

### 3 EXISTING AND FUTURE CONDITIONS

Background information was collected from numerous sources including:

- The review of pertinent background studies and reports;
- Data provided by Halton Region;
- Investigations undertaken as part of this Class EA study;
- Meetings with the Project Team;
- Correspondence and meetings with participating Technical Agencies, including the Town of Halton Hills, Conservation Halton; and
- Consultation with members of the public, including key stakeholders (e.g. property owners, representatives of churches, etc.).

The study area focuses on Trafalgar Road from Steeles Avenue to North of 10 Side Road, and is located within the Town of Halton Hills in Halton Region. **Exhibit 1-2** provides a key plan of the study area.

**Exhibit 3-1** is an aerial mosaic of the study area identifying existing conditions and key features which are discussed in the following sections.

#### 3.1 Transportation

##### 3.1.1 Transportation Network

The main components of the existing road network are described in **Table 3-1**:

**Table 3-1: Existing Road Network**

Road	Description
Trafalgar Road (Regional Road 3) – Steeles Avenue to north of 10 Side Road	<ul style="list-style-type: none"> <li>• Under the jurisdiction of Halton Region</li> <li>• Major Arterial Road</li> <li>• Mostly a 2-lane rural cross-section</li> <li>• Steeles Avenue / Trafalgar Road and 5 Side Road / Trafalgar Road intersections are already a 4-lane urban cross-section</li> <li>• Posted speed ranges between 60 km/h to 80 km/h</li> <li>• Signalized intersections (from south to north): Steeles Avenue, 5 Side Road, 10 Side Road</li> <li>• Few existing provisions for cyclists or pedestrians</li> <li>• Limited illumination</li> <li>• Farming equipment utilize Trafalgar Road</li> </ul>
Steeles Avenue (Regional Road 8)	<ul style="list-style-type: none"> <li>• Under the jurisdiction of Halton Region</li> <li>• Major arterial road</li> <li>• Signalized intersection at Trafalgar Road</li> <li>• 4-lane urban road east of Trafalgar Road</li> <li>• 2-lane rural road west of Trafalgar Road</li> </ul>
Hornby Road	<ul style="list-style-type: none"> <li>• Minor arterial road, under jurisdiction of the Town of Halton Hills</li> <li>• One-way stop-controlled T-intersection at Trafalgar Road</li> <li>• Channelized southbound access from Trafalgar Road via one-way road (north of intersection with Trafalgar Road)</li> </ul>

Road	Description
	<ul style="list-style-type: none"> <li>• 2-lane roadway south of intersection with Trafalgar Road</li> </ul>
5 Side Road	<ul style="list-style-type: none"> <li>• Minor arterial road, under jurisdiction of the Town of Halton Hills</li> <li>• Signalized intersection at Trafalgar Road</li> <li>• Trafalgar Road already at 4-lanes approaching 5 Side Road intersection</li> <li>• 2-lane roadway east and west of Trafalgar Road</li> </ul>
10 Side Road	<ul style="list-style-type: none"> <li>• Local road west of Trafalgar Road, under jurisdiction of the Town of Halton Hills</li> <li>• Major arterial road east of Trafalgar Road, under jurisdiction of Halton Region</li> <li>• Signalized intersection at Trafalgar Road</li> <li>• 2-lane roadway east and west of Trafalgar Road</li> </ul>

### 3.1.2 Transit

Currently, there are no transit services that operate on Trafalgar Road between Steeles Avenue and 10 Side Road.

### 3.1.3 Active Transportation

There are currently no dedicated active transportation facilities along Trafalgar Road between Steeles Avenue and 10 Side Road to accommodate cyclists or pedestrians; except for pedestrian crossings at signalized intersections.

Halton Region has completed an Active Transportation Master Plan Study to create a 20-year vision for active transportation in Halton Region. As part of the Trafalgar Road corridor improvements, features of active transportation were considered, such as paved shoulders, on-road bike lanes, multi-use paths, and sidewalks for pedestrians and cyclists.

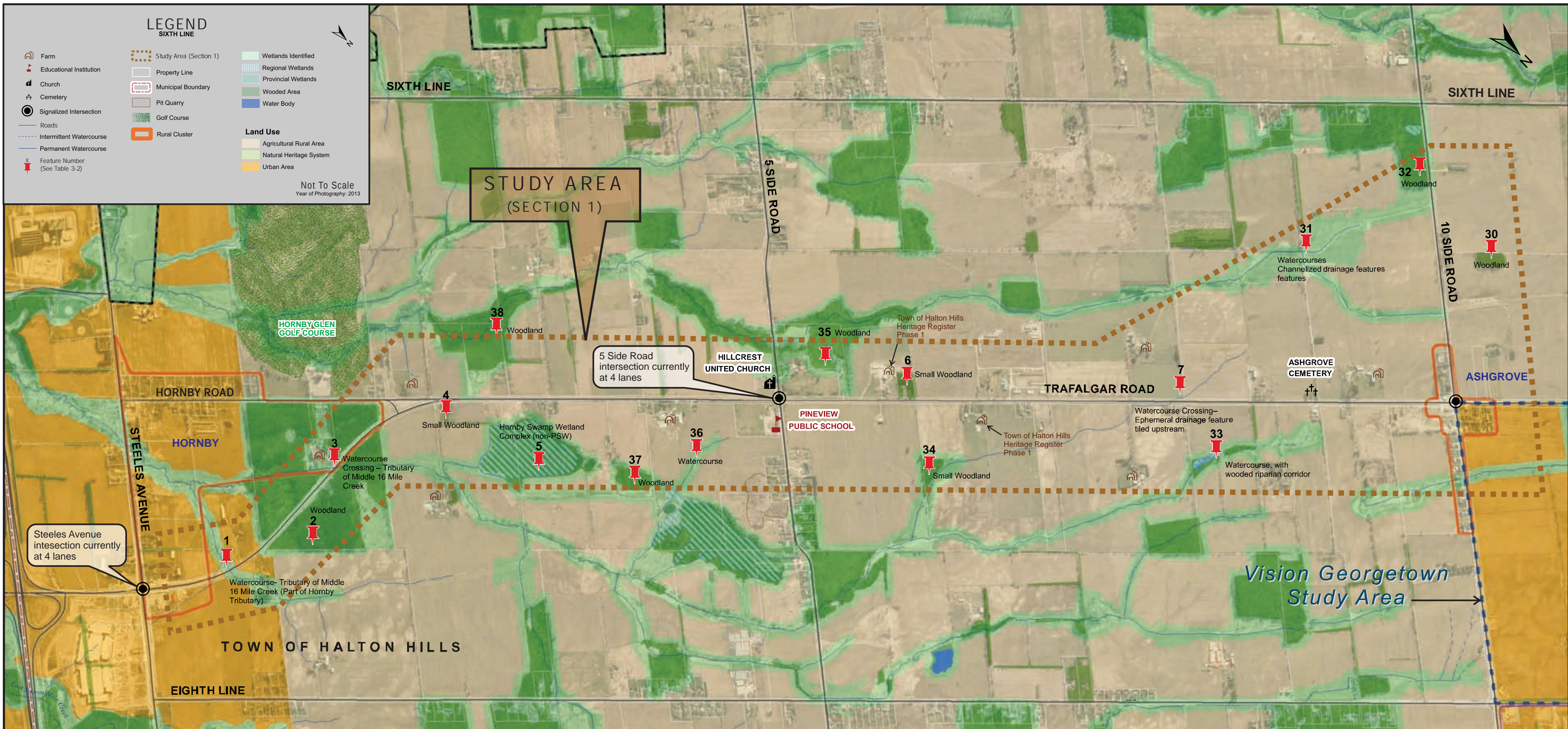
## 3.2 Socio-Economic Environment

### 3.2.1 Existing Communities

Currently, Trafalgar Road between Steeles Avenue and 10 Side Road consists of rural areas on both sides of Trafalgar Road, which are (from south to north) part of the Hornby, and Ashgrove communities within the Town of Halton Hills. There are some intermittent rural residential properties with direct access to Trafalgar Road.

### 3.2.2 Existing Land Use

Land use adjacent to Trafalgar Road between Steeles Avenue and 10 Side Road is primarily agricultural, with intermittent residential, commercial, and industrial land uses, as well as natural open spaces. This section describes the existing and future land use from south to north.



### **Steeles Avenue to Hornby Road**

While outside of the study area, the Toronto Premium Outlets is located in the southeast quadrant of Trafalgar Road and Steeles Avenue (i.e. immediately to the south of the southerly study limit). It is designated as a Gateway Employment Area within the Town of Halton Hill's 401/407 Employment Corridor. This site generates a significant amount of traffic to and from the urban areas of Halton Hills to the north and from Highway 401.

The lands adjacent to Trafalgar Road between Steeles Avenue and Hornby Road are a mix of commercial, agricultural, and residential uses including a major Regional woodlot. Three commercial lots are located in the northeast and northwest quadrants of the Trafalgar Road / Steeles Avenue intersection (two gas stations and an auto repair shop), which is already at 4-lanes. All three commercial lots have right-in/right-out access from Trafalgar Road.

North of the Steeles Avenue intersection, land use is primarily agricultural east and west of Trafalgar Road up the limits of the Coulson Tract Woodlot (approximately 600 m north of Steeles Avenue), where the Halton Recovery House is situated at 8173 Trafalgar Road. North of this location (through the Coulson Tract Woods), adjacent lands are entirely forested with the exception of a residential property at 8285 Hornby Road (approximately 1100 m north of Steeles Avenue). The woodlot ends approximately 100 m south of the Hornby Road intersection, where adjacent land uses are once again agricultural. All agricultural properties have direct full move access to Trafalgar Road.

### **Hornby Road to 5 Side Road**

Lands east and west of Trafalgar Road between Hornby Road and 5 Side Road are primarily agricultural land with intermittent rural residential properties with direct access onto Trafalgar Road.

The Trafalgar Road / 5 Side Road intersection is already at 4-lanes. Hillcrest United Church and Pineview Public School are situated in the southwest and southeast quadrants of this intersection, respectively. Access to Pineview Public School is on 5 Side Road and access to Hillcrest United Church is on both Trafalgar Road and 5 Side Road.

### **5 Side Road to 10 Side Road**

Lands east and west of Trafalgar Road between 5 Side Road and 10 Side Road are primarily agricultural, with intermittent commercial and rural residential properties that have direct access onto Trafalgar Road. Ashgrove Cemetery is situated on the west side of Trafalgar Road, approximately 600 m south of the 10 Side Road intersection. While there is no designated parking for the cemetery, there is an access to the cemetery from Trafalgar Road.

At the 10 Side Road intersection, there are commercial developments in the southeast and southwest quadrants (auto repair businesses), and a residential property in the northeast quadrant. Both commercial developments have full move access to Trafalgar Road and 10 Side Road. The rural cluster area in the proximity of the Trafalgar Road / 10 Side Road intersection is known as the Ashgrove Community.

### 3.2.3 Future Land Use

The Steeles Avenue corridor is designated for future employment land uses. It is expected that there will be some new commercial development in the proximity of the Trafalgar Road / Steeles Avenue intersection.

Beyond the Steeles Avenue corridor, there are no planned future developments adjacent to Trafalgar Road between Steeles Avenue and 10 Side Road. However, it should be noted that the Town of Halton Hills is planning to add new employment lands north of Steeles Avenue (up to approximately 1.3 km north of Steeles Avenue) between Eighth Line and Sixth Line. The ongoing study is called the Premier Gateway Phase 1B Employment Area Secondary Plan. See the Town of Halton Hills website for more details <http://www.haltonhills.ca/initiatives/Phase1B.php>.

### 3.2.4 Noise

There are Noise Sensitive Areas (NSAs) located within the study limits. A noise analysis has been carried out as part of this Class EA Study (see **Section 7.2.2**).

It should be noted that noise analysis will have to be prepared for any new residential developments as part of the development site plan approval process. Therefore, noise analysis for any new residential developments along the Trafalgar Road corridor was not carried out as part of the EA Study.

### 3.2.5 Pedestrian and Cycling Facilities

As noted in **Section 3.1.3**, Trafalgar Road within the Study Area is largely a 2-lane roadway with a rural cross section with few existing active transportation facilities along Trafalgar Road to accommodate cyclists or pedestrians. An active transportation strategy has been considered in this study.

## 3.3 Natural Environment

### 3.3.1 Study Approach

A thorough natural environment assessment was carried out as part of the Trafalgar Road EA Study. Field investigations and the existing conditions assessment was completed for the entire corridor between Steeles Avenue and Highway 7. A summary of the findings are documented in this section and the Natural Environment Report is included in **Appendix E**. While most of the discussion are related to the greater study area between Steeles Avenue and Highway 7; some of the discussions in this section (specifically the Exhibits) will be focused on the section of Trafalgar Road between Steeles Avenue and north of 10 Side Road only.

#### 3.3.1.1 Background Data Collection and Analysis

Background information was reviewed to assess the general character of the Study Area, identify potential constraints and sensitivities, and assess the general connectivity of natural features within the study limits to features within the surrounding landscape.

Background natural environment information collection included the following key sources:

- Trafalgar Road EA Study- 10 Side Road to Highway 7, Region of Halton (Various Reports 2004-2006);
- Silver Creek Subwatershed Study Phase 1 Characterization Report (CVC 2002);
- Black Creek Subwatershed Background Report Study (CVC 2009);
- Halton Region Environmentally Sensitive Areas Consolidation Report (Halton 2005);
- Trafalgar Road Animal Road Collision Data. (Halton Region 2014);
- Sixteen Mile Creek Monitoring Study (Dunn and Jamieson Undated);
- MNRF Natural Heritage Information Centre (NHIC) Land Information Ontario mapping (2014);
- MNRF Species at Risk website - regional Species at Risk list (2014);
- MNRF Land Information Ontario (LIO) (2014);
- Regional Official Plan (ROP) Consolidation 2013 (Halton Region 2013);
- Halton Region Official Plan (Halton Region 2009);
- Department of Fisheries and Oceans (DFO) Distribution of Species at Risk and Mussel Species at Risk Mapping, Credit Valley Conservation and Conservation Halton Authority Jurisdictions (2014); and
- Digital air photos

### 3.3.1.2 Aquatic and Fish Habitat Survey Approach

Field investigations of aquatic features within the study area were conducted on June 23 and September 15, 2014 by MMM Group ecologists. The compiled background information, including comments and input from agencies, was considered specifically in developing and undertaking the field program. As listed in **Section 3.3.1.1**, SAR information discussed below was obtained from a variety of background information sources. All watercourse and drainage features crossing Trafalgar Road within the study area were assessed and habitat mapped approximately 50 m upstream and 50 m downstream of Trafalgar Road where access was permitted. Within the remainder of the study area, all mapped watercourse features visible on aerial photography were assessed generally for habitat characteristics and quality from roadsides. Watercourse assessments included the following habitat parameters (where applicable):

- Flow condition, clarity, general gradient and velocities;
- Channel dimensions and general character;
- Morphology (e.g., riffles, pools);

- Cover opportunities (i.e., woody debris, undercut banks, boulders, aquatic vegetation);
- Substrate type;
- Bank height, character and stability/evidence of erosion;
- Riparian vegetation;
- Any observations of fish presence and/or barriers to fish movement;
- Potential specialized and important habitat areas including potential spawning habitat, good nursery cover, holding habitat (deeper refuge pools);
- Evidence of groundwater discharge or indicators; and
- Disturbances, habitat limitations and potential habitat enhancement opportunities.

Fish community surveys were not undertaken, as existing fish community data were available from numerous previous reports (see **Section 3.3.1.1**) in the study area. The available background information was deemed sufficient to categorize these watercourses without requiring additional fish community surveys.

### **3.3.1.3 Vegetation Survey Approach**

A two-season vegetation assessment and botanical inventories were undertaken on June 23, June 24, July 10, September 18 and September 19, 2014 within the study area (Right-of-Way and adjacent 120 m on either side, and select properties where permission to enter (PTE) was granted). For those properties in which access was not granted, vegetation communities were characterized by: existing available characterization information from previous studies, air photo interpretation, or by roadside survey (closest available vantage point).

The scope of vegetation fieldwork and analyses included the following:

- Classifying and mapping vegetation communities according to the Ecological Land Classification (ELC) System for Southern Ontario (Lee et. al., 1998);
- Evaluating vegetation community significance using Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1996) and vegetation community significance listed on the NHIC website at the time of report preparation. A vascular plant species list was prepared based on the botanical inventory work.
- Evaluating plant species status was using the rankings within The Vascular Plants of Halton Region (Halton Natural Areas Inventory 2006) for regional significance; the Rare Vascular Plants of Ontario, Fourth Edition (Oldham and Brinker 2009) for provincial significance; the current Species At Risk in Ontario List (OMNRF, May 2014) for Ontario species at risk; and, the Species At Risk Act (Schedules 1 and 3), for species at risk in Canada.

Vegetation characteristics were documented generally for each feature within the study area where information was available.

Vegetation communities between Steeles Avenue and 10 Side Road are mapped in **Exhibits 3-2a and 3-2b**.

#### **3.3.1.4 Wildlife Survey Approach**

A general field assessment of existing habitat conditions and wildlife use within the study limits was conducted in conjunction with the aquatic and vegetation field surveys. Wildlife surveys were undertaken on April 24, May 15, June 6, June 9, June 12, June 17, June 18, June 23, June 15, and September 16, 2014. Surveys included; avifauna, breeding amphibians, wildlife habitat assessment for SAR and SWH, as well as collection of general wildlife and habitat information. The surveys were carried out within the ROW and on adjacent private properties within 120 m of the ROW, where PTE was obtained.

Avian surveys were conducted to gather breeding bird data and to evaluate the study area for avian habitat potential. Breeding bird surveys were undertaken on June 6, 9, 17, 23, and 25 2014 and were conducted by qualified, experienced staff. The surveys included recording all visual and audible observations as well as the level of breeding bird evidence following standard criteria established by the Ontario Breeding Bird Atlas (OBBA).

Amphibian calling (breeding) activity was surveyed using the Marsh Monitoring Program (MMP) amphibian calling survey protocol (Bird Studies Canada 2003, revised 2009). Surveys were conducted by qualified experienced staff under appropriate conditions (i.e., dusk/evening survey with suitable air temperatures, high humidity or light rain, and low/no wind).

An assessment of existing wildlife habitats was undertaken to consider potential use for Species at Risk (SAR) and Species of Conservation Concern (SCC) known to occur within the vicinity of the study area as well as other wildlife. This included searches for cavity/snag trees and open building structures that may provide suitable roosting/maternity habitat for SAR bats. Existing habitats were also screened for potential as Significant Wildlife Habitat (SWH) as defined in Ecoregion 6E SWH Criterion Schedule (MNR 2015), including key wildlife movement corridors. Existing structures such as bridges and culverts were also surveyed to document any bird nesting or other wildlife use (e.g. using culverts as a movement corridor).

Supplemental observations of herpetofauna, mammals, and insects were recorded during all field visits. These observations were recorded, including sightings of species, as well as evidence of use (e.g. browse, tracks / trails, scat, burrows, and vocalizations).

Wildlife habitats between Steeles Avenue and 10 Side Road are mapped in **Exhibits 3-3a and 3-3b**.

#### **3.3.2 Existing Conditions**

Existing natural environmental features between Steeles Avenue and 10 Side Road, including reference to culvert locations, are shown on **Exhibit 3-1** and summarized in **Table 3-2** (listed in order of location from south to north). Further information can be found in **Appendix E** (Natural Environment: Appendix H).

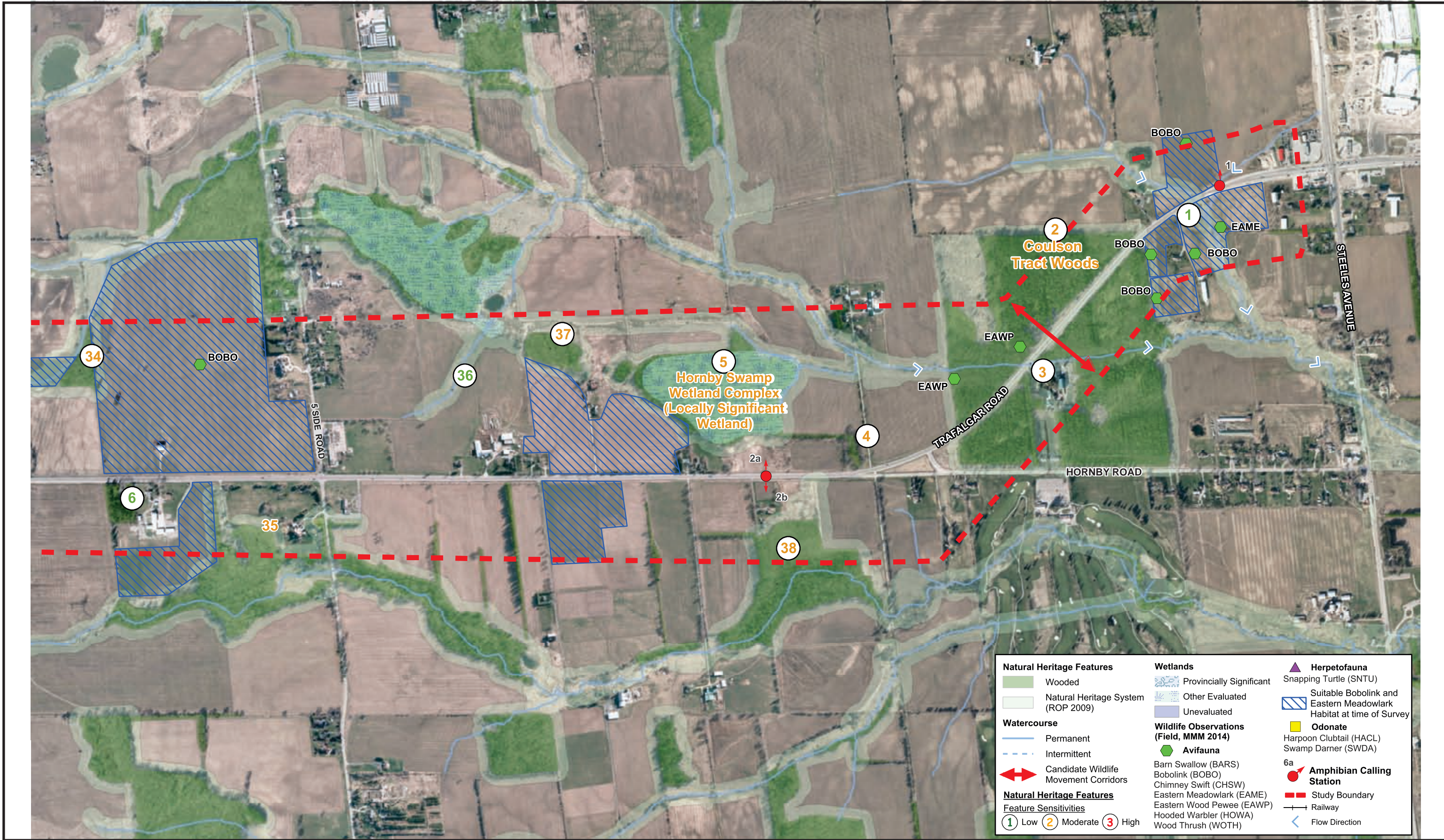


**Table 3-2: Summary of Natural Features within the Trafalgar Road EA Study Area (see Exhibit 3-1)**

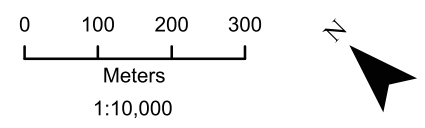
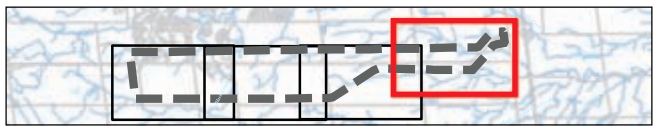
Feature #	Type of Feature/Name	Feature Description/Notes
1	Watercourse- Tributary of Middle 16 Mile Creek (part of Hornby Tributary)	<p><b>Vegetation:</b> Reed Canary Grass Mineral Meadow Marsh (MAM2-2) along the watercourse, adjacent cultural meadow (CUM1-1) and pasture, and a small spruce coniferous plantation (CUP3) at the north eastern edge of the study area.</p> <p><b>Wildlife:</b> Culvert is potentially suitable for Barn Swallow (provincially Threatened) although no nests observed at time of survey. Culvert is oversized (several meters high), and accomodates wildlife passage. Raccoon and muskrat prints were noted within the culvert.</p> <p><b>Aquatic:</b> Contributing fish habitat. Drains to fish bearing watercourse approximatly 450 m downstream. Defined channel with bankfull width &lt;1 m. Channel has sand/gravel/cobble substrate. MNRF identifies the reach as coldwater (MNRF 2014) although species records downstream indicate warmwater baitfish community. Connected to regulated Redside Dace creek (~2km downstream). Flowing on April 14 2015.</p>
2	Woodland (Coulson Tract)	<p><b>Vegetation:</b> Consists of a complex of pine plantation and deciduous forest (CUP3 / FOD9) with some moist cultural meadow openings. Transitions to northwest to Bur Oak Swamp (SWD1-2) associated with Feature 3.</p> <p><b>Wildlife:</b> Candidate Significant Wildlife Habitat (SWH) for Bat Maternity Colony habitat, Colonially –Nesting Bird Breeding Habitat (Trees/Shrubs), Woodland Raptor Nesting Habitat. East side confirmed to support SCC - Eastern Wood Pewee (provincially Special Concern) and is suitable for Wood Thrush (provincially Special Concern). North end, west side has habitat suitable for SCC- Canada Warbler (provincially Special Concern). Deer present in this woodland based on collison data. Potential wildlife movement corridor for large and small mammals.</p>
3	Watercourse Crossing – Tributary of Middle 16 Mile Creek (Hornby Tributary)	<p><b>Aquatic:</b> Permanent watercourse with bankfull width 4 - 7 m . Direct fsh habitat. Channel mostly shaded with cobble/gravel/sand substrate. Pool-Riffle sequences with baitfish observed in pools and spawning potential in gravel areas/riffles. Connected to regulated Redside Dace creek (~2km downstream). CH identifies the reach as warmwater baitfish. Fish community sampling in 2011 captured mostly baitfish/panfish species with one coldwater salmonid (Rainbow Trout) (CH 2011). MNRF identifies the reach as a coldwater fishery (MNRF 2014).</p> <p><b>Vegetation:</b> mid-age Bur Oak swamp (SWD1-2) surrounds watercourse (Feature #2). A rare vegetation type, Bur Oak Mineral Deciduous Swamp (S3), is also present adjacent to this feature.</p> <p><b>Wildlife:</b> Candidate SWH for Turtle Wintering Areas and reptile hibernaculum. Culvert potentially suitable for Barn Swallow (provincially Threatened) although none observed during field surveys. Watercourse habitat suitable for SCC (Louisiana Waterthrush [provincially Special Concern), Snapping Turtle [provincially Special Concern])- although species not observed. Culvert is oversized (several meters high), and accomodates wildlife passage. Sediment accumulation inclulvert provides a dry space for wildlife to move through.</p>
4	Small Woodland Patch	<p><b>Vegetation:</b> Species indicative of deciduous swamp (Bur Oak, Willow, Manitoba Maple, Green Ash). ELC community type SWD1-2. One rare vegetaion community, Bur Oak Mineral Deciduous Swamp (S3) is present within the feature.</p> <p><b>Wildlife:</b> Small, isolated feature and poor quality habitat with very low to no SAR potential apart from low probability of Milksnake (provincially Special Concern). Potential use by deer based on collision data.</p>
5	Hornby Swamp Wetland Complex (non-PSW)	<p><b>Vegetation:</b> Feature appears to consist of deciduous swamp (SWD1-2) with a small open natural area adjacent to the road consisting of cultural meadow (CUM1-1) and Reed Canary Grass Meadow Marsh (MAM2-2). Identified as a Regional Wetland. Desktop information indicates it is dominated by Eastern White Cedar. Species composition should be confirmed through detailed field surveys. A rare vegetation type, Bur Oak Mineral Deciduous Swamp (S3), is also present adjacent to this feature.</p> <p><b>Wildlife:</b> no field surveys undertaken (no PTE). A variety of herpetofaunal species are anticipated to be present. Candidate SWH for Reptile Hibernaculum and Colonially – Nesting Bird Breeding Habitat (Tre/Shrubs).</p>
38	Woodland	<p><b>Vegetation:</b> Likely deciduous forest (FOD). Woodland may be dominated by Sugar Maple with transition to southwest into mixed forest. Open area in front of woodland is a Reed Canary Grass dominated meadow marsh with scattered willow shrubs (MAM2-2).</p> <p><b>Wildlife:</b> no field surveys (no PTE), no desktop information available. Candidate SWH for Amphibian Breeding Habitat (woodland)</p>

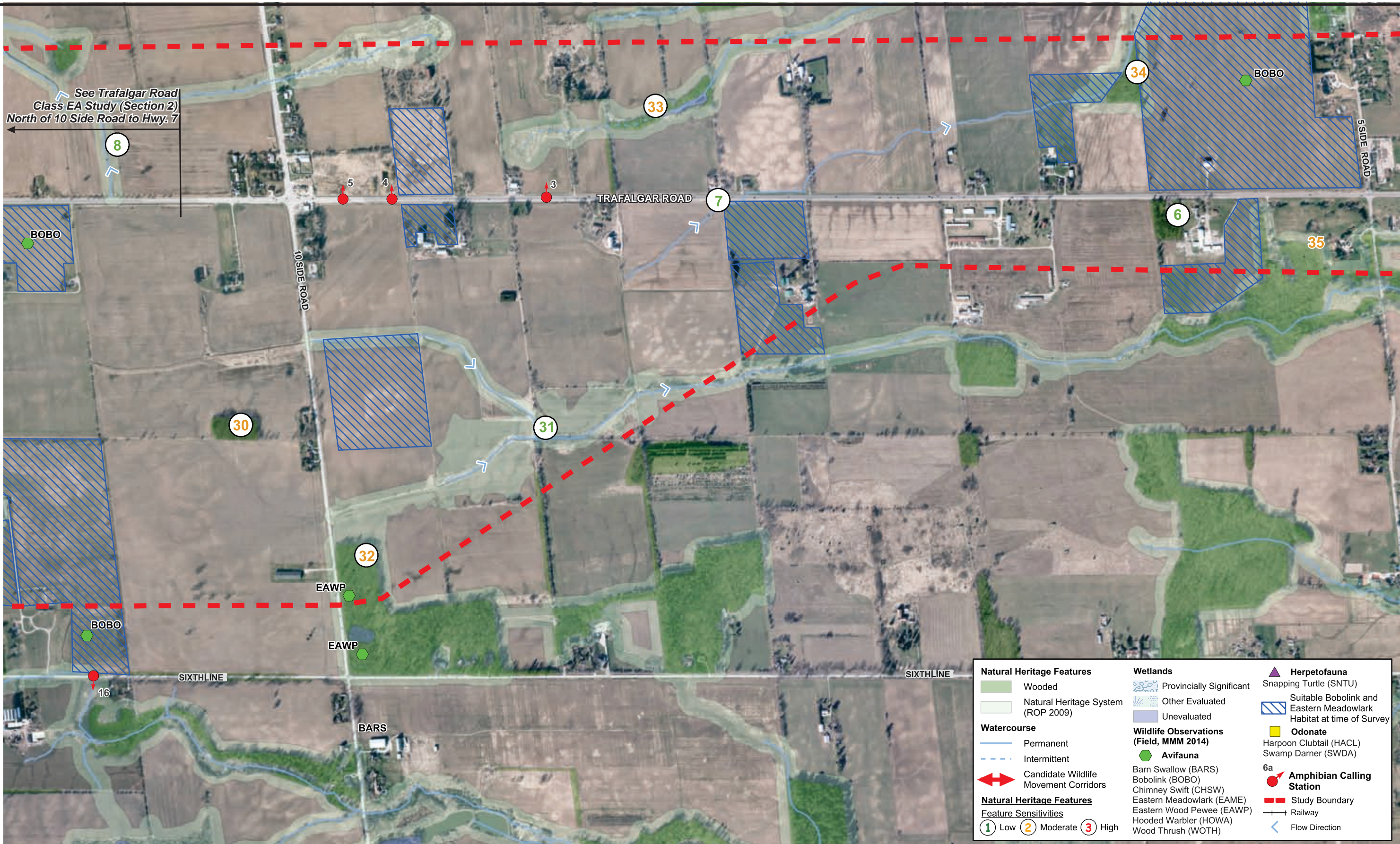
Feature #	Type of Feature/Name	Feature Description/Notes
37	Woodland	<b>Vegetation:</b> no field surveys (no PTE), no desktop information available. Air photo interpretation indicates Cultural Woodland (CUW1). <b>Wildlife:</b> no field surveys (no PTE). Deer are present based on collision data.
36	Watercourse	<b>Aquatic:</b> no field surveys (no PTE). CH identifies the reach as warmwater baitfish. Fish community sampling downstream indicates mostly baitfish/panfish (CH 2011). MNRF identifies the reach as a coldwater fishery (MNRF 2014). <b>Vegetation:</b> no field surveys (no PTE), no desktop information available. Based on air photos, the feature is a small swale feature through agricultural fields.
35	Woodland	<b>Vegetation:</b> Air photo interpretation indicates community is deciduous forest (FOD) with a stream corridor and potential for swamp habitat associated with the narrow bottomland. <b>Wildlife:</b> Watercourse likely suitable for Snapping Turtle (provincial Special Concern), marginal for Eastern Ribbonsnake (both provincially Special Concern). Woodland suitable for Eastern Wood Pewee and Wood Thrush (both provincially Special Concern). Open meadow adjacent to SR 5 suitable for Monarch (provincially Special Concern) – Milkweed present. Deer are present based on collision data.
6	Small Woodland Patch	<b>Vegetation:</b> very small woodland area around a residence containing planted Silver Maple, Sugar Maple, White Pine and spruce (CUW1). <b>Wildlife:</b> Largely anthropogenic feature with low SAR potential – Eastern Wood Pewee (provincially Special Concern) unlikely but possible. Deer possibly present based on collision data.
34	Small Woodland	<b>Vegetation:</b> no field surveys (no PTE), no desktop information available. Air photo interpretation indicates community is deciduous forest (FOD). <b>Wildlife:</b> no field surveys (no PTE). Deer are potentially present based on collision data.
7	Watercourse Crossing– Ephemeral drainage feature, tiled upstream	<b>Aquatic:</b> Shallow ephemeral drainage feature becoming more defined with some sand/gravel substrates near culvert. Some standing water, no flow. At downstream end, drainage channel has been blocked/filled in, not conveying drainage except in flooded conditions. Not fish habitat, no surface connection to fish bearing watercourse. <b>Vegetation:</b> agriculture – row crop <b>Wildlife:</b> No SAR potential.
33	Watercourse, with wooded riparian corridor (wetland)	<b>Aquatic:</b> no field surveys (no PTE). CH identifies the reach as warmwater baitfish. Fish community sampling downstream indicates mostly baitfish/panfish (CH 2011). MNRF identifies the reach as a coldwater fishery (MNRF 2014). <b>Vegetation:</b> Consists mainly of Cattail marsh (MAS2-1) and a small area of Willow – Manitoba Maple deciduous swamp SWD4) associated with the stream channel. <b>Wildlife:</b> no field surveys (no PTE), no desktop information available.
31	Watercourse- Channelized drainage feature	<b>Aquatic:</b> Ephemeral channelized drain feature. Standing water at ends of culvert, but no flow. Eventually drains into Middle 16 Mile creek. Contributing fish habitat. Flows to fish bearing watercourse downstream. MNRF identifies the reach as warmwater (MNRF 2014) <b>Vegetation:</b> Relatively narrow bands of low diversity Reed Canary Grass Meadow Marsh (MAM2-2) habitat associated with the channel. Cattail and willow shrubs occur infrequently. <b>Wildlife:</b> No SAR potential apart from low probability of Milksnake (provincially Special Concern).

Feature #	Type of Feature/Name	Feature Description/Notes
32	Woodland	<p><b>Vegetation:</b> Appears to consist of a complex of mid-age deciduous swamp and deciduous forest, with the portion within the Study Area consisting of FOD9. Bur Oak, Shagbark Hickory, and White Pine observed frequently. Air photo interpretation indicates areas of vernal pooling are present.</p> <p><b>Wildlife:</b> Fairly large, diverse woodlot with some oak / hickory. Eastern Wood Pewee confirmed in two locations, habitat for Wood Thrush suitable (both provincially Special Concern). Habitat for Acadian Flycatcher (provincially Endangered) marginal. Confirmed SWH with presence of Eastern Wood Pewee in suitable breeding habitat.</p>
30	Woodland	<p><b>Vegetation:</b> no field surveys (no PTE), no desktop information available. Air photo interpretation indicates community type is likely deciduous forest (FOD).</p> <p><b>Wildlife:</b> no field surveys (no PTE), no desktop information available.</p>
Ag Lands		<p><b>Vegetation:</b> agriculture fields (crop and pasture).</p> <p><b>Wildlife:</b> SAR (Bobolink [provincially Threatened] and Eastern Meadowlark [provincially Threatened]) in an agricultural field (hay crop) located south of the railway line at HWY 7 as well as within an old field/meadow located north of 17 Side Road, west of Trafalgar Road. Barn structures present within the study area supports breeding Barn Swallow (provincially Threatened). Eastern Milksnake [SC] should be considered possible throughout entire study area.</p>



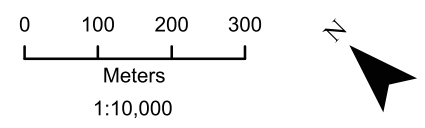
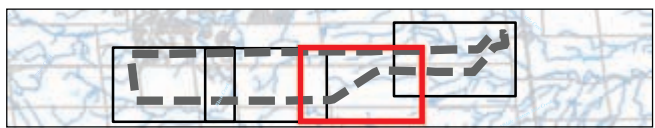
<b>Natural Heritage Features</b> Wooded Natural Heritage System (ROP 2009)	<b>Wetlands</b> Provincially Significant Other Evaluated Unevaluated	<b>Herpetofauna</b> Snapping Turtle (SNTU) Suitable Bobolink and Eastern Meadowlark Habitat at time of Survey Odonate Harpoon Clubtail (HACL) Swamp Darner (SWDA)
<b>Watercourse</b> Permanent Intermittent Candidate Wildlife Movement Corridors	<b>Wildlife Observations (Field, MMM 2014)</b> <b>Avifauna</b> Barn Swallow (BARS) Bobolink (BOBO) Chimney Swift (CHSW) Eastern Meadowlark (EAME) Eastern Wood Pewee (EAWP) Hooded Warbler (HOWA) Wood Thrush (WOTH)	6a Amphibian Calling Station Study Boundary Railway Flow Direction
<b>Natural Heritage Features Feature Sensitivities</b> 1 Low  2 Moderate  3 High		

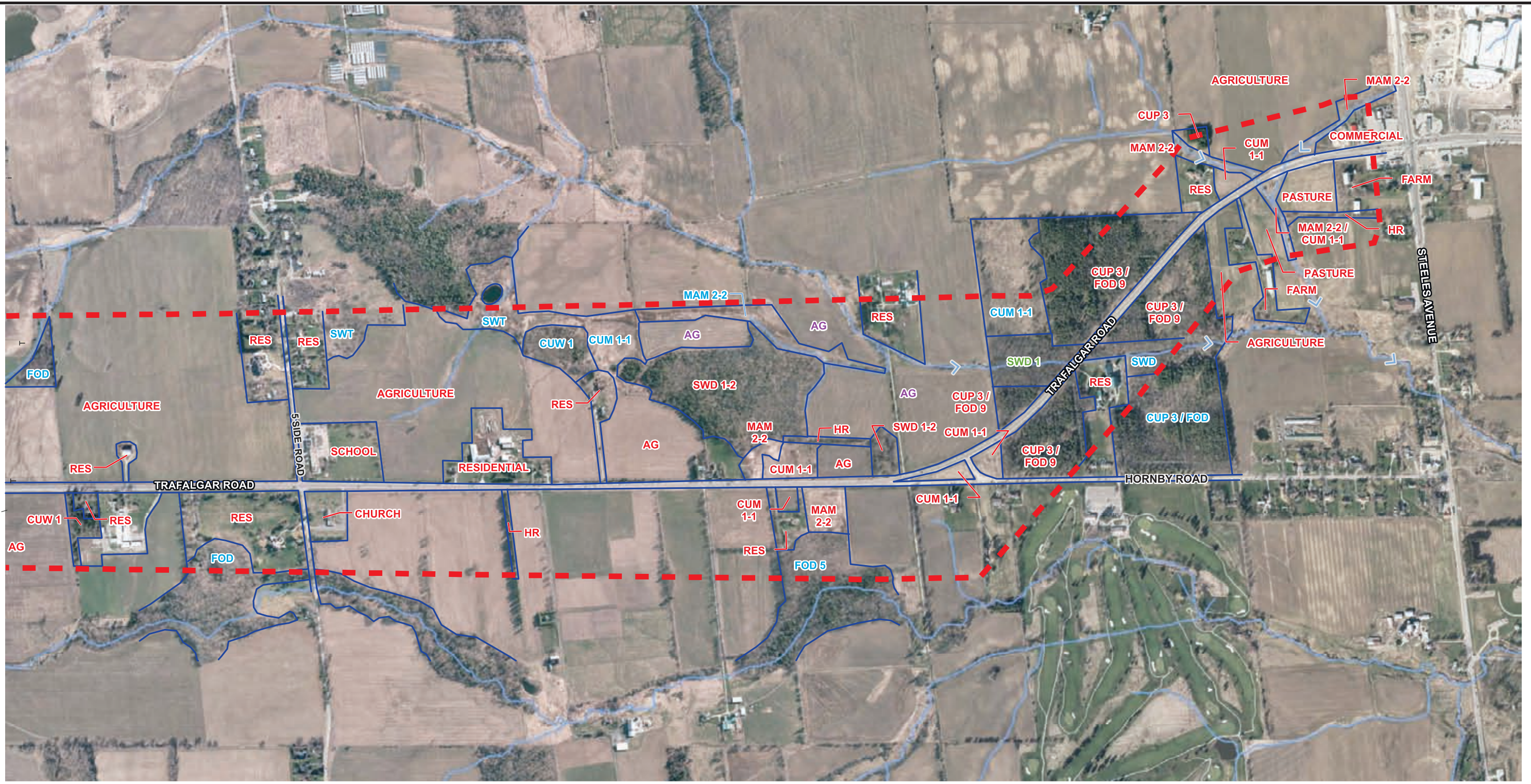




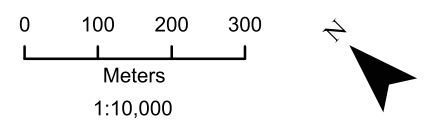
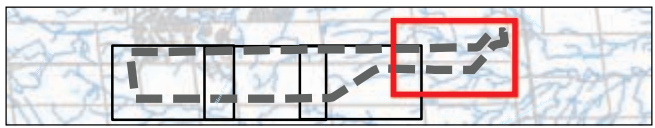
See Trafalgar Road  
Class EA Study (Section 2)  
North of 10 Side Road to Hwy. 7

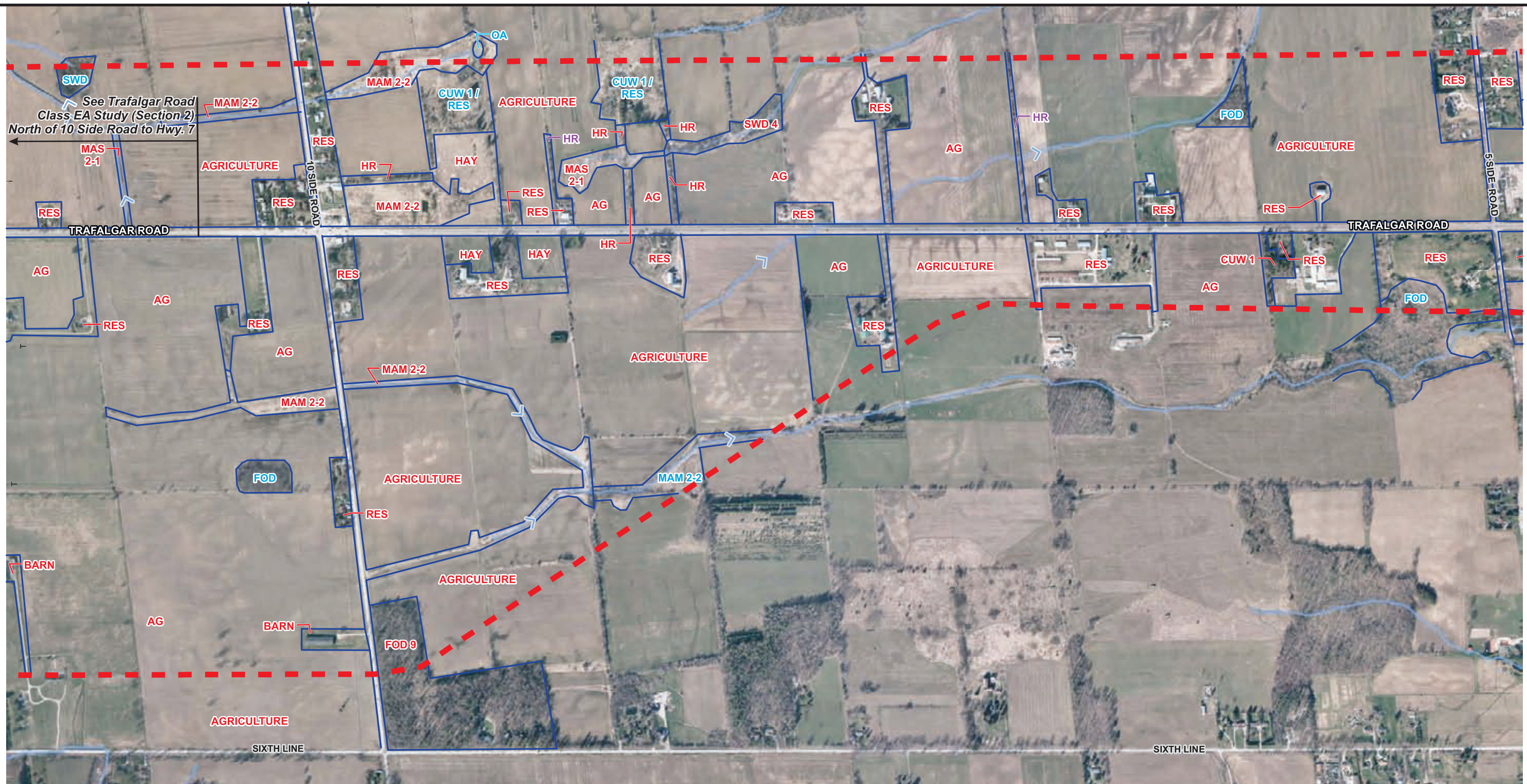
<p><b>Natural Heritage Features</b></p> <ul style="list-style-type: none"> <li>Wooded</li> <li>Natural Heritage System (ROP 2009)</li> </ul> <p><b>Watercourse</b></p> <ul style="list-style-type: none"> <li>Permanent</li> <li>Intermittent</li> </ul> <p><b>Candidate Wildlife Movement Corridors</b></p> <p><b>Natural Heritage Features Feature Sensitivities</b></p> <p>① Low ② Moderate ③ High</p>	<p><b>Wetlands</b></p> <ul style="list-style-type: none"> <li>Provincially Significant</li> <li>Other Evaluated</li> <li>Unevaluated</li> </ul> <p><b>Wildlife Observations (Field, MMM 2014)</b></p> <p><b>Avifauna</b></p> <ul style="list-style-type: none"> <li>Barn Swallow (BARS)</li> <li>Bobolink (BOBO)</li> <li>Chimney Swift (CHSW)</li> <li>Eastern Meadowlark (EAME)</li> <li>Eastern Wood Pewee (EAWP)</li> <li>Hooded Warbler (HOWA)</li> <li>Wood Thrush (WOTH)</li> </ul>	<p><b>Herpetofauna</b></p> <ul style="list-style-type: none"> <li>Snapping Turtle (SNTU)</li> <li>Suitable Bobolink and Eastern Meadowlark Habitat at time of Survey</li> </ul> <p><b>Odonate</b></p> <ul style="list-style-type: none"> <li>Harpoon Clubtail (HACL)</li> <li>Swamp Darner (SWDA)</li> </ul> <p><b>6a Amphibian Calling Station</b></p> <ul style="list-style-type: none"> <li>Study Boundary</li> <li>Railway</li> <li>Flow Direction</li> </ul>
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<p><b>Vegetation Community</b></p> <p><b>Cultural Communities</b></p> <p>CUM1-1 – Dry – Moist Old Field Meadow</p> <p>CUS1 – Mineral Cultural Savannah</p> <p>CUT1 – Mineral Cultural Thicket Ecosite</p> <p>CUW1 – Mineral Cultural Woodland Ecosite</p> <p>CUP2 – Mixed Plantation</p> <p>CUP3 – Coniferous Plantation</p>	<p><b>Swamp Communities</b></p> <p>SWD – Deciduous Swamp</p> <p>SWD1-2 – Bur Oak Mineral Deciduous Swamp</p> <p>SWD2-1 – Black Ash Mineral Deciduous Swamp</p> <p>SWD2-2 – Green Ash Mineral Deciduous Swamp</p> <p>SWD3-3 – Swamp Maple Mineral Deciduous Swamp</p> <p>SWD4 – Mineral Deciduous Swamp Ecosite</p> <p>SWC – Coniferous Swamp</p> <p>SWM1-1 – White Cedar – Hardwood Mineral Mixed Swamp</p> <p>SWT – Thicket Swamp</p>	<p><b>Forest Communities</b></p> <p>FOD – Deciduous Forest</p> <p>FOD3-1 – Dry - Fresh Poplar Deciduous Forest</p> <p>FOD5 – Dry - Fresh Sugar Maple Deciduous Forest Ecosite</p> <p>FOD5-1 – Dry - Fresh Sugar Maple Deciduous Forest</p> <p>FOD5-3 – Dry - Fresh Sugar Maple - Oak Deciduous Forest</p> <p>FOD5-8 – Dry - Fresh Sugar Maple - White Ash Deciduous Forest</p> <p>FOD6-5 – Fresh - Moist Sugar Maple - Hardwood Deciduous Forest</p>	<p><b>Marsh Communities</b></p> <p>MAMM1-12* – Common Reed Graminoid Mineral Meadow Marsh</p> <p>MAM2-2 – Reed-canary Grass Mineral Meadow Marsh</p> <p>MAS2-1 – Cattail Mineral Shallow Marsh</p>	<p><b>Open Water Communities</b></p> <p>OA – Open Water</p>	<p><b>Other</b></p> <p>Res / Residential</p> <p>AG / Agriculture</p>	<p><b>Watercourses</b></p> <p>Permanent</p> <p>Intermittent</p> <p>Study Boundary</p> <p>Railway</p> <p>Butternut</p> <p>Flow Direction</p> <p>Purple – Desktop/Background Information Available</p> <p>Blue – Air Photo Interpretation</p> <p>Green – Field Survey</p> <p>Red – Roadside/Edge Survey</p> <p>* – ELC type from Lee 2008</p>
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**Vegetation Community**

**Cultural Communities**

- CUM1-1 – Dry – Moist Old Field Meadow
- CUS1 – Mineral Cultural Savannah
- CUT1 – Mineral Cultural Thicket Ecosite
- CUW1 – Mineral Cultural Woodland Ecosite
- CUP2 – Mixed Plantation
- CUP3 – Coniferous Plantation

**Swamp Communities**

- SWD – Deciduous Swamp
- SWD1-2 – Bur Oak Mineral Deciduous Swamp
- SWD2-1 – Black Ash Mineral Deciduous Swamp
- SWD2-2 – Green Ash Mineral Deciduous Swamp
- SWD3-3 – Swamp Maple Mineral Deciduous Swamp
- SWD4 – Mineral Deciduous Swamp Ecosite
- SWC – Coniferous Swamp
- SWM1-1 – White Cedar – Hardwood Mineral Mixed Swamp
- SWT – Thicket Swamp

**Forest Communities**

- FOD – Deciduous Forest
- FOD3-1 – Dry - Fresh Poplar Deciduous Forest
- FOD5 – Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- FOD5-1 – Dry - Fresh Sugar Maple Deciduous Forest
- FOD5-3 – Dry - Fresh Sugar Maple - Oak Deciduous Forest
- FOD5-8 – Dry - Fresh Sugar Maple - White Ash Deciduous Forest
- FOD6-5 – Fresh - Moist Sugar Maple - Hardwood Deciduous Forest

**Marsh Communities**

- FOD7 – Fresh - Moist Lowland Deciduous Forest Ecosite
- FOD9 – Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
- FOM – Mixed Forest
- FOM2 – Dry - Fresh White Pine - Maple - Oak Mixed Forest Ecosite
- FOM4 – Dry - Fresh White Cedar Mixed Forest Ecosite

**Marsh Communities**

- MAMM1-12\* – Common Reed Graminoid Mineral Meadow Marsh
- MAM2-2 – Reed-cattail Grass Mineral Meadow Marsh
- MAS2-1 – Cattail Mineral Shallow Marsh

**Open Water Communities**

- OA – Open Water

**Watercourses**

- Permanent
- Intermittent

**Other**

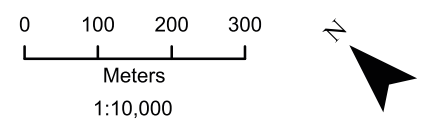
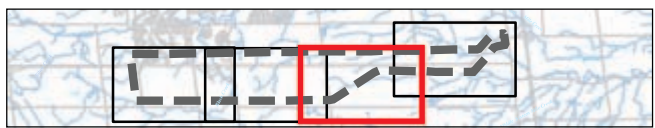
- Res / Residential
- AG / Agriculture

**Legend**

- Study Boundary
- Railway
- Butternut
- Flow Direction
- Purple – Desktop/Background Information Available
- Blue – Air Photo Interpretation
- Green – Field Survey
- Red – Roadside/Edge Survey
- \* – ELC type from Lee 2008



TRAFALGAR ROAD CLASS EA STUDY (Section 1)  
Steeles Avenue to North of 10 Side Road



Natural Heritage Features -  
Wildlife Habitat

Exhibit  
**3-3b**

### 3.3.2.1 Environmentally Designated Areas

Several overlapping natural heritage features and designated policy areas are present within the study area. These include:

#### Policy Plan Areas

The greater Study Area between Steeles Avenue and Highway 7 falls partially within the Niagara Escarpment Plan Area and the Greenbelt Plan Area:

- **Greenbelt Plan Natural Heritage System (2005) - Protected Countryside** – Portions of the study area, specifically on the west of Trafalgar Road between 17 Side Road and Highway 7, are designated under the Greenbelt Plan Natural Heritage System 'Protected Countryside'.
- **Niagara Escarpment Plan Area (2005)- Rural Area** – A small portion of the study area located on the west side of Trafalgar Road north of 20 Side Road is designated under the Niagara Escarpment Plan, Rural Area.

#### Provincially Designated Features

Floodplain regulation areas governed by the Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 160/06 and 162/06, respectively) are present within the study area.

#### Regional and Municipal Designated Features

Regionally and municipally designated features include those features identified as regionally or locally Significant in the Halton Region and / or the Town of Halton Hills Official Plans. Regionally and municipally designated features identified within the study area are as follows:

- **Hungry Hollow ESA** – The Hungry Hollow Ravine is a deep valley feature with several tributaries of the Credit River, including Black Creek. The feature woodland is extensive and diverse and is comprised of mature Sugar Maple forests and mixed forests and a lush herbaceous layer.
- **Waterfalls Woods ESA** – A largely deciduous forest with swamp habitats located west of Trafalgar Road on 20 Side Road. Provides functional habitat linkage to adjacent natural systems. SAR and regional species known to occur within the feature. Portions of the Niagara Escarpment are present within this feature, which is designated as a UNESCO biosphere reserve, although outside of the study area.
- **Stewarttown Woods ESA** – Extensive and diverse woodland and riverine habitat located west of Trafalgar Road primarily between 15 Side Road and 17 Side Road. Black Creek flows through this ESA.
- **Hornby Swamp Wetland Complex (locally significant wetland)** – Located east of Trafalgar Road, north of Hornby Road. Consists of deciduous swamp with a small open natural area adjacent to the road. Identified as a Regional Wetland.

### 3.3.2.2 Physiography and Soils

The Niagara Escarpment, located approximately 6 km northwest of the greater Study Area (i.e. Steeles Avenue to Highway 7), is the most significant physiographic feature



within the region. Within the study area, two physiographic regions are present, the Peel Plain in the south and South Slope in the north. The Peel Plain represents areas that were once covered by a pre-glacial lake (Glacial Lake Peel), whereby shallow water deposits (silt and clay) overlie deeper glacial till units, and bedrock. This region consists of flat to undulating terrain, whereby this plain has a very gentle slope to the southeast, towards Lake Ontario. As per Chapman and Putnam (1984), much of the Peel Plain is underlain by poorly drained clay soils, however select regions have sandy sub-soils. The South Slope differs from the Peel Plain in that the glaciolacustrine deposits are absent and glacial till is typically the surficial geological unit. Again, this area consists of undulating terrain (drumlinized to bevelled till plains), with a very gentle slope towards Lake Ontario - however the plain is characterized by flutings (subtle elongated ridges and valleys) and localized drumlins.

Additional detail, including bedrock geology, is provided in **Appendix N** Hydrogeology Report.

### **3.3.2.3 Surface Drainage and Watershed Characteristics**

The greater Study Area (between Steeles Avenue and Highway 7) lies within two watershed systems; Credit River (Credit Valley Conservation) and 16 Mile Creek (Halton Region Conservation). Within the Credit River watershed portion of the study area, Black Creek is the dominant watercourse feature. Within the 16 Mile Creek watershed (Middle Branch), the Hornby Tributary is the dominant watercourse feature. Both of these features are classified as permanent watercourses.

#### **Black Creek Subwatershed**

The Black Creek subwatershed is approximately 79.28 sq. km in area and is a major tributary of Silver Creek intercepting it in the west end of Georgetown. Silver Creek is a tributary to the Credit River (CVC 2009). The headwaters of Black Creek originate at Fairy Lake in the Town of Acton. The majority of the watercourse flows through undulating terrain and crosses over the Niagara Escarpment between Acton and Georgetown. Groundwater supports baseflow of the creek and maintains cool/coldwater thermal characteristics. Black Creek contains sensitive coldwater salmonids, specifically, Brown Trout (*Salmo trutta*), Brook Trout (*Salvelinus fontinalis*), Rainbow Trout (*Oncorhynchus mykiss*), and Atlantic Salmon (*Salmo salar*) (through stocking efforts by MNRF). Black Creek is currently managed as a mixed coldwater/coolwater system under the Credit River Fisheries Management Plan (MNRF & CVC 2002). Land use within the subwatershed is predominantly agriculture, with some naturalized areas (woodlands and wetlands), rural residential and urban (Acton, Stewarttown and Georgetown).

In addition to Black Creek, within the study area there are 3 tributaries of Black Creek present, two of which cross Trafalgar Road.

#### **16 Mile Creek Subwatershed (Middle and Middle East Branches):**

The Sixteen Mile Creek watershed is located at the western end of Lake Ontario. It drains approximately 372 km<sup>2</sup> of land within nine distinct sub-watersheds (Dunn and Jamieson Undated). The main branches of the creek originate from wetlands and forested swamps associated with the Niagara Escarpment. The tributaries within the study area generally support warmwater baitfish species. The Middle Branch of 16 Mile

Creek is known to be occupied by Redside Dace (*Clinostomus elongates*) a species listed as Endangered provincially, and therefore afforded protection under the Endangered Species Act (2007). Land use within the subwatershed is predominantly agriculture, with some naturalized areas (woodlands and wetlands), rural residential, becoming predominantly urban south of the study area as it flows through several Greater Toronto Area (GTA) communities.

The main associated watercourse within the study area is the Hornby Tributary. There are an additional 9 tributaries present within the study area associated with either the middle or east branches of 16 Mile Creek, 7 of which cross Trafalgar Road.

#### 3.3.2.4 Hydrogeology

A hydrogeology assessment was completed as part of the EA Study. The Hydrogeology Report can be found in **Appendix N**.

##### **Regional Aquifers**

The main regional aquifers within Halton Region include the shallow overburden aquifer, the overburden bedrock valley aquifer and bedrock aquifer.

The shallow overburden aquifer consists of thin sand and gravel lenses interbedded within the Halton Till. These lenses have created minor aquifers that support private domestic water supplies.

The bedrock underlying the Study Area is the Queenston Shale; that yields some water within the upper weathered zone. The groundwater yield is adequate to supply private domestic supplies, but has marginal aesthetic drinking water quality, due to the mineral content.

The Acton/Mississauga and Inglewood/Milton buried bedrock valley aquifers are the major regional supply aquifers. All the municipal wellfields in Georgetown namely, Cedarvale, Princess Anne and Lindsay Court are supplied by groundwater from these aquifers. The Lindsay Court and Princess Anne wellfields are located in the Acton/Mississauga bedrock valley aquifer, while the Cedarvale wellfield is located in the Inglewood/Milton bedrock valley aquifer, near the area where it joins the Acton/Mississauga bedrock valley (CVC, 2009). The aquifers were formed due to glaciofluvial processes that deposited sands and gravels within the bedrock valleys.

##### **Groundwater Resources**

Recent well surveys performed along Steeles Avenue and Hornby Road have determined that although access to municipal water is available on Steeles Avenue, most households and small commercial properties use private wells as the main source of water between Steeles Avenue and 5 Side Road.

The municipally serviced areas are located on Steeles Avenue, and north and east of the 15 Side Road intersection with Trafalgar Road. Properties on Trafalgar road between Steeles Avenue and 15 Side Road use private water wells for their water supply, (Halton Region Source Protection Area Assessment Report (2015)).

### 3.3.2.5 Vegetation

Land use within the greater Study Area (i.e. Steeles Avenue to Highway 7) is primarily agricultural with residential development concentrated at the northeastern end (Georgetown). Natural communities are fragmented and interspersed throughout the agricultural/rural landscape. Larger areas of natural vegetation in the form of woodlands and wetlands are concentrated within the northern portion of the study area with the presence of the Hungry Hollow ESA/PSW, Waterfalls ESA, and Stewarttown Woods ESA. Details of the vegetation species and communities in the Study Area are presented in the following sections, and detailed in **Appendix E**.

Plant lists for each community type are provided for communities where a reasonable level of observation of community strata was possible from the roadside/community edge or where property access was permitted. In some cases, communities were observed from a large distance away or had high edge density which reduced visibility, in which only the primary canopy and edge species could be observed. As such, no plant list for these communities has been included. Vascular plant lists are provided in **Appendix E** (Natural Heritage Report – Appendix D).

#### **Vegetation Communities**

Thirty-two distinct vegetation community types as classified using the ELC system were delineated along the study corridor. Maps of vegetation communities are provided in **Appendix E** (Natural Heritage Report - Appendix A, Figure 3, plates 1-12). Vegetation communities are also identified by Feature # in **Appendix E** (Natural Heritage Report - Appendix H). These community types are:

- Moist Old Field Meadow (CUM1-1) – Dry
- Mineral Cultural Savannah – CUS1
- Mineral Cultural Thicket Ecosite – CUT1
- Mineral Cultural Woodland Ecosite – CUW1
- Mixed Plantation – CUP2
- Coniferous Plantation – CUP3
- Deciduous Forest – FOD
- Fresh Poplar Deciduous Forest – FOD3-1 Dry
- Fresh Sugar Maple Deciduous Forest Ecosite – FOD5 Dry
- Fresh Sugar Maple Deciduous Forest – FOD5-1 Dry
- Fresh Sugar Maple – Oak Deciduous Forest – FOD5-3 Dry
- Fresh Sugar Maple – White Ash Deciduous Forest – FOD5-8 Dry
- Moist Sugar Maple – Hardwood Deciduous Forest – FOD6-5 Fresh
- Moist Lowland Deciduous Forest Ecosite – FOD7 Fresh
- Moist Oak – Maple – Hickory Deciduous Forest Ecosite – FOD9 Fresh
- Mixed Forest – FOM
- Fresh White Pine – Maple – Oak Mixed Forest Ecosite – FOM2 Dry
- Fresh White Cedar Mixed Forest Ecosite – FOM4 Dry
- Deciduous Swamp – SWD
- Bur Oak Mineral Deciduous Swamp – SWD1-2
- Black Ash Mineral Deciduous Swamp – SWD2-1
- Green Ash Mineral Deciduous Swamp – SWD2-2

- Swamp Maple Mineral Deciduous Swamp – SWD3-3
- Manitoba Maple Mineral Deciduous Swamp – SWD3-4
- Mineral Deciduous Swamp Ecosite – SWD4
- Coniferous Swamp – SWC
- White Cedar – Hardwood Mineral Mixed Swamp – SWM1-1
- Thicket Swamp – SWT
- Common Reed Graminoid Mineral Meadow Marsh – MAMM1-12
- Reed-canary Grass Mineral Meadow Marsh – MAM2-2
- Cattail Mineral Shallow Marsh – MAS2-1
- Open Water – OA

No federally designated vegetation communities were recorded along the study corridor.

Of the above noted community types, one is considered rare in the province: Bur Oak Mineral Deciduous Swamp (S3). This swamp type has been delineated within Natural Heritage Features 3, 4 and 5.

### **Floristic Inventory**

A vascular plant species checklist is provided in **Appendix E** (Natural Heritage Report – Appendix D). A total of 196 species were recorded within the study area during field surveys, 21 of which could not be identified to species due to an absence of identifying characteristics. Of the identified species, 31 (17%) are non-native.

Of the native species for which information is available, Coefficient of Conservatism (CC)<sup>2</sup> values range from 0 to 8 with the majority being 0 to 6. The majority of species observed have S-ranks<sup>3</sup> of S5 (Secure in the province), while one species has a rank of S4 (Apparently secure). One **provincially endangered** species with an S-rank of S3?, also a SAR, was observed within the study area:

- Butternut (*Juglans cineria*) – This species was observed within 2 communities in the study area – once at the edge of the FOD7 associated with Natural Heritage Feature 25, and within the FOD5 of Feature #17. It is likely that more than one individual is present within each of these communities, although this could not be confirmed due to lack of property access. Additionally, one dead specimen was observed within the SWD1-2 associated with Natural Heritage Feature #3. No other provincially or federally listed plant species were observed.

One vascular plant species considered **regionally rare** in Halton Region was observed during field surveys:

- Hackberry (*Celtis occidentalis*) – The observation was a planted specimen associated with SWM facilities near Natural Heritage Feature #19.

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<sup>2</sup> Value of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters (Oldham et al., 1995).

<sup>3</sup> Refer to plant list legend in Appendix D for an explanation of S-Ranks.

### 3.3.2.6 Wildlife

This section summarizes the birds, amphibians and reptiles, mammals, Lepidoptera and Odonates, and wildlife movement corridors observed within the greater Study Area (i.e. Steeles Avenue to Highway 7).

#### **Birds**

Breeding bird surveys were conducted on; June 6, 9, 17, 23, and 25 2014. Through completion of these surveys as well as documentation of any birds observed during other surveys, a total of 85 bird species were observed within the study area (refer to **Appendix E** (Natural Heritage Report – Appendix E) for a full list of species). A summary of results, including level of breeding evidence, is highlighted below:

- Of the 85 species observed, 81 are considered to be breeding within the study area (i.e. 'possible', 'probable' or 'confirmed' OBBA breeding evidence)
- Four (4) SAR species listed as Threatened provincially and afforded protection under the ESA (2007) were observed within the study area. These were: Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Chimney Swift (*Chaetura pelagica*) and Eastern Meadowlark (*Sturnella magna*).
- Three (3) species of Conservation Concern (SCC) were observed within the study area and included: Wood Thrush (*Hylocichla mustelina*) [federally listed as Threatened]; Eastern Wood Pewee (*Contopus virens*) [federally listed as Special Concern]; and Hooded Warbler (*Setophaga citrina*) [provincially S-Rank 3B].
- Several Regionally Significant bird species were observed within the study area:
  - Regionally Rare – a total of 3 regionally rare bird species within Halton Region were observed within the study area, this included the Common Raven (*Corvus corax*), Hooded Warbler (*Setophaga citrina*), and Orchard Oriole (*Icterus spurius*); and
  - Regionally Un-Common: a total of 19 regionally un-common bird species within Halton Region were observed within the study area.

Bird species observed are predominantly common, generalist, urban-adapted and agricultural species, with forest-associated species recorded in appropriate habitats. The avifauna observed and exhibiting breeding evidence in the study area are expected for the site conditions present. All of the SAR and SCC bird species recorded would be considered common and expected for Halton Region, given the habitats present. A full list of bird observations is provided in **Appendix E** (Natural Heritage Report – Appendix E), as is the Feature # in which the species was observed.

#### **Amphibians and Reptiles**

Seven calling amphibians were recorded during calling surveys undertaken by MMM staff in 2014, all of which except one are common and expected species for the area. These species included; Green Frog (*Lithobates clamitans*), Northern Leopard Frog (*Lithobates pipiens*), American Toad (*Anaxyrus americanus*), Gray Treefrog (*Hyla*

*versicolor*), Spring Peeper (*Pseudacris crucifer*), Chorus Frog (*Pseudacris*), and Wood Frog (*Rana sylvatica*).

These species were observed likely breeding in Features 23 (likely farm pond adjacent to the feature), 25, 28, 29, 38, and 45 within the study area. An additional dug farm pond had confirmed breeding noted, this pond is located south of 20 Side Road and north of Feature 15.

Spring Peepers were also noted calling during the April 14, 2015 agency site visit in the wetland/woodland Feature 20. Standing water was also observed within the wetland areas. It is inferred that this feature provides breeding amphibian habitat for a variety of species.

One species, Western Chorus Frog (*Pseudacris triseriata*, Great Lakes / St. Lawrence - Canadian Shield population), a federally Threatened species, was recorded at chorus (L3) call levels at calling station 9 on May 15, 2014. This calling station is located well outside of the study area within Natural Heritage Feature 17, which is part of the Niagara Escarpment Plan Area. Species recorded at each station are provided in **Appendix E** (Natural Heritage Report – Appendix E).

A total of 4 reptile species were observed within the study area during the 2014 surveys. This included two species with provincial Special Concern status; the Snapping Turtle (*Chelydra serpentina*) observed in Feature 24 (Stewarttown Woods ESA) as a roadkill specimen; and the Milksnake (*Lampropeltis triangulum*) observed in Feature 24 with an additional anecdotal observation noted in Feature 22. The remaining two species included the Midland Painted Turtle (*Chrysemys picta marginata*) observed in Feature 2 and the Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) observed in Feature 17 (Waterfall Woods ESA).

### **Mammals**

Mammal observations, including sightings and evidence of use (e.g. browse, tracks / trails, scat and burrows) were recorded during all field surveys.

In total, 12 common and expected mammal species, including Eastern Chipmunk (*Tamias striatus*), Grey Squirrel (*Sciurus carolinensis*), Raccoon (*Procyon lotor*), and White-tailed Deer (*Odocoileus virginianus*) were observed in the study area. A complete list of species is found in **Appendix E**, (Natural Heritage Report – Appendix E). All are expected in this rural and urbanizing setting.

No federally (SARA/COSEWIC) or provincially (SARO) designated SAR, or provincially rare species (i.e. S1 to S3 ranked by NHIC) were recorded within the study area.

This area likely supports a range of common mammals that were not observed during the field surveys but are often found in similar habitats throughout the province. These species may include but are not limited to a number of small mammals that often go undetected (e.g. shrews, voles, mice, bats).

Three species of bat including; Little Brown Bat (*Myotis lucifugus*), Northern Long-eared Bat (*Myotis septentrionalis*), and Eastern Small-Footed Bat (*Myotis leibii*) have potential

to occur within the study area. These species are listed as Endangered provincially and as such are afforded protection under the ESA (2007). There may be a potential for the presence of the three bat species in the study area.

### **Lepidoptera and Odonates**

Seventeen Odonate (damselfly and dragonfly) species and 26 Lepidoptera (butterfly and moth) species were recorded in the course of the field surveys within the study area. Of these species one SCC were recorded within the study area which included; Monarch (*Danaus plexippus*) [listed as Special Concern Provincially]. Nine of these species are considered regionally Rare in Halton Region, 4 are considered uncommon in Halton Region, and 5 are considered Locally Significant. A complete list of species is found in **Appendix E** (Natural Heritage Report – Appendix E).

Of the remaining species recorded, all would be considered common and expected for Halton Region. The greatest diversity of Odonates and Lepidoptera species was observed in Feature 24 (Stewarttown Woods ESA).

### **Wildlife Movement Corridors**

Field investigations did not indicate any areas of obvious high-use large / medium-sized mammal movement corridors or road crossing points. Examination of Halton Region Police Service (HRPS) collision data involving vehicular traffic and medium/large sized mammals suggest seven reported collisions between Steeles Avenue and 10 Side Road (approx. 4.5km's) over a 5-yr period. It should be noted that documentation of the collision locations is not sufficiently detailed to suggest any collision patterns or defined crossing points.

Within the broad study area, large and medium sized mammals such as White-tailed Deer and Coyote will likely follow the contours and / or interior of wooded features as they approach roadways. Areas where woodland patches of sufficient size are bisected by the roadway creates a potential crossing point. Examples of this within the study area include – Features 2, 24/11, and 15/19. Outside of these locations, mammals can be expected to follow wooded corridors such as hedgerows, riparian corridors or vegetated drains. In some cases, both large and small mammals may use the underside of bridges and culverts as movement opportunities, avoiding any vehicular interaction in the process. Amphibian movement is also anticipated to be similar in that they will move across Trafalgar Road at locations where natural features are bisected - this also includes Features 2, 24/11, and 15/19.

Within the road realignment study area, it is anticipated that wildlife movement is occurring along the length of Black Creek within Feature 24 as well as between Features 17, 18, and 15.

#### **3.3.2.7 Species at Risk and Species of Conservation Concern**

Species at Risk (SAR) are defined as species listed as Threatened or Endangered provincially by the Committee on the Status of Species at Risk in Ontario (COSSARO) and subsequently are afforded protection under the Endangered Species Act (ESA). Species designated as Special Concern provincially, assigned a conservation status (S-

Rank) of S1 to S3 or SH, or designated as Special Concern, Threatened, or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) or under the federal Species at Risk Act, are considered Species of Conservation Concern (SCC). Confirmed habitat for SCC is considered Significant Wildlife Habitat (SWH) under the Provincial Policy Statement (PPS) and therefore is discussed further within the context of SWH (**Section 3.3.2.8**).

Recent direction from MNR to assess the potential presence of SAR has been to undertake a screening exercise to identify which SAR have potential to be present within a given study area based on known occurrences of the species within the area and habitat present. The screening exercise involved developing a list of SAR and SCC known to occur within the vicinity of study area or region from review of various sources including: species indicated by MNR through correspondence, NHIC data extracted from online tool, MNR Species at Risk website regional species list, and DFO SAR mapping. Once the list of species was developed, each species known preferred habitat was then cross-referenced against habitats identified within the study area or adjacent lands. Background lists and other SAR information are provided in **Appendix E** (Natural Heritage Report – Appendix G) along with a summary table of the screening assessment.

Those species identified through the completion of the screening as having potential suitable habitat within the study area and that have reasonable potential to be present are summarized below, and discussed further in **Appendix E**.

#### **Aquatic SAR and SCC Habitat Potential in the Study Area**

Based on an analysis of the preferred habitat for all the SAR and SCC identified in the screening assessment table provided in **Appendix E** (Natural Heritage Report – Appendix G), no aquatic SAR are known to occur within the study area. Only one aquatic SAR was confirmed as being present in downstream reaches of Black Creek and Tributaries of the Middle 16 Mile Creek outside of the study area - Redside Dace. These features would be considered contributing habitat to the species.

Redside Dace is listed as Endangered provincially by SARO and is also listed as Special Concern-Schedule 1 federally under SARA. As such, this species is afforded protection under the ESA.

It is of note that Atlantic Salmon are present within Black Creek. This species is listed as Extinct in Ontario and is currently being reintroduced into the Credit River through an ongoing fish stocking programs. Success of the species within the systems has been documented.

#### **Terrestrial SAR Habitat Potential in the Study Area**

Findings of the SAR and SCC screening indicated that suitable habitat is present within the study area for several vegetation species. These species are summarized in **Table 3-3**.



**Table 3-3: Summary of SAR and SCC Vegetation Species with Reasonable Potential to be Present within the Study Area (Steeles Avenue to Highway 7)**

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
American Columbo ( <i>Frasera caroliniensis</i> )	S2	END	END	END-Schedule 1	Not observed. Suitable habitat throughout study area in open deciduous woods in Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42. Presence of species in suitable habitats could not be assessed as PTE was not granted.
Butternut ( <i>Juglans cineria</i> )	S3?	END	END	END-Schedule 1	Species was observed within Feature Units 17 and 25. Records provided from MNRF indicate presence in Feature #17 and 24. Suitable habitat present throughout study area in all natural communities or at their edges and in Hedgerows (HRs). Likely to be present within FOD communities, and moderate potential to occur within SWD and floodplain areas.
Broad Beech Fern ( <i>Phegopteris hexagonoptera</i> )	S3	SC	SC	SC-Schedule 3	Not observed. Suitable habitat present within FOD communities throughout study area (located within Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42. Presence of species in suitable habitats could not be assessed as PTE was not granted.
Northern Hawthorn ( <i>Crataegus pruinosa</i> var. <i>dissona</i> )	S3	NAR	NAR	NAR	Not observed. Potential to occur throughout study area, particularly in HRs where Hawthorns are abundant. Moderate potential to occur. Presence of species in suitable habitats could not be assessed as PTE was not granted.

S-Rank (provincial) (MNR NHIC 2014)  
 S2- Imperiled  
 S3- Vulnerable  
 COSEWIC – Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2014)

SARA – Species at Risk Act (SARA 2014)  
 END- Endangered  
 SC- Special Concern  
 NAR- Not at Risk  
 SARO – Species at Risk in Ontario (MNR 2014)

Of the species identified above, one species, Butternut, was observed within the study area. This species was observed within two communities in the study area – once at the edge of the FOD7 associated with Feature #25 (Stewarttown Woods ESA), and within the FOD5 of Feature #17 (Waterfall Woods ESA). More specimens have potential to be located within the study area. More detailed tree surveys should be undertaken at the detailed design phase in locations where tree removal is proposed. The remaining species were not observed in areas surveyed, although suitable habitats for the species are present within the study area and with limited PTE access, absence of the species cannot be confirmed.

**SAR and SCC Wildlife Species with Potential to be Present in the Study Area**

Findings of the SAR and SCC screening indicated that several wildlife species have been documented or have reasonable potential to be present with the study area. These species are summarized in **Table 3-4** and **Table 3-5**.

**Table 3-4: Summary of SAR Wildlife Species with Reasonable Potential to be Present within the Study Area (i.e. Steeles Avenue to Highway 7)**

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
<b>Birds</b>					
Barn Swallow ( <i>Hirundo rustica</i> )	S4B, SZN	THR	THR	No Status	Observed in Feature #24 (Stewarttown Woods) with confirmed breeding evidence and in agricultural fields throughout the study area. Suitable breeding habitat is present within the study area, in the form of culverts, barns, out buildings and other suitable structures.
Bobolink ( <i>Dolichonyx oryzivorus</i> )	S4B	THR	THR	No Status	Observed in agricultural lands within the study area. Records provided from MNRF indicate presence in Feature #24. Suitable breeding habitat is present adjacent to the Trafalgar Road corridor, in the form of hayfields, pasture, cultural meadow and old field habitat. Suitable breeding habitat is also located immediately adjacent to Feature 26.
Chimney Swift ( <i>Chaetura pelagica</i> )	S5B,SZ N	THR	THR	THR- Schedule 1	Observed in Feature #24 with possible breeding evidence.

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
					Potentially suitable habitat is present throughout the study area wherever wooded areas occur, or in the form of suitable chimneys as part of roadside / study area structures. Both woodland nesting (in hollow trees, snags or cavities) and anthropogenic nesting (chimneys, enclosed vertical surfaces) are extremely hard to detect without specific surveys.
Eastern Meadowlark ( <i>Sturnella magna</i> )	S4B	THR	THR	No Status	Observed in agricultural lands adjacent to Feature #3 within the study area. Suitable breeding habitat is present within the study area, in the form of hayfields, pasture, cultural meadow and old field habitat. Suitable breeding habitat also located immediately adjacent to Unit 26.
<b>Mammals</b>					
Eastern Small-footed Myotis ( <i>Myotis leibii</i> )	S2S3	NA	END	No Status	Not observed. Bats have potential to occur within the study area. As targeted bat surveys were not part of the approved study scope, presence/absence of these species and their habitat is unknown. No bat work was undertaken, but potential for cavity trees are present in woodland features- 15, 17, 19, 22, 24, 26, 28, 32
Little Brown Myotis ( <i>Myotis lucifuga</i> )	S4	END	END	No Status	
Northern Myotis ( <i>Myotis septentrionalis</i> )	S3	END	END	No Status	

S-Rank (provincial) (MNR NHIC 2014)  
 S3- Vulnerable  
 S4- Apparently Secure  
 S4B- Apparently Secure (Breeding)  
 S5B-  
 SZN- Non-breeding migrants/vagrants

COSEWIC – Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2014)  
 SARO – Species at Risk in Ontario (MNR 2014)  
 SARA – Species at Risk Act (SARA 2014)  
 END- Endangered  
 SC- Special Concern

**Table 3-5: Summary of SCC Wildlife Species with Reasonable Potential to be Present within the Study Area (i.e. Steeles Avenue to Highway 7)**

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
<b>Birds</b>					
Eastern Wood Peewee ( <i>Contopus virens</i> )	S4B	SC	No Status	No Status	Observed within the study area in Features 2, 17, 19, 24, and 32 with evidence of possible breeding. Suitable breeding habitat is present throughout the study area where moderate to large- sized deciduous and mixed woodland is present. Areas of most suitable habitat include Features 2, 3, 6, 12, 15, 17, 19, 22, 24, 25, 26, 28, 32, 35, and 39.
Hooded Warbler ( <i>Setophaga citrina</i> )	S3B	No Status	No Status	No Status	Observed in Feature 17 with possible breeding evidence. Note that is observation occurred within Feature #17 but outside of the study area.
Wood Thrush ( <i>Hylocichla mustelina</i> )	S4B	THR	SC	No Status	Observed in Feature #17 with possible breeding evidence. Suitable breeding habitat is present throughout the study area where moderate to large-sized deciduous and mixed woodland is present. Suitable habitat include Features 2,3,12,15,17,19,22,24,25,26, 28, and 32.
<b>Reptiles</b>					
Eastern Milksnake ( <i>Lampropeltis triangulum</i> )	S3	SC	SC	SC- Schedule 1	Not observed. This species was not observed within the study area, although no targeted snake surveys were undertaken. Anecdotal observations from locals indicated they have seen the snake in features #22 and #24.
Snapping Turtle	S3	SC	SC	SC- Schedule	Observed as a road kill hatchling specimen found

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
<i>(Chelydra s. serpentina)</i>				1	along 6th Line, adjacent to Feature #24. Records provided from MNRF also indicate presence in Feature # 24.  Suitable habitat is present wherever permanent or even seasonal water bodies are present. In the case of the study area, this could include any creek, river, pond or drain, depending on water levels, and rainfall amounts. Areas of best habitat, including conditions suitable for nesting and overwintering are Features 2, 3, 12, 24, with some potential in Features 19 and 33.
<b>Mammals</b>					
Tri-coloured Bat <i>(Perimyotis subflavus)</i>	S3?	END	No Status	No Status	Bats have potential to occur within the study area. As targeted bat surveys were not part of the approved study scope, presence/absence of these species and their habitat is unknown. No bat work was undertaken, but potential for cavity trees are present in woodland features- 15, 17, 19, 22, 24, 26, 28, 32.
<b>Insects</b>					
Harpoon Clubtail <i>(Gomphus desertus)</i>	S3	No Status	No Status	No Status	Observed in Feature #24, but outside of the study area. Suitable habitat for the species is present along the length of Black Creek (Feature #24).
Swamp Darner <i>(Epiaschna heros)</i>	S2,S3	No Status	No Status	No Status	Observed in Feature #24, but outside of the study area. Suitable habitat for the species is present along the length of Black Creek (Feature #24) and Feature #17.
Monarch	S4	SC	SC	SC-	Observed in features 16, 26,

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
<i>(Danaus plexippus)</i>				Schedule 3	and 41. Suitable habitat is present wherever nectar sources or the host plant (milkweed) are present, which was observed throughout the study area.

S-Rank (provincial) (MNR NHIC 2014)  
 S3- Vulnerable  
 S4- Apparently Secure  
 S4B- Apparently Secure (Breeding)  
 S5B-  
 SZN- Non-breeding migrants/vagrants

COSEWIC – Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2014)  
 SARO – Species at Risk in Ontario (MNR 2014)  
 SARA – Species at Risk Act (SARA 2014)  
 END- Endangered  
 SC- Special Concern

Of the species listed above, suitable nesting habitat for three species was identified within the study area. This includes the potential for Barn Swallow to nest in culvert structures at water crossings, as well as presence of suitable nesting habitat of Bobolink and Eastern Meadowlark in an agricultural field (hay crop) located south of the railway line at Highway 7 as well as within an old field/meadow located north of 17 Side Road, west of Trafalgar Road.

No key hibernation or roosting habitats were identified within the areas of the identified road alternatives.

### 3.3.2.8 Significant Wildlife Habitat

A general assessment of the potential for Significant Wildlife Habitat (SWH) within the study area was completed using the definitions provided below in consideration of available provincial guidance documents: Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000) and Ecoregion 6E Criterion Schedule (MNRF 2012).

In the SWHTG, SWH is broadly identified under four categories, with evaluation criteria presented under each category:

- Seasonal Concentration Areas
- Rare Vegetation Communities and Specialized Habitats for Wildlife
- Habitat of Species of Conservation Concern
- Wildlife Movement Corridors

These categories are discussed further in **Appendix E**. Based on a review of background information and results of site-specific field surveys, the assessment of SWH within the study area is discussed as ‘candidate’ and ‘confirmed’. Those categories that are identified as candidate require additional targeted surveys to be undertaken to confirm. Consideration for carrying out additional surveys to confirm presence of SWH may be undertaken at the detailed design phase when project footprints are known. Confirmed SWH, identifies those categories in which available information has confirmed that SWH category criteria are met. A summary of the findings of this exercise are as follows:

### **SWH Confirmed in the Area**

Within the Study Area, the presence of the following rare vegetation communities or specialized habitats for wildlife was confirmed:

- **Seeps and Springs** – Confirmed to be present within Features 11 and 24 through existing documentation and/or field observations.

Additionally, the presence of habitats for several Species of Conservation Concern (SCC) was confirmed within the Study Area, including:

- **Eastern Wood Pewee** – Observed within the study area in Features 2, 15, 17, 24, and 32 with evidence of possible breeding in suitable breeding habitat;
- **Wood Thrush** – Observed in Feature #17 with possible breeding evidence in suitable breeding habitat;
- **Snapping Turtle** – Observed as a road kill hatchling specimen found along 6th Line, adjacent to Feature #24. Feature likely supports breeding and nesting of the species;
- **Harpoon Clubtail** – Observed in Feature #24. Suitable habitat for the species is present along the length of Black Creek in Feature #24;
- **Swamp Darner** – Observed in Feature #24. Suitable habitat for the species is present along the length of Black Creek (Feature #24); and
- **Monarch Butterfly** – Observed throughout the study area (migrant individuals). Suitable habitat is present wherever nectar sources or the host plant (milkweed) are present, which was observed throughout the study area.

Therefore, based on the assessment of the existing natural heritage features, Features 2, 11, 15, 17, 24, and 32 meet the criteria for SWH although would require confirmation by MNRF.

### **Candidate SWH**

Critical habitat areas that provide for seasonal concentrations of animals within the Study Area include:

- **Waterfowl Stopover and Staging Areas** - CUM1 communities are present within Features #1, 5, 14, 16, 26, and 24. CUT1 community is also present just south of Feature #10. Large tracts of agricultural lands are also present within the study area. It is unknown if these areas flood in the spring, enabling them to act as waterfowl stopover and staging areas;
- **Bat Maternity Colonies** - Potential suitable habitat is present in the following woodland features that are greater than 10 ha in size: Features 2, 24, 23, 17, and 11;

- **Turtle Wintering Areas** – Potential suitable habitat present in Features 3, 12, and 24. Feature 24 highly likely, with a road-killed hatchling Snapping Turtle indicating suitable breeding habitat, overwintering likely to also occur within the feature;
- **Reptile Hibernaculum** – Potential suitable habitat likely to occur within study area. Most likely locations include man-made structures (e.g. old building foundations, rock piles, etc.). In natural areas, the greater potential occurs within Features 3, 11, 5, 24, and 17; and
- **Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)** - Potential suitable habitat for nesting herons may be present in larger woodlands within the study area, such as Features 2, 5, 11, and 24.

Rare vegetation communities or specialized habitats for wildlife within the Study Area include:

- **Rare Vegetation Community** - One rare vegetation community type is present within the study area; Bur Oak Mineral Deciduous Swamp (S3). This swamp type has been delineated within Features 3, 4 and 5;
- **Waterfowl Nesting Area** – Potential suitable habitat within the study area located adjacent to Features 13, 5, 29, 26, 20, and 24 in upland habitats.
- **Woodland Raptor Nesting Habitat** – Potential suitable habitat present within the study area in Features 2, 17, and 24. Cooper's hawk was recorded from Feature 24 and 40, very likely to be found nesting within study area.
- **Turtle Nesting Areas** – High potential for turtle nesting area located in Feature 24 with observation of a road-killed hatchling Common Snapping Turtle adjacent to the feature.
- **Amphibian Breeding Habitat (Woodland)** – Potential suitable habitat present within the study area including Features 23 (likely in adjacent pond), 19, 25, 28, 29, and 38.

See **Section 3.3.2.7.** for a list of all SCC that have potential to occur within the study area as suitable habitats are present within the study area and there is a reasonable likelihood the species may occur.

Wildlife movement corridors within the Study Area include:

- **Amphibian Movement Corridor** – Potential for amphibian movement corridors, although no data or observations confirmed within the study area. Amphibian movement is anticipated at locations where natural features are bisected - examples include Features 2, 24/11, and 15/19. Within the road realignment study area, it is anticipated that wildlife movement is concentrated along the length of Black Creek within Feature 24 as well as between Features 17, 18, and 15.
- **Deer Movement Corridor** – Potential for deer movement corridors, although no data or observations confirmed within study area. Areas where woodland



patches of sufficient size are bisected by the roadway create a potential crossing corridor. Examples of this within the study area include – Features 2, 24/11, and 15/19. Within the road realignment study area, it is anticipated that wildlife movement is concentrated along the length of Black Creek within Feature 24 as well as between Features 17, 18, and 15.

### 3.3.2.9 Watercourses and Fish Habitat

Field investigations of aquatic features within the study area were conducted on June 23 and September 15, 2014 by MMM Group ecologists. Aquatic habitat characterization surveys were carried out on all watercourses within the study area with exception of those where PTE was not granted. These features included Features 33 and 36 within the Trafalgar Road study corridor, as well as Feature 44 located in the road realignment study area.

A summary of findings from the watercourse assessments carried out within the study area is provided in **Appendix E** (Natural Heritage Report – Tables 2 and 3). A discussion of associated watersheds and subwatersheds (Black Creek and 16 Mile Creek) as well as watercourses present within the Study Area has been previously provided in **Section 3.3.2.3**.

In total, there are 12 watercourses present within the study area. Of these 12, nine cross Trafalgar Road. Two are permanent watercourses directly supporting fish: Hornby Tributary of Middle Sixteen Mile Creek, and Black Creek in the Credit River watershed. Both of these watercourses contain high quality fish habitat in the vicinity of Trafalgar Road.

Of the remaining watercourses present, only one watercourse (Feature 7) had no potential for fish habitat with no surface connection to a fish bearing watercourse. The remaining six watercourses were considered contributing fish habitat, with no potential to directly support fish communities, although they do provide flow to a fish bearing watercourse.

A summary of the existing conditions associated with each of the 12 watercourses/drainage features is presented in **Appendix E** (Natural Heritage Report – Tables 2 and 3).

## 3.4 Drainage

Trafalgar Road between Steeles Avenue and 10 Side Road includes portions of the Sixteen Mile Creek watershed under the jurisdiction of Conservation Halton. Two (2) of the watercourses between Steeles Avenue and 10 Side Road are regulated, and they are Sixteen Mile Creek Mideast Reach 13 Tributary (Culvert C1) and Sixteen Mile Creek Mideast Reach 13 Main (Culvert C2).

Sixteen Mile Creek Mideast Reach 13 is a permanent watercourse directly supporting fish, and both contain high quality fish habitat in the vicinity of Trafalgar Road. The other watercourses, including the Sixteen Mile Creek Mideast Reach 1 North and Sixteen Mile Creek Mideast Reach 13 Tributary, are intermittent or ephemeral. Drainage from the

roadway is being conveyed by roadside ditches and crossing culverts to the receiving watercourses. In general, the drainage pattern is from west to east.

The existing land use on both sides of Trafalgar Road is mainly agriculture with some forest, meadow, and residential features. The soil types in the area include: Chinguacousy Clay Loam, Chinguacousy Silt Loam, Farmington Loam, Fox Sandy Loam, Font Sandy Loam, Grimbsy Sandy Loam, Guelph Loam, Jeddo Clay Loam, London Loam, Lockport Clay, Oneida Silt Loam, and Oneida Clay Loam. The general topography slopes from west to east.

There are eighteen (8) culverts (Culverts C1 to C8) between Steeles Avenue and 10 Side Road. Culverts C1 through C8 are all located within Conservation Halton jurisdiction. The majority of culverts drain from west to east with the exception of Culverts C1 and C3 which drain from east to west and Culvert C2 that drains from north to south.

The existing conditions drainage mosaics are provided in **Exhibits 3-4 to 3-10**.

Under CH jurisdiction Catchments 100, 110, and 135 are conveyed through Culverts C1, C3, and C8, respectively. Catchments 115, 120, 125, and 130 are conveyed through Culverts C4, C5, C6, and C7, respectively. Flows from these four culverts combine and are routed through a channel before combining with flows from Catchment 105, ultimately discharging through Culvert C2. Culvert C4 drains a small roadway (and adjacent land) area only. This culvert will be eliminated in proposed conditions and the runoff will be directed south via the west side ditch.

A SWMHYMO hydrologic model was developed to estimate localized runoff from the roadway and external areas under existing conditions. The flows at each culvert were generated as follows:

- SWMHYMO modelling using the 12-hour Chicago, 24-hour Chicago and 24-hour SCS (Soil Conservation Service) storm distributions to determine the various return period and Regional Storm (Hurricane Hazel) peak flows; and

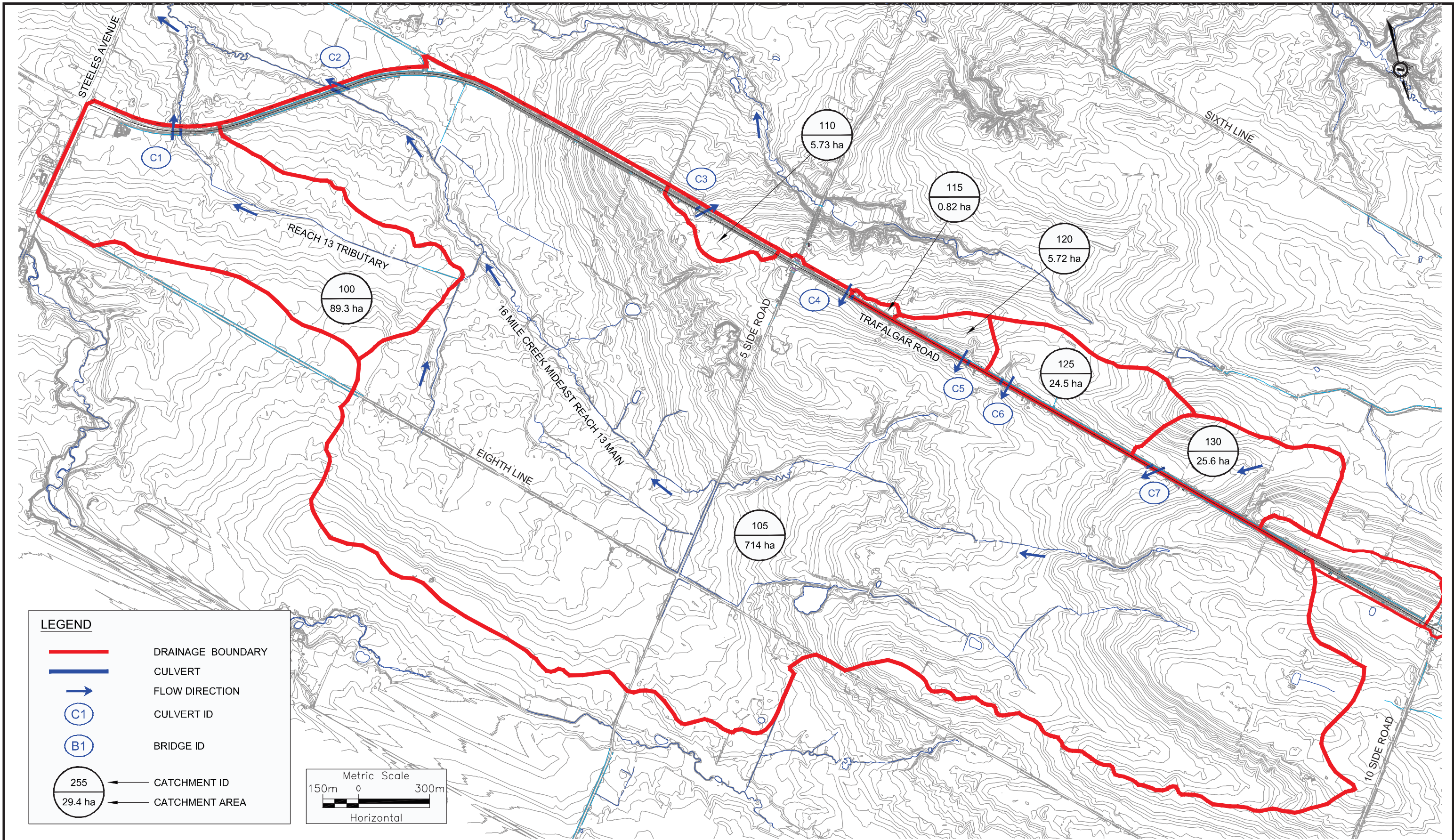
The summary of hydrological parameters, model schematics, and SWMHYMO output files are provided in Appendix A of the **Drainage and Stormwater Management Report in Appendix J**.

**Table 3-6** provide a comparison of flows obtained for each storm distribution at each culvert under CH and CVC jurisdiction respectively.

As shown in **Table 3-6**, the 24-hour SCS storm distribution generated the highest flows at most culvert locations. Therefore, the flows obtained from the 24-hour SCS storm distribution were carried forward for hydraulic analysis of the culverts to provide the most conservative results.

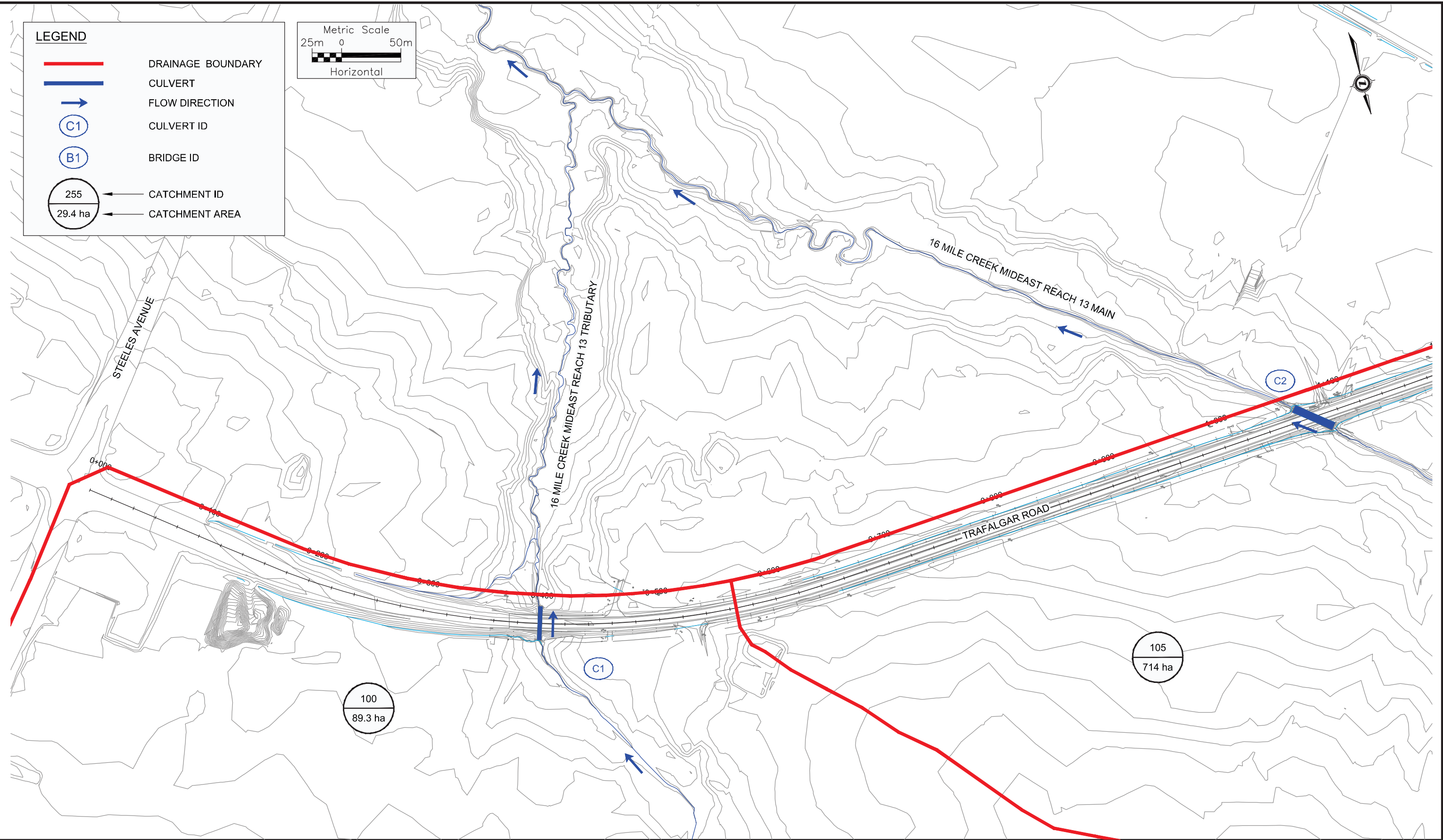
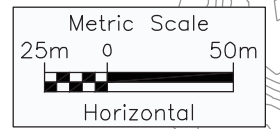
**Table 3-6: Existing Conditions Peak Flow Comparison**

Outlet	Hydro	Storm Distribution	Flow (m3/s)						Regional
			2-year	5-year	10-year	25-year	50-year	100-year	
C1	100	12-hr Chicago	1.33	2.23	2.84	3.74	4.35	5.01	9.19
		24-hr Chicago	1.62	2.58	3.33	4.37	5.15	5.79	
		<b>24-hr SCS</b>	<b>1.83</b>	<b>2.71</b>	<b>3.41</b>	<b>4.30</b>	<b>5.03</b>	<b>5.59</b>	
C2	505	12-hr Chicago	5.28	8.87	11.3	15.0	17.5	20.2	55.2
		24-hr Chicago	6.47	10.4	13.6	17.8	21.2	23.9	
		<b>24-hr SCS</b>	<b>7.21</b>	<b>10.9</b>	<b>13.9</b>	<b>17.8</b>	<b>21.0</b>	<b>23.5</b>	
C3	110	12-hr Chicago	0.171	0.293	0.376	0.497	0.579	0.667	0.761
		24-hr Chicago	0.209	0.338	0.437	0.573	0.672	0.758	
		<b>24-hr SCS</b>	<b>0.246</b>	<b>0.364</b>	<b>0.457</b>	<b>0.574</b>	<b>0.670</b>	<b>0.741</b>	
C4	115	12-hr Chicago	0.042	0.056	0.065	0.077	0.085	0.094	0.085
		24-hr Chicago	0.043	0.058	0.067	0.080	0.090	0.099	
		<b>24-hr SCS</b>	<b>0.040</b>	<b>0.051</b>	<b>0.060</b>	<b>0.071</b>	<b>0.081</b>	<b>0.089</b>	
C5	120	12-hr Chicago	0.104	0.185	0.242	0.328	0.388	0.453	0.706
		24-hr Chicago	0.129	0.217	0.287	0.387	0.463	0.529	
		<b>24-hr SCS</b>	<b>0.153</b>	<b>0.236</b>	<b>0.304</b>	<b>0.393</b>	<b>0.468</b>	<b>0.525</b>	
C6	125	12-hr Chicago	0.322	0.561	0.728	0.981	1.16	1.35	2.64
		24-hr Chicago	0.397	0.658	0.868	1.16	1.39	1.58	
		<b>24-hr SCS</b>	<b>0.460</b>	<b>0.704</b>	<b>0.902</b>	<b>1.16</b>	<b>1.38</b>	<b>1.55</b>	
C7	130	12-hr Chicago	0.347	0.605	0.786	1.06	1.25	1.46	2.79
		24-hr Chicago	0.428	0.711	0.937	1.26	1.50	1.71	
		<b>24-hr SCS</b>	<b>0.497</b>	<b>0.760</b>	<b>0.975</b>	<b>1.26</b>	<b>1.49</b>	<b>1.67</b>	
C8	135	12-hr Chicago	0.180	0.328	0.433	0.594	0.707	0.831	1.45
		24-hr Chicago	0.226	0.389	0.522	0.711	0.856	0.981	
		<b>24-hr SCS</b>	<b>0.272</b>	<b>0.427</b>	<b>0.555</b>	<b>0.725</b>	<b>0.867</b>	<b>0.977</b>	






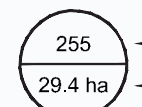


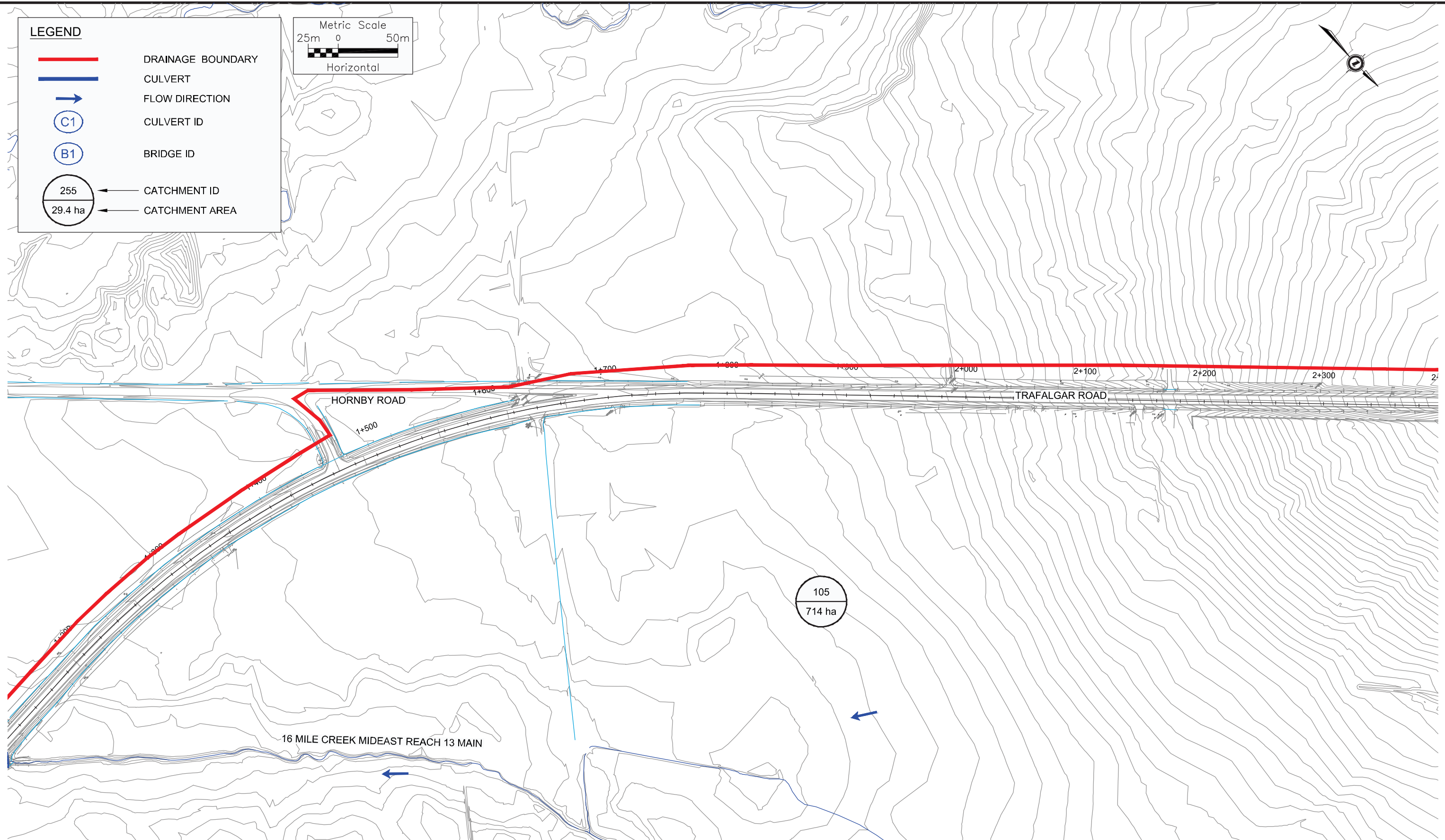
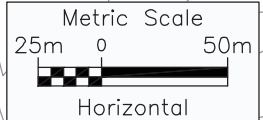
**LEGEND**

- DRAINAGE BOUNDARY
- CULVERT
- ➔ FLOW DIRECTION
- C1 CULVERT ID
- B1 BRIDGE ID
- 255 ← CATCHMENT ID
- 29.4 ha ← CATCHMENT AREA



**LEGEND**

-  DRAINAGE BOUNDARY
-  CULVERT
-  FLOW DIRECTION
-  CULVERT ID
-  BRIDGE ID
-  CATCHMENT ID  
CATCHMENT AREA






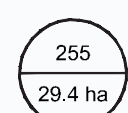


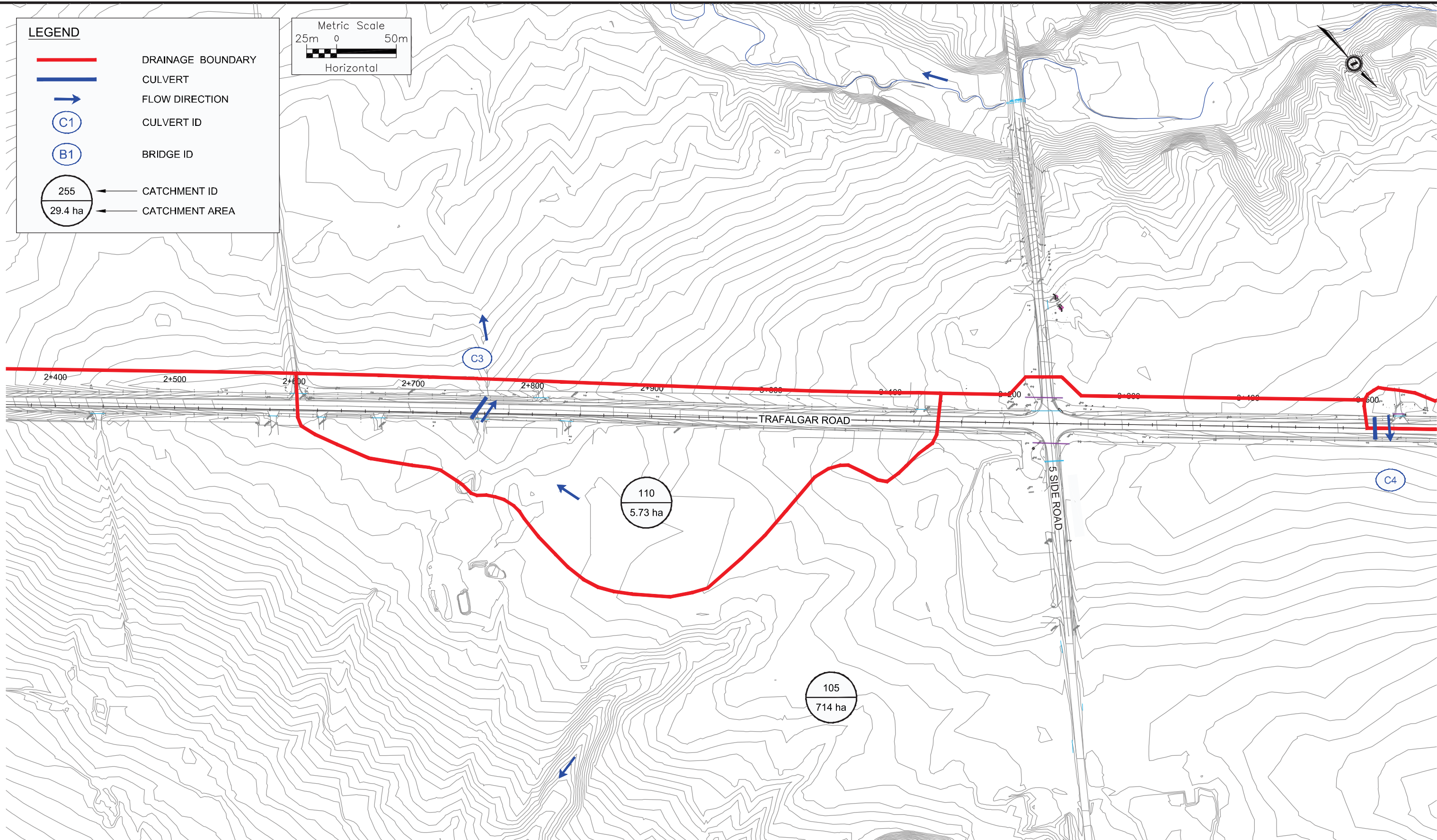
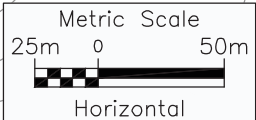
TRAFALGAR ROAD CLASS EA STUDY (Section 1)  
Steeles Avenue to North of 10 Side Road

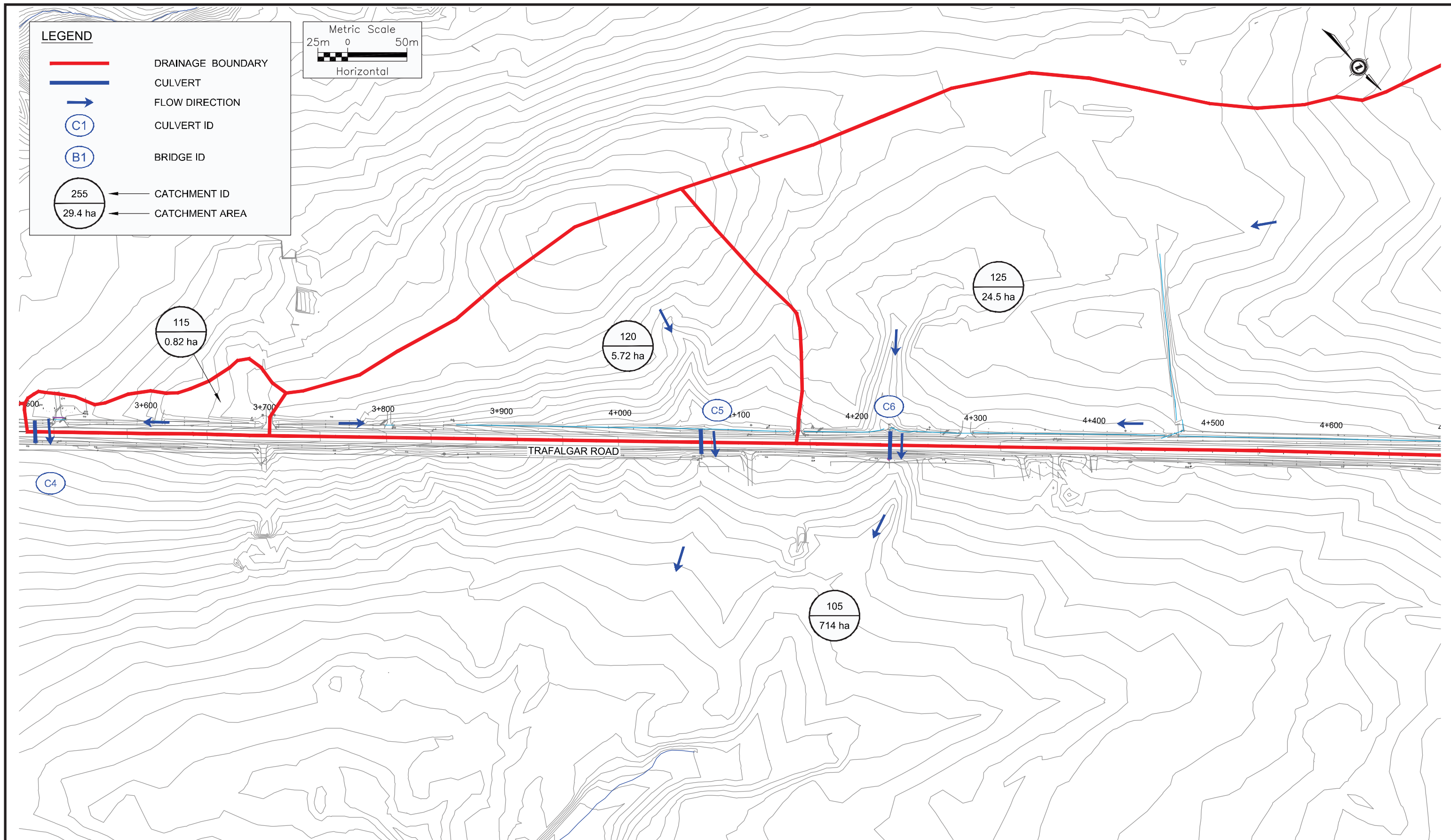
Existing Conditions  
Drainage Mosaic

Exhibit  
**3-6**

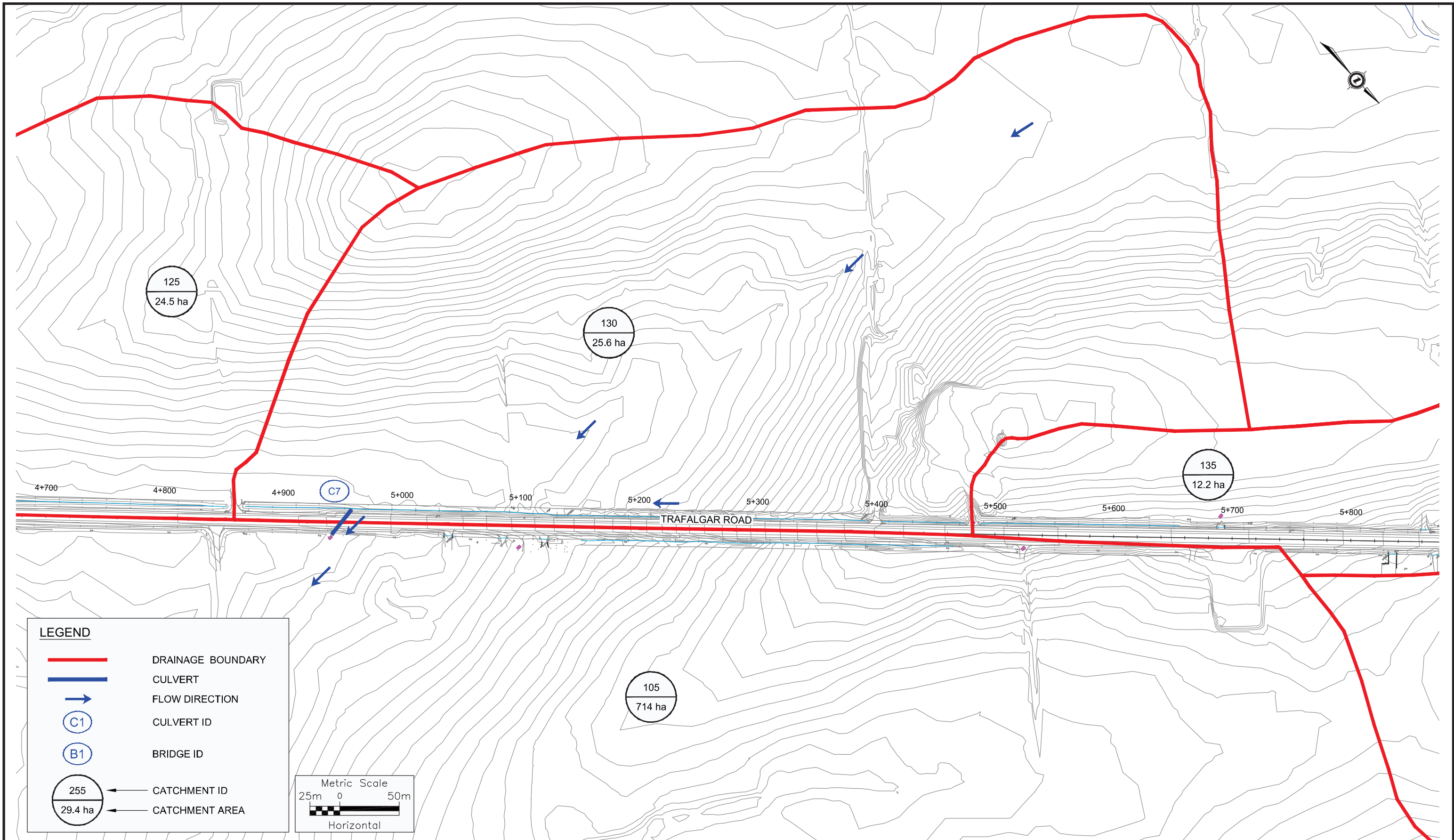
**LEGEND**

-  DRAINAGE BOUNDARY
-  CULVERT
-  FLOW DIRECTION
-  CULVERT ID
-  BRIDGE ID
-  CATCHMENT ID  
CATCHMENT AREA






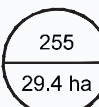


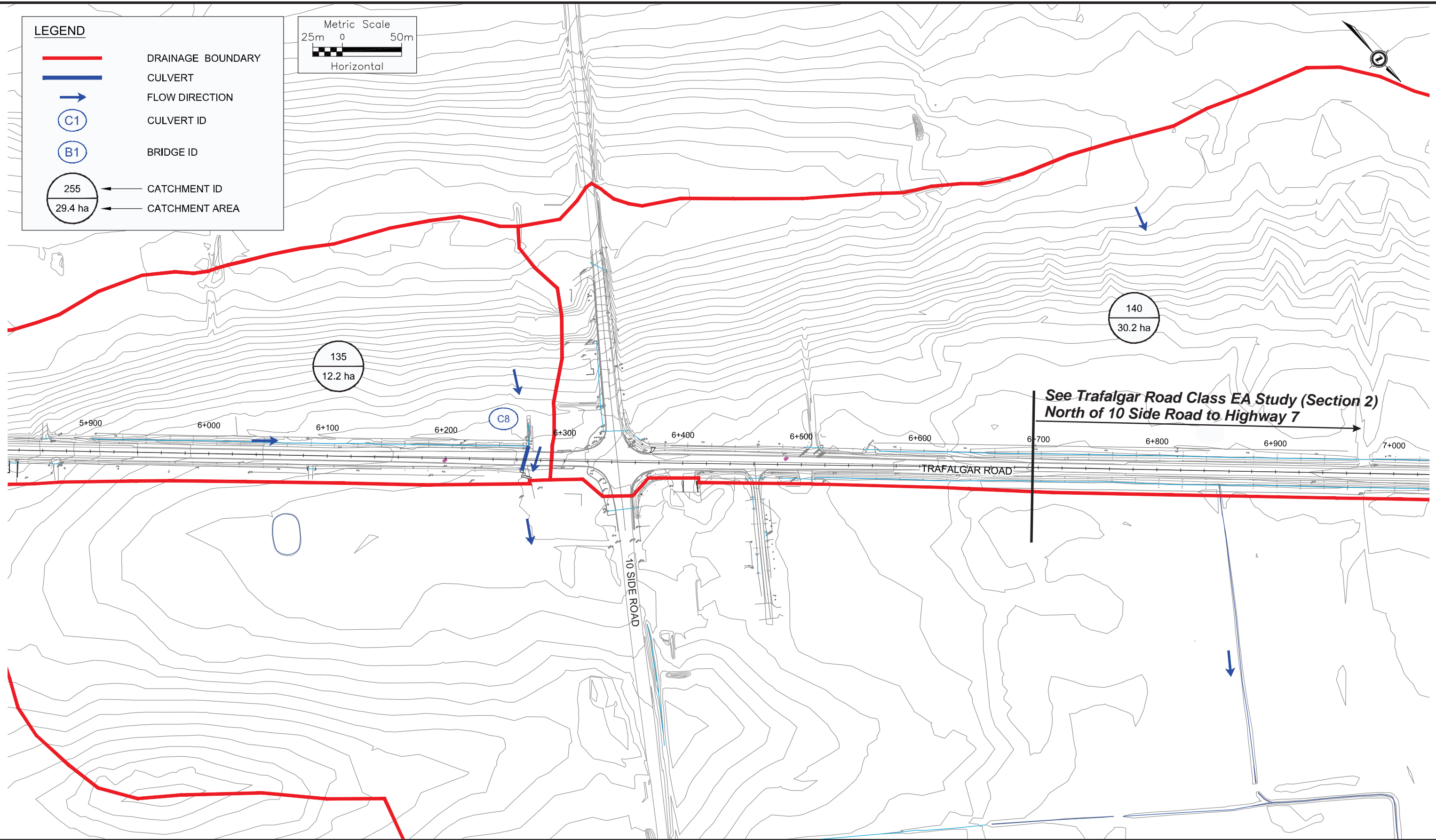
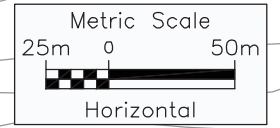






**LEGEND**

-  DRAINAGE BOUNDARY
-  CULVERT
-  FLOW DIRECTION
-  CULVERT ID
-  BRIDGE ID
-  CATCHMENT ID  
CATCHMENT AREA



See *Trafalgar Road Class EA Study (Section 2)*  
North of 10 Side Road to Highway 7



### 3.5 Source Protection Area

Areas between Steeles Avenue and 10 Side Road are located within the Halton Region Source Protection Area; within the Middle East Branch Subwatershed within the greater Sixteen Mile Creek Watershed.

The Middle East Branch Subwatershed are within areas that have very high surface water monthly stresses, at 266% Percent Water Demand, per Figure 5.8 of the Halton Region Source Protection Area (HRSPA) Assessment Report (July 2015). The surface water stresses are due to rural land use, with substantially higher agricultural and commercial takings. The construction of Trafalgar Road between Steeles Avenue and 10 Side Road are not anticipated to increase the surface water stresses within the Middle East Subwatershed, since no consumptive water takings will be required.

The annual groundwater stresses within the Middle East Branch Subwatershed; however, are very low, at 1% Percent Water Demand. For perspective, the highest groundwater stresses within the Halton Region Source Protection Area are associated with the Upper West Branch (15%) and Willoughby Creek (24%). The Upper West Branch contains the Kelso and Campbellville municipal supply wellfields.

According to Figure 6.9 of the HRSPA Assessment Report (2015), the area of Trafalgar Road between Steeles Avenue and 10 Side Road are located within an area of Medium Intrinsic Groundwater Susceptibility. A highly vulnerable aquifer near Ashgrove, crosses Trafalgar Road. Vulnerable aquifers, as defined in the HRSPA Assessment Report (2015), are subsurface, geologic formations that are sources of drinking water which could, relatively easily, be impacted by the release of pollutants on the ground surface.

Best Management Practices and a suitable Soil Management Plan (for imported fill used for the road extension) will have to be applied along the entire construction alignment to minimize impacts to groundwater aquifers and surface watercourses.

The alignment of Trafalgar Road between Steeles Avenue and 10 Side Road is not located within significant groundwater recharge areas (Figures 6.12 and 6.13 of the HRSPA Assessment Report (2015)) and as such, the construction related to the widening of Trafalgar Road is not anticipated to affect groundwater recharge.

### 3.6 Cultural Environment

Unterman McPhail Associates, Heritage Management Consultants, was retained by MMM to undertake the cultural heritage resource assessment for cultural heritage landscapes and built heritage resources. New Directions Archaeology Ltd. was retained to assess the area's archaeological potential. Both reports are provided in **Appendices F** and **G**, respectively, while the key findings are summarized in this section. It should be noted that these reports have been prepared for the limits of Trafalgar Road between Steeles Avenue and Highway 7. Cultural heritage features related to Trafalgar Road between Steeles Avenue and north of 10 Side Road (i.e. the Study Area for this ESR) have been extracted and summarized in **Sections 3.6.1** and **3.6.2**.

### 3.6.1 Built Heritage Resources and Cultural Heritage Landscapes

A cultural heritage resource is used to describe cultural heritage landscapes and built heritage resources. A cultural landscape is perceived as a collection of individual built heritage features and other related features that together form farm complexes, roadscape and nucleated settlements. Built heritage features are typically individual buildings or structures that may be associated with a variety of human activities, such as historical settlement and patterns of architectural development.

A Cultural Heritage Resource Assessment was carried out and is included in **Appendix F**.

Historic research revealed that the study corridor has origins in early nineteenth century survey and settlement and that by the mid-1800s an established pattern of agricultural fields, hedgerows, tree lines, woodlots and rural gravel roads were well established.

Field surveys conducted in March 2014 confirmed that vestiges of this nineteenth century landscape remain along the roadway. Agricultural lands containing farmhouse, barns, field, fence lines, tree lines and hedgerows characterize the surrounding land uses through the study area between Steeles Avenue and 10 Side Road. The land on the east side of Trafalgar Road between 10 Side Road and 15 Side Road lies within the Vision Georgetown Study Area and is planned for development.

Between Steeles Avenue and 10 Side Road, there are 4 Built Heritage Resources (BHR) and 26 Cultural Heritage Landscapes (CHL), including:

Site	Category
Township of Esquesing (Township Survey)	CHL
Agricultural landscape (Landscape)	CHL
Trafalgar Road (Roadscape)	CHL
Hornby (Hamlet)	CHL
13571 Steeles Avenue (Farm Complex)	CHL
8285 Hornby Road (Farm Complex)	CHL
Coulson Tract, Halton Regional Forest	CHL
8466 Trafalgar Road (Farm Complex and Cemetery)	CHL
8469-8471 Trafalgar Road (Farm Complex)	CHL
8637 Trafalgar Road (Residence)	BHR
8648 Trafalgar Road (Farm Complex)	CHL
8731 Trafalgar Road (Farm Complex)	CHL
8788 Trafalgar Road (Farm Complex)	CHL
8790 Trafalgar Road (Farm Complex)	CHL
8837 Trafalgar Road (Farm Complex)	CHL
13074 5 Side Road (School)	BHR
Barn northeast of Trafalgar Road and 5 Side Road (Barn)	BHR
9156-9158 Trafalgar Road (Farm Complex)	CHL
9289 Trafalgar Road (Farm Complex)	CHL
9348 Trafalgar Road (Former Farm Complex)	CHL
9527 Trafalgar Road (Farm Complex)	CHL
9536 Trafalgar Road (Farm Complex)	CHL
9621 Trafalgar Road (School)	BHR
9714 Trafalgar Road (Farm Complex)	CHL

Site	Category
9755 Trafalgar Road (Farm Complex)	CHL
9810 Trafalgar Road (Ashgrove Cemetery)	CHL
9866 Trafalgar Road (Farm Complex)	CHL
9871 Trafalgar Road (Farm Complex)	CHL
Ashgrove (Hamlet)	CHL
10054 Trafalgar Road (Farm Complex)	CHL

None of the listed heritages features are designated under Part IV of the Ontario Heritage Act.

### 3.6.2 Archaeological Assessment

A Stage 1 Archaeology Assessment was carried out. It was determined that the area within the right-of-way of Trafalgar Road between Steeles Avenue and 10 Side Road (east and west sides) has been completely disturbed by the existing roadway, gravel shoulders, and ditching associated with roadway construction. Therefore, since the study corridor within the right-of-way is completely disturbed, no further assessment is required for these areas. However, much of the area outside of the study corridor appears undisturbed, so it is recommended that any land outside of the right-of-way require a Stage 2 Archaeological Assessment if it is to be impacted by future roadway construction. Details may be found in **Appendix G** – Stage 1 Archaeological Assessment.

### 3.7 Major Utilities

There are a number of existing utilities along the Trafalgar Road corridor including:

- Halton Hills Hydro
- Bell
- Storm sewer along Trafalgar Road from the CN tracks to an outfall on the east side of Trafalgar Road opposite Stewarttown Road North
- Watermain along Trafalgar Road from Lindsay Court southerly to Stewarttown and then continuing to 15 Side Road