white oak, and bur oak, butternut, bitternut hickory, rock elm, silver maple, and blue beech. Species such as black cherry, black walnut, sycamore, swamp white oak, and shagbark hickory are also occasionally present. Species considered rare to the province, such as pignut hickory, tulip-tree, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, paw paw, Kentucky coffee-tree, red mulberry and sassafras are sporadically present. Needle-leaved trees such as hemlock, white pine, tamarack, eastern white cedar, eastern red cedar, and black spruce may be found in isolated patches where soil conditions are favorable.

3.2.2 Designated Natural Heritage Features

The MNRF's LIO website was accessed on July 6, 2017, to identify natural features in the study area, including areas of natural and scientific interest (ANSIs), provincially significant wetlands (PSWs), significant wildlife habitat (SWH), environmentally significant areas (ESAs), provincial or national parks, or conservation areas. No designated natural features were identified in the background review (**Figure1, Appendix A**).

3.2.3 Terrestrial Species at Risk and Provincially Rare Species

The Ontario Reptile and Amphibian Atlas (Ontario Nature 2017), Ontario Breeding Bird Atlas (OBBA) (Cadman et al. 2007) and the Atlas of the Mammals of Ontario (Dobbyn 1994) were accessed to identify species at risk and provincially rare species with known ranges that overlap with the study area. CH also provided information on potential species at risk within the study area.

The atlas search identified thirteen birds, three reptiles, one amphibian, three mammals and one insect with ranges that have the potential to occur in the study area. The wildlife atlas range maps are relatively coarse in nature and do not offer precise locations or information on concentrations/densities of records (e.g., the OBBA records are provided in 10 km by 10 km square grids).

The NHIC database provides more precise mapping for species at risk and provincially rare species than the atlases (1 km by 1 km squares), and is a better indicator of occurrence of significant species, particularly when used in combination with MNRF consultation. The NHIC database was accessed on July 6, 2017 to document known occurrences of species at risk and provincially rare species in the vicinity of the study area. There were no terrestrial species at risk with recent records in the NHIC database.

A habitat assessment for all species at risk and provincially rare species, which were identified through the atlas searches, NHIC background review and MNRF consultation is included in **Appendix C**.

3.2.4 Fish and Fish Habitat

There are three tributaries to the West Branch of Sixteen Mile Creek within the study area. The *Long Term Environmental Monitoring Program Grindstone Creek, Sixteen Mile Creek, and Supplemental Monitoring* report (CH 2013) indicates that the Sixteen Mile Creek subwatershed supports a diverse fish community with up to 15 species captured during 2011 sampling. The condition of the three tributaries within the study area was classified as 'fair' despite the increase in urban development upstream of the study area (CH 2013). The watercourses in the study area have a coolwater thermal regime (CH 2013). Fish community monitoring conducted by CH in the study area indicates that the Sixteen Mile Creek tributaries within the study area support the following fish species (CH 2013; CH 2017):

- Blacknose Dace (*Rhinichthys atratulus*)
- Bluntnose Minnow (*Pimephales notatus*)
- Brook Stickleback (*Culaea inconstans*)
- Creek Chub (*Semotilus atromaculatus*)
- Fathead Minnow (*Pimephales promelas*)
- Johnny Darter (*Etheostoma nigrum*)
- Northern Redbelly Dace (*Chrosomus eos*)
- Pumpkinseed (*Lepomis gibbosus*)
- Redside Dace (*Clinostomus elongatus*)
- White Sucker (*Catostomus commersonii*)

Redside Dace prefer coolwater habitats with slow moving pools and overhanging vegetation within 1 m of the water's surface (Scott and Crossman 1998; Holm *et al.* 2009). The remaining species are typically associated with cool and warmwater habitats and are tolerant to impacts resulting from human activities (Scott and Crossman 1998; Holm *et al.* 2009).

3.2.5 Aquatic Species at Risk

The MNRF and CH have indicated that the watercourses within the study area are regulated as occupied habitat for Redside Dace. These watercourses are crossed by RR25 at culverts C1, C2, C3 and C4 identified on **Figure 2, Appendix A**. Redside Dace is listed as Endangered on SARA and the ESA and therefore work at culverts C1, C2, C3, and C4 may require permits under SARA and the ESA.

4.0 FIELD INVESTIGATIONS

4.1 METHODS

Natural heritage field investigations conducted in the study area by Stantec in 2017 included the characterization and mapping of vegetation communities, a wildlife habitat assessment, incidental wildlife observations and an aquatic habitat assessment.

A summary of all field work completed by Stantec is provided in **Table 4.1**. Field investigation methods are provided in the sections below. Field notes are in **Appendix E**.

Table 4.1: Summary of Field Work Conducted for the Study Area

Type of Field Work	Date(s) of Field Work	Personnel
Terrestrial Field Work		
Ecological Land Classification	July 10, 2017	S. Spisani
Wildlife Habitat Assessment	July 10, 2017	S. Spisani
Incidental Wildlife Observations, Wildlife Habitat Assessment	July 12, 2017	S. Spisani, S. Stuart
Aquatic Field Work		
Aquatic Habitat Assessment	September 8, 2017	S. Stuart

4.1.1 Vegetation Communities

Vegetation communities were assessed by Stantec on July 10, 2017 using the Ecological Land Classification (ELC) field guide for Southern Ontario (Lee et al. 1998), with 2008 ELC code updates. ELC was completed to the finest level of resolution (vegetation type) where feasible, and included documentation of all vascular plant species encountered. ELC mapping received from CH was used to supplement Stantec assessments.

Provincial significance of vegetation communities was based on the rankings assigned by the NHIC (MNRF 2017c). Locally rare and uncommon plants were identified using the Vascular Plants of Halton Region (Crins et al. 2006). Flora nomenclature was based primarily on the Database of Vascular Plants of Canada (VASCAN) (Brouillet et al. 2010+) with updates to genera, specific epithets and family names as necessary to reflect recent taxonomic revisions.

The results of these surveys are summarized in **Section 4.2.1.**

4.1.2 Wildlife Habitat Assessment

A candidate significant wildlife habitat assessment of the study area was undertaken during the ELC survey. Criteria used to identify candidate significant wildlife habitat in the study area were derived from the Significant Wildlife Habitat Technical Guide (OMNR 2000) and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015). Results of the wildlife habitat assessment are in **Appendix C** and **Section 5.5.**

4.1.3 Aquatic Habitat Assessment

The aquatic habitat assessment was conducted on September 8, 2017 and documented existing habitat conditions in the following watercourses:

- An unnamed tributary to Sixteen Mile Creek (culvert C1) located approximately 100 m north of the intersection of Steeles Avenue and RR25
- The Tributary N-1A (culverts C2 and C3) located approximately 500 m south of the intersection of Highway 401 and RR25
- Tributary N-2B of Sixteen Mile Creek (culvert C4) located approximately 400 m north of the intersection of Highway 401 and RR25

The field investigations documented key habitat features (i.e., in water cover, substrate characteristics) at each of the three tributaries (**Figure 2, Appendix A).** Results of the aquatic habitat assessment are in **Section 4.2.3.**

4.1.4 Evaluation of Significance

Biological field data were evaluated to establish the significance of the observed natural heritage features. The provincial status of flora and fauna was provided by the Natural Heritage Information Centre (MNRF 2017c). Status rankings (SRANKs) for plants, vegetation communities and wildlife are based on the number of occurrences in Ontario and have the following meanings:

- S1: critically imperiled; often fewer than 5 occurrences
- S2: imperiled; often fewer than 20 occurrences
- S3: vulnerable; often fewer than 80 occurrences
- S4: apparently secure
- S5: secure
- S?: unranked, or, if following a ranking, rank uncertain (e.g. S3?)

The provincial status of all recorded plant communities is based on the updated list of Ontario plant communities produced by the NHIC (MNRF 2017c).

Identification of potentially sensitive plant species is based on the coefficient of conservatism value (*C*) assigned to each native species in southern Ontario (Oldham et al. 1995). The value of *C*, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance. Species with a *C* value of 9 or 10 generally exhibit a high degree of dependence to a narrow range of habitat parameters and undisturbed environments.

Species at risk are listed on the SARO list or by SARA as:

- Extirpated – no longer occurs in the wild
- Endangered – facing imminent danger of becoming extinct or extirpated
- Threatened – has the potential to become endangered
- Special Concern – has the potential to become threatened

Species that are listed as threatened or endangered on the SARO list are protected under the provincial *Endangered Species Act,* 2007. Federally protected species include those listed as threatened and endangered on Schedule 1 of SARA.

The potential for natural heritage features to provide significant habitat for wildlife was evaluated in accordance with the following provincial and municipal guideline documents:

- Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (MNR 2010) to determine Provincially Significant natural heritage features and associated ecological functions.
- Significant Wildlife Habitat: Technical Guide (MNR 2000) to determine the significance of identified wildlife habitat features and functions.
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015) to determine the updated significance criteria of identified habitat features and functions.

4.2 RESULTS

4.2.1 Vegetation Communities

The vegetation communities identified in the study area are illustrated on **Figure 1**, **Appendix A**. All communities observed are considered common in southern Ontario. A brief description of each community is provided below in **Table 4.2.** Field notes are provided in **Appendix G** and a plant list is provided in **Appendix H.**

Table 4.2: Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
Thicket (TH)	
Deciduous Thicket (THD)	
THDM2-11 Hawthorn Deciduous Shrub Thicket Type	One upland thicket community was located along a riparian corridor, southwest of the interchange with Highway 401. Dominant species included Hawthorn (not identifiable to species at the time of the inventory), Manitoba maple, grey dogwood, Canada goldenrod and cool-season grasses. This unit included large open grown bur oak, and a locally uncommon plant species (big bluestem) at the location indicated on **Figure 1**, **Appendix A**.
Cultural (CU)	
CUW1 – Cultural Woodland	Two woodland communities were present, one on either side of RR25, north of the interchange with Highway 401. Both units were connected to a drainage feature. The unit on the west side was dominated mid-aged bur oak, Manitoba maple, and Norway spruce; while the unit on the east side was dominated by young white poplar. A third unit was located on the west side of RR25 at the south end of the study area, north of Steeles Avenue East. This unit was dominated by hybrid white willow and little-leaved linden.
CUT1-1 Sumac Deciduous Shrub Thicket Type	Five sumac thickets were present in the study area, including three units along the rail line north of Steeles Avenue East, and two units located along a drainage feature located northwest of the interchange with Highway 401. All units were dominated by staghorn sumac, with common mixed meadow species also present (see below).
CUT1-4 Gray Dogwood Deciduous Shrub Thicket Type	One gray dogwood thicket was located approximately 100m west of RR25, south of the interchange with Highway 401. The unit was assessed from the edge; however, some wetland species appeared to be common, including reed canarygrass, blue cattail (*Typha x glauca*), purple loosestrife and white panicled aster.
Meadow (ME)	
Mixed Meadow (MEM)	
MEMM3 - Dry - Fresh Mixed Meadow Ecosite MEMM4 - Fresh - Moist Mixed Meadow Ecosite	Eight mixed meadow communities were present throughout the study area. These communities occurred in vacant lots and roadsides, and were created by anthropogenic disturbance. Dominant species included smooth brome, quackgrass, tall ryegrass, Canada goldenrod, Canada thistle, white sweet-clover, red clover, cow vetch, and bird's-foot trefoil.
Graminoid Meadow (MEG)	
MEGM3 - Dry - Fresh Graminoid Meadow Ecosite	Two graminoid meadow communities were present in the study area, one along the edge of a riparian corridor, northwest of the interchange with Highway 401, and one surrounding the Highway 401 carpool lot on the east side. Dominant species included smooth brome, quackgrass and timothy.

Table 4.2: Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
Swamp (SW)	
Deciduous Swamp (SWD)	
SWDM4-1/MASM1-12 Willow Mineral Deciduous Swamp Type / Common Reed Mineral Shallow Marsh Type	One swamp / march complex occurred in a riparian corridor on the west side to RR25, north of Steeles Avenue East. Dominant species included hybrid white willow and common reed.
Swamp Thicket (SWT)	
SWT2-5 - Red-osier Dogwood Mineral Deciduous Thicket Swamp Type	One red-osier dogwood swamp thicket was present along a riparian corridor, southwest of the interchange with Highway 401. Dominant species included red-osier dogwood, reed canary-grass, blue cattail, purple loosestrife and white panicled aster.
Marsh (MA)	
Shallow Marsh (MAS)	
MAS2-1 Cattail Mineral Shallow Marsh Type	One very narrow cattail marsh community occurred along a drainage feature northeast of the rail line crossing of RR25. The marsh was dominated by blue cattail.
MASM1-12 Common Reed Mineral Shallow Marsh Type	One common reed marsh community was present along a drainage feature in the RR25 ROW, north east of the rail line crossing of RR25. The unit was a dense colony of common reed.
Meadow Marsh (MAM)	
MAM2-3 Red-top Graminoid Mineral Meadow Marsh Type	One graminoid meadow marsh community was present along a riparian corridor, northeast of the interchange with Highway 401. Dominant species included redtop, reed canarygrass, purple loosestrife and white panicled aster.
MAMM1/SWM Graminoid Mineral Meadow Marsh Ecosite / Stormwater Management Facility	One naturalized dry stormwater management basin was located on the east side of RR25, south of 5 Side Road. This was documented from the edge of the feature; however, it appeared to be dominated by redtop and other cool-season grasses.

4.2.2 Wildlife Habitat

The study area is in a heavily urbanized landscape with many industrial developments. There was little natural habitat present. The isolated pockets of cultural woodland, thickets, meadows and marsh habitat may provide habitat for wildlife. Potential significant wildlife habitat features were identified and evaluated for significance in **Appendix D** and **Section 5.5** below.

4.2.3 Fish and Fish Habitat

Unnamed Tributary to Sixteen Mile Creek (culvert C1)

The unnamed tributary to Sixteen Mile Creek associated with culvert C1 originates west of RR25 in a combination of roadside ditches and online ponds. It flows through a marsh dominated by Common Reed (*Phragmites australis subsp. australis*) prior to entering the concrete box culvert at RR25. Downstream of RR25 the tributary flows east in a straightened, trapezoidal channel and through a 20 m corrugated steel pipe culvert prior to the confluence with the Tributary N-1A approximately 110 m east of RR25.

Upstream of RR25 within the marsh area, the tributary lacks a well-defined channel and the bottom substrate is 80% silt and 20% detritus. Downstream of RR25 within the trapezoidal channel, habitat consists of riffles and pools with substrates of cobble (30%), gravel (10%), clay (20%), and detritus (40%). At the time of the field investigations, the wetted width of the defined channel downstream of RR25 ranged from 0.8 m to 1.5 m and average depth was 0.1 m to 0.2 m. The channel contained dense cattails and Common Reed on both sides of RR25. At the time of the field investigation, there was an accumulation of vegetation at the culvert inlet that likely functions as a barrier to fish movement during low flow conditions.

Tributary N-1A (Culverts C2 and C3)

The Tributary N-1A originates northwest of the study area and generally flows in a southeasterly direction. Culverts C2 (RR25) and C3 (Chisholm Drive crossing) are located on this tributary.

Culvert C3 is the Chisholm Drive crossing of Tributary N-1A and is located approximately 80 m upstream of culvert C2. The tributary originates northwest of the study area and exhibits a natural meandering pattern with a riparian zone consisting of grasses and scattered trees as it approaches RR25. It then enters culvert C3 and parallels RR25 for approximately 80 m, crossing under two driveways before entering culvert C2. The exposed channel between culverts C2 and C3 was trapezoidal in shape with gabion basket lined banks. Habitat consisted of pools and riffles with a wetted width of 1.0 m to 2.0 m with a depth of 0.20 m to 0.30 m.

Downstream of culvert C2, the tributary consisted of a concrete-lined square channel (approximately 4 m wide and 20 m long) providing run habitat. Downstream of the concrete-lined channel, the banks were vegetated with a combination of grasses and small shrubs that overhang the channel. The wetted width of the channel within this reach ranged from 0.5 m to 3 m with average depths from 0.10 m to 0.40 m. Habitat consisted of a combination of runs and riffles with scattered slow flowing pools. Substrate in the reach downstream of RR25 was dominated by silt (80%) with scattered cobble (10%) and gravel (10%) underlain by areas hardened with riprap and gabion. There were areas of cattails and *Phragmites* that formed small islands within the main flow area. The channel was surrounded by manicured grass that provided no shade to the watercourse.

Tributary N-2B (culvert C4)

Tributary N-2B originates northwest of the study area and flows in an easterly direction through a combination of rural and urbanized areas.

Aquatic habitat near culvert C4 consisted of mostly runs with dense cattails upstream of the culvert. Downstream of the culvert, habitat consisted of a large pool followed by diffuse flow through a cattail marsh. Approximately 20 m downstream of culvert C4, the channel was recently realigned into a natural meandering pattern and consisted of a combination of riffles and slow flowing pools. The wetted width of the channel ranged from 1.0 m to 1.5 m with average depths from 0.10 m to 0.40 m. Substrates consisted of silt (40%), cobble (30%), sand (10%) and gravel (10%). Riparian vegetation consisted of a combination of grasses and other herbaceous species overhanging the channel along with scattered trees and shrubs within the floodplain. A combination of cobble and riprap observed at the C4 culvert inlet may be functioning as a barrier to fish passage during low flow conditions.

Photographs were taken of all watercourse crossings and are shown in **Appendix E**.

5.0 SIGNIFICANT NATURAL HERITAGE FEATURES

5.1 WETLANDS

There were no Provincially Significant or unevaluated wetlands identified in the study area according to LIO mapping (MNRF 2017b).

5.2 ENDANGERED AND THREATENED SPECIES

A habitat assessment was completed for species that were identified in the background review as potentially present in the study area (**Appendix C**). Barn Swallow was the only bird species at risk confirmed nesting in the study area at culvert C4. The three other culverts may also be suitable for nesting Barn Swallow but none were observed. Bat species at risk may also be present in the study area but there was no maternity roost habitat present. Habitat for species of special concern and other rare species is discussed below.

5.3 WILDLIFE OBSERVATIONS

There was a low abundance and diversity of wildlife observations in this urbanized setting. Common species that were incidentally observed during vegetation surveys included:

Insects

- Giant Swallowtail
- Summer Azure
- Cabbage White
- Sulfur Yellow
- Ebony Jewelwing

Birds

- Red-winged Blackbird
- Yellow Warbler

Mammals

- Muskrat

Amphibians

- Green Frog

All species that were observed had ranks of secure (S5) or apparently secure (S4) within Ontario.

5.4 MIGRATORY BIRD NESTS

One Barn Swallow nest was present in culvert C4. While no other bird nests were observed, the natural vegetation in the study area likely supports nesting migratory birds.

5.5 SIGNIFICANT WILDLIFE HABITAT (SWH)

The presence of SWH in the study area was assessed based on our background review and results of field surveys. SWH was classified as either 'candidate' or 'confirmed'. Features that were identified as candidate, may require additional targeted surveys. Consideration for carrying out additional surveys to confirm presence of SWH may be undertaken at the detailed design phase when project footprints are known. Features that were identified as confirmed SWH were those in which there was sufficient information available to confirm that that SWH category criteria were met.

There are four general types of significant wildlife habitat: seasonal concentration areas, rare or specialized habitat, habitat for species of conservation concern, and wildlife movement corridors. These are discussed in more detail below. MNRF's Significant Wildlife Habitat Technical Guide (OMNR 2000) and SWH Criteria Schedules for Ecoregion 7E (MNRF 2015) was applied to identify candidate and confirmed Significant Wildlife Habitat using ELC, habitat and wildlife observations. Details of the significant wildlife assessment for the study area are provided in **Appendix D** and summarized below.

5.5.1 Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. Examples include bird migratory stopover areas, raptor wintering areas, bat hibernacula or maternity colonies, reptile overwintering areas, colonially-nesting bird breeding habitat, and deer yarding areas. Only the best examples of these concentration areas are usually designated as significant wildlife habitat. Areas that support a species at risk, or if a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant.

No candidate significant wildlife habitat was identified in the study area.

5.5.2 Rare or Specialized Habitat

Rare or specialized habitats are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species.

No significant rare habitats were identified in the study area. One type of candidate specialized wildlife habitat was identified (amphibian breeding habitat – wetland). Candidate amphibian breeding habitat (wetlands) was identified in the red-osier dogwood swamp thicket (SWT2-5), which was present along a riparian corridor, southwest of the interchange with Highway 401.

5.5.3 Species of Conservation Concern

The group of species of conservation concern includes three types of species: those that are ranked 'special concern' provincially, those that have no ranking provincially but are ranked 'threatened' or 'endangered' federally, and those that have an S-rank of S1-S3 in Ontario. Regionally rare species can also be considered here.

Candidate habitat for Monarch was identified within the Fresh - Moist Mixed Meadow community (MEMM4) in the southern section of the study area, near culvert C1 (**Figure 1**, **Appendix A**). This meadow community contained milkweed plants, which are the larval host plants for monarch. A population of Big Bluestem, a locally uncommon plant species was present in the Hawthorn Deciduous Shrub Thicket south of Highway 401 on the west side of RR25.

5.5.4 Wildlife Movement Corridors

No natural wildlife movement corridors were observed in the study area. Migration corridors are areas that are traditionally used by wildlife to move to one habitat from another. This is usually in response to different seasonal habitat requirements. There are two types of animal movement corridors in Ecoregion 7E, amphibian and deer movement corridors. As per the Ecoregion Criterion Schedule, movement corridors must connect candidate or confirmed significant wildlife habitat features, including amphibian wetland breeding habitat, deer yarding, or deer winter congregation areas.

Although it does not qualify as SWH, a dry ledge is present in culvert C1and it was noted that racoons and possibly other small mammals are using the culvert as a travel corridor.

5.6 SIGNIFICANT WOODLANDS

There were no significant woodlands present in the study area (as defined by the Natural Heritage Reference Manual for Natural Heritage Policies of the PPS; MNR 2010).

5.7 SIGNIFICANT VALLEYLANDS

There were no valleylands present in the study area.

5.8 FISH HABITAT

Habitat within the study area is suitable to support many of the species that are known to inhabit the Sixteen Mile Creek West Branch (Holm et al 2009; Scott and Crossman 1998). Sensitive or limiting habitats were not observed within the study area. The watercourses provide fish habitat for a fish community comprised of tolerant warmwater species. The unnamed Sixteen Mile Creek tributary (culvert C1), Tributary N-1A (culverts C2 and C3) and Tributary N-2B (C4 culvert) provide suitable habitat to support Redside Dace, including slow flowing pools and overhanging vegetation.

5.9 SIGNIFICANT NATURAL HERITAGE FEATURES SUMMARY

In summary, the following significant natural heritage features were found in the study area:

- Barn Swallow was confirmed nesting in the culvert C4. The other three culverts were also suitable and could be used for nesting
- Fish habitat in the three Sixteen Mile Creek tributaries; Redside Dace habitat was present in the tributaries crossed by culverts C1, C2, C3 and C4
- The following Candidate Significant Wildlife Habitats were present:
    - Candidate amphibian breeding habitat (wetland) at SWT2-5
    - Habitat for Species of Conservation Concern: habitat for Monarch was observed at culvert C1; population of Big Bluestem was present in THDM2-11

6.0 PROPOSED DEVELOPMENT

Halton Region initiated a Municipal Class EA Study for RR25 from Steeles Avenue (Regional Road 8) to 5 Side Road, in the Town of Milton and Town of Halton Hills to identify improvements needed to accommodate future travel demand and active transportation facilities. To address both public safety and future travel demand along RR25, several road improvement alternatives were examined as part of the MCEA. Road improvements being considered include widening RR25 from four to six lanes, from Steeles Avenue to 5 Side Road and improvements at various intersections within the study area. The widened right-of-way will require the extension of culverts C2 and C3, located south of Chisholm Drive, to accommodate the road and intersection improvements.

7.0 PRELIMINARY IMPACTS AND MITIGATION RECOMMENDATIONS

The potential impacts to natural features that may occur because of the proposed road improvements were identified and are discussed in this section. Potential direct and indirect impacts, associated with the Project have been considered and appropriate mitigation measures recommended. This impact assessment was based on the preliminary design details. Impacts and recommended mitigation should be re-assessed at the detail design phase.

7.1 VEGETATION COMMUNITIES

The planned work will include disturbance to vegetation within and beyond the ROW including the following ELC community units (see **Figure 1, Appendix A**):

- Fresh - Moist Mixed Meadow (MEMM4)
- Dry - Fresh Mixed Meadow (MEMM3)
- Graminoid Mineral Meadow Marsh Ecosite (MAMM1)
- Dry - Fresh Graminoid Meadow (MEGM3)
- Hawthorn Deciduous Shrub Thicket (THDM2-11)
- Red-osier Dogwood Mineral Deciduous Thicket Swamp (SWT2-5)
- Sumac Deciduous Shrub Thicket (CUT1-1).

Potential construction related impacts to adjacent habitats include vegetation disturbance, soil compaction, sedimentation, contamination from spills, noise and dust generation.

7.2 WILDLIFE AND WILDLIFE HABITAT

7.2.1 Species at Risk and Species of Conservation Concern

There were three species at risk or species of conservation concern documented in the study area: Monarch, Barn Swallow and Big Bluestem. Habitat for Monarch and Big Bluestem are located outside the construction limits and no direct impacts are anticipated.

One Barn Swallow nest was observed at culvert C4, north of Highway 401. All culverts within the study area are suitable Barn Swallow habitat and nests could be established in future years.

7.2.2 Other Wildlife

Although no reptiles were documented in the study area, it is possible that reptiles and other ground-dwelling animals could enter work areas. Standard mitigation is available to reduce potential for interaction with snakes and other wildlife (**Section 7.4.5**).

7.3 MIGRATORY BIRDS

The MBCA protects migratory bird nests from damage or disturbance, including nests in vegetation and on structures. Although migratory bird nests were not identified in the study area during field investigations, vegetation clearing has the potential to damage or disturb nests of protected species. Measures to avoid contravention of the Act during vegetation clearing and construction are provided in **Section 7.4.4**.

7.4 POTENTIAL IMPACTS TO AQUATIC ENVIRONMENT

The following works are proposed at the culverts:

- Grade at Culvert C2 will be extended by approximately 3 m, however, the extension will consist of placing a retaining wall across the existing concrete lined channel and will not require the culvert to be extended. As a result, alterations to the channel will not be required for this culvert.
- Culvert C3 will require an extension to the north to accommodate improvements to the intersection of Chisholm Drive and RR25. The extension will require in-water works.
- Preliminary design suggests that Culverts C1 and C4 do not require extensions to accommodate the road widening.

The proposed works will require in-water works at culvert C3, with the remaining crossings limiting impacts to fish habitat to grading near the floodplain of the three Sixteen Mile Creek tributaries.

In addition to standard environmental protection measures, the following measures are recommended to reduce potential indirect effects to fish and fish habitat:

- Implementing ESC measures described in Section 7.5.1.
- Schedule work to avoid sensitive life periods such as spawning. Due to the presence of Redside Dace in Sixteen Mile Creek, work near water must be scheduled to occur between July 1 and September 15 (work near water not permitted from September 16 to June 30).
- If detailed design determines that culvert replacements are required, the new culvert design should be completed in consultation with CH and MNRF staff due to the presence of Redside Dace habitat and consider upgrading the culverts to an open-bottom culvert.

- Culvert C1, C2, C3 and C4 are regulated Redside Dace habitat and any extensions or replacements to these culverts should be designed according to the *Guidance for Development Activities in Redside Dace Protected Habitat* report published by the MNRF (2016).
- The regulated area for Redside Dace habitat is defined as the meander belt width plus 30 m on either side of the watercourse. Grading to accommodate the road widening within this area may require a permit under the ESA. A meander belt assessment should be conducted to determine the extent of disturbance within regulated Redside Dace habitat.

7.5 RECOMMENDED MITIGATION MEASURES

7.5.1 Sediment and Erosion Control

Mitigation measures for sedimentation, erosion, and dust control will be implemented to prevent sediment and dust from entering sensitive natural features. 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 to (6) trap sediment as close to the source as possible. To address these principles, the following mitigation measures are proposed:

- Silt fencing and/or barriers will be used along all construction areas adjacent to natural areas.
- No equipment will be permitted to enter natural areas beyond the vegetation protection fencing.
- Exposed soil areas will be stabilized and re-vegetated, through the placement of seed and mulching or seed and an erosion control blanket, promptly upon completion of construction activities.
- Equipment will be re-fueled 30 m away from watercourses to reduce the risk of potential impacts, in the event that an accidental spill occurs.
- In addition to any specified requirements, additional silt fence will be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.
- All sediment and erosion controls will be monitored regularly and properly maintained, as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected or until cover is re-established.
- Disturbed natural areas will be restored to pre-construction conditions.

7.5.2 Vegetation Protection

Temporary removal of vegetation cover is mitigated using standard protection measures identified above, including use of construction barrier fencing along natural areas, and re-vegetation of all disturbed substrates using seed suitable for site conditions. Seed will be introduced to disturbed substrates as soon as feasible following construction and sediment fencing will remain in place until vegetation cover is reestablished.

7.5.3 Tree Protection

In addition to the mitigation measures outlined above for sediment and erosion control and vegetation protection, a detailed tree inventory documenting the species, size and health of the trees to be removed at this location will be completed and documented under separate cover. A strategy that is consistent with Halton Region's Tree Canopy Replacement Policy on Regionally Owned Lands (LPS31-08) will be developed at the detail design phase to compensate for the removal of any trees.

Trees to be removed should be clearly marked to prevent unnecessary clearing. Barrier fencing may be coincident with silt fencing used to control erosion and sediment transport in the Project Location. Native soil and seed bank retention, including avoidance of root grubbing along disturbed edges, and other edge management recommendations should be developed during the detail design phase.

7.5.4 Migratory Birds

The Regional Nesting Period for the study area is April 1 to August 30, although nesting could occur outside of this period (Environment and Climate Change Canada 2017). Vegetation clearing should take place outside of this timing window. Activity must avoid active nests at any time. If this is not possible, then a migratory bird mitigation plan must be developed.

If a migratory bird nest is located within the work area at any time, a no-disturbance buffer will be delineated. This buffer will be maintained for the entire duration of the nest activity. The radius of the buffer will be set based on the sensitivity of the nesting species. The Project will not resume within the nest buffer until the nest is no longer active.

7.5.5 Avoidance of Wildlife

A visual search of the work area will be conducted by construction contractors before work commences each day, particularly for the period when snakes are active (generally April 1 to October 31). Visual inspections will locate and avoid snakes and other ground dwelling wildlife such as small mammals. Visual searches will include inspection of machinery and equipment left in the work area overnight prior to starting equipment. If snakes or other wildlife are encountered, work at that location will stop, and wildlife will be permitted reasonable time to flee the work area on their own.

7.5.6 Fish Habitat

To avoid causing serious harm to fish, we recommend the following measures be included during construction of the road improvements:

- Due to the presence of Redside Dace, construction will occur between July 1 and September 15 as per MNRF guidelines.
- Use of enhanced erosion and sediment control measures such as a double-row of non-woven sediment fencing separated by straw bales or filter logs.
- Minimize the access and temporary work space to the extent possible to limit destabilization of soils near the work area.
- If dewatering of the construction area is required, turbidity of the discharge water should not exceed 25 mg/L above the background stream level under baseflow conditions.
- Following construction, restore disturbed areas to pre-construction conditions to the extent possible.

7.6 SITE SPECIFIC MITIGATION

7.6.1 Species at Risk

Barn Swallow and its habitat (i.e. structures that are used for nesting) are protected from harm or harassment under general habitat regulations of the *ESA 2007*, and the *MBCA 1994*. If work is required at culverts with Barn Swallows, then under the streamlined approvals process, repair, maintenance, or demolition of a Barn Swallow nesting structure can proceed by registering the project with MNRF and following the rules outlined within the regulation. The requirements outlined below must be followed.

7.6.1.1 Minimize effects on barn swallow

If construction is required to take place within the Barn Swallow nesting period (May 1 to August 31), exclusionary measures must be implemented at culverts with nesting Barn Swallows. It is recommended that exclusion methods be installed before April 1 of the year of construction to dissuade Barn Swallow from attempting to nest in the culvert. Nests from previous years must also be removed. More information on best management practices for excluding Barn Swallows from structures can be found in the recently published document "Excluding Barn Swallows and Chimney Swifts from Buildings and Structures (MNRF 2017)".

7.6.1.2 Create new habitat

Habitat must be replaced by installing nest cups or by creating a new nesting structure. Any nests that are removed from culverts, must be replaced by nest cups. Nest cups can be placed on:

- A suitable part of the existing structure not affected by the activity
- A different structure suitable for barn swallow nesting within 1 km (e.g., bridge, barn, culvert)
- A new structure created or modified to be suitable for barn swallow nesting within 1 km

If no suitable pre-existing structures are available within 1 km to install nest cups, then new habitat must be created by either modifying an existing structure or building a new structure. The new structure must be within 1 km of the affected habitat and within 200 metres of a suitable foraging area. The new structure must also provide more habitat than what was removed. Consultation with experts is recommended to determine an appropriate location and design for the replacement habitat.

If construction activities are timed to take place outside of the Barn Swallow nesting period (May 1 to August 31), nests from previous years that have the potential to be damaged or destroyed on the culvert must be removed prior to commencement of construction. When construction is complete, artificial nest cups must be installed on the structure. Replacement of any removed nests is at a ratio of 1:1.

7.6.2 Wildlife Protection

Standard environmental protection measures for erosion and sediment control (**Section 7.5**) also serve as a wildlife barrier where structure replacements encroach into areas of natural vegetation near watercourses or significant features.

7.6.3 Significant Wildlife Habitat

Potential indirect impacts to SWH in the study area will be mitigated through the use of standard erosion and sedimentation control and vegetation protection measures discussed above. No impacts are anticipated to SWH, but this should be re-assessed during detail design.

7.6.4 Rare Vegetation Species

It is anticipated that work zones will avoid the locations the locally rare Big Bluestem.

8.0 PERMITTING REQUIREMENTS

8.1 FISHERIES ACT

The three watercourses within the study area support CRA fisheries in Sixteen Mile Creek and therefore the *Fisheries Act* applies to the crossings within the Study Area. Currently, grading over Culvert C2 will be extended approximately 3 m using a retaining wall with no in-water work and culvert C3 will be extended to the north. If culvert extensions are required at Culverts C1 and C4 to accommodate the road widening, detailed habitat assessments will be required within the proposed culvert footprints to identify habitat impacts.

A self-assessment will be conducted during the detailed design phase to determine if there is a risk of the proposed work to cause serious harm to fish. If the self-assessment determines that the project may result in serious harm to fish, a Request for Project Review will be submitted to DFO to determine if authorization under the *Fisheries Act* is required for the project.

8.2 SPECIES AT RISK ACT

A Request for Project Review will be submitted to DFO to determine if authorization under SARA is required. Permit requirements and Overall Benefit Plan will be developed in consultation with DFO and the MNRF (see Section 8.3 below) once the permanent and temporarily disturbed areas have been determined.

A permit under SARA to handle fish may also be required if fish salvages are required during construction.

8.3 ENDANGERED SPECIES ACT

The provincial ESA prohibits the killing, harming, harassing, capturing, or taking of a living member of a species listed as Threatened, Endangered or Extirpated by the SARO list (O. Reg 230/08) (S. 9), or the damage to habitat of similarly designated species (S. 10), except where a permit is issued under S. 17(2) of the same act or the Activity is registered under the Species at Risk Registry (the Registry), which was introduced alongside O. Reg 242/08 of the ESA in 2014. O. Reg 242/08 provides a regulatory framework for the registry process, which exempts activities that meet a defined set of criteria, as outlined within the regulation, from the ESA S.17(2) permit process. Not all species or activities are eligible for the Registry.

O. Reg. 242/08, S. 23.5 provides rules for altering a structure that provides habitat for Barn Swallow. Use of the Registry requires the proponent to prepare a Barn Swallow mitigation and restoration record and to monitor the replacement habitat for three years.

Widening of RR25 may require culvert extensions and grading within regulated Redside Dace habitat at culverts C1, C2, C3, and C4. This proposed work will likely require a permit under Section 17(2) of the ESA along with an Overall Benefit Plan. A meander belt assessment will be completed in Spring 2018 to determine the extent of disturbance within regulated Redside Dace habitat. Permit requirements and an Overall Benefit Plan will be developed in consultation with the MNRF and DFO (see Section 8.2 above) once the areas of temporary and permanent disturbance have been determined.

Culvert construction within Redside Dace habitat may also be registered under the Registry process of Section 23.4 of O.Reg. 242/08 if the proposed design meets the following conditions:

- The modification does not increase the footprint of the culvert within the bankfull width of the channel by more than 25%;
- The activity does not temporarily or permanently damage more than a total of 300 m^2 of land within the watercourse or within 30 m of the bankfull width of the channel with no more than 100 m^2 of area within the bankfull width of the stream;
- The work does not include the realignment of the watercourse; and,
- Construction does not include the installation of a temporary vehicle crossing.

Applicability of the Registry process will be determined during detailed design extent of area disturbed within regulated habitat has been finalized.

A permit under the ESA to handle fish may also be required if fish salvages are required during construction.

9.0 SUMMARY

The Region is undertaking a Municipal Class EA for road improvements on RR25 from Steeles Avenue to 5 Side Road that includes widening of the road from four to six lanes. This report describes vegetation communities, wildlife and wildlife habitat, and aquatic habitat within the study area. It also discusses recommended mitigation and potential permitting requirements that may be required for the project.

The study area is highly developed with commercial and industrial development throughout. Natural vegetation communities were highly fragmented and isolated. Natural features include thickets, meadows, marsh and swamp communities. Barn Swallow was the only avian species at risk confirmed in the study area but an area of suitable habitat for Monarch was also observed. Enhanced environmental protection measures are recommended to protect natural features and species.

Conservation Halton has captured Redside Dace within the study area and the Sixteen Mile Creek tributaries crossed by the project provide suitable habitat to support Redside Dace. The MNRF has indicated that these tributaries are regulated Redside Dace habitat. Widening of RR25 will likely require grading within regulated Redside Dace habitat. If the disturbed area meets the conditions of Section 23.4 of O.Reg. 242/08, the project can be registered under the Species At Risk Registry and will not require a permit. However, if detailed design determines that the proposed widening does not meet the Registry conditions, the project may require a permit under Section 17(2) of the ESA along with an Overall Benefit Plan. If required, permit requirements and Overall Benefit Plan will be developed in consultation with the MNRF once the areas that will be permanently and temporarily disturbed have been determined. Construction for road widening is expected to occur within regulated Redside Dace habitat at culverts C1, C2, C3, and C4 and may require in-water works. Once the disturbed areas are determined at culverts C1, C2, C3, and C4, impacts to regulated Redside Dace habitat will allow the detailed design phase to determine area of regulated habitat that will be affected by the project.

Grading and culvert extensions within regulated Redside Dace habitat near culverts C1, C2, C3 and C4 may also require a permit under SARA from DFO. It is anticipated that the application processes for these permits will occur at the same time.

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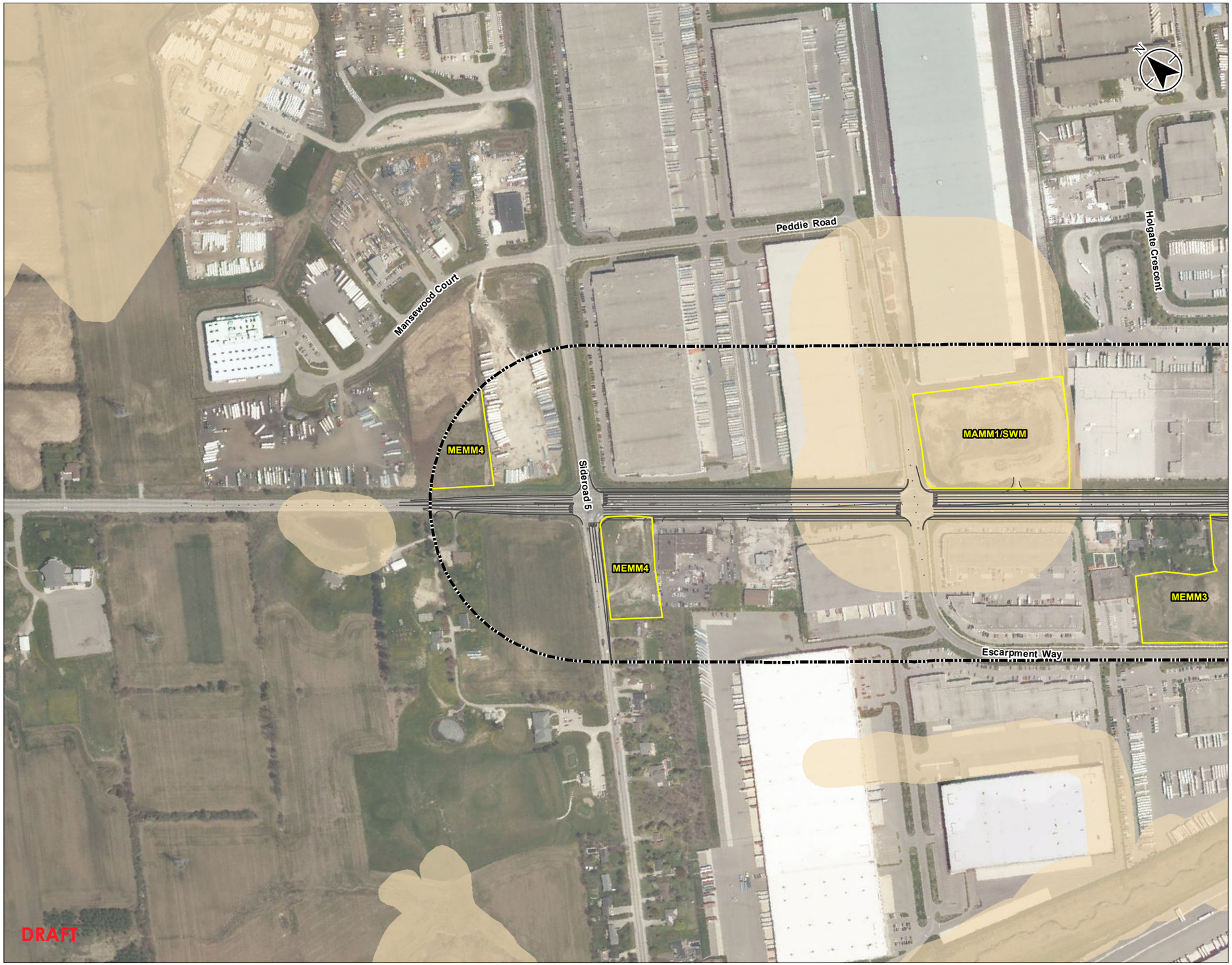
APPENDIX A:
FIGURES



Stantec

Legend

- Study Area
- Species Observation
- Site Plan
- ELC Vegetation Community
- Regulation Limit (Approximate)

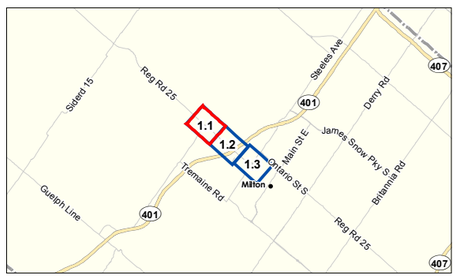
ELC Code	Description
SWDM4-1	Willow Mineral Deciduous Swamp Type
CUW1	Cultural Woodland
MEMM4	Fresh - Moist Mixed Meadow Ecosite
CUT1-1	Sumac Deciduous Shrub Thicket Type
MAS2-1	Cattail Mineral Shallow Marsh Type
MASM1-12	Common Reed Mineral Shallow Marsh Type
SWT2-5	Red-osier Dogwood Mineral Deciduous Thicket Swamp Type
THDM2-11	Hawthorn Deciduous Shrub Thicket Type
MEGM3	Dry - Fresh Graminoid Meadow Ecosite
CUT1-4	Gray Dogwood Deciduous Shrub Thicket Type
MAM2-3	Red-top Graminoid Mineral Meadow Marsh Type
MEMM3	Dry - Fresh Mixed Meadow Ecosite
MAMM1	Graminoid Mineral Meadow Marsh Ecosite
MASM1-12	Willow Mineral Deciduous Swamp Type
SWM	Stormwater Management Facility

0 150 300 metres

1:5,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018; © Conservation Halton, 2018.
3. Orthoimagery © First Base Solutions, 2018. Imagery Date, 2017.



Project Location
Regional Municipality of Halton

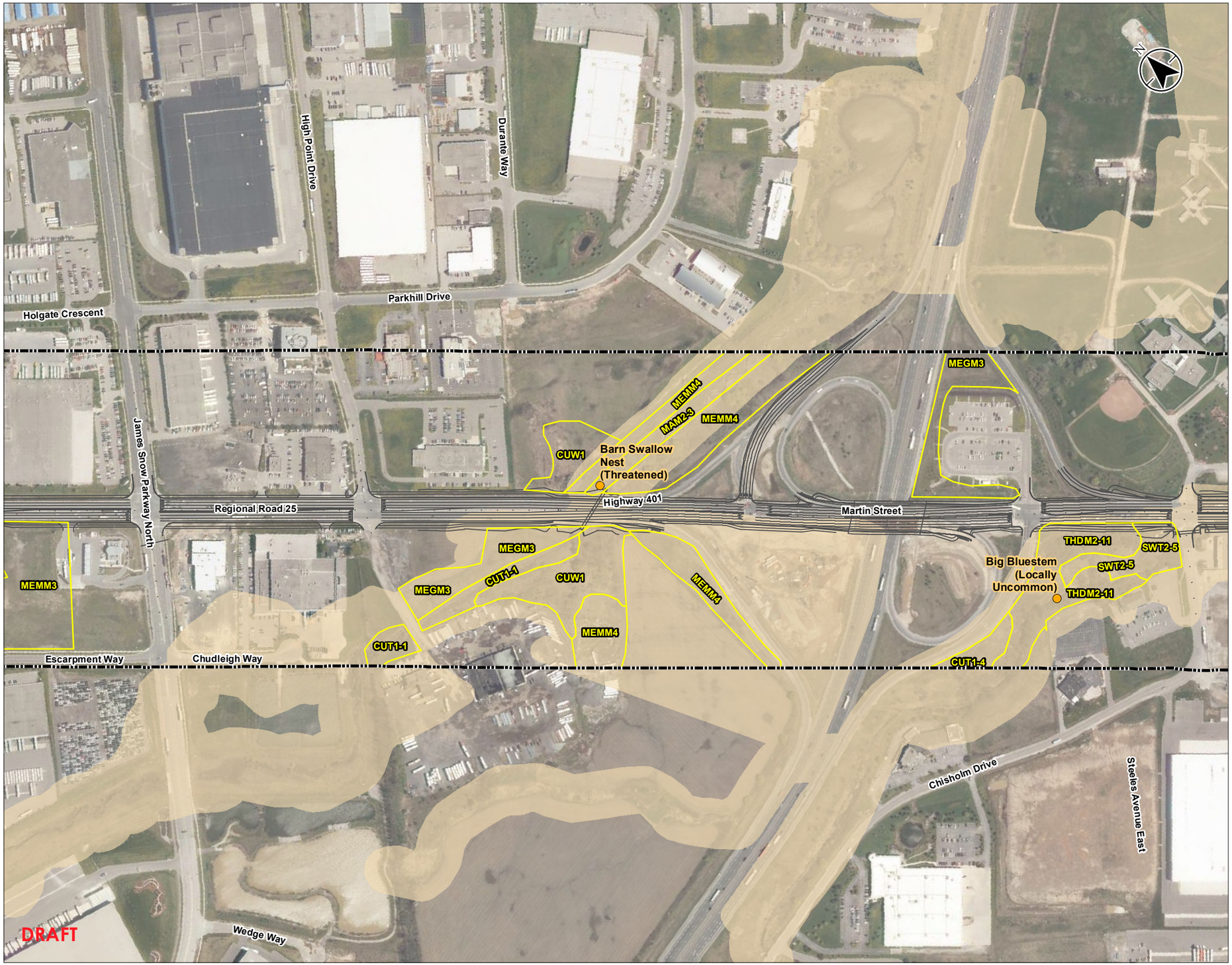
165010586 REVA
Prepared by PW on 2018-02-12
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
REGIONAL MUNICIPALITY OF HALTON
REGIONAL ROAD 25 CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
1.1

DRAFT

Title
ELC Vegetation Communities



Stantec

Legend

- Study Area
- Species Observation
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- ELC Vegetation Community
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MASM1-12	Common Reed Mineral Shallow Marsh Type
SWT2-5	Red-osier Dogwood Mineral Deciduous Thicket Swamp Type
THDM2-11	Hawthorn Deciduous Shrub Thicket Type
MEGM3	Dry - Fresh Graminoid Meadow Ecosite
CUT1-4	Gray Dogwood Deciduous Shrub Thicket Type
MAM2-3	Red-top Graminoid Mineral Meadow Marsh Type
MEMM3	Dry - Fresh Mixed Meadow Ecosite
MAMM1	Graminoid Mineral Meadow Marsh Ecosite
MASM1-12	Willow Mineral Deciduous Swamp Type
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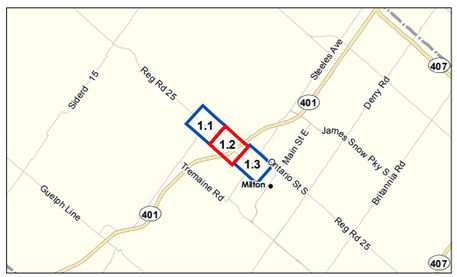

Project Location
Regional Municipality of Halton

165010586 REVA
Prepared by PW on 2018-02-12
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
REGIONAL MUNICIPALITY OF HALTON
REGIONAL ROAD 25 CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
1.2

DRAFT

Title
ELC Vegetation Communities

Stantec

Legend

- Study Area
- Species Observation
- Site Plan
- ELC Vegetation Community
- Regulation Limit (Approximate)

ELC Code	Description
SWDM4-1	Willow Mineral Deciduous Swamp Type
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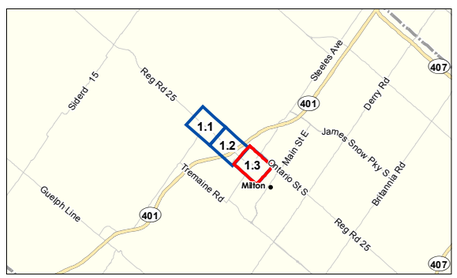
MASM1-12	Willow Mineral Deciduous Swamp Type
SWM	Stormwater Management Facility

0 150 300 metres

1:5,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018; © Conservation Halton, 2018.
3. Orthoimagery © First Base Solutions, 2018. Imagery Date, 2017.



Project Location
Regional Municipality of Halton

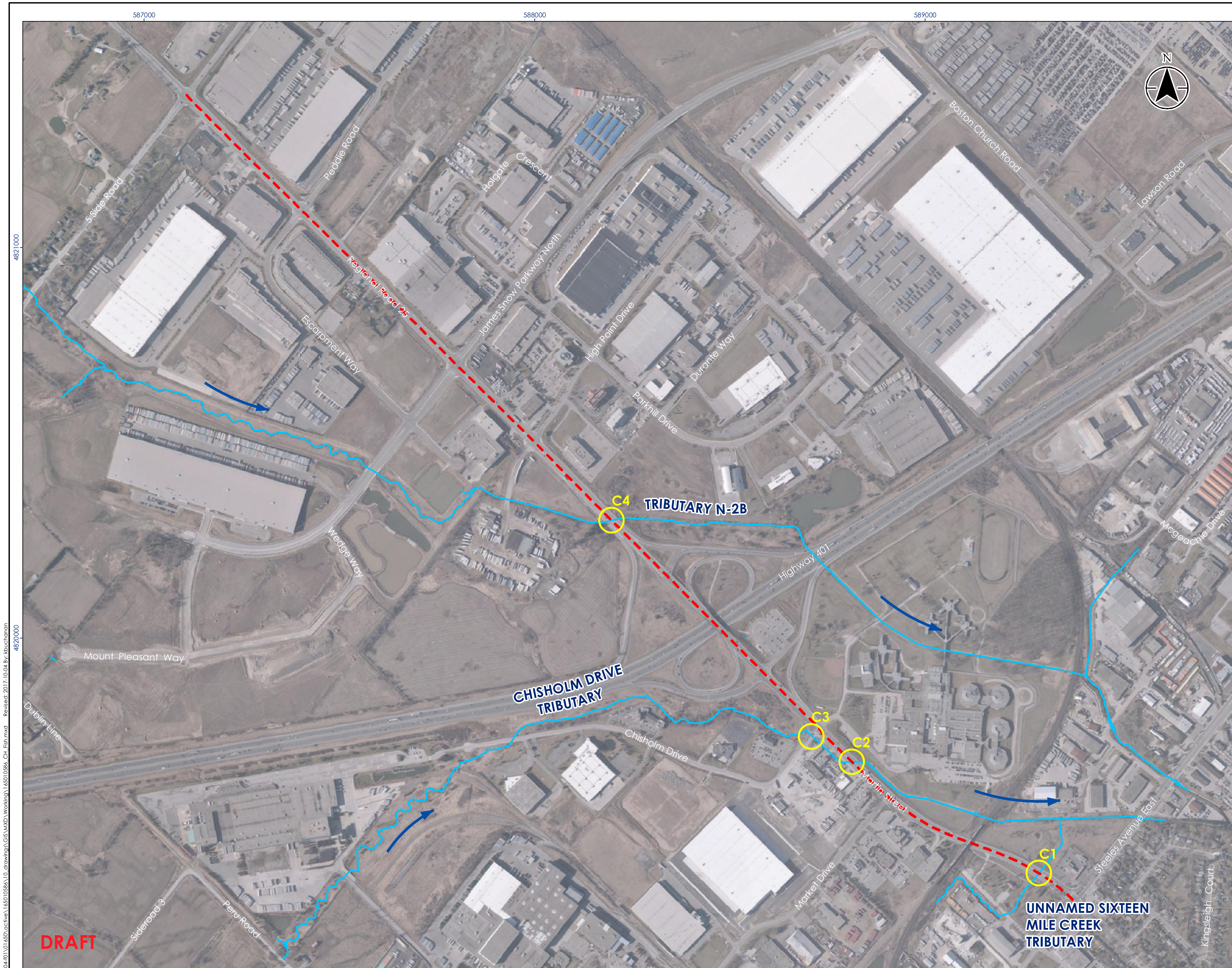
165010586 REVA
Prepared by PW on 2018-02-12
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
REGIONAL MUNICIPALITY OF HALTON
REGIONAL ROAD 25 CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
1.3

DRAFT

Title
ELC Vegetation Communities



Stantec

Legend

- Project Extent
- Watercourse Crossing

Watercourse

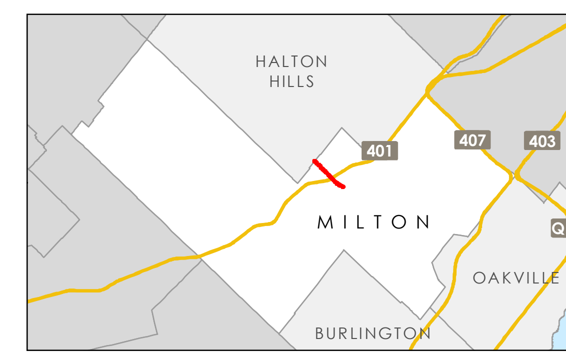
- Coolwater
- Flow Direction Arrow

0 200 400 m

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2016. Imagery Date, 20XX.



Project Location
Town of Milton

165010586 REVA
Prepared by KDB on 2017-10-04

Client/Project
REGION OF HALTON
REG. RD. 25 TRANSPORTATION CORRIDOR
IMPROVEMENTS FROM STEELES AVE. TO 5 SIDE RD.

Figure No.
2

DRAFT

Title
Aquatic Habitat

APPENDIX B:
AGENCY CORRESPONDENCE

Ontario

Aurora MNR
Information Request Form

Name:	**Debbie Giesbrecht**
Company Name:	**Stantec Consulting Limited**
Proponent Name:	**Regional Municipality of Halton**
Phone Number:	**(905) 381-3214**
Email Address:	**debbie.giesbrecht@stantec.com**
Project Name:	**Regional Road 25 Transportation Corridor Improvements from Steeles Avenue (Regional Ro**
Property Location:	**Town of Milton**
Township:	**Halton**
Lot & Concession:	**n/a**
UTM Coordinates:	Easting (X) _____ Northing (Y) _____
Brief Description of Undertaking	**• widen the road from 4 to 6 lanes** **• the addition of on-road and off-road active transportation facilities** **• improvements to the Canadian National Railway overpass**

Have you previously contacted someone at MNR for information on this site? ☐ Yes ☒ No

If yes, when and who? _____

Provide a map of accurate scale to illustrate footprint/study area of the proposed activity in relation to the surrounding landscape (e.g. property boundaries, roads, waterbodies, natural features, towns, transmission corridors, and other human landmarks). Use of aerial photography is strongly encouraged. Include scale, north arrow and legend.

ATTACHMENTS - I have attached a:

☐ Picture ☒ Map ☐ Other

REQUEST - I would like to request the following information for the property identified above:

☒ Fish Dot Information (fish and other aquatic species found in a particular area of a watercourse)

☒ Wetland Mapping (hard copy) and/or evaluation and data record - please provide name of wetland if known)

☒ ANSI Mapping (hard copy) and/or check- sheet - please provide name of ANSI if known)

☒ Species at Risk

☐ Other _____

Please forward the completed form to: esa.aurora@ontario.ca

Or send by mail:
Aurora District, Ministry of Natural Resources
50 Bloomington Rd Aurora, ON L4G 0L8

Environmental Assessment Checklist

The following list identifies the areas of interest or concern that Conservation Halton may have with the subject EA:

Regional Road 25 Corridor Improvements – Steeles Ave. to 5 Side Road, Milton/Halton Hills
PR-3130A CH File MPR 708

Conservation Halton Comment		Project Team Response
Ontario Regulation 162/06		
☒	The study area contains tributaries and channels of Sixteen Mile Creek. Conservation Halton regulates the erosion hazards, flooding hazards and associated allowance within 15m associated with this feature. Ontario Regulation 162/06 requires that a Permit be obtained from Conservation Halton prior to development, interference with wetlands or alterations to shorelines and watercourses. A copy of Ontario Regulation 162/06 and the associated Policy document, *Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document* can be found at www.conservationhalton.ca. Please ensure that the EA contains sufficient information to allow Conservation Halton staff to determine whether a Permit could be issued at detailed design.	Noted – the ESR will contain sufficient information to allow Conservation Halton staff to determine whether a permit could be issued at detailed design. The preliminary design plan will include Conservation Halton's regulation limits.
☒	The EA should identify areas where Permits pursuant to Ontario Regulation 162/06 will be required and include such Permits as future commitments in the ESR. Some details related to future Permits may not be deferred to detailed design. Please review the requirements of Policy 3.51 (Public Infrastructure – Utilities, Trails and Transportation) of Conservation Halton's *Policies and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document* (see enclosed).	Noted – the ESR will identify areas where permits pursuant to Ontario Regulation 162/06 will be required and include such permits as future commitments. All commitments in the ESR will be summarized as a separate section in the ESR, and/or referred to in the executive summary.

☒	Please survey all drainage features, watercourse ditch lines, culverts, etc.	A topographic survey of the study corridor and adjacent area has been undertaken by the Region as part of this study. A more detailed survey will be undertaken during detailed design.
☒	Please plot all areas regulated by Conservation Halton on drawings. ARL mapping may be utilized if more detailed study is not required at this time, however, please ensure that drawings indicate that limits shown are an approximation of the regulated area. Staff has enclosed Approximate Regulation Limit (ARL) mapping for your information.	Noted – the project team will incorporate Conservation Halton regulation limits in project maps of the study area, where applicable. The preliminary design plan will include Conservation Halton's regulation limits.
☒	A Data Request Form is required for all digital information requests. This form and additional information on data holdings can be found in the "GIS & Mapping" section of Conservation Halton's website: www.conservationhalton.ca. Staff notes that the following modeling is available for the study area: • ***Hydraulic models are available for Culverts 4 and 2***	Noted. A Data Request Form was submitted to CH and data has been obtained by the project team.
☒	It is recommended that 'potential impacts to natural hazards' (flooding and/or erosion hazards) should be one of the evaluation criteria. At a minimum, a proposed alternative must have no negative impacts on flooding and erosion hazards in order for Conservation Halton to issue a future approval under Ontario Regulation 162/06. Opportunities to improve any deficiencies with respect to flooding and erosion should be investigated.	Noted – a criterion for Natural Hazards with the suggested indicators will be included in the evaluation. It is our understanding that minor negative impacts on flooding can be tolerated with the landowner's permission.
☒	The EA should assess all flood plain impacts associated with each alternative including consideration of any change in storage, velocity and up and down stream water levels for a variety of flow conditions.	Flood plain impacts will be assessed where the preferred design causes a change to the flood lines/elevations.
☒	A hydrologic and/or hydraulic analysis *may be required* in the Environmental Study Report. Hydraulic analyses may be required for culvert modifications and any flood plain grading. A hydraulic analysis will be needed for the CNR	Noted. Calculations will be included in the stormwater management report where there are significant changes as a result of the preferred design.

	crossing to assess possible improvements to remove the backwater caused by the CNR (that floods the Maplehurst Correctional Facility).	
☒	Please consider MTO's flooding criteria, guidelines and/or the municipal engineering standards for flooding along/over roads. At a minimum, safe access & egress as defined in the MNR's 2002 *Technical Guide: River & Stream Systems – Flooding Hazard Limit*, should be provided.	Noted.
☒	If a roadway is considered by the Province or local municipality to be an Emergency Route then there should be no overtopping of the road with flood waters.	Regional Road 25 is an Emergency Detour Route. The Region will not allow overtopping of the road with flood waters under Regional Storm conditions.
☒	A fluvial geomorphological assessment is required to verify that crossing designs have adequately allowed for natural channel migration, fish/terrestrial passage, and sediment transport, as well as minimizes the risk to infrastructure. A fluvial geomorphic assessment will be needed as part of any modifications to channels, culverts or flood plain/overbank areas.	The project team will complete a geomorphic assessment for this project where significant changes to the stream are required. It should be noted that it is our intention to avoid such changes to the existing watercourses.
☒	A topographic survey is required to identify the lands impacted by the flooding hazard associated with Sixteen Mile Creek upstream of the CNR tracks.	We suggest that a topographic survey would only be necessary if significant changes were anticipated to existing flood lines/elevations.
☒	Other: The flood impacts to the Maplehurst Correctional Facility should be considered in the hydraulic assessment of the CNR crossing. Staff strongly encourage the Region to explore the possibility of increasing the hydraulic capacity of the CNR culvert, in partnership with the CNR, to reduce extent of flooding of the facility under Regional Storm conditions. The installation of new or additional culverts under the CNR tracks is particularly feasible should a temporary diversion track be considered to increase the span of the RR25 bridge.	The Region will discuss this possibility with CN, as owners of the culvert, however, the culvert and watercourse are on privately held lands and outside of Region jurisdiction/control.
Natural Heritage		

While Conservation Halton recognizes that Environmental Assessments are not subject to and/or limited to the policies outlined in the Provincial Policy Statement (PPS), we do believe that the PPS provides Provincial direction on how natural resources should be managed in Ontario. Furthermore, it is useful for identifying some of the key natural heritage features, water resources, and natural hazards that should be considered when evaluating any sort of development proposal. As such, some PPS related items have been outlined below, as we believe these items should be acknowledged and addressed as part of the EA study.		
☒	When undertaking any fieldwork and/or when making recommendations related to natural heritage and/or natural hazards, staff recommend that reference be made to the following guidelines prepared by the Ministry of Natural Resources and Forestry (MNRF): *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005, 2nd Edition, 2010*; *Significant Wildlife Habitat Technical Guideline*; and, *Natural Hazards Technical Guide* and *Understanding Natural Hazards*.	The project team met with Conservation Halton to discuss the scope of work for the environmental assessment. The study has been undertaken in accordance with the outcome of that meeting and with Conservation Halton's *Guidelines for Ecological Studies*, March 2017. Single season habitat assessments to confirm existing background information and identify natural features were completed. Aquatic habitat surveys in summer 2017 confirmed existing conditions at the three creek crossings. Fish community sampling was not completed given the availability of data from CH and MNRF.
☒	The study area may contain or pass between natural features. As per Policy 2.1.2 of the Provincial Policy Statement, the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and groundwater features. Where applicable, the use of ecopassages or other measures to facilitate wildlife movement should be evaluated.	Noted. The consideration of wildlife passages will be included in the commitments section of the ESR. Wildlife passages are to be explored during detailed design.
☒	The study area may contain the habitat of Endangered or Threatened species. As per Policy 2.1.7 of the Provincial Policy Statement,	Noted. Stantec will make contact with MNRF.

	development and site alteration shall not be permitted in the habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. The provincial *Endangered Species Act* and/or federal *Species at Risk Act* may also apply. Please contact the Ministry of Natural Resources and Forestry (MNRF) at esa.aurora@ontario.ca for further information on Endangered Species Act requirements.	
☒	Please use Ecological Land Classification to map natural and semi-natural features to vegetation type and identify protection/mitigation measures. ELC data sheets are required with the ESR submission (please include digital species spreadsheets).	Noted.
☒	Please refer to Conservation Halton's *Environmental Impact Study Guidelines* for information on general study requirements, impact assessment and appropriate timing and protocols for surveys. These guidelines can be found at www.conservationhalton.ca.	Noted.
☒	Conservation Halton's *Landscape Guidelines* should be consulted at detailed design. These guidelines can be found at www.conservationhalton.ca.	Noted. The project team will add a commitment to the ESR to apply Conservation Halton landscape guidelines during detailed design within the Regulated Area.
☒	**Other:** Milkweed was observed at Culvert C1 on our site walk, providing habitat to the Monarch Butterfly (species to be up-listed). Please re-plant/re-instate Milkweed as part of the restoration works post construction. Also, a small "natural" bench was observed along one side of C1 to assist with wildlife passage. If possible, consideration to installation of a second "metal shelf" animal passage would be beneficial for long term wildlife passage.	Noted. As milkweed may be an "up-listed" species, if required, the tracking of milkweed will be included in the commitments section of the ESR. Wildlife passages are to be explored during detailed design.
Fish Habitat		
☒	As per Policy 2.1.6 of the Provincial Policy Statement, development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.	Noted. Stantec will contact MNRF and DFO in this regard.
	Other: Please complete a Fish Habitat Assessment at C1.	A fish habitat assessment will be completed at C1.

Stormwater Management/Drainage		
☒	Please discuss quality/quantity/erosion controls within the Stormwater Management Section of the Environmental Study Report. Please examine the potential to combine SWM with adjacent development.	Stormwater management for the preferred design alternative will be outlined in the ESR.
☒	As per the *Sixteen Mile Creek Subwatershed Study and Functional Stormwater and Environmental Management Strategy – Hwy 401 Industrial/Business Park Secondary Plan Area* please be advised that the quality requirements are *enhanced.* Please discuss the mitigation of thermal impacts.	Noted. Thermal impacts/mitigation will be considered.
☒	As per the *Sixteen Mile Creek Subwatershed Study and Functional Stormwater and Environmental Management Strategy – Hwy 401 Industrial/Business Park Secondary Plan Area* please be advised that the quantity requirements are post to pre-controls.	Noted.
☒	As per the *Sixteen Mile Creek Subwatershed Study and Functional Stormwater and Environmental Management Strategy – Hwy 401 Industrial/Business Park Secondary Plan Area* please be advised that the erosion control requirements are 25mm detention over 24 hours wherever possible.	Noted.
Other		
☒	In order to allow sufficient time to review the Draft Environmental Study Report, staff would appreciate it if a review timeline of 4 weeks could be incorporated into the project schedule. We would like to request 4 hard copies of the ESR for review.	Noted.
☒	Please provide a figure with proposed works and/or alternatives overlaid on an airphoto.	Noted. The preferred preliminary plan outlining proposed works will be overlaid on an airphoto.

From:	Burnard, Paula
To:	Johnson, Roy; Chandler, Trevor; Spisani, Sean; Stuart, Sean; Amirault, Heather
Subject:	FW: Reg. Rd. 25 Transpo Corridor Improvements from Steeles Ave to 5 Side Road Municipal Class EA - Information Request
Date:	Thursday, April 27, 2017 11:32:58 AM
Attachments:	Study Area.png

FYI – the info request went to Conservation Halton today.
Thanks!
Paula

Paula (Neto) Burnard, MScPl, MCIP, RPP
Senior Environmental Planner
Stantec
600-171 Queens Avenue London ON N6A 5J7
Phone: 519-675-6666
paula.burnard@stantec.com

From: Burnard, Paula
Sent: Thursday, April 27, 2017 10:54 AM
To: 'pbond@hrca.on.ca' <pbond@hrca.on.ca>
Cc: 'Reid, Jeffrey' <Jeffrey.Reid@halton.ca>; Murray, Gordon <gordon.murray@stantec.com>
Subject: Reg. Rd. 25 Transpo Corridor Improvements from Steeles Ave to 5 Side Road Municipal Class EA - Information Request

Hi Paul,
Halton Region retained Stantec to complete a Municipal Class Environmental Assessment (Class EA) study to consider options for transportation corridor improvements on Regional Road 25, from Steeles Avenue (Regional Road 8) to 5 Side Road, in the Town of Milton (key plan attached). I am the environmental planner/assistant project manager for the project. A formal Notice of Commencement will be circulated in the near future; in the meantime, we are gathering data required for the existing conditions review and study area profile. The following is a list of items we would like to request from Conservation Halton:

- Thermal classifications for watercourses and the appropriate in-water construction timing windows
- ELC, natural areas and features, rare species records, watercourse data and fish records
- SAR and provincially rare species information (we'll be contacting MNRF as well)
- Digital copies of any hydraulic modeling (HEC-RAS) for the tributary to Sixteen Mile Creek south of Chrisholm Drive (identified as Culvert 10879610 (CU01) and Culvert 10879610 (CU02)), and any hydrology reports relevant to the flows in that model
- Archival aerial imagery (pre 2004)
- Reporting related to fluvial investigations or design of instream construction works, located upstream of RR25. Sections of the channel were altered (natural channel design) about 15 or so years ago.

If there is anything else applicable to the study area that you think would be useful, please include.

Please let me know if you have any questions or comments.

Thank you and regards,
Paula

Paula (Neto) Burnard, MScPl, MCIP, RPP
Senior Environmental Planner
Stantec
600-171 Queens Avenue London ON N6A 5J7
Phone: 519-675-6666
paula.burnard@stantec.com

Stantec Consulting Ltd.
200-835 Paramount Drive, Stoney Creek ON L8J 0B4

August 3, 2017
File: 165010586

Attention: Ministry of Natural Resources and Forestry (MNRF)
Ministry of Natural Resources and Forestry, Aurora District
50 Bloomington Road
Aurora, ON L4G 0L8

Via email: aurora.mcallister@ontario.ca, esa.aurora@ontario.ca

To Ms. McAllister,

Reference: Natural Heritage Information Request for corridor improvements on Regional Road 25 from Steeles Avenue to 5 Side Road in the Regional Municipality of Halton

INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by The Regional Municipality of Halton to complete the Municipal Class Environmental Assessment (EA) to identify transportation improvements to Regional Road 25 from Steeles Avenue to 5 Side Road (the Project). The Region's Transportation Master Plan – The Road to Change (2011) identified the need to widen this stretch of Regional road 25 from 4 to 6 lanes. In addition to widening, other required road improvements may include:

- the addition of on-road and off-road active transportation facilities
- improvements to the Canadian National Railway overpass
- improvements at the Highway 401 Interchange
- improvements at all intersections within the study area
- improvements to the vertical and horizontal alignments where necessary,

The natural heritage Study Area includes the Regional Road 25 right-of-way (ROW), plus 120 m (see Attachment 1).

NATURAL HERITAGE REVIEW

Stantec completed a background review of the following online databases (accessed July 2017)

- MNRF's Land Information Ontario (LIO) database
- MNRF's Natural Heritage Information Centre (NHIC) database

Reference: Natural Heritage Information Request for corridor improvements on Regional Road 25 from Steeles Avenue to 5 Side Road in the Regional Municipality of Halton

- Ontario Nature's Reptile and Amphibian Atlas

Databases were reviewed for information pertaining to provincially designated natural features, and recent (1997+) records of species at risk (SAR) and provincially rare species. There were no provincially designated features (i.e, Areas of Natural or Scientific Interest, provincial parks, conservation reserves) in the Study Area. Two Species at Risk/Provincially Rare species records were found in the NHIC database: Virginia Bluebells (*Mertensia virginica*) and Redside Dace (*Clinostomus elongates*). However, the Ontario Reptile and Amphibian database contained records for four reptile Species at Risk: Blanding's Turtle (Threatened), Jefferson Salamander (Endangered), Milksnake (Special Concern), and Snapping Turtle (Special Concern). Barn Swallow was identified in the Study Area during the 2017 field visit (see below).

CONFIRMATION OF SURVEY REQUIREMENTS

Vegetation communities in the Study Area were mapped in July 2017 and all structures were searched for the presence of migratory bird nests. The Study Area is within an urban landscape; natural vegetation communities were mostly meadows, which have been regularly cut. A single Barn Swallow nest was identified on one of the culverts. No other Species at Risk or Provincially rare species were observed and there was no suitable habitat present for grassland birds or bats.

Stantec aquatic biologists will conduct reconnaissance level aquatic habitat surveys in summer 2017 to confirm existing conditions at the three Sixteen Mile Creek crossings and refine available habitat information. Field studies will include habitat mapping (e.g., watercourse dimensions, in-stream cover, substrate characteristics, riparian and aquatic vegetation) and photographs of representative habitat features. Fish community sampling is not proposed given the availability of data from CH and MNRF.

INFORMATION REQUEST

We respectfully request confirmation of the included findings and identification of any additional information you may have for the Study Area, including:

- Species/community information including occurrences of terrestrial and aquatic SAR and/or provincially rare species
- Fisheries community and aquatic habitat information for the watercourses in the study area vicinity
- Watercourse thermal regimes
- Significant Wildlife Habitat and other special habitat features

Reference: Natural Heritage Information Request for corridor improvements on Regional Road 25 from Steeles Avenue to 5 Side Road in the Regional Municipality of Halton

- Vegetation community and wetland delineations
- Other relevant natural heritage data

We thank you for your time and consideration in reviewing this information. Please do not hesitate to contact us with any questions or concerns regarding the content of this letter.

Regards,

STANTEC CONSULTING LTD.

Debbie Giesbrecht, M.Sc.
Senior Ecologist
Phone: 905-381-3214
debbie.giesbrecht@stantec.com

Attachment: Figure 1. Background Data

c. Paula.Burnard@stantec.com
Sean.stuart@stantec.com

APPENDIX C:
SPECIES AT RISK ASSESSMENT

Appendix C: 165660077 Terrestrial Species at Risk Habitat Assessment for the Study Area						
Common Name	**Scientific Name**	**S-Rank**	**COSSARO**	**COSEWIC**	**Species Requirements/ Limitations (MNRF, 2000)**	**Potential Habitat in Study Area?**
Birds						
Bank Swallow	*Riparia riparia*	S4B	THR	THR-NS	nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits. Single nests may occur, although colonies are typical and range from two to several thousand	No – there are no exposed banks
Barn Swallow	*Hirundo rustica*	S4B	THR	THR-NS	farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water	Yes – nesting opportunities within culverts; foraging habitat within the meadow communities and over the stormwater management facility
Chimney Swift	*Chaetura pelagica*	S4B, S4N	THR	THR	uses chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs	There may be suitable chimneys within the study area but not within the proposed work zone.
Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR-NS	open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size	No – there are no meadows of sufficient size in the study area.
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR-NS	large, open grassland habitat, pastures and hayfields.	No – there are no grasslands, hayfields or pastures of sufficient size in the study area.
Eastern Wood Pewee	*Contopus virens*	S5B	SC	SC-NS	open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks	No areas of deciduous forest in the study area
Golden-winged Warbler	*Vermivora chrysoptera*	S4B	SC	THR	early successional habitats within a matrix of mature forest	No suitable habitat.
Wood Thrush	*Hylocichla mustelina*	S4B	SC	THR-NS	deciduous and mixed forests in southern Ontario, ranging from small and isolated to large and contiguous woodlots; presence of tall trees and a thick understory are preferred	No areas of deciduous forest in the study area
Acadian Flycactcher	*Empidonax virescens*	S2S3B	END	END	mature deciduous forests; heavily wooded ravines; creek bottoms or river swamps; needs at least 30 ha of forest	No mature forest in study area.

Appendix C: 165660077 Terrestrial Species at Risk Habitat Assessment for the Study Area						
Common Name	**Scientific Name**	**S-Rank**	**COSSARO**	**COSEWIC**	**Species Requirements/ Limitations (MNRF, 2000)**	**Potential Habitat in Study Area?**
Cerulean Warbler	*Dendroica cerulea*	S3B	THR	END-SC	mature deciduous forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha)	No large tracts of mature forest.
Canada Warbler	*Cardellina canadensis*	S4B	SC	THR	an interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30 ha	No suitable habitat present.
Louisiana Waterthrush	*Seiurus motacilla*	S3B	SC	THR-SC	wooded ravines with running streams; woodland swamps; large tracts of mature deciduous or mixed forests	No suitable habitat present.
Prothonotary Warbler	*Protonotaria citrea*	S1	END	END	prefers 100 ha of flooded or swampy woodlands with standing or flowing water and more than 25% canopy cover with numerous stumps and snags; stream borders or flooded bottomlands	No suitable habitat present.
Reptiles and Amphibians						
Blanding's Turtle	*Emydoidea blandingi*	S3	THR	THR	shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation	No suitable habitat present.
Snapping Turtle	*Chelydra serpentina*	S3	SC	SC	inhabits ponds, sloughs, streams, rivers, and shallow bays that are characterized by slow moving water, aquatic vegetation, and soft bottoms; females show strong nest site fidelity and nest in sand or gravel banks at waterway edges in late May or early June	No suitable aquatic habitat present.
Eastern Ribbonsnake	*Thamnophis sauritus*	S3	SC	SC	usually found close to water, particularly wetlands with an abundance of small fish and frogs	No suitable habitat present.

Appendix C: 165660077 Terrestrial Species at Risk Habitat Assessment for the Study Area						
Common Name	**Scientific Name**	**S-Rank**	**COSSARO**	**COSEWIC**	**Species Requirements/ Limitations (MNRF, 2000)**	**Potential Habitat in Study Area?**
Eastern Milksnake	*Lampropeltis triangulum*	S3	Not at risk	SC	farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings	Potential habitat in meadows but unlikely in this highly urbanized landscape.
Jefferson Salamander	*Ambystoma jeffersonianum*	S2	END	END	damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding	No suitable habitat present.
Mammals						
Little Brown Myotis	*Myotis lucifuga*	S4	END	END	uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	No maternity roost habitat present; bats may use trees in the cultural woodland or open areas for foraging.
Northern Myotis	*Myotis septentrionalis*	S3?	END	END	hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	No maternity roost habitat present; bats may use trees in the cultural woodland or open areas for foraging.
Tri-colored Bat	*Perimyotis subflavus*	S3?	END	END	roosts in colonies in tree cavities in a wide variety of deciduous and coniferous forest stands	No maternity roost habitat present; bats may use trees in the cultural woodland or open areas for foraging.
Insects						
Monarch	*Danaus plexippus*	S4B, S2n	SC	END	found primarily wherever milkweed and wildflowers (including goldenrods, asters and purple loosestrife) exist; larvae occur only where milkweed exists; adults are more generalized, feeding on a variety of wildflower nectar' habitat includes abandoned farmland, along roadsides, and other open spaces where these plants grow	Yes – common milkweed, the larval host plant for this species was observed in the study area at C1 culvert.

Appendix C: 165660077 Terrestrial Species at Risk Habitat Assessment for the Study Area						
Common Name	**Scientific Name**	**S-Rank**	**COSSARO**	**COSEWIC**	**Species Requirements/ Limitations (MNRF, 2000)**	**Potential Habitat in Study Area?**
Vegetation						
American Chestnut	*Castanea dentata*	S1S2	END	END	moist to well drained forests on sand, occasionally heavy soils	There were no natural forests in the study area.
American Columbo	*Frasera caroliniensis*	S2	END	END	open deciduous forests, and occasionally along open forest edges and dense shrub thickets	No deciduous forests were present.
Hart's-tongue Fern	*Asplenium scolopendrium*	S3	SC	SC	areas with shaded calcareous rock	No habitat was present.
Broad Beech Fern	*Phegopteris hexagonoptera*	S3	SC	SC	rich, moist soil in mature deciduous forests	No deciduous forests were present.
Dense Blazing-star	*Liatris spicata*	S2	THR	THR	Prairies, savannahs and open sandy woods	No suitable habitat was present.
Hoary Mountain Mint	*Pycnanthemum verticillatum var. pilosum*	S1	END	END	dry woodlands in partial shade of oaks and in openings	No suitable habitat was present.
Red Mulberry	*Morus rubra*	S2	END	END	moist woods and wooded river valleys	No suitable habitat was present.

APPENDIX D:
SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Area (Terrestrial)	• Fields with sheet water or utilized by tundra swans during spring (mid-March to May), or annual spring melt water flooding found in any of the following Community Types: Meadow (CUM1), Thicket (CUT1). • Agricultural fields with waste grains are commonly used by waterfowl, and these are not considered SWH unless used by Tundra swans in the Long Point, Rondeau, Lake St. Clair, Grand Bend and Point Pelee Areas.	• ELC surveys were used to assess features within the study area that may support waterfowl stopover and staging areas (terrestrial).	• Meadow communities were present in small pockets within the study area. However, these small communities were interspersed with industrial and commercial development and major highways so would not suitable for wildlife staging. • No candidate habitat for waterfowl stopover and staging (terrestrial) was present within the study area.
Waterfowl Stopover and Staging Area (Aquatic)	• The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD). • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. • The combined area of the ELC ecosites and a 100 m radius area is the SWH. • Sewage treatment ponds and storm water ponds do not qualify as a SWH; however, a reservoir managed as a large wetland or pond/lake does qualify.	• ELC surveys were used to assess features within the study area that may support waterfowl stopover and staging areas (aquatic).	• There was meadow marsh associated with a storm water management facility but this does not qualify as SWH. • All other marsh habitat was present in very small isolated patches or along the tributaries. • No candidate waterfowl stopover and staging (aquatic) was present within the study area.
Shorebird Migratory Stopover Area	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of amour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a significant wildlife habitat. • The following community types: Meadow Marsh (MAM), Beach/Bar (BB), or Sand Dune (SD)	• ELC surveys were used to assess features within the study area that may support migratory shorebirds.	• There were no seasonally flooded areas or shorelines within the study area. • No candidate habitat for shorebird stopover areas was present within the study area.
Raptor Wintering Area	• At least one of the following Forest Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) or Coniferous Forest (FOC), in combination with one of the following Upland Community Types:	• ELC surveys were used to assess features within the study area that may support wintering raptors.	• There were no meadow, cultural woodland and cultural thicket communities located adjacent to

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
	Meadow (CUM), Thicket (CUT), Savannah (CUS), Woodland (CUW) (<60% cover) that are >20 ha and provide roosting, foraging and resting habitats for wintering raptors. • Upland habitat (CUM, CUT, CUS, CUW), must represent at least 15 ha of the 20 ha minimum size.		forest communities in the study area. • No candidate habitat for raptor wintering areas was present within the study area.
Bat Hibernacula	• Hibernacula may be found in caves, mine shafts, underground foundations and karsts. • May be found in these Community Types: Crevice (CCR), Cave (CCA).	• ELC surveys were used to assess features within the study area that may support bat hibernacula.	• No crevices, caves or abandoned mines were located within the study area. • No candidate habitat for bat hibernacula was present within the study area.
Bat Maternity Colonies	• Maternity colonies considered significant wildlife habitat are found in forested ecosites. • Either of the following Community Types: Deciduous Forest (FOD), Mixed Forest (FOM), Deciduous Swamp (SWD) or Mixed Swamp (SWM) that have>10/ha wildlife trees >25cm diameter at breast height (dbh). • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.	• ELC surveys were used to assess features within the study area that may support bat maternity colonies.	• There were no deciduous forest communities in the study area that would provide suitable habitat for bat maternity colonies. • No candidate bat maternity colonies were present within the study area
Turtle Wintering Areas	• Snapping and Midland Painted turtles utilize ELC community classes: Swamp (SW), Marsh (MA) and Open Water (OA). Shallow water (SA), Open Fen (FEO) and Open Bog (BOO). • Northern Map turtle- open water areas such as deeper rivers or streams and lakes can also be used as over-wintering habitat. • Water has to be deep enough not to freeze and have soft mud substrate. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.	• ELC surveys were used to assess features within the study area that may support areas of permanent standing water but not deep enough to freeze.	• The tributaries were too shallow to support over-wintering turtles. • No candidate turtle wintering areas were present within the study area.

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
Snake Hibernacula	• Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock and other natural features. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. • Any ecosite in southern Ontario other than very wet ones may provide habitat. The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).	• ELC surveys and wildlife assessments were used to assess features within the study area that may support snake hibernacula.	• There were no candidate snake hibernacula observed in the study area. • No candidate habitat for snake hibernacula was present within the study area.
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	• Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (CUM), Thicket (CUT), Bluff (BL), Cliff (CL). • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation.	• ELC surveys were used to assess features within the study area that may support colonial bird breeding habitat.	• There were no eroding banks or cliff faces in the study area. • Candidate habitat for Bank Swallow was not present within the Study area.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	• Identification of stick nests in any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Treed Fen (FET). • The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH. • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.	• ELC surveys and Woodland Assessments were used to assess features within the study area that may support colonial bird breeding habitat (Trees/Shrubs).	• There were no appropriate community types within the Study areas and no large stick nests were observed during field investigations. • No candidate habitat for tree/shrub colonial nesting birds was present within the study area.
Colonial-Nesting Bird Breeding Habitat (Ground)	• Any rocky island or peninsula within a lake or large river. • For Brewer's Blackbird close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Meadow (CUM), Thicket (CUT), Savannah (CUS).	• ELC surveys and Woodland Assessments were used to assess features within the study area that may support colonial bird breeding habitat (Ground).	• No rocky islands or peninsulas were present within the study area. • In southern Ontario, Brewer's Blackbird known occurrences are primarily restricted to the Bruce Peninsula; none are known to occur in the study area region and it is considered a very rare irregular spring and autumn transient.

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
			• No candidate habitat for ground colonial nesting birds was present within the study area.
Migratory Butterfly Stopover Areas	• Located within 5 km of Lake Ontario • A combination of ELC communities, one from each land class is required: Field (CUM, CUT, CUS) and Forest (FOC, FOM, FOD, CUP) • Minimum of 10 ha in size with a combination of field and forest habitat present	• ELC surveys were used to assess features within the study area that may support migratory butterfly stopover areas.	• The Study area is not located within 5 km of the Lake Ontario shoreline. • No candidate habitat for migratory butterfly stopover areas were present within the study area.
Landbird Migratory Stopover Areas	• The following community types: Forest (FOD, FOM, FOC) or Swamp (SWC, SWM, SWD) • Woodlots must be >10 ha in size and within 5 km of Lake Ontario – woodlands within 2 km of Lake Ontario are more significant	• ELC surveys and GIS analysis were used to assess features within the study area that may support landbird migratory stopover areas.	• The study area is not located within 5 km of the Lake Ontario shoreline. • No candidate habitat for migratory landbird stopover areas were present within the study area.
Deer Winter Congregation Areas	• Woodlots typically > 100 ha in size unless determined by the MNR as significant. (If large woodlots are rare in a planning area >50ha) • All forested ecosites within Community Series: FOC, FOM, FOD, SWC, SWM, SWD • Conifer plantations much smaller than 50 ha may also be used	• No studies required as the MNRF determines this habitat.	• No deer winter congregation areas were identified by the MNRF within the study area. • No candidate habitat for deer winter congregation areas were present within the study area.
Rare Vegetation Communities			
Cliffs and Talus Slopes	• A Cliff is vertical to near vertical bedrock >3 m in height. • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris • Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT • Most cliff and talus slopes occur along the Niagara Escarpment	• ELC surveys were used to assess features within the study area that would be considered cliffs or talus slopes.	• No cliffs or talus slopes were identified within the study area. • No candidate wildlife habitat for cliffs or talus slopes was present within the study area.
Sand Barrens	• Sand barrens typically are exposed sand, generally sparsely vegetated and cause by lack of moisture, periodic fires and erosion. • Vegetation can vary from patchy and barren to tree covered but less than 60%. • Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite).	• ELC surveys were used to assess features within the study area that would be considered to be sand barrens.	• No sand barrens were identified within the study area. • No candidate wildlife habitat for sand barrens was present within the study area.

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
Alvars	• An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. • Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. • Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. • Vegetation cover varies from patchy to barren with a less than 60% tree cover. • Any of the following Community Types: ALO1(Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry-Fresh Pine Coniferous Forest), FOC2 (Dry-Fresh Cedar Coniferous Forest), CUM2 (Bedrock Cultural Meadow), CUS2 (Bedrock Cultural Savannah), CUT2-1 (Common Juniper Cultural Alvar Thicket), or CUW2 (Bedrock Cultural Woodland) • An Alvar site > 0.5 ha in size	• ELC surveys were used to assess features within the study area that would be considered to be alvar communities.	• No alvars were identified within the study area. • No candidate wildlife habitat for alvars was present within the study area.
Old-growth Forest	• Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species. • No minimum size criteria t in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest) • Forests greater than 120 years old and with no historical forestry management was the main criteria when surveying for old-growth forests.	• ELC surveys were used to assess features within the study area that would be considered to be old-growth forest communities.	• No old growth forests were identified within the study area. • No candidate wildlife habitat for old growth forests was present within the study area.
Savannahs	• A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. • In Ecoregion 6E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).	• ELC surveys were used to assess features within the study area that would be considered to be savannah communities.	• No savannahs were identified within the study area. • No candidate wildlife habitat for savannahs was present within the study area.

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
	• Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savannah Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savannah Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite).		
Tall-grass Prairies	• A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. • In Ecoregion 6E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). • Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite).	• ELC surveys were used to assess features within the study area that would be considered to be tall-grass communities.	• No tall grass prairies were identified within the study area. • No candidate wildlife habitat for tall grass prairies was present within the study area.
Other Rare Vegetation Communities	• Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG	• ELC surveys were used to assess features within the study area that would be considered to be other rare vegetation communities.	• No rare vegetation communities were identified within the study area. • No candidate wildlife habitat for rare vegetation communities were present within the study area.
Specialized Habitat for Wildlife			
Waterfowl Nesting Area	• All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 • Note: includes adjacency to Provincially Significant Wetlands	• ELC surveys were used to assess features within the study area that may support nesting waterfowl.	• There were no appropriate wetland communities with adjacent upland habitat that would support nesting waterfowl. • No candidate wildlife habitat for waterfowl nesting areas was present within the study area.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). • ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• ELC surveys and Woodland Assessments were used to assess features within the study area that may support nesting, foraging and perching habitat for large raptors.	• No large stick nests were identified within the study area. • No candidate wildlife habitat for Osprey or Bald Eagle habitat was present within the study area.

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
Woodland Raptor Nesting Habitat	• All natural or conifer plantation woodland/forest stands combined >30 ha and with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • May be found in all forested ELC Ecosites. • May also be found in SWC, SWM, SWD and CUP3	• ELC surveys, Woodland Assessments and GIS analysis were used to assess features within the study area that may support nesting habitat for woodland raptors.	• There were no forest stands > 30 ha within the study area, and no stick nests were identified during field investigations. • No candidate wildlife habitat for woodland raptor nesting was present within the study area.
Turtle Nesting Areas	• Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1 • Best nesting habitat for turtles is close to water, away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	• ELC surveys and GIS analysis were used to assess features within the study area that may support turtle nesting areas.	• Exposed soil was associated with disturbed meadows in vacant lots; however, they are not adjacent to wetland Ecosites and are not candidate overwintering habitat. • No candidate wildlife habitat for turtle nesting areas was present within the study area.
Seeps and Springs	• Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs. • Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system.	• ELC surveys were used to assess features within the study area that may support seeps and springs.	• No seeps/springs were observed in the study area during field investigations. • No candidate habitat for seeps and springs were present within the study area.
Amphibian Breeding Habitat (Woodland)	• All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD • Presence of a wetland, lake, or pond within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians.	• ELC surveys and Woodland Assessments were used to assess features within the Study area that may support woodland breeding amphibians.	• There were no woodlands with adjacent wetlands or with pooling water. • No candidate amphibian breeding habitat (woodland) was present within the study area.

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
	• Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat		
Amphibian Breeding Habitat (Wetland)	• ELC Community Classes SW, MA, FE, BO, OA and SA. • Wetland areas >120 m from woodland habitats. • Wetlands and pools (including vernal pools) >500 m^2 (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation.	• ELC surveys were used to identify wetland habitat features within the study area including those that may support bullfrogs (i.e., natural open aquatic and marsh habitats greater than 1 ha in size).	• The Red-osier Dogwood Mineral Deciduous Thicket Swamp (SWT2-5) that was present on the west side of Regional Road 25, south of Highway 401 is candidate amphibian breeding habitat. • **Candidate amphibian breeding habitat (wetland) was present within the study area.**
Species of Conservation Concern			
Marsh Bird Breeding Habitat	• All wetland habitats with shallow water and emergent aquatic vegetation. • May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: Swamp (SW), Marsh (MA) and Meadow (CUM) Community Types.	• ELC surveys were used to identify marshes with shallow water and emergent vegetation that may support marsh breeding birds.	• There were no wetlands with shallow water and emergent vegetation present. • There was no candidate habitat for marsh breeding birds within the study area.
Woodland Area-sensitive Bird Breeding Habitat	• Habitats >30ha where interior forest is present (at least 200 m from the forest edge); typically >60 years old. • These include any of the following Community Types: Forest (FO), Treed Swamp (SW)	• ELC surveys and GIS analysis were used to determine whether woodlots that occurred within the study area that were >30 ha with interior habitat present (>200 m from edge).	• No woodlots exceeded 30 ha in size occur in the Study area. • No candidate wildlife habitat for woodland area-sensitive breeding bird habitat was present within the study area.
Open Country Bird Breeding Habitat	• Grassland areas > 30 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (CUM).	• ELC surveys and GIS analysis were used to identify grassland communities within the study area that may support area-sensitive breeding birds.	• No meadows >30 ha were identified within the study area. • No candidate wildlife habitat for open country breeding bird habitat was present within the study area.
Shrub/Early Successional Bird Breeding Habitat	• Oldfield areas succeeding to shrub and thicket habitats >10 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the	• ELC surveys and GIS analysis were used to identify large CUT, CUS or CUW communities that may support shrub/early successional breeding birds.	• Thicket communities located within the study area were small and fragmented.

Appendix D: Wildlife Habitat Assessment			
Candidate Wildlife Habitat	**Criteria**	**Methods**	**Habitat Assessment of Features Found Within the Study area**
	following Community Types: Thickets (CUT), Savannahs (CUS), or Woodlands (CUW).		• No candidate wildlife habitat for shrub/early successional breeding bird habitat was present within the study area.
Terrestrial Crayfish	• Meadow marshes and edges of shallow marshes (no minimum size). Vegetation communities include MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3. • Construct burrows in marshes, mudflats, meadows • Can be found far from water	• ELC surveys were used to identify shallow marsh and meadow marsh communities that occurred within the study area.	• No crayfish chimneys were observed during field investigations. • No candidate wildlife habitat for terrestrial crayfish was present within the study area.
Animal Movement Corridors			
Amphibian Movement Corridor	• Corridors may be found in all ecosites associated with water. • Determined based on identifying significant amphibian breeding habitat (wetland).	• Analysis of candidate amphibian breeding habitat (wetland) determined the potential presence of an amphibian movement corridor.	• No amphibian movement corridors were present within the study area.

APPENDIX E:
PHOTO LOG

Photo 1: Facing upstream from the inlet of culvert C1 (09/08/2017).

Photo 2: Inlet of culvert C1 (09/08/2017).

Photo 3: Facing downstream from the outlet of culvert C1 (09/08/2017).

Photo 4: Facing upstream at the Culvert c2 outlet (09/08/2017).

Photo 5: Facing downstream from the outlet of culvert 2 culvert (08/09/2017).

Photo 6: Facing downstream from culvert C2 (08/09/2017).

Photo 7: Facing the inlet of culvert C2 from the culvert C3 outlet (08/09/2017).

Photo 8: Facing upstream from the culvert C3 inlet (08/09/2017).

Photo 9: Inlet of culvert C4 (12/07/2017).

Photo 10: Facing downstream from culvert C4 (12/07/2017).

APPENDIX F:
AQUATIC FIELD NOTES

Stantec Consulting Ltd.
70 Southgate Drive, Suite 1, Guelph ON N1G 4P5

Waterbody Rapid Assessment Form

Project Number: 165010586 | Project Name: Regional Road 25 Widening Class EA
Date: September 8, 2017 | Field Personnel: Sean Stuart

Weather Conditions (current): 15 TEMP (°C) | 0 PRECIPITATION
Weather Conditions (previous 24-hrs): 18 TEMP (°C) | 0 PRECIPITATION

Station No.: Culvert C1 | Watercourse Name: Tributary to Sixteen Mile Creek
UTM Coordinates: 17 (Zone) E 589298 (Easting) N 4819399 (Northing) | Datum: WGS84
Start Time: 10:30am | End Time: 11:15am | Photos:
Descriptive Location: RR25 crossing of Sixteen Mile Creek tributary north of intersection of RR25 and Steeles Ave.

Water Quality – Not recroded

Dissolved Oxygen: N/A mg/L | pH: N/A | Conductivity: N/A µS/cm
Water Temperature: N/A °C | Air Temperature: N/A °C | Time *in situ* measurements taken: | WQ Meter ID:

Watercourse Dimensions & Morphology

Mean Wetted Width: 0.8(m) | Maximum Pool Depth: 20(cm)
Mean Bankfull Width: 2.5(m) | Mean Water Depth: 10(cm)
Riffle: 20% | Pool: 80% | Run: % | Flat: %
Evidence of Eroding Banks: Upstream well vegetated with no visible erosion
Comments on Bank Stability: Banks appeared stable at time of field investigations

Substrate (percent cover)

Bedrock	Cobble	Sand	Silt	Muck
%	30%	%	%	%

Boulder	Gravel	Clay	Marl	Detritus
%	10%	20%	%	40%

In-water Cover (check cover types present)

☐ Undercut Banks ☐ Deep Pool ☐ Watercress ☒ Aquatic Vegetation
☒ Overhanging Vegetation ☐ Woody Debris ☐ Boulder ☐ Other:

Riparian Zone

Riparian Cover: Cattail marsh and shrubs
(% of watercourse shaded; dominant vegetation; mature or early successional)
Adjacent Land Use: Commercial

Fish Habitat Potential

Critical Habitat: None visible
(spawning or nursery areas; groundwater upwellings)
Migratory Obstructions: Minor vegetation jam at culvert inlet-seasonal
(seasonal; permanent)
Fish Observed: None
(note any fish observations)

Characteristics

Natural Watercourse	Trapezoidal Channel	Roadside Ditch	Buried Tile	Seep
	X			

Temporary Channel	Dugout Pond	Other (describe below)	

(e.g., furrows)

Other Notes (habitat, dominant vegetation type, incidental wildlife, etc.) ☐ check if notes continued on back of this form

Originates in phragmites pond west of RR25, enters narrow channel (1-2 m wide) and then flows under RR25 in concrete box culvert. Majority of channel morphology is pool habitat and is well shaded.

East of RR25, channel becomes straightened with dense cattail and reed canary grass in channel. SiltSoxx present in channel.

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Sean Stuart (field notes author) | Print Name & Initial: (field notes QA/QC personnel)

Stantec Consulting Ltd.
70 Southgate Drive, Suite 1, Guelph ON N1G 4P5

Waterbody Rapid Assessment Form

Project Number: 165010586 | Project Name: Regional Road 25 Widening Class EA
Date: September 8, 2017 | Field Personnel: Sean Stuart

Weather Conditions (current): 15 TEMP (°C) | 0 PRECIPITATION
Weather Conditions (previous 24-hrs): 18 TEMP (°C) | 0 PRECIPITATION

Station No.: Culverts C2 and C3 | Watercourse Name: Tributary to Sixteen Mile Creek
UTM Coordinates: 17T (Zone) E 588829 (Easting) N 4819680 (Northing) | Datum: WGS84
Start Time: | End Time: | Photos:
Descriptive Location: Approximately 150m downstream of intersection of Chisholm Drive and RR25

Water Quality – Not recorded

Dissolved Oxygen: N/A mg/L | pH: N/A | Conductivity: N/A µS/cm
Water Temperature: N/A °C | Air Temperature: N/A°C | Time *in situ* measurements taken: N/A | WQ Meter ID:

Watercourse Dimensions & Morphology

Mean Wetted Width: 4(m) | Maximum Pool Depth: 0.5(cm)
Mean Bankfull Width: 8(m) | Mean Water Depth: 0.3(cm)
Riffle: 10% | Pool: 90% | Run: % | Flat: %
Evidence of Eroding Banks: None visible – Banks within RR25 ROW have been hardened with riprap and gabion
Comments on Bank Stability: Banks well vegetated with grasses, herbs, and emergent aquatic vegetation

Substrate (percent cover)

Bedrock	Cobble	Sand	Silt	Muck
%	10%	%	80%	%

Boulder	Gravel	Clay	Marl	Detritus
%	10%	%	%	%

In-water Cover (check cover types present)

☐ Undercut Banks ☒ Deep Pool ☐ Watercress ☒ Aquatic Vegetation
☒ Overhanging Vegetation ☐ Woody Debris ☐ Boulder ☐ Other:

Riparian Zone

Riparian Cover: Downstream of Culvert C2, riparian zone includes approximately 2-3m of grasses and herbaceous plants bordered by mown lawn. Upstream of Culvert C3, riparian zone includes shrubs and small trees. Approximately 5% is shaded.
(% of watercourse shaded; dominant vegetation; mature or early successional)
Adjacent Land Use: Commercial

Fish Habitat Potential

Critical Habitat: None visible
(spawning or nursery areas; groundwater upwellings)
Migratory Obstructions: None visible
(seasonal; permanent)
Fish Observed: High number of Cyprinids
(note any fish observations)

Characteristics

Natural Watercourse	Trapezoidal Channel	Roadside Ditch	Buried Tile	Seep
	X			

Temporary Channel (e.g., furrows)	Dugout Pond	Other (describe below)	

Other Notes (habitat, dominant vegetation type, incidental wildlife, etc.) ☐ check if notes continued on back of this form

Upstream of Culvert C2, channel has natural meandering pattern becoming straightened within the RR25 ROW. Between C2 and C3, the channel becomes lined with riprap and minimal vegetation. Downstream of C3, the channel flows through a concrete-lined trapezoidal channel for approximately 20 m before entering a riprap/gabion lined channel. The riprap/gabion lined reach has silt deposition over the hardened substrate. Majority is densely vegetated adjacent to channel becoming mown lawn within 2 m. RR25 culvert outlet includes 20 m of concrete lining before becoming silt dominated.

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Sean Stuart (field notes author) | Print Name & Initial: (field notes QA/QC personnel)

Stantec Consulting Ltd.
70 Southgate Drive, Suite 1, Guelph ON N1G 4P5

Waterbody Rapid Assessment Form

Project Number: 165010586 | Project Name: Regional Road 25 Widening Class EA
Date: September 8, 2017 | Field Personnel: Sean Stuart

Weather Conditions (current): 16 TEMP (°C) | 0 PRECIPITATION
Weather Conditions (previous 24-hrs): 18 TEMP (°C) | 0 PRECIPITATION

Station No.: Culvert C4 | Watercourse Name: Tributary to Sixteen Mile Creek
UTM Coordinates: 17 (Zone) E 588204 (Easting) N 4820307 (Northing) | Datum: WGS84
Start Time: 11:30am | End Time: 12:15pm | Photos:
Descriptive Location: RR25 crossing of tributary immediately north of Highway 401

Water Quality – Not Recorded

Dissolved Oxygen: N/A mg/L | pH: N/A | Conductivity: N/A µS/cm
Water Temperature: N/A °C | Air Temperature: N/A°C | Time *in situ* measurements taken: | WQ Meter ID:

Watercourse Dimensions & Morphology

Mean Wetted Width: 1.5(m) | Maximum Pool Depth: 40(cm)
Mean Bankfull Width: 2.5(m) | Mean Water Depth: 20(cm)
Riffle: 30% | Pool: 60% | Run: 10% | Flat: %
Evidence of Eroding Banks: No visible erosion located within RR25 ROW
Comments on Bank Stability: Banks within RR25 ROW well vegetated with no visible erosion

Substrate (percent cover)

Bedrock	Cobble	Sand	Silt	Muck
%	30%	10%	40%	%

Boulder	Gravel	Clay	Marl	Detritus
%	10%	%	%	10%

In-water Cover (check cover types present)

☐ Undercut Banks ☒ Deep Pool ☐ Watercress ☒ Aquatic Vegetation
☒ Overhanging Vegetation ☐ Woody Debris ☐ Boulder ☐ Other:

Riparian Zone

Riparian Cover: Riparian zone consists of grasses and herbs with scattered trees and shrubs
(% of watercourse shaded; dominant vegetation; mature or early successional)
Adjacent Land Use: Commercial

Fish Habitat Potential

Critical Habitat: None visible within RR25 ROW. Pools with overhanging vegetation present beyond RR25 ROW.
(spawning or nursery areas; groundwater upwellings)
Migratory Obstructions: Cobble at C4 inlet may function as barrier under low flow conditions as it lacks low flow channel
(seasonal; permanent)
Fish Observed: None observed
(note any fish observations)

Characteristics

Natural Watercourse	Trapezoidal Channel	Roadside Ditch	Buried Tile	Seep
X				

Temporary Channel	Dugout Pond	Other (describe below)	

(e.g., furrows)

Other Notes (habitat, dominant vegetation type, incidental wildlife, etc.) ☐ check if notes continued on back of this form

Channel form suggests historic realignments upstream and downstream of the RR25 ROW. Upstream of ROW, channel is straightened with a meandering pattern downstream.

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Sean Stuart (field notes author) | Print Name & Initial: (field notes QA/QC personnel)

APPENDIX G:
TERRESTRIAL FIELD NOTES

Stantec Consulting Ltd.
1 – 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Project Number: | Project Name: RR25

Date: July 10/17 | Field Personnel:

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):

POLYGON DESCRIPTION

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 1

START TIME:

END TIME:

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☑ NATURAL
☑ RIVERINE	☐ CREVICE / CAVE	
☐ BOTTOMLAND	☐ ALVAR	☐ CULTURAL
☐ TERRACE	☐ ROCKLAND	
☐ VALLEY SLOPE	☐ BEACH / BAR	
☐ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	1	CORSTOL
2	SUB-CANOPY			PHAARUN > TYPXG
3	UNDERSTOREY			LYTSALI = ASTLANC
4	GRD. LAYER			

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	<10	10 – 24	25 – 50	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY:	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

VEGETATION TYPE: | CODE:

COMPLEX | CODE:

Evidence of Disturbance / Notes:

Low diversity.
channel 1-2m wide w standing water

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER				DISTANCE FROM RD.		COLL.
	1	2	3	4	≤5 m	>5 m	
TREES:							
SHRUBS:							
PARINSE							
GROUND:							
EUPMACU							

Page ___ of ___ Quality Control: This form is complete ☐ & legible ☐

Print Name: _____ Signature: _____
(Field Notes Author) (Field Notes QA/QC personnel)

Stantec Consulting Ltd.
1 – 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Project Number: | Project Name:
Date: | Field Personnel:

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):

POLYGON DESCRIPTION

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 2
START TIME:
END TIME:

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☑ NATURAL
☐ RIVERINE	☐ CREVICE / CAVE	
☐ BOTTOMLAND	☐ ALVAR	☐ CULTURAL
☐ TERRACE	☐ ROCKLAND	
☑ VALLEY SLOPE	☐ BEACH / BAR	
☐ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	4/3	1	ACENEGU
2	SUB-CANOPY	3	2	CRAT-SP
3	UNDERSTOREY	4	4	SOLCANA
4	GRD. LAYER	5	4	CoolSeason Grass

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m
CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	<10	10 – 24	25 – 50	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY:	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

VEGETATION TYPE: | CODE:

COMPLEX | CODE:

Evidence of Disturbance / Notes:

Open HR and CUT

ANDGERA in shallow drainage
Swallow at back of Tetra
Conference parking lot - several
stems in CARVULP, Cool season
Bromus, CORFOEM
no evidence of planting

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER 1	2	3	4	DISTANCE FROM RD. ≤5 m	>5 m	COLL.
TREES:							
MALPUMI							
QUEMACR							
JUGNIGR							
POP-DELT ct.							
QUERUBR							
CARCORD							
OSTVIRG							
QUERUBR							
SHRUBS:							
LONTATA							
RHACATH							
VITRIPA							
CORFOEM							
GROUND:							
Cool Season grasses							
SOLCANA							
LOTCORN							
H. Bindweed							
Sp. dogbane							
DEN_CA - BIEN							
TRIFOL SP							
BROINER							
CARVULP							

Page __ of __

Quality Control: This form is complete ☐ & legible ☐

Print Name: _____ (Field Notes Author)

Signature: _____ (Field Notes QA/QC personnel)

Stantec Consulting Ltd.
1 – 70 Southgate Drive
Guelph, ON
Canada N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

Roadside ELC, Woodland & Wildlife Habitat Assessment Form

Project Number: _____ Project Name: _____

Date: _____ Field Personnel: _____

Weather Conditions:	TEMP (°C):	WIND:	CLOUD:	PPT:	PPT (in last 24 hrs):

POLYGON DESCRIPTION

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

POLYGON: 3

START TIME:

END TIME:

TOPOGRAPHIC FEATURE		HISTORY
☐ LACUSTRINE	☐ TALUS	☐ NATURAL
☐ RIVERINE	☐ CREVICE / CAVE	☑ CULTURAL
☒ BOTTOMLAND	☐ ALVAR	
☐ TERRACE	☐ ROCKLAND	
☐ VALLEY SLOPE	☐ BEACH / BAR	
☐ TABLELAND	☐ SAND DUNE	
☐ ROLL. UPLAND	☐ BLUFF	
☐ CLIFF		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	3	2	PHAARUN
2	SUB-CANOPY	4	4	CIRARVE = BRONER
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60% N/O=not observed

STANDING SNAGS:	<10	10 – 24	25 – 50	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT N/O=Not observed

STAND MATURITY:	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

VEGETATION TYPE:	CODE:

	COMPLEX		CODE:

Evidence of Disturbance / Notes:

Shallow wide drains in TYPXG

LAYERS: 1=CANOPY >10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT N/O=Not observed

SPECIES CODE	LAYER				DISTANCE FROM RD.		COLL.
	1	2	3	4	≤5 m	>5 m	
TREES:							
SHRUBS:							
GROUND:							
SOLCANA		A					
DAUCARO		O					
DACGLOM		O					
CORLOT1		A					
ASCSYR1		R					
FRI. non-clasp		A					

Quality Control: This form is complete ☐ & legible ☐

Print Name: _____ Signature: _____

(Field Notes Author) (Field Notes QA/QC personnel)

July 10/17

RR25

- 24°C, 100% overcast, Wind = 2-3, no rain.
- Spi sand
- Start 2:00 pm - 6:00 pm

ROW/CUM			Planted
Pennycress	FESARUN	RUSS OLIVE	Eu. Tam.
DIPSYLV	CORLOTI	VITRIPA	ACESACC
ELYREPE	ASCSYRI	JUGNIGR	TILCORD
BROINER	HYPPERF	RHUTYPH	PIC - SP.
LYTSALI	SOLCANA	VIBLENT	Honey locust
TYRCAR X	CIRARVE	CRA. cf. Scar.	MALUS - sp
Silverbuyloss	ERI-non-clam	SAL cf. bebb.	ACEPLAT
VICCRAC	MELALBA		THUOCCI
VICCORN	CIRINTM		SAL cf. AMYG
Yarrow	SONASPE		SAL X.
Ragweed	PHAARUN		UCMPUMI
TAROFFI	PHRAUST		PINSTRO
CENMACU	PHLPRAT		PRUVIRG
ASTNOVA	DAUCARO		
TANSY	Red Clover		
CIRULG	TYPGRAM		
ARCMINO	RUMCRIS		
RUBHIRT	Camomile		
AGRSTOL(cf)	MEL-Yellow		

ASCSYRI common to occas. in dist meadows throughout

- ROW primarily mowed turf grass w some uncut areas of cool-season grasses rarely occurring
- CWM units are recently disturbed and/or graded and includ. legumes

CWT (a) - ~~RHUTYPH~~ >> ACENEGU > RUSS.a LOLE
TYP_X channel.

- Urban landscape w construction around 401 ramps and development of vacant lots

Stantec

Legend

- Study Area
- Highway
- Major Road
- Minor Road
- Railway
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wetland, Other Evaluated
- Lot

July 10/17
Spisani

0 100 200 m

1:7,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2015.

Project Location
Municipality of Halton

165010586 REVA
Prepared by AMW on 2017-07-06
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
HALTON REGION
REGIONAL ROAD 25 CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
1.2

DRAFT

Title
Field Atlas

Stantec

Legend

- Study Area
- Highway
- Major Road
- Minor Road
- Railway
- Hydro Line
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Lot

0 100 200 m

1:7,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2015.

Project Location
Municipality of Halton

165010586 REVA
Prepared by AMW on 2017-07-06
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
HALTON REGION
REGIONAL ROAD 25 CLASS ENVIRONMENTAL ASSESSMENT

Figure No.
1.1

DRAFT

Title
Field Atlas

A - Monarch (Special Concern)
B - Big bluestem (locally uncommon)
C - Barn Swallow nest (Threatened).


Mansewood Court
Peddie Road
Holgate Crescent
Parkhill Drive
High Point Drive
3
13
Regional Road 25
Martin Street
3
12
9
Escarpment Way
Chudleigh Way
5880000

APPENDIX H:
SPECIES LIST

Vascular plants recorded during field investigations

Planted	Family[1]	Scientific Name[1]	Common Name[1]	Establishment Means[1]	Coefficient of Conservatism[3]	Provincial Status[2]	SARO Status[2]	COSEWIC Status[3]	Global Status[2]	LOCAL STATUS Halton[4]
planted	Cupressaceae	*Thuja occidentalis*	eastern white cedar	native	4	S5			G5	
planted	Pinaceae	*Larix decidua*	European larch	introduced		SE2			G5	
planted	Pinaceae	*Picea sp.*								
planted	Pinaceae	*Pinus strobus*	eastern white pine	native	4	S5			G5	
x	Adoxaceae	*Viburnum lentago*	nannyberry	native	4	S5			G5	
x	Anacardiaceae	*Rhus typhina*	staghorn sumac	native	1	S5			G5	
x	Apiaceae	*Daucus carota*	wild carrot	introduced		SE5			GNR	
x	Apocynaceae	*Asclepias syriaca*	common milkweed	native	0	S5			G5	
x	Asteraceae	*Achillea millefolium*	common yarrow	introduced	0	SE			G5	
x	Asteraceae	*Ambrosia artemisiifolia*	common ragweed	native	0	S5			G5	
x	Asteraceae	*Anthemis sp.*								
x	Asteraceae	*Arctium minus*	common burdock	introduced		SE5			GNR	
x	Asteraceae	*Centaurea stoebe micranthos*	spotted knapweed	introduced		SE5			GNR	
x	Asteraceae	*Cichorium intybus*	wild chicory	introduced		SE5			GNR	
x	Asteraceae	*Cirsium arvense*	Canada thistle	introduced		SE5			GNR	
x	Asteraceae	*Cirsium vulgare*	bull thistle	introduced		SE5			GNR	
x	Asteraceae	*Erigeron annuus*	annual fleabane	native	0	S5			G5	
x	Asteraceae	*Eutrochium maculatum maculatum*	spotted Joe Pye weed	native	3	-?	-?		-?	
x	Asteraceae	*Rudbeckia hirta pulcherrima*	black-eyed Susan	native	0	-?	-?		-?	
x	Asteraceae	*Solidago canadensis canadensis*	Canada goldenrod	native	1	-?	-?		-?	
x	Asteraceae	*Sonchus asper*	prickly sow-thistle	introduced		SE5			GNR	
x	Asteraceae	*Symphyotrichum lanceolatum lanceolatum*	white panicled aster	native	3	-?	-?		-?	
x	Asteraceae	*Symphyotrichum novae-angliae*	New England aster	native	2	S5			G5	
x	Asteraceae	*Tanacetum sp.*								
x	Asteraceae	*Taraxacum officinale*	common dandelion	introduced		SE5			G5	
x	Betulaceae	*Ostrya virginiana*	ironwood	native	4	S5			G5	
x	Boraginaceae	*Echium plantagineum*	purple viper's bugloss	introduced		SE1			GNR	
x	Caprifoliaceae	*Dipsacus fullonum*	common teasel	introduced		SE5			GNR	
x	Caprifoliaceae	*Lonicera tatarica*	Tartarian honeysuckle	introduced		SE5			GNR	
x	Cornaceae	*Cornus racemosa*	grey dogwood	native	-?	S5		?	G5?	
x	Cornaceae	*Cornus stolonifera*	red-osier dogwood	native	2	S5			G5	

Vascular plants recorded during field investigations

Planted	Family[1]	Scientific Name[1]	Common Name[1]	Establishment Means[1]	Coefficient of Conservatism[3]	Provincial Status[2]	SARO Status[2]	COSEWIC Status[3]	Global Status[2]	LOCAL STATUS Halton[4]
x	Elaeagnaceae	*Elaeagnus angustifolia*	Russian olive	introduced		SE3			GNR	
planted	Fabaceae	*Gleditsia triacanthos*	honey locust	native	3	S2			G5	
x	Fabaceae	*Lotus corniculatus*	garden bird's-foot trefoil	introduced		SE5			GNR	
x	Fabaceae	*Melilotus officinalis*	yellow sweet-clover	introduced		SE5			GNR	
x	Fabaceae	*Securigera varia*	purple crown-vetch	introduced	-?	SE5		?	GNR	
x	Fabaceae	*Trifolium pratense*	red clover	introduced		SE5			GNR	
x	Fabaceae	*Vicia cracca*	tufted vetch	introduced		SE5			GNR	
x	Fagaceae	*Quercus macrocarpa*	bur oak	native	5	S5			G5	
x	Fagaceae	*Quercus rubra*	northern red oak	native	6	S5			G5	
x	Hypericaceae	*Hypericum perforatum perforatum*	common St. John's-wort	introduced		SE5			GNR	
x	Juglandaceae	*Carya cordiformis*	bitternut hickory	native	6	S5			G5	
x	Juglandaceae	*Juglans nigra*	black walnut	native	5	S4			G5	
x	Lythraceae	*Lythrum salicaria*	purple loosestrife	introduced		SE5			G5	
planted	Malvaceae	*Tilia cordata*	little-leaved linden	introduced		SE1			GNR	
x	Onagraceae	*Oenothera biennis*	common evening primrose	native	0	S5			G5	
x	Polygonaceae	*Fallopia dumetorum*	hedge bindweed	introduced		SEH			G5TU	
x	Polygonaceae	*Rumex crispus*	curled dock	introduced	-?	SE5		?	GNR	
x	Rhamnaceae	*Rhamnus cathartica*	European buckthorn	introduced		SE5			GNR	
x	Rosaceae	*Crataegus sp.*								
x	Rosaceae	*Malus pumila*	common apple	introduced		SE4			G5	
planted	Rosaceae	*Malus sp.*								
planted	Rosaceae	*Prunus virginiana virginiana*	chokecherry	native	2	S5			G5	
x	Salicaceae	*Populus deltoides deltoides*	eastern cottonwood	native	4	-?	-?		-?	
planted	Salicaceae	*Salix ×fragilis*	hybrid white willow	introduced	-?	-?	-?	-?	-?	
planted	Salicaceae	*Salix amygdaloides*	peach-leaved willow	native	6	S5			G5	
x	Salicaceae	*Salix bebbiana*	Bebb's willow	native	-?	S5		-?	G5	
x	Sapindaceae	*Acer negundo*	Manitoba maple	native	0	S5			G5	
planted	Sapindaceae	*Acer platanoides*	Norway maple	introduced		SE5			GNR	
x	Sapindaceae	*Acer saccharum*	sugar maple	native	4	S5			G5	
planted	Ulmaceae	*Ulmus pumila*	Siberian elm	introduced		SE3			GNR	
x	Vitaceae	*Parthenocissus quinquefolia*	Virginia creeper	native	6	S4?			G5	
x	Vitaceae	*Vitis riparia*	riverbank grape	native	0	S5			G5	

Vascular plants recorded during field investigations

Planted	Family[1]	Scientific Name[1]	Common Name[1]	Establishment Means[1]	Coefficient of Conservatism[3]	Provincial Status[2]	SARO Status[2]	COSEWIC Status[3]	Global Status[2]	LOCAL STATUS Halton[4]
x	Cyperaceae	*Carex vulpinoidea*	fox sedge	native	3	S5			G5	
x	Juncaceae	*Juncus sp.*								
x	Poaceae	*Agrostis stolonifera*	creeping bentgrass	introduced		SE5			G5	
x	Poaceae	*Andropogon gerardii*	big bluestem	native	7	S4			G5	Uncommon
x	Poaceae	*Bromus inermis*	smooth brome	introduced		SE5			G5TNR	
x	Poaceae	*Dactylis glomerata*	orchard grass	introduced		SE5			GNR	
x	Poaceae	*Elymus repens*	quackgrass	introduced		SE5			GNR	
x	Poaceae	*Lolium arundinaceum*	tall fescue	introduced		-?	-?		-?	
x	Poaceae	*Phalaris arundinacea arundinacea*	reed canarygrass	native	0	S5			G5	
x	Poaceae	*Phleum pratense pratense*	common timothy	introduced		SE5			GNR	
x	Poaceae	*Phragmites australis australis*	European reed	introduced	0	-?	-?		-?	
x	Typhaceae	*Typha ×glauca*	blue cattail	native	-?	-?	-?	-?	-?	
x	Typhaceae	*Typha angustifolia*	narrow-leaved cattail	introduced	3	SE5			G5	

Summary of vascular plants

		Total Number	Percentage
Species Diversity			
Vascular Plants Listed:		**76**	**-**
Identified to species or ssp/var		**70**	**-**
Identified to Genus (not included in calculations below)		**6**	-
Provincial Status			
S1-S3 Species:	*rare in Ontario*	1	1%
S4 Species:	*uncommon in Ontario*	3	4%
S5 Species:	*common in Ontario*	23	33%
Other:		34	49%
Not listed:		0	0%
Not defined ("-?"):		9	13%
Means of Establishment			
Native Species:		33	47%
Introduced Species:		37	53%
Not listed:		0	0%
Not defined ("-?"):		0	0%
Co-efficient of Conservatism (C) and Floristic Quality Index(FQI)			
C 0 to 3	*lowest sensitivity*	20	29%
C 4 to 6	*moderate sensitivity*	12	17%
C 7 to 8	*high sensitivity*	1	1%
C 9 to 10	*highest sensitivity*	0	0%
Not listed:		31	44%
Not defined ("-?"):		6	9%

Footnotes

[1] Brouillet L, Desmet P, Coursol F, Meades SJ, Favreau M, Anions M, Bélisle P, Gendreau C, Shorthouse D, and contributors (2010+). Database of Vascular Plants of Canada (VASCAN). Online at http://data.canadensys.net/vascan and http://www.gbif.org/dataset/3f8a1297-3259-4700-91fc-acc4170b27ce, released on 2010-12-10. Version [xx]. GBIF key: 3f8a1297-3259-4700-91fc-acc4170b27ce. Data paper ID: doi: http://doi.org/10.3897/phytokeys.25.3100 [accessed on April 18, 2016]

[2] Ontario Ministry of Natural Resources and Forestry. 2015. Ontario Vascular Plants. Online at from https://www.ontario.ca/page/get-natural-heritage-information. Accessed on May 3, 2016.

[3] Newmaster, S. G., A. Lehela, Peter W. C. Uhlig, Sean McMurray and Michael J. Oldham. 1998. Ontario Plant List. Forest Research Information Paper No. 123, Ontario Forest Research Institute, Ontario Ministry of Natural Resources, Sault Ste. Marie, Ontario.

[4] Crins, W.J., W.D. McIlveen, A.G. Goodban and P.G. O'Hara. The Vascular Plants of Halton Region, Ontario. Halton Natural Areas Inventory 2006: Volume 2 Species Checklists (ISBN 0-9732488-4).