Highway 401 Interchange Reconstruction at Highbury Avenue

GWP 3032-11-00

October 2012

Transportation Environmental Study Report Addendum

File No. 12-6151

DILLON CONSULTING

Ministry of Transportation, Ontario

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1. INTRODUCTION

In 2004, the Ministry of Transportation (MTO) completed the Class Environmental Assessment (EA) and Preliminary Design for improvements to Highway 401, from 1.0 km west of Highway 4 (Colonel Talbot Road) easterly to 1.0 km east of Highbury Avenue, approximately 14 km in the City of London. The purpose of the Planning and Preliminary Design study was to address short, medium and long-term needs within the study area associated with traffic operations, capacity and safety. The study identified the need to widen Highway 401 to eight lanes by 2021. It also identified improvements to the existing interchanges within the study area, including the Highbury Avenue Interchange. Improvements included upgrading the geometric design of the ramps, constructing a new bridge structure that can accommodate the future widening of Highway 401 and upgrading existing illumination along Highway 401. The study is documented in a Transportation Environmental Study Report (TESR) (2004) (included in **Appendix D**). The Class EA was completed following the requirements of a Group B Class EA under the *Class Environmental Assessment for Provincial Transport Facilities (2000)* (MTO Class EA).

In 2008, MTO and the City of London completed a separate detail design study to address the following interim improvements at the interchange:

- Rehabilitate the bridge, including deck and soffit repairs, median island repairs, barrier wall repairs, and concrete overlay
- Reconstruct and widen the Highway 401 off-ramps
- Reconstruct Highbury Avenue pavement in the vicinity of the interchange
- Replace existing traffic signals and illumination at the interchange ramp terminal
- Rehabilitate Highbury Avenue pavement:
    - Northbound lanes from the Highway 401 interchange to Commissioners Road
    - Southbound lanes from the Highway 401 interchange to the Thames River (completed in 2010)
    - Bradley Avenue and Commissioners Road interchange ramps.

The 2008 work was completed as an interim solution to address structural deficiencies and provide immediate capacity on the interchange ramps.

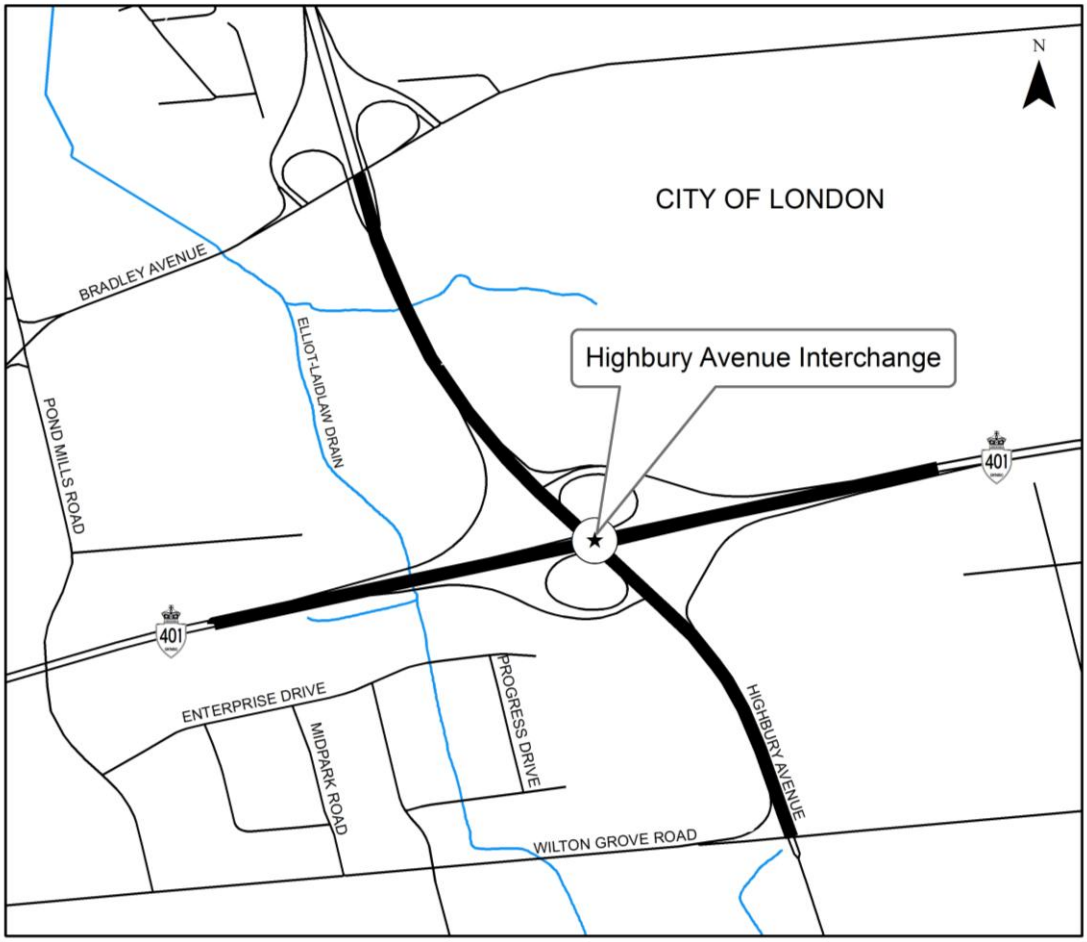
MTO initiated the current study in May 2012, to review and update the approved 2004 preliminary design for the Highbury Avenue/Highway 401 Interchange and complete the initial

detail design. The study includes work at the interchange as well as on Highbury Avenue, but does not include any widening on Highway 401. Improvements are required at the interchange to accommodate future traffic on Highbury based on background traffic growth and the City's plans to increase industrial development along the Highway 401 corridor.

As part of the current study, the project team updated the 2004 approved preliminary design to minimize overall impacts. Reflecting these changes, an Addendum to the 2004 TESR is required to document the planning and decision-making process leading to the selection of the updated preferred Preliminary Design of the Highway 401/Highbury Avenue interchange and resulting impacts.

The study area extends along Highbury Avenue, from Bradley Avenue to Wilton Grove Road and along Highway 401, approximately 1 km east and west of the interchange in the City of London, Ontario, as shown on **Figure 1**.

Figure 1: Study Area



2. CLASS ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The project is being completed as a 'Group B' Class Environmental Assessment following MTO's Class EA. A TESR was prepared during preliminary design with clearance under the *Environmental Assessment Act* received in January 2004.

A TESR Addendum is triggered if changes to the design are required that make significant changes to the commitments outlined in the TESR or change the concept of portions of the project. Components of the design which are consistent with the 2004 TESR are already considered approved under the *Environmental Assessment Act* and may proceed to construction. Only those portions of the project included in this Addendum are eligible for a Part II Order (Bump-up) Request. Due to the lapse in time since the TESR was completed, this report also documents any change to the environment that has occurred.

Following the review period, the TESR Addendum is considered approved under the *Environmental Assessment Act* and the project must be implemented as outlined in this report.

This TESR Addendum must be read in conjunction with the 2004 TESR. Unless specifically noted in this report, the commitments made in the TESR are still applicable to the current project.

The MTO Class EA recognizes there will be some design and/or implementation changes during the detail design phase, as the design builds on an approved preliminary design. The design refinements leading up to and during construction are part of MTO's approved design process and are anticipated in every project.

This Addendum is intended to update the TESR prepared during preliminary design and is being completed to a preliminary design level of detail. A Design and Construction Report will be prepared to document the detail design stage, including details on construction staging and environmental mitigation measures included in the contract.

3. PROJECT DESCRIPTION

3.1 2004 Project Description and Need

The 2004 TESR recommended maintaining the Parclo A-4 interchange configuration, with Highbury Avenue widened to six lanes west of the existing Highbury Avenue. The 2004 TESR recommended the upgrades to the interchange be completed by 2021.

As outlined in the 2004 TESR and shown on **Figure 2**, the project includes:

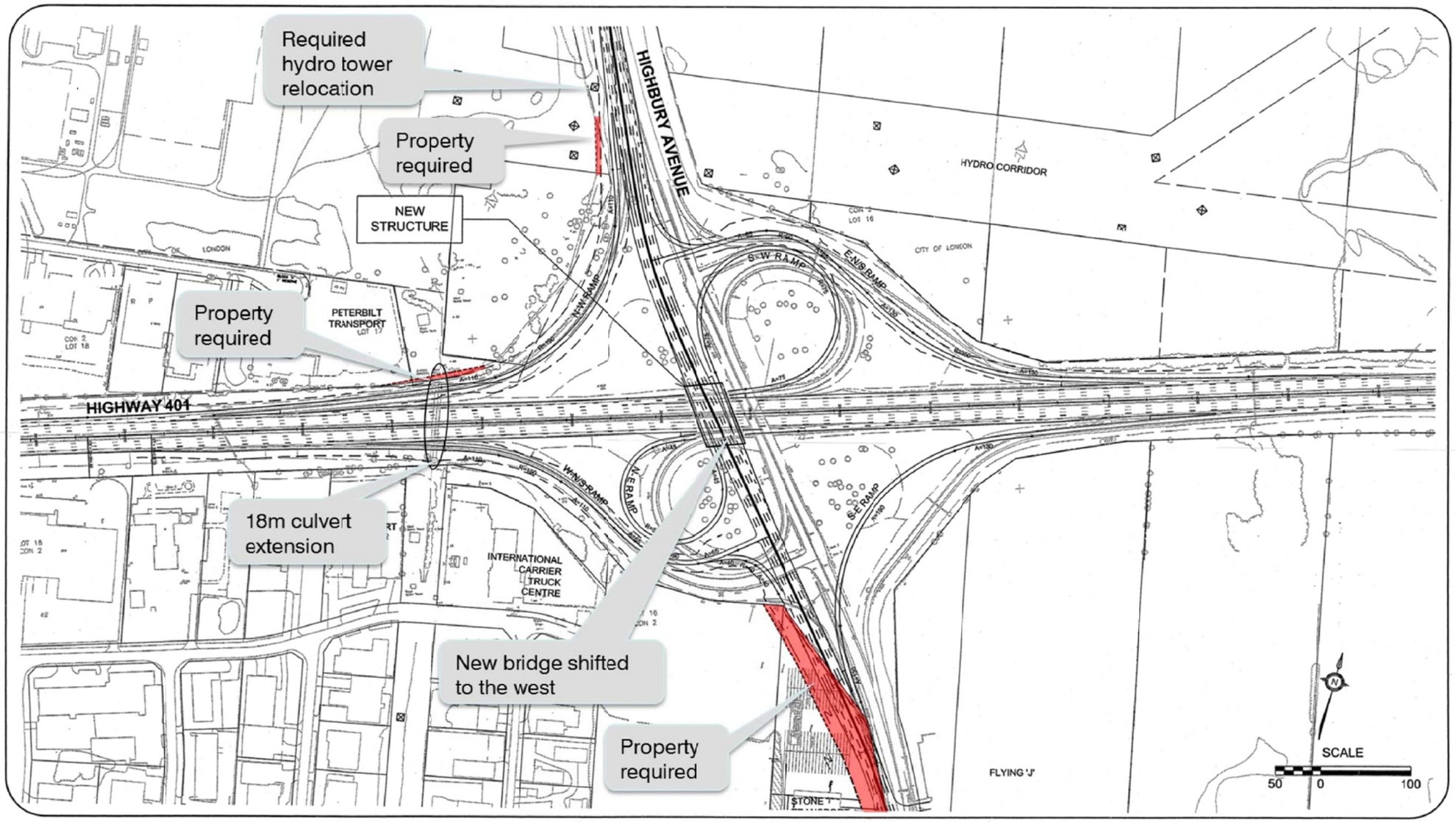
- Reconstruction of the Highway 401/ Highbury Avenue Interchange to accommodate future widening of Highway 401 to ten lanes. The widening of Highway 401 to eight lanes was approved in 2004; however, the construction of these improvements is not part of this project
- Replacement of the bridge and reconfiguration of the interchange ramps
- Widening and improvements along Highbury Avenue, between Bradley Avenue and Wilton Grove Road, to accommodate current and future traffic volumes
- High mast lighting on Highway 401.

As described in the 2004 TESR, the need for interchange improvements is based on upgrading geometric elements at the interchange ramps that do not meet current design standards and widening the structure to accommodate ten lanes on Highway 401.

3.2 2012 Project Need

In 2011, the City of London announced plans to actively encourage the development of employment lands along the Highway 401, from the City's eastern boundary to west of Highbury Avenue, as outlined in the 2011 City of London Highway 401 East Employment Land Corridor Planning and Economic Impact Analysis/Justification Report. Planned industrial growth along the highway corridor includes extending Veterans Memorial Parkway (VMP) to Wilton Grove Road and constructing a full interchange at Highway 401. The City of London is currently completing a Class EA and Official Plan and Zoning Amendment for the interchange and VMP extension.

The development of employment lands between Highbury Avenue and Veterans Memorial Parkway will lead to an increase in traffic in the area and provides further justification for the need for



Ontario Ministry of Transportation URS	HIGHWAY 401 IMPROVEMENTS PLANNING STUDY Highway 4 Easterly to Highbury Avenue G.W.P. 476-89-00	Highbury Avenue Interchange Recommended Plan (2021)	FIGURE 11

Ministry of Transportation
Highway 401 Interchange Reconstruction at Highbury Avenue

2004 Underpass Design
Figure 2

MAP CREATED BY: BJF
MAP CHECKED BY: JH
MAP PROJECTION: NAD 1983 UTM Zone 17N

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improvements to the Highbury Avenue Interchange and for widening Highbury Avenue to six lanes south of the interchange.

4. 2012 EXISTING CONDITIONS UPDATE

This section highlights changes to the environment since 2004 and summarizes the field investigations completed as part of the current project.

Lands surrounding the Highbury Avenue Interchange are a mix of agricultural fields to the southwest and northeast and commercial business development to the southeast and northwest. The existing agricultural areas are designated for future commercial development in the City of London's Official Plan. A woodlot southwest of the interchange along Highbury Avenue is designated "Significant" in the City's Official Plan. The closest houses are approximately 400 m south of the ramp terminal, along Wilton Grove Road.

4.1 Natural Environment

4.1.1 Terrestrial Ecosystem

An assessment of the terrestrial ecosystem in the study area was completed on May 8, 2012 and is documented in a Terrestrial Ecosystem Assessment Report (**Appendix B**). The Study Area has limited natural vegetation. The Westminster Ponds-Pond Mills complex, designated "Environmentally Sensitive Area (ESA)" in the Official Plan, is located in the study area, on both sides of Highbury Avenue, south of Bradley Avenue.

Vegetation

Seventy-seven flora species were identified within the study area, with none listed as Species at Risk or considered to be provincially rare. An Ecological Land Classification survey was completed and is summarized in **Appendix B** and on **Figures 3A** and **3B**. Vegetation in the study area includes culturally influenced meadows, shrub thickets and remnant deciduous forest.

The only naturalized area within the study boundary is a locally significant Dry-Fresh Up-land Deciduous Woodlot located southwest of the interchange, along Highbury Avenue across from the Flying 'J' Travel Plaza entrance. The forest community has abundant American Beech (*Fagus grandifolia*) and Basswood (*Tilia americana*) in the canopy and sub-canopy. There is Common Buckthorn in the understory and Yellow Trout Lily (*Erythronium americanum ssp. americanum*) in the ground layer. Other herbaceous species include White Trillium (*Trillium grandiflorum*) and Mayapple. The woodlot is designated "Significant" in the City's Official Plan.

Wildlife

Incidental wildlife observed during field investigations are documented in the Terrestrial Ecosystem Assessment Report. Wildlife observations and potential habitat in the Study Area were limited (**Figure 3B**). The majority of species observed have either secure or apparently secure populations in Ontario:

- Crayfish chimneys were observed in the southeast portion of the interchange. The habitat is not significant as it is not in an area of suitable habitat such as a meadow or shallow marsh
- Eastern Cottontail burrows were observed adjacent to the southwest off-ramp of the interchange. The burrows did not appear to be active (overgrown vegetation, no scat or tracks nearby) but were likely used by Eastern Cottontail Rabbit (*Sylvilagus floridanus*).

Birds

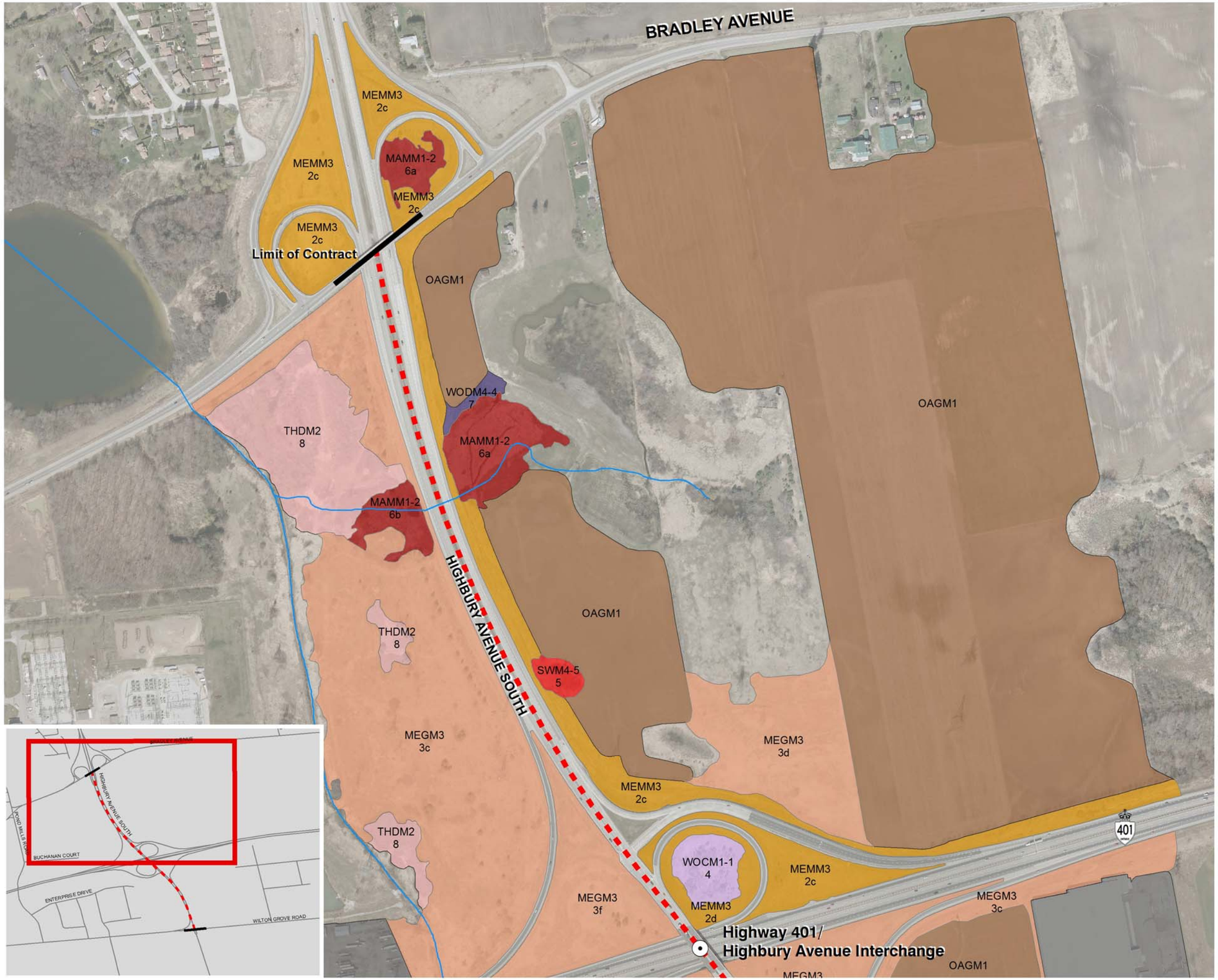
Three active bird nests were observed in the study area:

- Song Sparrow – Nest inside southwest interchange inner loop
- Red-winged Blackbird – Nest within cattail stand adjacent to Flying 'J' Travel Plaza
- Red-winged Blackbird – Nest within cattail stand south of the Flying 'J' Travel Plaza.

Species at Risk and Provincially Rare Species

Two species observed are listed under the *Endangered Species Act, 2007*:

- Eastern Meadowlark (*Sturnella magna*) is listed as Threatened and has general habitat protection under the ESA, 2007. The species was observed flying over the study area. There is no suitable habitat of sufficient size for the species within the study area
- Monarch (*Danaus plexippus*) is listed as Special Concern and does not have species or



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Highway 401 Interchange Reconstruction
at Highbury Avenue

Terrestrial Features and Ecological Land Classification
Figure 3A

- Culvert & Bridge Rehabilitations & Replacements
- Study Area
- Project Limits
- Waterbody
- CVC_1: Business Sector
- FODM4: Dry-Fresh Upland Deciduous Forest
- MAMM1-2: Cattail Mineral Meadow Marsh
- MEGM3-4: Mown Kentucky Bluegrass Graminoid Meadow
- MEGM3: Dry-Fresh Graminoid Meadow
- MEMM3: Dry-Fresh Mixed Meadow
- OAGM1: Annual Row Crops
- OAO: Open Aquatic (SWM Pond)
- SWM4-5: Poplar Mineral Deciduous Swamp
- THDM2: Dry-Fresh Deciduous Shrub Thicket
- WOCM1-1: Dry-Fresh Coniferous Woodland
- WODM4-4: Dry-Fresh Black Walnut Deciduous Woodland

SCALE 1:5000

N W E S

0 100 200 300 Meters

MAP CREATED BY: BJF
MAP CHECKED BY: JH
MAP PROJECTION: NAD 1983 UTM Zone 17N

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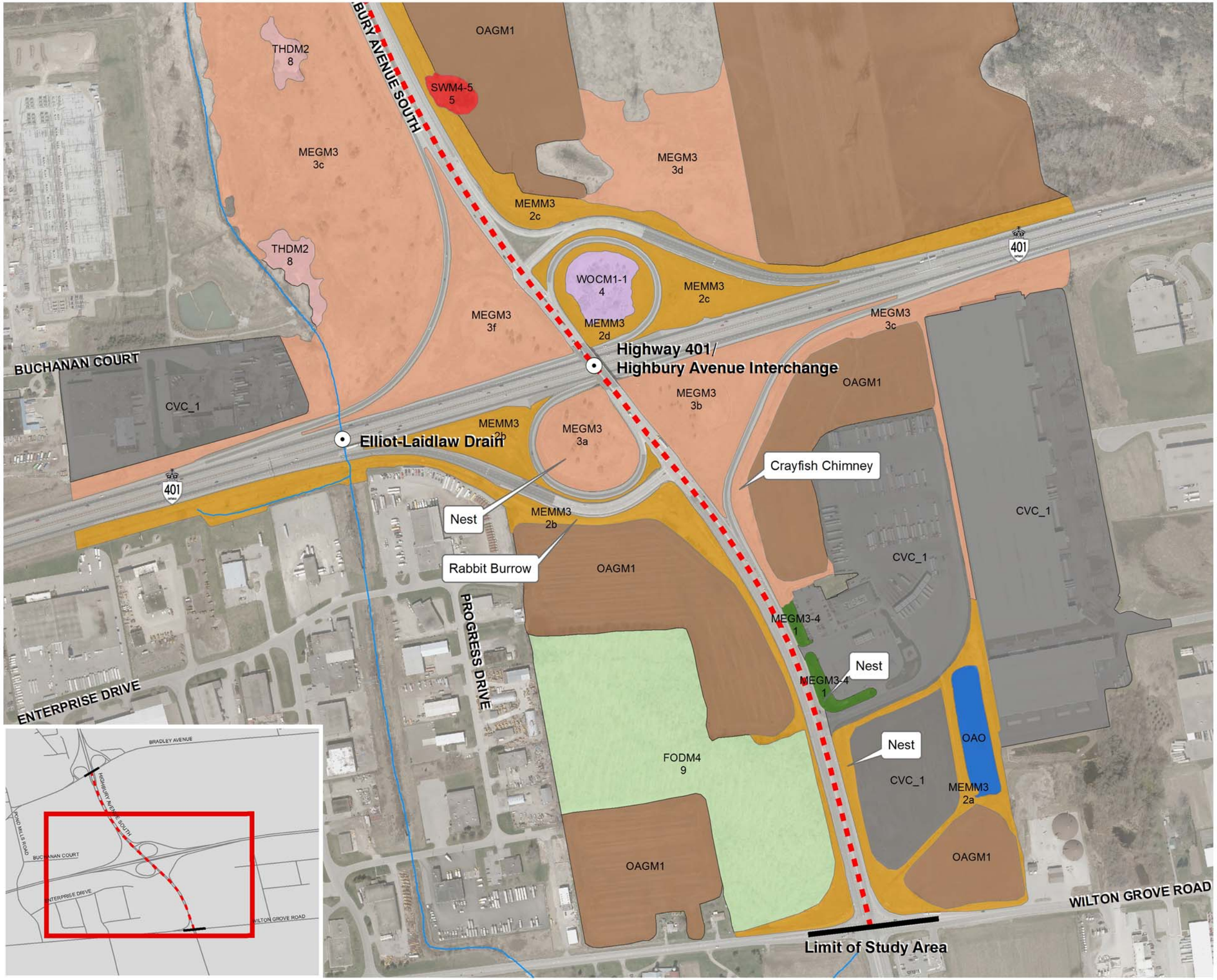

Ministry of Transportation
Highway 401 Interchange Reconstruction
at Highbury Avenue

Terrestrial Features and Ecological Land Classification
Figure 3B

- Culvert & Bridge Rehabilitations & Replacements
- Study Area
- Project Limits
- Waterbody
- CVC_1: Business Sector
- FODM4: Dry-Fresh Upland Deciduous Forest
- MAMM1-2: Cattail Mineral Meadow Marsh
- MEGM3-4: Mown Kentucky Bluegrass Graminoid Meadow
- MEGM3: Dry-Fresh Graminoid Meadow
- MEMM3: Dry-Fresh Mixed Meadow
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- THDM2: Dry-Fresh Deciduous Shrub Thicket
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habitat protection under the Act. It is a species of Conservation Concern. Individuals were noted within the Dry-Fresh Coniferous Woodland (WOCM1-1) and near the Cattail Mineral Meadow Marsh (MAMM1-2)/Dry-Fresh Black Walnut Deciduous Woodland (WODM4-4) (**Figures 3A** and **3B**). Due to the timing of the field investigations, individuals observed were most likely passing through as part of the Monarch's spring migration. There is no suitable habitat within the Study Area for the species to successfully reproduce.

4.1.2 Solis and Terrain

The study area is located on the till plain that parallels the southern edge of the Ingersoll Moraine. The landscape in and around the area is flat to gently undulating, rising with the moraine to the north. The moraine extends from the west edge of London, east to Putnam, with an extension continuing past Woodstock (east of the study area). The western end of the moraine is comprised of silty clay till, while the eastern end is loose, loamy or sandy till. The underlying bedrock is Middle Devonian.

Surficial geological mapping indicates the Highway 401 corridor is underlain by silty clay to clayey silt till or other fine grained deposits (silts or clays) of varying thicknesses. The area is considered to have relatively low susceptibility to groundwater contamination as there is a relatively thick confining layer of fine grained till soil protecting the underlying sand and gravel aquifers.

4.1.3 Fisheries and Aquatic Environment

The project is located within the Dingman Creek sub watershed. Elliott-Laidlaw Drain originates nearly 2 km upstream of Highway 401 in wetlands east of Highbury Avenue, flows west into the Westminster Ponds and continues southeast towards Dingman Creek. Dingman Creek flows westerly into the Thames River, approximately 21 km downstream. The Thames River flows to Lake St. Clair at Tilbury, Ontario, which ultimately discharges into Lake Erie via the Detroit River.

There are two watercourse crossings in the study area:

- Elliot-Laidlaw Drain, crossing under Highway 401 approximately 350 m west of the interchange. It is a permanent warmwater watercourse with a predominantly flat type habitat with limited riffle, run and pool areas throughout. During field investigations, the water was observed to be moderately flowing through a fairly incised channel. Substrate was dominated by a mixture of gravel, cobble, sand, silt, muck and detritus. Available stream cover was

moderate with large pocket sections of in-stream and overhanging vegetation. The presence of a beaver dam approximately 50 m downstream of the culvert crossing poses a potential barrier for fish migration.

- Tributary of Elliot-Laidlaw Drain, crossing Highbury Avenue approximately 690 m north of Highway 401. The tributary consists of a ditch line swale dominated by cattails and phragmites with a large pool of standing water dominated by duckweed and algae. Adjacent ditch-lines along Highbury Avenue drain into the pool before draining westerly to the main drain. No defined channel connecting to the main drain was observed. The system functions as overland drainage only, providing ephemeral contributions downstream.

A memo summarizing the existing conditions at each crossing is included in **Appendix C**.

4.2 Socio-Economic Environment

The project is located in the southeast portion of the City of London. Land uses in the study area include:

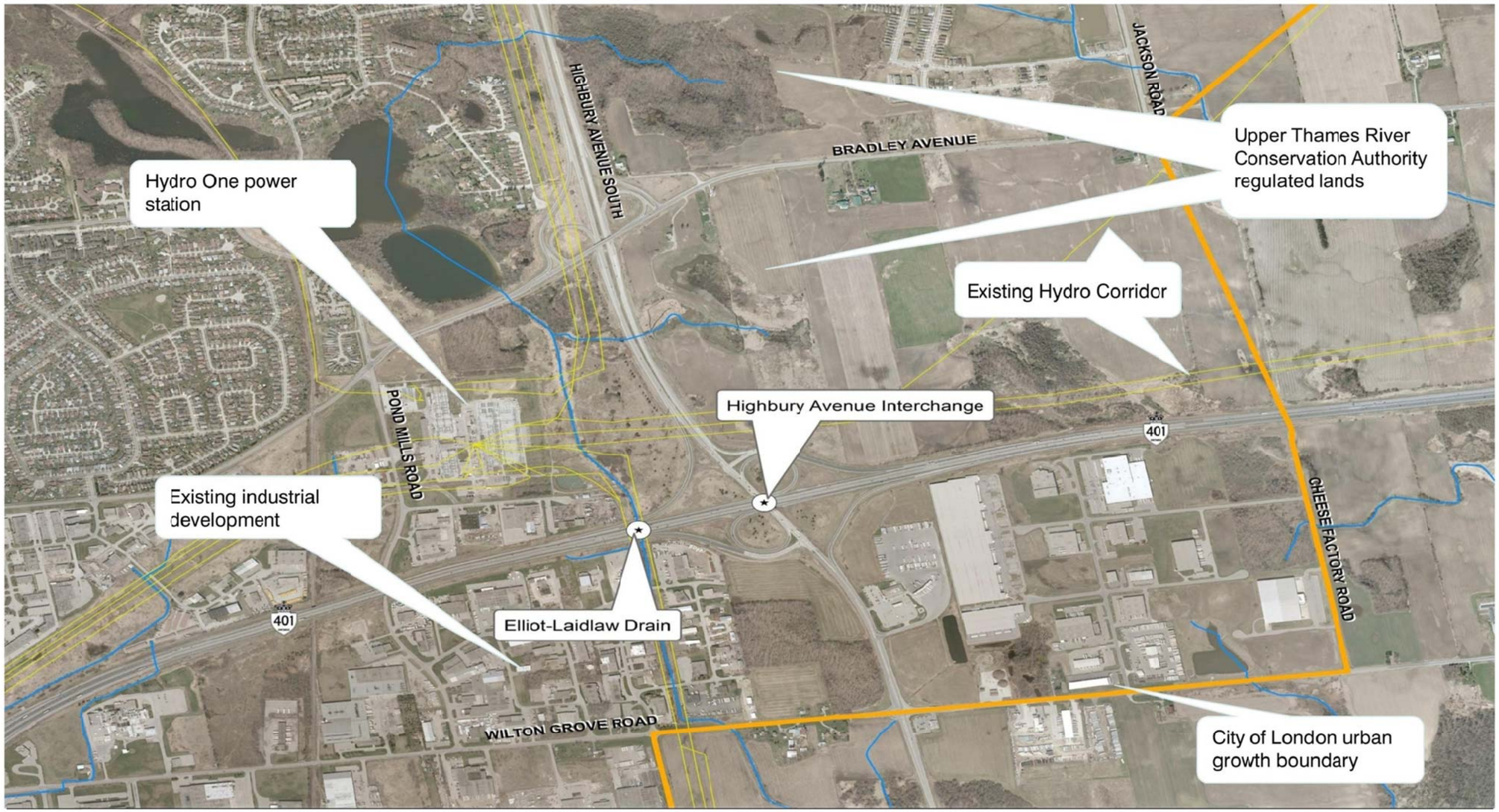
- Light Industrial
- Open Space
- Environment Review
- Urban Reserve Industrial Growth.

Five residential properties are located just outside the study area, with the closest approximately 100 m east of the Highbury Avenue/Wilton Grove Road intersection on Wilton Grove Road. **Figure 4** provides an overview of existing land uses.

Land in the vicinity of the interchange is a mix of agricultural fields to the southwest and northeast and commercial business development to the southeast and northwest. The prominent types of agricultural operations are field crops which have been designated for future commercial development in the City's Official Plan.

Within the study area there are four commercial/industrial businesses, none of which have direct access to Highway 401:

- Carrier Truck Service located southwest of the eastbound Highway 401/Highbury Avenue Interchange off-ramp



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Socio-Economic Land Uses
Figure 4

Legend

- Bridge Replacement
- Urban Growth Boundary
- Utility Line
- Rivers

SCALE 1:25,000

0 125 250 500 750 1,000 Meters

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MAP CHECKED BY: JH
MAP PROJECTION: NAD 1983 UTM Zone 17N

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- Peterbuilt Trucks parts and service depots located north of the Highway 401 ROW adjacent to the Elliot-Laidlaw Drain crossing
- Flying 'J' Travel Plaza at the southwest quadrant of the Highway 401/Highbury Avenue interchange
- Carpenters District Council of Ontario at the northwest quadrant of the Highbury Avenue/ Wilton Grove Road intersection. This building is new since the 2004 TESR.

Planned development in the vicinity of the interchange includes:

- Expansion of the Forest City Industrial Park. The industrial park is located east of Highbury Avenue off Wilton Grove Road. Current employment within the industrial park is approximately 700 people. The City of London anticipates that employment will increase to approximately 3,100 people by 2030
- Expansion of the Flying 'J' Travel Plaza. Specific details of the current expansion have not been made public; however, a previous development option included a small 100 room motel on the site
- Commercial Development west of Highbury Avenue. The City of London currently owns the lands west of the Flying 'J' on Highbury Avenue and has pans to sell the land for development in the future.

4.2.1 Utilities

Hydro One transmission lines cross Highbury Avenue approximately 200 m north of Highway 401. The transmission lines feed into the E.V. Buchanan Transformer Station, owned by Hydro One, located approximately 500 m northwest of the Highway 401/Highbury Avenue interchange at 850 Pondmills Road in London, Ontario.

4.3 Cultural Environment

4.3.1 Archaeological Resources

The Highbury Avenue interchange is an area considered to exhibit archaeological potential based on findings from the 2004 preliminary design TESR. An archaeological assessment will be completed during the initial detail design phase to further investigate the archaeological potential on previously undisturbed properties in the study area.

4.3.2 Built Heritage Resources

As described in the 2008 Cultural Heritage Evaluation Report (CHER) completed by Uterman McPhail Associates (UMcPA), the Highbury Avenue underpass is a continuous concrete box girder structure which utilizes reinforced cast-in-place concrete to span a distance of approximately 80.4 m. The bridge features a continuous deck slab with rectangular voids unique to over fourteen similar structures in Southwestern Ontario. Alterations to the original design of the bridge include the replacement of steel railings with concrete barriers and the removal of embankment fill for the addition of speed change lanes on Highway 401.

The bridge is not designated under the *Ontario Heritage Act* or listed in the *City of London's Inventory of Heritage Resources.* It is not included in the Candidate Bridge Lists as a Class A, B, or C structure in the Heritage Bridges Identification and Assessment Guide 1945-1965, Ontario.

4.3.3 Traffic

The Highway 401/Highbury Avenue interchange is a Parclo A4 configuration. The City's Official Plan classifies Highbury Avenue as a freeway north of Highway 401 and has a posted speed limit of 100 km/h. South of Highway 401, Highbury Avenue is classified as an arterial road with a posted speed limit of 80 km/h.

In 2008, Highbury Avenue had an Average Annual Daily Traffic (AADT) volume of 63,200. Due to the Flying 'J' Travel Plaza and surrounding industrial development, there is a high proportion of commercial vehicles in the area. As part of a 2012 traffic count, trucks accounted for 63% of the traffic at the southbound left turn into the Flying 'J' from Highbury Avenue.

As outlined in **Section 4.2** of this report, there are a number of developments planned in the vicinity of the interchange. In addition, the proposed extension of Veterans Memorial Parkway to Wilton Grove Road will influence the future traffic demands on Highbury Avenue since it will provide a convenient alternative access to the Highway 401 corridor from the Forest City Industrial Park. Future traffic growth related to development along the corridor was not accounted for in the 2004 TESR.

5. 2012 DESIGN CHANGES

This section outlines the changes to the design at the Highbury Avenue Interchange, as described in the 2004 TESR. Only the changes outlined in this Addendum are subject to a Part II Order (Bump-Up). Components of the design which are consistent with the 2004 TESR are already considered approved under the *Environmental Assessment Act* and may proceed to construction.

The 2004 TESR recommended the existing Parclo A-4 configuration be maintained, with the alignment of a new structure at Highway 401 shifted approximately 36 m to the west. The significant alignment shift results in a number of impacts including:

- Relocation of at least one existing hydro tower northwest of the interchange, close to the start of the westbound on-ramp. Estimated relocation cost is $1.5 million
- Extension of the Elliot-Laidlaw culvert by approximately 19 m
- Additional property requirements south of Highway 401, on the west side of Highbury Avenue. The required property includes undeveloped City-owned land and a woodlot designated "significant" in the City's Official Plan.

At the outset of the 2012 study, the preliminary design was reviewed to look for opportunities to reduce the impacts resulting from the alignment shift. The design review included the evaluation of three new alternatives for the interchange (Alternative 1 and 1A are grouped together as they both include an alignment shift to the west). All of the alternatives maintain the recommended Parclo A-4 design for the interchange.

The alternatives evaluated include:

- ***Alternative 1 – Alignment Shift West (2004 Approved)***
  - Shifts the centreline alignment of Highbury Avenue approximately 36.3 m west of the existing centerline at Highway 401
  - Shift is designed to permit construction of the new underpass in a single stage while traffic remains on the existing road
- ***Alternative 1A – Partial Alignment Shift West***
  - Modifies Alternative 1, by shifting the centerline alignment of Highbury Avenue approximately 15.3 m west of the existing centerline at Highway 401
  - Modification minimizes the impacts caused by the realignment of the centerline, but requires construction of the underpass in multiple stages

- ***Alternative 2 – Alignment Shift East***
  - Shifts the centerline alignment of Highbury Avenue approximately 36.3 m east of the existing centerline at Highway 401
  - Shift is designed to permit construction of the new underpass in a single stage, while traffic remains on the existing road
- ***Alternative 3 – Along Existing Alignment***
  - Generally maintains the existing centerline alignment of Highbury Avenue
  - Slight shift of the alignment to the west is incorporated, from the south ramp terminal to Wilton Grove Road, to avoid property impacts to the Flying 'J' Travel Plaza parking lot
  - Construction of the new underpass will occur in multiple stages.

Table 1 summarizes the comparative evaluation of the alternatives, while **Table 2** includes the detailed evaluation. The alternatives were compared based on a number of factors, including:

- Traffic operations and safety:
  - Future traffic needs – design should meet the needs of current and future traffic projections
  - Road safety – design should be consistent with current safety-related design standards
- Technical engineering:
  - Efficient use of existing infrastructure – preferred design should utilize existing infrastructure where possible
  - Highbury Avenue geometry – Alignment that minimizes changes to the Highbury Avenue geometry is preferred
  - Interchange ramp geometry - Alignment that minimizes changes to the existing ramp geometry is preferred
  - Utility impacts – Alignment that minimizes utility impacts is preferred
  - Impact of Elliot-Laidlaw Drain – Alignment that minimizes the length of the culvert extension is preferred
  - Traffic staging – Alignment that minimizes disruptions to the traffic during construction is preferred
  - Constructability – Recommended design should be constructable using standard construction practices
- Cultural Resources:
  - Archaeological resources – Alignment that minimizes potential for impacts to archaeological resources is preferred

  - Built Heritage and Cultural Landscapes – Alignment that does not impact built heritage and cultural landscapes is preferred
- Natural Environment:
  - Fish and aquatic habitat – Alignment that minimizes impacts to fish and aquatic habitat is preferred
  - Terrestrial features – Alignment that minimizes impacts to existing terrestrial resources, including Species at Risk is preferred
- Existing and Future Land Use:
  - Existing land use – Alignment that results in the least disruption to existing uses is preferred
  - Future land use – Alignment that minimizes property acquisition on land with future development potential is preferred
- Cost:
  - Relative Cost – Alignment with the lowest cost is preferred
  - Additional property cost – Alignment with the lowest property acquisition cost is preferred.

Based on the comparative evaluation, **Alternative 3 – Along Existing Alignment, is preferred**. Alternative 3 was equal to or recommended for all of the criteria except two:

- Impacts to Elliot-Laidlaw Drain Culvert. Similar to the other alternatives, the middle section of the culvert requires replacement. Minimal work (headwalls and small retaining walls) will be required on the ends of the culvert to accommodate the ultimate configuration of the interchange ramps. The ultimate configuration is for 10-laning Highway 401 and there is no timeline for when this is expected to occur. The improvements required are not anticipated to result in the Harmful Alteration, Disruption or Destruction of fish habitat. There will be no impact on the culvert (with the exception of the middle section being replaced) for the interim interchange configuration.
- Constructability. The underpass will be constructed in multiple stages, extending the contract duration compared to other alternatives. Given the benefits of this alignment, the construction duration is considered acceptable.

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Table 1: Highway 401 at Highbury Avenue Interchange – Summary of Comparative Evaluation

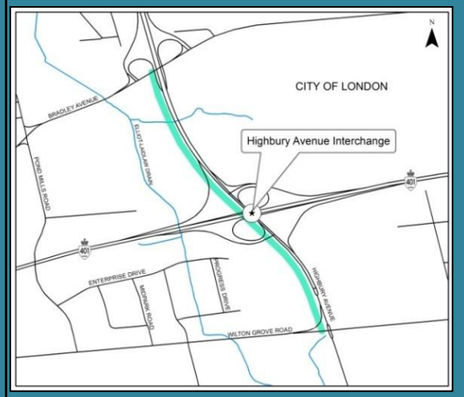
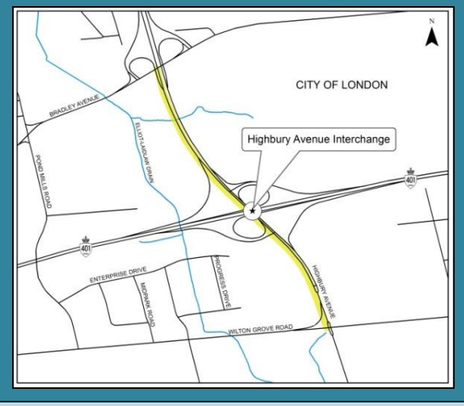
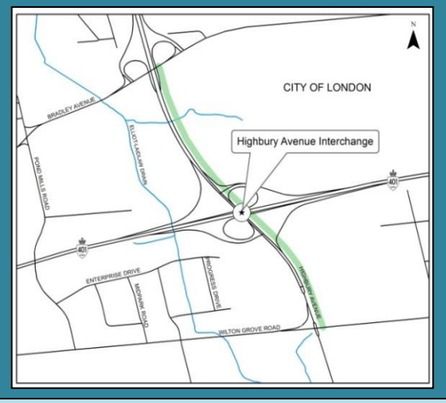
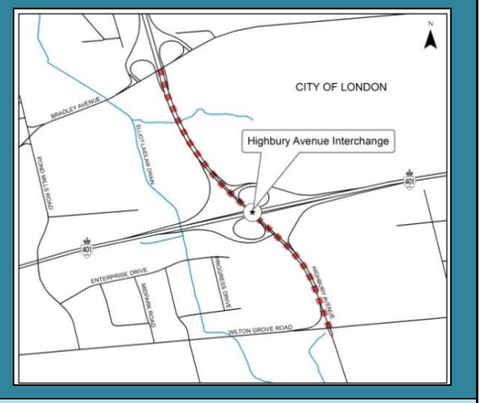
Evaluation Criteria	**Alternative 1** **Alignment Shift West** **New bridge and roadway approaches will be approximately 35 m west of their current location** 	**Alternative 1A** **Partial Alignment Shift West** **New bridge and roadway approaches will be approximately 15 m west of their current location** 	**Alternative 2** **Alignment Shift East** **New bridge and roadway approaches will be approximately 35 m east of their current location** 	**Alternative 3** **Along Existing Alignment** **New bridge and roadway approaches will be in the same general location** 
Traffic Operations and Safety	▤	▤	▤	✓
Engineering	×	▤	×	✓
Cultural Resources	✓	✓	✓	✓
Fisheries and Aquatic Habitat	▤	▤	▤	▤
Terrestrial Features	▤	✓	▤	✓
Existing and Future Land Uses	×	▤	×	✓
Cost	×	×	×	▤
× = Significant Impact ▤ = Neutral Impact ✓ = Minimal Impact				

Table 2: Highway 401 at Highbury Avenue Interchange – Comparative Evaluation of Alternatives

Evaluation Factors and Indicators	Alternative 1 Alignment Shift West (2004 Approved)	Alternative 1A Partial Alignment Shift West	Alternative 2 Alignment Shift East	Alternative 3 Along Existing Alignment (Recommended)	Recommended Alternative
1. Traffic Operations & Safety					
Future Traffic Needs	Meets current and projected traffic volumes on Highbury Avenue	Meets current and projected traffic volumes on Highbury Avenue	Meets current and projected traffic volumes on Highbury Avenue	Meets current and projected traffic volumes on Highbury Avenue	Equal
Road Safety	Right-lane must exit to S-W ramp is not desirable. All other standards are met or exceeded.	Right-lane must exit to S-W ramp is not desirable. All other standards are met or exceeded.	A back-to-back horizontal curve through the intersection north of Highway 401 reduces safety. Right-lane must exit to S-W ramp is not desirable.	Right-lane must exit to S-W ramp is not desirable. All other standards are met or exceeded.	Alternative 1, 1A and 3
2. Engineering					
Efficient Use of Existing Infrastructure	Road shift requires significant embankment construction (earth borrow) for Highbury Avenue and all new interchange ramps. Removal of existing approach embankments and ramps (earth waste) is required following construction. Limited opportunity to reuse excavated material on-site. Requires relocation of existing overhead signs for ramp identification on Highway 401.	Road shift less than Alternative 1, which permits the use of the existing Highbury Avenue embankments. New interchange ramps require new embankment construction. Removal of existing ramps (earth waste) is required following construction. Limited opportunity to reuse this excavated material on-site. Requires relocation of existing overhead signs for ramp identification on Highway 401.	Road shift requires significant embankment construction (earth borrow) for Highbury Avenue and all new interchange ramps. Removal of existing approach embankments and ramps (earth waste) is required following construction. Limited opportunity to reuse excavated material on-site. Requires relocation of existing overhead signs for ramp identification on Highway 401.	Maintaining the existing Highbury Avenue alignment utilizes the existing approach embankments and three ramps. Maintains existing Highbury Avenue north of the N-W ramp bullnose. Incorporates existing E-N/S and W-N/S ramps constructed in 2008. Minimizes earth borrow requirements. No relocation of overhead signs (ramp identification) on Highway 401 is required.	Alternative 3
Highbury Avenue Geometry	Alignment shift impacts Highbury Avenue from Bradley Avenue to Wilton Grove Road. Median island width remains at 2 m north of Highway 401 to avoid further hydro tower impacts. Superelevation adjustments for new horizontal curves at north and south tie-ins required through entire curve. Vertical curve over Highway 401 increased to meet 90 km/h design speed.	Alignment shift impacts Highbury Avenue from Bradley Avenue to Wilton Grove Road. Superelevation adjustments for new horizontal curves at north and south tie-ins required through entire curve. Vertical curve over Highway 401 increased to meet 90 km/h design speed.	Alignment shift impacts Highbury Avenue from Bradley Avenue to Wilton Grove Road. Superelevation adjustments for new horizontal curves at north and south tie-ins required through entire curve. Back-to-back horizontal curves in alignment north of Highway 401 through ramp terminal intersection required to avoid excessive skew for underpass structure, and property impacts. Vertical curve over Highway 401 increased to meet 90 km/h design speed.	Minimal impact. Median islands south of Highway 401 adjusted to maximize left turn lane lengths. A slight shift of the alignment to the west is incorporated, from the south ramp terminal to Wilton Grove Road, to avoid property impacts to the Flying ‘J’ Travel Plaza parking lot. Vertical curve over Highway 401 increased to meet 90 km/h design speed.	Alternative 3
Interchange Ramp Geometry	All new ramps required. R=55 m inner loop required for the N-E ramp to minimize impacts to property in the southwest quadrant. R=190 m outer loop for N-W ramp to minimize property acquisition, and avoid additional hydro tower impacts in the northwest quadrant.	All new ramps required. R=55 m inner loop required for the N-E ramp to minimize impacts to property in the southwest quadrant. R=190 m outer loop for N-W ramp to minimize property acquisition, and avoid additional hydro towers in the northwest quadrant.	All new ramps required. All ramps meet or exceed design standards. Minimum inner loop radius of 55 m (standard) required for the S-W ramp to reduce impacts to property in the northeast quadrant. N-E ramp inner loop radius of 60 m which exceeds the design standards.	New ramps utilize a portion of the existing ramps in the Interim Stage (i.e., until full build out of Highway 401). All ramps meet or exceed design standards. Minimum inner loop radius of 60m which exceeds the design standards. Outer loop ramps meet design standards.	Alternative 3

Evaluation Factors and Indicators	Alternative 1 Alignment Shift West (2004 Approved)	Alternative 1A Partial Alignment Shift West	Alternative 2 Alignment Shift East	Alternative 3 Along Existing Alignment (Recommended)	Recommended Alternative
Utility Impacts	One hydro tower in the northwest quadrant requires relocation. Tower is in the existing right-of-way, located approx. 11.2 m from the existing edge of pavement for the N-W ramp. Property acquisition from Hydro Corridor in northwest quadrant.	One hydro tower in the northwest quadrant requires relocation. Tower is in the existing right-of-way, located approx. 11.2 m from the existing edge of pavement for the N-W ramp. Property acquisition from Hydro Corridor in northwest quadrant.	One hydro tower in the northeast quadrant requires relocation. Property acquisition from Hydro Corridor in northeast quadrant.	No significant utility relocations required.	Alternative 3
Impact on Elliot-Laidlaw Drain Culvert	Replace deteriorated middle section. Culvert under Highway 401 would require significant extensions to accommodate new ramp alignments. Adjustment to culvert shape required to generate sufficient cover for the extensions.	Replace deteriorated middle section. Culvert under Highway 401 would require significant extensions to accommodate new ramp alignments. Adjustment to culvert shape required to generate sufficient cover for the extensions.	Replace deteriorated middle section only. No extensions required to accommodate Highway 401 widening and interchange ramps.	Replace deteriorated middle section. Minimal work (headwalls, and small retaining walls) on ends to accommodate the ultimate configuration of the interchange ramps. No impact to culvert under interim interchange configuration.	Alternative 2
Traffic Staging	Highbury Avenue traffic reduced to a single-lane in each direction and ramp closures at Bradley Avenue required for long duration to complete superelevation corrections north of Highway 401. Highbury Avenue traffic reduced to a single-lane in each direction south of the interchange to complete superelevation corrections. Long term ramp closures required to construct new ramp and approach embankments.	Highbury Avenue traffic reduced to a single-lane in each direction and ramp closures at Bradley Avenue required for long duration to complete superelevation corrections north of Highway 401. Highbury Avenue traffic reduced to a single-lane in each direction south of the interchange to complete superelevation corrections. Long term ramp closures required to construct new ramp and approach embankments. Multiple occasions of traffic impact on Highway 401 for demolition of existing bridge, and placement of girders in multiple stages.	Highbury Avenue traffic reduced to a single-lane in each direction and ramp closures at Bradley Avenue required for long duration to complete superelevation corrections north of Highway 401. Highbury Avenue traffic reduced to a single-lane in each direction south of the interchange to complete superelevation corrections. Long term ramp closures required to construct new ramp and approach embankments.	Highbury Avenue traffic reduced to single-lane in each direction for long duration to complete second stage of the underpass replacement, and approach embankment fills. No work required on Highbury Avenue north of the north ramp terminal. This reduces the overall traffic impact on Highbury Avenue. Highbury Avenue interchange ramps closed for long duration to raise profile on approach embankments. Re-use of existing embankments will reduce the duration of this work in comparison to the other alternatives. No impact to ramps at Bradley Avenue interchange. Multiple occasions of traffic impact on Highway 401 for demolition of existing bridge, and placement of girders in multiple stages.	Alternative 3
Constructability	Long term ramp closures required to permit construction of new ramp embankments. Underpass construction simplified by completion in one stage, which shortens the overall duration of contract.	Long term ramp closures required to permit construction of new ramp embankments. Underpass construction is complicated by multiple stages, which extends the overall duration of the contract.	Long term ramp closures required to permit construction of new ramp embankments. Underpass construction simplified by completion in one stage, which shortens the overall duration of the contract.	Underpass construction is complicated by multiple stages, which extends duration of contract. Grade raise on Highbury Avenue for profile adjustment complicates traffic staging. Earth movement and traffic maintenance is simplified by re-use of the existing ramps and embankments, to the extent possible.	Alternative 1 and 2
3. Cultural Resources					
Archaeological Resources	Limited potential for impacts to archaeological resources.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Equal
Built Heritage and Cultural Landscapes	No impact as there are no built heritage resources in the vicinity of the study area and the bridge has now cultural heritage value	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Equal

Evaluation Factors and Indicators	Alternative 1 Alignment Shift West (2004 Approved)	Alternative 1A Partial Alignment Shift West	Alternative 2 Alignment Shift East	Alternative 3 Along Existing Alignment (Recommended)	Recommended Alternative
4. Natural Environment					
Fish and Aquatic Habitat	Requires 19 m culvert extension at Elliot-Laidlaw Drain. Potential for extension to result in the Harmful Alteration, Disruption or Destruction of fish habitat.	Requires extension of Elliot-Laidlaw Drain culvert, however extension would be less than Alternative 1.	Elliot-Laidlaw Drain culvert extension not required	Same as Alternative 2	Alternative 2 and 3
Terrestrial Features	Impacts locally significant woodlot south of Highway 401, west of Highbury Avenue	Impacts locally significant woodlot south of Highway 401, west of Highbury Avenue, (less impact than Alternative 1).	Impact on potential habitat for bird species-at-risk in area of property acquisition and embankment construction in the northeast quadrant.	Impacts locally significant woodlot south of Highway 401, west of Highbury Avenue (less impact than Alternative 1).	Alternative 3
5. Existing and Future Land Uses					
Existing Land Use	Property acquisition is required in the northwest and southwest quadrants to accommodate the Highbury Avenue alignment shift and the new ramps. Amount of property acquisition is greater than Alternative 3.	Property acquisition is required in the northwest and southwest quadrants to accommodate the Highbury Avenue alignment shift and the new ramps. Amount of property acquisition is greater than Alternative 3, but less than Alternative 1.	Property acquisition is required in the northeast and southeast quadrants to accommodate the alignment shift of Highbury Avenue, and the new ramps. Property acquisition will include a portion of the parking lot at the Flying 'J' Travel Plaza. Amount of property acquisition is greater than Alternative 3.	Property required east and west of Highbury Avenue south of the south ramp terminal to accommodate the six lane widening. Property in the northwest quadrant is required for the ultimate design of the N-W ramp. No property is required in the northwest quadrant for the Interim Design.	Alternative 3
Future Land Uses	Impacts lands designated for industrial use in the southwest quadrant, however impacts limited to lands along Highbury Avenue and is not anticipated to have a significant impact on development potential of properties.	Impacts lands designated for industrial use in the southwest quadrant, however impacts limited to lands along Highbury Avenue and is not anticipated to have a significant impact on development potential of properties. Less property required than Alternative 1	Impacts lands designated for industrial use (Urban Reserve Industrial) in the northeast quadrant however impacts limited to lands along Highbury Avenue/Highway 401 and is not anticipated to have a significant impact on development potential of properties.	Minimal impacts to lands designated for industrial use.	Alternative 3
6. Costs					
Relative Cost	Higher cost than Alternative 3, due to new embankments for Highbury Avenue and the interchange ramps. More reconstruction on Highbury Avenue is required to adjust horizontal alignment and superelevation resulting in a higher cost than Alternative 3. Significant utility relocation costs. Underpass construction simplified by completion in one stage.	Higher cost than Alternative 3, due to new embankments for the interchange ramps. Utilizes existing embankments on Highbury Avenue which reduces cost; however, more reconstruction on Highbury Avenue is required to adjust horizontal alignment and superelevation resulting in a higher cost than Alternative 3. Significant utility relocation costs. Underpass construction is complicated by multiple stages.	Higher cost than Alternative 3, due to new embankments for Highbury Avenue and the interchange ramps. More reconstruction on Highbury Avenue is required to adjust horizontal alignment and superelevation resulting in a higher cost than Alternative 3. Significant utility relocation costs. Underpass construction simplified by completion in one stage.	Lowest cost due to the maximized use of existing infrastructure. Significant utility relocations can be deferred until construction of the ultimate design. Underpass construction is complicated by multiple stages.	Alternative 3
Additional Property Cost	High overall property acquisition cost. Similar to Alternative 2.	Property acquisition cost is lower than Alternative 1, but higher than Alternative 3 due to acquisitions in the southwest and northwest quadrants.	Highest overall property acquisition cost.	Lowest property acquisition cost.	Alternative 3

6. REVISED PREFERRED DESIGN

The revised preferred design for the interchange includes widening the structure along the existing alignment. A slight shift of the alignment to the west is required, between the south ramp terminal to Wilton Grove Road, to avoid property impacts to the Flying 'J' Travel Plaza parking lot. **Table 3** outlines the proposed changes to the design, compared to the 2004 design.

Table 3: Proposed Design Changes

	2004 Approved Design	2012 Revised Design
Highbury Avenue Alignment	Alignment shifted 36 m to the west	Widening along existing alignment
Highbury Avenue Widening to Six Lanes	Widen Highbury Avenue to six lanes between Bradley Avenue and Wilton Grove Road. The north and south limits of the widening are not defined in the 2004 design	Widen Highbury Avenue to six lanes, from the north ramp terminal to Wilton Grove Road. Highbury Avenue will remain as four lanes north of the interchange
Short Term Detour During Construction	No specific reference to construction staging and the need for short term detours	Short term detours may be required for periodic closures of Highbury Avenue and Highway 401 to replace the structure. The proposed detours are outlined in **Section 8.2.3** of this report. Additional information on construction staging will be provided in the Design and Construction Report, which will be available for review during detail design.

In order to address the current need to widen the structure, the revised design includes provisions for an interim design which accommodates the existing lane configuration on Highway 401 and the future Highway 401 widening to eight lanes. The ultimate configuration accommodates ten lanes on Highway 401. There are currently no plans to widen Highway 401 to ten lanes; however since the bridge is likely to be in place for approximately 75 years, it has been designed to accommodate the future expansion of Highway 401. This approach is consistent with the new structure that was recently constructed at the Wellington Road interchange. An interim design was not considered in the 2004 TESR, which stated improvements to the interchange would be completed by 2021.

Construction is expected to be completed over one construction season. General traffic impacts during construction are documented in **Section 8.2.3** of this report. More detailed traffic staging will be developed during detail design and will be documented in the Design and Construction Report.

The timing for construction of the ultimate design is based on future traffic volume growth. Widening Highway 401 to ten lanes will require a separate Class Environmental Assessment Study for the Highway 401 mainline.

7. PUBLIC AND AGENCY CONSULTATION

This section summarizes public and agency consultation completed during the Interim Design Stage regarding the design changes included in this TESR Addendum.

Notice of Commencement and Public Information Centre

A combined Notice of Study Commencement and PIC (included in **Appendix A**) was published in the London Free Press on Wednesday, June 13, 2012 and Saturday, June 16, 2012, as well as L'Action (French Language Newspaper) on Wednesday, June 13, 2012.

The notice was sent to Jeff Yurek, MPP Elgin-Middlesex-London, Chris Bentley, MPP London West and Teresa Armstrong, MPP London-Fanshawe on June 8, 2012.

The notice, with covering letter (**Appendix A**), was sent to the contact list on June 11, 2012. The contact list included over 150 businesses and agency representatives and approximately ten private land owners in the vicinity of the study area.

MTO sent the following First Nations the notice on June 11, 2012:

- Chippewas of the Thames First Nation
- Chippewas of Kettle & Stony Point First Nation
- Chippewas of Aamjiwnaang
- Moravian of the Thames
- Munsee-Delware Nation
- Oneida Nation of the Thames
- Walpole Island First Nation.

Public Information Centre

The PIC was held on June 20, 2012, as an informal walk-in session with displays (included in **Appendix A**) summarizing the study process, previous design work completed, existing conditions, and design recommendations. Brief presentations were planned for 4:30 p.m. and 6:00 p.m. Due to low attendance, the presentations were not made since one-on-one conversations with each member of the public were more effective.

The displays included information on the following:

- Public Information Centre Objectives
- Project Background, scope and milestones
- Class Environmental Assessment process
- Existing Conditions; Natural Environment and Socio-Economic Environment
- 2004 Preliminary Design Layout
- Summary of 2008 Highbury Avenue Improvements
- Evaluation Criteria and Alternative Alignments
- Interim and Ultimate Design Plans
- Proposed Short-term Detour Routes
- Mitigation Measures
- Next Steps.

Ten people attended and signed the record of attendance.

Sean Meksula from the City of London, Planning Department attended the agency session. Attendees were encouraged to complete a comment sheet and submit it to the study team by July 11, 2012. Three members of the public who live at the corner of Wilton Grove Road and Highbury Avenue expressed concerns regarding the design of the current intersection, in particular the southbound double left turn lane.

None of the attendees expressed significant concerns regarding the proposed improvements or potential impacts.

Sixteen comments were received throughout the project, with several requesting to be kept informed of the study. **Table 4** summarizes the comments received as well as the study team's response.

Emergency Medical Services Providers

A letter along with a copy of the PIC display panels, were sent to local Emergency Service Providers on July 20, 2012. The letter described the project, proposed traffic management plans and anticipated timing schedules. Emergency Service Providers were requested to provide comments on their use of the existing interchange and impacts construction may have on their ability to respond to incidents within the Highway 401 corridor.

City of London

The City has been involved in the project, including attending progress meetings and the PIC to ensure the project is co-ordinated with other City initiatives. City staff are aware of the proposed design changes and have not expressed concern regarding the changes included in this Addendum.

Table 4: Summary of Agency and Public Comments

Contact	Summary of Comments	Response
Government, Agencies and First Nations		
Consultation and Accommodation Unit Aboriginal Affairs and Northern Development Canada	Provided background information on First Nations land claims in area and list of recommended aboriginal groups to consult with.	No response required.
London Transit Commission	LTC does not currently have any transit routes in the area however, interchange used for transporting buses to garage. Consideration should be given to future transit services being provided for businesses around Wilton Grove Road/ Highway 401 area.	The proposed project involves the replacement of existing Highbury Avenue Underpass as well as the reconfiguration of the Highway 401/Highbury Avenue interchange ramps. Work on Highbury Avenue extends from Bradley Avenue to Wilton Grove Road. Both the Interim and Ultimate Design Plans do not exclude future provisions for transit on Highbury Avenue.
McIlwraith Field Naturalists of London/Nature London	Do any of the alternatives harm the two woodlands? What other natural heritage features are being studied?	A copy of the PIC displays was sent to Mr. Levin on June 25, 2012. Thank you for providing your comments on this study. As outlined in your June 25, 2012 email, you are interested in project alternatives impacting the adjacent woodlands as well as any other natural heritage features being studied. The proposed project involves the replacement of the existing Highbury Avenue underpass as well as the reconfiguration of the Highway 401/Highbury Avenue interchange ramps and improvements to Highbury Avenue between Bradley Avenue and Wilton Grove Road.

Contact	Summary of Comments	Response
		The exact extent of property required on the area of the woodlot that is west of Highbury Avenue, south of Highway 401 is being reviewed. We recognize the woodlot is identified as "significant" in the City's Official Plan and opportunities to minimize impacts are being reviewed. A Terrestrial Ecosystem Assessment Report will be completed for this study and will include mitigation measures to minimize impacts to the woodlot. A summary of the report will be included in the Transportation Environmental Study Report Addendum, which will be available for review later this year. Please let us know if you have any additional comments or concerns regarding this study.
Public		
Area resident	Concerned about property required from his property. Not available to attend PIC. Wishes to receive display boards.	A copy of the PIC materials was sent to the resident by email dated June 22, 2012.

8. IMPACTS AND MITIGATION

The proposed changes to the design included in this Addendum will have minimal negative impacts on adjacent lands as well as to the traveling public. The impacts are primarily short term disruptions typical of highway construction projects and can be mitigated to a significant extent by standard provisions in the Contract. **Table 5**, Summary of Impact and Proposed Mitigation, at the end of this section summarizes the impacts and mitigation measures which will be carried forward in the detail design and construction phases.

8.1 Natural Environment

8.1.1 Groundwater

As outlined in the 2004 TESR, there is an estimated 40 drilled wells within 500 m of the Highway 401 corridor located from Highway 4 (Colonel Talbot Road) to the west side of Wellington Road. The TESR did not identify any wells in the vicinity of the Highbury Avenue interchange.

Table 5.2 from the 2004 TESR, Summary of Environmental Effects and Mitigation Measures, states that prior to construction a well survey will be completed, including the monitoring of wells adjacent

to the highway, to establish baseline conditions for possible interference claims. Since no wells are in the vicinity of construction, this mitigation measure is not applicable.

8.1.2 Fisheries and Aquatic Habitat

The Elliot-Laidlaw Drain is a permanent warmwater fishery which originates nearly 2 km upstream of Highway 401 in wetlands east of Highbury Avenue flowing west into the Westminster Ponds and continuing southeast towards Dingman Creek.

The TESR states "An Environmental Inspector with a natural channel or biological background and construction experience should be employed for all in-stream works on permanent watercourses to ensure that mitigation and compensation measures are implemented as design." Based on the MTO/MNR/DFO Fisheries Protocol, fisheries monitoring is required when a *Fisheries Act* Authorization is required for a project. Where a Fisheries Authorization is not required, MTO's Contract Administrator or Contractor is responsible for implementing all environmental commitments and mitigation measures. Given the limited work required at the Elliot-Laidlaw Drain culvert, an Environmental Inspector with natural channel or biological background is not required.

As outlined in the 2004 TESR, in-stream work will only be permitted between July 1 and March 31. With the exception of the need for an Environmental Inspector with a natural channel or biological background, no changes to the mitigation measures outlined in the TESR are proposed.

The rehabilitation of the Elliot-Laidlaw Drain culvert will not be constructed at the same time as the Highbury Avenue Interchange improvements. The culvert rehabilitation will be completed under a separate contract, with the timing of construction currently unknown.

8.1.3 Terrestrial Ecosystems

The preferred option of maintaining the existing Highbury Avenue alignment will result in the loss of some vegetation but, overall, the impacts of the revised design are less than those of the 2004 design.

In the area of the Highbury Avenue Interchange, minimal impacts to vegetation will occur, including removal of some trees, to facilitate reconstruction of the interchange and accommodate the MTO's

Clear Zone Policy from the Roadside Safety Manual. Vegetation clearing will also be required to replace the Elliot-Laidlaw Drain culvert. The extent of vegetation removals and required compensation will be determined during detail design.

In the area of the significant woodland, along the west side of Highbury Avenue, south of Highway 401, approximately 600 m^2 of property will be required, which is less than the approximately 1000 m^2 required by the 2004 design. The extent of tree removals will be confirmed during detail design. A detailed inventory of the trees to be removed will be completed during detail design, following MTO's Guide to Roadside Tree Inventory and Assessment (August 2012). Appropriate edge planting strategies, such as planting native trees and shrubs, application of native seed mix, integration of early successional species and a dense shrub layer to limit the amount of debris that can enter the wooded area, will be utilized along the newly created edge of the significant woodlot along the west side of Highbury Avenue. The edge planting strategies will be developed during detail design.

Potential impacts from vegetation removal include:

- Increased erosion and sedimentation of lands adjacent to the construction area
- Increased vulnerability of the areas cleared of vegetation to invasion by non-native species
- Decreased shade and cover for fish and wildlife
- Localized temporary displacement of wildlife due to disturbance associated with construction activity
- Potential for imported materials (e.g., gravel) to be released to adjacent riparian habitat and displace native substrates.

The Monarch (provincially and federally *Special Concern*) identified during field investigations was observed within the northeast interchange loop. Due to the timing of the field investigations, individuals observed were most likely passing through as part of the Monarch's spring migration. There is no suitable habitat within the study area for the species to successfully reproduce. No impacts to this species are expected from the Highbury Avenue/Highway 401 interchange reconstruction.

An Eastern Meadowlark, a species listed as *Threatened* on the Species at Risk in Ontario List under the provincial *Endangered Species Act* (ESA), 2007, was observed flying over the study area. The SAR habitat screening completed (included in **Appendix B**) indicates there is no suitable habitat of

sufficient size for this species within the study area. No impacts to this species are expected.

Species protected under the federal *Migratory Birds Convention Act* (*MBCA*), 1994, were documented in the study area. Destruction and disturbance of active nests (with eggs or young birds) as well as wounding and/or killing species protected under the *MBCA* is prohibited under this federal legislation. Vegetation clearing should be completed outside of the core nesting season; between April 1 and August 15.

The culverts under Highway 401 and Highbury Avenue traverse riparian areas that are part of the natural environment of the City of London. These natural corridors, consisting mainly of riparian meadow vegetation type, provide ecological connections for the movement and dispersal of local flora and fauna between two Environmentally Sensitive Areas. Impacts to these areas are expected to be minimal and temporary, possibly extending slightly beyond the Highway 401 and Highbury Avenue road corridors during the construction period.

The following mitigation measures, in addition to those included in the TESR will be in place to avoid or reduce the natural environment impacts:

- An inventory of the trees to be removed will be completed during detail design, following MTO's Guide to Roadside Tree Inventory and Assessment (August 2012)
- Tree Protection Zones (TPZs) will be established during detail design and shown on the contract drawings adjacent to proposed work areas along Highbury Avenue to protect vegetation, in particular the woodlot north west of the Wilton Grove Road/Highbury Avenue intersection
- Banks cleared of vegetation to facilitate culvert replacement/rehabilitation along Elliot-Laidlaw Drain will be stabilized (e.g., vegetated) prior to removal of erosion and sediment control measures
- Re-vegetate disturbed areas along drain with native species to minimize the invasion and colonization by non-native species and increase shade/cover for fish and wildlife
- Appropriate edge planting strategies, such as planting native trees and shrubs, application of native seed mix, integration of early successional species and a dense shrub layer to limit the amount of debris that can enter the wooded area, will be utilized along the newly created edge of the significant woodlot along the west side of Highbury Avenue. The edge planting strategies will be developed during detail design.

8.1.4 Erosion and Sedimentation

Localized grading will be required for widening Highbury Avenue to six lanes and reconstruction of the interchange will potentially result in erosion and sedimentation. Construction activities will not change local drainage patterns. Erosion control measures to be developed during detail design should focus on preventing erosion by specifying erosion control blanket in areas of high erosion potential and the use of straw bale and rock flow checks.

8.2 Socio-Economic Environment

Socio-economic impacts include impacts to adjacent property owners, businesses and the travelling public. Impacts are primarily related to the construction stage of the project and will be short-term in duration. These include construction noise, increase in dust and vehicle emissions and traffic disruptions during each stage of construction. Minor property taking is also required for both the Interim Design as well as the Ultimate. Mitigation measures outlined in **Table 5** are anticipated to minimize the impacts to the extent possible. As in all construction projects, there will be some disruptions during the site preparation and construction phases. Mitigation measures will be further developed during detail design and documented in the DCR.

8.2.1 Noise

It is anticipated overnight work will be required to remove the existing structure. The City of London Noise Control By-law (PW-12, Consolidated July 25, 2011) states "the noise arising from Construction that is clearly audible at a Point of Reception in a Residential Area between 6:00 p.m. and 7:00 a.m." is prohibited. If construction is required during this time, a temporary noise permit (Class 2) can be applied for from the City. Due to the proximity of residential houses beyond the study area, a permit is not anticipated. The need for a permit will be confirmed during detail design.

8.2.2 Property

Property for the Interim Design is required from both the City of London and Flying 'J' Travel Plaza. The property owned by the City is undeveloped and includes the significant woodlot and agricultural land. The agricultural land owned by the City is designated General Industrial. For the Ultimate Design, additional property will be required along Highway 401 to accommodate widening of the

ramp terminals. Impacts to property owners will be minimal and the amount of property required will not result in a significant impact to the overall function of the property.

Due to the shift in the alignment from the 2004 design, property requirements have been reduced. Approximately 6,000 m^2 of property will be required for the Interim Design, along Highbury Avenue, south of Highway 401. An additional 3,000 m^2 of property is required for the Ultimate Design. The exact extent of property required will be confirmed during detail design.

8.2.3 Traffic Management During Construction

Disruptions to traffic during construction are unavoidable, but will be mitigated to the extent possible.

Throughout construction, regular progress meetings will be held with MTO, the Contractor, Emergency Management Services and the City of London to review the project progress and revise the staging plan if required.

Traffic management and construction staging will be confirmed during detail design and documented in the Design and Construction Report. The following provides an overview of anticipated traffic impacts.

Highway 401

- Traffic will be reduced to two lanes in each direction through the construction area.
- Periodic short term closures (for example, overnight or weekends) of Highway 401 to replace the structure are anticipated.
- Ramp closures will be required, however, efforts will be made to limit the duration of closures where possible during construction.

Highbury Avenue

- Traffic will be reduced to one lane in each direction.
- Periodic short term closures (for example, overnight or weekends) of Highbury Avenue to replace the structure are anticipated.
- Temporary ramp connections will be used to limit the impact of required ramp closures.

As outlined above, periodic closures of Highway 401 and Highbury Avenue may be required to replace the structure.

During the closures of Highway 401, it is anticipated traffic will be detoured along the existing Emergency Detour Routes, or on other roads in the area based on input from the local municipalities, including the City of London. The detour routes will be confirmed during detail design and will be documented in the Design and Construction Report.

Figure 5 shows the proposed detour route that may be used when Highbury Avenue is closed:

- Highway 401 traffic will be maintained on temporary one lane ramp connections across Highbury Avenue
- Southbound Highbury Avenue traffic wanting to access eastbound Highway 401 will be directed to use Veterans Memorial Parkway to access Highway 401. All other Highbury Avenue traffic will follow Wilton Grove Road, Wellington Road and Bradley Avenue
- Signs will direct all other Highbury Avenue traffic along the proposed detour route.

Additional detail on the timing and duration of the closures as well as the detour routes will be included in the Design and Construction Report.

8.3 Cultural Resources

A Stage 2 Archaeological Assessment is required on the lands where property acquisition is required. Based on the findings of the Stage 2 assessment, Stage 3 and 4 assessments may be required. The need for additional assessment will be documented in the Design and Construction Report.

Prior to construction, confirmation from the Ministry of Tourism, Culture and Sport that the area is free of archaeological concerns is required.

8.4 Summary of Concerns and Mitigating Measures

Table 5 summarizes the commitments to mitigate specific environmental concerns which are different than the commitments made in the 2004 TESR. **Table 5** of this report should be read in conjunction with Table 5.2 of the TESR. Unless specifically noted, all commitments made in the 2004 TESR are still in effect and must be incorporated into the design and construction.

9. PERMITS/APPROVALS REQUIRED

In addition to the requirements outlined in the TESR, the following permits/approvals are required prior to construction:

- Class 2, Temporary Noise Permit from the City of London is not anticipated for overnight work as there are no residential areas within close proximity of the interchange. The need for the permit should be confirmed with the City during detail design and documented in the Design and Construction Report.
- Ministry of Tourism, Culture and Sport acceptance of the archaeological assessment is required prior to construction.

10. FUTURE CONSULTATION AND COMMITMENTS

As outlined in the TESR, a Public Information Centre may be held (if necessary) during detail design to present the proposed improvements and detailed mitigation measures.

The 2004 TESR indicates a Design and Construction Report will be prepared to provide information for compliance and monitoring purposes and to document existing conditions, potential impacts and mitigation measures during detail design. The report will also outline how commitments for additional field work outlined in the TESR and this TESR Addendum have been met.

DILLON CONSULTING LIMITED
LONDON, ONTARIO

Ministry of Transportation
Highway 401 Interchange Reconstruction
at Highbury Avenue

Detour Routes
Figure 5

Legend

- Bridge Replacement
- East Bound Detour Route
- West Bound Detour Route
- Rivers
- East Bound Detoured Traffic Direction
- West Bound Detoured Traffic Direction

SCALE 1:25,000

0 185 370 740 1,110 1,480 Meters

MAP CREATED BY: BJF
MAP CHECKED BY: JH
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\126151\ELC MAPPING\HIGHBURY_ELC_MAPPING.MXD

DILLON CONSULTING

PROJECT: 12-6151
STATUS: FINAL
Date: 10/2/2012

Table 5: Summary of Impacts and Proposed Mitigation Measures

I.D. #	I. D. # Sub-issues	Issues/Concern Potential Effects	Potentially Concerned Agencies	Proposed Mitigation
1. Highway Safety, Construction Traffic and Emergency Services Access	1.1 Traffic	Access disruptions and delays caused by: Highway 401: • Traffic will be reduced to two lanes in each direction through the construction area. • Periodic short term closures of Highway 401 to replace the structure are anticipated. • Ramp closures will be required, however, efforts will be made to limit the duration of closures where possible during construction. Highbury Avenue: • Traffic will be reduced to one lane in each direction. • Periodic short term closures of Highbury Avenue to replace the structure are anticipated. • Temporary ramp connections will be used to limit the impact of required ramp closures.	City of London/EMS	Traffic management and construction staging will be confirmed during detail design and documented in the Design and Construction Report.
2. Natural Features	2.1 Terrestrial Features	• Removal of approximately 600 m^2 of the significant woodlot, south of Highway 401, west of Highbury Avenue • Additional limited disturbance, removal or destruction of vegetation along the ROW	MNR/ Property Owners/ City of London	• A detailed inventory of the trees to be removed will be completed during detail design, following MTO's Guide to Roadside Tree Inventory and Assessment (August 2012) • Tree Protection Zones (TPZs) will be established during detail design and shown on the contract drawings adjacent to proposed work areas along Highbury Avenue to protect vegetation, in particular the woodlot north west of the Wilton Grove Road/Highbury Avenue intersection. • Confirm extent of silt fencing required along the boundary of the Cattail meadow marshes in the northern extent of the study area during detail design • Banks cleared of vegetation to facilitate culvert replacement/rehabilitation along Elliot-Laidlaw Drain will be stabilized (e.g., vegetated) prior to removal of erosion and sediment control measures • Re-vegetate disturbed areas along drain with native species to minimize the invasion and colonization by non-native species and increase shade/cover for fish and wildlife. • Appropriate edge planting strategies, such as planting native trees and shrubs, application of native seed mix, integration of early successional species and a dense shrub layer to limit the amount of debris that can enter the wooded area, will be utilized along the newly created edge of the significant woodlot along the west side of Highbury Avenue. The edge planting strategies will be developed during detail design.
	2.2 Migratory and other Protected Birds	Potential destruction of nests, eggs and young prior to, and during, construction	MNR	• Vegetation removal completed outside of the breeding bird period (April 1 to August 15). • Vegetation removal during the restricted bird breeding period can occur if a qualified Avian Biologist conducts a nest search of the vegetated area prior to work commencing and it is determined that active nests are not present in proximity to the removal area.
3. Cultural Resources	3.1 Cultural Resources in ROW	Potential destruction of cultural resources during construction	Ministry of Tourism, Culture and Sport (MTCS)	• Prior to construction, confirmation from the Ministry of Tourism, Culture and Sport that the area is free of archaeological concerns is required.
4. Land Uses and Socio-Economic Environment	4.1 Property Acquisition – Interim	Property required along Highbury Avenue, south of the interchange along both sides of the ROW.	Property Owners	• Property owners will be fairly compensated. • Property required at the Flying 'J' Travel Plaza has been minimized to the extent possible. Property required will not impact the existing parking lot. • Property required along the west side of Highbury Road is currently undeveloped. The extent of land required is not anticipated to limit the development potential of the property.
	4.2 Property Acquisition – Ultimate	Property required at the ramp terminals to accommodate 10-lanes on Highway 401.	Property Owners	• Property requirements will be confirmed during detail design
5. Human Health	5.1 Noise	Construction related noise	City of London	• Confirm need for a permit under the City of London Noise Control By-law (PW-12, Consolidated July 25, 2011) during detail design for overnight work

APPENDIX A
PUBLIC AND AGENCY CONSULTATION

NOTICE OF STUDY COMMENCEMENT AND PUBLIC INFORMATION CENTRE

Reconstruction of Highway 401/Highbury Avenue Interchange, City of London G.W.P. 3032-11-00

The **Ministry of Transportation (MTO)** is planning to reconstruct the existing Highway 401/Highbury Avenue Interchange. The work will include:

- A new bridge over Highway 401 to accommodate future widening of Highway 401;
- Reconfiguration of the interchange ramps; and
- Widening and improvements along Highbury Avenue, from Bradley Avenue to Wilton Grove Road.

The Preliminary Design and Class Environmental Assessment for the Highbury Bridge replacement was included in the *Highway 401 Improvements Planning and Preliminary Design Study Transportation Environmental Study Report* (TESR) (2004) which received Environmental Clearance in September 2004.

MTO has retained Dillon Consulting Limited to update the Preliminary Design and initiate the Detailed Design for the work at the interchange and along Highbury Avenue. Additional information is available at **www.highburyinterchange.ca**.

PUBLIC CONSULTATION

A Public Information Centre (PIC) will be held **June 20, 2012** to receive input on the technically preferred design and associated traffic impacts. Members of the Project Team will be available to present the information, receive comments and answer questions.

Public Information Centre

Date: Wednesday, June 20, 2012
Time: 4 p.m. to 7 p.m.
There will be brief presentations at 4:30 p.m. and 6 p.m.
Location: Summerside Community Church
1447 Commissioners Road East, London

THE PROCESS

This study is being carried out in accordance with the requirements for Group 'B' projects under the MTO *Class Environmental Assessment* (EA) *for Provincial Transportation Facilities* (2000). The design changes and Class EA process will be documented in a Transportation Environmental Study Report Addendum, which will be available for public review later in 2012.

COMMENTS

We are interested in hearing any comments you may have by **Wednesday, July 11, 2012**. Information collected will be used in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record. To obtain additional information, provide comments or be placed on the mailing list, please contact:

Kevin Welker, P.Eng., Project Manager
Dillon Consulting Limited
P.O. Box 426
London, ON N6A 4W7
tel: 519-438-6192
toll-free: 1-888-345-5668 ext. 1283
fax: 519-672-8209
e-mail: highburyinterchange@dillon.ca

Brian Goudeseune
Senior Project Manager
Ministry of Transportation, Ontario
West Region, Planning and Design Section
659 Exeter Road, London, ON N6E 1L3
tel: 519-873-4546
toll-free: 1-800-265-6072
fax: 519-873-4600
e-mail: brian.goudeseune@ontario.ca

If you have any accessibility requirements in order to participate in this project, please contact one of the team members listed above. Des renseignements sont disponibles en français en composant Stephen Betts,1-888-345-5668.

DILLON CONSULTING

Ontario

AVIS DE DÉBUT D'ÉTUDE ET DE MISE EN PLACE D'UN CENTRE D'INFORMATION DU PUBLIC

Reconstruction de l'échangeur de Highbury Avenue sur l'autoroute 401, ville de London
G.W.P. 3032-11-00

Le **ministère des Transports (MTO)** envisagent de procéder à la reconstruction de l'échangeur actuel de Highbury Avenue sur l'autoroute 401. Les travaux comprendront :

- la création d'un nouveau pont au-dessus de l'autoroute 401 afin de faciliter son futur élargissement;
- la reconfiguration des bretelles de raccordement; et
- l'élargissement de Highbury Avenue, entre Bradley Avenue et Wilton Grove Road, et l'apport d'améliorations sur cette portion.

L'avant-projet sommaire et l'évaluation environnementale de portée générale relatifs au remplacement du pont Highbury ont été intégrés au *rapport d'étude environnementale sur les transports (RÉET) de l'avant-projet sommaire et la planification des améliorations apportées à l'autoroute 401*, lequel a fait l'objet d'une approbation du point de vue environnemental en septembre 2004.

Le ministère des Transports a demandé à Dillon Consulting Limited de mettre à jour l'avant-projet sommaire et d'amorcer l'avant-projet détaillé ayant trait aux travaux qui seront effectués sur l'échangeur et le long de Highbury Avenue. Des informations supplémentaires sont disponibles sur le site **www.highburyinterchange.ca**.

CONSULTATION DU PUBLIC

Un centre d'information du public (CIP) sera mis en place le **20 juin 2012** afin que le public puisse donner son avis au sujet de la conception technique privilégiée et des répercussions connexes en matière de trafic. Les membres de l'équipe chargée du projet seront présents afin de communiquer des informations, recevoir des commentaires et répondre aux questions.

Centre d'information du public

Date :	Mercredi 20 juin 2012
Horaire :	De 16 h à 19 h De courtes présentations seront effectuées à 16 h 30 et 18 h.
Lieu :	Summerside Community Church 1447 Commissioners Road East, London

PROCESSUS

Conformément à l'*évaluation environnementale (ÉE) pour les installations de transport provinciales* (2000) du MTO, l'étude sera réalisée dans le respect des exigences des projets relevant du groupe « B ». Les modifications de conception et le processus d'évaluation environnementale de portée générale seront documentés dans un addenda du rapport d'étude environnementale sur les transports, lequel sera mis à la disposition du public aux fins de consultation au courant de l'année 2012.

COMMENTAIRES

N'hésitez pas à nous transmettre vos commentaires avant le **mercredi 11 juillet 2012**. Les informations recueillies seront utilisées conformément à la *Loi sur l'accès à l'information et la protection de la vie privée*. À l'exception des renseignements personnels, tous les commentaires seront intégrés au dossier public. Afin d'obtenir des informations supplémentaires, de donner votre avis ou de figurer dans la liste de distribution, veuillez contacter :

Kevin Welker, ingénieur, gestionnaire de projet
Dillon Consulting Limited
P.O. Box 426
London, ON N6A 4W7
Tél. : 519-438-6192
Sans frais : 1-888-345-5668, poste 1283
Téléc. : 519-672-8209
Courriel : highburyinterchange@dillon.ca

Brian Goudeseune
Gestionnaire principal de projet
Ministère des Transports de l'Ontario
Région de l'ouest, division conception/planification
659 Exeter Road, London, ON N6E 1L3
Tél. : 519-873-4546
Sans frais : 1-800-265-6072
Téléc. : 519-873-4600
Courriel : brian.goudeseune@ontario.ca

En cas d'exigences en matière d'accessibilité concernant votre participation à ce projet, veuillez contacter l'un des membres de l'équipe dont les coordonnées figurent ci-dessus. Des renseignements sont disponibles en français en appelant Stephen Betts au 1-888-345-5668.

DILLON CONSULTING

Ontario

Welcome
Highway 401 Interchange Reconstruction at Highbury Avenue

Class Environmental Assessment and Initial Design

GWP 3032-11-00

Public Information Centre

June 20, 2012

Public Information Centre Objectives

- Introduce the project
- Outline changes proposed to the approved 2004 design for the Highbury Avenue Interchange
- Provide information on the preferred design plan and associated traffic impacts
- Seek input on existing conditions in the study areas (i.e. natural, social, economic and cultural)
- Answer questions about the project




Project Background

MTO completed the Preliminary Design and Class Environmental Assessment (EA) for widening Highway 401, from 1km west of Highway 4 (Colonel Talbot Road) easterly to 1km east of Highbury Avenue in 2004. The study is documented in a Transportation Environmental Study Report.

MTO initiated the current study to review the 2004 design for the Highway 401/ Highbury Avenue Interchange and complete the initial design.

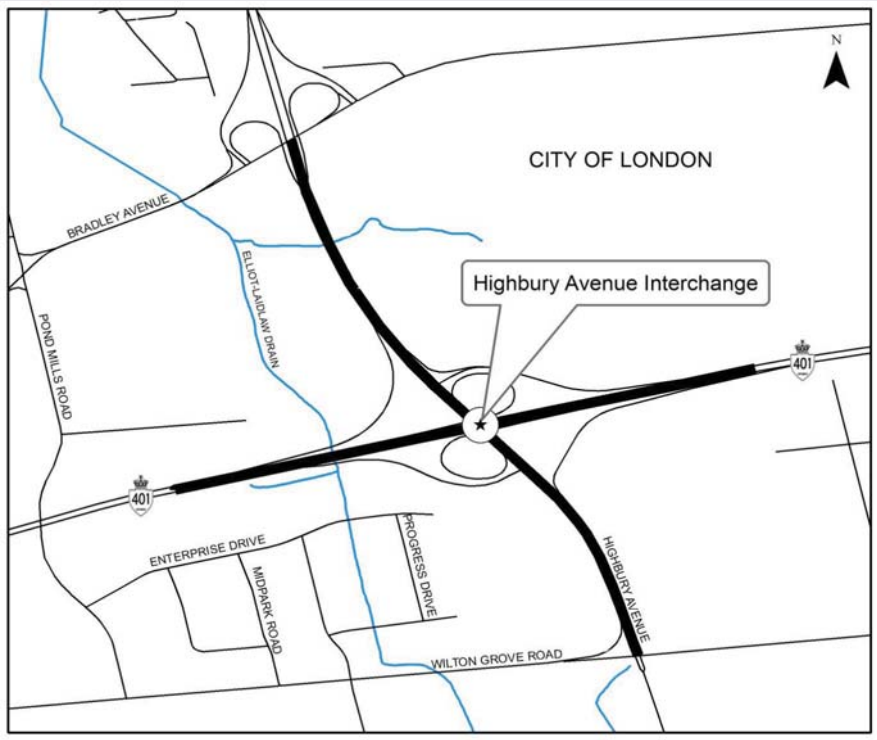
As part of this study, the team has developed alternatives to the approved 2004 design that minimize overall impacts. As a result, an update to the 2004 study is required. The following boards outline the design changes and resulting overall impacts.

In 2011 the Highbury Avenue/ Highway 401 bridge was dedicated to fallen OPP Officer Constable William Shores.

Project Scope

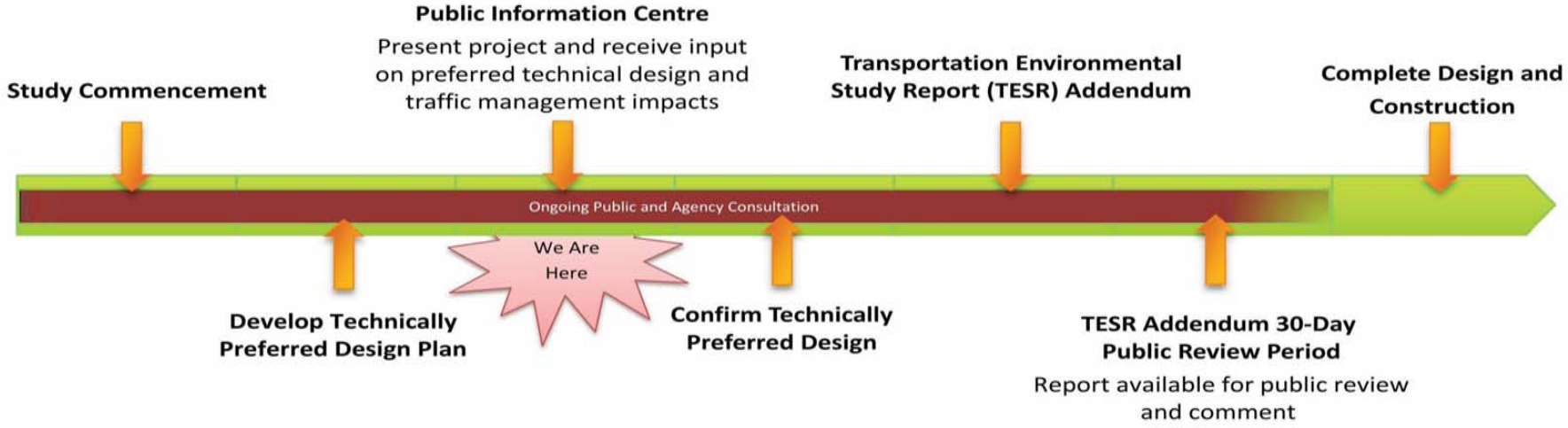
The project includes:

- The reconstruction of the Highway 401/ Highbury Avenue Interchange to accommodate the future widening of Highway 401*.
- Replacement of the bridge and reconfiguration of the interchange ramps
- Widening and improvements along Highbury Avenue; between Bradley Avenue and Wilton Grove Road to support City development plans for economic growth
- High mast lighting on Highway 401



* Note: The design to widen Highway 401 to 8-lanes was approved in 2004. Construction of the Highway 401 widening is not included as part of this project

Project Milestones



MTO Class Environmental Assessment

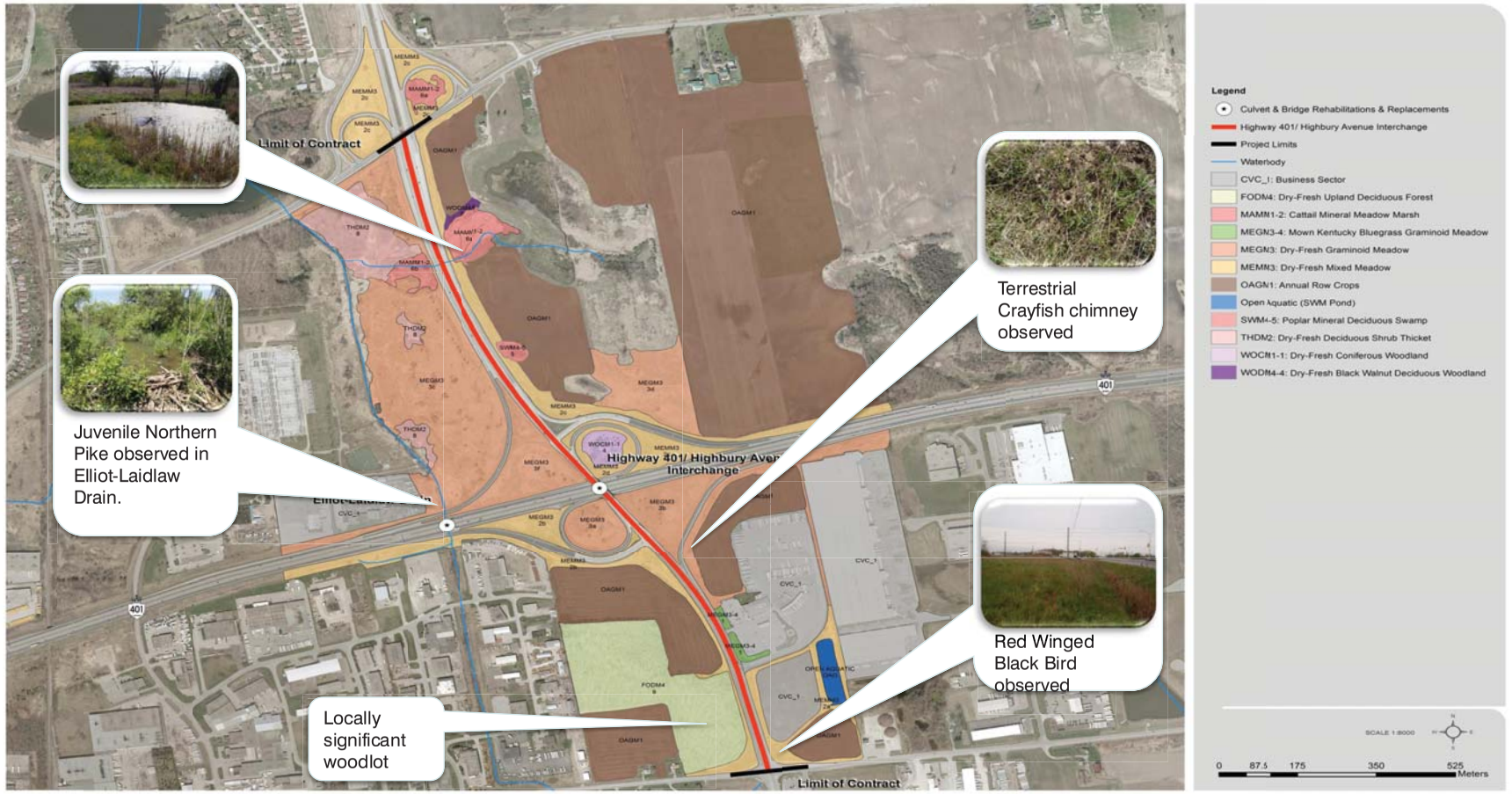
Ontario

The *Class Environmental Assessment for Provincial Transportation Facilities (2000)* (Class EA) provides a decision-making process to ensure that all relevant engineering and environmental factors are considered in the planning and design of transportation facilities. This study has been classified as a group "B" undertaking under the MTO Class EA.

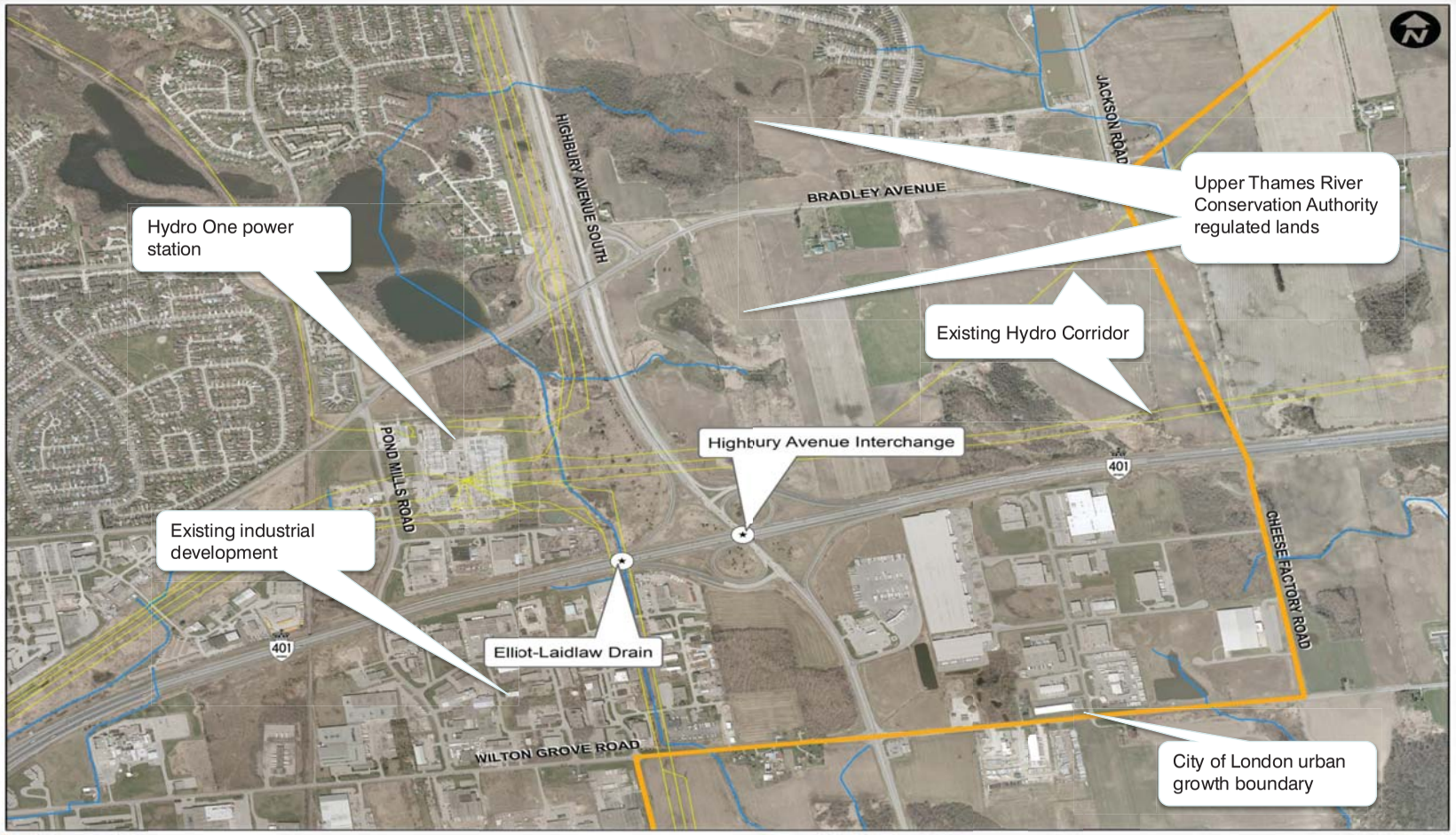
A Class EA Study considers potential impacts on the full range of the "environment", including the natural, social, economic and cultural environments. Through this process commitments are made for the future design and construction of projects. These commitments are documented in a Transportation Environmental Study Report.

Based on the changes identified as part of the updated design, an addendum is required is required to the original report.

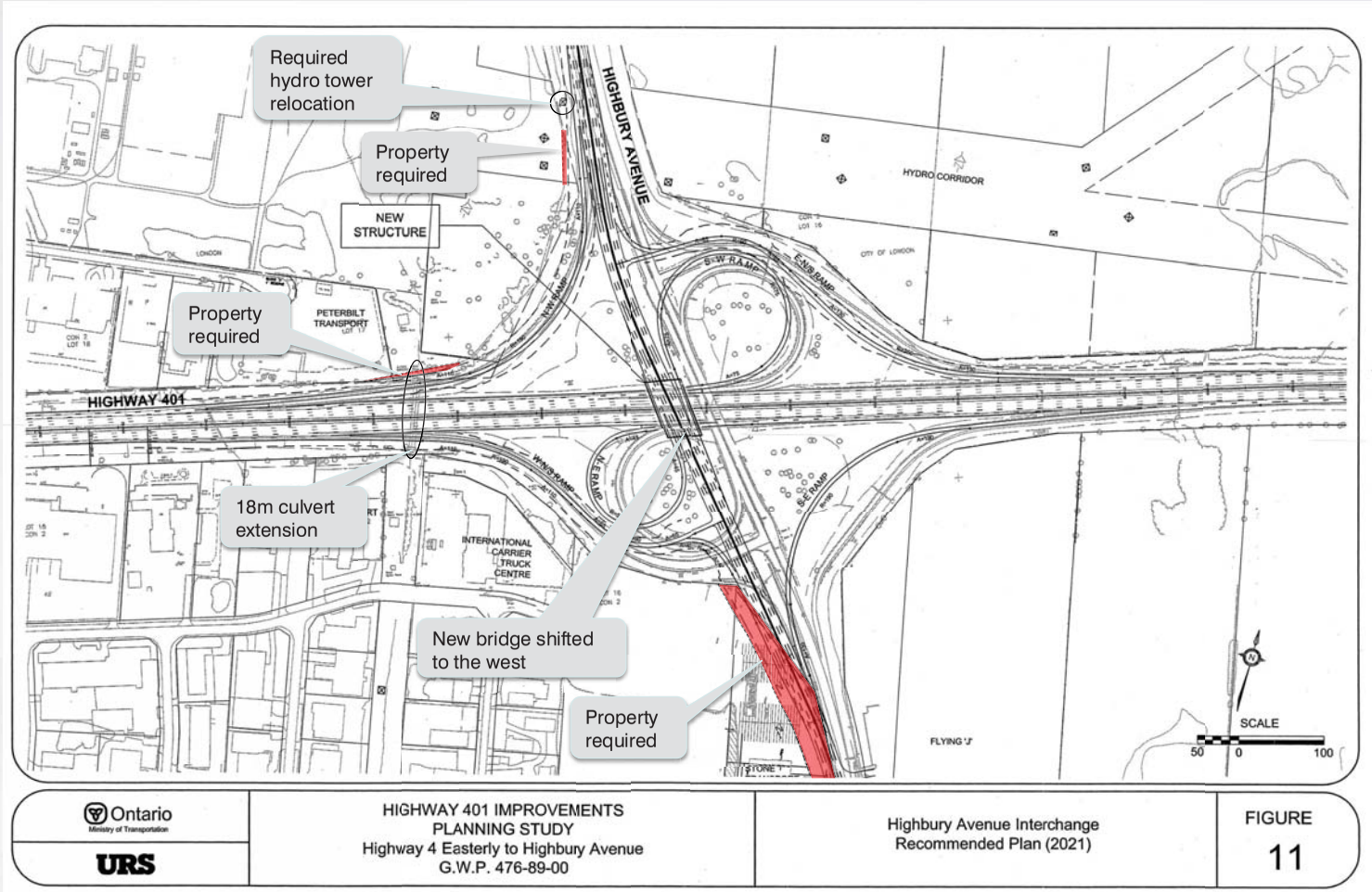
Existing Conditions – Natural Environment



Existing Conditions – Socio-Economic Environment



Highbury Avenue 2004 Preliminary Design



Original design approved in 2004 Preliminary Design Study.

The design was reviewed and alternatives were generated to lessen overall impacts.

The original 2004 design is carried forward as Alternative 1 in the comparative evaluation.

Summary of 2008 Improvements to Highbury Avenue

MTO and the City of London completed the following improvements to the Highbury Avenue Interchange in 2008:

- rehabilitate the bridge, including deck and soffit repairs, median island repairs, barrier wall repairs, and concrete overlay
- reconstruct and widen the Highway 401 off-ramps
- reconstruct Highbury Avenue pavement in the vicinity of the interchange
- replace existing traffic signals and illumination at the interchange ramp terminal
- rehabilitate Highbury Avenue pavement:
    - northbound lanes from the Highway 401 interchange to Commissioners Road
    - southbound lanes from the Highway 401 interchange to the Thames River (completed in 2010)
    - Bradley Avenue and Commissioners Road interchange ramps.

Opportunities to incorporate the works outlined above was considered in the evaluation of alternatives.

Evaluation Criteria

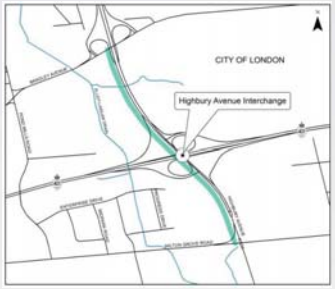
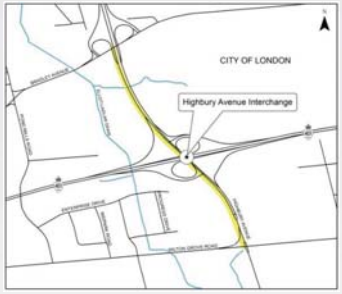
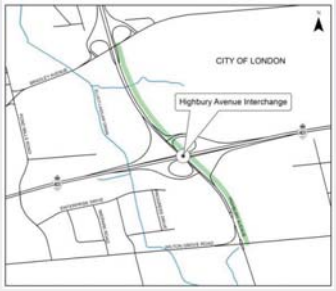
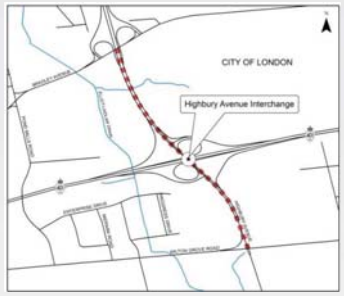
Three new designs were developed for the interchange. All four alternatives were evaluated based on the following criteria:

Evaluation Criteria

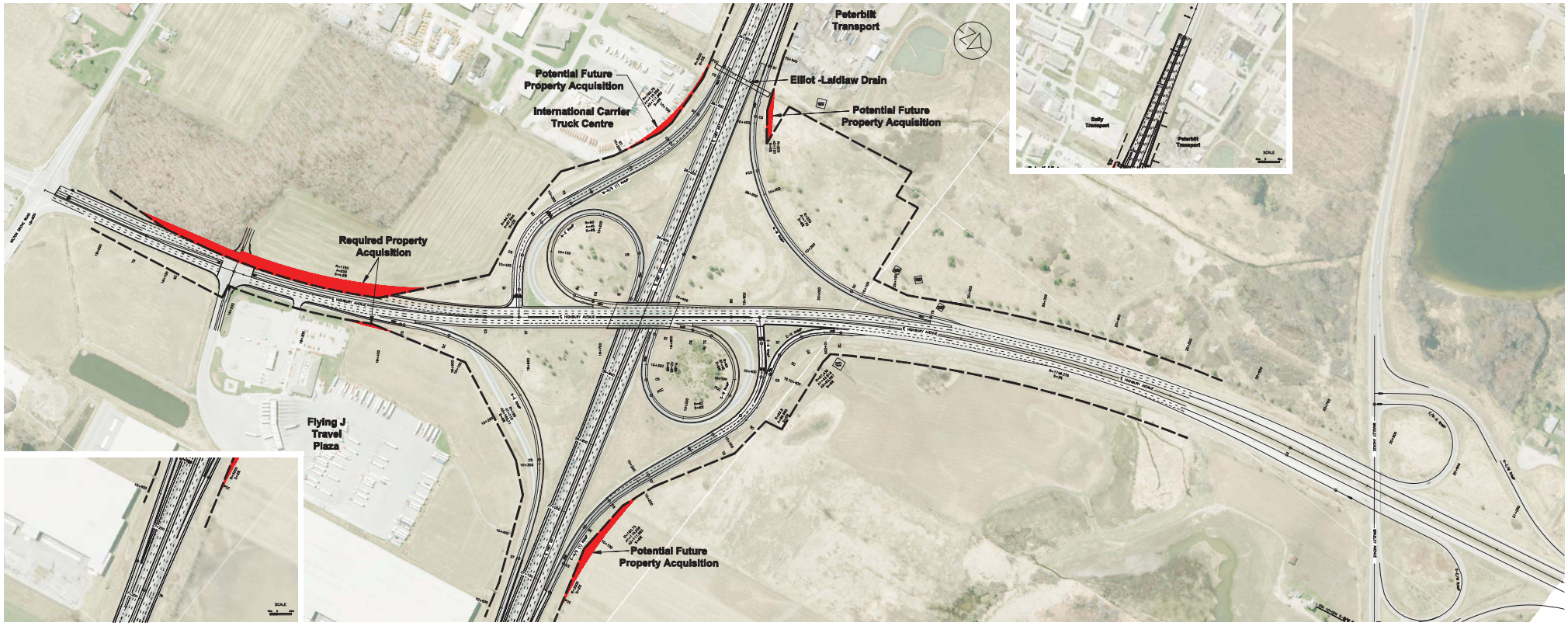
Traffic Operations and Safety	Alternatives which minimize traffic disruptions during construction are preferred
	Preferred alternative will meet current and future traffic volumes on Highbury Avenue based on future growth and development
	Alternatives that best meet traffic operations, capacity and safety are preferred – includes assessment of sightlines, intersection alignments and potential for weaving conflicts with interchange ramps
Engineering	Alternatives which avoid utility conflicts are preferred
	Alternatives which minimize construction complexity, duration and traffic impacts during construction are preferred
	Limiting impacts on existing infrastructure is preferred – including existing road network, Elliot-Laidlaw Drain culvert and interchange ramps
Cultural Resources	Alternatives which minimize impacts to land with archaeological potential are preferred
Fisheries and Aquatic Habitat	Alternatives which limit impacts to fish and fish habitat are preferred
Terrestrial Features	Alternatives which limit impacts to significant terrestrial resources are preferred
	Alternatives which limit impacts to Species at Risk and habitat are preferred
Existing and Future Land Uses	Minimal impacts to existing and future employment lands are preferred
Costs	Lower capital construction costs, relative to other alternatives, are preferred
	Alternatives which limit property acquisition are preferred

Alternative Alignments

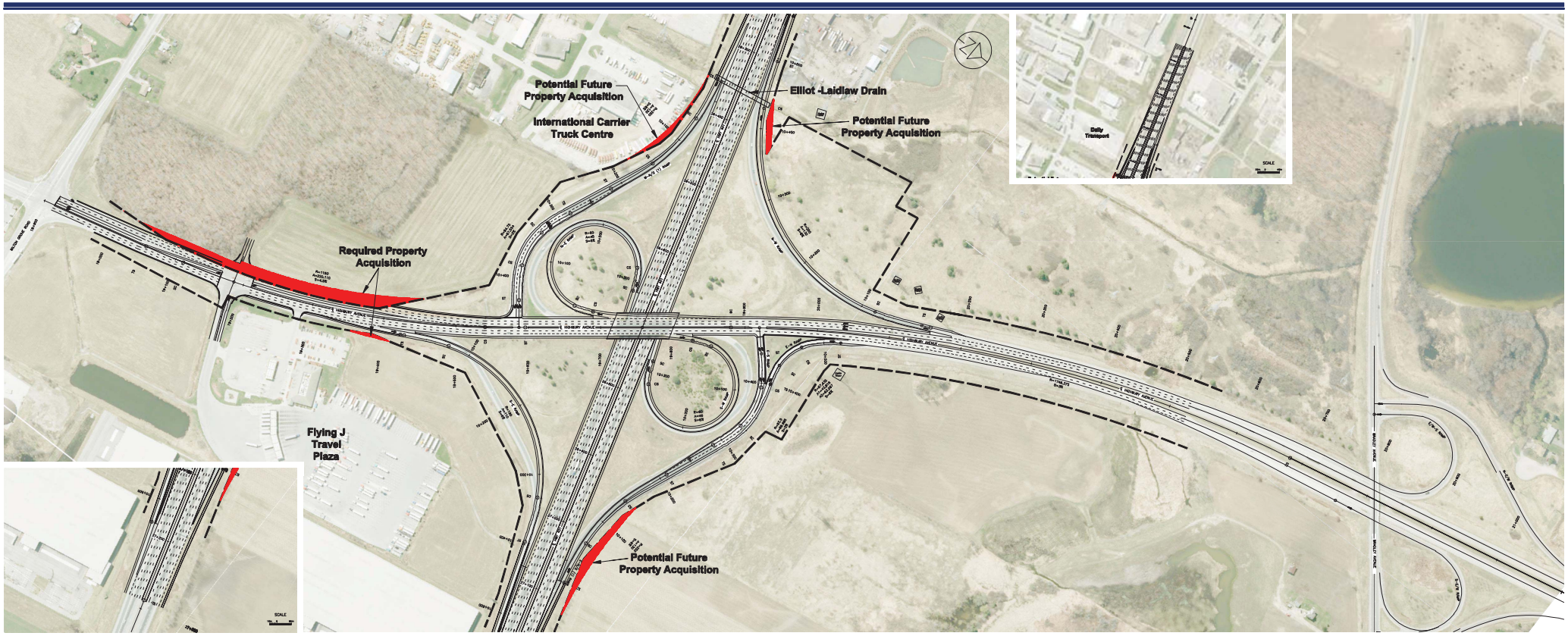
Ontario

Evaluation Criteria	Alternative 1 Alignment Shift West	Alternative 1A Partial Alignment Shift West	Alternative 2 Alignment Shift East	Alternative 3 Along Existing Alignment
				
	New bridge and roadway approaches will be approximately 35m west of their current location **2004 Approved**	New bridge and roadway approaches will be approximately 15m west of their current location	New bridge and roadway approaches will be approximately 35m east of their current location	New bridge and roadway approaches will be in the same general location **Preferred**
Traffic Operations and Safety	-	-	-	✓
Engineering	×	-	×	✓
Cultural Resources	✓	✓	✓	✓
Fisheries and Aquatic Habitat	-	-	-	-
Terrestrial Features	-	✓	-	✓
Existing and Future Land Uses	×	-	×	✓
Cost	×	×	×	-

× = Significant Impact - = Neutral Impact ✓ = Minimal Impact



Interim Highway 401 Interchange Reconstruction at Highbury Avenue


Potential Future
Property Acquisition
International Carrier
Truck Centre
Elliot -Laidlaw Drain
Potential Future
Property Acquisition
Required Property
Acquisition
Flying J
Travel
Plaza
Potential Future
Property Acquisition
Daily
Transport

Traffic Impacts During Construction

The following outlines the general traffic impacts during construction. Construction will be completed over one construction season.

More detailed traffic staging will be developed during later stages of the design.

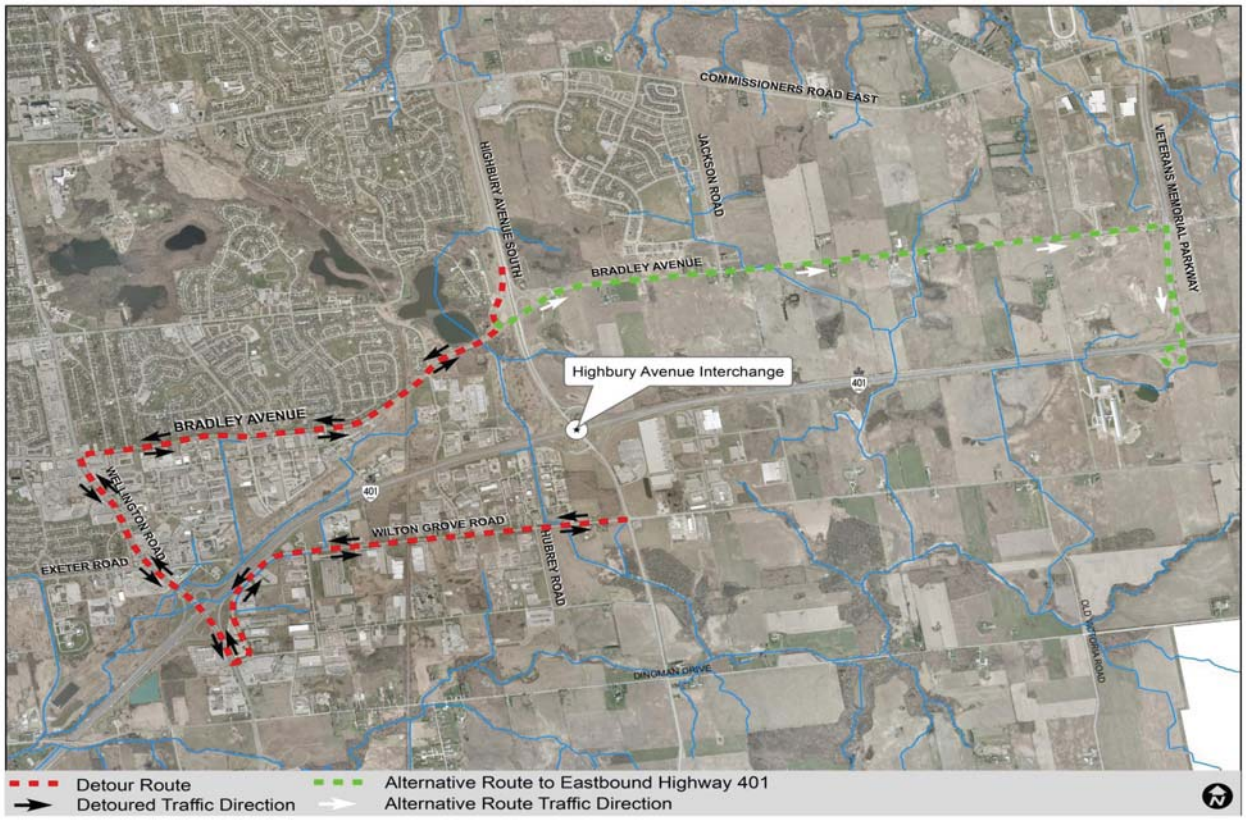
Highway 401:

- Traffic will be reduced to two lanes in each direction through the construction area
- Periodic night-time reductions to one lane in each direction are also anticipated
- Ramp closures will be required, however efforts will be made to limit the duration of closures where possible during construction.

Highbury Avenue:

- Traffic will be reduced to one lane in each direction
- Periodic night-time weekend closures of Highbury Avenue to replace the structure are anticipated
- Temporary ramp connections will be used to limit the impact of required ramp closures.

Proposed Short-term Detour Routes



- Periodic weekend closures of Highbury Avenue will be required to replace the Highbury Avenue structure
- Highway 401 traffic will be maintained on temporary one lane ramp connections across Highbury Avenue
- Southbound Highbury Avenue traffic wanting to access eastbound Highway 401 will be directed to use Veterans Memorial Parkway to access Highway 401. All other Highbury Avenue traffic will follow Wilton Grove Road, Wellington Road and Bradley Avenue
- Signs will direct all other Highbury Avenue traffic along the proposed detour route.

Mitigation Measures

In order to minimize traffic disruptions during construction, the following measures will be in place:

- Advanced notification signs on local roads
- Provide notification of road and lane closures to emergency services, local businesses and school boards
- Contractual constraints to limit the duration of construction
- Coordinate with City of London to keep public informed through local media and websites
- Interchange ramp closures will be coordinated to avoid high traffic weekends (ie. Labour day weekend etc.)

Mitigation measures will also be included in the contract to limit impacts to area residents and the natural environment, including:

- Contractor will be required to follow City of London Noise By-Law. A permit will be required for overnight work, such as demolition of the existing bridge
- Contractor will only be permitted to enter Elliot-Laidlaw Drain and adjacent natural areas for specific activities. Construction equipment and supplies cannot be stored near these areas

Next Steps

Use input received from Public and Agencies at the PIC to confirm preferred design and traffic staging

Complete inventory of natural, social, cultural and economic environments

Complete impact assessment and outline mitigation measures for consideration during further design stages and during construction

Document changes to 2004 design, environmental impacts and mitigation measures in Transportation Environmental Study Report Addendum

30-day review period Transportation Environmental Study Report Addendum

Detail design and construction Additional consultation regarding impacts during construction will be completed

Public and Agency Consultation

MTO's Southern Highways Program identifies construction of the Highbury Avenue Interchange be completed by 2016

Thank you for attending.

Your input is important to the outcome of this project.

Please complete a comment form and speak with a member of the project team regarding any comments, questions or concerns you may have.

Information for this project is being collected in accordance with the Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record.

June 11, 2012

Sample letter sent to contact list

DILLON CONSULTING

130
Dufferin Avenue
London, Ontario
Canada
N6A 5R2
Mail: Box 426
London, Ontario
Canada
N6A 4W7
Telephone
(519) 438-6192
Fax
(519) 672-8209

Notice of Study Commencement and Public Information Centre
Reconstruction of Highway 401/ Highbury Avenue Interchange, City of London

As outlined in the attached notice, the Ontario Ministry of Transportation (MTO) has retained Dillon Consulting Limited to update the Preliminary Design and initiate the detail for the reconstruction of the existing Highway 401/ Highbury Avenue interchange in the City of London. The project includes work on Highbury Avenue, from Bradley Avenue to the Wilton Grove Road intersection.

A Public Information Centre (PIC) is scheduled for June 20, 2012 to:

- Provide information on the proposed reconstruction and associated traffic impacts
- Seek input on existing conditions in the study area (i.e., natural, social, economic and cultural)
- Answer questions about the study.

The PIC will be a drop-in format, with brief presentations at 4:30 p.m. and 6:00 p.m.:

Wednesday June 20, 2012
Summerside Community Church
1447 Commissioners Road East, London
4:00 p.m. to 7:00 p.m.

Additional information on the project is available at **www.highburyinterchange.ca**. The project website will be updated as the project proceeds and will include information on the proposed work, including traffic impacts during construction.

. . . continued

If you have any comments, questions or concerns and would like to be updated throughout the study, please complete and return the enclosed form by **July 11, 2012**.

Yours sincerely,

DILLON CONSULTING LIMITED

Sabrina Stanlake, RPP
for Kevin Welker, P.Eng.
Project Manager

BJF:lpt
Encl. Notice of Study Commencement Ad
Comment Form

cc: Brian Goudeseune, MTO
Susan Wagter, MTO

Our file: 12-6151

June 21, 2012

John Gawley
Project Manager
130 Dufferin Avenue
London, Ontario N6A 5R2
highburyinterchange@dillon.ca

Dear Mr. Gawley,

Thank you for your email of June 11, 2012 regarding your request for information held by Aboriginal Affairs and Northern Development Canada (AANDC) on established or potential Aboriginal and treaty rights in the vicinity of the highway 401 & Highbury Avenue Interchange reconstruction project for London, Ontario.

Consulting with Canadians on matters of interest or concern to them is an important part of good governance, sound policy development and decision-making. In addition to good governance objectives, there may be statutory or contractual reasons for consulting, as well as the common law duty to consult with First Nations, Métis and Inuit when conduct that might adversely impact Aboriginal or treaty rights (established or potential) is contemplated.

It is important to note that the information held by AANDC is provided as contextual information and may or may not pertain directly to Aboriginal or treaty rights. In most cases, the Aboriginal community remains best positioned to explain their traditional use of land, their practices or claims that may fall under section 35, including claims they may have put before the courts.

The Department has recently developed a new information system, the Aboriginal and Treaty Rights Information System (ATRIS), which brings together information regarding Aboriginal groups such as their location, related treaty information, claims (specific, comprehensive and special) and litigation. Using ATRIS and a 100 km radius surrounding the project location, information regarding potentially affected Aboriginal communities is presented in the attached report in the following sections for each community:

Aboriginal Community Information includes key contact information and any other information such as Tribal Council affiliation.

Treaties, Claims and Negotiations includes Historic Treaties, Specific, Comprehensive and Special Claims. Self-Government may be part of Comprehensive claims or stand-alone negotiations.

Litigation usually refers to litigation between the Aboriginal Group and the Crown, often pertaining to section 35 rights assertions or consultation matters.

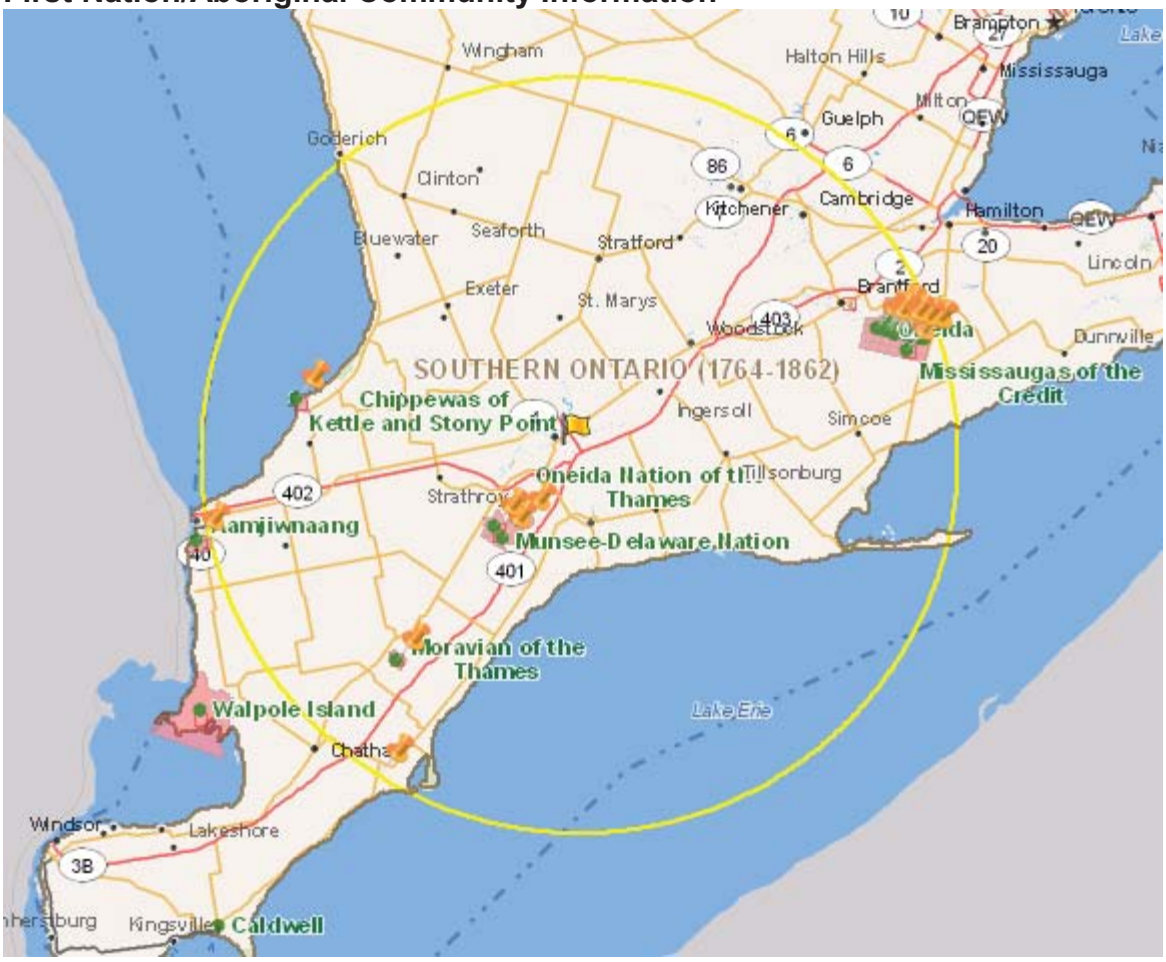
Also included, where available, is a section entitled **Other Considerations**. This may include information on Métis rights, consultation-related protocols or agreements and other relevant information.

Should you require further assistance regarding the information provided, or if you would prefer that a smaller or greater buffer be used to gather information, please do not hesitate to contact me.

Regards,

Allison Berman
Regional Subject Expert for Ontario
Consultation and Accommodation Unit
Aboriginal Affairs and Northern Development Canada
300 Sparks Street, Ottawa
Tel: 613-943-5488

First Nation/Aboriginal Community Information



Within a 100 km radius of your project there are 21 First Nation communities. This response includes Caldwell First Nation and the Mississauga of the Credit which are not listed in your letter. Walpole Island First Nation has been included, as you have indicated this group in your letter. The following information should assist you in planning any consultation that may be required.

In general, where historic treaties have been signed, the rights of signatory First Nation's are defined by the terms of the Treaty. In many cases, however, there are divergent views between First Nations and the Crown as to what the treaty provisions imply or signify. For each First Nation below, the relevant treaty area is provided.

In areas where no historic treaty exists or where such treaties were limited in scope (i.e. where only certain rights were addressed by the treaty, such as the Peace and Friendship Treaties), there may be comprehensive claims that are asserted or being negotiated. Comprehensive claim negotiations are the means by which modern treaties are achieved.

Specific claims refer to claims made by a First Nation against the federal government related to outstanding lawful obligations, such as the administration of land and other First Nation assets, and to the fulfillment of Indian treaties, although the treaties themselves are not open to re-negotiation. The below response provides summaries of relevant claims that are current to the

date of the response. As the claims progress regularly, it is recommended that the status of each claim be reviewed through the Reporting Centre on Specific Claims at: http://pse4-esd4.ainc-inac.gc.ca/SCBRI/Main/ReportingCentre/IndexExternal.aspx?lang=eng

Self-government agreements set out arrangements for Aboriginal groups to govern their internal affairs and assume greater responsibility and control over the decision making that affects their communities. Many comprehensive claims settlements also include various self-government arrangements. Self-government agreements address: the structure and accountability of Aboriginal governments, their law-making powers, financial arrangements and their responsibilities for providing programs and services to their members. Self-government enables Aboriginal governments to work in partnership with other governments and the private sector to promote economic development and improve social conditions.

Aamjiwnaang
Chief Christopher Plain
978 Tashmoo Avenue
Sarnia, Ontario, N7T 7H5
Phone: (519) 336-8410 Fax: (519) 336-0382
www.aamjiwnaang.ca

Treaty Area - Southern Ontario Treaties to open the Interior: 1815 to 1862
For more information on the treaties, see “Other Considerations” below.

Membership
Union of Ontario Indians
Chiefs of Ontario
London District Chiefs Council
Southern First Nations Secretariat
For more information, see “Other Considerations” below.

Specific Claims
Name: Clench Defalcation
Status: in negotiations
Description: The Plaintiffs claim a misappropriation of sale proceeds.

Name: Enniskillen (Split #01) Aamjiwnaang
Status: settled through negotiation
Description: Alleged that certain lands in Enniskillen Township were sold without surrender between 1866 and 1918.

Self-Government Agreement negotiations
Anishinabek Nation Final Agreement negotiations on Governance and Education
Please see “Other Considerations” below for more details.

Litigation
Name: Ada Lockridge v. Ministry of the Environment, HMTQ in Right of Ontario, Suncor Energy Products Inc., Attorney General of Ontario, Minister of the Environment Ontario
Status: active

Court No: 528/10
Description: The Plaintiffs allege that the Ministry of the Environment has granted permits and licenses resulting in the release of pollutants in an area south of Sarnia which surrounds the territory around the Applicants' reserve.

Name: Chippewas of Sarnia v. Attorney General of Canada et al, Attorney General of Canada, CN Realties, Great Western Railway
Status: active
Court No.: not available
Description: In 1995 the Sarnia FN launched a lawsuit against Canada, Ontario, several thousand property owners, and business and industries, regarding an 1839 sale of 1/3 of the Sarnia reserve to Malcolm Cameron. On Dec 21, 2000, the Ontario Court of Appeal found that although there was no formal surrender, the actions of the First Nation indicated their intent to surrender the land. In these exceptional circumstances, the Court ruled that the rights of the innocent third parties who have relied on the patent must prevail. The patent was therefore found to be valid. The Court left open the right of the Chippewas to proceed with a claim for damages against the Crown.

Current events
In September of 2011, the First Nation launched the above lawsuit (listed first) against Ontario's Ministry of the Environment. Two members of the Aamjiwnaang assert that by permitting a recent 25 percent increase in production at a Suncor refinery, the government has violated Section 7 of the Canadian Charter of Rights and Freedoms: the right to life, liberty and the security of the person. Lawyers also cite a violation of equality rights under Section 15 of the Charter, saying the Aamjiwnaang bear a disproportionate environmental burden. Within 25 kilometres of the Aamjiwnaang reserve, there are more than 60 industrial facilities, about 46 of them on the Canadian side of the border. These concerns are of great importance to the Aamjiwnaang community, and should be taken in to consideration when determining whether a consultation process is required.

Caldwell First Nation
Chief Louise Hillier
P.O. Box 388
Leamington, Ontario, N8H 3W3
Phone: 519-322-1766 Fax: 519-322-1533
www.sfns.on.ca/pages/Caldwell

Treaty area – Southern Ontario Treaties for Settlement: 1783 to 1815
In the early part of the 20th century, the Department of Indian Affairs took some preliminary steps to provide a reserve for this First Nation. None of these attempts were completed, and the First Nation remained without a land base and other benefits under Treaty 2 of 1790. The Caldwell land claim is being settled through the Specific Claims process. For more information on the treaties, see "Other Considerations" below.

Membership
Association of Iroquois and Allied Indians
London District Chiefs Council

Southern First Nations Secretariat
Chiefs of Ontario
For more information, see “Other Considerations” below.

Specific Claims
Name: Land Entitlement
Status: settling through negotiations as of 2011
Description: The First Nation alleged that their members are the original inhabitants, occupants and owners of Point Pelee & Pelee Island. They contended that they never surrendered Point Pelee in 1790, and that the 999 year lease to Pelee Island was invalid.

Name: Pelee Island
Status: concluded – no lawful obligation found
Description: The First Nation alleged that they did not surrender Pelee Island and that the 999 year lease is invalid since the Crown's patent is void.

Litigation
Name: Peter Welch v. HMTQ in Right of Ontario
Status: active
Court No.: not yet available
Description: This is a Fish and Wildlife Conservation Act prosecution involving a member of the Caldwell First Nation. The case involves an investigation regarding the shooting of a deer in 2011. The applicant is claiming Aboriginal and treaty rights to hunt, and will argue that his Charter rights were breached in the investigation.

Chippewas of Kettle and Stony Point
Chief Elizabeth Cloud (appt expires June 23, 2012)
6247 Indian Lane
Kettle and Stony Point First Nation, Ontario, N0N 1J1
Phone: (519) 786-2125 Fax: (519) 786-2108
www.kettlepoint.org/home.html

Treaty Area - Southern Ontario Treaties to open the Interior: 1815 to 1862
For more information on treaties, see “Other Considerations” below.

Membership
Southern First Nations Secretariat (SFNS)
Union of Ontario Indians
Chiefs of Ontario
London District Chiefs Council
See “Other Considerations” below for further information.

Specific Claims
Name: 1927 Surrender
Status: active litigation
Description: The First Nation alleges that the 1927 surrender of part of the Kettle Point Indian reserve no. 44 and its subsequent sale in 1929, was invalid.

Name: 1928 Surrender at Stoney Point
Status: active negotiation
Description: The First Nation alleges that the 1928 surrender and sale of 377 acres of the Stoney Point Reserve was invalid. (1928 Surrender at Stoney Point - Ipperwash Provincial Park).

Name: Clench Defalcation
Status: active negotiations
Description: The Plaintiffs claim a misappropriation of sale proceeds.

Name: Enniskillen (Split #02) Chippewas of Kettle and Stony Point
Status: settled through negotiation
Description: The First Nation alleged that certain lands in Enniskillen Township were sold without surrender between 1866 and 1918.

Name: Lot 27 – Bosanquet Lands
Status: concluded – no lawful obligation found
Description: Misappropriation of sale proceeds of Lot 27, concession 6, Township of Bosanquet.

Self-Government Agreement negotiations
Anishinabek Nation Final Agreement negotiations on Governance and Education
Please see “Other Considerations” below for more details.

Litigation
Name: Chippewas of Sarnia et al. v. HMTQ in Right of Canada, Laurie Desautels, Polysar Hydrocarbons Limited
Status: active
Court No.: 1796A/87
Description: In 1987, the Chippewas of Sarnia and Kettle Point (Chippewas) sued Ontario and Polysar for a declaration of Aboriginal rights recognized by the Royal Proclamation of 1763 and never ceded to the waterbeds of the St. Clair River and Lake Huron and damages for Polysar’s gas pipeline contained therein. The Plaintiffs allege that Ontario has breached its fiduciary duties and trust obligations to the band as a result of granting licenses to the various companies named as defendants. The plaintiffs seek damages and declatory relief.

Name: Chippewas of Kettle and Stony Point v. Attorney General of Canada et al.
Status: active
Court No: C22725
Description: The Plaintiffs allege that the 1927 surrender and subsequent letters patent for a portion of the Kettle Point Reserve is invalid, and that the beach front was not surrendered.

Name: Rosalie Winnifred Manning et al v. HMTQ
Status: active
Court No.: T-3077-94
Description: The plaintiffs, who claim to be members of the self-styled Stony Point First Nation, and the defendants, the Chippewas of Kettle and Stony Point are recognized as one band by the department. The plaintiffs claim, among other things, that the Crown breached its fiduciary duty. They allege this occurred through the Crown’s failure to ensure the plaintiffs' interests: with regards to the Stony Point Reserve; when represented in its negotiations with the

Chippewas of Kettle and Stony Point Band; trespassing from 1942 to 1994; the environmental degradation of the land; and the plaintiffs loss of the use and enjoyment of the lands.

Traditional Territory: In March 2012, the Chippewas of Kettle and Stony Point First Nation reaffirmed their claim (see above Chippewas of Sarnia et al. v. HMTQ) to the lakebed surrounding their First Nation in a letter to AANDC. They wish to be notified by government, proponents, groups or individuals who use, or who plan to use, the area they consider their traditional territory. This area is described as such:

"from the point of intersection of the surrendered lands with Lake Huron at its most northerly point, extending directly out onto Lake Huron to the Intertational boundary, then running along the Internation boundary to the southerly limit of the herein described lands at the water's edge of the St. Clair River, and the land underlying this portion of Lake Huron (lake bed)"

Chippewas of the Thames
Chief Joe Miskokomon (appointment expires June 27, 2013)
320 Chippewas Road
Muncey, Ontario, N0L 1Y0
Phone: (519) 289-5555 Fax: (519) 289-2230
www.cottfn.ca/index.html

Treaty Area – Southern Ontario Treaties to open the Interior: 1815 to 1862
For more information on the treaty see "Other Considerations" below.

Membership
London District Chiefs Council
Southern First Nations Secretariat
Union of Ontario Indians
Chiefs of Ontario
See "Other Considerations" below for further information.

Specific Claims
Name: Big Bear Creek Reserve
Status: active negotiations
Description: It is alleged that the 5,120 acre Big Bear Cree Reserve was patented and sold by the Crown in the 1830s without a proper surrender by the First Nation. Furthermore, the compensation paid by the Crown for the loss of the reserve in 1849-50 was inadequate. The land in question was reserved for the First Nation under the Longwoods Treaties (1819-1822).

Name: Caradoc IR Railway Right of Way
Status: under assessment
Description: The First Nation alleges the failure to properly manage 3 railway transactions on Caradoc Indian reserve and failure to provide proper and lawful consideration to protect First Nation interest.

Name: Caradoc Reserve 1834 Surrender

Status: under assessment
Description: The First Nation alleges that Canada breached fiduciary duties and duty of honour and integrity in relation to the 1834 Surrender.

Name: Clench Defalcation
Status: settled through negotiation
Description: Misappropriation of sale proceeds from 1845-1854.

Name: Muncey
Status: settled through negotiation
Description: The First Nation alleged that lots 12 and 13 of Caradock Township were illegally patented in 1831, on the basis that no surrender was obtained from the Chippewa Indians for those dates.

Name: Hydro-Right-of-Way
Status: concluded
Description: The First Nation alleged a breach of fiduciary obligations by the Crown for wrongfully renewing a Hydro easement in 1956 after the option to renew expired, and for failing to obtain appropriate compensation for the renewal of the easement. The claim is located in the townships of Caradoc and Delaware.

Self-Government Agreement negotiations
Anishinabek Nation Final Agreement negotiations on Governance and Education
Please see "Other Considerations" below for more details.

Litigation
No relevant litigation listed.

Mississaugas of the Credit
Chief M. Bryan Laforme (appointment expires December 15, 2013)
2789 Mississauga Road
RR 6
Hagersville, Ontario, N0A 1H0
Phone: (905) 768-1133 Fax: (905) 768-1225
www.newcreditfirstnation.com

Treaty Area – Southern Ontario treaties for Settlement: 1783 -1815
For more information on the treaties, see "Other Considerations" below.

Membership
Association of Iroquois and Allied Indians
Chiefs of Ontario
See "Other Considerations" below for more information.

Specific Claims
Name: Brant Tract Purchase
Status: settled through negotiations

Description: The First Nation alleged that the 1797 treaty for cession of lands at Burlington Bay was illegal, and that the Mississauga Nation retained rights and title to lakeshore at Burlington Bay and 200 acres at Burlington Heights. The other First Nations involved in this claim are: Curve Lake, New Credit, Alderville, Scugog and Hiawatha. Note: this claim was settled on October 29, 2010.

Name: Crawford Purchase
Status: concluded- no lawful obligation found
Description: The First Nation alleged that the purchase of 1783-1784 covering lands in Frontenac, Prince Edward, Hastings counties and United county of Lennox Addington was illegal.

Name: Damages to Wild Rice
Status: concluded- no lawful obligation found
Description: The First Nation alleged that Mississauga title to wild rice, traditional economy, waters and lands beneath the waters. They claim that flooding by the Trent canal has destroyed the wild rice and hence their traditional economy.

Name: Gunshot Treaty
Status: concluded- no lawful obligation found
Description: The First Nation alleged that the Gunshot Treaty of 1788 covering lands in Prince Edward and Northumberland counties and regional municipality of Durham was illegal. The First Nations involved are: Curve Lake, New Credit, Alderville, Scugog and Hiawatha.

Name: Lake Ontario Lakeshore
Status: concluded- no lawful obligation found
Description: The Mississauga Tribal Claims Council alleged that part of the lakeshore in the townships of Oakville Burlington, Mississauga and Etobicoke were never ceded by treaty or otherwise. The First Nations involved are: Curve Lake, New Credit, Alderville, Scugog and Hiawatha.

Name: Navy Island
Status: concluded- no lawful obligation found
Description: The Mississauga Tribal Claims Council alleged that islands were never ceded in the Niagara treaty of 1781.

Name: Niagara Treaty Lands
Status: concluded- no lawful obligation found
Description: The Mississauga Tribal Claims Council (MTCC) alleged that lands covered by the Niagara treaty of 1781 in the Regional Municipality of Niagara were never properly ceded & that the Mississauga were not compensated for them. This claim was originally submitted in 1986 by the MTCC as a component of the Williams Treaty claim & was subsequently hived off as a separate claim in 1990.

Name: 200 Acre
Status: settled through negotiations
Description: The First Nation alleged that there was an invalid surrender in 1820, of 200 acres of land on the north shore of the Credit River.

Name: Railway Claim – Loss of Use
Status: settled through negotiation

Description: The First Nation alleged that there was an invalid expropriation of land for railway purposes in 1876, and failure to compensate for interest in lands taken.

Name: Toronto Purchase
Status: settled through negotiation in 2010
Description: Non-fulfillment of the terms of the 1805 Surrender.

Litigation
No relevant litigation.

Moravian of the Thames
Chief Greg Peters
RR 3
Thamesville, Ontario, N0P 2K0
Phone: (519) 692-3936 Fax: (519) 692-5522

Treaty Area – Southern Ontario treaties for settlement: 1783 to 1815
For more information on the treaty, see "Other Considerations" below.

Membership
Southern First Nations Secretariat
Association of Iroquois and Allied Indians
See "Other Considerations" below for further information.

Specific Claims
Name: Orford Township
Status: concluded – no lawful obligation found
Description: Alleged unlawful alienation of 26,325 acres in Orford township.

Litigation
No litigation to report.

Munsee-Delaware Nation
Chief Patrick Waddilove (appointment expires June 4, 2012)
RR1
Muncey, Ontario, N0L 1Y0
Phone: (519) 289-5396 Fax: (519) 289-5156
www.sfns.on.ca/pages/munsee/index.html

Treaty - Southern Ontario treaties for settlement: 1783 to 1815
For more information on the treaties, see "Other Considerations" below.

Membership
London District Chiefs Council (LDCC)

Southern First Nations Secretariat (SFNS)
Union of Ontario Indians
Chiefs of Ontario
See “Other Considerations” below for further information.

Specific Claims
Name: Reserve Allocation
Status: concluded
Description: The claimants alleged that they were to receive more land than was allotted to them.

Self-Government Agreement negotiations
Anishinabek Nation Final Agreement negotiations on Governance and Education
Please see “Other Considerations” for more details.

Litigation
No relevant litigation listed.

Oneida Nation of the Thames
Chief Joel Abram (appointment expires August 2012)
2212 Elm Ave.
Southwold, Ontario, N0L 2G0
Phone: (519) 652-3244 Fax: (519) 652-9287
www.oneida.on.ca

Treaty - Southern Ontario treaties for settlement: 1783 to 1815
For more information on the treaties, see “Other Considerations” below.

Membership
Association of Iroquois and Allied Indians
London District Chiefs Council (LDCC)
Southern First Nations Secretariat (SFNS)
Chiefs of Ontario
See “Other Considerations” below for further information.

No relevant Specific Claims or litigation to report.

Six Nations of the Grand River
Chief William (Bill) Kenneth Montour
1695 Chiefswood Road
PO Box 5000
Ohsweken, Ontario, N0A 1M0
Phone: (519) 445-2201 Fax: (519) 445-4208
www.sixnations.ca

The main reserve is the Six Nations of the Grand River, and is an 18,000 hectare land base located 25 km southwest of the city of Hamilton, between the cities of Brantford, Caledonia and Hagersville, Ontario. Their ancestral homeland is located in the Mohawk River Valley (Ontario and Quebec) and present day states of New York and Vermont.

The Six Nations of the Grand River is the contact point for the following local individual First Nation communities which fall under the Six Nations and/or Haudenosaunee leadership.

Bearfoot Onondago	Mohawks of the Bay of Quinte	Tuscarora
Delaware	Niharondasa Seneca	Upper Cayuga
Konadaha Seneca	Oneida	Upper Mohawk
Lower Cayuga	Onondaga Clear Sky	Walker Mohawk
Lower Mohawk		

The Haudenosaunee Grand Council of Chiefs, also known as the Six Nations Confederacy Council, considers itself to be the central government of the Iroquois Confederacy. They contend that they represent the fifty Chiefs of the Six Nations Confederacy, and assert traditional rights in the southern Ontario region based on the text of the Nanfan treaty. In the past, federal officials have included them in their notification and consultation, however, they are not legally recognized as the official Canadian leadership of the Iroquois.

There is also an American component of the Haudenosaunee Grand Council. It exercises its sovereignty by issuing passports to its citizens travelling abroad. As the territory crosses the Canada/ USA border, many Haudenosaunee citizens work and live on opposite sides and may not recognize either a Canadian or American identity. They also may not view the international border in their territory in the same way that the federal governments of either country do.

Treaty Areas
Southern Ontario pre-Confederation treaties to open the interior: 1815 to 1862 and other pre-Confederation treaties. Haudenosaunee Six Nation rights are premised under these pre-Confederation treaties.

<u>Between the Lakes Treaty of 1784 and 1792</u>
This treaty was a land purchase signed by the Mississauga for a tract of land on either side of the Grand River. Governor Haldimand purchased this land for the Six Nations to enhance the original purchase made for them. This treaty is one of over 30 land purchases and treaties known as the Upper Canada Treaties.

<u>Haldimand Proclamation of 1784</u>
The Six Nations and their descendants were granted by decree, lands six miles deep from each side of the Grand River as compensation for their loss of territory as a result of their alliance with the British during the American War of Independence.

<u>Simcoe Patent of 1793</u>
This patent confirms the lands granted to the Six Nations by the Haldimand Proclamation. It specifies that the Six Nations can surrender and dispose of their land only to the Crown. Any other leases, sales or grants to people other than Six Nations shall be unlawful and such intruders evicted.

<u>Nanfan Treaty of 1701</u>

This Treaty, also known as the Treaty of Albany, covers a land base of 800 by 400 miles around the Lake Erie, Huron and Ontario area, as well as a portion of the United States and includes the five nations of the Mohawks, the Onondagas, the Oneida, the Seneca and Cayuga. The Treaty states:

> "We (the five nations are to have free hunting for us and their heirs and descendants from the Five Nations forever and that free of all disturbances expecting to be protected therein by the Crown of England."

The Province of Ontario (*R. v. Ireland (1990)* decision) recognizes the hunting rights under the Nanfan Treaty. To date, Canada does not have a position concerning the standing of this Treaty.

The Haudenosaunee Council and the elected Chief of the Six Nations submitted a claim to the Minister of AANDC regarding their "right to hunt and fish" which was premised in part on the Nanfan Treaty. The Haudenosaunee Six Nations was referred to the Ontario Government for remedy, as hunting and fishing issues are the responsibility of the province.

<u>The Jay Treaty 1794 – Treaty of Amity, Commerce and Navigation</u>
Since its conclusion in 1794, Aboriginal Peoples have been guaranteed the right to trade and travel between the United States and Canada. This right is recognized in Article III of the Treaty, and subsequent laws of the United States that stem from this Treaty. Canadian-born people with at least 50% Aboriginal blood can enter, live in, and work in the United States without immigration restrictions, and they cannot be deported for any reason. Canada has not passed legislation to implement Article III of the Jay Treaty.

*Atlas of Canada

History of Claims and Negotiations with the Six Nations
Prior to 2006, the Government of Canada and the Province of Ontario held discussions with the Elected Chief and Council of the Six Nations in an attempt to achieve out-of-court resolution on various claims. However, this process was interrupted in February of 2006 when a group of Six Nations protesters took occupation in a residential building site in Caledonia known as the

Douglas Creed Estates. When the situation escalated, the discussion table was extended to include the Haudenosaunee Confederacy Council (HCC). At this time, a Special Federal Representative and Senior Federal Negotiator were appointed.

The Elected Chief and Council (who are elected under the Indian Act) delegated the lead on resolving matters tied to the Douglas Creek Estates to the Haudenosaunee Confederacy Council. Negotiations on other claims continued to include the HCC, who has retained the lead at the negotiating table. The Elected Chief and Council are also represented at the negotiations by a member or members of the Council.

With regard to the litigation process, the elected Chief and Council of the Six Nations and the Haudenosaunee Grand Council are well informed and have an established capacity. It is recommended that any consultation proceed with respect for their negotiating experience, as well as their consultation knowledge and capacity. When planning consultation, federal officials should be approaching both the elected Chief and Council and the Haudenosaunee Council regarding any federal engagement. While the Haudenosaunee Development Insitute (HDI) maintains that the Haudenosaunee Confederacy Chiefs have legislated them to represent their interests on development issues, the federal government is not aware of any legal authority in place for HDI to do so.

Specific Claims and Negotiations

Six Nations of the Grand River have many specific claims filed with Canada, not all of which are currently active. From the 1980s to the mid-1990s, Six Nations submitted 29 specific claims to Canada. In 2007 Canada made an offer to Haudenosaunee Six Nations for settlement of 4 claims: Grand River Navigation Company Investment; Block 5 (Moulton Township); Welland Canada Flooding and the Burtch Tracts. The offer was not accepted and negotiations have not continued since 2008. The specific claims are grouped according to areas below:

The Haldimand Tract

In general, Six Nations' claims deal with past grievances that relate to lands known as the Haldimand Tract. These lands were set aside for Six Nations when they came from New York to Canada in 1784 as allies of the Crown after the American Revolution. A link to a map and information is: http://www.sixnations.ca/LandsResources/HaldProc.htm

Today, the Six Nations reserve covers approximately 50,000 acres of the original million acre tract. The Haudenosaunee/Six nations claims that over the past two centuries, thousands of acres were stolen, improperly transferred to non-Aboriginals, or sold without proper compensation. Canada's negotiation of Six Nations' claims is an out-of-court process. In 1999, 2000 and 2001, all three parties-Six Nations, the Province of Ontario and the Government of Canada-turned from active litigation to talks to find common ground upon which to proceed with some form of out-of-court resolution.

While these efforts did not produce results, other efforts have been made since 2004. The Government of Canada began exploratory discussions with the Six Nations' Elected Chief and Council and the Province of Ontario to address the claims. These discussions were interrupted when a group of Six Nations protesters occupied the then privately owned Douglas Creek Estates site in Caledonia.

There have been no formal negotiation sessions since October 8, 2009. Canada continues to engage in bilateral and trilateral exploratory discussions with representatives from Ontario and

Six Nations (both the elected Chief and Council and the Haudenosaunee Council). The purpose of these discussions has been to explore means to redefine the negotiation process.

The Culbertson Tract Claim
This claim concerns the easterly most First Nation, the Mohawk of the Bay of Quinte. The Culbertson Tract claim relates to a land transaction that took place in 1793. In recognition of military alliance of the Mohawk people during the American Revolution, a tract of land the size of a township was set aside for the Six Nations under a formal treaty issued by Lt.-Gov. John Graves Simcoe. Under the terms of the treaty, if the lands were to fall into the hands of non-Six Nations interests, the Crown promised to "dispossess and evict" the trespassers from the lands and restore the occupied lands to Six Nations possession.

The Mohawk of the Bay of Quinte's claim alleges that approximately 827 acres, now located in the townships of Desoronto and Tyendinaga, was improperly taken from the First Nation in 1837. Specific claim negotiations with Canada closed in 2008, and the issue is now in litigation with the Ontario Federal Court since 2010. However, the Mohawk are not asking the court to determine the validity of their claim to the Tract, but rather they are seeking an order that Canada is in breach of fiduciary duty and other legal duties to negotiate in good faith under the Specific Claims Branch Policy. If the Mohawk choose to claim title to the land, they can do so through AANDC's Special Claims process.

Litigation
Name: Six Nations Elected Council on its own behalf and on behalf of the Six Nations of the Grand River v. The Corporation of the City of Brantford
Status: active
Court No: CV-08-361454
Description: The Plaintiffs seek various declarations pertaining to Ontario and/or the City of Brantford's constitutional duty to consult with and accommodate the Six Nations of the Grand River before considering or undertaking any planning activities and disposition of lands which could potentially affect the interests of the Six Nations of the Grand River.

Name: Six Nations of the Grand River Band of Indians et al. – Superior Court of Justice
Status: active
Court No.: 406/95
Description: The Plaintiffs claims that an accounting of all Six Nations' assets including money and real property that was to be held in trust by the Crown for the benefit of the Six Nations since 1784. The Plaintiff seeks a declaration by the Court that the Defendants are in breached of their fiduciary duties towards the Plaintiff, and are liable for replacing all assets or the value of all assets found to be missing, with compound interest.

Name: Aaron Detlor; the Haudenosaunee Development Institute v. the Corporation of the City of Brantford – Superior Court of Justice
Status: active
Court No.: CV-08-356782
Description: The Applicants Aaron Detlor and the Haudenosaunee Development Institute intend to question the constitutional validity and applicability of By-laws 63-2008 and 64-2008 of the City of Brantford Municipal Code, made under the Municipal Act, 2001, S.O. 2001, c. 25.

Name: King Chief ah'she hodeeheehonto v. HMTQ in Right of Canada
Status: active
Court No.: 10-20244 JR

Description: This is a Notice of Constitutional Question which seems to involve an argument involving Six Nations that among other things relies on the Two Row Wampum Treaty and other Aboriginal and treaty rights, as protection from the jurisdictional obligation to follow Canada's laws and other obligatory requirements.

Unitlateral Protocols

Six Nations of the Grand River Land Use Consultation and Accommodation Policy

The Six Nations of the Grand River published a consultation and accommodation policy in 2009. The Six Nations request that the Crown, developers and municipalities consult in good faith to obtain free and informed consent prior to approval of any projects affecting their interests. It is recommended that this protocol be reviewed in advance of consultation to better understand First Nation expectations. However, the federal government does not endorse its content. The link to the protocol is: http://www.sixnations.ca/admConsultationAccomodationPolicy.pdf

The Development Protocol of the Haudenosaunee Development Institute

The Haudendosaunee Development Institute states that the Haudenosaunee Confederacy Chiefs have legislated the Institute to represent their interests in the development of lands within areas of Haudenosaunee jurisdiction. They maintain that this includes, but is not limited to, the land prescribed by the Haldimand Proclamation and the 1701 Treaty area. It is recommended that this protocol be reviewed in advance of consultation to better understand First Nation expectations. However, the federal government does not endorse its content. The link to the protocol and further information is: www.haudenosauneeconfederacy.ca/HDI/aboutus.html

Walpole Island

Chief Joseph Gilbert (appointment expires June 23, 2012)
RR 3, Wallaceburg, Ontario, N8A 4K9
Phone: (519) 627-1481 Fax: (519) 627-0440
www.bkejwanong.com

Treaty Area

There is no treaty establishing the Walpole Island reserve. Walpole Island is unsurrendered land of the First Nation which was granted reserve status through the 1850 Proclamation intended to protect the "lands and property of the Indians in Lower Canada". The following specific claims and litigation refers to land outside of the Walpole Island reserve. The Federal Government's position is that it does not recognize Aboriginal rights and title to these off-reserve areas.

Membership

Southern First Nations Secretariat
Chiefs of Ontario
See "Other Considerations" below for more information.

Specific Claims

Many of the below claims are listed as 'active litigation'. This means that the First Nation may have chosen to pursue these claims through the courts after submitting them to the Specific Claims process, or, to refer them to the Specific Claims Tribunal for a binding decision.

Name: Anderdon
Status: active litigation
Description: The First Nation alleges that the Crown failed to carry out the terms of the surrender of 300 acres in Anderdon Township in 1848.

Name: Bob Lo (Bois Blanc) Island
Status: active litigation
Description: The First Nation alleges that the surrender in 1786 was invalid and that no compensation was ever paid.

Name: East Sister Island
Status: active litigation
Description: The First Nation alleges that the Crown breached its fiduciary obligations regarding the use, license and disposition of the island.

Name: Fighting Island
Status: active litigation
Description: The First Nation alleges that Fighting Island and the adjacent fishery and waters have never been lawfully surrendered by Walpole Island First Nation.

Name: Grass Island
Status: active litigation
Description: The First Nation alleges that Canada illegally patented Grass Island in 1890, and that the island was never surrendered. Furthermore, no compensation for it was paid to Walpole Island.

Name: Hen and Chicken Island
Status: active litigation
Description: The First Nation alleges the Crown breached its fiduciary obligations regarding the use, licence and disposition of the island.

Name: Lower Indian Reserve
Status: active negotiations
Description: The First Nation seeks the return of lower reserve, or compensation and questions the price paid for the land. The claim is located in the township of Moore.

Name: Middle Island
Status: active litigation
Description: The First Nation alleges the Crown breached its fiduciary obligations permitting Middle Island to be occupied pursuant to a license of occupation with no renumeration to the First Nation. The Crown also failed to advertise the sale of Middle Island.

Name: North Harbour Island
Status: active litigation
Description: The First Nation alleges the Crown breached its fiduciary obligations regarding the use, licence and disposition of the island

Name: Peche Island (Fishing / Peach Island)
Status: active litigation

Description: The First Nation alleges licenses and leases were issued to Peche Island without any compensation paid to First Nation. Claimant also alleges that they did not receive fair market value for Peche Island at time of surrender in 1857.

Name: Pelee Island
Status: active litigation
Description: The First Nation alleges Pelee Island was never surrendered, and that 1870 surrender did not include Pelee Island. Furthermore, no compensation has been paid to the First Nation for the island.

Name: St. Clair Flats
Status: active litigation
Description: The First Nation alleges that in 1892 Ontario illegally sold and patented part of St. Clair Flats.

Name: Turkey Island
Status: active litigation
Description: The First Nation alleged that Walpole Island Indians and the Chippewas of Anderdon were the rightful owners of Turkey Island. They claim that Canada erred in seeking a surrender from the Wyandotts of Anderdon in 1874.

Name: Chenail Ecarte Reserve
Status: concluded – no lawful obligation found
Description: The First Nation alleged that Chenail Ecarte Reserve was intended to be 144 sq. miles, while the Surrender #7 document specified on 12 sq. miles. Furthermore, it is claimed that as per the terms of treaty, payment were never fulfilled. (Sombra Townships)

Name: Sawmill and Dock Lease Surrender (Surrender Project)
Status: concluded - no lawful obligation found
Description: The First Nation alleged the Crown broke its fiduciary obligations to the Band regarding a 5 year lease of 3 acres of reserve land in 1883, for the purposes of constructing a dock and lumber mill.

Name: Enniskillen (SPLIT #03) Walpole Island
Status: concluded - file closed
Description: The First Nation alleged that certain lands in Enniskillen Township were sold without surrender. Other Claimants - Kettle and Stony Point and Aamjiwnaang First Nations have settled this claim.

Name: 1958 Seaway Treaty (Surrender Project)
Status: concluded – no lawful obligation found
Description: This claim concerns construction of 16mi x 1000ft channel on Indian Reserve #46. The First Nation alleged that the Crown: did not conduct sufficient evaluation or impact studies prior to surrender; provided inadequate compensation; created injurious affection to remaining lands; created loss of economic opportunity related to the lands and damages resulting from construction of the channel. They also alleged no consideration was given to a lease rather than a surrender.

Name: Attempted Survey
Status: settled through negotiations

Description: The First Nation alleged the government attempted to survey Walpole Island 1890-1910 against the wishes of the First Nation. They sought return of First Nation trust funds used to pay for the survey, which was never completed.

Name: Fawn Island
Status: concluded – no lawful obligation found
Description: The Walpole Island First Nation claims that Canada was negligent in breach of its fiduciary duty regarding the deposition of Fawn Island and that the lands were sold for less than their fair market value. The island was surrender in 1857, but only sold in 1875.

Name: Middle Sister Island
Status: no lawful obligation found
Description: Alleged the Crown breached its fiduciary obligations regarding the use, licence and disposition of the island, and sold the island for less than fair market value.

Name: Surrender for Timber on Walpole Island
Status: no lawful obligation found
Description: The First Nation alleges that Canada breached its fiduciary obligation by upholding the Jan. 30, 1883 vote when the Indian Act Agent provided only one proposal for consideration and in suggesting or threatening that if the First Nation didn't value in favour of the proposal, the timber would be surrendered to the Crown for sale by tender.

Litigation
Name: Walpole Island First Nation, Bkejwanong Territory v. Attorney General of Canada, HMTQ in Right of Ontario
Status: active
Court No.: 00-CV-189329
Description: The Plaintiff is asserting their unextinguished Aboriginal title and claiming the Aboriginal right to hunt, access and preserve sacred sites to the Three Fires Confederacy Unceded Traditional Lands. The claimed area includes land that is subject to treaty 25 (1822) which was not signed by the Plaintiff. These lands also include lands subject to treaties 2,6,7,12,29 and the Township of Anderdon. The Plaintiff excludes islands or water lots that were encompassed by treaties signed by them or their predecessors, as well as any land that is owned in fee simple by private parties.

Name: HMTQ in Right of Canada v. Clark Peters, Paul Tooshkenig Jr., William Shipman, Lonni Shipman, Clark Peters Jr.
Status: active
Court No.: not available
Description: The Notice of Constitutional Question deals with the Robinson-Superior Treaty that provides that " its Aboriginal beneficiaries the full and free privilege to hunt". The Defendants are members of the Walpole First Nation, and were hunting moose in the Robinson-Superior Treaty area, with the permission of the Michipicoten First Nation. They are challenging Section 6 of the Fish and Wildlife Conservation Act, alleging that it gives no priority to any persons having Treaty or Aboriginal rights, and is inconsistent with section 35 of the Constitution Act, 1982, and it is therefore inapplicable to Aboriginal persons.

Name: William Shipman, Clark Peters Jr., Clark Peters, Paul Tooshkenig, Lonnie Shipman v. HMTQ in Right of Canada
Status: active
Court No.: 260-91; 260-92; 260-94; 260-25

Description: The Defendants intend to question the validity of s.6 of the Fish and Wildlife Conservation Act made pursuant to the Interim Enforcement Policy, generally and in regard to the application to the Defendants. The Defendants were charged with hunting moose for food purposes, within the boundaries of the Robinson-Superior Treaty. The Defendants assert that they were exercising their aboriginal and/or treaty right to hunt within their traditional territory.

Name: William Shipman, Clark Peters Jr., Clark Peters, Paul Tooshkenig, Lonnie Shipman v. HMTQ in Right of Canada
Status: active
Court No.: C44543
Description: The Appellants intend to question the constitutional validity and applicability of s.6 of the Fish and Wildlife Conservation Act. The Appellants assert that the Ontario licensing system for the issuance of moose hunting licences gives no priority to any persons having Treaty or Aboriginal rights. They will argue, inter alia, that s.6 of the Fish and Wildlife Conservation Act is inconsistent with s. 35 of the Constitution Act as it does not give priority to persons having Treaty or Aboriginal rights, and that prosecutorial discretion cannot be exercised if the constitutional priority of Treaty and Aboriginal rights is not respected. They will also argue that they are entitled to the benefits of the hunting rights protected by the Robinson-Superior Treaty and by s. 35 of the Constitution Act, and that these hunting rights are unjustifiably infringed by s. 6 of the Fish and Wildlife Conservation Act.

Name: Chief Daniel R. Miskokomon v. Minister of Transport
Status: closed
Court No.: T-1920-93
Description: The plaintiffs claim Aboriginal and treaty rights and aboriginal title to the waters and beds under the waters of portions of Lake Huron, the St. Clair River, Lake St. Clair, and Lake Erie stemming from the Royal Proclamation of 1763. The plaintiffs further state that Canada is in breach of its fiduciary duty to the First Nation for granting easements to permit construction of the CN tunnel, which will directly interfere with the rights and title of the First Nation.

Name: Walpole Island First Nation v. Attorney General of Canada, Minister of Environment, ICI Canada Inc.
Status: closed
Court No.: T-272-97
Description: Imperial Chemical Industries Canada (ICI) operated a fertilizer plant on the St. Clair River from 1967-1968. On 10 Feb 1995, ICI applied for approval to discharge waste into the river - approval was granted. The Walpole Island First Nation (WIFN) commenced actions to have the decision rescinded. The Minister of Environment refused because, among other things, the proposed discharge posed no threat to public health or environment. On May 29, 1997 WIFN filed a Memorandum of Argument, claiming that the Minister's decision constituted an infringement of their Charter rights i.e. enjoyment of life and health.

Walpole Island First Nation Consultation and Accommodation Protocol
The Walpole Island First Nation passed its own consultation and accommodation protocol. It states their expectations from government and proponents in any activities or decision making undertaken in their traditional territory. It is recommended that this protocol be reviewed in advance of consultation to better understand the First Nation's expectations. However, the federal government does not endorse its content. The link to the protocol is:
www.bkejwanong.com/Newsletter/consult%20protocol%20final%2003%2003%2009.pdf

Consultation Feedback

In January 2012, during consultations with an agency of the Federal Government, it was noted by the Walpole Island First Nation that they would like to be consulted, in person, regarding specific projects but also regarding agency/department policies on approving specific projects involving environmental impacts. Of specific interest is insuring that the First Nation were taken into account when projects are being screened, assessed and approved.

Other Considerations

Aboriginal Rights Assertions: the Métis

The inclusion of the Métis in s.35 represents Canada's commitment to recognize and value their distinctive cultures, which can only survive if they are protected along with other Aboriginal communities. In 2003, the Supreme Court of Canada affirmed Métis rights under s.35 of the Constitution Act, 1982, in the Sault St. Marie area, in the *Powley* decision. For more information on the Powley decision visit the following link: www.aadnc-aandc.gc.ca/eng/1100100014419

The Office of the Federal Interlocutor for Métis and Non-Status Indians (OFI) is aware that the Métis Nation of Ontario (MNO), its regional and community councils, have asserted a Métis right to harvest in a large section of the province.

The provincial government has accommodated Métis rights on a regional basis within Métis harvesting territories identified by the MNO. These accommodations are based on credible Métis rights assertions. An interim agreement (2004) between the Métis Nation of Ontario (MNO) and the Ministry of Natural Resources (MNR) recognizes the MNO's Harvest Card system. This means that Harvester's Certificate holders engage in traditional Métis harvest activities within identified Métis traditional territories across the province. For a map of Métis traditional harvesting territories visit the MNO website at:
http://www.metisnation.org/harvesting/harvesting-map.aspx

The MNO maintains that Aboriginal 'rights-holders' are Métis communities which are collectively represented through the MNO and its Community Councils. In partnership with community councils, MNO has established a consultation process. The MNO has published regional consultation protocols on their website which offer pre-consultation stage instructions on engaging the Métis through their community councils (via the consultation committee made up of an MNO regional councilor, a community councilor representative and a Captain of the Hunt). A list of the community councils is also available. Note however, that this organization does not represent all Métis in Ontario.

Métis Nation of Ontario
Métis Consultation Unit is located within the MNO head office.
500 Old St. Patrick Street, Unit D
Ottawa, Ontario, K1N 9G4
Phone: (613) 798-1488 Fax: (613) 725-4225
www.metisnation.org/home.aspx

Métis National Council
350 Sparks Street, Suite 201
Ottawa, Ontario, K1R 7S8
Phone: (613) 232-3216 Fax: (613) 232-4262
www.metisnation.ca

For an indication of the population in Ontario who self-identify as Métis, visit the Statistics Canada website. The Ontario map indicates populations as small as 250 up to over 2,000 within its borders.
http://geodepot.statcan.gc.ca/2006/13011619/20080513012009031301161 9/16181522091403090112_13011619/15140102151809070914011 2_2015200112130520091909041615 16_0503-eng.pdf

Métis Litigation in Ontario
Name: HMTQ in Right of Canada v. Michel Blais
Status: active
Court No.: 08-213
Description: The Application is charged with unlawfully harvesting forest resources in a Crown forest without a license contrary to the Crown Forest Sustainability Act, 1994. The Applicant, a Métis, asserts that he is an Aboriginal person within the meaning of s. 35 of the Constitution Act, 1982 and that the alleged harvesting occurred in lands set apart for the Batchewana Band pursuant to the Robinson Treaty of 1850. He claims that the Batchewana First Nation may permit Métis persons to exercise the same Aboriginal and treaty rights as its members pursuant to this treaty.

Name: HMTQ in Right of Canada v. Denis Larabie
Status: active
Court No.: n/a
Description: The defendant has been charged for unlawfully hunting cow and bull moose without a license and possessing killed wildlife contrary to s.6 (1)(a) and s.12 of the Fish and Wildlife Conservation Act. The defendant identifies himself as Métis and claims that he was exercising his Aboriginal and/or treaty right by hunting within his traditional territory in Ontario.

Name: HMTQ in Right of Canada, Laurie Desautels v. Henry Wetelainen Jr.
Status: active
Court No.: CV-08-151
Description: The defendant, Henry Wetelainen Jr., intends to question the constitutional validity of sections 28, 31 and 40 of the Crown Forest Sustainability Act (1994), S.O. 1994, c. 25 and Ontario Regulation 167/95, as amended, in relation to an act or omission of the government of Ontario. The defendant claims that he was exercising Aboriginal and treaty rights afforded by the Adhesion to Treaty 3, by harvesting wood within his traditional territory. He claims that he is a Métis/Non-Status Indian and that the imposition of payment for harvesting or use of the forest resource is an infringement and violates is constitutional rights.

Name: Ministry of Natural Resources v. Kenneth Sr. Paquette
Status: active
Court No.: to be determined
Description: This Notice of Constitutional Question relates to a provincial prosecution involving a charge pertaining to hunting moose. The Defendant intends to assert his s. 35 right as a Métis person to hunt moose, and he also intends to seek a Charter remedy under s. 15 of the *Charter.*

Court Decisions concerning Métis in Ontario
R. v. Laurin, Lemieux, Lemieux - 2007
Court No.: ONCJ 265

Three Métis defendants were charged with fishing violations and claimed that the decision of the Ministry of Natural Resources (MNR) to prosecute them violated the terms of the Interim Agreement (2004) between the MNR and the Métis Nation of Ontario (MNO). As the defendants

were indeed Harvester Card holders authorized to fish in the Mattawa/Nipissing territory, therefore, they were entitled to the exemption in the agreement.

The Court concluded that laying of charges against any valid Harvester Card holder who is harvesting in the territory designated on the card within 2 years of the 2004 agreement was a breach. The Interim Agreement itself was silent as to any geographic limitations. There was no mention of the Agreement only applying north and east of Sudbury. Further, the reliance on Harvester Cards, which explicitly contained the territorial designation of the cardholder, signified that the MNR accepted such designations for the purpose of the agreement. The Court was clear to note that this case did not make any ruling regarding the merits of any claim that the Mattawa/Nipissing area contains section 35 rights bearing Métis communities.

Membership

First Nations may or may not delegate certain authority and/or powers to tribal councils to administer programs, funding and/or services on their behalf. The best source of information with respect to consultation is though individual First Nations themselves.

Association of Iroquois and Allied Indians
This is a political organization which advocates the interests of its eight members. Using political lines the members form a collective to protect their Aboriginal and treaty rights.
387 Princess Avenue
London, Ontario, N6B 2A7
Phone: (519) 434-2761
www.aiai.on.ca

Chiefs of Ontario
The Chiefs of Ontario is a coordinating body for 133 First Nation communities in Ontario. The main objective of this body is to facilitate the discussion, planning, implementation and evaluation of all local, regional and national matters affecting its members.
www.chiefs-of-ontario.org

Administrative Office:
111 Peter Street, Suite 804
Toronto, Ontario, M5V 2H1
Phone: (416) 597-1266
Fax: (416) 597-8365

Political Office:
Fort William First Nation
RR 4, Suite 101, 9- Anemki Drive
Thunder Bay, Ontario, P7J 1A5
Phone: (807) 626-9339
Fax: (807) 626-9404

The Union of Ontario Indians (UOI)
The UOI is a political advocate for approximately 40 member First Nations across Ontario. Its headquarters is located on Nipissing First Nation, just outside of North Bay Ontario, and has satellite offices in Thunder Bay, Curve Lake First Nation and Munsee-Delaware First Nation. The UOI delivers a variety of programs and services. The Anishinabek Nation incorporated the Union of Ontario Indians (UOI) as its secretariat in 1949.
Head Office:
1 Miigizi Mikan
North Bay, Ontario, P1B 8J8
Phone: (705) 497-9127
Fax: (705) 497-9135

Thunder Bay
300 Anemki Place
Thunder Bay, Ontario, P7J 1H9
Phone: (807) 623-8887

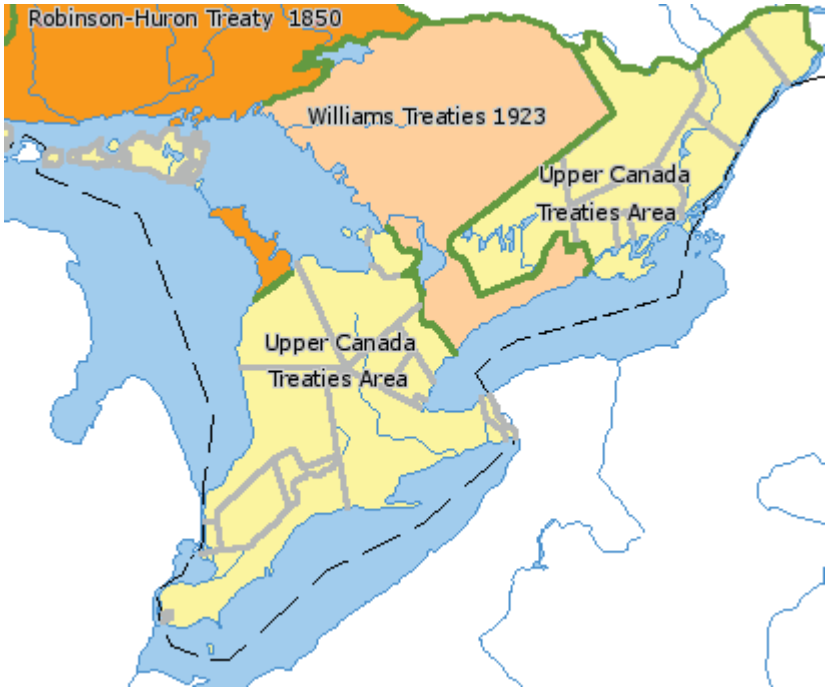
London District Chiefs Council (LDCC) and the Southern First Nations Secretariat (SFNS)

The Council is an association of Seven First Nation governments in southwestern Ontario.
22361 Austin Line
Bothwell, Ontario, N0P 1C0
Phone: 519-692-5868 Fax: 519-692-5972

The Secretariat is a non-profit, non-political corporate support body. It provides service delivery for the London District Chiefs Council (LDCC). The Secretariat facilitates communications amongst their member First Nations, their organizations and other similar service providers.
22361 Austin Line
Bothwell, Ontario
N0P 1C0
Tel: 519-692-5868
http://www.sfns.on.ca

Treaties of Southern Ontario- The Upper Canada Treaties

There are several treaty making eras which impact the province of Ontario. These eras are known as the Upper Canada Land Surrenders from 1764 to 1862. The Upper Canada Land Surrenders are seen as treaties which transfer all Aboriginal rights and title to the Crown in exchange for one-time payments. In light of the evolution of Aboriginal law over the past twenty years, this position may not be as clear as believed. There may be residual rights remaining especially relating to hunting and fishing.



*Atlas of Canada

1764-1782 – Early Land Surrenders

The Royal Proclamation of 1763 established the protection from encroachment of an Aboriginal territory outside of the colonial boundaries. Rules and protocols for the acquisition of Aboriginal lands by Crown officials were set out and became the basis for all future land treaties. In response to military and defensive needs around the Great Lakes, the Indian Department negotiated several land surrender treaties in the Niagara region.

1783-1815- Treaties for Settlement
As part of the plan to resettle some 30,000 United Empire Loyalists who refused to accept American rule, and fled to Montreal, the Indian Department undertook a series of land surrenders west of the Ottawa River with the Mississauga and the Chippewa of the southern Great Lakes.

1815-1862- Treaties to Open the Interior
After the war of 1812, the colonial administration of Upper Canada focused on greater settlement of the colony. The Indian Department completed the last of the over 30 Upper Canada Land Surrenders around the Kawartha, Georgian Bay, and the Rideau and Ottawa Rivers. All of this land which today is known as Southern Ontario, was ceded to the Crown.

Self Government Agreement Negotiations

Anishinabek Nation (Union of Ontario Indians) Final Agreement Negotiations on Governance and Education

In 1995, the Anishinabek Nation's Grand Council authorized its secretariat arm, the Union of Ontario Indians (UOI), to begin self-government negotiations with Canada. Negotiations toward agreements in the areas of education and governance began in 1998.

An agreement-in-principle (AIP) on education was signed in November 2002. In February 2007, the parties signed the AIP with respect to governance. Final agreement negotiations are proceeding in parallel, and together these agreements would mark important steps toward the Anishinabek Nation's long-term objective of supporting participating First Nations to achieve greater autonomy.

The governance final agreement will provide the framework for the establishment of the Anishinabek Nation government and for the recognition of participating First nation lawmaking authority in four core governance areas: leadership selection, citizenship, culture and language, and management and operations of government.

The education final agreement (which is nearing conclusion) authorized the parties to negotiate a final agreement with respect to lawmaking authority for primary, elementary and secondary education for on-reserve members, and to administer AANDC's post-secondary education assistance program. The Province of Ontario is not a party to these negotiations but is engaged in tripartite discussions on particular issues that would assist in the implementation of the final agreement.

A draft Anishinabek Nation Constitution ("Ngo Dwe Waangizid Anishinaabe") is scheduled to go to a vote at the Grand Council Assembly in June of 2012. Individual First nation constitutions are also being developed. In order to prepare for self-government in member communities, the Union of Ontario Indians has undertaken a range of activities including a Community Engagement Strategy, the development of an appeal and redress process, as well as a number of capacity development activities.

Provincial guidelines

Under its responsibility to promote stronger Aboriginal relationships, the Ontario Ministry of Aboriginal Affairs has produced *Draft Guidelines on Consultation with Aboriginal Peoples Related to Aboriginal Rights and Treaty Rights.* These guidelines are for use by ministries who seek input from key First Nations and Métis organizations, all Ontario First Nations and selected non-Aboriginal stakeholders. To review the guidelines, visit:
http://www.aboriginalaffairs.gov.on.ca/english/policy/draftconsultjune2006.pdf

Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London

Notice of Study Commencement and Public Information Centre – Comment Form

Please complete this form and return it to Dillon Consulting Limited. Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. Unless otherwise stated in the submission, all personal information such as name, address, and property location will become part of the public record and will be included in the final report.

☑ I/we would like to kept informed regarding this project.

☐ Please remove me from the mailing list for this project.

Agency: (If applicable) London Transit Commission

Name:

Mailing Address: 450 Highbury Ave N.
London, ON N5W 5L2

☐ I/we prefer to receive information by email.

E-mail:

Comments/ Questions/ Concerns:

LTC currently does not have any transit routes within area, however consideration should be given to any possible future service to businesses around Wilton Grove / 401 area. We also use this interchange for transporting buses between the Highbury and Wonderland Garages.

Please return this form by **July 11, 2012** to:

Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2

Tel: 519-438-1288 Ext. 1235
Fax: 519-672-8209
E-mail: hwy3and4@dillon.ca

DILLON CONSULTING

Attention: Sabrina Stanlake
File No. 12-6151

Highbury Interchange ›

today's PIC

2 posts by 2 authors in Highbury Interchange

[redacted] Jun 20 Post reply

We only just received the notice today. Other than the two woodlands to the south of the Highbury / 401 interchange, we are unaware of other natural heritage features in the area. We have two questions:

1. Do any of the alternatives harm the two woodlands?
2. What other natural heritage features are being studied?

Thank you in advance for your reply.

[redacted]

Reply

me (bf...@dillon.ca change) Jun 25 Post reply

[redacted]

Thank you for your comments and questions regarding the Highway 401 Interchange Reconstruction at Highbury Avenue project. We are sorry to hear that you were not able to attend the Public Information Centre held on June 20, 2012. Attached you will find a copy of the display boards presented at the Public Information Centre for your review. At this time, we are collecting comments from the PIC and anticipate responding to all inquires after July 11, 2012; we will respond to your inquiries at that time. In the mean time should you have any further comments or wish to further discuss this project please contact us.

Sincerely,

DILLON CONSULTING

Brandon Fox
Dillon Consulting Limited
130 Dufferin Suite 1400
London, Ontario, N6A 5R2
T - 519.438.1288 ext. 1307
BFox@dillon.ca
www.dillon.ca

Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London

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☑ I/we would like to kept informed regarding this project.

☐ Please remove me from the mailing list for this project.

Agency: (If applicable) Campbell Bros. Movers Limited

Name: Kim Myles

Mailing Address: 55 Midpark Cres.
London, On
N6N 1A9

☐ I/we prefer to receive information by email.

E-mail: _____

Comments/ Questions/ Concerns:

Please return this form by **July 11, 2012** to:

Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2

Tel: 519-438-1288 Ext. 1235
Fax: 519-672-8209
E-mail: hwy3and4@dillon.ca

DILLON CONSULTING

Attention: Sabrina Stanlake
File No. 12-6151

Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London
GWP 3032-11-00

RECEIVED
JUN 2 7 2012
DILLON, LONDON

Public Information Centre – Record of Comment Form
June 20, 2012

Comments:

We are a local moving company with many tractor-trailers and trucks that use this area on a regular basis. We would like to be informed on when ramp closures are expected (dates and duration) if possible. And perhaps information on when lanes will be reduced. We are concerned with the traffic impacts during the project and would be to be informed of anything affecting that. We realize details will be not issued until the next phase of the project and will be waiting for any notice. Thank you.

Please complete and place in the comment box or return by **July 11, 2012** to:

Sabrina Stanlake, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Tel: (519) 438-1288 Ext. 1235
Fax: (519) 672-8209
Email: highburyinterchange@dillon.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act.* With the exception of personal information, all comments will become part of the public record.

Agency: (If applicable) Campbell Bros. Movers Limited

Name: Don Campbell Please send info to: Kim Myles

Mailing Address: 55 Midpark Cres., London, On. N6N 1A9

Telephone/ e-mail: (519) 681-5710 / doncampbell@campbellbros.com

Please send info to: kimm@campbellbros.com
(519) 681-5710
ext. 232

DILLON CONSULTING

File No. 12-6151

Highbury Interchange ›

Fwd: FW: Scanned from MFP-04632930 06/26/2012 14:26

1 post by 1 author in Highbury Interchange

me (bf...@dillon.ca change) Jul 17 (2 days ago) Post reply

On Tuesday, June 26, 2012 2:34:19 PM UTC-4, Bob Brown wrote:

> Just a response to keep us informed as you proceed with highbury project
>
> Thank you
>
> Bob Brown
> Manager - Safety - Compliance
>
> 1497 Wilton Grove Road| London | ON | N6N 1M3
> O:(800) 567-2609 x208 | P:(519) 644-9090 x208
>
> ----Original Message----
> From: London shop [mailto:trailer_photo@challenger.com]
> Sent: Tuesday, June 26, 2012 3:26 PM
> To: Bob Brown
> Subject: Scanned from MFP-04632930 06/26/2012 14:26
>
> Scanned from MFP-04632930.
> Date: 06/26/2012 14:26
> Pages:1
> Resolution:200x200 DPI
> ---

Reply

Call from area business

1 post by 1 author in Highbury Interchange

Stanlake, Sabrina Jun 19 Post reply

Images are not displayed
Display images in this post - Always display images from Stanlake, Sabrina - Always display images in Highbury Interchange

I spoke with Don Ferguson, Northern Marketing. He works at a business at the northeast corner of Highway 401 and Pond Mills Road.

He asked about property required at their business (none required) and any other impacts to the operation.

No one from the company is available to attend the PIC, so I am am going to forward the boards after the meeting.

Sabrina Stanlake RPP, LEED AP
Associate
Dillon Consulting Limited
130 Dufferin Avenue Suite 1400
London, Ontario, N6A 5R2
T - 519.438.1288 ext. 1235
F - 519.672.8209
M - 519.630.3849
SStanlake@dillon.ca
www.dillon.ca

Please consider the environment before printing this email

Reply

Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London

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☑ I/we would like to kept informed regarding this project. by e-mail address below

☐ Please remove me from the mailing list for this project.

Agency: (If applicable) FRED BARBER CONSTRUCTION LIMITED

Name: FRED BARBER

Mailing Address: 435 Piccadilly ST
LONDON ON N5Y 3G4

☑ I/we prefer to receive information by email.

E-mail: barberfred@rogers.com

Comments/ Questions/ Concerns:

We are owners of the property at 91 Enterprise DRIVE.

Please return this form by **July 11, 2012** to:

Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2

Tel: 519-438-1288 Ext. 1235
Fax: 519-672-8209
E-mail: hwy3and4@dillon.ca

DILLON CONSULTING

Attention: Sabrina Stanlake
File No. 12-6151

Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London

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☐ Please remove me from the mailing list for this project.

Agency: (If applicable) _____

Name: GEORGIAN BAY FIRE & SAFETY LTD.

Mailing Address: 1022 Hubrey Rd
LONDON, ONT

☑ I/we prefer to receive information by email.

E-mail: rjtaylor@gbfire.com.

Comments/ Questions/ Concerns:

Please return this form by **July 11, 2012** to:

Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2

Tel: 519-438-1288 Ext. 1235
Fax: 519-672-8209
E-mail: hwy3and4@dillon.ca

DILLON CONSULTING

Attention: Sabrina Stanlake
File No. 12-6151

Fox, Brandon <bfox@dillon.ca>

Re: Access to Contact List - Highbury Avenue Interchange

1 message

[redacted] Sat, Jun 16, 2012 at 12:31 PM
Reply-To: [redacted]
To: "Fox, Brandon" <bfox@dillon.ca>

Thank you Brandon.

[redacted]
Sent wirelessly from my BlackBerry device on the Bell network.
Envoyé sans fil par mon terminal mobile BlackBerry sur le réseau de Bell.

From: "Fox, Brandon" <bfox@dillon.ca>
Date: Fri, 15 Jun 2012 14:24:55 -0400
To: [redacted]
Cc: Sabrina Stanlake<sstanlake@dillon.ca>; 126151<126151@dillon.ca>; Kevin Welker<kwelker@dillon.ca>
Subject: Access to Contact List - Highbury Avenue Interchange

Dear [redacted]

Thank you for your recent request for access to the Highbury Avenue Interchange Contact List page which is found at www.highburyinterchange.ca. Prior to your request for access, we were unaware of a glitch on the web form; thank you for bringing this issue to our attention. We have now fixed the IT issue with the website and it is now open for all to access and submit their contact information for inclusion in the contact list.

We have added your name and email address to the list as per your access request. Thank you for your email.

Sincerely,

--

Brandon Fox
Dillon Consulting Limited
130 Dufferin Suite 1400
London, Ontario, N6A 5R2
T - 519.438.1288 ext. 1307
BFox@dillon.ca
www.dillon.ca

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Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London

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JUN 25 2012
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☐ Please remove me from the mailing list for this project.

Agency: (If applicable) N/A

Name: M.T. Group Inc

Mailing Address: 11 Riddout St. W
Tillsonburg ON
N4G-2C8

This is our 4 months.

☑ I/we prefer to receive information by email.

E-mail: YUANGEL@KWIC.COM
yuangel@kwic.com

Comments/ Questions/ Concerns:

phone 519-842-9368

contact - George Colliesy
519-842-9368

Please return this form by **July 11, 2012** to:

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Attention: Sabrina Stanlake

File No. 12-6151

Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London

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Name: _____

Mailing Address: _____

MRK Company Inc.
1665 Shawson Drive
Mississauga, ON L4W 1T7

☑ I/we prefer to receive information by email.

E-mail: robert.edmonds@driveproducts.com

Comments/ Questions/ Concerns:

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File No. 12-6151

Ontario Ministry of Transportation
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☑ I/we would like to kept informed regarding this project.

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Agency: (If applicable) _____

Name: SFJ Inc.

Mailing Address: 5508 Longs Rd.
Knoxville, TN 37909

☐ I/we prefer to receive information by email.

E-mail: _____

Comments/ Questions/ Concerns:

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London, Ontario, N6A 5R2

Tel: 519-438-1288 Ext. 1235
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Attention: Sabrina Stanlake
File No. 12-6151

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Ontario Ministry of Transportation
Reconstruction of Highway 401/ Highbury Avenue Interchange - City of London

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☐ Please remove me from the mailing list for this project.

Agency: (If applicable)

Name:

Mailing Address:

[redacted]

☐ I/we prefer to receive information by email.

E-mail:

Comments/ Questions/ Concerns:

WE OPERATE A TRUCKING CO IN THIS AREA & WOULD APPRECIATE NOTICE OF ANY ROAD CLOSINGS OR INTERUPTIONS IN TRAFFIC

[redacted]

Please return this form by **July 11, 2012** to:

Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2

Tel: 519-438-1288 Ext. 1235
Fax: 519-672-8209
E-mail: hwy3and4@dillon.ca

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Attention: Sabrina Stanlake
File No. 12-6151

APPENDIX B

Terrestrial Ecosystem Assessment Report

Highway 401 Interchange Reconstruction at Highbury Avenue

GWP 3032-11-00
Agreement No. 3011-E-0022

August 2012

Terrestrial Ecosystem Assessment Report

File No. 12-6151

DILLON CONSULTING

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1. INTRODUCTION

Dillon Consulting Limited was retained by the Ministry of Transportation, Ontario (MTO) to update the Preliminary Design, initiate the Detail Design and complete the Class Environmental Assessment (EA) process for the reconstruction of the existing Highway 401/Highbury Avenue interchange in the City of London, including work on Highbury Avenue from south of Bradley Avenue to the Wilton Grove Road intersection (see **Figure 1**).

Dillon completed an assessment of Terrestrial Ecosystems as part of the Class EA. This Terrestrial Ecosystems Assessment Report (TEAR) addresses the potential environmental impacts of the project on existing terrestrial ecosystems and follows the requirements of the MTO Environmental Reference for Highway Design (ERD; MTO 2009). The report also identifies potential mitigation measures to reduce or eliminate potential impacts on existing terrestrial features.

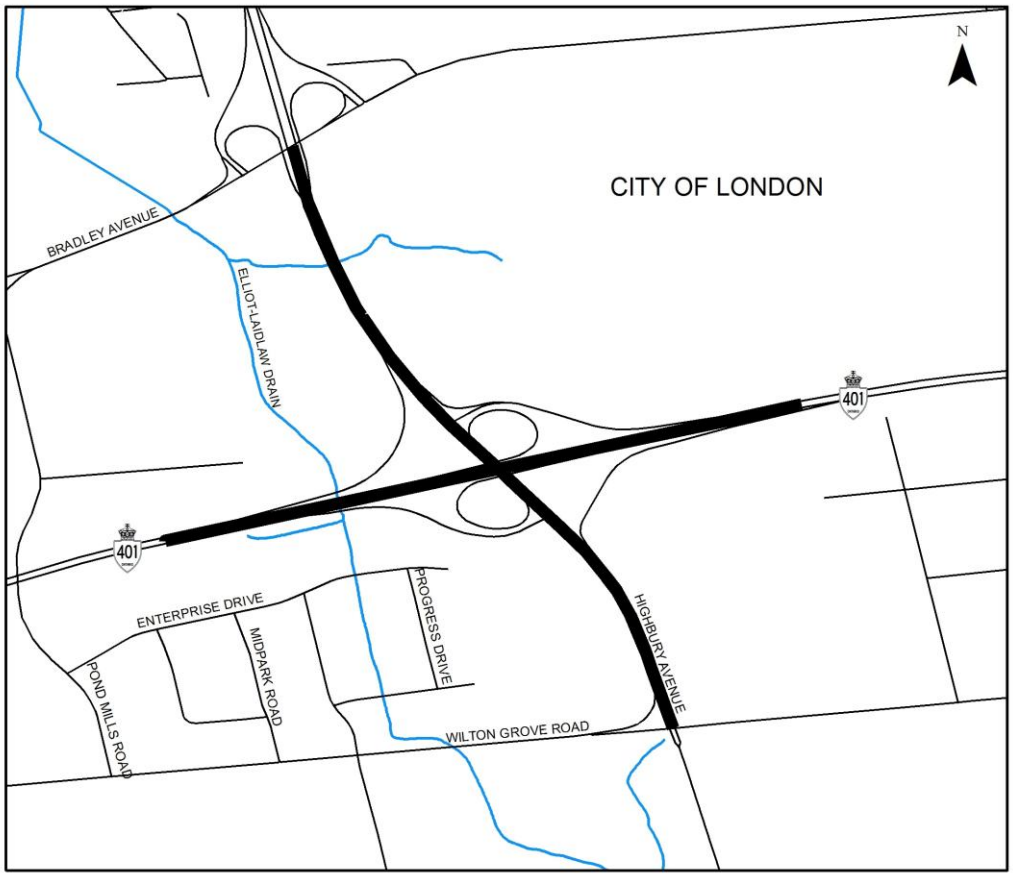


Figure 1: Study Area

2. METHODOLOGY

As outlined in Section 3.2, Terrestrial Ecosystems of MTO's ERD (MTO 2009), the requirements for conducting an assessment of the terrestrial natural environment include:

- Collection and summary of background terrestrial natural environment information
- Field investigations to assess/evaluate existing conditions within 120 metres of the Highbury Avenue/Highway 401 Right-of-Way (ROW), or within 200 metres of the ROW to include environmentally sensitive areas
- Determination of the significance of terrestrial natural features documented in the Study Area
- Determination of the potential permanent and temporary impacts of the project
- Proposition of environmental protection/mitigation methods to avoid or minimize identified impacts and compensation options for potential highway improvement impacts that cannot be mitigated (if applicable)
- Documentation in a Terrestrial Ecosystem Assessment Report (TEAR).

2.1 Background Information Review Methodology

The background information review involved the collection and summary of secondary source terrestrial natural environment data. Secondary source information was collected from the Ontario Ministry of Natural Resources' (MNR) Natural Heritage Information Centre (NHIC). Digital base map information such as Natural Resources and Values Information System (NRVIS) map data was collected from Land Information Ontario (LIO). The background review also included summarizing the terrestrial environment as identified and mapped in the City of London Official Plan (2006). Official Plan Schedules were reviewed to identify lands designated Environmentally Sensitive Areas (ESA). Sensitive, rare and/or Species at Risk (SAR) with the potential to occur were reviewed using data provided by Environment Canada's Species at Risk database, MNR's NHIC Biodiversity Explorer database as well as various wildlife atlases.

2.2 Field Investigation Methodology

Field verification of terrestrial natural resources included the following:

- Ecological Land Classification (ELC) of vegetation communities and a concurrent vegetation survey
- A migratory bird nest search of bridges, culverts and vegetated areas potentially affected by the project
- Documentation of incidental wildlife and wildlife habitat encountered in the field
- Documentation of sensitive, rare and/or Species at Risk and/or associated habitat encountered in the field.

Field studies were undertaken using accepted protocols in Ontario (e.g., Ecological Land Classification for Southern Ontario – Lee *et al.* 1998; Ontario Ministry of Natural Resources' (MNR's) Wildlife Monitoring Programs and Inventory Techniques in Ontario Document – Konze and Mclaren 1997). During the field inventory work, a photographic record of the terrestrial ecosystem was collected.

2.2.1 Ecological Land Classification and Vegetation Survey

During field investigations, vegetation was characterized using the ELC System for Southern Ontario (Lee *et al.* 1998). Vegetation community boundaries were determined by aerial photography and further refined by on-site vegetation studies. These studies involved identifying the dominant species in each vegetation cover type, based on visual estimates of species abundance.

Field data collection was undertaken to classify and map these ecological communities to the vegetation level. The ELC system recommends that a vegetation community be a minimum of 0.5 ha in size before it is defined. Patches of vegetation less than 0.5 ha or disturbed/planted vegetation were described to the community level only. In some instances, where vegetation was less than 0.5 ha, but appeared relatively undisturbed and clearly fit within an ELC vegetation type, the more refined vegetation classification was used. Long linear vegetation features consisting of trees and shrubs, were classified as hedgerows.

Vegetation communities were then mapped on aerial photography using ELC nomenclature to graphically represent the specific spatial pattern in the vegetation based on species composition, physiognomy, and physical site characteristics (**Figures 3a** and **3b**). Within each delineated community, wandering transects were completed to document vegetation species within the Study Area. Species were recorded as they were encountered within each vegetation community. Species nomenclature is based on Flora Ontario – Integrated Botanical Information System (FOIBIS), Phase 1 (Newmaster et al. 1998). Information collected for ELC and vegetation species was recorded using ELC forms provided in Appendix 3.2.D of the ERD (MTO 2009).

2.2.2 Migratory Bird Nest Search

The Bradley Avenue underpass and Highway 401 underpass, Elliot-Laidlaw Drain Culvert, and areas adjacent to the interchange ramps were examined for the presence of bird nests which are protected under the federal *Migratory Birds Convention Act, 1994*. Where possible, the number of nests, the species using or that previously was recorded as well as a GPS point and photograph.

2.2.3 Wildlife and Wildlife Habitat

Incidental wildlife observations, supplemented with secondary source data, were used to assess wildlife presence and extent of wildlife habitat use, including feeding grounds, migratory stopover, wintering areas, key wildlife corridors and functional linkages.

2.3 Evaluation of Significance Methodology

The significance of evaluated natural features observed in the Study Area was determined through examination of secondary source background information (e.g., NHIC, LIO, Official Plan Schedules, etc.). The significance of unevaluated natural features in the Study Area was determined using provincially accepted protocols such as those adapted from the MNR's Natural Heritage Reference Manual (MNR 2010).

3. RESULTS AND DISCUSSION

3.1 Background Terrestrial Natural Environment Information Review

The MNR and the Upper Thames River Conservation Authority (UTRCA) were contacted to provide further background information on the project. Information contained in **Sections 1-3** of this report was provided to both agencies for review and comment. To date, background information was collected from the following sources:

- MNR's Natural Heritage Information Centre (NHIC), including:
  - Ontario Herpetofaunal Atlas (Oldham and Weller 2000)
  - Ontario Odonata Atlas (NHIC, 2005)
- Federal Species at Risk database
- City of London Official Plan (2006)
- Various wildlife atlases and counts, including:
  - Ontario Nature Reptile and Amphibian Atlas (Ontario Nature, 2010)
  - Ontario Breeding Bird Atlas (Square 17MH85, 2001-2005)
  - Christmas Bird Count for London (ONLO)
  - Atlas of the Mammals of Ontario (Dobbyn, 1994).

3.1.1 Species at Risk and Provincially Rare Species

The secondary source information reviewed indicated 11 Species at Risk listed as *Threatened* or *Endangered* under the *Ontario Endangered Species Act, 2007* (*ESA, 2007*) have the potential to occur in the vicinity of the Study Area (see **Table 1**).

Table 1: List of Species at Risk with Potential to Occur in the Study Area

Scientific Name	Common Name	Provincial Conservation Rank (SRank)^	Federal *SARA* Status (Schedule 1)^	Ontario *ESA, 2007* Status^	Information Source*
Vascular Plants and Bryopyhtes					
Viola pedata	Bird's-foot Violet	S1	END	END	NHIC
Trillium flexipes	Drooping Trillium	S1	END	END	NHIC
Bryoandersonia illecebra	Spoon-leaved Moss	S1	END	END	NHIC
Birds					
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	THR	OBBA
Sturnella magna	Eastern Meadowlark	S4B	---	THR	OBBA
Dolichonyx oryzivorus	Bobolink	S4B	---	THR	OBBA
Hirundo rustica	Barn Swallow	S4B	---	THR	OBBA
Falco peregrinus	Peregrine Falcon	S2S3B, ZN	THR	THR	OBBA, CBC
Aquila chrysaetos	Golden Eagle	S2B	---	END	CBC
Herptiles					
Emydoidea blandingii	Blanding's Turtle	S3	THR	THR	NHIC, OHA, ON
Apalone spinifera spinifera	Eastern Spiny Softshell	S3	THR	THR	OHA, ON

*Information sources included: OBBA = Ontario Breeding Bird Atlas; CBC = Christmas Bird Count; OHA = Ontario Hertofaunal Atlas;
ON = Ontario Nature; ^see Appendix C4 for codes

In addition, 26 Species of Conservation Concern were identified as potentially occurring within the Study Area based on secondary source information (see **Table 2**). Species of Conservation Concern are defined as species listed as *Threatened* or *Endangered* on the federal *Species at Risk Act, 2002* (*SARA*), but not under *ESA, 2007*, and/or species that are provincially rare/tracked (i.e., have a Sub-national (provincial) Rank of S1 - *Critically Imperiled*, S2 - *Imperiled* or S3 - *Vulnerable*) or are designated as *Special Concern* under the *ESA, 2007*.

Table 2: Species of Conservation Concern with Potential to Occur in the Study Area

Scientific Name	Common Name	Provincial Conservation Rank (SRank) ^	Federal *SARA* Status (Schedule 1)^	Ontario *ESA, 2007* Status^	Information Source*
Plants					
Fraxinus quadrangulata	Blue Ash	S3	SC	SC	NHIC
Arisaema dracontium	Green Dragon	S3	SC	SC	NHIC
Bartonia virginica	Yellow Bartonia	S2	---	---	NHIC
Conioselinum chinense	Hemlock-parsley	S3	---	---	NHIC
Gentianella quinquefolia ssp. occidentalis	Stiff Gentian	S2	---	---	NHIC
Hybanthus concolor	Green Violet	S2	---	---	NHIC
Lupinus perennis ssp. perennis	Wild Lupine	S3	---	---	NHIC
Panicum villosissimum	White-haired Panic Grass	S3	---	---	NHIC
Polygonum erectum	Erect Knotweed	S1	---	---	NHIC
Scleria triglomerata	Tall Nut Rush	S1	---	---	NHIC
Birds					
Chlidonias niger	Black Tern	S3B	---	SC	OBBA
Melanerpes erythrocephalus	Red-Headed Woodpecker	S4B	THR	SC	CBC
Haliaeetus leucocephalus	Bald Eagle	S4B, SZN	---	SC	CBC
Buteo lagopus	Rough-legged Hawk	S1B, S4N	---	---	CBC
Larus marinus	Great Black-backed Gull	S2B	---	---	CBC
Aythya americana	Redhead	S2B, S4N	---	---	CBC
Calcarius lapponicus	Lapland Longspur	S3B	---	---	CBC

Scientific Name	Common Name	Provincial Conservation Rank (SRank) ^	Federal *SARA* Status (Schedule 1) ^	Ontario *ESA, 2007* Status ^	Information Source*
Clangula hyemalis	Long-tailed Duck	S3B	---	---	CBC
Herptiles					
Thamnophis sauritus septentrionalis	Northern Ribbonsnake	S3	SC	SC	NHIC, ON
Chelydra serpentina	Common Snapping Turtle	S4	SC	SC	OHA, ON
Graptemys geographica	Northern Map Turtle	S3	SC	SC	NHIC, OHA, ON
Lampropeltis triangulum	Eastern Milksnake	S3	SC	SC	OHA, ON
Odonata					
Aeshna verticalis	Green-striped Darner	S3	---	---	OA
Enallagma traviatum	Slender Bluet	S1	---	---	OA
Mammals					
Myotis lucifugus	Little Brown Bat	S4	END	---	AMO
Myotis septentrionalis	Northern Long-eared Bat	S3	END	---	AMO

*Information sources included: CBC = Christmas Bird Count; AMO = Atlas of the Mammals of Ontario; OA = Ontario Odonata Atlas; ^see Appendix C4 for codes

All other species identified through secondary source information have secure (S5) or apparently secure (S4) populations within Ontario and are not considered Species at Risk or Species of Conservation Concern. The full list of plant and wildlife species with the potential to occur in the Study Area is included in **Appendix C1**.

3.1.2 Natural Heritage Features

As shown on the City of London Official Plan Schedules (see **Appendix A**), there is an Environmentally Sensitive Area (ESA) within the Study Area. This ESA is known as the Westminster Ponds-Pond Mills complex which is also designated as a Provincially Significant Wetland (PSW) and a Life Science Area of Natural or Scientific Interest (ANSI). This ESA is located south of Bradley Avenue and is found on either side of Highbury Avenue (see **Figure 2**).

In addition, there is a woodland at the northwest corner of the intersection of Highbury Avenue and Wilton Grove Road that is identified as significant in the City of London Official Plan (see **Figure 2** and **Appendix A**).

Other lands within the Study Area are designated:

- Light Industrial
- Open Space
- Environmental Review (i.e., natural features requiring further evaluation to assess significance)
- Urban Reserve Industrial Growth
- Big Picture Meta-Cores and Meta Corridors (i.e., potential naturalization areas).

The areas designated as areas of Environmental Review are restricted to parts of the Westminster Ponds-Pond Mills complex and the woodland adjacent to the significant woodland discussed above. Those areas requiring further review are located outside of the Highbury Avenue ROW.

The Big Picture Meta-cores and Meta-Corridors are immediately adjacent to the Westminster Ponds-Pond Mills complex and are partially located within the Study Area.

Based on a review of background resources, no important bird areas (IBA) or any other type of wildlife habitat was identified within the Study Area or adjacent 200 metres.

3.2 Field Investigation Results and Discussion

A Dillon terrestrial biologist completed a field investigation on May 8, 2012. The weather conditions during the investigation consisted of fairly clear skies and an average ambient temperature of 15°C. There was no precipitation during the site investigation. The following summarizes the terrestrial natural features inventoried in the Study Area.

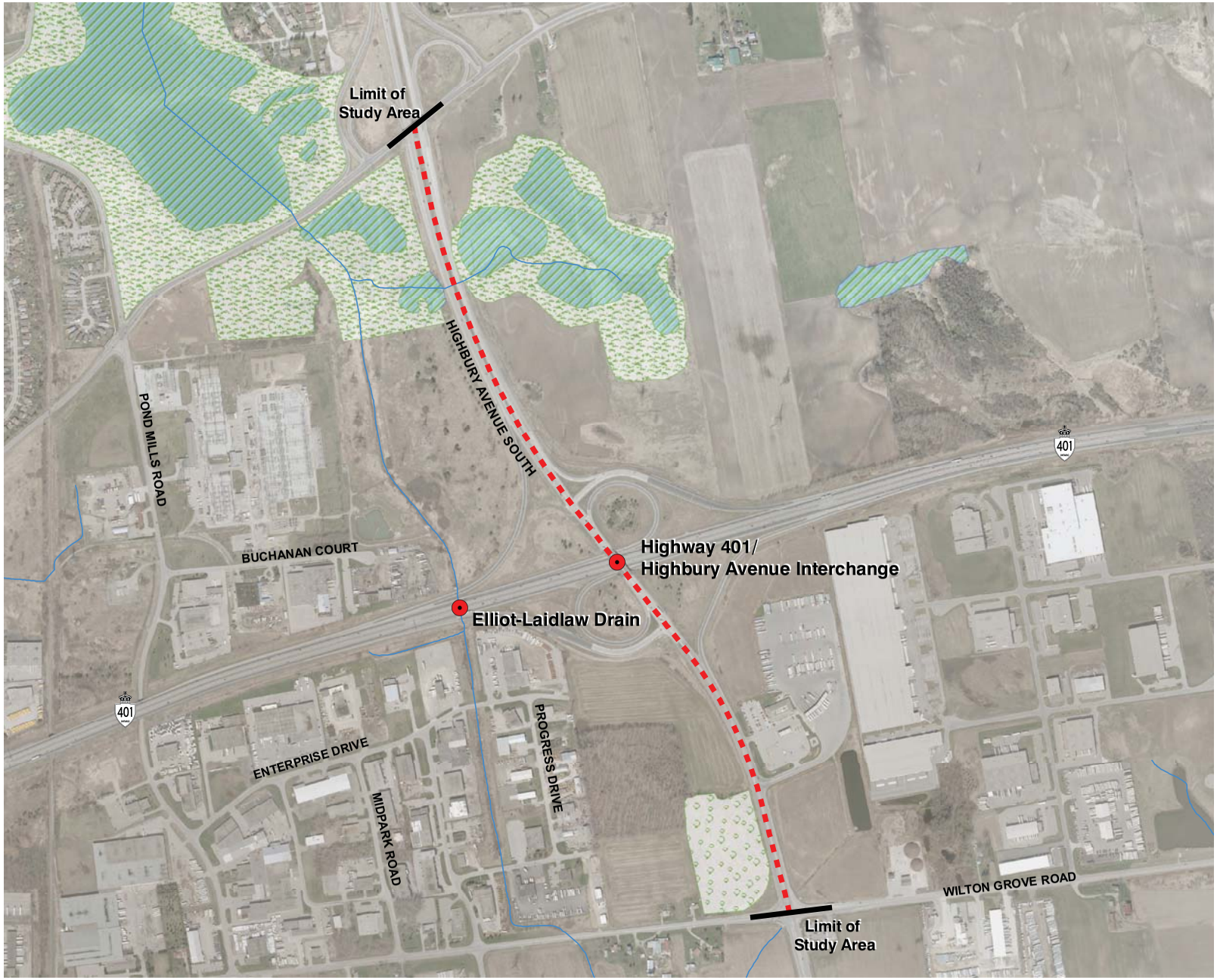
3.2.1 Topography

The landscape is a mix of primarily agricultural field (cropland), culturally influenced meadows and shrub thickets, remnant deciduous forest, roadways, and commercial areas. The natural features in the Study Area are associated with gradual topographical relief such as roadway drainage and remnant woodlands surrounded by residential housing and agricultural fields.

Based on the limited topography and water features within the Study Area, valleylands were not identified.

3.2.2 Ecological Land Classification (ELC)

Based on the completed ELC field investigation, the soils in the Study Area are highly disturbed and consist of fill from the construction of Highway 401 and Highbury Avenue. Moisture regime was estimated using the presence of certain vegetation species. The general Study Area is predominantly agricultural cropland and urban areas with culturally influenced meadow. Ecological connectivity throughout the landscape is maintained through natural features associated with surface water drainage. **Table 3** outlines the communities documented during the ELC surveys. None of the vegetation communities documented are rare in Ontario.



Ministry of Transportation
Highway 401/ Highbury Avenue
Interchange Reconstruction

Study Area and Natural Features
Figure 2

- Culvert & Bridge Rehabilitations & Replacements
- Study Area
- Project Limits
- Waterbody
- Life Science ANSI
- Provincially Significant Wetland
- Significant Woodlot

SCALE 1:8000

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MAP CREATED BY: BJF
MAP CHECKED BY: JH
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\126151\ELC MAPPING\HIGHBURY_ELC_MAPPING.MXD

DILLON CONSULTING

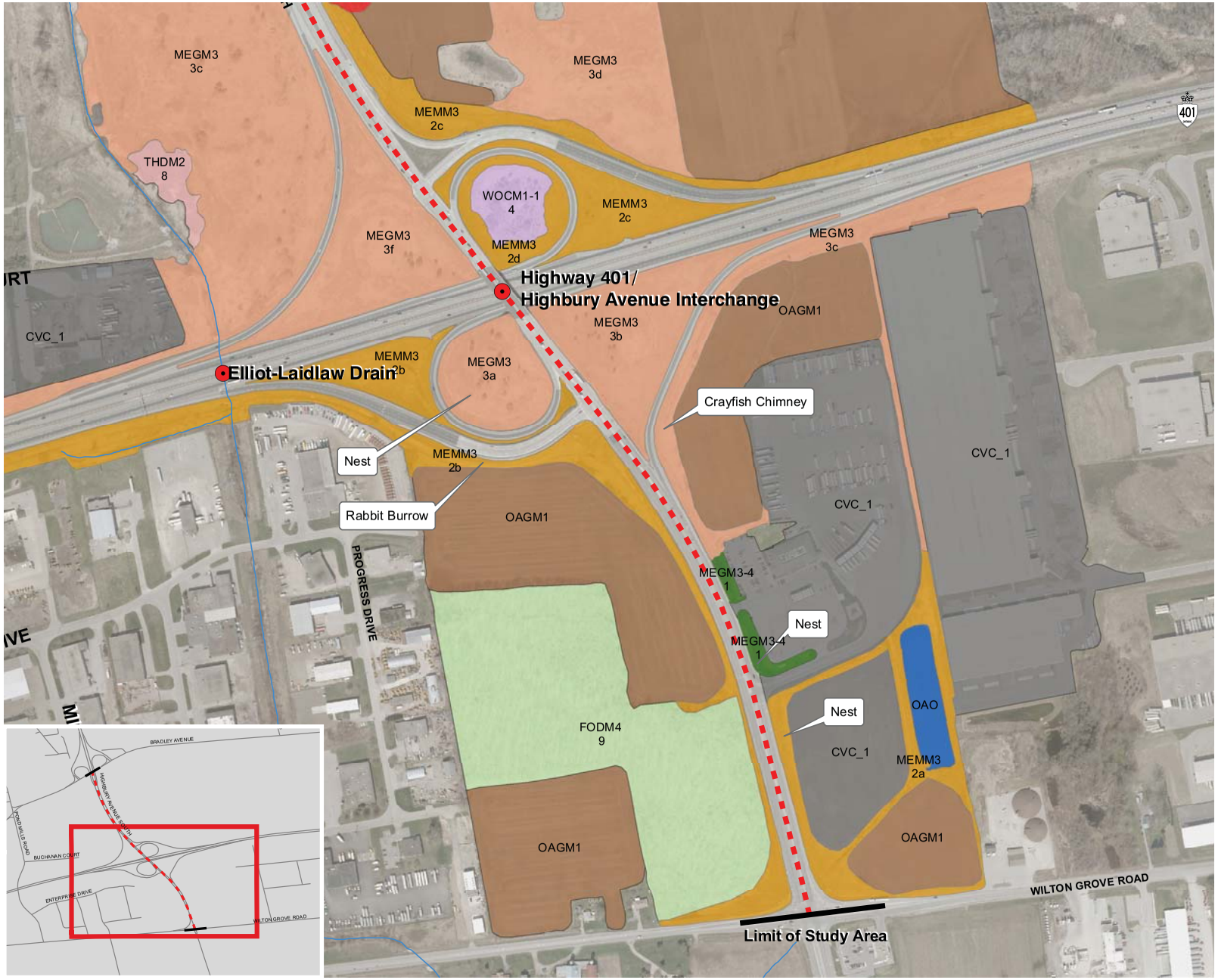
PROJECT: 12-6151
STATUS: FINAL
Date: 7/26/2012

Table 3: Descriptions of the ELC communities within the Study Area

ELC Code	Classification	Vegetation*	Comments (Photos included in Appendix B)
MEGM3-4	Kentucky Bluegrass Graminoid Meadow (Mown Grass)	• Meadow community is dominated by regularly mown Kentucky Blue Grass (*Poa pratensis ssp. pratensis*) and contains small areas of manicured garden and patches of Common Cattail (*Typha latifolia*) and Common Reed (*Phragmites australis ssp. australis*) within the roadside ditches.	• Around the border of the Gas Station and Denny's Restaurant located adjacent to the southeast interchange on-ramp (Polygon 1 on **Figure 3a**). • **Photo 1**
MEMM3	Dry-Fresh Mixed Meadow	• Meadow community is characterized by a ground layer dominated by a mix of non-native forb and graminoid species such as Common Reed, Crown Vetch (*Coronilla varia*), Common Plantain (*Plantago major*), Kentucky Blue Grass, Bird's Foot Trefoil (*Lotus corniculatis*), and Smooth Brome (*Bromus inermis ssp. inermis*).	• Within the Road Right-of-Way (ROW) of Highbury Avenue and Highway 401 (Polygons 2a-2e) on **Figure 3a** and **3b**. • **Photos 2, 4, 7, 8, 9**
THDM2-4	Grey Dogwood Deciduous Shrub Thicket	• Thicket community is an inclusion within Polygon 2a and 2b on **Figure 3a** and **3b**. It is dominated by Grey Dogwood (*Cornus foemina ssp. racemosa*) with occasional Common Buckthorn (*Rhamnus cathartica*) and Goldenrod species (*Solidago sp.*).	• Within Polygon 2a and 2b on **Figures 3a** and **3b**. One patch is near the Wilton Grove/Highbury Intersection and the other near the southwest off ramp of the Highbury/401 interchange. • **Photos 3** and **5**
MEGM3	Dry-Fresh Graminoid Meadow	• Meadow community is characterized by a ground layer dominated by non-native graminoid species such as Common Reed, Smooth Brome, and Kentucky Blue Grass.	• Within the Road ROW of Highbury Avenue and Highway 401 (Polygons 3a-3f on **Figure 3a** and **3b**). • **Photos 10-14, 16**
WOCM1-1	Dry-Fresh Coniferous Woodland	• Woodland community is characterized by an abundance of Austrian Pine (*Pinus nigra*) in the sub-canopy and understory layers. The ground layer is dominated by a mix of forbs and graminoid species such as Common Plantain, Kentucky Blue Grass, and Common Strawberry (*Fragaria virginiana ssp. virginiana*).	• Centre of the northeast interchange inner loop, adjacent to the north off ramp (Polygon 4 on **Figure 3a**). • **Photo 17**
SWDM4-5	Poplar Mineral Deciduous Swamp	• Small poplar swamp is dominated by Eastern Cottonwood (*Populus deltoides ssp. deltoids*) with occasional occurrences of White Willow (*Salix alba*) and Green Ash (*Fraxinus pennsylvanica*). Other species observed include Common Buckthorn and Kentucky Blue Grass.	• Outside of the Highbury Avenue ROW, just north of Highbury/401 interchange (Polygon 5 on **Figures 3a** and **3b**). • **Photo 18**
MAMM1-2	Cattail Mineral Meadow Marsh	• Marsh community is dominated by Common Cattail and has occasional occurrences of Common Reed and Reed Canary Grass (*Phalaris arundinacea*).	• South of Bradley Avenue and within the eastern interchange circle of Highbury/Bradley. • Part of the Westminster Ponds-Pond Mills ESA/PSW (Polygon 6a and 6b on **Figure 3b**). The two polygons are connected by a culvert under Highbury Avenue. • **Photos 19** and **20**

ELC Code	Classification	Vegetation*	Comments (Photos included in Appendix B)
WODM4-4	Dry-Fresh Walnut Deciduous Woodland	• Small woodland community is dominated by Black Walnut (*Juglans nigra*) in the sub-canopy. • Understory layer is dominated by Reed Canary Grass and the ground layer by Mayapple (*Podophyllum peltatum*) and Kentucky Blue Grass.	• Adjacent to the northern boundary a cattail mineral meadow marsh (Polygon 6a). • **Photo 21**
THDM2	Dry-Fresh Deciduous Shrub Thicket	• Community was assessed from the ROW. • Thicket community appears to be dominated by Grey Dogwood and Common Buckthorn and is surrounded by the meadow species listed under MEMM3.	• Outside of the ROW in the area between Elliot-Laidlaw Drain/Highbury Avenue/Bradley Avenue and Highway 401 (Polygon 8 on **Figure 3b**). • **Photo 22**
FODM4	Dry-Fresh Upland Deciduous Forest	• Forest community has abundant American Beech (*Fagus grandifolia*) and Basswood (*Tilia americana*) in the canopy and sub-canopy. There is abundant Common Buckthorn in the understory and Yellow Trout Lily (*Erythronium americanum ssp. americanum*) in the ground layer. Other herbaceous species include White Trillium (*Trillium grandiflorum*) and Mayapple.	• Northwest of the Wilton Grove/Highbury intersection. The southeast portion of the woodland is designated as Significant by the City of London (Polygon 9 on **Figure 3a**). • **Photo 23**

**Status of species listed is further detailed in Appendix C2*



Ministry of Transportation
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Terrestrial Features and Ecological Land Classification
Figure 3a

- Culvert & Bridge Rehabilitations & Replacements
- Study Area
- Project Limits
- Waterbody
- CVC_1: Business Sector
- FODM4: Dry-Fresh Upland Deciduous Forest
- MAMM1-2: Cattail Mineral Meadow Marsh
- MEGM3-4: Mown Kentucky Bluegrass Graminoid Meadow
- MEGM3: Dry-Fresh Graminoid Meadow
- MEMM3: Dry-Fresh Mixed Meadow
- OAGM1: Annual Row Crops
- OAO: Open Aquatic (SWM Pond)
- SWM4-5: Poplar Mineral Deciduous Swamp
- THDM2: Dry-Fresh Deciduous Shrub Thicket
- WOCM1-1: Dry-Fresh Coniferous Woodland
- WODM4-4: Dry-Fresh Black Walnut Deciduous Woodland

SCALE 1:5000

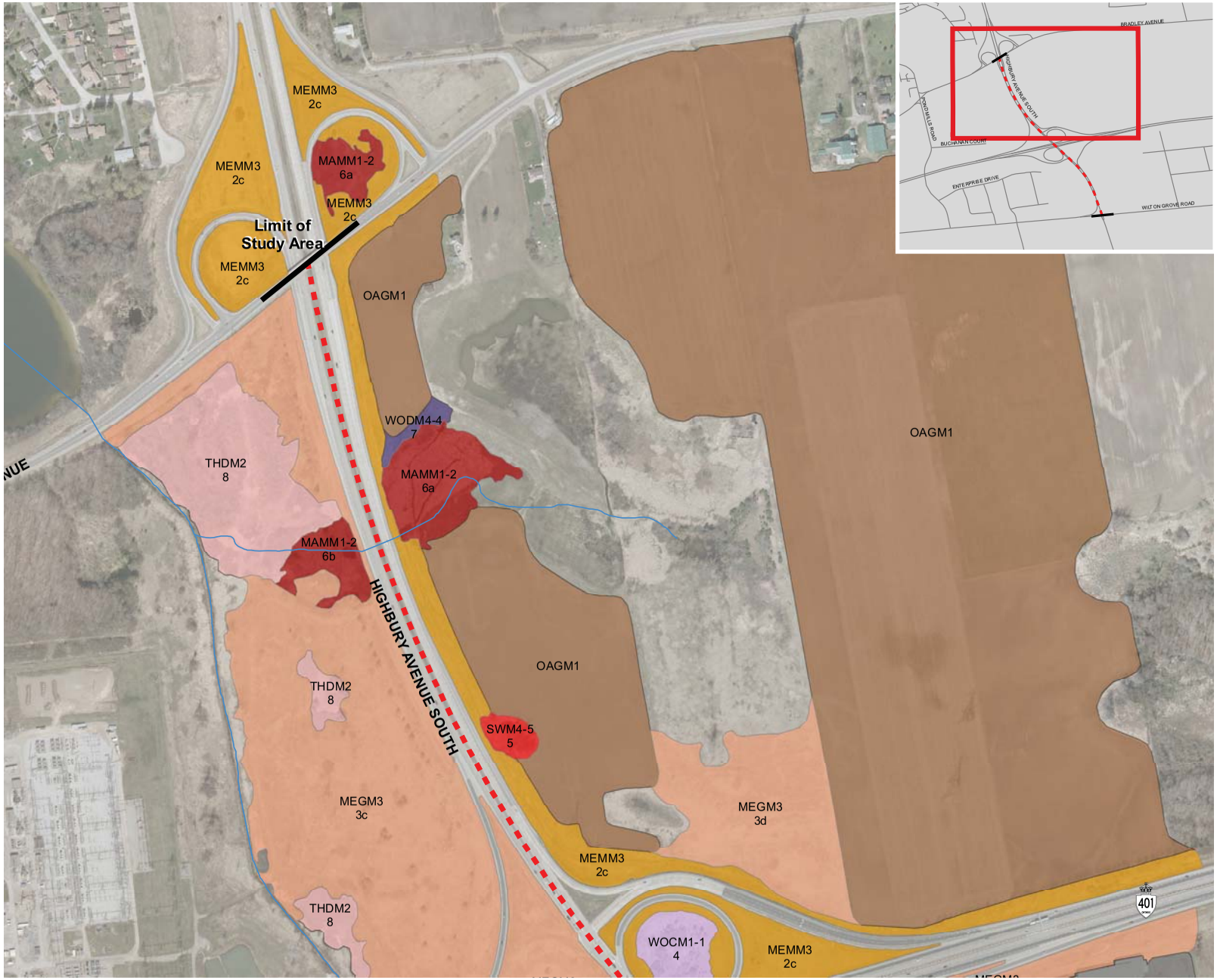
0 100 200 300 Meters

MAP CREATED BY: BJF
MAP CHECKED BY: JH
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\126151\ELC MAPPING\HIGHBURY_ELC_MAPPING.MXD

DILLON CONSULTING

PROJECT: 12-6151
STATUS: FINAL
Date: 7/26/2012



Ministry of Transportation
Highway 401/ Highbury Avenue
Interchange Reconstruction

Terrestrial Features and Ecological Land Classification
Figure 3b

- Culvert & Bridge Rehabilitations & Replacements
- Study Area
- Project Limits
- Waterbody
- CVC_1: Business Sector
- FODM4: Dry-Fresh Upland Deciduous Forest
- MAMM1-2: Cattail Mineral Meadow Marsh
- MEGM3-4: Mown Kentucky Bluegrass Graminoid Meadow
- MEGM3: Dry-Fresh Graminoid Meadow
- MEMM3: Dry-Fresh Mixed Meadow
- OAGM1: Annual Row Crops
- OAO: Open Aquatic (SWM Pond)
- SWM4-5: Poplar Mineral Deciduous Swamp
- THDM2: Dry-Fresh Deciduous Shrub Thicket
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- WODM4-4: Dry-Fresh Black Walnut Deciduous Woodland

SCALE 1:5000

N W E S

0 100 200 300 Meters

MAP CREATED BY: BJF
MAP CHECKED BY: JH
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\126151\ELC MAPPING\HIGHBURY_ELC_MAPPING.MXD

DILLON CONSULTING

PROJECT: 12-6151
STATUS: FINAL
Date: 7/26/2012

3.2.3 Vegetation Survey

In total, 77 flora species were identified within the Study Area during the terrestrial survey. A full list of plant species encountered during field surveys, including their federal and provincial status, is presented in **Appendix C2**. The flora species have been separated by ELC polygon number; refer to **Figure 3** for the location of each polygon (1 to 9). None of the species identified are listed SAR or considered to be provincially rare.

The majority of species (42%) identified within the Study Area are either non-native or exotic species. Due to the timing which the vegetation survey took place (early spring) some plants could only be identified to *Genus*. None of the plant species identified as potentially occurring SAR or Species of Conservation Concern during the collection of background information belong to any of the Genus' where the specimen was not able to be identified to species.

3.2.4 Wildlife and Wildlife Habitat

During the field investigation, incidental wildlife was noted from the Highbury Avenue/Highway 401 ROW. Wildlife observations in the Study Area were sparse, as was potential wildlife habitat. Incidental species observed are included in **Appendix C3**. The majority of species observed have either secure (S5) or apparently secure (S4) populations within Ontario.

The potential for wildlife habitat was based on the vegetation communities identified within the Study Area and signs of wildlife use (e.g., scat, burrows, tracks). Habitats with the potential to occur in the Study Area include:

- Amphibian Breeding Habitat
- Habitat for Terrestrial Crayfish
- Habitat for Game Animals (Eastern Cottontail).

The significance of these features as wildlife habitat is discussed in **Section 4.3**.

3.2.5 Species at Risk and Provincially Rare Species

Two species observed are listed under the *ESA, 2007*. The two listed species include:

- Eastern Meadowlark (*Sturnella magna*). This species is listed as *Threatened* and has general habitat protection under the *ESA, 2007*. This species was observed flying over the Study Area
- Monarch (*Danaus plexippus*). This species is listed as *Special Concern* and currently does not have species or habitat protection under the *ESA, 2007* and is considered to be a Species of Conservation Concern. Individuals were noted within the Dry-Fresh Coniferous Woodland (WOCM1-1) and near the Cattail Mineral Meadow Marsh (MAMM1-2)/Dry-Fresh Black Walnut Deciduous Woodland (WODM4-4).

3.2.6 Migratory Bird Nest Survey Results

A survey of migratory bird nests was carried out along the Study Area. Culverts passing under Highway 401 were inspected, as well as the Highbury Avenue and Bradley Avenue bridges. Three nests were identified within the ROW of Highbury Avenue and the interchange (see **Figure 2a**):

- Song Sparrow – Nest inside southwest interchange inner loop (Polygon 3a)
- Red-winged Blackbird – Nest within cattail stand adjacent to Flying 'J' Travel Plaza (Polygon 1)
- Red-winged Blackbird – Nest within cattail stand south of the Flying 'J' Travel Plaza (Polygon 2a).

All three nests were active at the time of the spring field studies. There are potentially more Red-winged Blackbird nests hidden within the cattail stands of Polygon 2a, 2c, 6a, and 6b (see **Figures 3a** and **3b**).

3.2.7 Ecological Corridors and Linkages

The Study Area is predominately agricultural crop land and urban areas with culturally influenced meadow. Wildlife movement between natural areas in the landscape in proximity to the Study Area is tenuously maintained through ecological linkages primarily associated with the Elliot-Laidlaw Drain and associated tributaries. The Elliot-Laidlaw Drain riparian corridor to the south of Highway 41 is identified as Significant Corridor in the City of London Official Plan (see **Appendix A**) and connects two environmentally sensitive areas (Westminster Ponds as identified on **Figure 2** and Elliot Laidlaw Wetland/Tenant's Pond located beyond the limit of the Study Area).

4. DETERMINATION OF SIGNIFICANCE

Based on the review of background information and field investigation, natural features previously evaluated to be significant are outlined below. Where a feature has not previously been evaluated, an evaluation has been undertaken as part of the scope of this study and is provided below. The determination of significance for woodlands, valleylands, wildlife habitat, and SAR habitat observed in the Study Area is discussed below.

4.1 Wetlands and Life Science ANSIs

The Westminster Ponds-Pond Mills occurs partially within the Study Area and has been previously evaluated as a Provincially Significant Wetland, regionally significant Life Science ANSI and an Environmentally Sensitive Area. As shown on **Figures 3a** and **3b**, the delineation of this feature differs from the boundaries provided by the MNR. As this wetland is part of a MNR evaluated provincially significant wetland, any changes to the boundaries would require approval from the MNR.

4.2 Woodlands

The province delegates the responsibility of defining the evaluation criteria for significant woodlands to the local planning authority, although guidelines for establishing the evaluation criteria are outlined in the Natural Heritage Reference Manual (MNR 2010) (i.e., woodland size, ecological functions, uncommon characteristic and economic and social functional values). According to the City of London Official Plan, significant woodlands are determined based on the following criteria:

- Age, Size, Site Quality
- Diversity of biological communities
- Presence of uncommon species
- Contains significant habitat for SAR
- Contains distinctive, unusual or high quality natural communities or landforms
- Contains important natural features or ecological functions.

In terms of the size criteria, the Official Plan and associated guide *Guideline Document for the Evaluation of Ecologically Significant Woodlands* also states that any size of wooded area could be considered significant, if in the woodland assessment, one or more criteria meet the standard for High or five or more criteria meet the standard for Medium. Part of the 8.62 hectare Dry-Fresh Upland Deciduous Forest northwest of the Wilton Grove Road and Highbury Avenue intersection has already been designated as significant woodland in the Official Plan (see **Figure 2** and **Appendix A**). The adjacent portion of woodland is further identified as an area of "Environmental Review" by the City of London (see **Section 3.1.2**).

4.3 Wildlife Habitat

Guidelines for identifying and confirming significant wildlife habitat are outlined in the Natural Heritage Reference Manual (MNR 2010), Significant Wildlife Habitat Technical Guide (MNR 2000) and the guide's draft addendum for Ecodistrict 7E (MNR 2012). Using the ELC classifications, described in **Section 3.2**, the following candidate wildlife habitats may be present within the Study Area:

- Amphibian Breeding Habitat (Wetlands)
- Terrestrial Crayfish
- Habitat for Game Animals (Eastern Cottontail).

Amphibian Breeding Habitat (Wetland)

Candidate amphibian breeding habitat is found within the cattail meadow marshes and poplar mineral deciduous swamp identified during the ELC surveys. In order to determine the significance of this habitat, amphibian surveys would be required using acceptable protocols to determine species diversity and abundance. Based on the proximity of these candidate habitats to Highbury Avenue, they are unlikely to be significant.

Terrestrial Crayfish

In the area adjacent to the southeast portion of the interchange (see **Figure 3a**), crayfish chimneys were observed. This habitat would not be designated as significant as it is not in an area of suitable habitat such as meadow or shallow marsh.

Habitat for Game Animals (Eastern Cottontail)

Burrows were observed adjacent to the southwest off-ramp of the interchange (see **Figure 3a**). These burrows did not appear to be active (overgrown vegetation, no scat or tracks nearby) but were likely used by Eastern Cottontail Rabbit (*Sylvilagus floridanus*). This type of habitat is not described as significant in the Significant Habitat Technical Guide but Cottontail Rabbits are listed game mammals under the *Fish and Wildlife Conservation Act, 1997* and therefore are the animals and habitat they are occupying are protected from destruction. A qualified biologist should check the burrows and adjacent areas prior to construction to confirm they are inactive. If active, a permit under the *Fish and Wildlife Conservation Act* may be required.

4.4 Species at Risk and Provincially Rare Species

The evaluation of the Study Area for suitability as habitat for Species at Risk and provincially rare species (i.e., Species of Conservation Concern) is discussed in **Table 4**.

Table 4: Species at Risk and Provincially Rare Species Habitat Evaluation for the Highbury Avenue/Highway 401 Interchange Reconstruction Project

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
REPTILES										
Emydoidea blandingii	Blanding's Turtle	THR	THR	S3	Yes	---	• Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation • Basks on logs, stumps, or banks • Surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats • Hibernates in bogs; not readily observed.	No	• No shallow water marshes, bogs, lakes • Ponds and swamp communities were small, ephemeral and lacking basking features • Records for this species are not current (i.e., >20 years; last observed in 1965).	No
Graptemys geographica	Northern Map Turtle	SC	SC	S3	Yes	---	• Large bodies of water with soft bottoms, and aquatic vegetation • Basks on logs or rocks or on beaches and grassy edges, will bask in groups • Uses soft soil or clean dry sand for nest sites • May nest at some distance from water • Home range size is larger for females (about 70 ha) than males (about 30 ha) and includes hibernation, basking, nesting and feeding areas • Aquatic corridors (e.g., stream) are required for movement • Not readily observed.	No	• No large bodies of water • Records for this species are not current (i.e., >20 years; last observed in 1990).	No
Thamnophis sauritus	Eastern Ribbonsnake	SC	SC	S3	Yes	---	• Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water • Wet meadows, grassy marshes or sphagnum bogs • Borders of ponds, lakes or streams • Hibernates in groups.	No	• Grassy areas with low dense vegetation near shallow, permanent stream present in the Study Area but the absence of suitable hibernacula habitat (e.g., burrows/rock crevices) would greatly reduce the quality of habitat for this species • Records for this species are not current (i.e., >20 years; last observed in 1933).	No

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
Apalone spinifera spinifera	Eastern Spiny Softshell	THR	THR	S3	No	No	• Intolerant of pollution • Large river systems, shallow lakes and ponds with muddy bottoms and aquatic vegetation • Basks on sandbars, mud flats, grassy beaches, logs or rocks • Eggs are laid near water on sandy beaches or gravel banks in areas with sun • Requires acceptable feeding, nesting, habitat and natural, undisturbed corridors between these critical habitats.	No	• No large river systems, shallow lakes or ponds with muddy bottoms.	No
Chelydra serpentina	Common Snapping Turtle	SC	SC	S4	No	No	• Permanent, semi-permanent fresh water • Marshes, swamps or bogs • Rivers and streams with soft muddy banks or bottoms • Often uses soft soil or clean dry sand on south-facing slopes for nest sites • May nest at some distance from water • Often hibernate together in groups in mud under water • Home range size ~28 ha.	No	• No permanent, semi-permanent fresh water marshes, swamps or bogs • Marsh communities are dominated by cattail and have very little open water • No large rivers or streams with muddy bottoms observed.	No
Lampropeltis triangulum	Eastern Milksnake	SC	SC	S3	No	No	• Farmlands, meadows, hardwood or aspen stands • Pine forest with brushy or woody cover • River bottoms or bog woods • Hides under logs, stones, or boards or in outbuildings • Often uses communal nest sites.	No	• Meadows and hardwood stands present but no hibernacula observed that would support overwintering milksnakes.	No

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
BIRDS										
Sturnella magna	Eastern Meadowlark	---	THR	S4	No	Yes	• Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches • Cultivated land and weedy areas with trees • Old orchards with adjacent, open grassy areas >10 ha in size.	No	• Species was observed flying over the study area • No open, grassy meadows, farmland, pastures, hayfields greater than 10 ha within Study Area.	No
Chaetura pelagica	Chimney Swift	THR	THR	S4B	No	No	• Commonly found in urban areas near buildings • Nests in hollow trees, crevices of rock cliffs, chimneys • Highly gregarious • Feeds over open water.	No	• No residential houses with appropriate chimneys, hollow trees, or rock cliffs.	No
Dolichonyx oryzivorus	Bobolink	---	THR	S4B	No	No	• Large, open expansive grasslands with dense ground cover • Hayfields, meadows or fallow fields • Marshes • Requires tracts of grassland >50 ha.	No	• No tracts of grasslands >50 ha.	No
Hirundo rustica	Barn Swallow	---	THR	S4B	No	No	• Farmlands or rural areas • Cliffs, caves, rock niches • Buildings or other man-made structures for nesting • Open country near body of water.	No	• Man-made structures are bridges are over busy highways • No nests or barn swallows observed • No cliffs or caves.	No
Falco peregrinus	Peregrine Falcon	THR	THR	S2S3	No	No	• Rock cliffs, crags, especially situated near water • Tall buildings in urban centres • Threatened by chemical contamination • Reintroduction efforts have been attempted in numerous locations throughout Ontario.	No	• No rock cliffs, crags or tall buildings.	No
Aquila chrysaetos	Golden Eagle	---	END	S2B	No	No	• Wild, arid plateaus, deeply cut by streams and canyons or sparsely treed slopes and rock crags	No	• No canyons, treed slopes or rock crags.	No

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
Chlidonias niger	Black Tern	---	SC	S3B	No	No	• Wetlands, coastal or inland marshes • Large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows • Returns to same area to nest each year in loose colonies • Must have shallow (0.5 m to 1 m deep) water and areas of open water near nests • Requires marshes >20 ha in size • Feeds over adjacent grasslands for insects • Also feeds on fish, crayfish and frogs.	No	• No marshes >20 ha.	No
Melanerpes erythrocephalus	Red-Headed Woodpecker	THR	SC	S4B	No	No	• Open, deciduous forest with little understory • Fields or pasture lands with scattered large trees • Wooded swamps • Orchards, small woodlots or forest edges • Groves of dead or dying trees • Feeds on insects and stores nuts or acorns for winter • Loss of habitat is limiting factor • Requires cavity trees with at least 40 cm dbh • Require about 4 ha for a territory.	No	• No open deciduous forest or fields with scattered trees • Forests communities in Study Area have dense understory growth.	No

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
Haliaeetus leucocephalus	Bald Eagle	---	SC	S4B	No	No	• Require large continuous area of deciduous or mixed woods around large lakes, rivers • Require area of 255 ha for nesting, shelter, feeding, roosting • Prefer open woods with 30% to 50% canopy cover • Nest in tall trees 50 m to 200 m from shore • Require tall, dead, partially dead trees within 400 m of nest for perching • Sensitive to toxic chemicals.	No	• No large mature trees • Forest areas are small and not continuous.	No
Buteo lagopus	Rough-legged Hawk	---	---	S1B	No	No	• In winter, they inhabit open fields, plains, marshes, and farmland.[7]	No	• No large open fields, marshes or farmland.	No
Larus marinus	Great Black-backed Gull	---	---	S2B	No	No	• Flat rocky coastal islands, moorlands, rocky beaches, cliffs • Nest is solitary or in small (rarely large) colonies.	No	• No coastal islands, moorlands, rocky beaches, or cliffs.	No
Aythya americana	Redhead	---	---	S2B	No	No	• Shallow cattail/bulrush marshes, lakes and ponds and fens • Preferred nesting usually close to shallow water (most within 2 m), but can be found as far as 266 m from water's edge.	No	• Cattail marshes are very shallow (meadow marsh) and are not high quality nesting habitat for any species of waterfowl.	No
Calcarius lapponicus	Lapland Longspur	---	---	S3B	No	No	• During migration and in winter, they frequent prairies, pastures, and grassy beaches.[7]	No	• No prairies, pastures and grassy beaches.	No
Clangula hyemalis	Long-tailed Duck	---	---	S3B	No	No	• In the winter can be found on the ocean or great lakes over sandy substrates.[7]	No	• No large bodies of water.	No

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
LEPIDOPTERA										
Danaus plexippus	Monarch	SC	SC	S2N,S4B	No	Yes	• Breeding habitat is meadows/marsh meadows with available milkweeds, in particular Common Milkweed (*Asclepias syriaca*). Also, between five and 20 significant migratory concentration areas are known (largely along the shorelines of the lower Great Lakes), but others may exist, thus the rank range of S2S3. Only these migratory concentration areas are tracked.	Yes	• Study Area is not located along the shores of a Great Lake • Only rare occurrences of Common Milkweed observed.	No
MAMMALS										
Myotis lucifugus	Little Brown Bat	END	---	S4	No	No	• Uses caves, quarries, tunnels, hollow trees or buildings for roosting • Winters in humid caves • Maternity sites in dark warm areas such as attics and barns • Feeds primarily in wetlands, forest edges	No	• No caves, quarries, tunnels, hollow trees or suitable buildings for roosting.	No
Myotis septentrionalis	Northern Long-eared Bat	END	---	S3	No	No	• Hibernates during winter in mines or caves • During summer males roost alone and females form maternity colonies of up to 60 adults • Roosts in houses, manmade structures but prefers hollow trees or under loose bark • Hunts within forests, below canopy.	No	• No mines, caves, large hollow trees or suitable housing.	No
ODONATA										
Aeshna verticalis	Green-striped Darner	---	---	S3	No	No	• Forest ponds and lakes with much aquatic vegetation.[8]	No	• No forest ponds or lakes.	No
Enallagma traviatum	Slender Bluet	---	---	S1	No	No	• Vegetated ponds and lakes.[9]	No	• No vegetated ponds and lakes • The small patch of open water in polygon 6b covered with algae and most likely receives runoff from Highbury Avenue.	No

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
VASCULAR PLANTS AND BYROPHYTES										
Viola pedata	Bird's-foot Violet	END	END	S1	Yes	---	• Open, dry oak and jack pine woods, sand barrens, dry prairies and dune forests.	No	• No open, dry oak and jack pine woods, sand barrens, dry prairies or dune forests • Species records are not current (i.e., >20 years; last observed in 1890).	No
Trillium flexipes	Drooping Trillium	END	END	S1	Yes	---	• Rich deciduous woods often along river flats or on heavy basic soils associated with limestone.	No	• No rich deciduous woods often along river flats or on heavy basic soils associated with limestone • Species records not current (i.e., >20 years; last observed in 1883).	No
Fraxinus quadrangulata	Blue Ash	SC	SC	S3	Yes	---	• Floodplains, shallow soil over limestone.	No	• No floodplains with shallow soil over limestone • Records for this species are not current (i.e., >20 years; last observed in 1977).	No
Arisaema dracontium	Green Dragon	SC	SC	S3	Yes	---	• Wet bottomlands along rivers and creeks.	No	• No bottomlands • Records for this species are not current (i.e., >20 years; last observed in 1979).	No
Bryoandersonia illecebra	Spoon-leaved Moss	END	END	S1	Yes	---	• Prefers soil substrates, particularly on banks, although it sometimes occurs on rocks or tree bases. Canadian collections are from a variety of habitats (e.g., wet deciduous woodlot, grassy clearing among planted pines, among cedars in a swamp).[6]	No	• No banks with exposed soil substrate • Records for this species are not current (i.e., >20 years; last observed between 1825 and 1827).	No
Bartonia virginica	Yellow Bartonia	---	---	S2	Yes	---	• Open to slightly shaded moist Polytrichum and Sphagnum mats.	No	• No moist mats of Polytrichum or Sphagnum • Records for this species are not current (i.e., >20 years; last observed in 1932).	No
Conioselinum chinense	Hemlock-parsley	---	---	S3	Yes	---	• Calcareous cedar swamps • Wet borders of streams and rivers • Seepage slopes in wet coniferous woods, swampy thickets, moist clearings and damp roadsides.	No	• No calcareous cedar swamps, coniferous woods, swampy thickets and moist clearings • The roadsides are damp (ditch) but are dominated by Common Reed and Cattail • Borders of the Elliot-Laidlaw Drain are wet but because this species is found almost exclusively in undisturbed areas (Conservation Coefficient of 10) it is unlikely that it would be growing in the highly disturbed area surrounding the drain • Records for this species are not current (i.e., >20 years; last observed in 1880).	No

Species		Status in Ontario[1]	Status in Canada[2]	S-Rank[3]	NHIC Occurrence Record[4]	Observed during field studies	Habitat Requirements[5,6]	Potential Habitat in the Study Area	Rationale (Based on observation of Study Area)	Species and/or Habitat Affected by the Project
Scientific Name	**Common Name**									
Gentianella quinquefolia ssp. occidentalis	Stiff Gentian	---	---	S2	Yes	---	• Moist soil, roadsides, streambanks and edges of woods • Prairies.	No	• Species is found in almost pristine, undisturbed area (Conservation Coefficient of species is 9) • Study Areais highly disturbed, this species would likely not be found growing in the Study Area • Records for this species are not current (i.e., >20 years; last observed in 1885).	No
Hybanthus concolor	Green Violet	---	---	S2	Yes	---	• Rich, wet-mesic floodplain forests and mesic forests over limestone.	No	• No rich, wet-mesic floodplain forests or mesic forests over limestone • Records for this species are not current (i.e., >20 years; last observed in 1982).	No
Lupinus perennis ssp. perennis	Wild Lupine	---	---	S3	Yes	---	• Dry, sandy oak savannahs and prairies • Open forests and forest edges.	No	• No dry, sandy oak savannahs, prairies and open forests • Forest edges are highly disturbed whereas this species is found almost exclusively in undisturbed areas (Conservation Coefficient of 10) • Records for this species are not current (i.e., >20 years; last observed in 1880).	No
Panicum villosissimum	White-haired Panic Grass	---	---	S3	Yes	---	• Dry open sandy woods, prairie.	No	• No dry, open sandy woods and prairie • Records for this species are not current (i.e., >20 years; last observed in 1879).	No
Polygonum erectum	Erect Knotweed	---	---	S1	Yes	---	• Moist, silty, clay/loam soils in areas subject to persistent disturbance • Edges of actively cultivated fields, dirt farm roads, trampled cattle pastures, farmyards • Wet stream edges and floodplain washout areas.	No	• No moist, silty clam/loam soils • Soils are highly disturbed and have high level of aggregates. Soil within the ROW consists of fill from road construction • Records for this species are not current (i.e., >20 years; last observed in 1880).	No
Scleria triglomerata	Tall Nut Rush	---	---	S1	Yes	---	• Moist prairie and thicket.	No	• Moist prairie and thicket not observed • Records for this species are not current (i.e., >20 years; last observed in 1881).	No

1 - Species at Risk in Ontario List under the provincial *Endangered Species Act*, 2007; 2 – Status identified by the Committee on the Status of Endangered Wildlife in Canada under the federal *Species at Risk Act*, 2002; 3 - Ontario SRank; S5 = secure; S4= apparently secure; S3 = vulnerable; S2 = imperiled; SX = Extirpated; SH = Possibly Extirpated; 4 - OMNR Natural Heritage Information Centre Biodiversity Explorer; 5 - OMNR Significant Wildlife Technical Guide - Appendix G (2000); 6 – COSEWIC – Spoon-leaved Moss Assessment Report (2003); 7 - Seattle Audubon Society: Bird Web; 8 - Paulson, D. 2011. Dragonflies and damselflies of the east; 9 - The Dragonflies and Damselflies of New Jersey

5. ASSESSMENT OF POTENTIAL IMPACTS AND PROPOSED MITIGATION

5.1 Potential Impacts

This section summarizes the potential impacts that could result if mitigation measures are not implemented for the Highbury Avenue/Highway 401 reconstruction and culvert replacement/rehabilitation. The impacts discussed below are based on the proposed interchange reconstruction design presented in **Figure 4** and the preferred alternative for the Highbury Avenue alignment.

Potential Impacts to Natural Features and Vegetation

The preferred option of maintaining the existing alignment of Highbury Avenue will allow the new bridge and roadway approaches to be in the same general location (**Figure 4**). This option is expected to have minimal impacts on existing terrestrial resources along Highbury Avenue. In the area of the Highbury Avenue Interchange, minimal impacts to vegetation will occur, including removal of some trees, to facilitate reconstruction of the interchange and accommodate the MTO's Clear Zone Policy from the Roadside Safety Manual (**Figure 4**). Some tree removal and vegetation clearing may also take place along the Elliot-Laidlaw Drain where it passes under Highway 401.

In the area of the significant woodland (**Figure 2**), tree removal of edge species will be required to facilitate the widening of Highbury to six lanes (**Figure 4**). The area of permanent displacement from this woodland is approximately 600 m^2. This removal of woodland edge vegetation is anticipated to be minimal and is unlikely to impact the ecological function of the woodland.

Potential impacts from vegetation removal include:

- Creation of a new woodland edge in areas of cleared woodland
- Increased erosion and sedimentation of lands adjacent to the construction area
- Increased vulnerability of the areas cleared of vegetation to invasion by non-native species
- Decreased shade and cover for fish and wildlife

- Localized temporary displacement of wildlife due to disturbance associated with construction activity
- Potential for imported materials (e.g., gravel) to be released to adjacent riparian habitat and displace native substrates.

Potential Impacts to Species at Risk and Provincially Rare Species

The Monarch (provincially and federally *Special Concern*) identified during field investigations was observed within the northeast interchange area identified for reconstruction. Due to the timing of the field investigations, individuals observed were most likely passing through as part of the Monarch's spring migration. There is no suitable habitat within the Study Area for the species to successfully reproduce. No impacts to this species are expected from the Highbury Avenue/Highway 401 interchange reconstruction.

An Eastern Meadowlark, a species listed as *Threatened* on the Species at Risk in Ontario List under the provincial *Endangered Species Act* (ESA), 2007, was observed flying over the Study Area. The SAR habitat screening shown in **Table 4** indicates that there is no suitable habitat of sufficient size for this species within the Study Area. No impacts to this species are expected from the Highbury Avenue/Highway 401 interchange reconstruction.

Other than the potential impacts mentioned in this section, the proposed project is not expected to result in potential impacts to Species at Risk or provincially rare species.

Potential Impacts to Migratory Nesting Birds

Species protected under the federal *Migratory Birds Convention Act* (*MBCA*), 1994, were documented in the Highbury Avenue/Highway 401 Interchange Study Area. Destruction and disturbance of active nests (with eggs or young birds) as well as wounding and/or killing species protected under the *MBCA* is prohibited under this federal legislation. Any vegetation clearing from April 1 to August 15 or culvert works from May 1 to August 15 could impact migratory nesting birds resulting in a contravention of the *MBCA*.

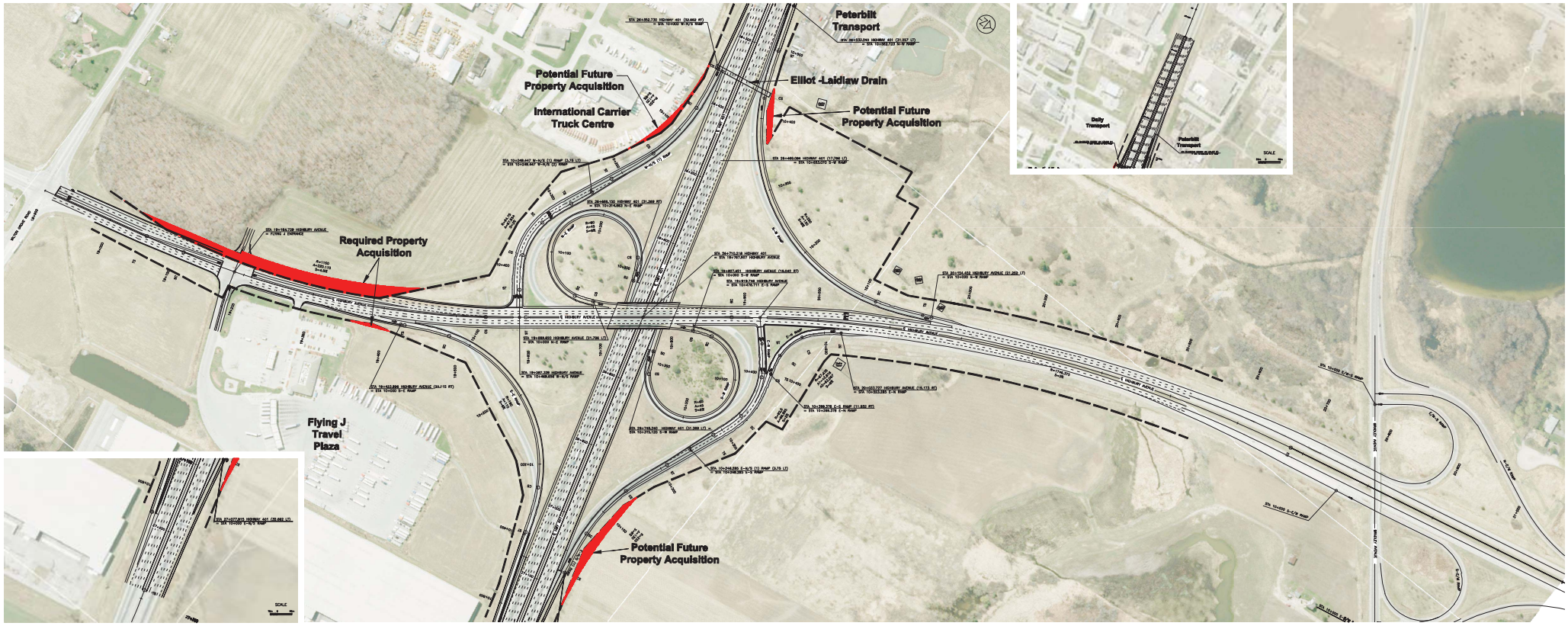

Figure 4 - Ultimate Highway 401 Interchange Reconstruction at Highbury Avenue
As Presented at June 21, 2012 Public Information Centre

Temporary Disturbance to Ecological Corridors

The culverts under Highway 401 and Highbury Avenue traverse riparian areas that are part of the natural environment of the City of London. These natural corridors, consisting mainly of riparian meadow vegetation type, provide ecological connections for the movement and dispersal of local flora and fauna between two Environmentally Sensitive Areas. Impacts to these areas are expected to be minimal and temporary, possibly extending slightly beyond the Highway 401 and Highbury Avenue road corridors during the construction period.

5.2 Mitigation Measures

The following mitigation measures are recommended to avoid or reduce the natural environment impacts of the highway rehabilitation.

- Minimize the amount of area of vegetation removal to the extent possible
- Delineation of vegetation clearing zones and vegetation retention zones on the Contract drawings and in the field prior to construction
- Tree Protection Zones (TPZs) will be established during detail design and shown on the contract drawings adjacent to proposed work areas along Highbury Avenue to protect vegetation, in particular the woodland at the intersection of Wilton Grove Road and Highbury Avenue. Tree protection fences/barriers will be utilized to demarcate TPZs and protect existing trees along cut lines from equipment damage. The tree barrier protection will be in accordance with *OPSS 565 Construction Specification for Protection of Trees*.
- Specifications for appropriate tree felling and grubbing procedures, in accordance with *OPSS 201 Construction Specification for Clearing, Close Cut Clearing, Grubbing, and Removal of Surface Piled Boulders*, to be implemented in order to minimize impacts on surrounding vegetation
- Erosion and sediment control measures will be established during detailed design for the work on the Elliot-Laidlaw Drain culvert
- To protect birds and comply with the federal *MBCA*, vegetation removal should be completed outside of the breeding bird period (April 1 to August 15). Vegetation removal during the restricted bird breeding period can occur if a qualified Avian Biologist conducts a nest search of the vegetated area prior to work commencing and it is determined that active nests are not present in proximity to the removal area

- Banks cleared of vegetation to facilitate culvert replacement along Elliot-Laidlaw Drain will be stabilized (e.g., vegetated) prior to removal of erosion and sediment control measures
- Grading, placement of topsoil and seeding specifications to be implemented to promote suitable native vegetation regeneration. Re-vegetation of disturbed areas along drains and waterways with native species will minimize the invasion and colonization by non-native species and increase shade/cover for fish and wildlife
- Appropriate edge planting strategies, such as planting native trees and shrubs, application of native seed mix, integration of early successional species, and a dense shrub layer in order to limit the amount of debris that can enter the wooded area, will be developed during detail design for newly created edges in the area of the significant woodland.

6. CONCLUSION

The Highbury Avenue/Highway 401 Interchange Reconstruction Project may result in impacts to the terrestrial natural environment, if left unmitigated. Wildlife disturbance impacts to natural features located in or near the Study Area are expected to be minimal and temporary in duration. The construction works may require the removal of select trees to apply the Clear Zone policy; however, vegetation removals have been minimized to the extent possible. The mitigation measures proposed in this document will avoid or minimize the potential impacts to vegetated areas including significant woodlands, migratory nesting birds, and other potential wildlife and wildlife habitat in proximity to the project.

DILLON CONSULTING LIMITED
LONDON, ONTARIO

Jennifer Petruniak, M.Sc.
Biologist

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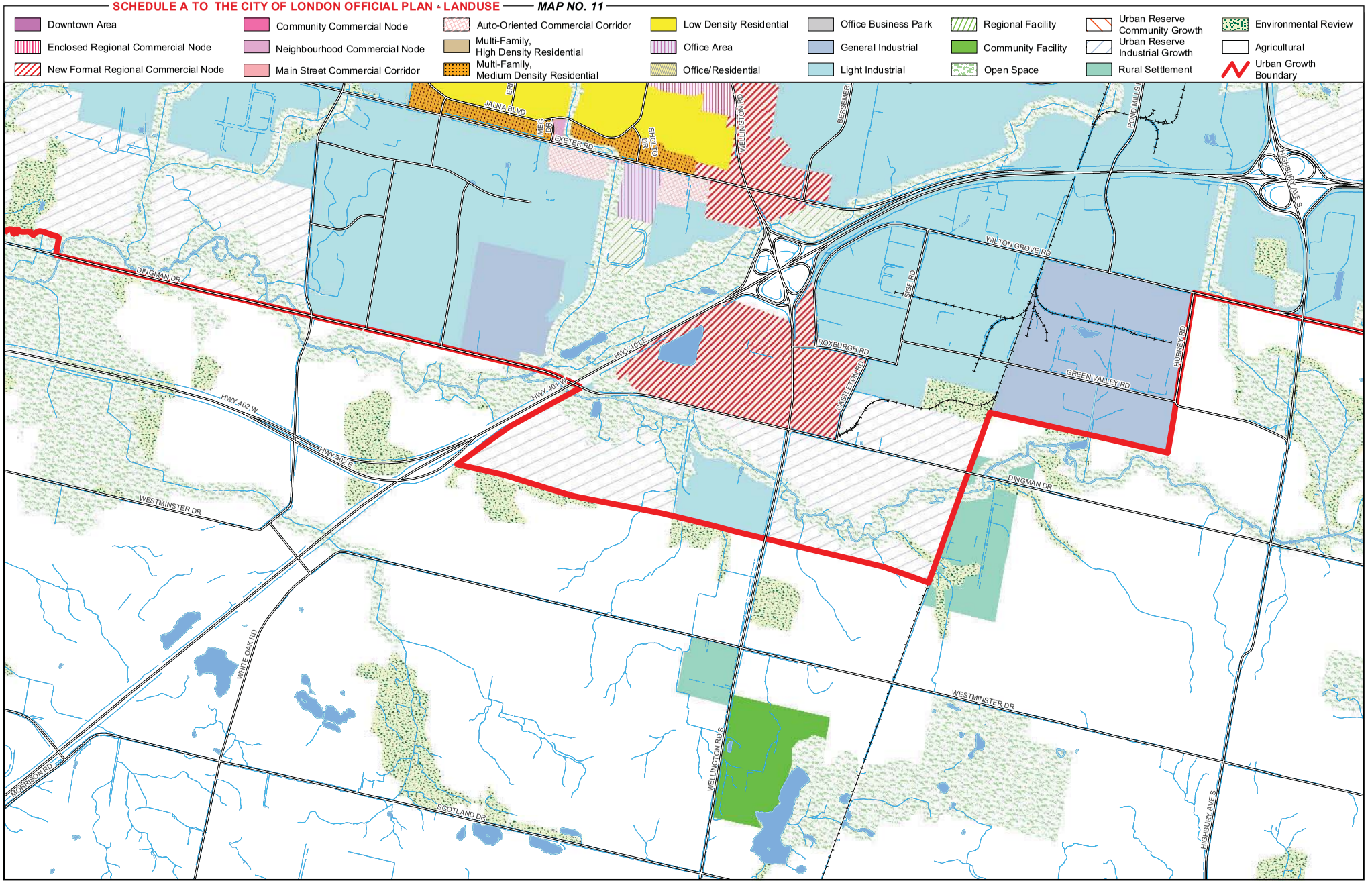
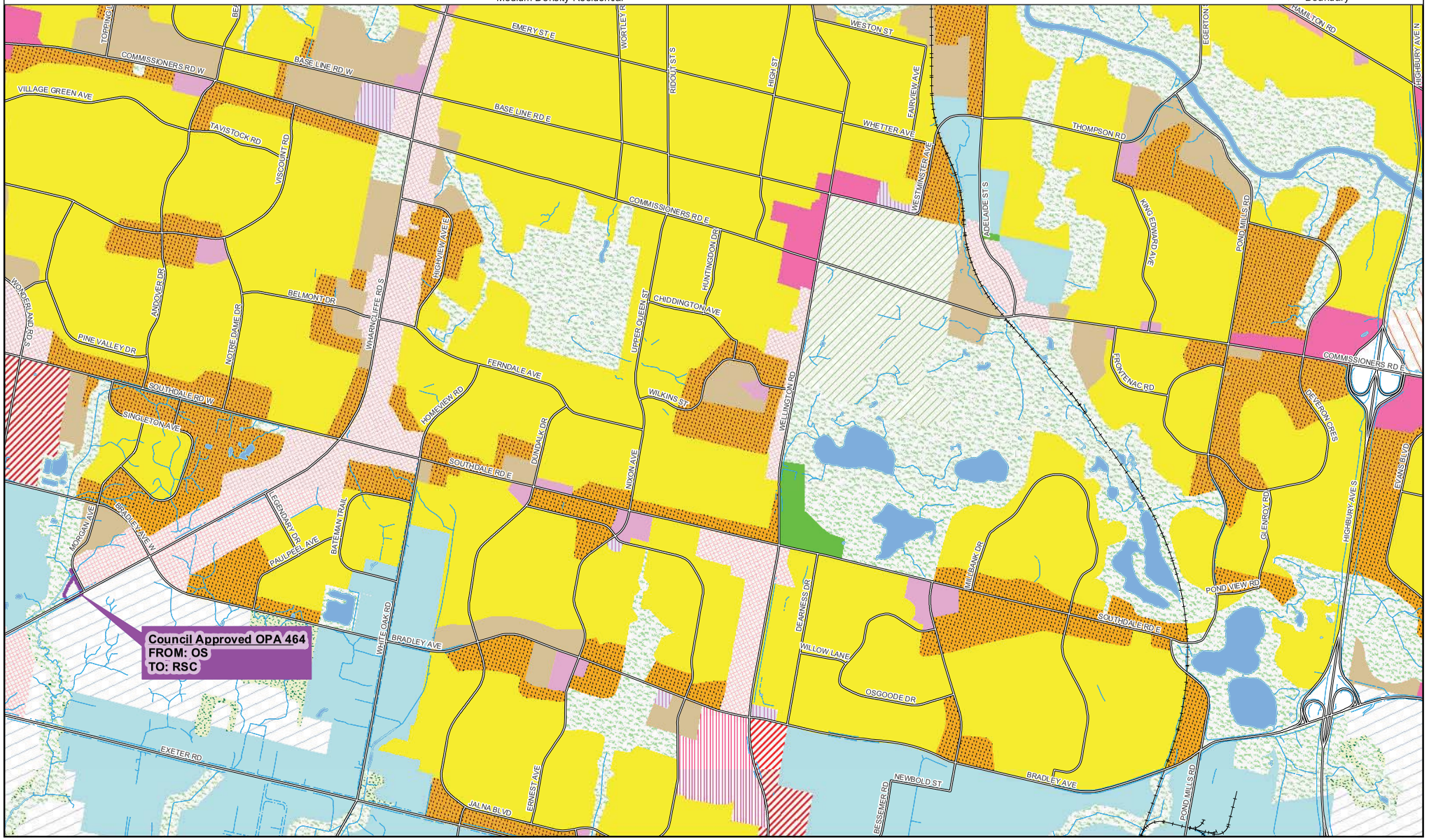
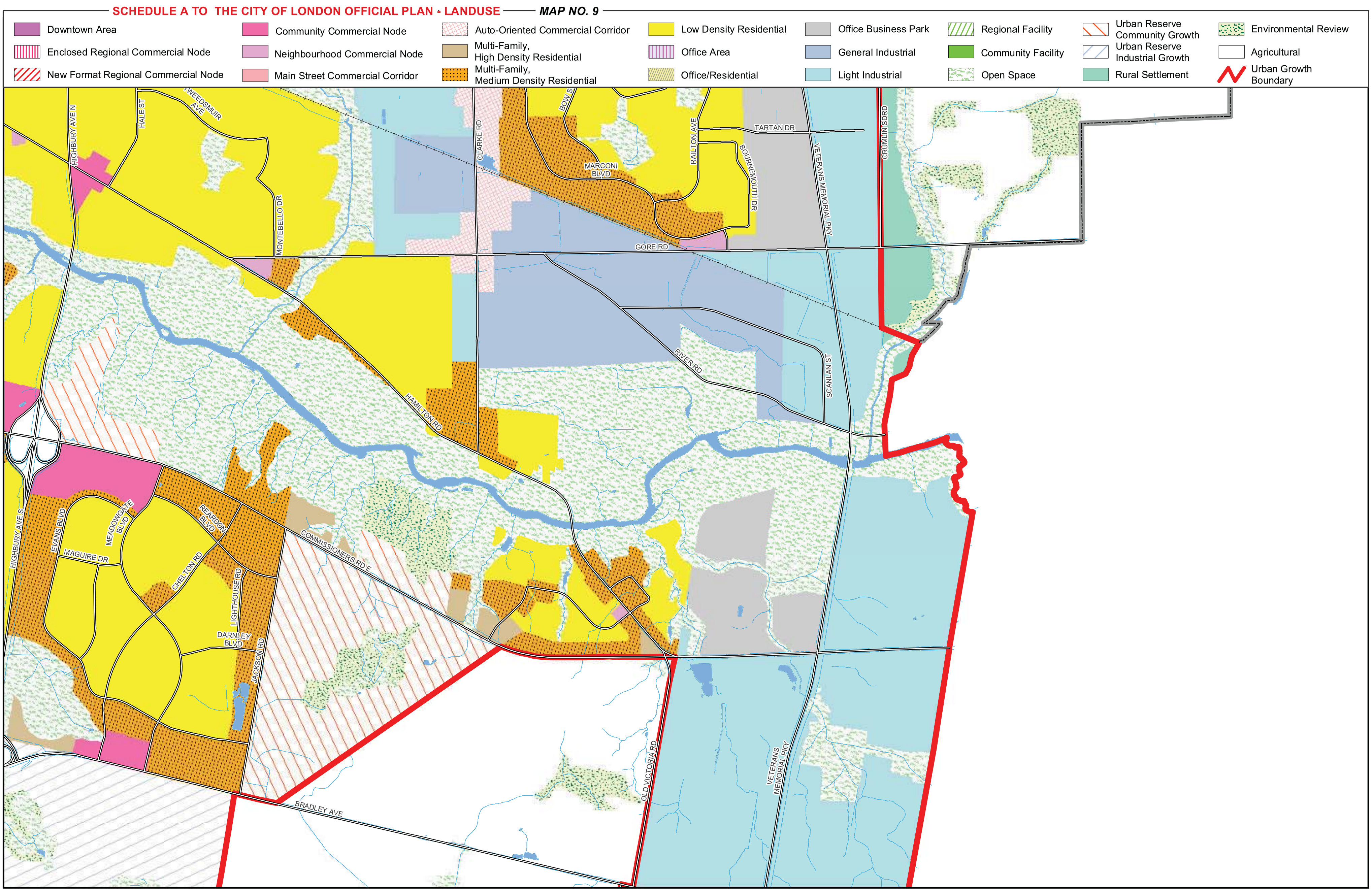
APPENDIX A
OFFICIAL PLAN SCHEDULES

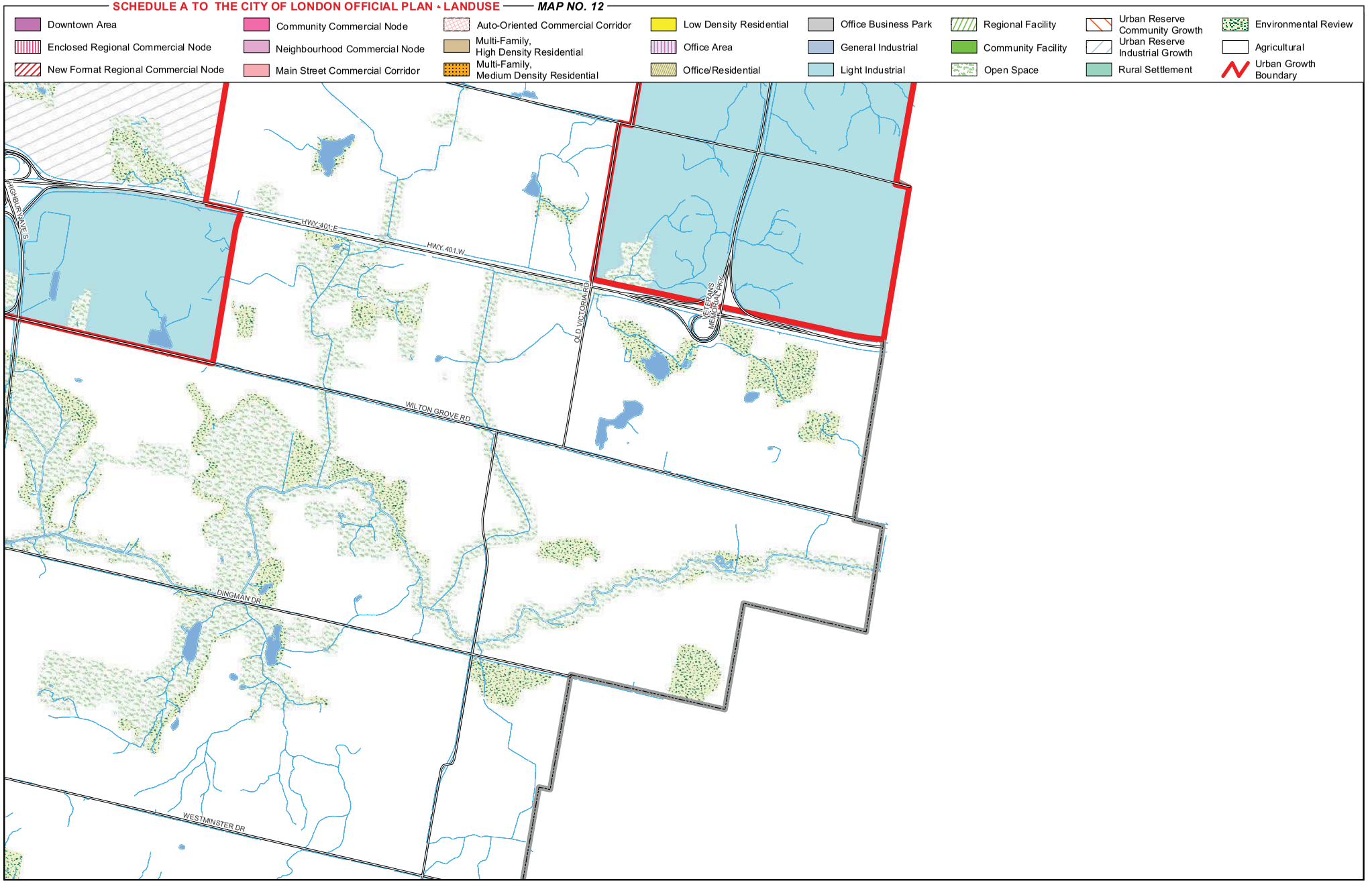

SCHEDULE A TO THE CITY OF LONDON OFFICIAL PLAN - LANDUSE
MAP NO. 11
Downtown Area
Enclosed Regional Commercial Node
New Format Regional Commercial Node
Community Commercial Node
Neighbourhood Commercial Node
Main Street Commercial Corridor
Auto-Oriented Commercial Corridor
Multi-Family, High Density Residential
Multi-Family, Medium Density Residential
Low Density Residential
Office Area
Office/Residential
Office Business Park
General Industrial
Light Industrial
Regional Facility
Community Facility
Open Space
Urban Reserve Community Growth
Urban Reserve Industrial Growth
Rural Settlement
Environmental Review
Agricultural
Urban Growth Boundary
JALNA BLVD
EXETER RD
WELLINGTON RD
BESSEMER
POND MILLS
HIGHBURY AVE S
WILTON GROVE RD
SISE RD
ROXBURGH RD
CASTLETON RD
GREEN VALLEY RD
HUBREY RD
DINGMAN DR
HWY 401 E
HWY 401 W
HWY 402 W
HWY 402 E
WESTMINSTER DR
WHITE OAK RD
MORRISON RD
SCOTLAND DR
WELLINGTON RD S

SCHEDULE A TO THE CITY OF LONDON OFFICIAL PLAN - LANDUSE — MAP NO. 8

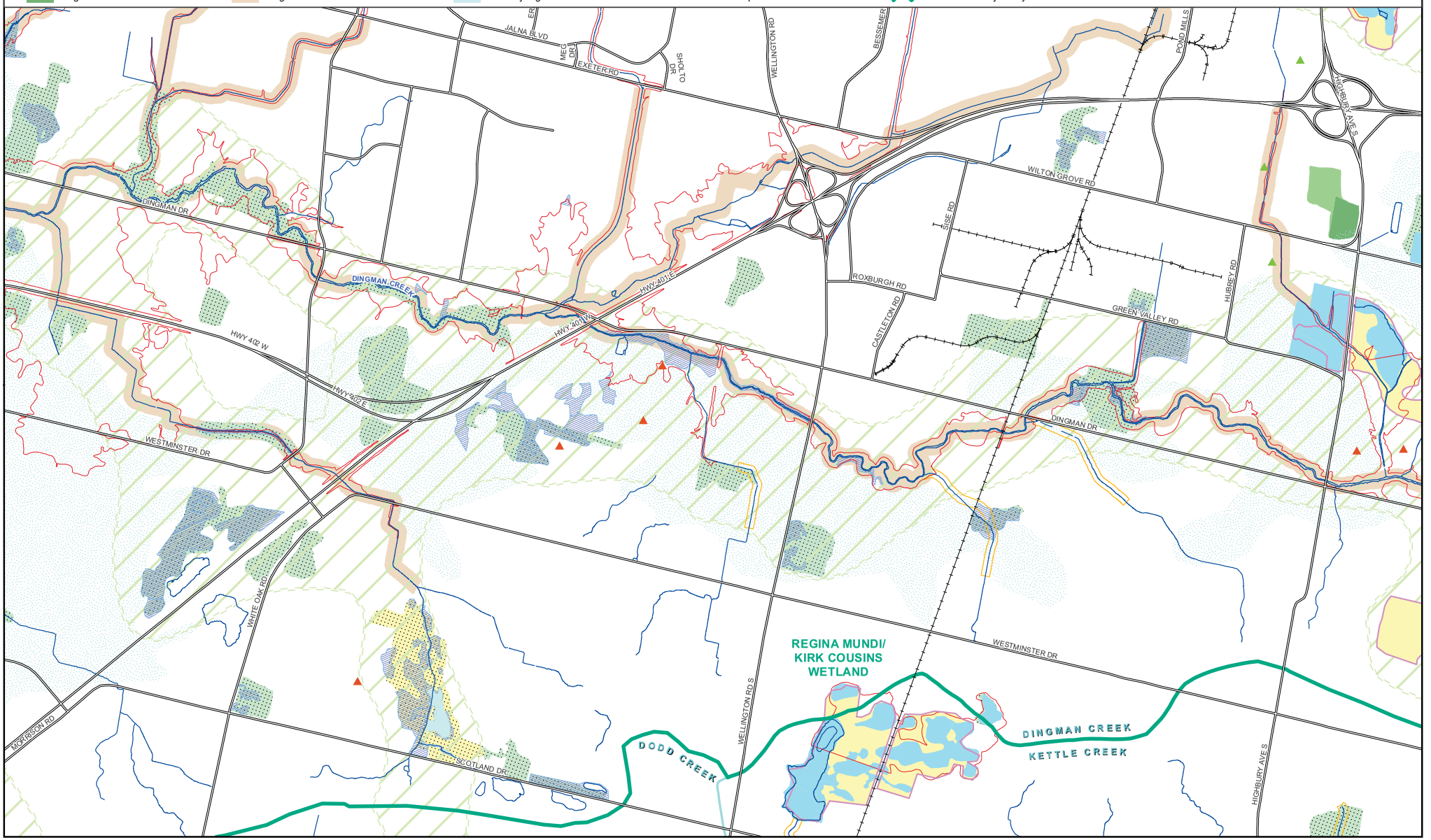
- Downtown Area
- Enclosed Regional Commercial Node
- New Format Regional Commercial Node
- Community Commercial Node
- Neighbourhood Commercial Node
- Main Street Commercial Corridor
- Auto-Oriented Commercial Corridor
- Multi-Family, High Density Residential
- Multi-Family, Medium Density Residential
- Low Density Residential
- Office Area
- Office/Residential
- Office Business Park
- General Industrial
- Light Industrial
- Regional Facility
- Community Facility
- Open Space
- Urban Reserve Community Growth
- Urban Reserve Industrial Growth
- Rural Settlement
- Environmental Review
- Agricultural
- Urban Growth Boundary



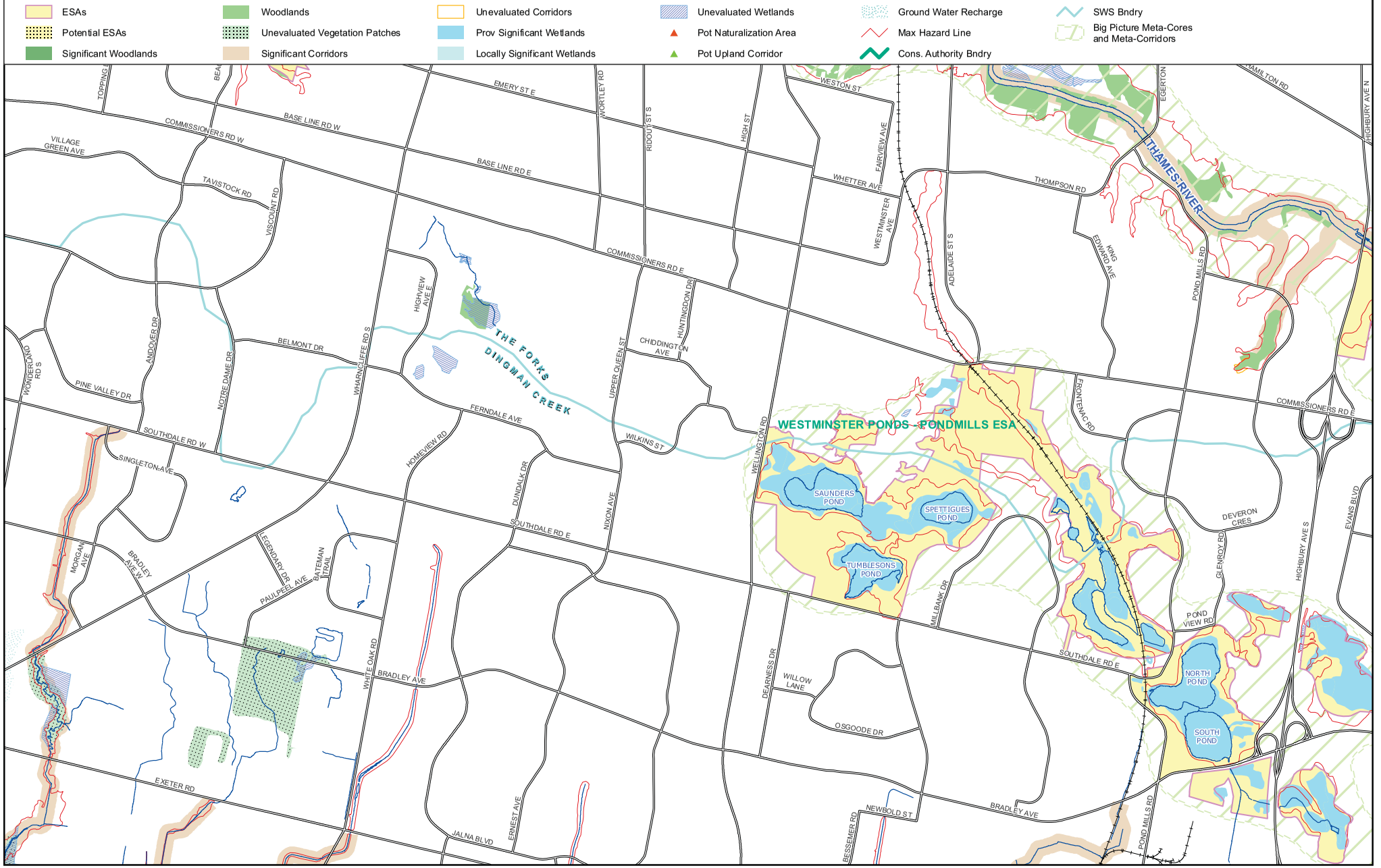

SCHEDULE A TO THE CITY OF LONDON OFFICIAL PLAN • LANDUSE
MAP NO. 9
Downtown Area
Enclosed Regional Commercial Node
New Format Regional Commercial Node
Community Commercial Node
Neighbourhood Commercial Node
Main Street Commercial Corridor
Auto-Oriented Commercial Corridor
Multi-Family, High Density Residential
Multi-Family, Medium Density Residential
Low Density Residential
Office Area
Office/Residential
Office Business Park
General Industrial
Light Industrial
Regional Facility
Community Facility
Open Space
Urban Reserve Community Growth
Urban Reserve Industrial Growth
Rural Settlement
Environmental Review
Agricultural
Urban Growth Boundary
HIGHBURY AVE N
HALE ST
TWEEDSMUIR AVE
MONTEBELLO DR
CLARKE RD
BOW S
MARCONI BLVD
RAILTON AVE
BOURNEMOUTH DR
TARTAN DR
VETERANS MEMORIAL PKY
CRUMLIN SDRD
GORE RD
RIVER RD
SCANLAN ST
HAMILTON RD
HIGHBURY AVE S
EVANS BLVD
MEADOWGATE BLVD
MAGUIRE DR
REARDON BLVD
CHELTON RD
LIGHTHOUSE RD
DARNLEY BLVD
JACKSON RD
COMMISSIONERS RD E
BRADLEY AVE
OLD VICTORIA RD
VETERANS MEMORIAL PKY


SCHEDULE A TO THE CITY OF LONDON OFFICIAL PLAN - LANDUSE
MAP NO. 12
Downtown Area
Enclosed Regional Commercial Node
New Format Regional Commercial Node
Community Commercial Node
Neighbourhood Commercial Node
Main Street Commercial Corridor
Auto-Oriented Commercial Corridor
Multi-Family, High Density Residential
Multi-Family, Medium Density Residential
Low Density Residential
Office Area
Office/Residential
Office Business Park
General Industrial
Light Industrial
Regional Facility
Community Facility
Open Space
Urban Reserve Community Growth
Urban Reserve Industrial Growth
Rural Settlement
Environmental Review
Agricultural
Urban Growth Boundary
HIGHBURY AVE S
HWY 401 E
HWY 401 W
OLD VICTORIA RD
EVANS MEMORIAL PKY
WILTON GROVE RD
DINGMAN DR
WESTMINSTER DR

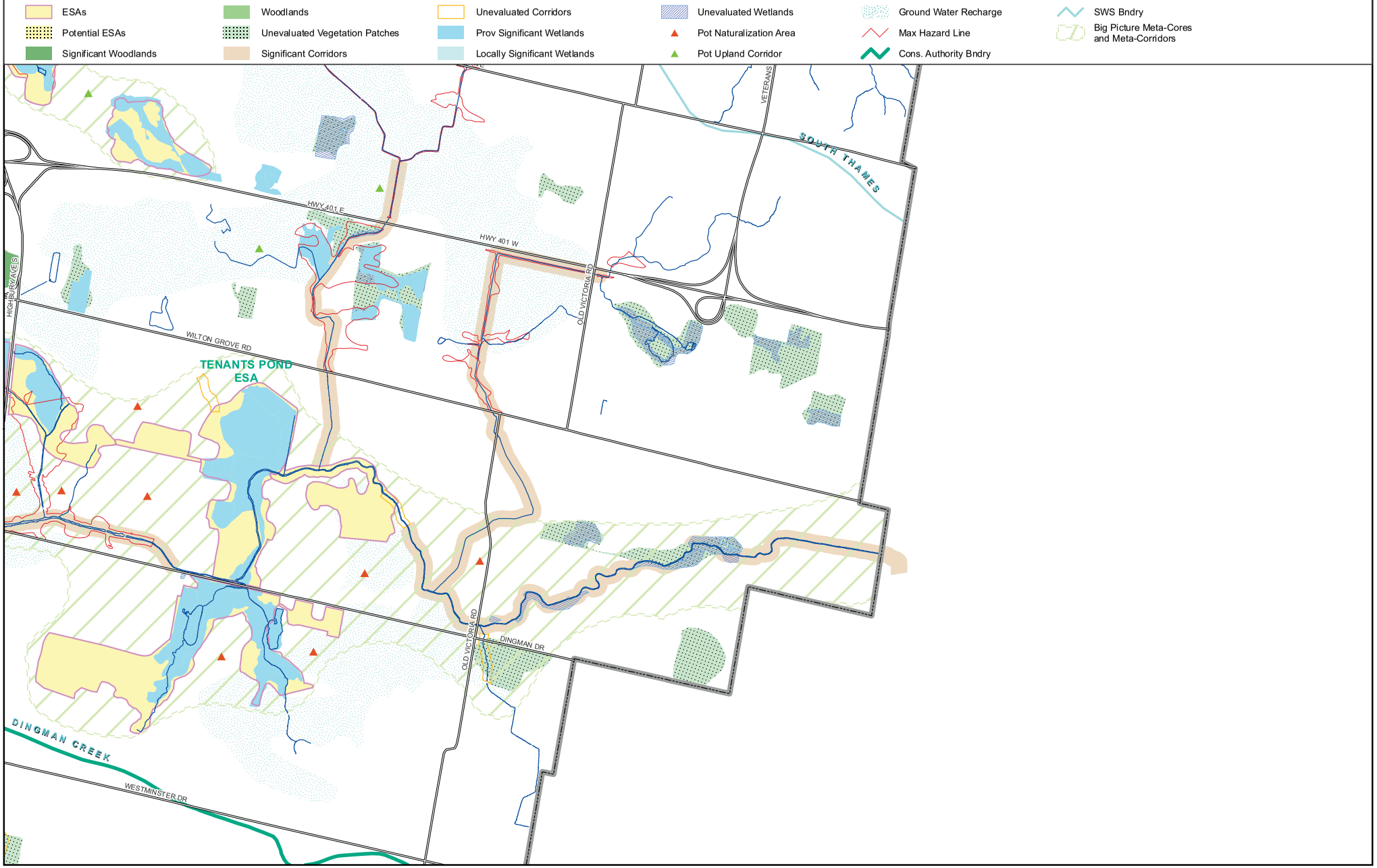
SCHEDULE B-1 TO THE CITY OF LONDON OFFICIAL PLAN - NATURAL HERITAGE FEATURES — MAP NO. 11



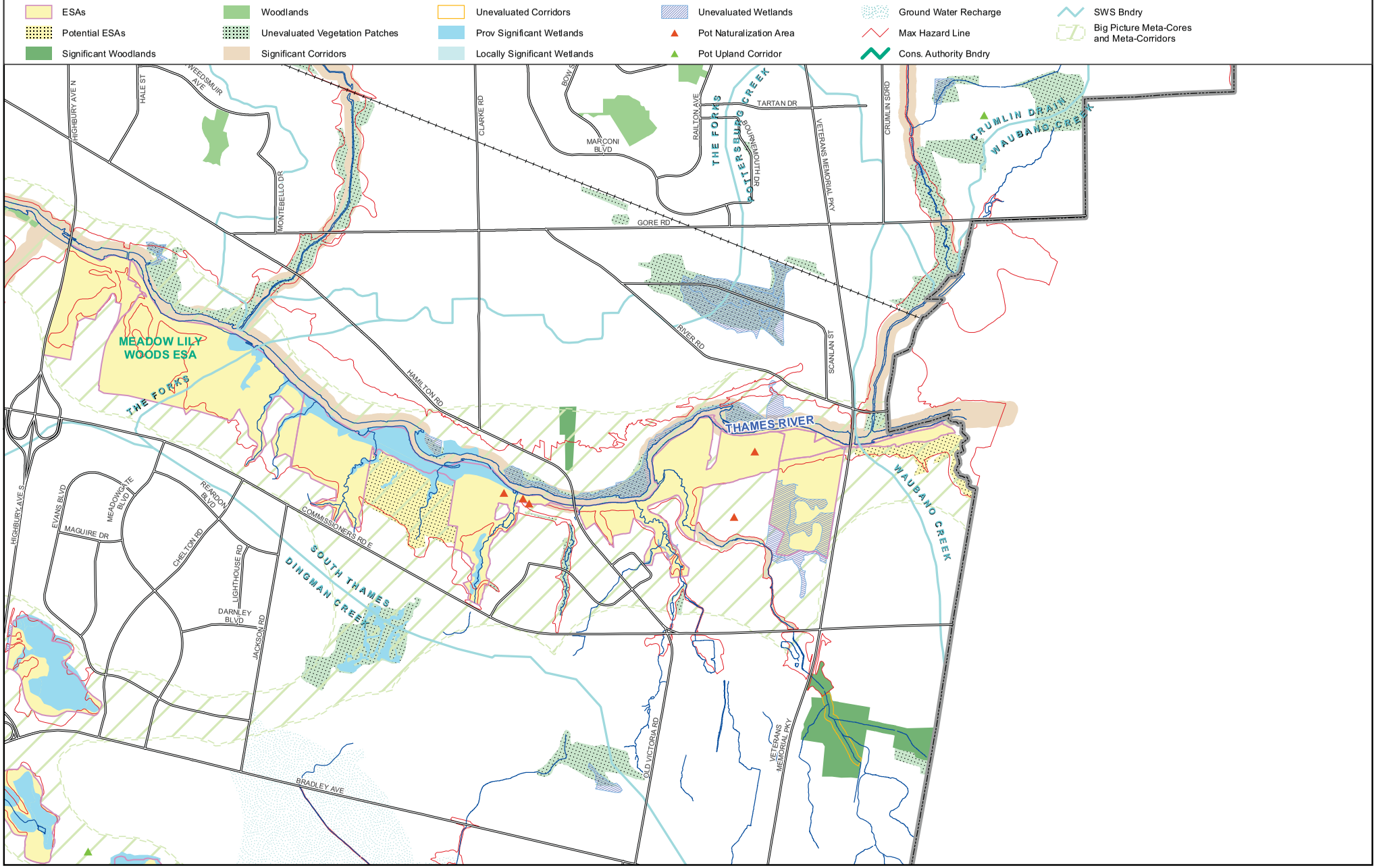
SCHEDULE B-1 TO THE CITY OF LONDON OFFICIAL PLAN • NATURAL HERITAGE FEATURES — MAP NO. 8



SCHEDULE B-1 TO THE CITY OF LONDON OFFICIAL PLAN - NATURAL HERITAGE FEATURES — MAP NO. 12



SCHEDULE B-1 TO THE CITY OF LONDON OFFICIAL PLAN • NATURAL HERITAGE FEATURES — *MAP NO. 9*



APPENDIX B
PHOTO PLATES

Photo 1 Highbury Avenue May 08, 2012 ELC Polygon 1 MEGM3-4: Kentucky Bluegrass Graminoid Meadow (Mown)	
Photo 2 Highbury Avenue May 08, 2012 ELC Polygon 2a MEMM3: Dry-Fresh Mixed Meadow	

Photo 3 Highbury Avenue May 08, 2012 ELC Polygon 2a (Inclusion) THDM2-4: Grey Dogwood Deciduous Shrub Thicket	
Photo 4 Highbury Avenue May 08, 2012 ELC Polygon 2b MEMM3: Dry-Fresh Mixed Meadow (Taken from Wilton Grove/Highbury Intersection looking north)	

Photo 5 Highbury Avenue May 08, 2012 ELC Polygon 2b (Inclusion) THDM2-4: Grey Dogwood Deciduous Shrub Thicket	
Photo 6 Highbury Avenue May 08, 2012 ELC Polygon 2b Elliot-Laidlaw Drain (south of 401)	

Photo 7 Highbury Avenue May 08, 2012 ELC Polygon 2c MEMM3: Dry-Fresh Mixed Meadow (Taken from Bradley Avenue looking south)	
Photo 8 Highbury Avenue May 08, 2012 ELC Polygon 2d MEMM3: Dry-Fresh Mixed Meadow ELC Polygon 4 WOCM1-1: Dry-Fresh Coniferous Woodland	

Photo 9 Highbury Avenue May 08, 2012 ELC Polygon 2e MEMM3: Dry-Fresh Mixed Meadow	
Photo 10 Highbury Avenue May 08, 2012 ELC Polygon 3a MEGM3: Dry-Fresh Graminoid Meadow	

Photo 11 Highbury Avenue May 08, 2012 ELC Polygon 3b MEGM3: Dry-Fresh Graminoid Meadow	
Photo 12 Highbury Avenue May 08, 2012 ELC Polygon 3c MEGM3: Dry-Fresh Graminoid Meadow	

Photo 13 Highbury Avenue May 08, 2012 ELC Polygon 3d MEGM3: Dry-Fresh Graminoid Meadow	
Photo 14 Highbury Avenue May 08, 2012 ELC Polygon 3e MEGM3: Dry-Fresh Graminoid Meadow	

Photo 15 Highbury Avenue May 08, 2012 ELC Polygon 3e Elliot-Laidlaw Drain (north of 401)	
Photo 16 Highbury Avenue May 08, 2012 ELC Polygon 3f MEGM3: Dry-Fresh Graminoid Meadow	

Photo 17 Highbury Avenue May 08, 2012 ELC Polygon 4 WOCM1-1: Dry-Fresh Coniferous Woodland ELC Polygon 2d MEMM3: Dry-Fresh Mixed Meadow	
Photo 18 Highbury Avenue May 08, 2012 ELC Polygon 5 SWDM4-5: Poplar Mineral Deciduous Swamp	

Photo 19 Highbury Avenue May 08, 2012 ELC Polygon 6a MAMM1-2: Cattail Meadow Marsh	
Photo 20 Highbury Avenue May 08, 2012 ELC Polygon 6b MAMM1-2: Cattail Meadow Marsh	

Photo 21 Highbury Avenue May 08, 2012 ELC Polygon 7 WODM4-4: Dry-Fresh Walnut Deciduous Woodland	
Photo 22 Highbury Avenue May 08, 2012 ELC Polygon 8 THDM2: Dry-Fresh Deciduous Shrub Thicket	

Photo 23 Highbury Avenue May 08, 2012 ELC Polygon 9 FODM4: Dry-Fresh Upland Deciduous Forest	

APPENDIX C
SPECIES

APPENDIX C1
POTENTIAL WILDLIFE SPECIES

Wildlife Species with Potential to Occur in Study Area

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]	Information Source					
					OBBA Square # 17MH85	Christmas Bird Count ONLO	Atlas of the Mammals of Ontario	NHIC Herptofaunal Atlas	Ontario Nature Reptile and Amphibian Atlas	NHIC Odonata Atlas
BIRDS										
Anas rubripes	American Black Duck	---	---	S4		●				
Fulica americana	American Coot	---	---	S4B		●				
Corvus brachyrhynchos	American Crow	---	---	S5B	●	●				
Carduelis tristis	American Goldfinch	---	---	S5B	●	●				
Falco sparverius	American Kestrel	---	---	S4	●	●				
Setophaga ruticilla	American Redstart	---	---	S5B	●					
Turdus migratorius	American Robin	---	---	S5B	●	●				
Spizella arborea	American Tree Sparrow	---	---	S4B		●				
Scolopax minor	American Woodcock	---	---	S4B	●					
Icterus galbula	Baltimore Oriole	---	---	S4B	●					
Strix varia	Barred Owl	---	---	S5		●				
Ceryle alcyon	Belted Kingfisher	---	---	S4B	●	●				
Coccyzus erythropthalmus	Black-billed Cuckoo	---	---	S5B	●					
Poecile atricapillus	Black-capped Chickadee	---	---	S5	●	●				
Cyanocitta cristata	Blue Jay	---	---	S5	●	●				
Polioptila caerulea	Blue-gray Gnatcatcher	---	---	S4B	●					
Vermivora pinus	Blue-winged Warbler	---	---	S4B	●					
Certhia americana	Brown Creeper	---	---	S5B		●				
Toxostoma rufum	Brown Thrasher	---	---	S4B	●					
Molothrus ater	Brown-headed Cowbird	---	---	S4B	●	●				
Bucephala albeola	Bufflehead	---	---	S4		●				
Branta canadensis	Canada Goose	---	---	S5	●	●				
Thryothorus ludovicianus	Carolina Wren	---	---	S4	●	●				
Bombycilla cedrorum	Cedar Waxwing	---	---	S5B	●	●				
Spizella passerina	Chipping Sparrow	---	---	S5B	●	●				
Spizella pallida	Clay-coloured Sparrow	---	---	S4B	●					
Petrochelidon pyrrhonota	Cliff Swallow	---	---	S4B	●					
Bucephala clanula	Common Goldeneye	---	---	S5		●				
Quiscalus quiscula	Common Grackle	---	---	S5B	●					
Mergus merganser	Common Merganser	---	---	S5B, S5N		●				
Carduelis flammea	Common Redpoll	---	---	S4B		●				
Geothlypis trichas	Common Yellowthroat	---	---	S5B	●	●				

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]	Information Source					
					OBBA Square # 17MH85	Christmas Bird Count ONLO	Atlas of the Mammals of Ontario	NHIC Herptofaunal Atlas	Ontario Nature Reptile and Amphibian Atlas	NHIC Odonata Atlas
Accipiter cooperii	Cooper's Hawk	---	---	S4B, SZN	●	●				
Junco hyemalis	Dark-eyed Junco	---	---	S5B		●				
Phalacrocorax auritus	Double-crested Cormorant	---	---	S5B		●				
Picoides pubescens	Downy Woodpecker	---	---	S5	●	●				
Sialia sialis	Eastern Bluebird	---	---	S5B	●	●				
Tyrannus tyrannus	Eastern Kingbird	---	---	S4B	●					
Sayornis phoebe	Eastern Phoebe	---	---	S5B	●					
Otus asio	Eastern Screech-owl	---	---	S4	●	●				
Pipilo erythrophthalmus	Eastern Towhee	---	---	S4B	●	●				
Contopus virens	Eastern Wood-pewee	---	---	S4B	●					
Sturnus vulgaris	European Starling	---	---	SNA	●	●				
Spizella pusilla	Field Sparrow	---	---	S4B	●	●				
Passerella iliaca	Fox Sparrow	---	---	S4B		●				
Anas strepera	Gadwall	---	---	S4B		●				
Larus hyperboreus	Glaucous Gull	---	---	S4N		●				
Regulus satrapa	Golden-crowned Kinglet	---	---	S5B		●				
Dumetella carolinensis	Gray Catbird	---	---	S4B	●					
Ardea herodias	Great Blue Heron	---	---	S4		●				
Myiarchus crinitus	Great Crested Flycatcher	---	---	S4B	●					
Bubo virginianus	Great Horned Owl	---	---	S4	●	●				
Aythya marila	Greater Scaup	---	---	S4		●				
Butorides virescens	Green Heron	---	---	S4B	●					
Anas crecca	Green-winged Teal	---	---	S4		●				
Picoides villosus	Hairy Woodpecker	---	---	S5	●	●				
Catharus guttatus	Hermit Thrush	---	---	S5B		●				
Larus argentatus	Herring Gull	---	---	S5B, S5N		●				
Lophodytes cucullatus	Hooded Merganser	---	---	S5B, S5N		●				
Eremophila alpestris	Horned Lark	---	---	S5B, SZN	●	●				
Carpodacus mexicanus	House Finch	---	---	SNA	●	●				
Passer domesticus	House Sparrow	---	---	SNA	●	●				
Troglodytes aedon	House Wren	---	---	S5B	●					
Larus glaucoides	Iceland Gull	---	---	S4N		●				
Passerina cyanea	Indigo Bunting	---	---	S4B	●					
Charadrius vociferus	Killdeer	---	---	S5B, S5N	●					
Empidonax minimus	Least Flycatcher	---	---	S4B	●					

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]	Information Source					
					OBBA Square # 17MH85	Christmas Bird Count ONLO	Atlas of the Mammals of Ontario	NHIC Herptofaunal Atlas	Ontario Nature Reptile and Amphibian Atlas	NHIC Odonata Atlas
Larus fuscus	Lesser Black-backed Gull	---	---	SNA		●				
Aythya affinis	Lesser Scaup	---	---	S4		●				
Melospiza lincolnii	Lincoln's Sparrow	---	---	S5B		●				
Anas platyrhynchos	Mallard	---	---	S5	●	●				
Falco columbarius	Merlin	---	---	S5B		●				
Zenaida macroura	Mourning Dove	---	---	S5	●	●				
Cygnus olor	Mute Swan	---	---	SNA	●	●				
Cardinalis cardinalis	Northern Cardinal	---	---	S5	●	●				
Colaptes auratus	Northern Flicker	---	---	S4B	●	●				
Accipiter gentilis	Northern Goshawk	---	---	S4		●				
Circus cyaneus	Northern Harrier	---	---	S4B		●				
Mimus polyglottos	Northern Mockingbird	---	---	S4	●	●				
Anas acuta	Northern Pintail	---	---	S5		●				
Stelgidopteryx serripennis	Northern Rough-winged Swallow	---	---	S4B	●					
Lanius excubitor	Northern Shrike	---	---	SNA		●				
Seiurus noveboracensis	Northern Waterthrush	---	---	S5B	●					
Pandion haliaetus	Osprey	---	---	S5B	●					
Seiurus aurocapillus	Ovenbird	---	---	S4B	●					
Podilymbus podiceps	Pied-billed Grebe	---	---	S4B, S4N		●				
Dryocopus pileatus	Pileated Woodpecker	---	---	S5	●	●				
Carduelis pinus	Pine Siskin	---	---	S4B		●				
Dendroica pinus	Pine Warbler	---	---	S5B	●					
Carpodacus purpureus	Purple Finch	---	---	S4B		●				
Progne subis	Purple Martin	---	---	S4B	●					
Melanerpes carolinus	Red-bellied Woodpecker	---	---	S4	●	●				
Mergus serrator	Red-breasted Merganser	---	---	S4B, S5N		●				
Sitta canadensis	Red-breasted Nuthatch	---	---	S5	●	●				
Vireo olivaceus	Red-eyed Vireo	---	---	S5B	●					
Buteo lineatus	Red-shouldered Hawk	SC	---	S4B		●				
Buteo jamaicensis	Red-tailed Hawk	---	---	S5	●	●				
Agelaius phoeniceus	Red-winged Blackbird	---	---	S4	●	●				
Larus delawarensis	Ring-billed Gull	---	---	S5B, S4N		●				
Aythya collaris	Ring-necked Duck	---	---	S5		●				
Phasianus colchicus	Ring-necked Pheasant	---	---	SNA		●				
Columba livia	Rock Dove	---	---	SNA	●	●				

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]	Information Source					
					OBBA Square # 17MH85	Christmas Bird Count ONLO	Atlas of the Mammals of Ontario	NHIC Herptofaunal Atlas	Ontario Nature Reptile and Amphibian Atlas	NHIC Odonata Atlas
Pheucticus ludovicianus	Rose-breasted Grosbeak	---	---	S4B	●	●				
Regulus calendula	Ruby-crowned Kinglet	---	---	S4B		●				
Archilochus colubris	Ruby-throated Hummingbird	---	---	S5B	●					
Oxyura jamaicensis	Ruddy Duck	---	---	S4B, S4N		●				
Bonasa umbellus	Ruffed Grouse	---	---	S4	●					
Passerculus sandwichensis	Savannah Sparrow	---	---	S4B	●					
Cistothorus platensis	Sedge Wren	---	---	S4B	●					
Accipiter striatus	Sharp-shinned Hawk	---	---	S5B, SZN		●				
Plectrophenax nivalis	Snow Bunting	---	---	SNA		●				
Chen caerulescens	Snow Goose	---	---	S5B		●				
Melospiza melodia	Song Sparrow	---	---	S5B	●	●				
Actitis macularia	Spotted Sandpiper	---	---	S5	●					
Melospiza georgiana	Swamp Sparrow	---	---	S5B	●	●				
Tachycineta bicolor	Tree Swallow	---	---	S4B	●					
Cygnus buccinator	Trumpeter Swan	---	---	S4		●				
Baeolophus bicolor	Tufted Titmouse	---	---	S4		●				
Cygnus columbianus	Tundra Swan	---	---	S4		●				
Cathartes aura	Turkey Vulture	---	---	S5B	●					
Catharus fuscenscens	Veery	---	---	S4B	●					
Pooecetes gramineus	Vesper Sparrow	---	---	S4B	●	●				
Rallus limicola	Virginia Rail	---	---	S5B	●					
Vireo gilvus	Warbling Vireo	---	---	S5B	●					
Sitta carolinensis	White-breasted Nuthatch	---	---	S5	●	●				
Zonotrichia leucophrys	White-crowned Sparrow	---	---	S4B		●				
Zonotrichia albicollis	White-throated Sparrow	---	---	S5B		●				
Loxia leucoptera	White-winged Crossbill	---	---	S5B		●				
Meleagris gallopavo	Wild Turkey	---	---	S5	●	●				
Empidonax traillii	Willow Flycatcher	---	---	S5B, SZN	●					
Gallinago gallinago	Wilson's Snipe	---	---	S5B, SZN		●				
Troglodytes troglodytes	Winter Wren	---	---	S5B		●				
Aix sponsa	Wood Duck	---	---	S5	●	●				
Hylocichla mustelina	Wood Thrush	---	---	S4B	●					
Dendroica petechia	Yellow Warbler	---	---	S5B	●					
Sphyrapicus varius	Yellow-bellied Sapsucker	---	---	S5B		●				
Coccyzus americanus	Yellow-billed Cuckoo	---	---	S4B, SZN	●					

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]	Information Source					
					OBBA Square # 17MH85	Christmas Bird Count ONLO	Atlas of the Mammals of Ontario	NHIC Herptofaunal Atlas	Ontario Nature Reptile and Amphibian Atlas	NHIC Odonata Atlas
MAMMALS										
Blarina brevicauda	Northern Short-tailed Shrew	---	---	S5			●			
Canis latrans	Coyote	---	---	S5			●			
Castor canadensis	Beaver	---	---	S5			●			
Condylura cristata	Star-nosed Mole	---	---	S5			●			
Didelphis virginiana	Virginia Opossum	---	---	S4			●			
Eptesicus fuscus	Big Brown Bat	---	---	S5			●			
Glaucomys volans	Southern Flying Squirrel	---	---	S4			●			
Lasionycteris noctivagans	Silver Haired Bat	---	---	S4			●			
Lasiurus borealis	Eastern Red Bat	---	---	S4			●			
Lasiurus cinereus	Hoary Bat	---	---	S4			●			
Marmota monax	Woodchuck	---	---	S5			●			
Mephitis mephitis	Striped Skunk	---	---	S5			●			
Microtus pennsylvanicus	Meadow Vole	---	---	S5			●			
Mustela frenata	Long-tailed Weasel	---	---	S4			●			
Mustela vison	Mink	---	---	S5			●			
Odocoileus virginianus	White-tailed Deer	---	---	S5			●			
Ondatra zibethicus	Muskrat	---	---	S5			●			
Parascalops breweri	Hairy-tailed Mole	---	---	S4			●			
Peromyscus leucopus	White –footed Mouse	---	---	S5			●			
Peromyscus maniculatus	Deer Mouse	---	---	S5			●			
Procyon lotor	Raccoon	---	---	S5			●			
Sciurus carolinensis	Gray Squirrel	---	---	S5			●			
Sorex cinereus	Masked Shrew	---	---	S5			●			
Sorex fumeus	Smoky Shrew	---	---	S5			●			
Sylvilagus floridanus	Eastern Cottontail	---	---	S5			●			
Tamias striatus	Eastern Chipmunk	---	---	S5			●			
Tamiasciurus hudsonicus	Red Squirrel	---	---	S5			●			
Vulpes vulpes	Red Fox	---	---	S5			●			
Zapus hudsonius	Meadow Jumping Mouse	---	---	S5			●			
Mus musculus	House Mouse	---	---	SNA			●			
Rattus norvegicus	Norway Rat	---	---	SNA			●			
HERPTILES										
Plethodon cinereus	Northern (Eastern) Redback Salamander	---	---	S5				●	●	
Ambystoma maculatum	Spotted Salamander	---	---	S4				●	●	
Bufo americanus	American Toad	---	---	S5				●	●	
Pseudacris crucifer	Spring Peeper	---	---	S5				●	●	
Pseudacris triseriata Pop. 1	Western Chorus Frog	---	---	S4				●	●	

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]	Information Source					
					OBBA Square # 17MH85	Christmas Bird Count ONLO	Atlas of the Mammals of Ontario	NHIC Herptofaunal Atlas	Ontario Nature Reptile and Amphibian Atlas	NHIC Odonata Atlas
	(**Carolinian Population**)									
Hyla versicolor	Gray Treefrog	---	---	S5				●	●	
Rana sylvatica	Wood Frog	---	---	S5				●	●	
Rana pipiens	Northern Leopard Frog	---	---	S5				●	●	
Rana palustris	Pickerel Frog	---	---	S4				●	●	
Rana clamitans	Green Frog	---	---	S5				●	●	
Rana catesbeiana	Bullfrog	---	---	S4				●	●	
Chrysemys picta marginata	Midland Painted Turtle	---	---	S5				●	●	
Thamnophis sirtalis sirtalis	Eastern Garter Snake	---	---	S5				●	●	
Nerodia sipedon sipedon	Northern Water Snake	---	---	S5				●	●	
Storeria dekayi	Brown Snake	---	---	S5				●	●	
Notophthalmus viridescens viridescens	Red-spotted Newt	---	---	S5				●		
Ambystoma jeffersonianum-laterale "complex	Jefferson / Blue-spotted Salamander Complex	---	---	---				●		
Ambystoma laterale	Blue Spotted Salamander	---	---	S4					●	
ODONATA										
Aeshna canadensis	Canada Darner	---	---	S5						●
Aeshna constricta	Lance-tipped Darner	---	---	S5						●
Aeshna umbrosa	Shadow Darner	---	---	S5						●
Anax junius	Common Green Darner	---	---	S5						●
Calopteryx aequabilis	River Jewelwing	---	---	S5						●
Calopteryx maculata	Ebony Jewelwing	---	---	S5						●
Hetaerina americana	American Rubyspot	---	---	S4						●
Argia apicalis	Blue-fronted Dancer	---	---	S4						●
Argia fumipennis violacea	Violet Dancer	---	---	S5						●
Argia moesta	Powdered Dancer	---	---	S5						●
Coenagrion resolutum	Taiga Bluet	---	---	S5						●
Enallagma antennatum	Rainbow Bluet	---	---	S4						●
Enallagma boreale	Boreal Bluet	---	---	S5						●
Enallagma carunculatum	Tule Bluet	---	---	S5						●
Enallagma civile	Familiar Bluet	---	---	S5						●
Enallagma ebrium	Marsh Bluet	---	---	S5						●
Enallagma exsulans	Stream Bluet	---	---	S5						●
Enallagma geminatum	Skimming Bluet	---	---	S4						●

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]	Information Source					
					OBBA Square # 17MH85	Christmas Bird Count ONLO	Atlas of the Mammals of Ontario	NHIC Herptofaunal Atlas	Ontario Nature Reptile and Amphibian Atlas	NHIC Odonata Atlas
Enallagma signatum	Orange Bluet	---	---	S4						●
Enallagma vesperum	Vesper Bluet	---	---	S4						●
Ischnura posita	Fragile Forktail	---	---	S4						●
Ischnura verticalis	Eastern Forktail	---	---	S5						●
Nehalennia irene	Sedge Sprite	---	---	S5						●
Epitheca princeps	Prince Baskettail	---	---	S5						●
Gomphus spicatus	Dusky Clubtail	---	---	S5						●
Celithemis elisa	Calico Pennant	---	---	S5						●
Celithemis eponina	Halloween Pennant	---	---	S4						●
Erythemis simplicicollis	Eastern Pondhawk	---	---	S5						●
Ladona julia	Chalk-fronted Corporal	---	---	S5						●
Leucorrhinia frigida	Frosted Whiteface	---	---	S5						●
Leucorrhinia glacialis	Crimson-ringed Whiteface	---	---	S4						●
Leucorrhinia intacta	Dot-tailed Whiteface	---	---	S5						●
Libellula incesta	Slaty Skimmer	---	---	S4						●
Libellula luctuosa	Widow Skimmer	---	---	S5						●
Libellula pulchella	Twelve-spotted Skimmer	---	---	S5						●
Nannothemis bella	Elfin Skimmer	---	---	S4						●
Pachydiplax longipennis	Blue Dasher	---	---	S5						●
Pantala hymenaea	Spot-winged Glider	---	---	S4						●
Perithemis tenera	Eastern Amberwing	---	---	S4						●
Plathemis lydia	Common Whitetail	---	---	S5						●
Sympetrum obtrusum	White-faced Meadowhawk	---	---	S5						●
Sympetrum rubicundulum	Ruby Meadowhawk	---	---	S5						●
Sympetrum semicinctum	Band-winged Meadowhawk	---	---	S4						●
Sympetrum vicinum	Yellow-legged Meadowhawk	---	---	S5						●
Tramea lacerata	Black Saddlebags	---	---	S4						●

[1]Species at Risk Act; [2]Endangered Species Act; [3]SRank Code – S5 = Secure Population, S4 = Apparently Secure Population, SE = Exotic/Non-native Species, SNA = species not suitable for conservation activities (vagrants, non-natives), SU = insufficient data
● denotes occurrence record; --- denotes no information, no status or not applicable;

APPENDIX C2
VASCULAR PLANT LIST

Table 1: Plant Species Observed within the Highbury Avenue/Highway 401Interchange Reconstruction Study Area (Polygon's 1 - 3d)

Scientific Name[1]	Common Names	Federal SARA Registry Status[2]	Ontario ESA Species At Risk List Status[3]	Provincial Conservation Rank (SRank)[4]	Coefficient Conservation	Coefficient Wetness	ELC Community									
							MEGM3-4 (#1)	MEMM3 (#2a)	MEMM3 (#2b)	MEMM3 (#2c)	MEMM3 (#2d)	MEMM3 (#2e)	MEGM3 (#3a)	MEGM3 (#3b)	MEGM3 (#3c)	MEGM3 (#3d)
Acer platanoides	Norway Maple	---	---	SE5	---	5			●	●					●	
Acer X freemanii	Freeman's Maple	---	---	S5	---	---				●						
Alliaria petiolata	Garlic Mustard	---	---	SE5	---	0			●	●						
Antennaria howellii ssp. neodioica	Small Pussytoes	---	---	SU	2	5				●	●					
Apocynum sp	Dogbane Species	---	---	---	---	---						●				
Arctium minus ssp. minus	Common Burdock	---	---	SE5	---	5			●		●	●		●	●	
Arctium sp	Burdock Species	---	---	---	---	---										
Asclepias sp	Milkweed Species	---	---	---	---	---			●				●			
Aster sp	Aster Species	---	---	---	---	---				●	●					●
Barbarea vulgaris	Common Wintercress	---	---	SE5	---	0	●	●		●	●	●	●			
Betula pendula	European White Birch	---	---	SE4	---	-4						●				
Bromus inermis ssp. inermis	Smooth Brome	---	---	SE5	---	5								●		
Bromus sp	Brome Species	---	---	---	---	---			●	●						
Cirsium arvense	Canada Thistle	---	---	SE5	---	3	●		●			●		●	●	
Cornus alternifolia	Alternate-leaved Dogwood	---	---	S5	6	5									●	
Cornus foemina ssp. racemosa	Grey Dogwood	---	---	S5	2	-2		●	●	●	●		●	●	●	
Cornus stolonifera	Red-osier Dogwood	---	---	S5	2	-3			●	●						
Coronilla varia	Trailing Crown-vetch	---	---	SE5	---	5			●	●	●	●	●	●		
Crataegus sp	Hawthorn Species	---	---	---	---	---		●								
Daucus carota	Wild Carrot	---	---	SE5	---	5		●	●	●			●			
Dipsacus fullonum ssp. sylvestris	Common Teasel	---	---	SE5	---	5	●		●		●		●	●		
Elaeagnus angustifolia	Russian Olive	---	---	SE3	---	4			●	●			●	●		
Epilobium sp	Willow-herb Species	---	---	---	---	---			●							
Equisetum arvense	Field Horsetail	---	---	S5	0	0			●							
Equisetum sp	Horsetail Species	---	---	---	---	---				●						
Erigeron philadelphicus ssp. philadelphicus	Philadelphia Fleabane	---	---	S5	1	-3					●					
Fragaria virginiana ssp. virginiana	Common Strawberry	---	---	S5	2	1		●	●	●	●	●		●		

Scientific Name[1]	Common Names	Federal SARA Registry Status[2]	Ontario ESA Species At Risk List Status[3]	Provincial Conservation Rank (SRank)[4]	Coefficient Conservation	Coefficient Wetness	ELC Community									
							MEGM3-4 (#1)	MEMM3 (#2a)	MEMM3 (#2b)	MEMM3 (#2c)	MEMM3 (#2d)	MEMM3 (#2e)	MEGM3 (#3a)	MEGM3 (#3b)	MEGM3 (#3c)	MEGM3 (#3d)
Fraxinus pennsylvanica	Green Ash	---	---	S5	3	-3		●	●	●			●			
Juniperus virginiana	Eastern Red Cedar	---	---	S5	4	3			●	●		●		●		
Lepidium campestre	Field Cress	---	---	SE5	---	5			●							
Lonicera tatarica	Tartarian Honeysuckle	---	---	SE5	---	3				●	●		●			
Lotus corniculatis	Birds-foot Trefoil	---	---	SE5	---	1		●	●							
Melilotus sp	Sweet-clover Species	---	---	---	---	---		●	●					●		
Phalaris arundinacea	Reed Canary Grass	---	---	S5	0	-4		●	●	●		●		●		
Phragmites australis ssp. australis	Common Reed	---	---	SNR	---	-4		●	●	●	●	●			●	
Picea glauca	White Spruce	---	---	S5	6	3							●	●		
Picea pungens	Blue Spruce	---	---	SNA	---	---							●	●		
Pinus nigra	Austrian Pine	---	---	SE2	---	-5					●	●	●			
Plantago major	Common Plantain	---	---	SE5	---	-1	●		●	●	●	●	●	●	●	
Poa pratensis ssp. pratensis	Kentucky Blue Grass	---	---	SE5	---	1	●		●	●		●	●	●	●	
Poa sp	Blue Grass Species	---	---	---	---	---		●			●					
Podophyllum peltatum	Mayapple	---	---	S5	5	3			●							
Populus deltoides ssp. deltoides	Eastern Cottonwood	---	---	S5	4	-1		●	●	●			●			
Populus nigra	Lombardy Poplar	---	---	SE4	---	5								●		
Prunus virginiana ssp. virginiana	Choke Cherry	---	---	S5	2	1		●		●			●			
Rhamnus cathartica	Common Buckthorn	---	---	SE5	---	3		●		●			●	●	●	
Rhus typhina	Staghorn Sumac	---	---	S5	1	5				●						
Ribes sp	Currant Species	---	---	---	---	---			●		●		●			
Rosa multiflora	Multiflora Rose	---	---	SE4	---	3			●		●					
Salix alba	White Willow	---	---	SE4	---	-3				●						
Salix sp	Willow Species	---	---	---	---	---		●								
Sisyrinchium montanum	Common Blue-eyed Grass	---	---	S5	4	-1				●	●					
Solidago sp	Goldenrod Species	---	---	---	---	---	●	●		●	●			●	●	●
Sorbus aucuparia	European Mountain-ash	---	---	SE4	---	5				●						
Taraxacum officinale	Common Dandelion	---	---	SE5	---	3	●	●	●	●	●			●	●	
Thalictrum dioicum	Early Meadow-rue	---	---	S5	5	2										
Tilia americana	Basswood	---	---	S5	4	3				●						

Scientific Name[1]	Common Names	Federal SARA Registry Status[2]	Ontario ESA Species At Risk List Status[3]	Provincial Conservation Rank (SRank)[4]	Coefficient Conservation	Coefficient Wetness	ELC Community									
							MEGM3-4 (#1)	MEMM3 (#2a)	MEMM3 (#2b)	MEMM3 (#2c)	MEMM3 (#2d)	MEMM3 (#2e)	MEGM3 (#3a)	MEGM3 (#3b)	MEGM3 (#3c)	MEGM3 (#3d)
Trifolium sp	Clover Species	---	---	---	---	---		●						●		
Tussilago farfara	Coltsfoot	---	---	SE5	---	3			●							
Typha latifolia	Broad-leaved Cattail	---	---	S5	3	-5	●	●	●	●					●	
Ulmus americana	White Elm	---	---	S5	3	-2			●						●	
Ulmus pumila	Siberian Elm	---	---	SE3	---	5						●				
Verbascum thapsus	Common Mullein	---	---	SE5	---	5					●					
Vicia sp	Vetch Species	---	---	---	---	---		●	●						●	
Vitis riparia	Riverbank Grape	---	---	S5	0	-2		●		●						
---	Various Grass species	---	---	---	---	---										●

Table 2: Plant Species Observed within the Highbury Avenue/Highway 401Interchange Reconstruction Study Area (Polygon's 3f - 9)

Scientific Name[1]	Common Names	Federal SARA Registry Status[2]	Ontario ESA Species At Risk List Status[3]	Provincial Conservation Rank (Srank)[4]	Coefficient Conservation	Coefficient Wetness	ELC Community							
							MEGM3 (#3f)	WOCM1-1 (#4)	SWDM4-5 (#5)	MAMM1-2 (#6a)	MAMM1-2 (#6b)	WODM4-4 (#7)	THDM2 (#8)	FODM4 (#9)
Acer saccharum ssp. saccharum	Sugar Maple	---	---	S5	4	3							●	●
Acer X freemanii	Freeman's Maple	---	---	S5	---	---								●
Antennaria howellii ssp. neodioica	Small Pussytoes	---	---	SU	2	5		●						
Apocynum sp	Dogbane Species	---	---	---	---	---								
Arctium minus ssp. minus	Common Burdock	---	---	SE5	---	5		●						
Arctium sp	Burdock Species	---	---	---	---	---	●							
Arisaema triphyllum ssp. triphyllum	Jack-in-the-pulpit	---	---	S5	5	-2								●
Aster sp	Aster Species	---	---	---	---	---	●	●						
Barbarea vulgaris	Common Wintercress	---	---	SE5	---	0	●	●						
Betula pendula	European White Birch	---	---	SE4	---	-4	●							
Cirsium arvense	Canada Thistle	---	---	SE5	---	3	●							
Cornus foemina ssp. racemosa	Grey Dogwood	---	---	S5	2	-2		●					●	●
Cornus stolonifera	Red-osier Dogwood	---	---	S5	2	-3								
Coronilla varia	Trailing Crown-vetch	---	---	SE5	---	5	●							
Crataegus sp	Hawthorn Species	---	---	---	---	---								●
Daucus carota	Wild Carrot	---	---	SE5	---	5	●							
Dipsacus fullonum ssp. sylvestris	Common Teasel	---	---	SE5	---	5	●	●						
Elaeagnus angustifolia	Russian Olive	---	---	SE3	---	4	●							
Erigeron philadelphicus ssp. philadelphicus	Philadelphia Fleabane	---	---	S5	1	-3		●						
Erythronium americanum ssp. americanum	Yellow Trout Lily	---	---	S5	5	5								●
Fagus grandifolia	American Beech	---	---	S5	6	3								●
Fragaria virginiana ssp. virginiana	Common Strawberry	---	---	S5	2	1	●	●						●
Fraxinus pennsylvanica	Green Ash	---	---	S5	3	-3			●					●
Geranium robertianum	Herb Robert	---	---	SE5	---	5								●
Juglans nigra	Black Walnut	---	---	S4	5	3						●		
Ligustrum vulgare	Common Privet	---	---	SE5	---	1		●						
Lonicera tatarica	Tartarian Honeysuckle	---	---	SE5	---	3		●					●	●
Phalaris arundinacea	Reed Canary Grass	---	---	S5	0	-4				●		●		
Phragmites australis ssp. australis	Common Reed	---	---	SNR	---	-4	●			●				

Scientific Name[1]	Common Names	Federal SARA Registry Status[2]	Ontario ESA Species At Risk List Status[3]	Provincial Conservation Rank (Srank)[4]	Coefficient Conservation	Coefficient Wetness	ELC Community							
							MEGM3 (#3f)	WOCM1-1 (#4)	SWDM4-5 (#5)	MAMM1-2 (#6a)	MAMM1-2 (#6b)	WODM4-4 (#7)	THDM2 (#8)	FODM4 (#9)
Picea glauca	White Spruce	---	---	S5	6	3	●						●	
Picea pungens	Blue Spruce	---	---	SNA	---	---	●							
Pinus nigra	Austrian Pine	---	---	SE2	---	-5	●	●						
Plantago major	Common Plantain	---	---	SE5	---	-1		●						
Poa pratensis ssp. pratensis	Kentucky Blue Grass	---	---	SE5	---	1	●		●			●		
Poa sp	Blue Grass Species	---	---	---	---	---		●						
Podophyllum peltatum	Mayapple	---	---	S5	5	3						●		●
Populus deltoides ssp. deltoides	Eastern Cottonwood	---	---	S5	4	-1			●					
Populus nigra	Lombardy Poplar	---	---	SE4	---	5								
Prunus virginiana ssp. virginiana	Choke Cherry	---	---	S5	2	1						●		●
Rhamnus cathartica	Common Buckthorn	---	---	SE5	---	3	●		●				●	●
Rhus typhina	Staghorn Sumac	---	---	S5	1	5							●	
Ribes sp	Currant Species	---	---	---	---	---		●						
Rosa multiflora	Multiflora Rose	---	---	SE4	---	3		●						
Salix alba	White Willow	---	---	SE4	---	-3	●		●					
Salix sp	Willow Species	---	---	---	---	---			●				●	
Sisyrinchium montanum	Common Blue-eyed Grass	---	---	S5	4	-1	●	●						
Solidago sp	Goldenrod Species	---	---	---	---	---	●	●					●	
Sorbus aucuparia	European Mountain-ash	---	---	SE4	---	5								
Taraxacum officinale	Common Dandelion	---	---	SE5	---	3	●	●						
Thalictrum dioicum	Early Meadow-rue	---	---	S5	5	2								●
Tilia americana	Basswood	---	---	S5	4	3								●
Trillium grandiflorum	White Trillium	---	---	S5	5	5								●
Typha latifolia	Broad-leaved Cattail	---	---	S5	3	-5				●	●	●		
Ulmus americana	White Elm	---	---	S5	3	-2								●
Verbascum thapsus	Common Mullein	---	---	SE5	---	5	●	●						
Verbena sp	Vervain Species	---	---	---	---	---				●				
Vitis riparia	Riverbank Grape	---	---	S5	0	-2								●

[1]Nomenclature According to Newmaster et al (1998)[2]Species at Risk Act; [3]Endangered Species Act; [4]SRank Code – S5 = Secure Population, S4 = Apparently Secure Population, SE = Exotic/Non-native Species, SNA = species not suitable for conservation activities (vagrants, non-natives), SU = insufficient data
● denotes occurrence record; --- denotes no information, no status or not applicable;

APPENDIX C3
OBSERVED WILDLIFE LIST

Wildlife Species Observed Within Study Area

Scientific Name	Common Names	Federal SARA Registry Status[1]	Ontario ESA Species At Risk List Status[2]	Provincial Conservation Rank (Srank)[3]
BIRDS				
Actitis macularia	Spotted Sandpiper	---	---	S5
Carpodacus mexicanus	House Finch	---	---	SNA
Zenaida macroura	Mourning Dove	---	---	S5
Agelaius phoeniceus	Red-winged Blackbird	---	---	S4
Turdus migratorius	American Robin	---	---	S5B
Carduelis tristis	American Goldfinch	---	---	S5B
Sturnus vulgaris	European Starling	---	---	SNA
Melospiza melodia	Song Sparrow	---	---	S5B
Tachycineta bicolor	Tree Swallow	---	---	S4B
MAMMALS				
Canis latrans	Eastern Coyote	---	---	S5
Odocoileus virginianus	White-tailed Deer	---	---	S5
Sylvilagus floridanus	Eastern Cottontail	---	---	S5

[1]Species at Risk Act; [2]Endangered Species Act; [3]SRank Code – S5 = Secure Population, S4 = Apparently Secure Population, SE = Exotic/Non-native Species,
SNA = species not suitable for conservation activities (vagrants, non-natives), SU = insufficient data
● denotes occurrence record; --- denotes no information, no status or not applicable;

APPENDIX C4
CONSERVATION STATUS CODES

Overview of Codes for the Conservation Status of Species

Federal Conservation Status

Federal Status: Status assigned by the Committee on the Status of Endangered Wildlife in Canada. (COSEWIC, 2007) and listed under the *Species at Risk Act*

EXT Extinct. A wildlife species that no longer exists.
EXP Extirpated. A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
END Endangered. A wildlife species facing imminent extirpation or extinction.
THR Threatened. A wildlife species likely to become endangered if limiting factors are not reversed.
SC Special Concern. A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
DD Data Deficient - A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.
NAR Not At Risk. A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Provincial Conservation Status

Provincial Status: Status assigned by the Ontario Ministry of Natural Resources (OMNR, 2006) under the *Endangered Species Act, 2007*

EXT Extinct. A species that no longer exists anywhere.
EXP Extirpated. A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END Endangered. A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's ESA.
THR Threatened. A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC Special Concern. A species with characteristics that make it sensitive to human activities or natural events.
DD Data Deficient. A species for which there is insufficient information for a provincial status recommendation.
NAR Not At Risk. A species that is currently not listed as risk.

Provincial (S) Rank

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (2007) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC

evaluates provincial ranks on a continual basis and produces updated lists at least annually.

S1 Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.

S2 Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences; often susceptible to extirpation.

S3 Rare to uncommon in Ontario; usually between 20 & 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances. Most species with an S3 rank are assigned to the watch list, unless they have a relatively high global rank.

S4 Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.

S5 Very common and demonstrably secure in Ontario.

SH Historically known from Ontario, but not verified recently (typically not recorded in the province in the last 20 years); however suitable habitat is thought to be still present in the province and there is reasonable expectation that the species may be rediscovered.

SR Reported for Ontario, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.

SRF Reported falsely from Ontario.

SX Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.

SE Exotic; not believed to be a native component of Ontario's flora.

S? Not Ranked Yet, or if following a ranking, Rank Uncertain (e.g. S3?). S? Species have not had a rank assigned.

SU Unrankable, often because of low search effort or cryptic nature of the species, there is insufficient information available to assign a more accurate rank; more data is needed.

Coefficient of Conservatism (CC) Definition (Plants)

Each native taxon was assigned a rank of 0 to 10 ("coefficient of conservatism") based on its degree of fidelity to a range of synecological parameters. Plants found in a wide variety of plant communities, including disturbed sites, were assigned ranks of 0 to 3. Taxa that typically are associated with a specific plant community, but tolerate moderate disturbance, were assigned ranks of 4 to 6. Rankings of 7 to 8 were applied to those taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance. Those plants with high degrees of fidelity to a narrow range of synecological parameters were assigned a value of 9 to 10

Wetness Index (CW) (Plants)

The wetness index gives an indication of were plant species are typically found. A wetness value (coefficient of wetness) between -5 and 5. A value of -5 was assigned to

Obligate Wetland (OBL) species and a value of 5 to Obligate Upland species (UPL), with intermediate values assigned to the remaining categories. The wetland categories and their corresponding values are as follows:

These categories are defined as follows:

OBL	-5	OBL Wetland	Obligate	Occurs almost always in wetlands under natural conditions (estimated > 99% probability).
FACW+	-4	FACW	Facultative Wetland	Usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability).
FACW	-3			
FACW-	-2			
FAC +	-1	FAC	Facultative	Equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability).
FAC	0			
FAC-	1			
FACU+	2	FACU	Facultative Upland	Occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33 % probability).
FACU	3			
FACU-	4			
UPL	5	UPL	Obligate Upland	Occurs almost never in wetlands under natural conditions (estimated <1 % probability).

APPENDIX D
ELC FIELD SHEETS

ELC Map ID #1

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 120151		POLYGON: 1	
SURVEYOR(S): JWH	DATE: May.08.12	TIME: start	finish
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
G OPEN WATER	G CARB. BEDRK.	G TABLELAND	G OPEN	G LICHEN	G SWAMP
G SHALLOW WATER		G ROLL. UPLAND	G SHRUB	G BRYOPHYTE	G FEN
G SURFICIAL DEP.		G CLIFF	G TREED	G DECIDUOUS	G BOG
G BEDROCK		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

		< 10		10 - 24		25 - 50		> 50
SIZE CLASS ANALYSIS:								
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	✓	PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	Kentucky Blue grass Graminoid Meadow	MEGM3-4 - mown
INCLUSION	common reed marsh	MAMM1-12 - d.tch - P2
~~COMPLEX~~	cattail meadow Marsh	MAMM1-2 - d.tch - P3/P4

Notes:
- regularly mown
- small gardens w/ exotics present

ELC
STAND CHARACTERISTICS

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 1-7

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	soils disturbed - on fill pre construction.				
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: 126151
POLYGON: 1
DATE: May.08.12
SURVEYOR(S): JWH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
P1	Poa prat				D	
	Tara off				O	
	common plantain				O	
Inclusions P2	Phragmites		D			
	cirsarv				O	
P3	Typh lat			D		
P4	Typh lat		D	D		
	solidago sp.				O	
	Barb vul				R	
	Teasel			R		

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

Page ...... of ......

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 12615
POLYGON: 1
DATE: May.08.12
SURVEYOR(S): A.M.H
START TIME: END TIME:

TEMP (°C): 15 CLOUD (10th): 10 WIND: 2 PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
B	RWBL	08	nest						

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID #2a

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 126151 | POLYGON: 5

SURVEYOR(S): JWH | DATE: May.08.12 | TIME: start / finish

UTMZ: | UTME: | UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: | BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	✓	PIONEER		YOUNG		MID-AGE		MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:	Dry-fresh Mixedmeadow	MEMM3
~~VEGETATION TYPE~~ Inclusion:	common reed Mineral meadow marsh	MAMM1-12
INCLUSION	Cattail Mineral Meadow Marsh	MAMM1-2
~~COMPLEX~~ Inclusion:	Gray-Dogwood deciduous	THDM2-4

Notes: shrub thicket

ELC STAND CHARACTERISTICS

SITE:
POLYGON:
DATE:
SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 8-20

Notes:

ELC
SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Slope: Aspect	%	Type	Class	Z	UTM: EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	Soil highly disturbed - in fill from construction - lots of course fragments.				

	1	2	3	4	5
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					

SOIL SURVEY MAP	
LEGEND CLASS	

ELC
PLANT SPECIES LIST

SITE: 120151
POLYGON: 5
DATE: May. 08.12
SURVEYOR(S): JWH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
E. cottonwood			R		
Salix sp.			R		

SPECIES CODE	LAYER 1	2	3	4	COL.
Poaprat				A	
Phragmites		A	O		
Phalaru				O	
Daucar			A		
Taraoff				O	
Solidago sp.			O		
Typhlat			A		
Melialb			O		
Triprat				R	
Vetch sp.				R	
Barbvul				R	
Hawthorn sp.				R	
Fragvir				O	
Lotucor				O	
Gray Dogwood		O	A	O	
Rhamcat		R			
Fraxpenn		R	R		
Solidago sp.				O	
Vitirip		R			
Prunvir			R		

inclusion P6

Page .... of ....

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 12G151
POLYGON: 5
DATE: May.08.12
SURVEYOR(S): JW H
START TIME:
END TIME:

TEMP (°C): 15 | CLOUD (10th): 20 | WIND: 2 | PRECIPITATION: light rain

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
B	RWBL	CS	nest	3					

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID #2b

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 126151		POLYGON: 7	
SURVEYOR(S): JWH	DATE: May.08.12	TIME: start / finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
(circled) TERRESTRIAL WETLAND AQUATIC	ORGANIC (circled) MINERAL SOIL PARENT MIN. ACIDIC BEDRK. BASIC BEDRK. CARB. BEDRK.	LACUSTRINE RIVERINE BOTTOMLAND TERRACE VALLEY SLOPE TABLELAND ROLL. UPLAND CLIFF TALUS CREVICE / CAVE ALVAR ROCKLAND BEACH / BAR SAND DUNE BLUFF	NATURAL (circled) CULTURAL	PLANKTON SUBMERGED FLOATING-LVD. GRAMINOID FORB LICHEN BRYOPHYTE DECIDUOUS CONIFEROUS (circled) MIXED	LAKE POND RIVER STREAM MARSH SWAMP FEN BOG BARREN (circled) MEADOW PRAIRIE THICKET SAVANNAH WOODLAND FOREST PLANTATION
SITE OPEN WATER SHALLOW WATER SURFICIAL DEP. BEDROCK			**COVER** (circled) OPEN SHRUB TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	✓ PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	[redacted] DM-Fresh Mixed Meadow	MEMM3
INCLUSION	Common Reed Mineral Meadow Marsh	MAMM1-12
[redacted]	Gray Dogwood Deciduous ...	THDM 2-4

Notes: MAMM1-12 located along roadside ditch

ELC
STAND CHARACTERISTICS

SITE:
POLYGON:
DATE:
SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 24-27
40-45
[redacted] 47-49
50-61 — 54-56 Elliott-laidlaw area
78-

Notes:

* 2 burrows GPS'd -Burrow 1 Photo 49
-Burrow 2 51
-likely E. cottontail

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON			Soils heavily disturbed from road construction - infill - lots of coarse fragments		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE: 126151
POLYGON: P7
DATE: May. 08. 12
SURVEYOR(S): JWH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
E.cottonwood		R	R		
Ulmvame				R	
Russian dive		R	O		
Acerpal	R				
Ribes sp.				R	
Cornsto				R	
Redcedar			R		
Grey dogwood			D		
Fra-pennsyl		R			

inclusion P7.1

SPECIES CODE	LAYER 1	2	3	4	COL.	
Barvul				O		
Lepicam				R		
Phragmites		A				→ ditch
Dauccar			O			
Typhlat			O			→ ditch
Poapra				D		
Melalb			O			
Teasel			O			
Lotucor				O		
Arctmin			R			
Taraoff				R		
common plantain				A		
Multirosa			O			
Asclsyr			R			
Phalaru			R			
field horsetail				R		
willowherb sp.			R			
Cirsarv				O		
Podopel				R		
Tussfar				R		
Fragvir				O		
Allipet				R		
Bromine				O		
crown vetch				A		

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

>ditches

ELC

WILDLIFE

SITE: 126151
POLYGON: 7
DATE: May. 08. 12
SURVEYOR(S): JWH
START TIME: END TIME:

TEMP (°C): 18 | CLOUD (10th): 10 | WIND: 2 | PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA	✓	FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
B	RWBL	OB							
M	E. cottontail	SC							
M	WT. Deer	TK							
B	AMRO	OB		1					

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID # 9

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 120151		POLYGON: 8	
SURVEYOR(S): JW H	DATE: May. 06/12	TIME: start	
		finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
G OPEN WATER	G CARB. BEDRK.	G TABLELAND	G OPEN	G LICHEN	G SWAMP
G SHALLOW WATER		G ROLL. UPLAND	G SHRUB	G BRYOPHYTE	G FEN
G SURFICIAL DEP.		G CLIFF	G TREED	G DECIDUOUS	G BOG
G BEDROCK		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY		4	Fagugra > Tiliame > Acersac
2	SUB-CANOPY		3	Tiliame > Acersac
3	UNDERSTOREY			Rhamcat
4	GRD. LAYER			

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	O	< 10	A	10 - 24	O	25 - 50	R	> 50
STANDING SNAGS:	R	< 10	O	10 - 24	R	25 - 50	N	> 50
DEADFALL / LOGS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG	V	MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:	Dry-fresh upland Deciduous	FODM4
VEGETATION TYPE:	~~Dry-fresh Beech~~ Forest ~~Deciduous Forest~~	~~FOD4~~
INCLUSION		
COMPLEX		

Notes: - large beech trees 25-50 DBH

- no access, could only view from forest edge. So only classified to Ecosite.

ELC — STAND CHARACTERISTICS

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 28-36
24-25
44-46
77

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON			no access		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

downy?

ELC
PLANT SPECIES LIST

SITE: Highbury Ave. / 401
POLYGON: P8
DATE: May. 08. 12
SURVEYOR(S): JWH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Ulmuame	R	R	O		
Americanbeech	A	O			
Fraxpenn		O	R		
Acersac	O	O		O	
Crataegusp.		R			
Tiliame.	O	A	O		
Acerfre.	R				
Lonitat		R			
Cornus Dogwood		O	O		
Rhamcat.		O	A		
Vitrip.	R	O			
Prunvir			R		

SPECIES CODE	LAYER 1	2	3	4	COL.
Trillgra				O	
Podopel				O	
Herbrobert.				R	
Jack-in-pulpit				R	
Fragvir				R	
Yellowtrillby				A	
Early Meadow Rue				R	

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 12a151
POLYGON: 8
DATE: May 08, 13
SURVEYOR(S): JWH
START TIME: END TIME:

TEMP (°C): 15 CLOUD (10th): 10 WIND: 2 PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

✓	VERNAL POOLS	✓	SNAGS
	HIBERNACULA	✓	FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
B	AMRO	OB	VO	1					
B	EVST	OB	VO	3					
B	TRSW	VO	F/O	1					

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC map ID # 3a

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 120151		POLYGON: 9
	SURVEYOR(S): JWH	DATE: May 08.12	TIME: start / finish
	UTMZ:	UTME:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
(G) TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	(G) MINERAL SOIL	G RIVERINE	(G) CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		(G) GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
G OPEN WATER	G CARB. BEDRK.	G TABLELAND	(G) OPEN	G LICHEN	G SWAMP
G SHALLOW WATER		G ROLL. UPLAND	G SHRUB	G BRYOPHYTE	G FEN
G SURFICIAL DEP.		G CLIFF	G TREED	G DECIDUOUS	G BOG
G BEDROCK		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	(G) MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	Dry-Fresh Graminoid Meadow	MEGM3
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 79 - 81

Notes:

* SOSP nest GPS'd - SOSP1

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	UTM Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON			soil highly disturbed		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

white spruce

ELC

PLANT SPECIES LIST

SITE: 126151
POLYGON: 9
DATE: May.08.12
SURVEYOR(S): [illegible]

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
Fraxpenn			R			Common plantain				A	
Coloradoblue	O					Poa prat				D	
E.cottonwood.			R			Daucar			O		
Pinunig	O					Berbvul				A	
Piceabies	R					Teasel			O		
Picegla	R					Crown vetch				A	
						Asclsyr			O		
gray dogwood			O								
Russian olive.			R	R							
choke cherry.			R								
Ribes sp.				R							
Rhamcat			O								
Lonitar			R								

Page .... of ....

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 126151
POLYGON: 4
DATE: May. 08. 12
SURVEYOR(S): [illegible]
START TIME: END TIME:

TEMP (°C): 18 CLOUD (10th): 0 WIND: 2 PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
B	SOSP	OB	nest						

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID # 36

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 12b51		POLYGON: 10	
	SURVEYOR(S): JW H	DATE: May.08.12	TIME: start	finish
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
G OPEN WATER	G CARB. BEDRK.	G TABLELAND	G OPEN	G LICHEN	G SWAMP
G SHALLOW WATER		G ROLL. UPLAND	G SHRUB	G BRYOPHYTE	G FEN
G SURFICIAL DEP.		G CLIFF	G TREED	G DECIDUOUS	G BOG
G BEDROCK		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	Dry-Fresh Graminoid Meadow	MEGM3
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 32-36

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Slope Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL TEXTURE x HORIZON	1	2	3	4	5
			highly disturbed soil - infill from road construction -		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: 12615 1
POLYGON: 10
DATE: May. 08. 13
SURVEYOR(S): J wolf

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
C. Blue Spruce	O				
Lombardy Poplar		R	R		
Picea glauca	R				
Russian olive			R		
Gray Dogwood			R	R	
Red cedar			O		
Rhamnus				R	

SPECIES CODE	LAYER 1	2	3	4	COL.
Poagrass				D	
Phragmites			O	r	
Teasel			O		
Melilotus			R		
Tragopogon				R	
Fragaria				O	
Bromus				O	
Common plantain				A	
Red clover				A	
Solidago			O		
Crown vetch				A	
Cirsium				O	
Common burdock			R		

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 126151
POLYGON: 10
DATE: May .08.12
SURVEYOR(S): JW/H
START TIME: END TIME:

TEMP (°C): 18 | CLOUD (10th): 10 | WIND: 2 | PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID# 3c

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 120151		POLYGON: 11	
	SURVEYOR(S): JWH	DATE: May.08.12	TIME: start	finish
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	Dry-fresh Graminoid Meadow	MEGM3
INCLUSION	Common reed Mineral	MAMM1-12
COMPLEX	Meadow Marsh	

ditch

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 85 - 87
90 - 91

Notes:

* crayfish chimneys identified GPS - crayfish chim - in ditch Photo 88/89

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	UTM Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON		soil highly disturbed from road - in fill construction - lots of coarse fragments			
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: 126151
POLYGON: 11
DATE: May.08.12
SURVEYOR(S): JWH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
Acerpal	R				
Ulmame		R			
Rhamcat			R	R	
Cornalt		R			
Gray dogwood				O	

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	
Poaprat				D		
Taraoff				O		
phragmites		A				→ ditch
Solidago sp.			O			
common plantain				A		
Typhlat		O	O			→ ditch
Common burdock			R			
Cowvetch				A		
Cirsarv				O		

Page .... of ....

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 120151
POLYGON: 11
DATE: May-08-12
SURVEYOR(S): JWH
START TIME: END TIME:

TEMP (°C): 18 | CLOUD (10th): 10 | WIND: 2 | PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
B	R-WBL	OB							

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID# 26

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 126151		POLYGON: 12	
	SURVEYOR(S): SWH	DATE: May.08.12	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G (T)ERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G (M)INERAL SOIL	G RIVERINE	G (C)ULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
G OPEN WATER		G ROLL. UPLAND	G (O)PEN	G BRYOPHYTE	G FEN
G SHALLOW WATER		G CLIFF	G SHRUB	G DECIDUOUS	G BOG
G SURFICIAL DEP.		G TALUS	G TREED	G CONIFEROUS	G BARREN
G BEDROCK		G CREVICE / CAVE		G (M)IXED	G (M)EADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:	Dry-fresh Mixed Meadow	MEMM3
~~VEGETATION TYPE:~~ Inclusion	Cattail mineral meadow marsh	MAMM1-2
INCLUSION	Common reed mineral meadow marsh	MAMM1-12
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo - 92 - 96
99 - 102, 101
115 - 118
126 - 127

Notes:

* GPS'd burrow 3 - photo 102

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON			soil heavily disturbed - likely from construction		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: Plot 1
POLYGON: 12
DATE: May. 08. 12
SURVEYOR(S): SWH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acerpal	R				
E.cottonwood			R		
Fraxpenn	O				
Acerfre	R				
Salixalb		R			
Tiliame		R			
Sorbauc		R			
Staghornsumac		R			
Lowitar			R		
Rhamcat			O	R	
chokecherry				R	
Russianolive				R	
Gray Dogwood			O	O	
Cornsto				R	
red cedar				R	
Vibutr			O	R	

hedgerow ←

SPECIES CODE	LAYER 1	2	3	4	COL.
Poapra				A	
Phragaustr		A			
Solidago sp.				O	
Daucar				O	
Barbvul				R	
Eyegrass sp.				A	
crown vetch				A	
Cirsarv				O	
Taraff				O	
Hieracium sp.				R	
Alliper			R	O	
Bromine				O	
common plantain				A	
Fragvir				O	
Anteneo				R	
Phalaru				O	
Sisymon				R	
Aster sp.				O	
Typhlat			D		
Phragaustr		D			

- ditch

- inclusion

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	(NONE)	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	(NONE)	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	(DOMINANT)	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	(EXTENSIVE)	
PLANTING (PLANTATION)	(NONE)	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	(FAINT TRAILS)	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	(LOCAL)	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	(LIGHT)	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	(WIDESPREAD)	EXTENSIVE	
EARTH DISPLACEMENT	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	(INTENSE)	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	(EXTENSIVE)	
DISEASE/DEATH OF TREES	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	(NONE)	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 126151
POLYGON: 12
DATE: May. 08. 12
SURVEYOR(S): JWH
START TIME:
END TIME:

TEMP (°C): 18 | CLOUD (10th): 10 | WIND: 1 | PRECIPITATION: haze

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#
B	MDLK	OB	F/O	1
B	RWBL	OB		3
L	PaintedLady	OB		1
B	SpottedSandpiper	OB		1

TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

* Sandpiper sp. - look up.

ELC Map ID # 2e.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 126151		POLYGON: 13
	SURVEYOR(S): JWH	DATE: May.08.12	TIME: start / finish
	UTMZ:	UTME:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	< 10	10 - 24	25 - 50	> 50
STANDING SNAGS:	< 10	10 - 24	25 - 50	> 50
DEADFALL / LOGS:	< 10	10 - 24	25 - 50	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:	Dry-Fresh Mixed Meadow	MEMM3
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

photo - 103 - 108

Notes:

ELC

SOILS ONTARIO

SITE:

POLYGON:

DATE:

SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON		Soils heavily disturbed + infill from road construction			
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: 12G 151

POLYGON: 13

DATE: May. 08. 12

SURVEYOR(S): JWH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Siberian elm			R		
red cedar			R		
Pinus sp.			R		
Betapen		R			

SPECIES CODE	LAYER 1	2	3	4	COL.
Barbvul				O	
Crown vetch				A	
Phalaru				O	
Phragmites		O			
Cirsarv				O	
Poapra t				A	
Ryegrass sp.				A	
Comm plantain				O	
Burdock sp.			R		
Dogbane sp.			R		
Fragvir				O	

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 126151
POLYGON: 13
DATE: May. 08. 18
SURVEYOR(S): JW H
START TIME: END TIME:

TEMP (°C): 18 | CLOUD (10th): 10 | WIND: 2 | PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID # 2d / 4

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 126151		POLYGON: 14
	SURVEYOR(S): JWH	DATE: May.08.12	TIME: start / finish
	UTMZ:	UTME:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

		< 10	10 - 24	25 - 50	> 50
SIZE CLASS ANALYSIS:					
STANDING SNAGS:					
DEADFALL / LOGS:					

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	✓	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:	DM-Fresh Mixed Meadow	MEMM3
~~VEGETATION TYPE:~~ inclusion	DM-Fresh Coniferous woodland	WOCM1-1
~~INCLUSION~~		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo - 109 - 113

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON			soils heavily disturbed - infill from road construction -		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE: 126151
POLYGON: 14
DATE: May.08.12
SURVEYOR(S): JW4

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Pihurig		O	A	R	
Lonitar			R		
Gray Dogwood			R	O	
Ribes sp.				R	
Privet			R		

SPECIES CODE	LAYER 1	2	3	4	COL.
Poa sp.				A	
Ryegrass sp.				A	
common plantain				A	
Phragmites		O			
Crownvetch				A	
Solidago sp.				O	
Aster sp.			R		
Teasel			O		
Burdock sp.			R		
Berberul				R	
common mullein			R		
Fragvir				O	
Taraoff				O	
Eriphi				O	
Sisymon				R	
Antenco				R	
Multiflora				R	

✓ Also only in WOCM1-1

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 120151
POLYGON: 14
DATE: May.08.12
SURVEYOR(S): JW+H
START TIME: END TIME:

TEMP (°C):	CLOUD (10th):	WIND:	PRECIPITATION:

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
L	Monarch	08		1					

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID #5

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 12615-1		POLYGON: 15
	SURVEYOR(S): JW/H	DATE: May.08.12	TIME: start / finish
	UTMZ:	UTME:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY		3	E. Cottonwood > Fra-x penn
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	R	< 10	A	10 - 24	R	25 - 50	N	> 50
STANDING SNAGS:	N	< 10	N	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	N	< 10	N	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG	✓	MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	Poplar mineral deciduous swamp	SWDM 4-5
INCLUSION		
COMPLEX		

Notes: Soil unknown - appearance of mineral

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo 118 - 119 - GPS - emphermeal Pond

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL TEXTURE x HORIZON	1	2	3	4	5
			no access		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: 12U15 1
POLYGON: 15
DATE: May.08.12
SURVEYOR(S): JW/T

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
E.cortenwood	D				
Salixalb		O			
Salix sp.		O			
Fraxpenn	O				
Rhamcat			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
Poagrat				A	

JBPS' emplacement / pond.

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: R2615I
POLYGON: 15
DATE: May.08.12
SURVEYOR(S): SWH.
START TIME:
END TIME:

TEMP (°C): 18 | CLOUD (10th): 20 | WIND: 2 | PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

✓	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map # 6a / 7

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 2615 | POLYGON: 16 | 17

SURVEYOR(S): JW LT | DATE: May. 08. 12 | TIME: start / finish

UTMZ: | UTME: | UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION

SITE	COVER
G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK	G OPEN G SHRUB G TREED

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: | BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	Cattail mineral meadow marsh	MAMM1-2 P16
INCLUSION		
COMPLEX		

Notes:

Dry-fresh Black walnut deciduous woodland WODM4-4 P17

ELC STAND CHARACTERISTICS

SITE:
POLYGON:
DATE:
SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo - 121-123 P16
124 - P17

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL TEXTURE x HORIZON	1	2	3	4	5
		soils heavily disturbed - infill from road construction	no access.		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

P17

ELC
PLANT SPECIES LIST

SITE: 12A151
POLYGON: 16
DATE: May. 08. 12
SURVEYOR(S): JwH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Jugnig		A			
Mayapple				A	
chokecherry			O		
Poaprat				D	
Typhlat			R		
Phalaru			A		

SPECIES CODE	LAYER 1	2	3	4	COL.
Typhlat			D		
vernain sp.			R		
Phragmites			O		
Phalaru				O	

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE:
POLYGON:
DATE:
SURVEYOR(S):
START TIME: END TIME:

TEMP (°C):	CLOUD (10th):	WIND:	PRECIPITATION:
CONDITIONS:			

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
L	Monarch	OB							
B	RWBL								

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID #3e

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: 12615 1		POLYGON: 18	
SURVEYOR(S): JWH	DATE: May.08.12	TIME: start / finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL (circled) G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL (circled) G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL (circled)	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID (circled) G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW (circled) G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN (circled) G SHRUB G TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: BA:

SIZE CLASS ANALYSIS:	R	< 10	O	10 - 24	R	25 - 50	N	> 50
STANDING SNAGS:	R	< 10	O	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	R	< 10	O	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	/	PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	~~DEPTH TO MOTTLES / GLEY~~	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:	Dry-Fresh Graminoid Meadow	
ECOSITE:	~~[illegible]~~	MEGM 3
VEGETATION TYPE:	~~[illegible]~~	
INCLUSION	MAMM1-12	
COMPLEX	Common reed mineral meadow marsh	

— along ditch

Notes:

ELC — STAND CHARACTERISTICS

SITE:
POLYGON:
DATE:
SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

photo 147 - 149
MAM 144-146 - Elliot lard(?) drain
138 - 143
128 / 129

Notes:

ELC

SOILS ONTARIO

SITE:

POLYGON:

DATE:

SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON			Soils heavily disturbed - in ROW area road construction		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE: 126151

POLYGON: 18

DATE: May.08.12

SURVEYOR(S): JW/M

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
White poplar		R			
Picea sp.	R				
E. cottonwood.	R	R			
Acersac.	O				
Fraxpenn	R				
Acersas		R			
Salix sp.			R		
Salixalb	R				
Hawthorn sp.		R			
Russian olive		R			
Lonitar.		O	O	R	
Gray dogwood.			R	O	
Rhamcat		R	R		
Staghornsumac			O	R	
red cedar			R		

SPECIES CODE	LAYER 1	2	3	4	COL.
Bromine				O	
Fragvir				A	
common plantain				A	
Solidago sp.				O	
Poapra t				A	
Phragmites.		A			
Cirsarv				O	
Phalarv				O	
Teasel			O		
Multiflora			R	R	
Aster sp.			R		
Burdock sp			R		
Berbvul				R	
Tripra t				O	
Taraoff.				R	
Daucar			R		
Lotcor				R	

ditch

fencerow

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 126151
POLYGON: 18
DATE: May-08-12
SURVEYOR(S): JW
START TIME: END TIME:

TEMP (°C): 12 CLOUD (10th): 20 WIND: 2 PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS	✓	SNAGS
	HIBERNACULA	✓	FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

ELC Map ID #8

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 120151		POLYGON: 19/20
	SURVEYOR(S): JWH	DATE: May 08 12	TIME: start / finish
	UTMZ:	UTME:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

		< 10		10 - 24		25 - 50		> 50
SIZE CLASS ANALYSIS:	A		O		N		N	
STANDING SNAGS:	N		O		N		N	
DEADFALL / LOGS:	N		R		N		N	

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	✓	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE	
COMMUNITY CLASS:			
COMMUNITY SERIES:			
ECOSITE:	Dry-fresh Deciduous shrub Thicket	THDM2	P19
VEGETATION TYPE:			
INCLUSION	Cultural mineral meadow	MAMM1-2	P20
COMPLEX	marsh		

Notes:

* no access to whole community for in depth analysis

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Photo - 137 - PM P20

135/136 - pond

130-134 - P19

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON		no access			
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: 126151
POLYGON: 19
DATE: May 08. 12
SURVEYOR(S): JW

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer Sac	R				
Salix sp.	R	R			
Pice ~~sp~~ gla	R				
Grey Dogwood			A		
Lon/Tar.		R	O		
Rhamnat		A	O		
Staghorn sumac			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
Solidago sp.			O		
~~Aster~~					
Typhlat			D		

P20

V across from P16 - Pond GPS'd Pond 1

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: D6151
POLYGON: 19
DATE: May. 08. 12
SURVEYOR(S): JWH
START TIME: END TIME:

TEMP (°C): 18 CLOUD (10th): 2 WIND: 2 PRECIPITATION: none

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS	✓	SNAGS
	HIBERNACULA	✓	FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

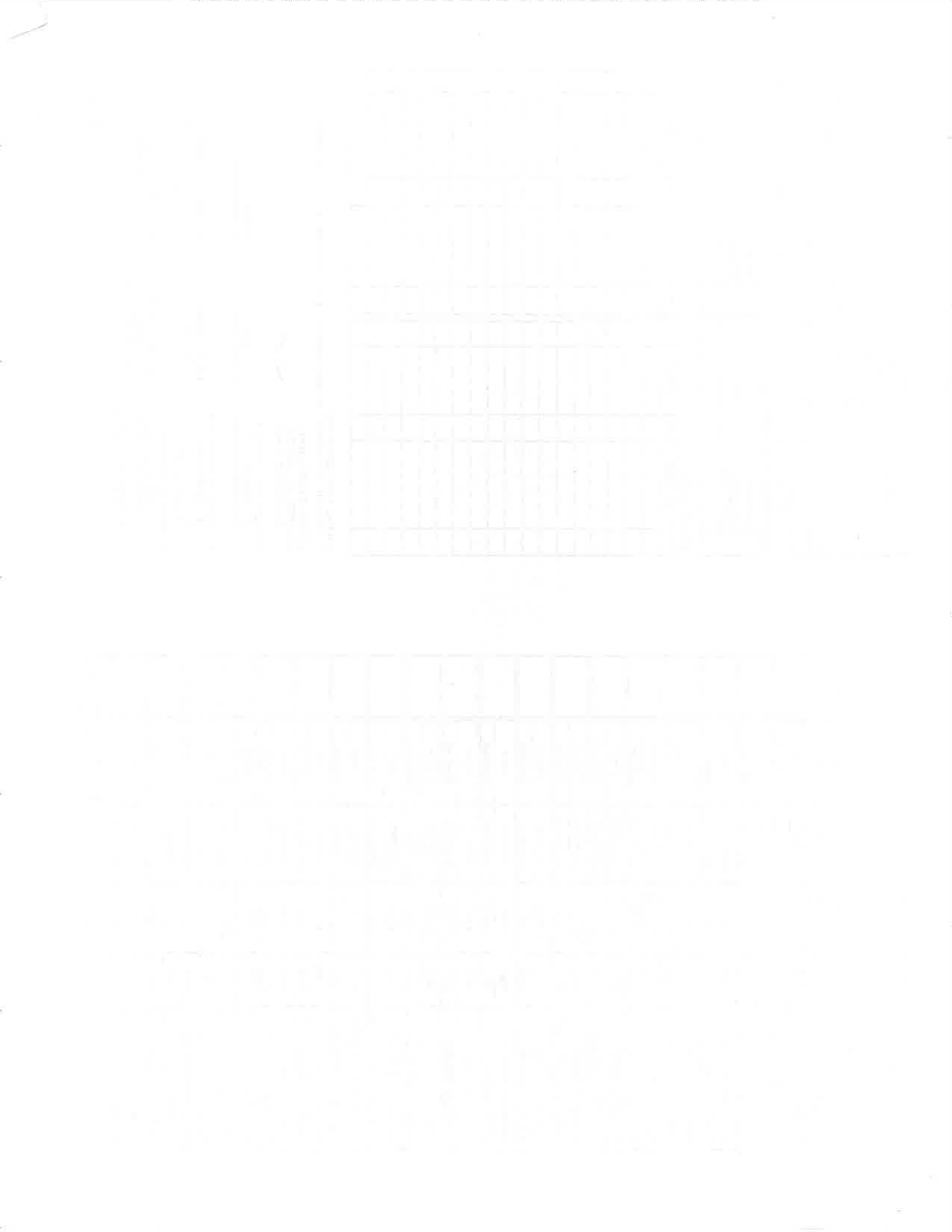
EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)



ELC Map ID# 3F

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: 12a151		POLYGON: 2.1
	SURVEYOR(S): JWH	DATE: May 08,12	TIME: start 07:30 finish 10:40.
	UTMZ:	UTME:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

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

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

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

		< 10		10 - 24		25 - 50		> 50
SIZE CLASS ANALYSIS:	N		O		N		N	
STANDING SNAGS:	N		N		N		N	
DEADFALL / LOGS:	N		N		N		N	

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:	Dry-Fresh Graminoid Meadow	MEGM3
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

photo - 150 - 154

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON			Soils heavily disturbed - infill from construction of roads.		
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: T26151
POLYGON: 21
DATE: May. 08. 12
SURVEYOR(S): JW/T

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Betpen		R			
C.Blue spruce	R	1			
Russian olive	R	R	O		
white spruce	R				
Pinurs		R			
Rhamcat		R			

SPECIES CODE	LAYER 1	2	3	4	COL.
Poapra				A	
Dancar			R		
Phragmites		O			
Teasel			O		
Aster sp.			R		
crown vetch				O	
Cirarv				O	
Barbvul				R	
Burdock sp.			R	R	
Solidago sp.				O	
Ryegrass sp.				A	
Common mullein			R		
Myriosa				R	
Taroff				R	
Fragvir				O	
Sisymon				R	

ELC

MANAGEMENT / DISTURBANCE

SITE:
POLYGON:
DATE:
SURVEYOR(S):

DISTURBANCE / EXTENT	0	1	2	3	SCORE †
TIME SINCE LOGGING	> 30 YRS	15 - 30 YRS	5 - 15 YRS	0 - 5 YEARS	
INTENSITY OF LOGGING	NONE	FUEL WOOD	SELECTIVE	DIAMETER LIMIT	
EXTENT OF LOGGING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
SUGAR BUSH OPERATIONS	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF OPERATIONS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
GAPS IN FOREST CANOPY	NONE	SMALL	INTERMEDIATE	LARGE	
EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS OR	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF RECR. USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DISEASE/DEATH OF TREES	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISEASE / DEATH	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
WIND THROW (BLOW DOWN)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF WIND THROW	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BROWSE (e.g. DEER)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BROWSE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
BEAVER ACTIVITY	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF BEAVER	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FLOODING (pools & puddling)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FLOODING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
FIRE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF FIRE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ICE DAMAGE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF ICE DAMAGE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
OTHER	NONE	LIGHT	MODERATE	HEAVY	
EXTENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

† INTENSITY x EXTENT = SCORE

ELC

WILDLIFE

SITE: 126151
POLYGON: 21
DATE: May. 08. 12
SURVEYOR(S): SWM
START TIME: 07:30 END TIME: 16:30 - continuous

TEMP (°C): 18 CLOUD (10th): 20 WIND: 2 PRECIPITATION: None

CONDITIONS:

POTENTIAL WILDLIFE HABITAT:

	VERNAL POOLS		SNAGS
	HIBERNACULA		FALLEN LOGS

SPECIES LIST:

TY	SP. CODE	EV	NOTES	#	TY	SP. CODE	EV	NOTES	#
M	Coyote	SC							
B	A. Goldfinch	VO/OB	M/F	2					

FAUNAL TYPE CODES (TY):
B = BIRD M = MAMMAL H = HERPETOFAUNA L = LEPIDOPTERA F = FISH O = OTHER

EVIDENCE CODES (EV):

BREEDING BIRD - POSSIBLE:
SH = SUITABLE HABITAT SM = SINGING MALE

BREEDING BIRD - PROBABLE:
T = TERRITORY D = DISPLAY P = PAIR
A = ANXIETY BEHAVIOUR N = NEST BUILDING V = VISITING NEST

BREEDING BIRD - CONFIRMED:
DD = DISTRACTION NU = USED NEST FY = FLEDGED YOUNG
NE = EGGS NY = YOUNG FS = FOOD/FAECAL SACK
AE = NEST ENTRY

OTHER WILDLIFE EVIDENCE:
OB = OBSERVED VO = VOCALIZATION CA = CARCASS
DP = DISTINCTIVE PARTS HO = HOUSE/DEN FY = EGGS OR YOUNG
TK = TRACKS FE = FEEDING EVIDENCE SC = SCAT
SI = OTHER SIGNS (specify)

APPENDIX C
Fisheries and Aquatic Environment Existing Conditions Memo

MEMO

TO: Project File

FROM: Daniel Knee

DATE: July 30, 2012

SUBJECT: Highway 401 Interchange Reconstruction at Highbury Avenue
Fisheries Assessment – Existing Conditions
GWP 3032-11-00

OUR FILE: 12-6151

The following memo summarizes the background data collected and field work completed as part of the Preliminary Design and 30% Detail Design assignment for the reconstruction of the Highway 401/Highbury Avenue Interchange. The full fisheries assessment will be documented in a Fish and Fish Habitat Impact Assessment Report.

Background Data Collection

The project is located within the Dingman Creek subwatershed; which is under the jurisdiction of the Upper Thames River Conservation Authority (UTRCA). The watercourses within the Study Area have been identified by the Ministry of Natural Resources (OMNR) Land Information Ontario (LIO) database as permanent.

Elliott-Laidlaw Drain, as shown in **Photo 1**, originates nearly 2 kilometres upstream of Highway 401 in wetlands east of Highbury Avenue flowing west into the Westminster Ponds and continuing southeast towards Dingman Creek. Dingman Creek flows westerly into the Upper Thames River, approximately 21 kilometres downstream. The Upper Thames River flows to Lake St. Clair at Tilbury, Ontario, which ultimately discharges into Lake Erie via the Detroit River.

UTRCA has three fish sampling stations near the proposed works: Westminster Ponds, Elliott-Laidlaw Drain at Enterprise Road and Elliott-Laidlaw Drain at Wilton Grove Drive. **Table 1** summarizes fish community information for this area during sampling in 1999, 2003 and 2010 based on fisheries data provided by the UTRCA (Cathy Reeves, Personal Communication, April 25, 2012). In addition to the data from the UTRCA, Ben Hindmarsh from the OMNR provided historical data (from a 1975 file) for the watercourse, which is considered to be a warmwater ecosystem (Personal Communication, June 1, 2012). Where available, **Table 1** shows the Provincial Ranks (S Ranks) and status by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

DFO Species at Risk (SAR) distribution mapping and a background search of the MNR Natural Heritage Information Centre indicated that there are no records of aquatic SAR present in or adjacent to the Study Area.

Table 1: Historical Fish Presence in the Elliot-Laidlaw Drain System

Common Name	Scientific Name	Westminster Ponds[1]	Elliott-Laidlaw Drain (Enterprise Road)[1]	Elliott-Laidlaw Drain (Wilton Grove Drive)[1]	OMNR 1975[2]	Provincial Rank	COSEWIC Status
Black crappie	*(Pomoxis nigromaculatus)*	X				S4	---
Bluegill	*Lepomis macrochirus*	X				S5	---
Blacknose dace	*Rhinichthys atratulus*			X		S5	---
Bluntnose Minnow	*Pimephales notatus*			X		S5	---
Brook Stickleback	*Culaea inconstans*		X	X	X	S5	---
Central Mudminnow	*Umbra limi*				X	S5	---
Central Stoneroller	*Campostoma anomalum*		X			S4	NAR
Common Carp	*Cyprinus carpio*	X		X		SNA	---
Common Shiner	*Luxilus cornutus*			X	X	S5	---
Creek Chub	*Semotilus atromaculatus*		X	X	X	S5	---
Fathead Minnow	*Pimephales promelas*		X			S5	---
Green Sunfish	*Lepomis cyanellus*		X			S5	---
Horneyhead Chub	*Nocomis biguttatus*				X	S4	NAR
Iowa Darter	*Etheostoma exile*		X				---
Johnny Darter	*Etheostoma nigrum*			X	X	S5	---
Largemouth Bass	*Micropterus salmoides*	X					---
Northern Redbelly Dace	*Phoxinus eos*			X	X	S5	---
Northern Pike	*Esox lucius*		X			S5	---
Pumpkinseed	*Lepomis gibbosus*	X				S5	---
Rock Bass	*Ambloplites rupestris*	X				S5	---
White Sucker	*Catostomus commersoni*	X	X		X	S5	---
Yellow Perch	*Perca flavescens*	X		X		S5	---

--- = no status
NAR = not at risk
1 Source: Cathy Reeves, Aquatic Biology Technician, UTRCA, personal communication, 2012.
2. Elliott-Laidlaw Drain and Wilton Grove Dr.; Source: Ben Hindmarsh, Sr. Fish and Wildlife Technicial Specialist, OMNR, personal communication, 2012.

As outlined in **Table 1**, the historical records of fish communities in the Elliott-Laidlaw Drain and upstream ponds contain a mixture of cool and warmwater fish species, including baitfish and sportfish. Furthermore, no rare species are identified in the table.

Results of Field Investigations

A general description of the watercourse potentially affected by the proposed works is provided in this section, with references to photographs provided. In addition, a summary of the existing fishery and habitat conditions at the crossings is provided in **Table 2**.

Elliott-Laidlaw Drain

Upstream of Highway 401
This reach of the drain was assessed and observed to be predominantly flat type habitat with limited riffle, run and pool areas throughout (**Photo 1**). The wetted width was approximately 1.0 m with a mean water depth of 0.30 m – 0.55 m. During field investigations, the water was observed to be moderately flowing through a fairly incised channel. Available in-stream cover was moderate (approximately 40%) with the majority represented as in-stream vascular plants (20%), undercut banks (10%), organic debris (5%), and overhanging herbacous cover (5%) (**Photo 2**). The reach has minimal shading by overhead cover (1 - 30%). A natural step and narrowing within the channel located approximately 30 m upstream of the culvert inlet has the potential to be a seasonal barrier to fish migration.

Downstream of Highway 401
The assessed downstream reach of the watercourse was comprised of primarily pool habitat (70%) with sections of flats (20%), run (10%) and riffle (10%) areas. The channel has been straigtened was observed to have a wetted width ranging from approximately 0.20 m – 0.50 m with depths ranging between 0.08 m on the riffles and 0.20 m – 0.5 m within flats, pools and run areas. Substrate was dominated by a mixture of gravel, cobble, sand, silt, muck and detritus. Available in-stream cover was abundant including cobble (15%), overhanging (15%) and in-stream (5%) woody debris, in-stream (10%) and overhanging (10%) herbaceous cover as well as undercut banks (5%) and organic debris (5%). In contrast to the upstream reach, this section of the watercourse had abundant shading (60% – 90%) from overhead riparian cover and dense overhanging vegetation along the banks. Banks were observed to be slightly unstable with some erosion observed. A beaver dam was observed approximately 50 m downstream of the culvert impeding flow to downstream reaches and potentially serving as a seasonal migration barrier for fish (**Photo 4**).

Tributary to Elliott-Laidlaw Drain

Upstream of Highbury Avenue
The upstream reach of this tributary consists of a ditch line swale dominated by cattails and phragmites with a small pool of water upstream of the culvert at the time of field investigations (**Photo 5**). Cobble was placed at the upstream end of a CSP culvert. This system functions as overland drainage only, providing ephemeral contributions downstream.

Downstream of Highbury Avenue
From the culvert outlet, the downstream reach of this tributary consists of a large standing pool approximately 16 m by 8 m with a depth of 0.15 m over a deep muck substrate with an abundance of duckweed and algae (**Photo 6**). Adjacent ditch-lines along Highbury Avenue drain into the pond before it drains westerly to the main drain. No defined channel connecting to the main drain was observed; however, the ephemeral pool likely overflows via cattail swale during high flow period periods.

Table 2 - Highbury Interchange Existing Fish and Fish Habitat Conditions Summary

Waterbody	Flow	Thermal Regime	Substrate Type	Vegetation (instream and ripairian)	Direct Fishery? (Y/N)	Fish Observed (species)
Watercourse #1 – Elliott-Laidlaw Drain	Permanent	Warmwater (Timing Window is July 1 – Mar 15)	• Cobble • Gravel • Sand • Silt • Detritus	Right-of-Way: Riparian trees and shrubs are present. Abundant terrestrial grass in the riparian area and overhanging the drain. Emergent grasses instream and submergent vegetation (water milfoil) Upstream: Scattered riparian trees. Terrestrial grasses characterize in-stream and overhanging vegetation with patches of water milfoil (submergent). Downstream: Abundant riparian trees and shrubs overhanging the drain. Emergent vegetation including terrestrial grasses present as well as submergent vegetation dominated by water milfoil.	Y – Low sensitivity	Blacknose Dace[1,3] Bluntnose Minnow[1,3] Brook Stickleback[1,2,3] Brown Bullhead[3] Central Mudminnow[2,3] Central Stoneroller[1,3] Common Carp[1] Common Shiner[1, 2, 3] Creek Chub[1,2, 3] Emerald Shiner[3] Fathead Minnow[1,3] Green Sunfish[1,3] Horneyhead Chub[2] Iowa Darter[1,3] Johnny Darter[1,2,3] Longnose Dace[3] Northern Pike[1] Northern Redbelly Dace[1,2,3] Pumpkinseed[3] Sunfish YOY[3] White Sucker[1,2,3]
Watercourse #2 – Tributary of Elliott-Laidlaw Drain	Ephemeral	Warmwater	• Cobble • Muck • Detritus	Upstream: Overland swale dominated by cattails and phragmites across the entire section. Sparse shrubs located in riparian area. Downstream: Small, isolated, shallow open water area containing duckweed and floating algae surrounded by cattails and grasses with a treed hedgerow north of the culvert. Overland swale dominated by cattails along the Highbury Road ditch line.	N	None

1 = UTRCA Fish Sampling Records (September 22, 1999 and October 20, 2010)
2 = MNR Fish Data (August 8, 1975).
3 = Dillon Consulting Limited Fish Sampling (May 31, 2012).

Photo 1 **May 31, 2012** Elliott-Laidlaw Drain Upstream of 401 culvert and right of way. Facing downstream.	
Photo 2 **May 31, 2012** Elliott-Laidlaw Drain Riparian cover and undercut banks upstream of the 401 culvert. Facing downstream.	

Photo 3 **May 31, 2012** Elliott-Laidlaw Drain Downstream of 401 culvert. Facing upstream.	
Photo 4 **May 31, 2012** Elliott-Laidlaw Drain Abundant cover and pooled water from beaver dam downstream of 401 culvert. Facing upstream.	

Photo 4 **May 31, 2012** Elliott-Laidlaw Drain Beaver dam downstream of 401 culvert acting as a fish migration barrier. Facing upstream.	
Photo 5 **May 31, 2012** Tributary to Elliott-Laidlaw Drain Upstream end of tributary. CSP culvert under Highbury Avenue. Facing south.	

Photo 6 **May 31, 2012** Tributary to Elliott-Laidlaw Drain Downstream pond. CSP under Highbury Avenue. Facing downstream (west).	

APPENDIX D

Transportation Environmental Study Report

(2004)

HIGHWAY 401 IMPROVEMENTS
PLANNING AND PRELIMINARY DESIGN STUDY
FROM 1.0 KM WEST OF HIGHWAY 4 (COL. TALBOT ROAD)
EASTERLY TO 1.0 KM EAST OF HIGHBURY AVENUE
G.W.P. 476-89-00

CITY OF LONDON
COUNTY OF MIDDLESEX

CLASS ENVIRONMENTAL ASSESSMENT GROUP "B"

TRANSPORTATION ENVIRONMENTAL STUDY REPORT

January 2004

HIGHWAY 401 IMPROVEMENTS
PLANNING AND PRELIMINARY DESIGN STUDY
FROM 1.0 KM WEST OF HIGHWAY 4 (COL. TALBOT ROAD)
EASTERLY TO 1.0 KM EAST OF HIGHBURY AVENUE
G.W.P. 476-89-00

CITY OF LONDON
COUNTY OF MIDDLESEX

CLASS ENVIRONMENTAL ASSESSMENT GROUP "B"

TRANSPORTATION ENVIRONMENTAL STUDY REPORT

Ce document hautement spécialisé n'est disponsible qu'en anglais en vertue du règlement 411/97, qui en exempte l'application de la Loi sur les services en français. Pour de l'aide en français, veuillez communiquer avec le ministère des Transports, Bureau des services en français au: 905-704-2045 ou 905-704-2046

January 2004

TRANSPORTATION ENVIRONMENTAL STUDY REPORT

CLASS ENVIRONMENTAL ASSESSMENT GROUP "B"

G.W.P. 476-89-00

HIGHWAY 401 IMPROVEMENTS
PLANNING AND PRELIMINARY DESIGN STUDY
FROM 1.0 KM WEST OF HIGHWAY 4 (COL. TALBOT ROAD)
EASTERLY TO 1.0 KM EAST OF HIGHBURY AVENUE

City of London
County of Middlesex

Prepared for the Ministry of Transportation by:
URS Canada Inc.

Prepared and Reviewed by:

Tim Sorochinsky, P. Eng.
Project Manager

Tyler Drygas
Environmental Planner

January 2004

THE PUBLIC RECORD

Copies of this document have been sent to the following locations:

Ontario Ministry of Environment
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M4V 1L5

Ontario Ministry of Transportation
Southwestern Region
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L3T 7N9

TABLE OF CONTENTS

LIST OF FIGURES

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APPENDICES

1.0 THE TRANSPORTATION ENVIRONMENTAL STUDY REPORT

A Transportation Environmental Study Report (TESR) for Highway 401 was filed on the public record in November 2002. In response to stakeholder comments, the TESR was withdrawn to further review impacts associated with this project and to examine additional designs for the Highway 401 / Highway 4 (Col. Talbot Road) interchange, including an underpass for Highway 401 at Glanworth Drive.

This Transportation Environment Study Report (TESR) has been prepared in compliance with the requirements of the Class Environmental Assessment (Class EA) for Provincial Transportation Facilities (2000). This project is classified as a Group B project under the Class EA.

The TESR includes a description of the project need and justification, alternatives that were considered to resolve identified problems, specific and net environmental effects of the recommended solution and committed mitigation measures and monitoring measures associated with Ministry of Transportation (MTO) Group Work Project (G.W.P. 476-89-00).

Detailed background information, including supporting background study reports, is contained in the environmental study file. The Project Manager and/or Environmental Planner are available to discuss this information and can be contacted as follows:

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Fax: (519) 873-4338

1.1 Summary Description of the Undertaking

This report outlines the problem statement, the need and justification, alternative solutions to the problem, alternative designs and the evaluation of those designs leading to a recommended design for the improvements and widening of Highway 401 from Highway 4 (Col. Talbot Road) to Highbury Avenue.

This project is intended to address the deficiencies and needs for improvements related to traffic operation, capacity and safety on this section of Highway 401 (refer to Section 1.2). The associated improvements include modifications to interchanges at Highway 4 (Col. Talbot Road), Wellington Road and Highbury Avenue, including new structures and improved ramp geometrics, widening Highway 401 to improve capacity and improvements to illumination and drainage. Ultimately, these improvements aim to enhance the transportation network's ability to move people and goods safely, quickly and efficiently along this section of Highway 401.

Alternatives were developed for the entire length of the study area from 1.0 km west of Highway 4 (Col. Talbot Road) easterly to 1.0 km east of Highbury Avenue. These alternatives were analyzed for their impacts to the natural, social, economic, and cultural environments and transportation. The impacts were evaluated based on differences of the impacts (and benefits) to select a technically preferred alternative that achieves the best overall balance of transportation engineering and environmental impacts including input received throughout the consultation process.

A Transportation Environmental Study Report (TESR) for Highway 401 was filed on the public record in November 2002. In response to stakeholder comments, the TESR was withdrawn to further review impacts associated with this project and to examine additional designs for the Highway 401 / Highway 4 (Col. Talbot Road) interchange, including an underpass for Highway 401 at Glanworth Drive.

Based on the evaluation of alternatives, the following improvements are proposed to this section of the Highway 401 corridor:

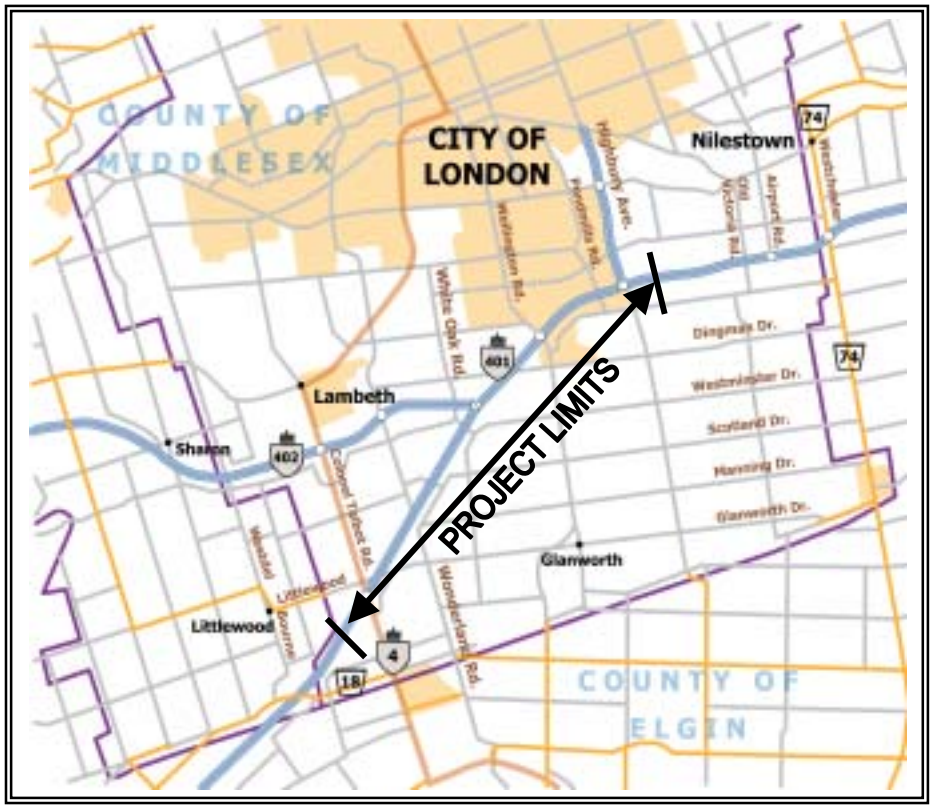
- Highway 4 (Col. Talbot Road) to Highway 402 – widen Highway 401 to a 6 lane cross-section by 2021;
- Highway 402 to Wellington Road – widen Highway 401 to a 6 lane cross-section by 2006 and 8 lanes by 2021;
- Wellington Road to Highbury Avenue – widen Highway 401 to an 8 lane cross-section by 2021;
- Highway 4 (Col. Talbot Road) Interchange - a Parclo A-4 interchange design with a new Glanworth Drive alignment over Highway 401;
- Wellington Road Interchange - a Parclo A-4 interchange design;
- Highbury Avenue interchange - a Parclo A-4 interchange design;
- Illumination and drainage improvements throughout the study area.

The rationale for the selection of the preferred alternatives is provided in Section 4.3 of this report.

1.1.1 Study Area

The study area extends along the Highway 401, from 1.0 km west of Highway 4 (Col. Talbot Road) and 401 interchange, easterly 14.4 km, to 1.0 km east of Highbury Avenue and Highway 401 interchange. Within these limits, Highway 401 represents a major highway connection traversing the County of Middlesex and City of London. The highway is largely bounded by industrial development to the east, and agricultural lands to the west section of the project area. The study area for this project is shown in Figure 1.

FIGURE 1 **STUDY AREA**



1.2 Project Justification and Purpose

The purpose of this project is to undertake a Planning and Preliminary Design Study to address short, medium and long-term needs of Highway 401 from 1.0 km west of Highway 4 (Col. Talbot Road) easterly to 1.0 km east of Highbury Avenue to address the problems associated with traffic operations, capacity and safety. Problems on this section of Highway 401 can be defined under four categories as summarized below:

Traffic Operations

As currently constructed, Highway 401 will not continue to operate at an acceptable level of service in future years within the project limits. Traffic is expected to increase in the future requiring additional lanes.

Three locations along Highway 401 were revealed to have existing operational problems (weaves):

- Highway 4 (Col. Talbot Road) interchange S-W to E-S ramps;
- Highway 4 (Col. Talbot Road) interchange N-E to W-N ramps; and
- Wellington Road interchange S-W to E-S ramps.

Currently, this section of Highway 401 operates well during peak travel periods. In the future, traffic volumes will continue to increase causing congestion along Highway 401.

Short-term (2001 to 2006)

Traffic operations are projected to deteriorate to a poor level of service as early as 2006. Additional capacity is required on Highway 401 between Highway 402 and Wellington Road.

Medium-term (2006 to 2011)

With short-term improvements in place, no other traffic improvements are required during this period.

Long-term (by 2021)

Traffic operations are expected to deteriorate to a poor level of service throughout the project limits. Additional capacity is required between Highway 4 (Col. Talbot Road) and Highbury Avenue.

Future capacity requirements on Highway 401 mainline are outlined as follows:

Location	Existing Capacity	Future Capacity Required
Highway 401 from Highway 4 (Col. Talbot Road) to Highway 402	4 lanes	2021 – 6 lanes
Highway 401 from Highway 402 to Wellington Road	4 lanes	2006 – 6 lanes, 2021 – 8 lanes
Highway 401 from Wellington Road to Highbury Avenue	6 lanes	2021 – 8 lanes

Safety
A 1.0 km section of main line Highway 401 demonstrates a collision rate that slightly exceeds the provincial average in the vicinity Highway 4 (Col. Talbot Road). Another segment of Highway 401 between Wellington Road and Highbury Avenue has a collision rate which is below the provincial average. However, the combination of several geometric deficiencies along this segment of Highway 401 make this area prone to collisions in the future. Although the collision analysis undertaken for this project does not support a need for action, collision statistics in combination with other analysis (capacity and geometrics) suggest the need for improvements at all interchanges along Highway 401.

Geometrics
Based on geometric assessments and roadside safety, vertical curves have been found to be substandard at various locations within the project limits.

The following interchanges have one or more ramps with geometric elements (horizontal and vertical alignments, speed change lane lengths and tapers) that do not meet current design standards:

- Highway 4 (Col. Talbot Road)
- Wellington Road
- Exeter Road
- Highbury Avenue

Illumination
There is currently no mainline illumination within the project limits. Existing illumination within the project limits is found at the following locations:

- Highway 401 and Highway 402 interchange
- Highway 401 and Wellington Road interchange
- Highway 401 and Exeter Road – Wellington Road north exit ramp
- Highway 401 and Highbury Avenue interchange

Upgrades to existing illumination are warranted within the project limits.

1.3 Short-Term Improvements at the Highway 4 (Col. Talbot Road) Interchange

The following related projects have been recently completed within the study area:

Highway 401 and Highway 4 (Col. Talbot Road) Interim Improvements

Following the withdrawal of the TESR for Highway 401, the announcement of a new 'Advanced Border Processing Centre' on Littlewood Drive, west of Colonel Talbot Road raised concerns about the safety of the existing interchange/configuration of local roads. In consultation with local landowners, and City of London officials, the Ministry has developed interim improvements for the Highway 4 (Col. Talbot Road) interchange, which include a new ramp in the northeast quadrant of the existing interchange that ties into Glanworth Drive.

Since the Ministry proposal had no significant environmental or property impacts, the interim improvements were classified as a Group 'C' undertaking under the Class Environmental Assessment for Provincial Transportation Facilities. Long-term improvements for this interchange, which are a part of this TESR, are classified as a Group 'B' undertaking under the Class Environmental Assessment for Provincial Transportation Facilities.

Highlights of the interim improvements include:

- The realignment of the Highway 401 westbound ramp to tie into Glanworth Drive;
- Traffic signals and illumination at Highway 4 (Col. Talbot Road) and the realigned Highway 401 westbound ramp / Glanworth Drive / Littlewood Drive intersection;
- Illumination at the Highway 4 / Burtwistle Lane intersection;
- Speed reduction from 80 km/h to 70 km/h through the interchange area; and
- Enhanced signing through the entire interchange area.

Construction of the interim improvements was completed in November 2003.

Future Wonderland Road Interchange

A Municipal Class Environmental Assessment was undertaken for a future interchange at Wonderland Road and Highway 401 including the extension of Wonderland Road. The proponent of this undertaking was the City of London. An Environmental Study Report (ESR) for Wonderland Road was filed (by the City of London) on the public record in December 2002. Design and construction of the interchange can commence upon availability of funding.

2.0 ONTARIO ENVIRONMENTAL ASSESSMENT PROCESS

This environmental assessment study is being undertaken to meet the requirements of a Group "B" project under the Class Environmental Assessment for Provincial Transportation Facilities (2000). Under the Class EA, Group B projects include highway and freeway improvements which provide an increase in traffic capacity and / or access and comprise such improvements as widening, interchange improvement, major alignment shifts and other analogous improvements.

The sequence of key events (activities) and study phases are summarized in Figure 2.

2.1 Study Process

The study process used is divided into five major steps:

1) Review Transportation Needs Assessment
2) Generate, Evaluate and Select Preferred Planning Alternatives
3) Generate and Assess Preliminary Design Alternatives
4) Evaluate and Select Preferred Preliminary Design Alternative
5) Develop Preferred Preliminary Design Alternative

The study process provided opportunities for periods of public and external ministry and agency input and review at key stages during the project, as well as for a continuous approach to the technical work involved. Refer to **Figure 3** for an overview of the study process.

2.2 Consultation

There are five features that are key to a successful planning study / Environmental Assessment. The five features include:

- Consultation with affected parties;
- Consideration of reasonable alternatives;
- Consideration of all aspects of the environment (i.e. natural, social, economic, cultural and technical);
- Systematic evaluation of net environmental effects; and,
- Clear and complete documentation of the planning process.

(Source: Interim Guidelines on Environmental Assessment Planning and Approval, Ministry of Environment, 1989).

The consultation process developed for this study assisted in achieving each of these key features.

One of the intentions of this study was to ensure that, from the earliest stages of planning, decisions were made after considering environmental impacts. Consultation with affected parties was an essential component of the planning process and provided a mechanism to define and respond to issues.

As mentioned, the first key feature to successful planning involves early consultation with affected parties. The study was organized so that affected parties were:

- Involved throughout the study at appropriate times;
- Provided access to information;
- Provided sufficient time to respond to questions and data requests; and,
- Encouraged to participate in an issue identification/resolution process.

FIGURE 2 **STUDY SCHEDULE**

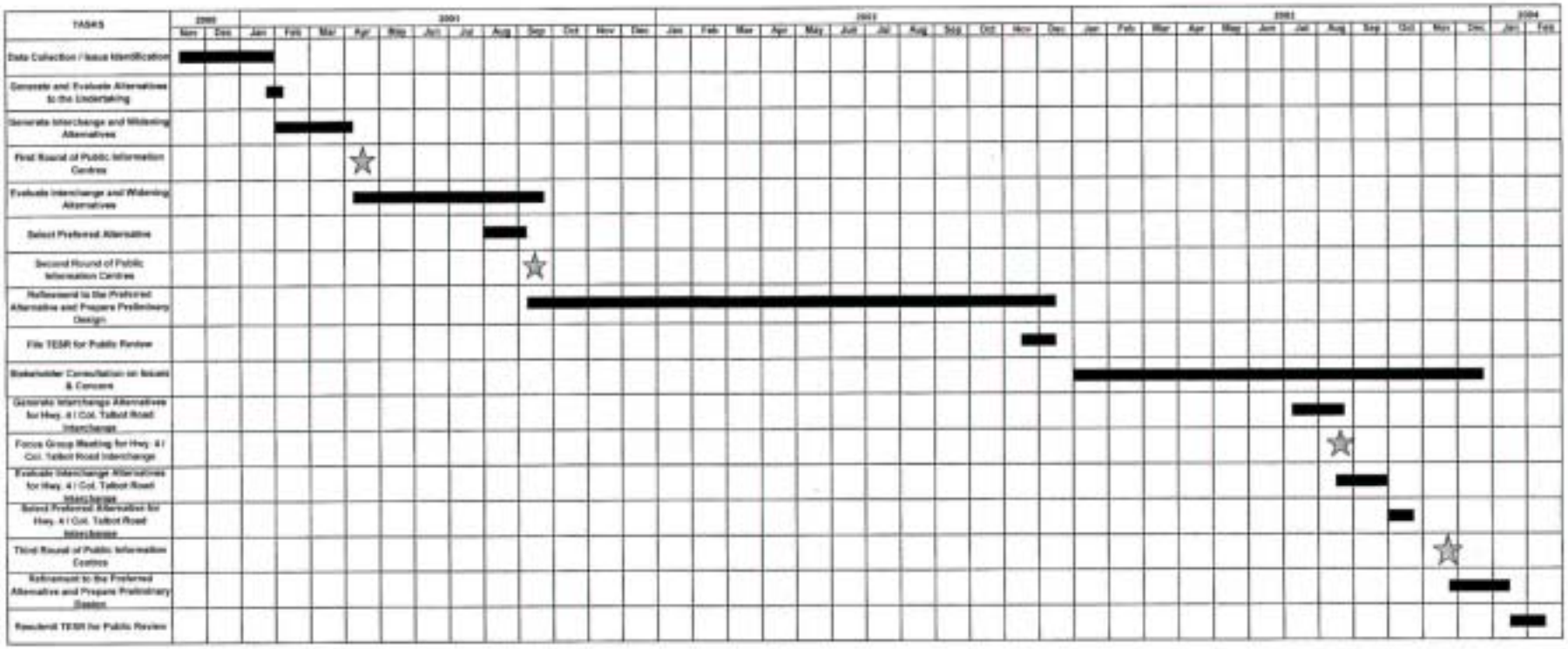
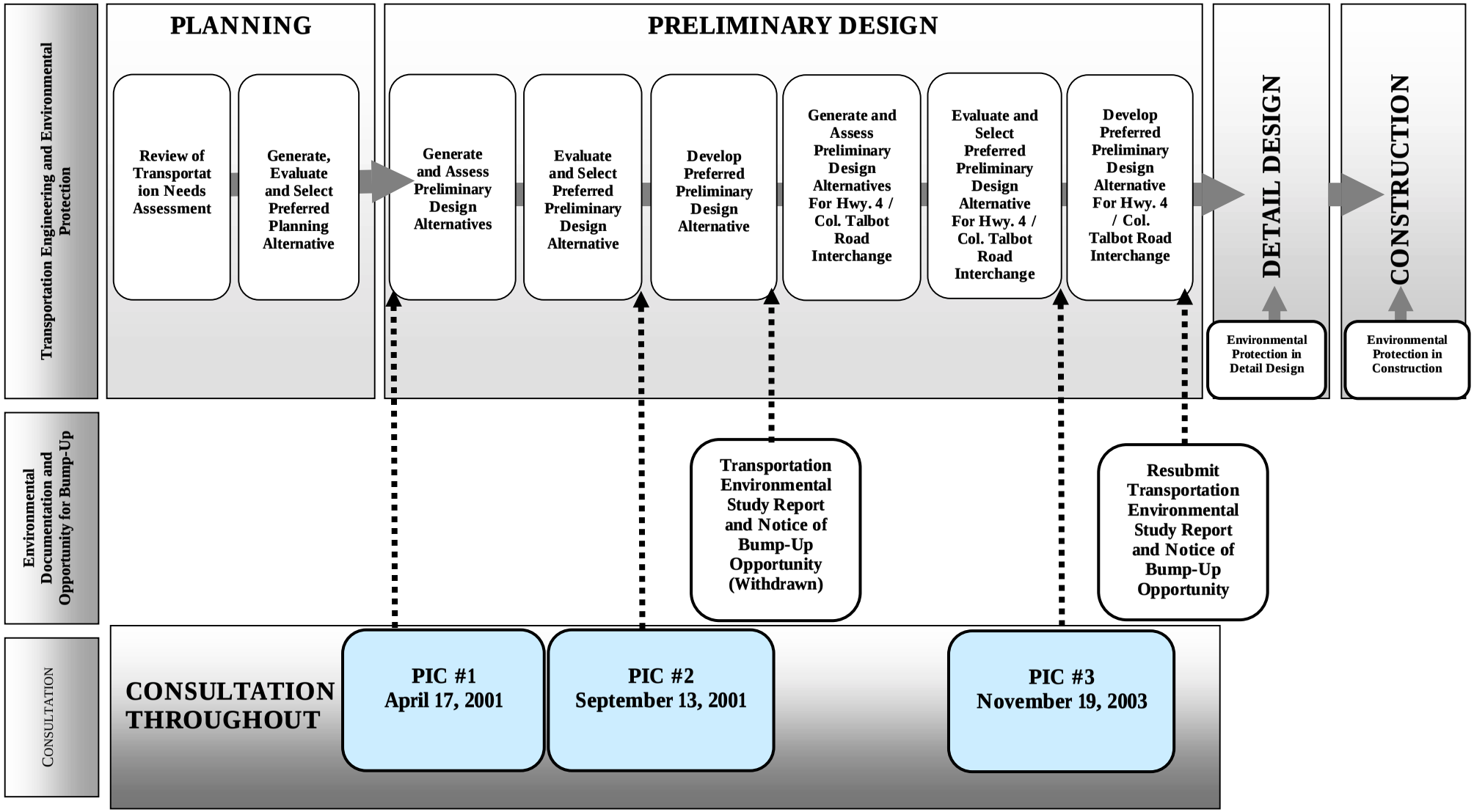


FIGURE 3 **STUDY PROCESS**



The public and various government agencies were provided the opportunity to review and comment on the alternatives, evaluation method and identify concerns and comment on the proposed mitigation measures. The following section outlines the consultation process implemented for this undertaking.

External and public consultation took place as follows:

- Initial letters, dated January 8, 2001 were distributed to those on the external and agency list including government agencies, ministries, municipalities and interest groups.
- "Notice of Study Commencement" was placed in the London Free Press newspaper January 11, 2001 and in the L'Express newspaper March 13, 2001.
- Start up meeting held on November 16, 2000 with the City of London staff.
- Meeting held on February 22, 2001 with staff from the City of London.
- Meeting held on March 8, 2001 with London Police and OPP (London).
- Meeting held on March 22, 2001 with staff from the City of London.
- Notice of First Public Information Centre was placed in the London Free Press newspaper on April 10, 2001 and in the L'Express newspaper on April 11, 2001.
- Invitation letters were distributed to those on the project mailing list including government agencies, ministries, municipalities, interest groups and property owners/tenants.
- First Public Information Centre (PIC) was held on April 17, 2001.
- Telephone conversations with various local residences and institutions in Summer / Fall 2001 to discuss potential property impacts associated with the proposed improvements.
- Telephone conversations with Gentex on August 16, 2001 and August 20, 2001 to discuss potential property impacts and plans for future expansion.
- Invitation letters were distributed to those on the project mailing list including those individuals who signed up at the first PIC, affected property owners/tenants, government agencies, ministries, municipalities and interest groups.
- Notice of Second Public Information Centre was placed in the London Free Press newspaper on September 5, September 8, 2001 and in the L'Express newspaper on September 5, 2001.
- Second Public Information Centre (PIC) was held on September 13, 2001.
- An information package was courier to property owners directly impacted by the proposed improvements in September 2001.
- Meeting with the Upper Thames River Conservation Authority and Kettle Creek Conservation Authority on December 17, 2001.
- Telephone conversation with the Ministry of Natural Resources on February 13, 2002.
- Focus Group Meeting held on August 20, 2003 with property and business owners in the vicinity of the Highway 401 / Highway 4 (Col. Talbot Road) interchange, City of London engineering staff, municipal politicians, and representatives from the local agricultural community.
- Invitation letters and brochures were sent directly to those people on the project team's external team mailing list, including government agencies and ministries, municipalities, interest groups, those individuals who signed up at the previous PICs and individuals who requested to be added to the mailing list.
- Notice of Third Public Information Centre was placed in the London Free Press newspaper on November 17, 2003 and in the L'Express newspaper on November 12, 2003.
- Third Public Information Centre (PIC) was held on November 19, 2003.

2.2.1 External/Agency Participation

The External Team was comprised of government ministries and agencies including:

- Ministry of Environment - Southwestern Region
- Ministry of Economic Development and Trade

- Ministry of Citizenship, Cultural and Recreation
- Ministry of Municipal Affairs and Housing
- Ministry of Natural Resources
- Ontario Native Affairs Secretariat
- Ministry of Agriculture, Food and Rural Affairs
- City of London Fire Department
- Ministry of Health
- Hydro One Networks Inc. Environmental Services and Approvals
- Ontario Power Generation
- Upper Thames River Conservation Authority
- Ontario Provincial Police – London District
- London Police Department

At the start of the study, External Team members were contacted by mail and asked to respond to the following questions:

- Does your Ministry or Agency have an interest in the study?
- Who will act as your Ministry's or Agency's spokesperson and our contact?
- Does your Ministry or Agency have any relevant background information?
- Does your Ministry of Agency have any comments or concerns?

A summary of issues and concerns raised by the external ministries and agencies is outlined in Table 1.

TABLE 2.1 ISSUES/CONCERNS RAISED BY THE EXTERNAL TEAM

External Agency	Comment	Action / Response
Canadian Coast Guard *Letter: March 25th, 2002*	Response to inquiry regarding the navigability of Dingman Creek (letter dated February 19th, 2002).	Coast Guard advised that the section of Dingman Creek at Highway 401 is considered a navigable waterway, as such an application for approval under section 5(1) of the Navigable Waters Protection Act is required. Approval will be sought during detail design.
Ontario Native Affairs Secretariat *Letter: Aug. 29,2001*	Response to initial notification letter. Noted that local First Nations should be contacted	Comment noted, no local First Nation within the project limits
Ministry of Agriculture Food and Rural Affairs *Letter: Jan 22,2001*	Response to initial notification letter. Provided project contact information. OMAFRA not opposed in principle to the project and noted that the west portion of the project limits comprise prime agricultural lands OMAFRA requests that: ❑ Proposed work near agricultural lands occur within the existing ROW to the extent possible and impacts to farmland should be minimized; ❑ Impacts to prime agricultural land should be avoided or disruption should be minimized and that post construction prime lands are returned to productive agricultural use; ❑ Disruption of agricultural infrastructure should be avoided or minimized to the extent possible.	Comments and contact noted. Impacts to agricultural lands and operation are addressed in the evaluation of alternatives. Potential impacts will be minimized to the extent possible. Temporary disruption impacts of agricultural operations during construction of the highway will be mitigated by replacement of fences which area removed during construction. Areas used on a temporary basis for construction will be restored to current conditions in consultation with the affected agricultural operator.
Ministry of Tourism, Culture and Recreation *Letter: April 10,2001*	Response to initial notification letter. Provided project contact information. If there are potential impacts to heritage areas, a heritage assessment should be undertaken. If significant heritage or archaeological remains are identified, negative impacts will have to be mitigated by either avoidance or excavation.	Comments and contact noted. A Stage 1 Archaeological Assessment and Built Heritage Resource Assessment were conducted for this project. Pertinent reports documenting existing conditions, potential impacts, proposed mitigation measures and future work will be filed with MTCR and are included in this TESR.

External Agency	Comment	Action / Response
	Requested to continue to be involved in this project.	
Ministry of Municipal Affairs and Housing *Letter: April 24,2001*	Provided project contact information. Noted that current provincial policy on land use planning matters in Ontario is the "Provincial Policy Statement" and that Planning Act requirements apply for planning approval regarding official plan amendments and zoning bylaw amendments.	Comments and contact noted. Planning Act approval will not be required for this undertaking.
Ministry of the Environment	Response to initial notification letter. Provided project contact information Provided well records for the Highway 401 / Highway 4 (Col. Talbot Road) interchange area.	Contact noted.
Ministry of Natural Resources	Response to initial notification letter. Provided project contact information	Contact noted.
Upper Thames River Conservation Authority	Response to initial notification letter. Provided project contact information	Contact noted.
Ontario Cycling Association	Did not wish to participate in this study.	Comment noted
O.P.P. / London Police Meeting: March 8, 2001	Provided accident information regarding Highway 402 interchanges and comments regarding operational conditions and safety concerns along this section of the Highway 401 corridor. Specific comments include: ❑ The section of Highway 401 between Highway 4 and Highway 402 does not provide the opportunity for emergency vehicles to turnaround, resulting in an increase in response time to incidents. The addition of a Wonderland Avenue Interchange would improve response times for emergency vehicles. ❑ An express-collector system would be desirable to separate through truck traffic from local "London" traffic. ❑ Widening Highway 401 would improve operations. ❑ OPP suggested that all alternatives considered should maintain or add rumble strips along both edges of pavement. ❑ A paved outside shoulder should be provided along the entire project limits to provide a safe area of refuge for motorists and police vehicles in case of emergencies. ❑ The concrete median barrier should be extended west of the project limits to Windsor. Six lanes for Highway 401 to Windsor should be considered to accommodate the high truck volumes along the corridor, and to improve operations.	Comments noted ❑ A Municipal Class Environmental Assessment is being undertaken for a future interchange at Wonderland Road and Highway 401 including the extension of Wonderland Road. The proponent of this undertaking is the City of London. ❑ Comment noted. Not within scope of this study. ❑ Widening Highway 401 is proposed to improve capacity and operations. ❑ Comment noted. Use of ruble strips will be addressed during detail design. ❑ Comment noted. Paved shoulders will be provided as per current MTO geometric design standards. ❑ Comment noted. Is outside of the project limits and thus beyond the scope of this study.
Upper Thames River and Kettle Creek Conservation Authorities Meeting: December 17, 2001	❑ Provided information and comments on natural features in the study area and stormwater management issues including the following specific comments: ❑ The provision for a low flow channel at Dingman Creek while maintaining the natural character of the stream would be a benefit. ❑ Opportunities for increased stormwater	Comments noted. Natural conditions and proposed mitigation measures are outlined in this TESR (Section 5.2) and documented in separate natural environment and drainage and hydrology reports (forwarded to the Conservation Authorities for their information).

External Agency	Comment	Action / Response
	treatment throughout the highway corridor should be examined. ❑ Small rock check damns rather than straw-bale check damns are preferred from a sediment control perspective. ❑ With respect to mitigation for vegetation loss, opportunities for replanting should be examined.	

External Team Meetings

An External Team meeting was arranged prior to the first Public Information Centre on April 17, 2001. The objective of the meeting was to update the External Team on the project activities undertaken and the project schedule, discuss problems and opportunities along the Highway 401 corridor, as well as discuss the preliminary alternatives under consideration. No members of the External Team attended the meeting.

Another External Team meeting was held prior to the second Public Information Centre on September 13, 2001. The objective of this meeting was to provide an opportunity to discuss the analysis and evaluation of alternatives and the recommended preferred alternative. No members of the External Team attended the meeting.

A Focus Group Meeting, comprised of property and business owners in the vicinity of the Highway 401 / Highway 4 (Col. Talbot Road) interchange, City of London engineering staff, municipal politicians, and representatives from the local agricultural community, was held on August 20, 2003. The objective of this meeting was to present long-term alternatives for the Highway 401 / Highway 4 (Col. Talbot Road) interchange, including a Glanworth bridge over Highway 401, and to identify outstanding issues and concerns related to the interchange.

2.2.2 Public Participation

A mailing list of interested individuals was established at the commencement of the study and continuously updated throughout the study. The purpose of this list was to ensure that individuals who stated an interest in the study were kept informed of upcoming events and the project's progress. The list was first developed from the City of London's property assessment roles and included all property owners within the corridor.

A notice of study commencement was published in local newspapers notifying area residents of the project and requesting them to contact the Project Team if they require information and/or to be placed on the mailing list.

The public was formally involved in the decision making process through a series of Public Information Centres (PICs) held at two major decision points:

- Preliminary Alternatives / Proposed Evaluation Method and Criteria
- Analysis and Evaluation of Alternatives

Notification of these PICs was provided for in the following ways:

- Advertisements in local newspapers;
- Letters mailed to individuals on the Project Team mailing list;
- Letters couriered to individuals directly impacted by the recommended alternatives; and,
- Letters mailed directly to external and municipal representatives.

The PICs were designed as drop-in centres where members of the public could discuss the project on an individual basis with Project Team representatives.

First Public Information Centre

The first Public Information Centre (PIC) was held on April 17, 2001 at the Ramada Inn – Somerset Ballroom in the City of London from 2:00 p.m. to 5:00 p.m. and from 7:00 p.m. to 9:00 p.m.

The purpose of the PIC was to focus on the identification of project needs, reasonable alternatives and the proposed evaluation method. The PIC also provided the public an opportunity to review and comment on the following:

- Project Limits;
- Study Schedule;
- Class Environmental Assessment Process;
- Study Purpose and Problem Statement;
- Existing Conditions;
- Proposed Planning Alternatives;
- Proposed Interchange Alternatives; and
- Proposed Evaluation Method and Criteria.

A total of 50 members of the public chose to sign the visitor's register for the PIC. Fourteen written comments were received. The following table summarizes the major issues and concerns raised by the public during the PIC and the appropriate response/mitigation to the issues.

TABLE 2.2 ISSUES/CONCERNS RAISED AT THE FIRST PUBLIC INFORMATION CENTRE

ISSUES/CONCERNS	RESPONSE/MITIGATION
Poor traffic operations and safety improvements at Highway 4 (Col. Talbot Road).	Alternatives were developed to address traffic operations and safety, including extension of the acceleration and deceleration lanes at Highway 4 (Col. Talbot Road).
Increased noise levels.	A noise impact assessment was conducted to determine the level of impact on noise sensitive receivers. Based on the results of the assessment, there will be no significant increase in noise levels (i.e. greater than 5 dBA) as a result of the widening.
High traffic flow on Decker Road.	Traffic signals will be incorporated in the preliminary design of the preferred alternative at Wonderland Road interchange to improve traffic operations and to reduce traffic on Decker Road.
Disagree with closing Morrison Road.	Due to the number of concerns raised on the closure of Morrison Road, the preferred alternative was refined to allow Morrison Road to remain open.
Traffic signals would increase congestion on Highway 4 (Col. Talbot Road).	Traffic signals will be incorporated in the preliminary design of the preferred alternative at Highway 4 (Col. Talbot Road) interchange, as appropriate.
High water tables and drainage impacts.	A groundwater assessment was part of this study. No significant impacts to areas of high water table and ground water recharge and discharge areas are anticipated. Potential impacts to specific wells will be examined during detail design.
Storm water quality and quantity to address water run off	A storm water quality and quantity plan has been developed to address water run off from Highway 401.
Property impacts.	Property acquisition and compensation will be restricted to those properties required for the widening of the highway, including interchange reconstruction. In situations where a property is required, compensation is based on the market value of the property. Market value is determined at the time of purchase by a property appraisal report. Other ancillary costs are negotiated on a case by case basis. Additional modifications will be made when preparing the preliminary

ISSUES/CONCERNS	RESPONSE/MITIGATION
	design of the preferred alternative to reduce property impacts. Nuisance impacts to properties not directly affected are addressed by mitigation measures, such as landscaping and construction restrictions.

Second Public Information Centre

The second Public Information Centre (PIC) was held on September 13th, 2001at the Ramada Inn – Somerset Ballroom in the City of London from 2:00 p.m. to 5:00 p.m. and from 7:00 p.m. to 9:00 p.m.

The purpose of the second Public Information Centre (PIC) was to present the results from the first Public Information Centre, present the analysis and evaluation of alternatives and the preferred alternatives. The PIC also provided the public an opportunity to review and comment on the following:

1. Project Limits;
2. Study Schedule;
3. Class Environmental Assessment Process;
4. Study Purpose and Problem Statement;
5. Summary of Issues and Concerns Raised During the First Public Information Centre;
6. Analysis and Evaluation of Alternatives;
7. Preferred Alternatives; and
8. What's Next.

A total of 50 members of the public chose to sign the visitor's register for the PIC. Seven written comments were received. The following table summarizes the major issues and concerns raised by the public during the PIC and the appropriate response/mitigation to the issues.

TABLE 2.3 ISSUES/CONCERNS RAISED AT THE SECOND PUBLIC INFORMATION CENTRE

ISSUES/CONCERNS	RESPONSE/MITIGATION
Noise impact evaluation	A noise assessment was conducted for this study. The existing (year 1999) noise levels along Highway 401 from Highway 4 (Col. Talbot Road) to Highbury Avenue ranged from 72.6 dBA to 57.4 dBA and the future undertaking (year 2021) noise levels were estimated to increase ranging from 74.9 dBA to 60.3 dBA. Based on the results, it was determined that noise mitigation is not warranted (in accordance with the Ministry of Environment/Ministry of Transportation noise protocol) as the increase in noise levels resulting from these improvements were less than 5 dBA.
High traffic flow on Decker Road.	Traffic signals will be incorporated in the preliminary design of the preferred alternative at Wonderland Road interchange to improve traffic operations and to reduce traffic on Decker Road.
Impact to business entrances along Highway 4 (Col. Talbot Road)	The exact location and configuration of a new entrance to Gentek from Colonel Talbot Road will be determined in consultation with the City of London and the Ministry of Transportation during the detail design phase. Improvements to the Highway 4 (Col. Talbot Road) interchange have been identified for the mid-term planning horizon of this study (2011).
Impacts to Utilities on Glanworth Drive	It is anticipated that utilities on Glanworth Drive would be unaffected by the preferred interchange alternative. Utility relocates will be addressed during the detail design phase of this study in consultation with affected utility companies.
Improvements to the left-turn lane (northbound) from Highway 4 (Col. Talbot Road) to Burtwistle Lane needed	Further consideration of extending the left turn lane from Colonel Talbot Road to Burtwistle Lane (south) will be examined during the detail design stage.

ISSUES/CONCERNS	RESPONSE/MITIGATION
Cleaning the Fourine drain is needed	Maintenance concerns regarding Fourine Drain have been forwarded to the City of London Transportation and Works Department for further consideration.
Impacts to Dingman Creek drain	Impacts to Dingman Creek have been reviewed as part of this study. The recommended improvements and mitigation measures are discussed in Section 5.2 of this report.
Replacement of fences along Highway 401	Where fence are impacted by the proposed improvements, they will be repaired / replaced to their original condition. Comments regarding the installation of new fences along Highway 401 between White Oak Road and Highway 402 have been forwarded to the Ministry of Transportation Works Department for further consideration.
Operations at the "6-way corner"- Littlewood Road and Colonel Talbot Road	A new interchange layout has been recommended at Highway 401 and Highway 4 (Col. Talbot Road) as a mid-term improvement (2011). The new interchange will eliminate concerns at Littlewood Road, and will provide a superior level of operations along Highway 4 (Col. Talbot Road) and ramps.

Third Public Information Centre

The third Public Information Centre (PIC) was held on November 19, 2003 at the CAW Local 150 Auditorium in the City of London from 3:00 p.m. to 8:00 p.m.

The purpose of the PIC was to update the public on the progress of this study, the evaluation of alternatives and the recommended alternatives, including long-term interchange alternatives at Highway 4 (Col. Talbot Road) with a Glanworth bridge over Highway 401. The PIC also provided the public an opportunity to review and comment on the following:

1. Project Limits
2. Study Background
3. Problem Statement
4. Interim Improvements
5. Overview of the Class EA Process
6. Study Schedule
7. Future Highway 401 Lane Requirements
8. Evaluation Summaries for Interchange Alternatives
9. Summary of Issues and Concerns Raised
10. Alternatives Considered at the Highway 4 / Col. Talbot Road Interchange
11. Evaluation Criteria
12. Evaluation Summary of Highway 4 (Col. Talbot Road)
13. What's Next

A total of 21 members of the public chose to sign the visitor's register for the PIC. Three written comments were received. The following table summarizes the major issues and concerns raised by the public during the PIC and the appropriate response/mitigation to the issues.

TABLE 2.4 ISSUES/CONCERNS RAISED AT THE THIRD PUBLIC INFORMATION CENTRE

ISSUES/CONCERNS	RESPONSE/MITIGATION
The interim improvements provide safer traffic conditions; and the temporary signals on Col. Talbot (at Littlewood) are slowing traffic speeds through the Highway 401 / Col. Talbot Road interchange area.	Comment noted. Support for the interim improvements and the temporary signals on Col. Talbot Road at Littlewood Drive is appreciated.
Concern regarding the speed of the	With respect to the speed of traffic on the Highway 401 westbound exit

ISSUES/CONCERNS	RESPONSE/MITIGATION
trucks exiting westbound Highway 401; need to make traffic existing Highway 401 aware of the 30 km/h ramp speed limit.	ramp, the ramp is signed at a 30 km/h speed limit. An electronic sign showing a 30 km/h ramp advisory speed was positioned in advance of the ramp along Highway 401 on a temporary basis to make westbound travelers destined to Highway 4 / Col. Talbot Road aware of the posted speed. There is also an advisory sign posted on the ramp indicating that there are traffic signals ahead.
Concern regarding the lack of illumination at the intersection of Glanworth Drive and the E-NS ramp; suggest installing traffic lights or beacons on top of the stop sign.	The design of this intersection meets current Ministry of Transportation standards. However, in light of concerns raised, the Ministry of Transportation will review illumination issues associated with the interim interchange design.
Agree with the interim improvements (new E-N/S ramp and intersection).	Comment noted. Support for the interim improvements (new E-N/S ramp and intersection) is appreciated.
Need to accommodate agricultural vehicles to Wonderland Road via Tempo Road and Glanworth Drive if Orr Drive is closed.	Comment noted. The recommended plan will facilitate this movement.
Concern regarding the movement of wide and slow moving vehicles through the project limits.	The proposed interchange design includes a centre paved median along Highway 4 / Col. Talbot Road, shoulders on both bridges and signalized intersections at Tempo Road and Littlewood Drive, which will help facilitate the movement of agricultural equipment through the interchange.
Lengthening the left turn lane into Burtwistle Lane would accommodate safer left turns.	We also note your suggestion to lengthen the left turn lane into Burtwistle Lane. Your suggestion will be taken into consideration in the detail design phase, which will be scheduled when a construction date is announced.
Need for improved illumination through the Highway 401 / Highway 4 (Col. Talbot Road) interchange area.	High mast illumination will be provided when the new interchange is constructed. Conventional lighting will be provided at signalized intersections.
The E-S ramp at the Highway 4 (Col Talbot Road) interchange should be closed to eliminate the weaving condition on Highway 401.	The Ministry of Transportation will monitor traffic operations at this ramp and will make changes, if warranted.
Need for improved illumination at the Glanworth Drive structure.	Comment noted. In light of concerns raised, the Ministry of Transportation will review the need and opportunity for illumination enhancements through this area.
Need for the City of London to construct an acceleration lane on Col. Talbot Road north of Highway 401 to reduce truck interference with car passage.	Col. Talbot Road north of Littlewood Drive is under the jurisdiction of the City of London and your comment will be forwarded to the City of London for further consideration.
Concern with the closure of Orr Drive, particularly during construction when the Tempo Rd. detour is in place. This condition will cause slow moving agricultural vehicles normally using Orr Drive to mix with detour traffic.	Comment noted. Further consideration regarding the closure of Orr Drive will be examined during the detail design stage.
Either Alternative 1 or 2 is acceptable for the Highway 401 /	Comment noted. High mast illumination will be provided when the new interchange is constructed.

ISSUES/CONCERNS	RESPONSE/MITIGATION
Col. Talbot Road long-term improvements, however, tower lighting is required.	
Future improvements to Highway 401 and Wonderland Road should be accelerated.	Please note that this is a City of London initiative and is subject to the availability of funding.
Stop signs at Highway 401 and Col. Talbot Road (interim improvements) are too small, and require bold text to prevent vehicles from entering one-way traffic.	Please note that the signing meets Ministry of Transportation standards. However, in light of concerns raised, the Ministry of Transportation will review the need and opportunity for signing enhancements through this area.
Will a new bridge be required for the short-term improvements to Highway 401 and Wellington Road?	A new Wellington Road bridge over Highway 401 will be constructed to the east side of the existing bridge.

3.0 TRANSPORTATION NEEDS ASSESSMENT

3.1 Statement of Problem and Opportunity

The purpose of this section is to outline the existing and projected transportation problems and opportunities in the study area. The problems addressed in this study are related to the deficiencies in the capacity of the transportation network, roadside safety, structural and interchange improvements for Highway 401 from Highway 4 (Col. Talbot Road) to Highbury Avenue to accommodate forecasted commuter and commercial travel needs.

The study also addresses the opportunity to identify a plan for resolving the short and medium problems while protecting the Ministry of Transportation's long-term strategic goals for the movement of people and goods through the City of London.

The transportation problems and opportunities were identified from the following sources:

- Transportation Network Plans;
- Ministry of Transportation's Traffic Data Inventories (i.e.; AADT, SADT, WADT, traffic counts);
- Municipal Intersection Collision Records;
- Municipal Road AADT Data (1990-1998) City of London;
- City of London Official Plan; and,
- County of Middlesex Official Plan.

3.1.1 Problem

Existing Conditions

Highway 401 is currently a six lane controlled access freeway from east of Highbury Avenue interchange to the Wellington Road interchange. From the Wellington Road interchange westerly to beyond the Highway 4 (Col. Talbot Road) interchange, Highway 401 has a four lane cross-section.

Future Conditions

Traffic operations are projected to deteriorate to a poor level of service as early as 2006. As traffic volumes continue to increase, congestion on Highway 401 will occur. This will lead to increased driver frustration, potential for collisions, trip delays and associated waste of energy resources, increased costs of moving goods and significant diversion of traffic to adjacent roads. Structures will also need to be widened or replaced to accommodate mainline improvements.

Future capacity requirement on Highway 401 mainline is outlined as follows:

Highway 401 Segment	Existing Traffic Volumes (2001 AADT)	Existing Capacity	Project Future Traffic Volumes (2006 / 2021 AADT)	Future Capacity Required
Highway 4 (Col. Talbot Road) to Highway 402	31,900	4 lanes	2006 – 37,600 2021 - 54,000	2021 – 6 lanes
Highway 402 to Wellington Road	46,800	4 lanes	2006 – 53,700 2021 – 75,750	2006 – 6 lanes, 2021 – 8 lanes
Wellington Road to Highbury Avenue	54,450	6 lanes	2006 – 62,150 2021 - 85,500	2021 – 8 lanes

Under future conditions, traffic operations on most interchange ramps within the project limits will be at or approaching unacceptable level of service. These ramps include:

- Highbury Avenue S-E;
- Highbury Avenue N-E;
- Highbury Avenue N-W;
- Highbury Avenue W-N/S;
- Highbury Avenue E-N/S;
- Wellington Road S-E;
- Wellington Road W-N/S;
- Wellington Road N-W;
- Wellington Road E-N;
- Highway 402 W-E;
- Highway 402 E-W; and
- Highway 4/Colonel Talbot Road W-S.

3.1.2 Opportunity

Transportation improvements are required along Highway 401 from Highway 4 (Col. Talbot Road) to Highbury Avenue to address transportation network deficiencies associated with forecasted commuter travel needs.

In recognition of increased traffic and transportation needs along the Highway 401 corridor, this area was assessed to define and designate the property or right-of-way that may be required for the transportation improvements prior to it being developed.

3.2 Alternatives to the Undertaking

The purpose of the undertaking is to resolve the deficiencies associated with Highway 401. Consistent with the Class Environmental Assessment for Provincial Transportation Facilities (2000), alternatives to the undertaking were examined to determine which alternatives were considered reasonable. For this study, the judgement of reasonableness was based on the ability of the alternative to resolve the transportation problems identified, or to take advantage of an opportunity. In total, six types of alternatives to the undertaking were assessed to determine the most reasonable approach to addressing the identified problems and opportunities.

1) Do nothing

The "do nothing" alternative maintains the status quo of transportation infrastructure and services, with no significant changes or actions being taken to either manage demand, expand infrastructure, or improve operations. Traffic is expected to continue to increase. To "do nothing" would result in a further deterioration of the level of service. This in turn would result in an increase in travel time, congestion, collisions, and fuel wastage. The negative consequences of the "Do Nothing" approach clearly suggest that actions must be taken in order to address the existing and projected deficiencies of Highway 401. As such, this was not considered an acceptable alternative.

2) Road Improvements (Existing Transportation Facilities) Excluding Highway 401

There are very few parallel arterial road networks that would provide diversion for Highway 401 through-traffic due to the distances of these other roads from Highway 401. Improvements and/or widening of arterial roads would not provide sufficient additional capacity for through-traffic to be significantly diverted from Highway 401. Therefore, road improvements (excluding Highway 401) were not considered an acceptable alternative.

3) Non-Roadway Improvements (Rail, Air, Transit) / Improve or Introduce New Facilities

This alternative involved improving existing or introducing new types of modes other than road users. This alternative did not address improvements to the traffic operations and capacity problems, geometrics and would be very expensive to construct. Highway 401 serves a diverse nature of trips. Although rail and transit expansion would provide a more competitive choice of travel modes for some users, such improvements would not significantly reduce vehicle trips. This alternative alone would not be able to address travel demand and was therefore eliminated from further consideration.

4) Transportation Demand Management

Managing transportation demand includes the implementation of measures to sufficiently reduce, shift, or eliminate transportation demand, such that improved transportation infrastructure /operation within the study is not required. This alternative would not significantly improve or eliminate any of the identified deficiencies and was not considered an acceptable alternative.

5) Construction of a New Road Corridor

This alternative would improve capacity problems but would not address safety or geometric concerns. This alternative would result in significantly high natural, social, economic and cultural impacts and would have considerably high costs. Therefore, this alternative was eliminated from further consideration.

6) Roadway Improvements to Highway 401

Improvements to Highway 401 mainline and interchanges at Highway 4 (Col. Talbot Road), Wellington Road, Exeter Road and Highbury Avenue address the problems associated with traffic operations, capacity, geometrics, safety and illumination concerns in the study area. This alternative would result in minor natural, social, economic and cultural impacts that are mitigatable. Therefore, this alternative was recommended for further consideration.

Highway 401 is an important transportation corridor contributing to transportation services between Detroit and Toronto. Through the study area, conditions warrant improvements to traffic capacity and operations. The assessment of alternatives to the undertaking concluded that the “do nothing” alternative, management of travel demand, the use of road and non-road based alternatives are not acceptable measures to resolve existing and potential problems in the study area. Improving the traffic carrying capacity, geometrics and safety is the most desirable means of resolving the deficiencies. As such, roadway improvements to Highway 401 was identified as the best solution and carried forward for further consideration.

4.0 PRELIMINARY DESIGN

The overall objective of generating a reasonable range of alternatives was to eliminate alternatives that did not satisfy components of technical considerations. To accomplish this, a multi-step process was employed:

Step 1: Identify Significant Study Area Features

Step 2: Generate Preliminary Design Alternatives

Step 3: Evaluate and Select the Preferred Alternative

Based on the evaluation of alternatives to the undertaking, alternative methods of carrying out the undertaking were examined along Highway 401 from 1 km west of Highway 4 (Col. Talbot Road) to 1 km east of Highbury Avenue to the year 2021.

HIGHWAY 401 MAINLINE (2001 – 2006):

This section of Highway 401 within the project limits is anticipated to operate well during peak travel periods until 2006. Roadside safety, illumination and drainage features are improvements required to reflect current Ministry Standards.

Highway 401 requires widening from four lanes to six lanes between Highway 402 to east of Wellington Road.

Location	2001 AADT	2006 AADT
Highway 402 to Highway 4 (Colonel Talbot Road)	31,900	37,600

HIGHWAY 401 MAINLINE (BY 2021):

Traffic operations are projected to deteriorate to a poor level of service as early as 2006. As traffic volumes continue to increase, congestion on Highway 401 will occur. This will lead to increased driver frustration, potential for collisions, trip delays and associated waste of energy resources, increased costs of moving goods and significant diversion of traffic to adjacent roads. Structures will also need to be widened or replaced to accommodate mainline improvements.

Highway 401 requires widening from four lanes to six lanes from Highway 4 (Col. Talbot Road) to Highway 402 and six lanes to eight lanes between Highway 402 to Highbury Avenue.

Location	2001 AADT	2006 AADT	2021 AADT
Highway 402 to Highway 4 (Colonel Talbot Road)	31,900	37,600	54,000
Highbury Avenue Wellington Road	54,450	62,150	85,500
Wellington Road Highway 402	46,800	53,700	75,750

Highway 401 Existing Interchanges:

The interchanges within the project limits (Highway 4 (Col. Talbot Road), Wellington Road, Exeter Road and Highbury Avenue) warrant improvements to address traffic operation issues and to reflect current Ministry Standards.

4.1 Study Area Constraints

In order to generate a reasonable range of alternatives, all significant features within the study area limits were identified to determine the sensitive areas within the proposed alignment options and the potential for impact on these areas from the proposed widening alternatives.

Identifying significant features involved the collection of primary and secondary source data derived from surveys, field studies, published and unpublished literature, government sources and consultation with agencies and the public. The data collected was grouped in the following categories:

- Natural Environment;
- Socio-Economic Environment;
- Cultural Environment;
- Technical Considerations.

4.1.1 Natural Environment

The natural environment information was obtained from reviews of existing documents, air photo interpretation, surveys and field investigations (i.e., aquatic habitat and fisheries, hydrogeological assessment, wildlife and vegetation communities) undertaken in May 2001.

The following sections summarize the natural features within the study area. Detailed descriptions are included in the Natural Environment stand alone report prepared by Gartner Lee Limited *Natural Environment Assessment – Highway 401 Existing Conditions Report, July 2001 (Final Draft).*

4.1.1.1 Hydrogeology

The surficial geological mapping shows that most of the highway corridor is underlain by silty clay to clayey silt till or other fine grained deposits (silts or clays) of varying thickness. Most wells in this area (30 wells) obtain their water supply from discrete sand and gravel layers within the overburden although there are records of a few shallow bored wells completed into the overburden. This area is considered to have a relatively low susceptibility to groundwater contamination as there is a relatively thick confining layer of fine grained till soil protecting the underlying sand and gravel aquifers. Shallow, large diameter bored wells are however, more susceptible to interference.

The area between Scotland Drive and one kilometer southwest of Westminster Road (three wells) and between 500 m northeast of Westminster Road and Dingman Creek (two wells) are considered to be low to moderately hydrogeologically sensitive as they are underlain by lacustrine or pond deposits composed of silty sand to fine sand. Wells in this area range in depth from 16 m to 62 m. They are completed in sand and gravel layers or the bedrock. A 16 m deep dug well (MOE well 3642) in the area penetrates 12 m of clay overlying the gravel aquifer. This confining layer typically provides adequate protection of aquifers.

The area from one kilometer northeast of Scotland Drive to one-quarter kilometer southwest of Westminster Road (four wells) and the area from 375 m to 500 m northeast of Westminster Road (one well) is considered to be hydrogeologically sensitive. These areas are underlain by porous sand to sand and gravel which are considered to have a high susceptibility to contamination. Sand and gravel extraction operations have been active in the sandy deposits north of Scotland Drive. An abandoned pit in this area (Lot 20, Concession 5) has sand pit faces from 3 m to 8 m high (OGS, 1982). This area tends to have wells completed in sand and gravel deposits at depths greater than 40 m and overlain by fine grained tills or non-water bearing sand and gravel layers. In this area, there are two wells within 500 m of the current highway alignment. Records indicate that they are shallow wells with total depths of 6 m (MOE well 8180) and 8 m (MOE well 3644). The shallower 6 m well has a 2.4 m thick clay layer overlying the fine sand aquifer. The 8 m deep well is located slightly northeast of the Westminster Road/Highway 401 crossing and is

a shallow drilled well penetrating sand and gravel from surface. These wells are considered to be hydrogeologically sensitive.

A number of municipal wells drilled by the Public Utilities Commission (PUC) are located adjacent to White Oak Road (south of Highway 401). These are generally deeper wells deriving their supply from sand and gravel layers more than 40 m below ground surface. The aquifers are all overlain by at least 15 m (and more commonly over 35 m) of clay or fine grained till providing protection from surface contamination. Most of this area has been included in an area interpreted to have a low susceptibility to construction impacts from a groundwater recharge perspective.

The areas of surface sand and gravel in the vicinity of Westminster Drive are considered to be hydrogeologically sensitive whereas the areas of till soil at surface are considered to have low susceptibility to contamination. The sands and gravels are considered sensitive from a recharge and discharge perspective. Those low lying areas adjacent to Dingman Creek are likely to be in discharge areas where the groundwater table is near or at surface. The upland areas are considered to have high recharge potential. Paving of these areas would potentially reduce the amount of recharge.

Four expired "Permit-To-Take-Water" permits were located within 3.5 km of the current highway alignment. Two permits were for industrial use, one for municipal and one for commercial use. Three of the permits were for drilled wells and one was for a surface water source. The maximum amount of water permitted for each of the four sites ranged from 360,000 L/day to 65,462 L/day. There are currently no "Permit-To-Take-Water" within 3.5 km of the highway alignment. Of the two permits within 500 m of the highway corridor, one was a surface water source (91-P-0013) and the other was a groundwater source (78-P-1095).

Two deep (drilled) wells were encountered in the north-east quadrant of Highway 401 and Highway 4 during the interim improvements, and these wells have been abandoned in accordance with Ministry of the Environment guidelines.

A total of 40 wells are estimated to lie within 500 m of the current highway alignment between Highway 4 (Col. Talbot Road) and the west side of Wellington Road.

4.1.1.2 Fisheries and Aquatic Environment

In total, eight watercourses were identified as being potentially impacted within the study area. A general summary of watercourse conditions has been provided in Table 4.1. Of the eight watercourses, Murray Drain is crossed of two locations (refer to **Figure 4**). In addition to the crossings, one area of encroachment was also identified as an area potentially affected by interchange modification (Orr Drain). The remaining area of potential concern (right-of-way encroachment on Murray Drain, west of Wellington St.) identified through desktop analysis, was visually assessed in the field, at which time, it was determined that the watercourse was outside of the affected footprint area. The eight watercourses affected are as follows:

1. Fourine Drain (*within interchange foot print, not crossed by Hwy 401*)
2. Courtney Drain
3. Number 1 Highway Drain
4. C B Smith Drain
5. Bannister-Johnson Drain
6. Dingman Creek
7. Murray Drain (at two locations)
8. Elliot-Laidlaw Drain

TABLE 4.1 FISH AND AQUATIC HABITAT OF ASSESSED WATERCOURSES WITHIN THE HIGHWAY 401 STUDY AREA

Watercourse Name	Fish Present/ Absent	Drain Classification (DFO 2001)	Flow Condition (May 3-4, 2001)	Assessed Sensitivity	Adjacent Lands
Fourine Drain	Not Sampled	C	Not Sampled *Standing Water	Low-Moderate	Interchange and Agriculture
Courtney Drain	Present	C	Poor Flow – Standing Water	Low-Moderate	Woodlot and Agriculture
Number 1 Highway Drain	Absent	F	Poor Flow – Standing Water	Low	Agriculture
C B Smith Drain	Absent	F	Poor Flow – Standing Water	Low	Agriculture
Bannister-Johnson Drain	Present	F	Poor Flow – Standing Water	Low-Moderate	Agriculture
Dingman Creek	Present	C	Good Flow	Low-Moderate	Agriculture
Murray Drain	Present	C	Poor Flow – Standing Water	Low-Moderate	Interchange and Industrial
Elliot-Laidlaw Drain	Present	C	Good Flow	Low-Moderate	Interchange and Industrial

*Based on KCCA Drain Classification Assessment (pers. comm. 2001)

- **Fourine Drain – Station 1**

Fourine Drain is a watercourse that does not cross Highway 401within the project limits. The majority of the Highway 4 (Col. Talbot Road) interchange drains south-east towards the Fourine Drain.

This watercourse originates at the Highway 4 (Col. Talbot Road) and Highway 401 interchange, where it flows south for approximately 6 kilometers before reaching its confluence with Dodd Creek. The Kettle Creek Conservation Authority (KCCA) has classified this watercourse as a Class C drain (C. Cooper, *pers comm.*), which designates the wetted channel as permanent, with warm water, containing baitfish. This classification was derived at a downstream location below Highway 401. Although this watercourse is managed as a Class C drain, we suspect that the area affected within the footprint is typically ephemeral due to the nature of the surrounding drainage which, is mainly agricultural surface water runoff and roadside conveyance.

Current aquatic habitat appears to have been significantly altered in the past by land use practices and by the existing interchange. Available fish records provided by KCCA do not indicate any significant or sensitive fish species. Furthermore, the predicted ephemeral characteristics of the headwater reach of Fourine Drain would limit fish and fish habitat potential.

Based on air photo interpretation and predicted ephemeral characteristics of this system through desk top analysis, along with available background information provided by KCCA (C. Cooper, *pers comm.*) field surveys were not collected based on poor habitat potential within the project limits.

- **Courtney Drain – Station 2**

Courtney Drain flows in a westerly direction for approximately 7 kilometers, from its origin at Wonderland Road, to its confluence with Dodd Creek, within the Kettle Creek watershed. This watercourse flows under Highway 401 through an open bottom concrete culvert.

This system has been classified as a Class C Drain, therefore, flow within the channel has been determined to be permanent, with warm water, containing baitfish (C. Cooper *pers comm.*). Flow conditions during the sampling period were poor, with minimal visible movement (May 3, 2001). Water depth throughout the channel, both up stream and downstream of the 401, were shallow with mean depths of 0.08m and 0.10m respectively. The greatest

water depths were observed within the ROW, directly upstream and downstream of the culvert crossing, as well as within the culvert.

Substrate composition in this watercourse was dominated by clay, over lain with fine silt and silty-clay, with sparse gravel and cobble in the upstream reach. Downstream, channel form became more channelized, with areas of thick cattail growth and heavier silt accumulations.

Adjacent land use upstream was wooded with trees and shrubs for the entire station length. Downstream of the 401, adjacent lands were typically in oldfield succession, with agricultural encroachment approximately 70 meters downstream of the Highway 401.

The study reaches, upstream and downstream of the highway, generally exhibit a flat morphology with low gradient. Within the ROW the channel form is significantly different, displaying a deeply cut and defined narrow channel with hummocky banks. In these deepened areas we suspect that water will be present year round providing a standing water refuge area. However, despite the applied drain classification, we anticipate, based on field observations, that downstream connectivity with the headwater reaches of Courtney Drain will be lost, limiting fisheries potential.

Bank stability in the assessed reach was moderately stable. Bank erosion and scouring were observed along the entire high waterline throughout the upstream reach. Downstream bank stability has been improved due to herbaceous vegetation establishment.

Fish sampling at this station on May 3, 2001, produced 3 species: white sucker, brook stickleback, and creek chub; all which were captured within the ROW. These species are commonly found throughout the study watershed and do not represent a significant fisheries resource. Although flows may diminish in this watercourse, standing water areas within the culvert and pools may provide limited refuge for fish during dry periods. Habitat and fisheries potential are limited due to poor connectivity and the anticipated ephemeral nature of the system in the study area.

- **Number 1 Highway Drain – Station 3**

Number 1 Highway Drain is intersected by the 401 approximately 50 meters downstream from its headwater origin. At the upstream origin, the drainage originates from a corrugated steel tile drain at the toe of an elevated agricultural field. This watercourse is a headwater branch of Krasnicki Drain, which flows into Dingman Creek south of Highway 402, approximately 5 kilometers downstream.

Survey results on May 3, 2001, revealed poor flowing, shallow water with average water depths of 0.06m, up and downstream of the culvert. This drainage has been classified by the Upper Thames River Conservation Authority (UTRCA) as a Class F Municipal Agricultural Drain (1999). Based on field surveys and UTRCA Drainage Classification data, this tributary is ephemeral within the study area.

Substrate composition of this drain was dominated by clay, overlaid by fine silts and sand. Abundant grasses and cattails also filled portions of the channel. Stream morphology of this watercourse was flat with a moderate gradient. Angular rip rap stone has been placed at the culvert inlet and immediately below the downstream culvert outlet for approximately 30 meters. A poured concrete base has been placed at the culvert outflow invert. Following the riprap, a gabion basket structure has been placed in stream for grade control in this section. Below the gabion basket, the drain is a uniformly flat, heavily channelized and comprised of cattail throughout.

Upstream riparian vegetation is comprised of grasses and herbaceous plants. Adjacent land use was entirely agricultural. A secondary road intersects the headwater origin at its tile outflow, immediately outside the upstream ROW.

Banks were moderately stable, with areas of greatest degradation observed below the armored downstream section. In this section, steep grades, combined with high flows have created erosion and scouring downstream of the gabion basket structure. Heavy erosion was also present upstream at the tile outflow.

No fish were captured within the study reach on May 3, 2001, despite sampling effort. Based on the absence of fisheries data collected and the UTRCA Drainage Classification, it is unlikely that this watercourse supports a fisheries resource within the study area, based on it's poor habitat potential.

- **C B Smith Drain – Station 4**

C B Smith Drain is a small tributary to the Dingman Creek watershed. It is intersected by Highway 401 in the vicinity of it's headwater origin. At this location, the watercourse flows under Highway 401, through an open bottom concrete culvert before reaching its confluence with Dingman Creek approximately 3 kilometers downstream.

At the time of survey (conducted on May 3, 2001), this watercourse exhibited poor flows. The low flow channel within the streambed was shallow, averaging 5 centimeters in depth. This drain has been classified by UTRCA as a Class F Municipal Agricultural Drain (1999). Based on surveyed flows and UTRCA Drainage Classification data, it is certain that this tributary is ephemeral within the study area.

Substrates within the channel were dominated by clay, overlaid by fine silts and sand. Abundant grasses and cattails also filled portions of the channel. Stream morphology of this watercourse was flat with a low gradient.

Upstream riparian vegetation is comprised of grasses and sparse woody shrubs. A secondary road and residential property border the adjacent ROW lands upstream of Highway 401. Downstream, adjacent land use is agriculture. In this area a secondary roadway crosses the watercourse approximately 25 meters downstream. At the secondary crossing the watercourse flows through a old open bottom culvert where it continues downstream through a channelized section adjacent to agricultural land.

Bank stability in the assessed reach was moderately stable, with areas of greatest bank degradation observed in the vicinity of Highway 401 culvert crossing. In this area, high amounts of bank erosion and scouring were observed. The remaining banks were moderately stable with areas of slumping and erosion at stress points along the assessed channel length.

No fish were collected within the study reach on May 3, 2001, despite collection efforts. Based on the absence of fisheries data collected and the UTRCA Drainage Classification, it is unlikely that this watercourse supports a fisheries resource within the study area, due to it's limited fisheries potential.

- **Bannister-Johnson Drain – Station 5**

Bannister-Johnson Drain is a small tributary to Dingman Creek. This watercourse is intersected by Highway 401, where it flows through an open bottom concrete culvert before reaching its confluence approximately 4 kilometers downstream.

During the survey on May 3, 2001, observed flows were poor. Water was observed throughout the study area, with average water depths of 0.06m. This watercourse has been classified by UTRCA as a class F Municipal Agricultural Drain within the study area. However, this classification has been given with discretion, as isolated water has been observed at Highway 401 culvert and permanent water has been observed to varying degrees downstream of the 401 (UTRCA 1999). Based on surveyed flow results and UTRCA Drainage Classification, it is certain that this tributary is typically ephemeral within the study area, with limited fisheries potential.

Substrate composition observed within the study area was dominantly comprised of clay with pockets of fine silts, sand and gravel. Areas of standing water also displayed dense filamentous algae growth. Channel morphology was typically flat and channelized with minimal pool and riffle areas. One large pool area was recorded downstream of Highway 401, below a perched corrugated steel culvert with a height of 0.31m, which permitted tractor access to adjacent agriculture lands. This pool represented the only significant habitat unit and cover area in the study reach.

Riparian vegetation consists of grassy banks with herbaceous vegetation and sporadic, sparse woody shrubs. The adjacent land use, both upstream and downstream, is agricultural land.

The bank stability within the assessed area is moderate to poorly stable. Several areas of slumping and erosion were observed at stress points along the channel length. Heavy erosion was also observed at the inlet and outlet of the secondary downstream culvert crossing.
During fish sampling conducted on May 3, 2001 no fish were collected. Downstream of the highway, 4 species were captured; creek chub, brook stickleback, central mudminnow, and fathead minnow, all which were isolated in the plunge pool below the perched secondary culvert. These species are commonly found throughout the study watershed and do not represent a significant fisheries resource. Although flows may diminish in this watercourse, standing water areas within the culvert and pools may provide limited refuge for these fish during dry periods. Habitat and fisheries potential are limited due to poor connectivity and the ephemeral nature of the system.

- **Dingman Creek – Station 6**

Dingman Creek is the only major waterbody within the study area. It flows under a small concrete span bridge with two instream support structures, dividing the stream into three channel sections. Depositional evidence suggests that all three channels function during high flow events; however, base flow conditions only utilize the western most channel section.

This watercourse is a permanent flowing warm water system. It is the primary drainage path for surrounding watercourses; therefore, it receives large inputs of surface water from adjacent drainage's within the study area. Water flows were good at the time of survey. Water clarity was high with clear, uncolored water. Stream morphology upstream was comprised of a sequence of long deep pools and flats cut through clay lenses. Downstream morphologic conditions followed a more typical riffle pool sequence. Average wetted widths were 5.0 to 6.0m with water depths averaging 0.30m.

Upstream substrates were mainly comprised of clay, over laid with fine silts, sand, and cobble. Moderate instream structure was present throughout the assessed reach. Areas of overhanging bank vegetation and shrubs created scour areas in the clay substrates, providing deepened pools and excellent habitat for fish. Downstream substrates were more typical of a riffle pool sequence. Clay lenses were dominant in some areas; however, greater amounts of cobble, gravel and sand existed in this reach. Instream cover was moderate throughout the downstream reach. Deepened pools with overhanging shrubs and undercut banks represented the majority of habitat potential. Pool habitat in both reaches averaged 0.40 to 0.60m in depth.

Riparian vegetation is composed of thick grasses with areas of dense shrub growth. The upstream channel is confined in a valley by a road embankment to the east and agricultural land to the west. Downstream, the channel remains bordered by the road berm with active horse pasture to the west. Pasture areas have been fenced off to limit access to the stream.

Bank stability over the assessed reach is moderate to poorly stable. Slumping banks were evident along the entire reach, exhibiting heavy erosion and scouring at stress points. Through much of the assessed area, the bank formation has developed a "hummocky" contour due to past and current bank slumping and erosion.

Fish sampling during the field assessment on May 3, 2001, found 8 species; common shiner, white sucker, bluntnose minnow, creek chub, Johnny darter, sunfish sp., blacknose dace, and central stoneroller. These species commonly occur within the Thames River Watershed and have been frequently recorded in past fish sampling in Dingman Creek (UTRCA 1999). Other species records listed by regulatory agencies within the Dingman Creek watershed include central mudminnow and brook stickleback, which were not captured during sampling. Based on past fisheries records and those collected by GLL field staff, the fish community of Dingman Creek can be classified as a warm water baitfish system.

- **Murray Drain – Station 7**

Murray Drain at the Wellington Street interchange is crossed by Highway 401, Wellington Street and two interchange ramps. Previous channel modifications and diversions have left Murray Drain in a highly modified and

degraded environmental state. The watercourse at this location continues to flow south-west from Wellington Street, for approximately 2 kilometers, before reaching its confluence with Dingman Creek.

This watercourse is a permanent warm water system, classified as a Class C Agricultural Municipal Drain (UTRCA 1999). Water flows were poor at the time of survey, and appeared to be standing, as there was no visible flow. Clarity was poor with turbid, brown colored water. Stream morphology upstream and downstream was entirely channelized. Cross-sectional profiles of the channel were typically concave to trapezoidal likely from dredging for ditch maintenance. The long deepened channels were cut through clay substrates, heavily over laid by silty clay substrates and algae. Average wetted widths were 3.0 to 4.0 meters with depths averaging 0.30m.

Substrates upstream and downstream were composed of clay, over laid with fine silts. Moderate instream structure was present throughout the assessed reach. Areas of overhanging herbaceous bank vegetation provide near shore habitat for resident minnow species. The deepened channel also provides refuge habitat for fish species during dry periods. Deepened pools with overhanging herbaceous shrubs represented the majority of habitat potential.

Riparian vegetation consists of grassy banks with herbaceous vegetation and sporadic, small woody shrubs. The adjacent land use, both upstream and downstream, is ROW within the Wellington Street interchange.

Bank stability over the assessed reach was moderate to poor. Slumping banks were evident along the entire reach, exhibiting points of erosion and scouring at stress points during high water flows.

Fish sampling during the field assessment on May 3, 2001, found 3 species; creek chub, fathead minnow, and brook stickleback. These species commonly occur within the Thames River Watershed and are often found in degraded warmwater habitats within an urban setting. Based on fish records collected by GLL field staff, the fish community of Murray Drain at Wellington Street can be classified as a permanent warm water baitfish system. Although this system is expected to provide year round habitat to common baitfish, current habitat quality is poor with limited fisheries potential.

- **Murray Drain – Station 8**

Murray Drain is intersected by Highway 401 for a second time, just east of the Wellington Street interchange. At this location, the watercourse functions as a municipal drain that collects surface runoff from surrounding industrial lots. Past channel modifications and surface water diversions have left Murray Drain in a highly modified and degraded environmental state. The watercourse at this location intermittently flows to the south for approximately 4 kilometers, before reaching its confluence with Dingman Creek

This watercourse is a permanent warm water system, and is classified as a Class C Municipal Agricultural Drain by UTRCA (1999). The assessed channel length at this station was short, approximately 30 meters upstream and downstream, due to industrial fencing which inhibited entrance by field staff. Water flows were poor at the time of survey (May 4, 2001), and appeared to be standing. Clarity was poor with turbid, brown colored water. Stream morphology upstream and downstream was entirely channelized. Average wetted widths were 2.0 to 3.0 meters with shallow depths averaging 7.0 centimeters. Although this drain is classified as a permanent system, areas within the assessed reach, immediately downstream of Highway 401 culvert appeared to be intermittent. At this location, connectivity was lost due to a lack of flow, sediment accumulation and thick cattail growth which appeared to inhibit downstream flow movement.

Substrates upstream and downstream were composed of clay, over laid with fine silts. Instream structure was minimal throughout the assessed reach. Sparse areas of overhanging herbaceous bank vegetation and instream vegetation (cattails) provided the only source of habitat for resident minnow species. The deepened channel area within the culvert is anticipated to provide refuge habitat for fish species during dry periods.

Riparian vegetation consists of grassy banks with sparse herbaceous vegetation and sporadic outcroppings of cattails and reeds. The adjacent land use, both upstream and downstream, is ROW bordered by heavily developed industrial land.

Bank stability over the assessed reach was moderately stable. Slumping banks were evident at the culvert inlet and outlet, exhibiting erosion and scouring at stress points during high water flows.

Fish sampling during the field assessment on May 4, 2001, identified a single species of brook stickleback, which was captured just inside the culvert. This species commonly occurs within the Thames River Watershed and is often found in degraded warmwater habitats, within an urban setting. Based on fish records collected by GLL field staff, the fish community of Murray Drain east of Wellington Street, can be classified as a warm water baitfish system. Although this system provides year round habitat to common baitfish in standing water areas, current habitat quality is poor. Therefore, due to past land use degradation, current fisheries potential at this site is limited to its current state.

- **Elliot-Laidlaw Drain – Station 9**

Elliot-Laidlaw Drain is crossed by Highway 401 immediately west of the Highbury Avenue interchange. This drainage flows through an open bottom concrete culvert. Below Highway 401, the watercourse continues to flow through a confined drainage area for approximately 2 kilometers, before reaching its confluence with Dingman Creek.

This watercourse is a permanent flowing warm water system. It is the primary downstream drainage path for Pond Mills, a lentic system north of Highway 401 through Westminster Ponds and Pond Mills Conservation Area. Water flows were good at the time of survey. Water clarity was high with clear, uncolored water. Stream morphology upstream was comprised of deep pools and deep flats and riffle/cascades cut through clay lenses. Downstream morphologic conditions followed in a riffle pool sequence that was engineered, due to the presence of riprap and terra fix construction materials. Since its apparent alteration, the downstream channel has naturalized well. Average wetted widths ranged from 1.0 to 2.0m with depths averaging 0.16m in riffle sections and depths ranging from 0.60 to 1.20m in pool areas.

Upstream substrates are mainly comprised of clay, over laid with fine silts, sand, and cobble. Abundant instream structure are present throughout the assessed reach. Areas of overhanging bank vegetation and shrubs, deep pools, and undercut banks provided excellent habitat areas for inhabiting fish species. Downstream substrates were more typical of a riffle pool sequence. Large amounts of cobble, gravel and sand exist in this reach, along with gabion basket bank revetments and terra fix substrates. Instream cover is moderate throughout the downstream reach. Deepened pools with overhanging shrubs and undercut banks represent the majority of habitat potential. Pool habitat in both reaches average 60 to 120 centimeters in depth.

Riparian vegetation is composed of thick grasses with areas of dense shrub growth. The upstream channel is confined in a valley by industrial land to the west and the Highbury Avenue interchange to the east. Downstream, the channel is highly confined and bordered by industrial land.

Bank stability over the assessed reach is moderate to poor. Slumping banks were evident along the entire upstream reach, exhibiting heavy erosion and scouring at stress points. Much of the assessed upstream area, displayed a "hummocky" bank formation due to past and current bank slumping and erosion. Downstream erosion was minimal due to bank stabilization materials used. High water scouring was visible both up and downstream.

Fish sampling during the field assessment on May 4, 2001, found 5 species; common shiner, white sucker, creek chub, Iowa darter, and fathead minnow. These species commonly occur within the Thames River Watershed. Based on past fisheries records and those collected by GLL field staff, the fish community of Elliot-Laidlaw Drain can be classified as a warm water baitfish system. Fisheries potential at this site is low, and is limited to its current state due to adjacent land use.

Pond at the Southeast Quadrant of Glanworth Drive / Highway 401

During consultation with the property owner at the southeast quadrant of Highway 401 and Glanworth Drive, it was identified that the pond provides the primary source of water to the well. The pond has also been stocked with fish.

Pond at Burtwistle Lane / Highway 4

A stormwater management pond servicing the Ultramar property exists on the west side of Burtwistle Lane. The primary function of the pond is for treating surface run-off from Ultramar.

Pond East of Col. Talbot Road North of Highway 401

A retention pond is located at the northeast quadrant of the Highway 401 / Col. Talbot Road interchange, associated with Gentek Building Products Limited.

4.1.1.3 Terrestrial Environment

Vegetation (uplands and Wetlands)

This section describes the vegetation communities occurring at the interchange locations and along the highway ROW. This section of Highway 401 passes through a landscape that is predominantly agricultural with occasional small isolated woodlots, that is typical of southwestern Ontario. The aquatic and terrestrial features are presented in **Figure 4**.

Highbury Avenue

The interchange is a "Parclo A-4" configuration where the right-of-way (ROW) is maintained by MTO. A number of ornamental trees have been planted within the cloverleaf, in particular White Spruce (*Picea glauca*), Sugar Maple (*Acer saccharum*) and European White Birch (*Betula pendula*). The surrounding land use is agricultural or urban with no well established natural vegetation. A medium-aged hedgerow of Red Ash (*Fraxinus pennsylvanica*) and Carolina Poplar (*Populus x canadense*) runs parallel to Highway 401 on the northeast side of the interchange. Another row of planted Norway Maple (*Acer platanoides*), Carolina Poplar and Crack Willow (*Salix x rubens*) is present on the northwest side. Cultural old field occurs to the west.

Wellington Road

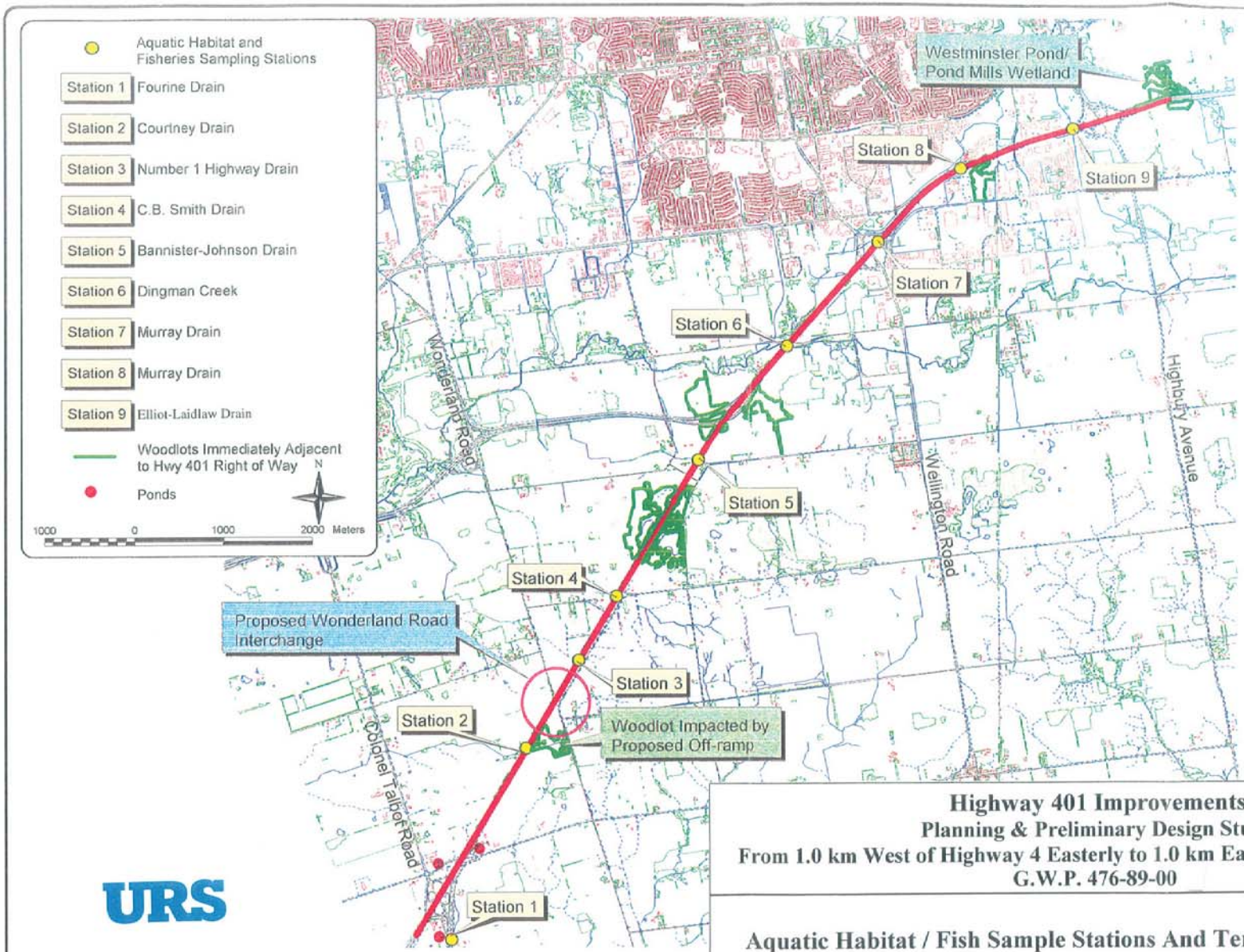
This interchange is a modified cloverleaf configuration, and is mostly open grass maintained by MTO with a few scattered plantings of White Spruce and Sugar Maple. The surrounding lands are mostly urban but cultural old field occurs immediately adjacent to the ROW on the northwest side of the interchange. Thickets of Gray Dogwood (*Cornus foemina*), Hawthorn (*Crataegus* spp.), and Nannyberry (*Viburnum lentago*) are scattered. A dense planted willow (*Salix* spp) hedgerow occurs on the northeast side of the interchange. A cultural thicket occurs under the transmission line to the northeast.

Highway 4 (Col. Talbot Road)

The Colonel Talbot Road interchange is a cloverleaf configuration and is situated in an open agricultural setting. A few ornamental trees have been planted within the maintained cloverleaf and young discontinuous hedgerows mark the boundary of the ROW. A small Common Buckthorn (*Rhamnus cathartica*) thicket with some Silver Maple occurs at the northeast side of the interchange.

Vegetation in the Right-of-Way and Immediately Adjacent

On either side of the highway within the ROW, vegetation is typically disturbed meadow dominated by non-native grasses with a variety of native and non-native forbs. Shrub thickets composed of such species as Staghorn Sumac (*Rhus typhina*) and Gray Dogwood can be found fringing the ROW at some locations. Cattail (*Typha* spp.) marsh is commonly found lining the drainage ditches within the ROW. Road maintenance involves regular mowing of the ROW which maintains field conditions and prevents woody vegetation from getting established.



URS

Highway 401 Improvements
Planning & Preliminary Design Study
From 1.0 km West of Highway 4 Easterly to 1.0 km East of Highbury Avenue
G.W.P. 476-89-00

Aquatic Habitat / Fish Sample Stations And Terrestrial Features	**FIGURE 4**

Within the study area, Highway 401 largely extends through agricultural fields. There are only a few locations where natural vegetation occurs outside and adjacent to the ROW. The only designated natural area in the study area is a small portion of the *Westminster Ponds/Pond Mills Wetland Complex*, a Provincially Significant Wetland (PSW) located approximately 600 m east of Highbury Avenue. The natural areas adjacent to the ROW, including the PSW, are described below.

- **Westminster Drive (Highway 401 Sta. 18+900 to 19+850)**

At this location, wooded areas occur on either side of the Highway 401 just west of Westminster Drive.

On the north side a variable successional woodland/thicket exists. The canopy is dominated by Trembling Aspen (*Populus tremuloides*) and Manitoba Maple (*Acer negundo*) and the understorey is characterized by Common Buckthorn and Manitoba Maple. Vegetation is relatively disturbed here. To the west of this woodland/thicket, between the pond and the ROW limit, exists a narrow thicket characterized by Common Buckthorn, Choke Cherry (*Prunus virginiana*) and American Elm.

Much of the south side of the ROW is lined with Common Lilac (*Syringa vulgaris*) hedgerows with some American Elm, Apple and Common Buckthorn. A small woodlot at the east end is a dominated by American Elm, with some Bitternut Hickory (*Carya cordiformis*), Red Ash and Silver Maple (*Acer saccharinum*).

- **Highway 402 (Highway 401 Sta. 20+500 to 21+000)**

At the junction of Highways 401 and Highway 402 exist three fragments of mature upland deciduous woodlot on the north side of the ROW. East of Highway 402, the woodlot is dominated by White Ash (*Fraxinus americana*) and American Basswood (*Tilia americana*), while the other two units are dominated by Sugar Maple occurring with some Black Cherry (*Prunus serotina*) and American Beech (*Fagus grandifolia*). However, the western most unit has been heavily cut over in winter 2000. It appears that approximately 60% of the large trees have been removed. The central forest unit contains a relatively rich ground flora.

On the south side of the ROW is a small isolated triangular woodlot similar to the woodlot units described above for the north side of the ROW.

- **Highway 402 (Highway 401 Sta. 21+100 to 21+400)**

On the south side of the ROW where the Highway 402 off ramp joins Highway 401 is a scrubby woodlot dominated by Trembling Aspen and American Elm, with an understorey of Common Buckthorn. Further to the south is a conifer plantation of Norway Spruce (*Picea abies*), Red Pine (*Pinus resinosa*) and White Cedar (*Thuja occidentalis*)

- **Dingman Road (Highway 401 Sta. 22+050 to 22+500)**

A deciduous thicket exists just east of Dingman Road on the north side of the ROW. Dominant species include Gray Dogwood and Dotted Hawthorn (*Crataegus punctata*), with occasional small trees (up to 10 m height) of American Elm.

- **East of Highbury Avenue (Highway 401 Sta. 27+350 to 27+575)**

A mature upland Sugar Maple-White Ash deciduous forest community occurs on the north side of the ROW just east of Highbury Avenue. It is situated immediately adjacent to the Westminster Ponds/Pond Mills Wetland Complex, a PSW, located to the east and north of this upland forest community.

- **Westminster Ponds and Wetland Complex (Highway 401 Sta. 27+575 to 27+850)**

A small portion of the Westminster Ponds/Pond Mills Wetland Complex (Provincially Significant Wetland) is situated adjacent to the north side of the ROW limit. Vegetative communities include a Red Maple-American Elm swamp community and a Cattail marsh-open water pond community.

Highway 401 Sta. 27+550 to 27+850

At the extreme eastern edge of the study area, on the south side of the ROW, is a medium-aged upland deciduous woodlot contiguous with a deciduous swamp community. The upland woodlot has a somewhat broken canopy and is dominated by Sugar Maple, White Ash and American Elm. The swamp is dominated by American Elm and Red Maple (*Acer rubrum*), with Red Ash in the understorey. These wooded communities are generally higher in quality than most of the wooded areas in the study area.

4.1.1.4 Wildlife

Breeding Birds

Surveys were conducted in eight locations along the study area. A total of 37 species were recorded as possible breeders within 100 m on either side of Highway 401. Most of these species were not within the ROW but in the forest, thicket or old field habitat immediately adjacent to the ROW. The noise and motion of traffic causes most birds to avoid setting territories within the ROW. Some birds were noted in the ROW. Red-winged Blackbirds breed in small pockets of cattail marsh in the ditches. Song Sparrow and Eastern Kingbird were the only other species observed within the ROW.

The locations with the greatest number of species were in the vicinity of the proposed Wonderland Road interchange, on the south side of Highway 401 (17 species), and the wooded areas on the north and south sides of Highway 401 between Scotland Drive and Westminster Drive (20 species). The relatively high number of species reflects the variety of habitat types (forest/thicket, field, open water) at these locations. Most of the species recorded (e.g., American Robin, Song Sparrow, Red-winged Blackbird) are considered common. However, a couple of interesting species were noted, including Wood Thrush (*Hylocicla mustelina*), which is considered an indicator of forest interior habitat. This species was heard calling from a relatively large woodlot approximately 100 m from the northern ROW limit, between Scotland Drive and Westminster Drive. In addition, a Green Heron (*Butorides striatus*), an indicator of swamp habitat, was recorded flying over the deciduous thicket east of Dingman Road on the north side of Highway 401. At the other survey locations, between 5 and 8 common species were recorded.

Other Wildlife Observations

There are several ponds and wetland communities situated adjacent to the ROW within the study area that provide some amphibian breeding and living habitat. Leopard Frog (*Rana pipiens*) and Green Frog (*Rana clamitans*) were observed in the cattail marsh-open water pond in the Westminster Ponds/Pond Mills Wetland Complex. At the Highway 402/401 junction, an Eastern Red-backed Salamander (*Plethodon cinereus*) was observed under a log in the central forest unit in the median of Highway 402. A Green Frog was noted in the ROW ditch on the east side of Highway 402 and a Spring Peeper (*Pseudacris crucifer*) was heard calling in the wooded area on the west side of Highway 402, north of the Highway 401 ROW.

The only mammals observed in the study area were Gray Squirrel (*Sciurus carolinensis*) and Eastern Chipmunk (*Tamias striatus*) in some of the woodlots. The Highway 401 forms a significant barrier to wildlife. Mortality is typically high for mammals or herpetofauna attempting to cross the highway, due to the presence of median barriers.

4.1.2 Socio-Economic Environment

The following sources were used to inventory the social environment:

- Official Plan for the County of Middlesex;
- City of London Official Plan;
- Aerial Photography ;
- Field Investigations undertaken in November 2000.

4.1.2.1 Land Use

The study area is located within the City of London in the County of Middlesex. The current population for the City of London is approximately 360,100 with an estimated future population expected to grow to approximately 431,900 in 2016.

The predominant land use within the study area from Highway 4 (Col. Talbot Road) to Dingman Road is agricultural with some scattered rural residences. From Wellington Road to Highbury Avenue there are a variety of industrial and commercial businesses located along the highway.

Residential

Residential development along the Highway 401 corridor is generally comprised of scattered rural residences. There are approximately 8 residences adjacent to the highway. A majority of the residences are located at the Highway 4 (Col. Talbot Road) interchange and in the vicinity of the proposed Wonderland Road interchange.

The residences along the highway are considered to be older and established farm complexes consisting of single family detached dwellings and barns.

Community/Recreation/Institutional/Park Features

There are two institutional features located within the highway corridor. The first feature is the Tempo Presbyterian Church located on the southeast quadrant of Highway 401 and Highway 4 (Col. Talbot Road). The church is presently closed and has been since December 2000. There are no plans to re-open it in the future.

The second feature is the OPP Station located on the northwest quadrant of Highway 401 and Wellington Road, south of Exeter Road.

Agricultural

The adjacent land use along Highway 401 within the study area is predominantly agricultural. The study area includes soil capability classes ranging from Class 1 to 7 and organic soils. The majority of land is composed of Class 1 soils throughout the study area.

There are approximately 14 agricultural operations that are adjacent to Highway 401 from Highway 4 (Col. Talbot Road) to Highbury Avenue. The prominent types of agricultural operations are field crops with few parcels of livestock production, including cattle, hog and poultry.

Commercial/Industrial Uses

Within the study area limits there are 32 industrial/commercial businesses, all of which do not have direct access to the highway. The following types of businesses are described in Table 4.2.

TABLE 4.2 COMMERCIAL/INDUSTRIAL BUSINESSES

Business Type	Location/Activity
Retail	• Costco Wholesale located on the southwest side of Highway 401 and Wellington Road. • Shopping Mall located on the southwest side of Highway 401 and Wellington Road south of Exeter Road.
Manufacturing	• Gentek Building Products Limited located on the northeast side of the Glanworth Drive and Highway 4 (Col. Talbot) Road intersection. • Scrapwood Recycling located on the southeast side of Highway 401 and Glanworth Drive. • Pipeline Commercial located on Burtwistle Lane on the southwest side of Highway 401 and Highway 4 (Col. Talbot) Road. • Sterling Trucks located on the southwest side of Highway 401 and Wellington Road. • Wilton Grove Centre located on the south side of Highway 401 and Wilton Grove Road east of Wellington Road. • Windsor Factory Supply Limited located on the south side of Highway 401 and Wilton Grove Road west of Wellington Road. • London Mack located on the south side of Highway 401 and Wilton Grove Road east of Wellington Road. • Nestle located on the south side of Highway 401 on Wilton Grove Road between Wellington Road and the CN Railway. • Lamko Tool & M& W Inc. located on the north side of Highway 401 between Wellington Road and the CN Railway. • Uhaul Self Storage located on the north side of Highway 401 between Wellington Road and the CN Railway. • Laidlaw located on the north side of Highway 401 between Wellington Road and the CN Railway. • Hydro One located on the north side of Highway 401 between the CN Railway and Pond Mills Road. • Gentek located on the south side of Highway 401 just east of the CN Railway. • Loomis located on the south side of Highway 401 west of Pond Mills Road. • Hostess/Fritos located on the south side of Highway 401 west of Pond Mills Road. • Toromount located on the south side of Highway 401 west of Pond Mills Road. • London Compressed Air Equipment located on the south side of Highway 401 west of Pond Mills Road. • Northern Marketing located on the north side of Highway 401 west of Pond Mills Road. • KMZ Windows located on the north side of Highway 401 west of Pond Mills Road.
Transport and Related	• Advanced Border Crossing Processing Centre (ABC) on the north side of Littlewood Drive, west of Highway 4 (Col. Talbot Road). • Canadian Auto Workers Local 1520 located on Tempo Road on the southeast side of Highway 401 and Highway 4 (Col. Talbot) Road interchange. • Penske Truck Rental & Leasing located on the north side of Highway 401 between Wellington Road and the CN Railway. • Ryder Transportation Services located on the south side of Highway 401 west of Pond Mills Road. • Peterbilt Transport located on the northwest side of Highway 401 and

Business Type	Location/Activity
	Highbury Avenue interchange. • Daily Transport located on the southwest side of Highway 401 and Highbury Avenue interchange. • International Carrier Truck Centre located on the southwest side of Highway 401 and Highbury Avenue interchange.
Auto and Related	• Ultramar Canada Incorporated Gas Station located on Burtwistle Lane at the southwest quadrant of Highway 401 and Highway 4 (Col. Talbot) Road. • Petro Canada located on the southeast side of Highway 401 and Wellington Road • Toshiba Car Retail located on the north side of Highway 401 west of Pond Mills Road.
Tourism	• Best Western Stoneridge Inn & Conference Centre located on Burtwistle Lane on the southwest quadrant of the Highway 401 and Highway 4 (Col. Talbot) Road interchange. • Ramada Inn located on the northeast quadrant of Highway 401 and Wellington Road interchange south of Exeter Road.

4.1.2.2 Railway Crossings

There is one railway crossing located within the study area limits. The CN Talbot Subdivision crossing passes under Highway 401 between Wellington Road and Highbury Avenue.

4.1.2.3 Utilities

There are numerous hydro crossings of Highway 401 throughout the study limits. A set of three (3) hydro transmission towers run parallel to Highway 401 between Highbury Avenue and Wellington Road interchange.

Bell Canada cables are located along the westside of the Highway 401 right-of-way from Highway 4 (Col. Talbot) Road to Wellington Road and along the eastside of Tempo Road and Glanworth Drive right-of-way. The cables continue to run along the westside of the Highway 401 right-of-way from Wellington Road to Highbury Avenue and along the westside of Wellington Road right-of-way.

Union Gas high pressure lines cross under Highway 401 within the southwest right-of-way at Pond Mills Road, Westminster Drive, White Oak Road and Glanworth Drive.
Hydro London is located throughout the study area and has poles which are generally located adjacent to the right-of-way. Aerial hydro crossings over Highway 401 at Scotland Drive, White Oak Road, Dingman Drive, Exeter Road and Pond Mills Road.

4.1.2.4 Aggregate

There is one aggregate (gravel pit) and recycling operation within the study area. The ARROC Aggregate & Recycling facility is located on Scotland Drive and White Oak Road.

4.1.2.5 Aesthetics

Within the Highway 401 corridor there are negligible landscape components which provide aesthetic views. The majority of the landscape adjacent to the right-of-way is characterized as old fields, plantations and small tree clusters/or linear hedgerows.

Areas containing significant vegetation communities are located south of the Wellington Road Interchange, Dingman Creek which is surrounded by mature woodlots and the Pond Mills Wetland Complex located south of the Highbury Avenue Interchange.

Sensitive viewer groups within the Highway 401 corridor include residences, commercial and institutional uses adjacent to the highway. The locations of the sensitive viewer groups were determined to be the residences, commercial and institutional uses that directly abut or are adjacent to the highway. In total, approximately 8 residences, 7 commercial uses and 2 institutional uses (OPP Station, Tempo Presbyterian Church) were considered to be sensitive viewer groups.

4.1.2.6 Noise

Noise analysis was performed using STAMSON v5.03, a computerized noise model advocated by the Ministry of Environment (MOE), ORNAMENT with available road and traffic data. The following factors were taken into account in the analysis:

1. Road-receiver geometry;
2. Road gradient;
3. Ground absorption;
4. Traffic volume and percentage of trucks; and,
5. Vehicle speed.

Noise sensitive receivers within the study area were defined as scattered rural residences, commercial and industrial uses adjacent to the highway (within 600 metres as per the MTO / MOE Noise Protocol). Approximately 24 noise sensitive receivers were identified along the corridor within the study area limits including 18 residences, 4 commercial businesses (Peterbilt Transport, Penske Truck Rental & Leasing, Ramada Inn and Best Western Inn), OPP Station and a church. Details on the impact assessment are provided in section 5.2.2.2. Refer to Appendix C for the Noise Assessment Report.

4.1.2.7 Property Waste & Contamination

The following properties were identified along the right-of-way with the potential for contaminated soils:

Highway 4 (Col. Talbot Road)

- Ultramar gas station on Burtwistle Lane, southwest quadrant of the Highway 401 / Highway 4 (Col. Talbot Road) interchange.
- Former farm buildings, including a silo in the northwest quadrant of the Highway 401 / Highway 4 (Col. Talbot Road) interchange.
- Gentek Building products (light industrial) located on the northeast side of Highway 4 (Col. Talbot Road) and Glanworth Drive;
- Scrapwood recycling yard south of Highway 401 east of Glanworth Drive.

Highway 402 Interchange

- Farm buildings located west of the interchange;
- Farm buildings located west of Dingman Drive.

Wellington Road Interchange

- A retail plaza and restaurant located northwest of the interchange;
- "Costco" retail outlet located southwest of the interchange;
- A former furniture store, now empty and a multi-tenant retail plaza located southeast of the interchange;
- A vacant industrial property, formerly Pfizer, located southeast of the interchange across Wilton Grove Road;
- A former Northern Telecom plant that is now occupied by "Sterling Trucks" dealership and repair facility and a Petro-Canada truck stop facility located southeast of the interchange across Wilton Grove Road. The Petro-Canada truck stop is equipped with underground bulk fuel storage tanks;
- A London Hydro transformer located adjacent to the south side of the ROW;
- Northern Telecom property located on the south side of the ROW;

- An O.P.P. station and Ramada Inn located between Exeter Road and the ROW northeast of the interchange. Adjacent to the Ramada Inn at the southeast corner of Exeter Road and Wellington Road is a Shell gas station;
- North of Exeter Road and east of Bessemer Road is a vacant commercial/industrial property and Ontrac Equipment Service, a heavy equipment servicing facility. An aboveground storage tank (AST) was observed at Ontrac;

Between Wellington Road and Highbury Avenue

- A Nestle ice cream plant located south of the ROW;
- U-haul self storage located north of the ROW;
- Lamko Tool and Mould Inc. production facility located north of the ROW;
- Penske Truck rental and leasing facility located north of the ROW between, an AST was observed on this site;
- Laidlaw Bus Lines Yard located north of the ROW, a fuelling area with underground storage tanks (USTs) was observed at this facility;
- A CN Rail Corridor crossing beneath the ROW;
- Toshiba manufacturing facility north of the ROW;
- Ryder truck rental south of the ROW, a fuelling area with USTs was observed on this site;
- Loomis Courier depot located south of the ROW;
- A Hostess – Frito Lay production plant located south of the ROW;
- Toromont Equipment Sales and Service located south of the ROW;
- An un-named recycling facility located north of the ROW;
- KML Windows production facility located north of the ROW;
- Peterbilt Trucks parts and service depot located north of the ROW, a vehicle fuelling area with USTs was observed at this facility;
- London Compressed Air, an office and sales facility located south of the ROW;
- Daily warehouse and shipping facility located south of the ROW.

Highbury Avenue Interchange

- Carrier Truck Service located southwest of the eastbound Highway 401 to Highbury Avenue off-ramp. A fuelling area with USTs was observed at this location;
- A new "Flying J" truck stop at the southeast quadrant of the Highway 401 / Highbury Avenue interchange. This facility has a restaurant area and a retail fuel area with USTs.

4.1.3 Cultural Environment

Archaeological Resources

A Stage 1 Archaeological Investigation was undertaken in July 2001. Field reviews were undertaken on July 13th, 2001 to determine the precontact and historic archaeological potential of the study area. Based on records of the Ontario Archaeological Site Database, one site has been documented in the study area. The Exeter Road Site (AfHh-80) is located in the vicinity of the Highway 401 – Wellington Road interchange. No cultural or temporal affiliations have been assigned to this site. In addition, five sites have been documented within 1 kilometer of this section of Highway 401 as outlined in Table 4.3.

Table 4.3: Registered Archaeological Sites within 1 km of the Study Area

Borden No.	Site Name	Cultural-Temporal Affiliation	Site Type
AfHh-2	Pond Mills	Middle Woodland – Late Woodland (Middle Iroquois)	Camp Village
AfHh-47	No name	Undetermined Precontact	Unknown

AfHh-73	Bradley Avenue	Middle Woodland	Camp
AfHh-80	Exeter Road	Undetermined Precontact	Isolated Find
AfHh-87	Wallace-Laidlaw	Early Archaic Late Woodland	Camp
AfHo-192	Buchanan TS	Undetermined Precontact	Camp

With respect to archaeological potential, given the physiographic character of the region and the presence of significant areas of undisturbed agricultural land, the Highway 4 (Col. Talbot Road), Highbury Road and Wellington Road interchange areas are considered to exhibit archeological potential. With respect to Highway 401 mainline, from Highbury Avenue to Exeter Road this area has largely been developed and lands are extensively disturbed, as such this area exhibits low archaeological potential.

Built Heritage Resources

A built heritage and cultural landscape assessment was undertaken in July 2001. Field reviews were undertaken on July 14th, 2001. There are no structures located in the study area designated under the Ontario Heritage Act, however, based on field investigations, five built heritage features and nineteen cultural landscape units have been identified as follows:

Table 4.4: Built Heritage Features

BHF	Feature Type	Municipal Inventory	Location
1	House		Colonel Talbot Road and Glanworth Drive
2	Barn		6272 Colonel Talbot Road
3	Silo		Southwest quadrant of Highway 4 (Col. Talbot Road) / Highway 401 interchange
4	Church	Priority 1	6706 Burtwistle Lane
5	House	Priority 1	6694 Burtwistle Lane

Table 4.5: Cultural Landscape Units

CLU	Feature Type	Municipal Inventory	Location
1	Roadscape		Highway 4, Colonel Talbot Road
2	Farm Complex	Priority 1	6188 Colonel Talbot Road
3	Farm Complex	Priority 1	6283 Colonel Talbot Road
4	Roadscape		Littlewood Drive
5	Barn Complex		7031 Littlewood Drive
6	Farm Complex		6787 Colonel Talbot Road
7	Farm Complex	Priority 1	6820 Colonel Talbot Road
8	Roadscape		Tempo Road
9	Roadscape		Wonderland Road
10	Roadscape		Scotland Road
11	Roadscape		Decker Road
12	Farm Complex		4511 Scotland Road
13	Farm Complex	Priority 1	4436 Scotland Road
14	Roadscape		Manning Road
15	Farm Complex	Priority 1	4492 Manning Drive
16	Farm Complex		4412 Manning Drive
17	Roadscape		Exeter Road
18	Roadscape		Wellington Road
19	Roadscape		Wilton Grove Road

4.2 Generation of Preliminary Design Alternatives

The development of alternative methods for improvements to Highway 401 was completed in a rationale manner in two phases, (1) alternatives for widening Highway 401 and (2) alternatives for improving Highway 4 (Col. Talbot Road), Wellington Road and Highbury Avenue interchanges including new structures and improved ramp geometrics.

4.2.1 Mainline Highway 401

To improve operations and relieve congestion, consideration was given to widening Highway 401 to address short and long-term needs to year 2021.

Short Term Improvements

- Widen Highway 401 from 4 lanes to 6 lanes between Highway 402 to Wellington Road interchange

Long Term Improvements

- Widen Highway 401 from 4 lanes to 6 lanes between Highway 4 (Col. Talbot Road) to Highway 402
- Widen Highway 401 from 6 lanes to 8 lanes between Highway 402 to Highbury Avenue interchange

In addition to improving traffic operations, capacity and safety on Highway 401 mainline, the interchanges within the project limits warrant improvements to address traffic operational conditions and to reflect current Ministry Standards.

4.2.2 Highway 4 (Col. Talbot Road)

Alternatives for the Highway 4 (Col. Talbot Road) / Highway 401interchange are provided in Appendix D. The following alternatives were developed for the Highway 4 (Col. Talbot Road) interchange prior to withdrawing the TESR in November 2002:

Alternative 1

Realignment of Glanworth Drive, reconfigure interchange ramps to a Parclo A-4 configuration and replace the Highway 4 (Col. Talbot Road) and Glanworth Drive structures.

Alternative 2

Realignment of Glanworth Drive, realign Tempo Road, reconfigure interchange ramps to a "Parclo A-4" configuration, replace the Highway 4 (Col. Talbot Road) structure and close the Glanworth Drive structure.

Alternative 3

Reconfigure interchange ramps to a "diamond" configuration, and replace the Highway 4 (Col. Talbot Road) and Glanworth Drive structures.

Alternative 4

Realignment of Glanworth Road and Tempo Road, reconfigure interchange ramps to a "Parclo B" configuration, construct the Highway 4 (Col. Talbot Road) structure on a straight alignment and replace the Glanworth Drive structure.

Based on comments received by Project Team representatives, modifications to Alternative 2 and Alternative 4 were suggested to minimize impacts. These alternatives are described as follows:

Alternative 2A

Same as Alternative 2, with Tempo Road realigned opposite Burtwistle Lane at a signalized intersection.

Alternative 4B

Similar to Alternative 4, with a "Parclo A" configuration on the north side of Highway 401, Tempo Road realigned opposite Burtwistle Lane at a signalized intersection, and the Glanworth Drive structure closed.

The following alternatives were developed for the Highway 4 (Col. Talbot Road) interchange subsequent to withdrawing the TESR in November 2002:

Alternative 1

Parclo A – 4 interchange, with a new Glanworth Drive crossing over Highway 401, and realigned north of Gentek Building Products Limited.

Alternative 1A

Parclo A – 4 (modified) interchange, with Glanworth Drive crossing over Highway 401 connecting with Littlewood Drive, and the E-N/S ramp realigned north of Gentek Building Products Limited.

Alternative 2

Parclo A north side and Parclo B south side, with a new Glanworth Drive crossing over Highway 401, realigned north of Gentek Building Products Limited.

Alternative 3

Parclo A north side and Diamond south side, with a new Glanworth Drive crossing over Highway 401, realigned north of Gentek Building Products Limited.

4.2.3 Wellington Road

Alternatives for the Wellington Road / Highway 401interchange are provided in Appendix D. The following alternatives were developed for the Wellington Road Interchange.

Alternative 1

Reconfigure interchange ramps and replace the Wellington Road structure to accommodate highway widening.

Alternative 2

Reconfigure interchange ramps and replace the Wellington Road structure to accommodate highway widening.

4.2.4 Highbury Avenue

The following alternatives were developed for the Highbury Avenue interchange.

Alternative 1

Reconfigure interchange ramps and replace the Highbury Avenue structure.

Alternative 2

Reconfigure interchange ramps and replace the Highbury Avenue structure.

4.3 Evaluation and Selection of Preferred Alternative

This section summarizes the evaluation undertaken to assist the Project Team in the selection of the preferred alternatives. The complete analysis and evaluation of alternatives is provided in Appendix D of this report. The following summarizes the rationale for the selection of the preferred alternative. All alternatives were evaluated by comparing the natural, social, economic, cultural environments as well as technical considerations and costs.

Criteria used in the analysis and evaluation of alternative were presented at the first Public Information Centre and are outlined as follows:

ENVIRONMNETAL COMPONENT	CRITERIA
Natural Environment	• Effect on Fish and Aquatic Habitat • Effect on Terrestrial Habitat and Vegetation • Effect on Wetlands • Effect on Greenways and Open Space Linkages • Effect on Groundwater / Surface Water • Effect on Naturally Significant Areas • Effect on Agricultural Lands (soils)
Social Environment	• Aesthetics • Noise • Community Effects (residential, institutional, recreational and community features, and out-of-way travel)
Economic Environment	• Effects on Commercial/Industrial uses • Effect on Agricultural Operations • Property Waste and Contamination
Cultural Environment	• Effect on Archaeological Resources • Effect on Heritage Resources
Transportation	• Traffic Operations • Traffic Safety • Construction Impacts • Compatibility with Local Road System • Cost

4.3.1 Mainline Highway 401

Subsequent to consultation with Project Team representatives and government agencies, the widening of Highway 401 symmetrically on both sides of the existing centreline was identified as the preferred alternative as it can be implemented within the existing highway right-of-way thereby minimizing adverse environmental impacts and reducing construction costs.

4.3.2 Highway 4 (Col. Talbot Road)

Originally six alternatives were developed and evaluated. Alternative 2A, a Parclo A-4 interchange design including the closure of Glanworth Drive, was selected as the preferred alternative because it maximizes traffic operations while minimizing property and cost requirements. This alternative was preferred because it resulted in low natural, social, economic and cultural impacts.

The key advantages of this alternative included:

- Maintains free-flow moves onto Highway 401;
- Eliminates weaving sections along Highway 401;
- Improves ramp geometry to meet desirable MTO standards;
- Provides improved sight distance over the structure;
- Consolidates the number of intersections along Highway 4 (Col. Talbot Road);
- Improves access to businesses along Burtwistle Lane by providing traffic signals on Highway 4;
- Least costly to build; and
- Does not disrupt any local residences or businesses.

During the review period for the TESR in October 2002, concerns were raised regarding the recommended closure of Glanworth Drive. The TESR was withdrawn to further review the concerns.

Subsequent to withdrawing the TESR in November 2002, it was determined that Glanworth Drive would remain open in the long-term scenario.

Four new alternatives (Alternatives 1, 1A, 2 and 3) were developed and evaluated.

All alternatives result in relatively minor impacts to the natural environment. However, Alternative 1A is slightly preferred from a fisheries and aquatic habitat perspective. Alternatives 2 and 3 are the least preferred in all environmental and technical factors.

Alternative 1 is preferred from a social, cultural and transportation perspective. Relative to Alternative 1, Alternative 1A is slightly preferred with respect to agricultural and commercial access considerations, however the differences are not significant. Alternative 1A is more expensive to construct relative to Alternative 1 due to the increased structural span of Glanworth Drive over Highway 401.

The benefits to traffic operations and cost savings associated with Alternative 1 outweigh the relatively minor natural and economic benefits associated with Alternative 1A. As such, Alternative 1 is preferred.

Refer to **Figure 5** for the Summary Evaluation of Highway 4 (Col. Talbot Road) Interchange alternatives. The complete analysis and evaluation of alternatives is provided in Appendix D.

4.3.3 Wellington Road

Two alternatives were developed and evaluated. Alternative 1, a "Parclo A-4" interchange design was recommended as the preferred alternative because it maximizes capacity by providing free flow ramps onto Highway 401 while producing lower or similar natural, social, economic and cultural impacts. Alternative 1 results in minor impacts to the O.P.P property and one business. However these impacts were eliminated through refinements during preliminary design.

The key advantages of the preferred alternative include:

- Maximizes capacity by maintaining free-flow moves onto Highway 401, providing superior operations for high volume Ramp North-East;
- Eliminates a weaving section on Highway 401 westbound;
- Improves ramp geometry to meet desirable MTO standards;
- Eliminates operational concerns with combined Exeter/Wellington Road South off ramp.

Refer to **Figure 6** for the Summary Evaluation of Wellington Road Interchange alternatives. The complete analysis and evaluation of alternatives is provided in Appendix D.

4.3.4 Highbury Avenue

Two alternatives were developed and evaluated. Both Alternatives 1 and 2 resulted in similar low natural, social, economic and cultural impacts. However, Alternative 1, a "Parclo A-4" interchange design was recommended as the preferred alternative because it resulted in better traffic operations. The key advantages of the preferred alternative include:

- Maintains existing interchange configuration;
- Maintains free-flow moves onto Highway 401 and maximizes interchange capacity;
- Ramp geometry improved to meet desirable MTO standards.

Refer to **Figure 7** for the Summary Evaluation of Highbury Avenue Interchange alternatives. The complete analysis and evaluation of alternatives is provided in Appendix D.

CATEGORY – SUMMARY OF EVALUATION

FACTOR	IMPORTANCE	ALTERNATIVE 1 PARCLO A-4	ALTERNATIVE 1A PARCLO A-4/ (MODIFIED)	ALTERNATIVE 2 PARCLO A/ PARCLO B	ALTERNATIVE 3 PARCLO A/ DIAMOND	COMMENTS
1 NATURAL ENVIRONMENT	Low	②	❶	③	④	Alternative 1A is the most preferred as it has very small effects on fish habitat, the terrestrial environment and the least potential to impact water wells. Alternative 1 is the second choice, as it has only some impact on fish and terrestrial wildlife habitat. Alternative 3 is the least preferable, as it results in low to moderate impacts on wetland habitat and includes the loss of a small amount of a fish-stocked pond. Alternative 2 is marginally better. Although Alternative 2 results in the loss of less wetland habitat, it does result in a greater degree of fish habitat disturbance than Alternative 3. **THEREFORE, ALTERNATIVE 1A IS PREFERRED.**
2 SOCIAL ENVIRONMENT	High	❶	❶	③	④	All alternatives result in similar minor impacts to the aesthetic quality of the existing landscape associated with removal of the vegetation cover required for the additional interchange ramps. Alternatives 2 and 3 result in the displacement of one residence, which also has an adverse effect on the aesthics of the existing landscape. Alternatives 2 and 3 also affect community mobility due to the closure and cul-se-sac of Tempo Road resulting in out-of-way travel. **THEREFORE, ALTERNATIVES 1 AND 1A ARE EQUALLY PREFERRED.**
3 ECONOMIC ENVIRONMENT	Medium	②	❶	③	④	Alternative 1A results in the lowest impacts to the economic environment. Alternative 3 results in the highest impacts to the economic environment relative to the other alternatives associated with impacts to commercial property and agricultural operations. Alternatives 1 and 2 result in similar impacts to agriculture and operations, however, Alternative 2 results in higher impacts to businesses and properties with potential for contamination. **THEREFORE, ALTERNATIVE 1A IS PREFERRED.**
4 CULTURAL ENVIRONMENT	Medium	❶	❶	②	②	Alternatives 1 and 1A result in no impacts to the cultural environment, where as Alternatives 2 and 3 impact a known heritage feature (Tempo Presbyterian Church). **THEREFORE, ALTERNATIVES 1 AND 1A ARE PREFERRED.**
5 TRANSPORTATION & ENGINEERING	High	❶	②	④	③	Alternative 1 is preferred for traffic operations based on the interchange configuration, which would be consistent with driver's expectation. However, Alternatives 2 and 3 will be slightly less complex to stage and construct relative to Alternatives 1 and 2. Alternatives 1, 2 and 3 are equally preferred since all have similar cost. Although, Alternative 1 is slightly more complex to stage and construct, this alternative is preferred as it improves the overall interchange operations at the lowest relative cost. **THEREFORE, ALTERNATIVE 1 IS THE PREFERRED ALTERNATIVE.**

Summary of Evaluation:

All alternatives result in relatively minor impacts to the natural environment. However, Alternative 1A is slightly preferred from a fisheries and aquatic habitat perspective. Alternatives 2 and 3 are the least preferred in all environmental and technical factor areas.

Alternative 1 is preferred from a social, cultural and transportation perspective. Relative to Alternative 1, Alternative 1A is slightly preferred with respect to agricultural and commercial access considerations, however the differences are not significant. Alternative 1A is more expensive to construct relative to Alternative 1 due to the increased structural span of Glanworth Drive over Highway 401.

The benefits to traffic operations and cost savings associated with Alternative 1 outweigh the relatively minor natural and economic benefits associated with Alternative 1A. As such, Alternative 1 is preferred.

OVERALL, ALTERNATIVE 1 IS THE PREFERRED ALTERNATIVE.

RANKING OF ALTERNATIVES

❶ ⟶ ④

Most Preferred Least Preferred

**All factors were considered to be of equal importance for the purposes of this evaluation.*

Summary Evaluation of Highway 4 (Col. Talbot Road) Interchange Alternatives

FIGURE 5

URS

Highway 401 Improvements
Planning & Preliminary Design Study
From 1.0 km West of Highway 4 Easterly to 1.0 km East of Highbury Avenue

FACTOR	ALTERNATIVE 1	ALTERNATIVE 2	COMMENTS
1 NATURAL ENVIRONMENT	❶	❶	Alternative 1 is preferred, from a terrestrial perspective, but the difference between Alternative 1 and Alternative 2 is minimal. Alternative 2 impacts to aquatic resources are much more substantial affecting significantly more channel length than Alternative 1. However, the channel has poor habitat value through the interchange. Therefore, the smallest amount of anticipated impact to the natural environment is with Alternative 1. Alternatives 1 & 2 are equally preferred since there is negligible difference between the level of environmental sensitivity for both alternatives. THEREFORE, BOTH ALTERNATIVES ARE EQUALLY PREFERRED.
2 SOCIAL ENVIRONMENT	②	❶	Both alternatives result in similar low impacts to the social environment except that Alternative 1 results in slightly higher impacts to a community institutional facility (OPP Station). THEREFORE, ALTERNATIVE 2 IS SLIGHTLY PREFERRED.
3 ECONOMIC ENVIRONMENT	❶	②	Both alternatives result in low impacts to the economic environment. Alternative 2 results in slightly higher impacts because it will disrupt more agricultural and commercial property and impact property with the potential for contamination. THEREFORE, ALTERNATIVE 1 IS SLIGHTLY PREFERRED.
4 CULTURAL ENVIRONMENT	❶	❶	There are no cultural features in the vicinity of the proposed interchange. THEREFORE, BOTH ALTERNATIVES ARE EQUALLY PREFERRED.
5 TRANSPORTATION & ENGINEERING	❶	②	Alternative 1 will result in superior traffic operations THEREFORE, ALTERNATIVE 1 IS THE PREFERRED ALTERNATIVE.

Summary of Evaluation:

Alternative 1 is preferred or equal to Alternative 2 in all areas except for the social environment since it results in a minor impact on the OPP Station. This impact will not significantly affect OPP operations.

THEREFORE, ALTERNATIVE 1 IS THE PREFERRED ALTERNATIVE.

RANKING OF ALTERNATIVES

❶ → ②

Most Preferred Least Preferred

**All factors were considered to be of equal importance for the purposes of this evaluation.*

Summary Evaluation of Wellington Road Interchange Alternatives

FIGURE 6

URS

Highway 401 Improvements
Planning & Preliminary Design Study
From 1.0 km West of Highway 4 Easterly to 1.0 km East of Highbury Avenue
G.W.P. 476-89-00

FACTOR	ALTERNATIVE 1	ALTERNATIVE 2	COMMENTS
1 NATURAL ENVIRONMENT	❶	❶	Both alternatives result in low impacts to the natural environment. Although, Alternative 2 has slightly lower impacts to fish habitat and no impacts to the terrestrial environment compared to Alternative 1, the differences are insignificant. THEREFORE, BOTH ALTERNATIVES ARE EQUALLY PREFERRED.
2 SOCIAL ENVIRONMENT	❶	❶	Both alternatives result in the same low impacts to the social environment. THEREFORE, BOTH ALTERNATIVES ARE EQUALLY PREFERRED
3 ECONOMIC ENVIRONMENT	❶	❶	Both alternatives result in the same low disruption impacts to agricultural and commercial property and operations. THEREFORE, BOTH ALTERNATIVES ARE EQUALLY PREFERRED.
4 CULTURAL ENVIRONMENT	❶	❶	There are no cultural features in the vicinity of the proposed interchange. THEREFORE, BOTH ALTERNATIVES ARE EQUALLY PREFERRED.
5 TRANSPORTATION & ENGINEERING	❶	②	Alternative 1 provides better traffic operations because of the free-flow movement onto Highway 401 and higher interchange capacity as well as being consistent with driver's expectations. THEREFORE, ALTERNATIVE 1 IS THE PREFERRED ALTERNATIVE.

Summary of Evaluation:

All alternatives result in similar low impacts to all factors, however Alternative 1 provides for better traffic operations and is therefore preferred.

THEREFORE, ALTERNATIVE 1 IS THE PREFERRED ALTERNATIVE.

RANKING OF ALTERNATIVES

❶ ⟶ ②

Most Preferred Least Preferred

**All factors were considered to be of equal importance for the purposes of this evaluation.*

Summary Evaluation of Highbury Avenue Interchange Alternatives

FIGURE 7

URS

Highway 401 Improvements
Planning & Preliminary Design Study
From 1.0 km West of Highway 4 Easterly to 1.0 km East of Highbury Avenue
G.W.P. 476-89-00

5.0 DETAILED DESCRIPTION OF THE PREFERRED ALTERNATIVE

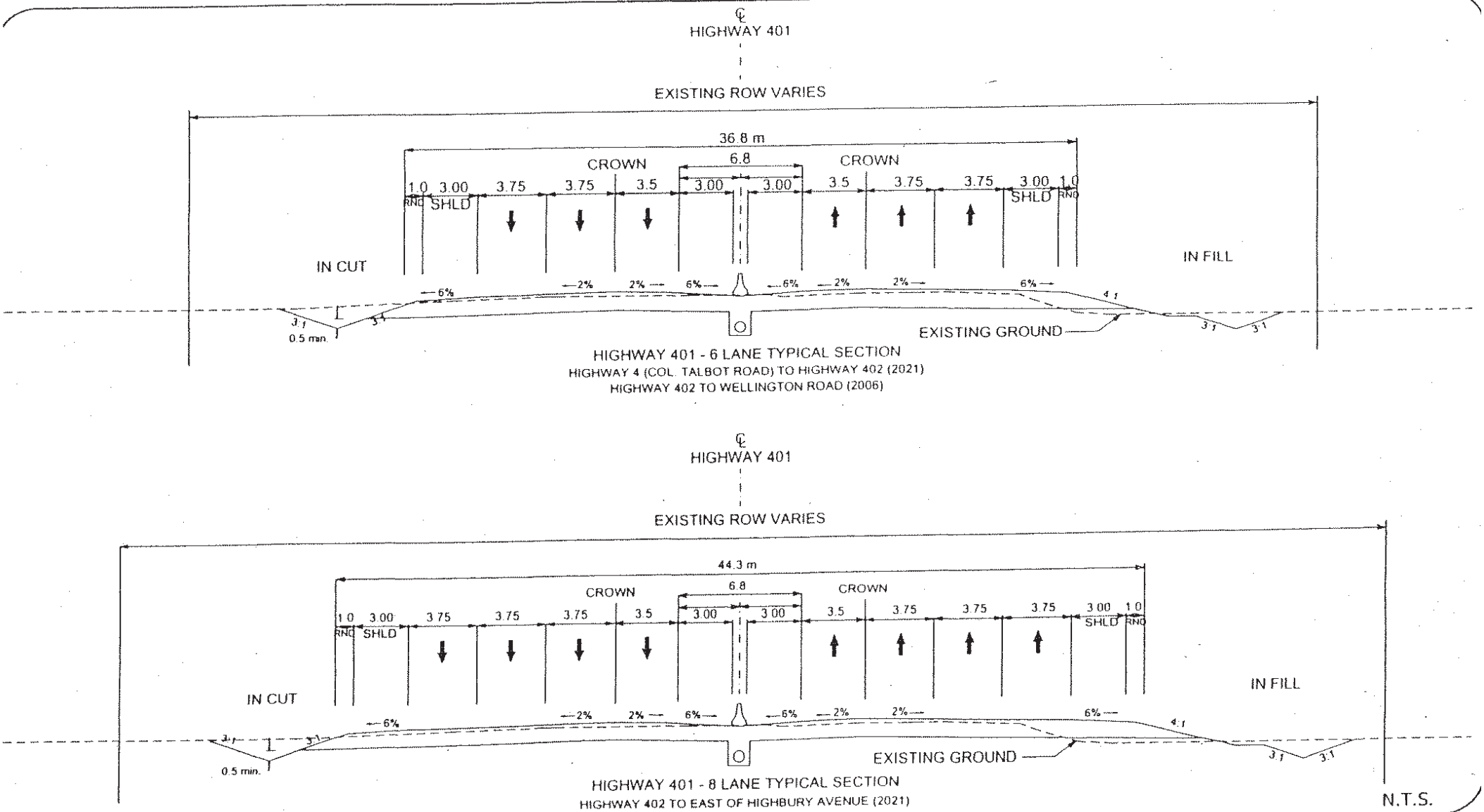
5.1 Major Features of the Proposed Improvements

The following improvements are proposed to this section of the Highway 401 corridor:

- Highway 4 (Col. Talbot Road) to Highway 402 – widen Highway 401 to a 6 lane cross-section by 2021 (refer to **Figure 8**);
- Highway 402 to Wellington Road – widen Highway 401 to a 6 lane cross-section by 2006 and 8 lanes by 2021 (refer to **Figure 8**);
- Wellington Road to Highbury Avenue – widen Highway 401 to an 8 lane cross-section by 2021 (refer to **Figure 8**);
- Highway 4 (Col. Talbot Road) Interchange - a Parclo A-4 interchange design with a new Glanworth Drive alignment over Highway 401 by 2021 (refer to **Figure 9**);
- Wellington Road Interchange - a Parclo A-4 interchange design by 2006 (refer to **Figure 10**);.
- Highbury Avenue interchange - a Parclo A-4 interchange design by 2021 (refer to **Figure 11**);
- Illumination and drainage improvements throughout the study area.

The rationale for the selection of the preferred alternatives is provided in Section 4.3 of this report. The following sections outline the environmental issues, future consultation and mitigation measures associated with the proposed improvements.

A Municipal Class Environmental Assessment was undertaken for a future interchange at Wonderland Road and Highway 401 including the extension of Wonderland Road. The proponent of this undertaking was the City of London. An Environmental Study Report (ESR) for Wonderland Road was filed (by the City of London) on the public record in December 2002. Design and construction of the interchange can commence upon availability of funding.



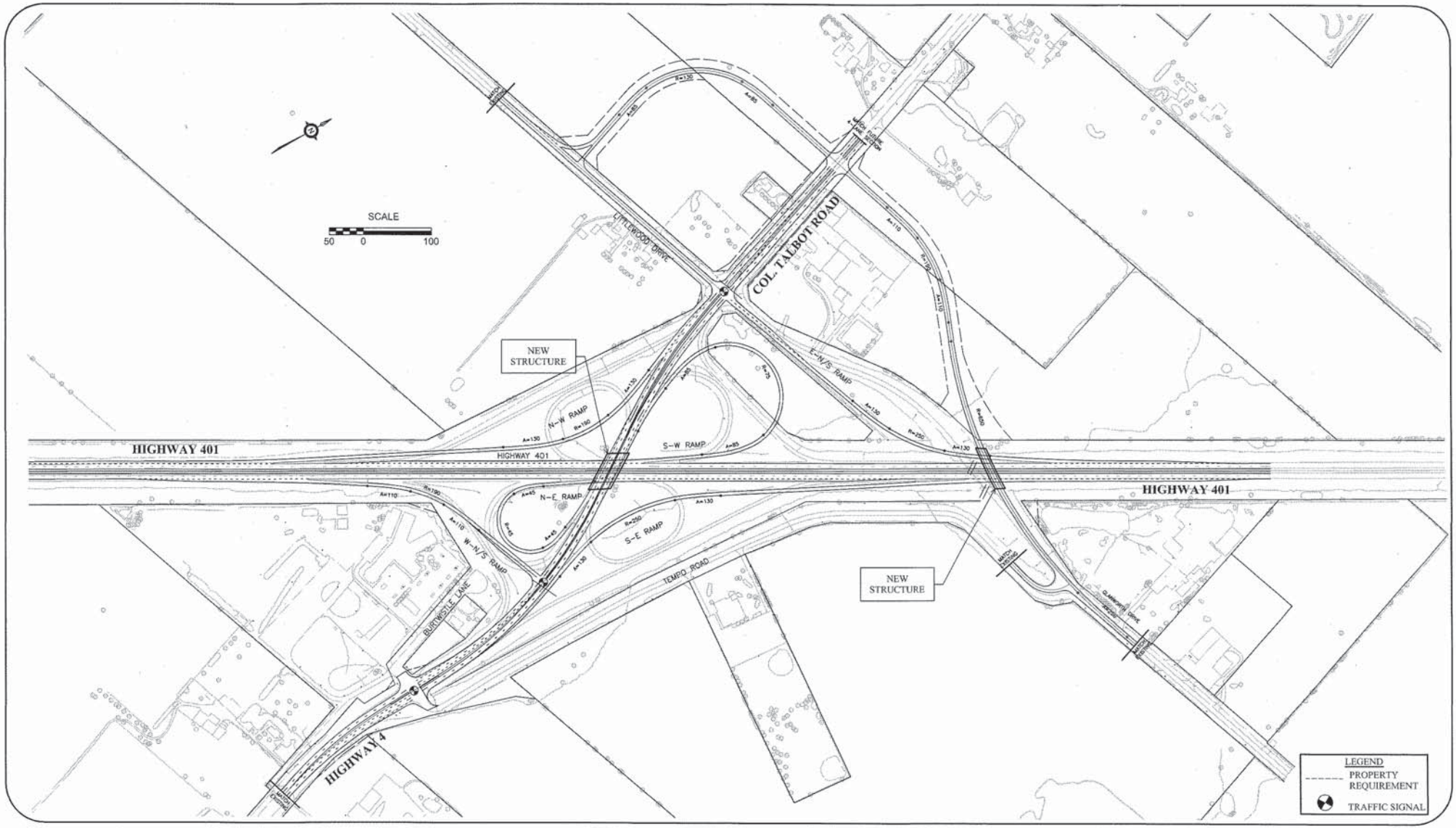
Ontario
Ministry of Transportation

URS

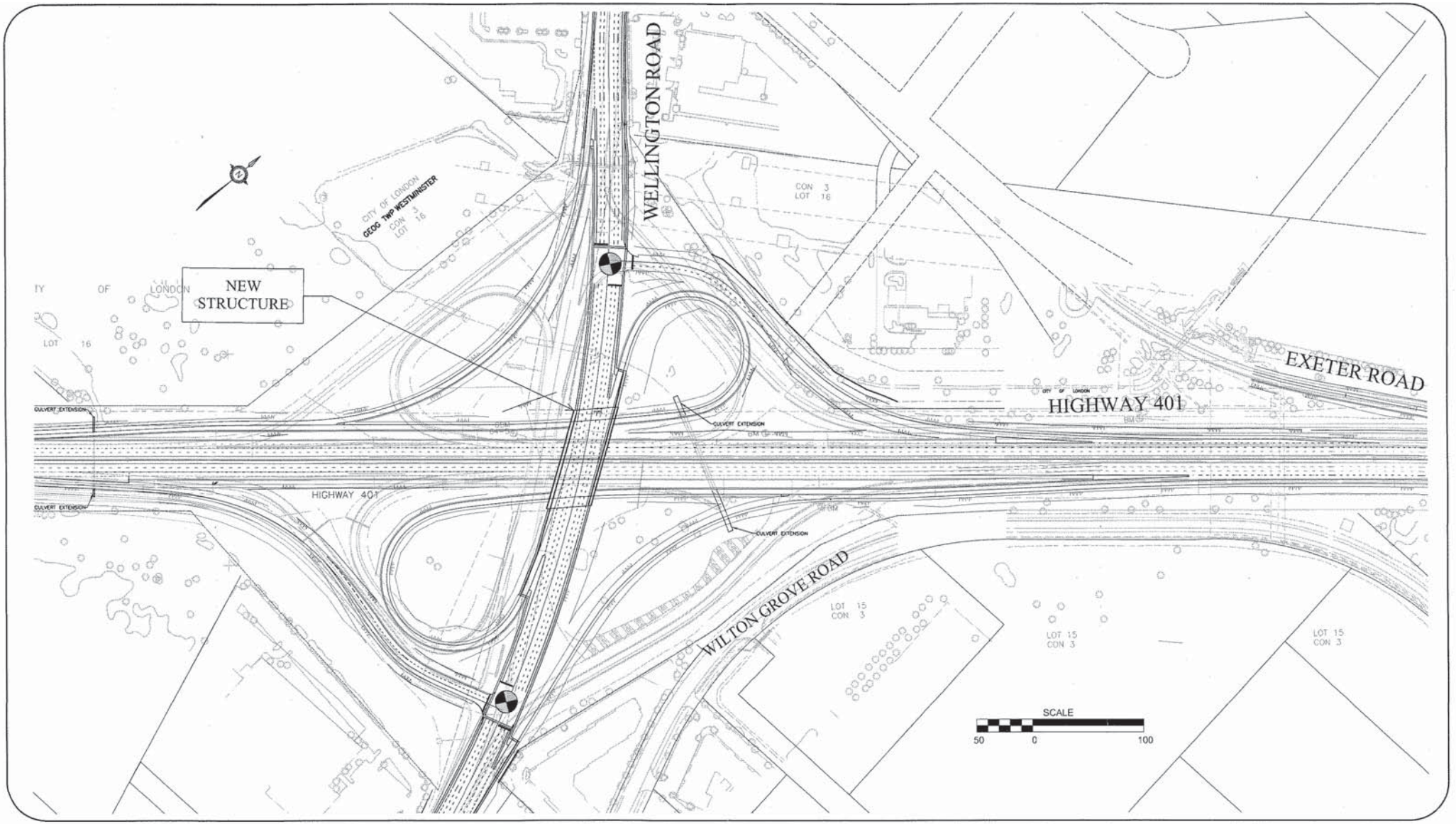
HIGHWAY 401 IMPROVEMENTS
Planning & Preliminary Design Study
From 1.0 km West of Highway 4 to 1.0 km East of Highbury Avenue
G.W.P. 476-89-00

PROPOSED HIGHWAY 401
TYPICAL CROSS SECTIONS

FIGURE
8



Ontario Ministry of Transportation URS	HIGHWAY 401 IMPROVEMENTS PLANNING STUDY Highway 4 Easterly to Highbury Avenue G.W.P. 476-89-00	Highway 4/Col. Talbot Road Interchange Recommended Plan (2021)	FIGURE 9



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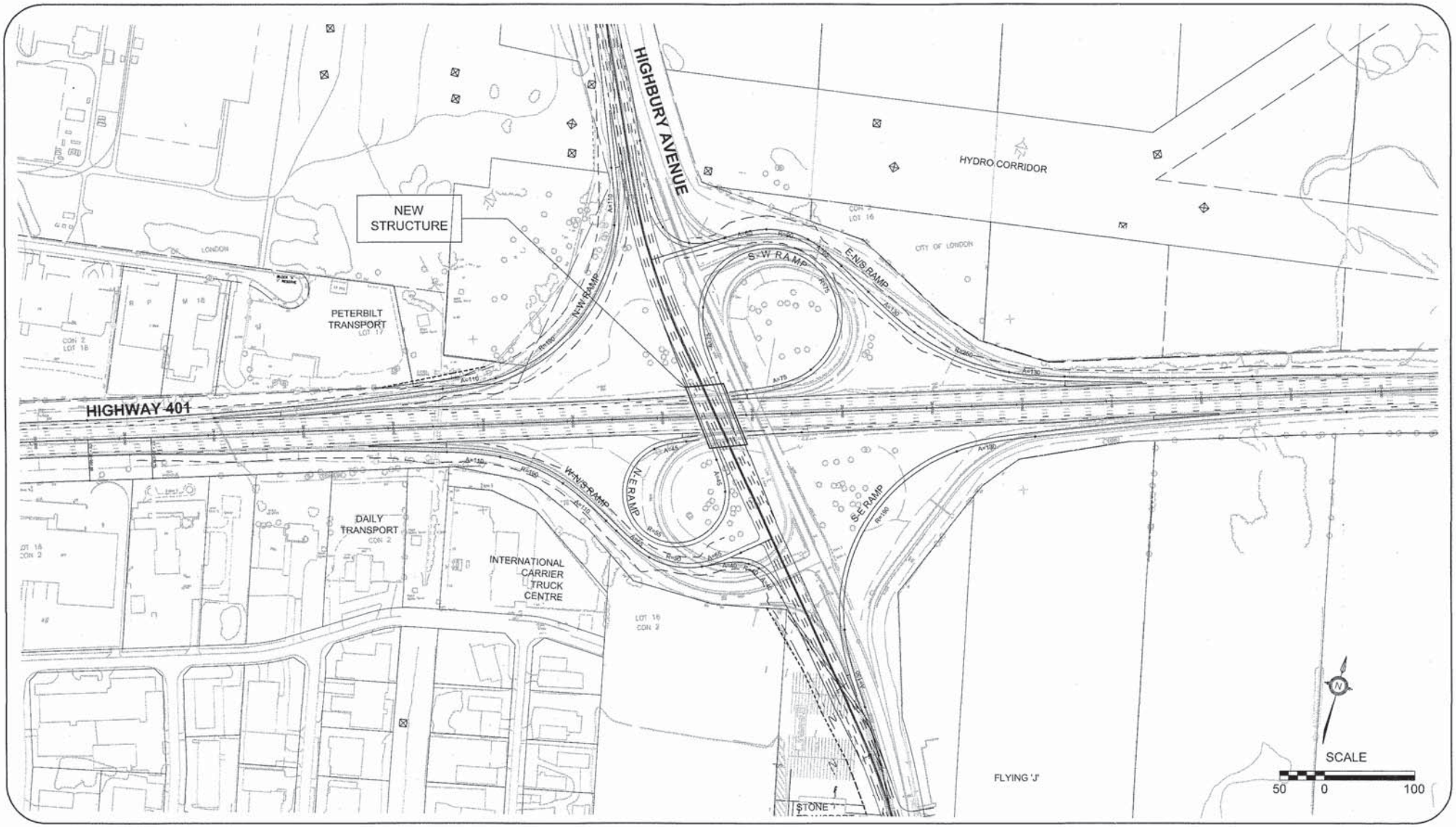
Ministry of Transportation

URS

HIGHWAY 401 IMPROVEMENTS
PLANNING STUDY
Highway 4 Easterly to Highbury Avenue
G.W.P. 476-89-00

Wellington Road Interchange
Recommended Plan (2006)

FIGURE
10



Ontario Ministry of Transportation URS	HIGHWAY 401 IMPROVEMENTS PLANNING STUDY Highway 4 Easterly to Highbury Avenue G.W.P. 476-89-00	Highbury Avenue Interchange Recommended Plan (2021)	FIGURE 11

5.2 Environmental Issues and Commitments

This section identifies the impacts produced by the preferred alternative on the environmental features and the proposed measures for mitigation.

5.2.1 Natural Environment

The potential environmental impacts on fisheries and aquatic habitat, terrestrial and wildlife areas, and groundwater at interchange locations have been assessed as described in the following sections.

5.2.1.1 Hydrogeology

The areas of surface sand and gravel soils in the central portion of the study area are highly susceptible to contamination and have the greatest potential for groundwater recharge and discharge. This includes the area from about 1 km northeast of Scotland Drive to one-quarter kilometre southwest of Westminster Road and the area at about 375 m to 500 m northeast of Westminster Road. The remaining area to the south and north of the specified chainage area consists of finer grained till soil and has a relatively low susceptibility to contamination.

Most wells in the study area adjacent to the current alignment of Highway 401 are completed in deep sand and gravel aquifers and are overlain by relatively thick clay and till deposits. Anticipated impacts are low. A number of private properties located along Highway 401 are assumed to have wells, which supply water for domestic purposes. Well records were reviewed, as were air photos to define the potential locations of these wells relative to the highway project. Unfortunately, water well records are not complete for every property and therefore, it was not possible to define the number of wells that are at risk from highway construction and operations without a well survey. The numbers of properties with wells were grouped according to whether they occur in areas of low permeability or high permeability soils throughout the highway corridor. Only those properties fronting onto Highway 401 were included as these are considered to be of greatest concern. A total of 10 wells were identified, of which 9 are in the low permeability till soils and are typically founded in deep aquifers, while 1 is found in the high permeability soils. In addition, Well #6392 and #3644 are also located adjacent to the highway in this area (refer to the Gartner Lee Limited Natural Environment Assessment Report).

It is recommended that prior to road construction, a well survey be completed. This would include taking water samples at selected locations determined during field investigations and, where possible, measurements of background water levels in wells directly adjacent the highway construction activities. In particular, water samples will be extracted from wells found in high permeability soils (i.e. well #8180) as well as wells located directly adjacent to the Highway 401 right-of-way (i.e. well #6392 and #3644) (refer to the Gartner Lee Limited Natural Environment Assessment Report). This would provide baseline information against which possible future well interference complaints could be measured.

5.2.1.2 Fisheries and Aquatic Habitat

Nine (9) watercourse crossings were present along the Highway 401 alignment (discussed later in the section). All nine watercourses were considered to be warm water systems. Two (2) of which are considered to be permanent watercourses (Dingman Creek, and Elliot-Laidlaw Drain), with the remaining seven (7) watercourses considered as ephemeral roadside drains. No “Species of Concern” species were identified in the field or through desktop analysis within the project area as defined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2000).

Anticipated environmental impacts to aquatic habitat include providing appropriate mitigation, to be undertaken during the construction phase are discussed by crossing in this section. Fish species identified in the field and through background data collection are all commonly found in the Thames River watershed. All species are typical warmwater fish species that are commonly encountered in an urban setting and are tolerant of a variety of environmental conditions. None are considered significant or sensitive to construction activities.

Table 5.1A: Summary of Aquatic Habitat Impacts and Mitigation Measures

Crossing	Watercourse	Chainage / Location	Existing Culvert Length (m)	Proposed Culvert Length (m)	Net Effect (m)	Total Habitat Length Impacted (m)	Existing Crossing Conditions	Habitat Function	Potential Impact / Habitat Loss	Mitigation Measures	Net Impact
1a	Fourine Drain	Hwy 4 – Tempo Rd.	No Culvert	34.0	+34.0	141.0	• Ephemeral flows • Mainly roadside and agricultural conveyance • Potential for standing water areas at the culverts • Fishing was not undertaken	• Standing water pools at the culvert may provided refuge habitat during dry periods • Potential seasonal fish habitat • Roadside and agricultural conveyance	• Loss of refuge pools at culvert inlet and outlets • Alteration of potential seasonal fish habitat and agricultural field drainage conveyance • Low impacts	• General mitigation measures (refer to section 5.2) • Restore refuge pools • Maintain conveyance during construction; channel by-pass	• No Fisheries Act Approval required • Culvert maintains habitat functions
1b	Fourine Drain	Hwy 4 – Tempo Rd.	No Culvert	26.0	+26.0						
1c	Fourine Drain	Hwy 4 – Tempo Rd.	36.6	36.6	0.0						
1d	Fourine Drain	Hwy 4 – Tempo Rd.	75.0	156.0	+81.0						
2a	Courtney Drain	16+290	80.76	104.0	+23.24	99.24	• Ephemeral flows • Channel narrow and deeply incised within ROW • Hummocky grass stream banks • Potential for standing water areas • Mainly agricultural and roadside runoff conveyance	• Habitat potential is limited by ephemeral flows • Pool areas in ROW may provided refuge habitat during dry periods when flows do not exist • Mainly roadside and agricultural conveyance • Few isolated fish captured in the ROW • Seasonal fish habitat	• Loss of refuge pools within the ROW • Temporary alteration of conveyance • Low impacts	• General mitigation measures (refer to section 5.2) • Restore refuge pools • Maintain conveyance during construction; channel by-pass	• No Fisheries Act Approval required • Culvert maintains habitat functions
2b	Courtney Drain	Wonderland Rd.	30.0	50.0	+20.0						
2c	Courtney Drain	Realigned Manning Rd.	No Culvert	36.0	+36.0						
2d	Courtney Drain	Manning Rd.	20.0	Culvert Removal	0.0						
2e	Courtney Drain	Realigned Morrison Rd.	No Culvert	40.0	+40.0						
3	Number 1 Highway Drain	17+501	52.28	56.0	+3.72	3.72	• Ephemeral flows • Fish passage barriers upstream and downstream of 401 • Mainly agricultural and roadside runoff conveyance • Originates from tile drain 80m upstream of 401 • Instream concrete and riprap upstream and downstream of culvert	• No fish • No fish habitat • Roadside and agricultural conveyance	• No habitat loss • No impact	• General mitigation measures (refer to section 5.2)	• No harmful alteration • No Fisheries Act Approval required
4	C B Smith Drain	18+433	57.54	60.5	+2.94	2.94	• Ephemeral flows • Receives agricultural and roadside runoff • Heavy stream bank erosion in ROW • Grass and algae instream	• No fish • No fish habitat • Roadside and agricultural conveyance	• No habitat loss • No impact	• General mitigation measures (refer to section 5.2)	• No harmful alteration • No Fisheries Act Approval required
5	Bannister-Johnson Drain	20+267	57.74	61.0	+3.26	3.26	• Ephemeral flows • Fish passage barrier (perched CSP) downstream of the 401 • Isolated pool below perched culvert • Stream bank erosion upstream and downstream of the culvert • Grass and algae instream	• Fish found were isolated in the only surveyed pool below the perched culvert, downstream of the 401 • Roadside and agricultural conveyance • Pool areas may provided refuge habitat during dry periods • Seasonal fish habitat	• No habitat loss from culvert extension • No impact	• General mitigation measures (refer to section 5.2) • Restore refuge pools • Maintain conveyance during construction; channel by-pass	• No harmful alteration • No Fisheries Act Approval required

Table 5.1B: Summary of Aquatic Habitat Impacts and Mitigation Measures

Crossing	Watercourse	Chainage / Location	Existing Culvert Length (m)	Proposed Culvert Length (m)	Net Effect (m)	Total Habitat Length Impacted (m)	Existing Crossing Conditions	Habitat Function	Potential Impact / Habitat Loss	Mitigation Measures	Net Impact
6	Dingman Creek	21+983	30.0*	65.0*	+35.0*	35.0*	• Permanent Flow • Riffle/pool habitat sequence • Variable substrate composition • Moderate to poor stream bank stability • Good instream habitat quality	• Feeding, spawning and rearing habitat • Identified as warm water baitfish community	• Loss of riparian vegetation (grasses and herbaceous plants) • Stream bank alteration from extension of bridge footings • Channel form alteration • Substrate disturbance (sand, gravel, cobble) in riffle • Loss of instream habitat features – upstream pool and downstream riffle/pool	• General mitigation measures (refer to section 5.2) • Work during specific timing window (July 1 to March 31) • Maintain and/or recreate instream habitat features • Enhancement of downstream banks • Maintain or recreate downstream riffle for spawning purposes	• Habitat alterations to riffles and pools • Potential opportunities for site enhancement, stabilize bank erosion • Verify approval requirements with MNR at the detailed design stage
7a	Murray Drain	Wellington St.	17.5	17.5	0.0	-8.3	• Ephemeral flow • Channel recently dredged • Channelized drain • Deep channel with flat morphology • No instream cover or structure • Standing water	• Water in ROW and interchange area may provided refuge habitat during dry periods when flows do not exist • Warm water baitfish community present • Roadside drainage conveyance • Seasonal fish habitat	• Refuge habitat • Spawning feeding and rearing habitat for tolerant baitfish species • Bank alterations from culvert extensions • Channel relocation to accommodate proposed 401 culvert crossing (7e); opportunity to enhance	• General mitigation measures (refer to section 5.2) • Instream work during specific timing window (July 1 to March 31) • Maintain refuge area in channel • Temporary disruption of roadside conveyance • Improve instream conditions with channel relocation – addition of instream structure, maintain depth for refuge	• Habitat alteration required • Alterations are not harmful as existing channel conditions (clay/silt flat) are extremely poor • Verify approval requirements with MNR at the detailed design stage
7b	Murray Drain	Wellington St.	42.5	52.0	+9.5						
7c	Murray Drain	Wellington St.	34.7	28.0	-6.7						
7d	Murray Drain	Wellington St.	64.6	76.0	+11.4						
7e	Murray Drain	Wellington St.	80.5	124.0	+43.5						
7f	Murray Drain	Wellington St.	66.0	Culvert Removal	-66.0						
8	Murray Drain	24+944	74.0	74.0	0.0	0.0	• Ephemeral flow • Refuge water in culvert • Channelized drain • Channel overgrown with reeds and cattails • Channel within ROW is heavily degraded from sedimentation	• Standing water in culvert may provided refuge habitat during dry periods when flows do not exist • Seasonal fish habitat	• No habitat loss • No Impacts	• Standard mitigation requirement (see section 6.3)	• No harmful alteration • No Fisheries Act Approval required
9	Elliot-Laidlaw Drain	26+350	77.8	96.0	+18.2	18.2	• Permanent flow • Riffle/pool habitat sequence • Severe bank erosion upstream, moderate bank erosion downstream • Constructed channel downstream • Good habitat availability	• Feeding, spawning and rearing habitat • Identified as warm water baitfish community • Good cover – pools, undercut banks, overhanging vegetation	• Loss of riparian vegetation (grasses and herbaceous plants) • Stream bank alteration from culvert extension • Substrate disturbance (clay, gravel, cobble) • Potential loss of instream habitat features – upstream pool and downstream riffle • Habitat enhancement opportunities upstream of culvert	• General mitigation measures (refer to section 5.2) • Instream work during specific timing window (July 1 to March 31) • Enhancement of upstream banks • Maintain and/or recreate instream habitat features upstream and downstream of the culvert	• Habitat alteration required • Verify approval requirements with MNR at the detailed design stage

Note: * *Dingman Creek, Concrete 3 span rigid beam bridge*
* *Culvert replacement, implementing a smaller culvert, results in decreased of total habitat area impacted (6.7m) from existing culvert conditions at 7c*
* *Culvert lengths based on long term (2021) requirements: 6 lanes from west of Hwy 4 to Hwy 402, 8 lanes from Hwy 402 to east of Highbury Ave*

Potential watercourse impacts have been summarized in Table 5.1 and are discussed below, according to the preferred interchange options and mainline widening.

Based on field observations and information provided, the proposed Highway 401 widening and preferred interchange options will effect eight of the nine water crossings. No culvert modifications are anticipated at the Murray Drain (crossing 8). Of the eight watercourses impacted, two permanently flowing waterbodies (Dingman Creek and Elliot-Laidlaw Drain) may require specific mitigation/compensation options, based on Fisheries Act requirements, to be determined in consultation with the Ministry of Natural Resources. The remaining ephemeral drainage systems are not expected to require Fisheries Act approval due to their natural ephemeral flow characteristics. Therefore, general mitigation requirements, as described below, will provide necessary habitat protection as instream construction activities will typically be in the dry. A telephone meeting was held with the Ministry of Natural Resources (MNR) on February 13th, 2002. MNR concurred with the natural environment assessment and an agreement was reached for approval in principle regarding proposed mitigation measures (refer to Appendix A for correspondence).

Crossing 1-Fourine Drain

At this location, Fourine Drain is not impacted by the proposed highway modifications. General construction mitigation measures are recommended to manage potential watercourse impacts from adjacent construction activities.

Crossing 2-Courtney Drain

Courtney Drain is directly impacted at the Highway 401 crossing. In total, 23 m of existing channel will be impacted by the culvert extension (refer to Table 5.1A). Anticipated impacts to this system are low, due to the ephemeral characteristics of the drain, which limit aquatic habitat and fish potential. General instream construction mitigation measures are recommend for this watercourse, with an instream construction window from July 1 to March 31, due to the potential seasonal presence of baitfish.

Crossing 3-Number 1 Highway Drain

This drain is directly impacted at the Highway 401 crossing. The proposed culvert extension would require an extension of 3.72m to the existing culvert. Since Number 1 Highway Drain is an ephemeral F Type drainage, construction impacts are not anticipated to be harmful provided general instream mitigation measures are implemented. Specific timing windows are not required, as instream works should be done in the dry due to take advantage of the natural ephemeral characteristics of the watercourse.

Crossing 4-C B Smith Drain

C B Smith Drain is directly impacted at the Highway 401 crossing. This proposed culvert extension would impact approximately 2.94m of existing channel (refer to Table 5.1A). Since this drainage is an ephemeral F Type drain, construction impacts are not anticipated to be harmful provided general instream mitigation measures are implemented. Specific timing windows are not required, as instream works should be done in the dry due to take advantage of the natural ephemeral characteristics of the watercourse.

Crossing 5-Bannister-Johnson Drain

This watercourse is directly impacted at the Highway 401 crossing. The proposed extension of the existing culvert would impact approximately 3.36 m of existing channel. Since the Bannister-Johnson Drain drainage is an ephemeral F Type drain, construction impacts are not anticipated to be harmful provided general instream mitigation measures are implemented. Specific timing windows are not required, as instream works should be done in the dry to take advantage of the natural ephemeral characteristics of the watercourse.

Crossing 6-Dingman Creek

Dingman Creek is intersected at Highway 401 by a 3-span ridged frame beam bridge. Approximately 35.0m of existing channel will be impacted by the proposed extension (refer to Table 5.1B). Impacts to habitat include the loss of riparian grasses, the alteration of stream bank and channel form from the extension of the bridge footing on the west side of the crossing, as well as the disturbance of existing substrates (course sand, gravel, and cobble). In addition, the potential loss of existing instream habitat features (upstream pool and downstream riffle) may occur as the result of construction activities. This section is expected to provide habitat for spawning and rearing of the resident forage fish species. Restoration of instream habitat features should be specified during the detail design phase. Compensation may be required for the alterations to the existing habitat. In the event compensation is required in consultation with MNR, several degraded sections within the survey area on Dingman Creek have been identified as potential site enhancement opportunities (bank stabilization). Therefore, standard mitigation measures are recommended within a specific timing window (July 1 to March 31).

Crossing 7-Murray Drain

At this location, Murray Drain is directly impacted by the proposed modifications to the Wellington Road interchange (refer to Table 5.1B). The preferred alternative would result in approximately 8.3 m of channel impacted by the addition of culvert length within the interchange area. The removal of the existing eastbound on-ramp culvert located west of Wilton Grove Road will result in the realignment of approximately 130m of channel. The proposed impacts to Murray Drain at this location are low, due to the ephemeral flow characteristics of the drain, which limit aquatic habitat and fish potential, as well as the current habitat conditions which have already been extremely altered. Opportunities exist to improve the channel conditions with the relocation. General instream construction mitigation measures are recommended for this watercourse, with an instream construction window from July 1 to March 31, due to the presence of baitfish.

Crossing 8-Murray Drain

At this location, Murray Drain is not impacted by the proposed highway modifications. General construction mitigation measures are recommended to manage potential watercourse impacts from adjacent construction activities.

Crossing 9-Elliot-Laidlaw Drain

Elliot-Laidlaw drain is directly impacted by the modifications of the Highbury Avenue interchange. At this location, approximately 18.2 m of existing channel is impacted by the proposed culvert extension (refer to Table 5.1B). The anticipated impacts include the loss of riparian grasses, the alteration of stream bank and channel form, as well as the disturbance of existing substrates (course sand, gravel, and clay). In addition, the potential loss of existing instream habitat features (upstream pool and downstream riffle) may occur as the result of construction activities. The habitat is expected to provide for spawning and rearing of the resident forage species. The detail designs for this crossing should include restoration of the instream habitat features. Compensation may be required for the alterations to the existing habitat. In the event compensation is required in consultation with MNR, several degraded sections within the study area have been identified for potential site enhancement opportunities (bank stabilization). Therefore, standard mitigation measures are recommended within a specific timing window (July 1 to March 31).

Pond at Southeast Quadrant of Glanworth Drive / Highway 401

During consultation with the property owner at the southeast quadrant of Highway 401 and Glanworth Drive, it was identified that the pond provides the primary source of water to the well. The pond has also been stocked with fish. Mitigation measures include realigning Glanworth Drive slightly west in order to avoid impacting the pond. Additional mitigation measures are described below.

General Mitigation Measures

Based on the following general mitigation measures, operational constraints (in the form of special provisions) will be developed during detail design and included in the contract:

- An Environmental Inspector with a natural channel or biological background and construction experience should be employed for all instream works on permanent watercourses to ensure that mitigation and compensation measures are implemented as designed.

- Areas for refueling of machinery will be located well away from any watercourse or drainage ditch.

- Sediment and erosion controls will be implemented throughout the construction area, maintained frequently and in response to storm events. These controls will consist of sediment fences, check dams in swales and restoration of exposed soils with vegetative cover within 45 days of the start of work. On steeper slopes, geotextiles should be used to enhance slope stability and the growth of the vegetation. An Environmental Inspector should be employed to monitor the success of the sediment and erosion control methods used and to provide guidance on maintenance requirements. Sediment and erosion controls will remain in place and maintained until such time as the vegetation has taken sufficiently to provide adequate protection for the watercourses.

- Restoration will take place within 45 days of the start of grading and disruption of soil, as weather conditions permit. The schedule for the completion of construction should coincide with a seasonally appropriate time to allow for the successful growth of vegetation.

- All construction debris and litter will be removed frequently. Stockpiles will not be permitted within the regulatory floodplain. All stockpiles will be removed upon completion of the works and the site restored under the location, as appropriate.

- Sediment laden water in the working area must be first pumped to a temporary sediment control basin or through a filter bag or dense vegetation prior to outletting to the floodplain or road side ditches. Additional measures such as straw bales or check dams may be required depending on the site specific conditions and as determined in the field by the Environmental Inspector. Dissipaters should be available to spread the pumped water out through the discharge zone.

- Flow through the watercourses where instream works are taking place shall be maintained and without excessive sedimentation or erosion. Flows may be diverted by piping or damming and pumping for short duration. In the event temporary channel bypass measures are required in areas known to contain fish species, all fish should be removed and transplanted upstream of construction activities prior to channel dewatering.

- Instream construction activities will be conducted in the “dry” summer season on watercourses identified as ephemeral drainages. This will limit the potential for sediment transport during construction activities. Watercourses that have been identified as containing permanent flows and / or baitfish populations should have specific construction timing windows applied (July 1 to March 31) to eliminate potential effects on fish spawning activity.

Pond at Burtwistle Lane / Highway 4

This pond is not impacted by the proposed interchange modification. General construction mitigation measures are recommended to manage potential impacts from adjacent construction activities.

Pond East of Col. Talbot Road North of Highway 401

This pond is not impacted by the proposed improvements. General construction mitigation measures are recommended to manage potential impacts from adjacent construction activities.

5.2.1.3 Terrestrial and Wildlife

No wildlife or plant species were identified as species of concern, in the field or through desktop analysis, within the project area (COSEWIC 2000).

No ANSIs or ESAs are located within or adjacent to the study area. As mentioned above, the Westminster Pond/Pond Mills Wetland Complex, a PSW is located adjacent to the north side of the ROW, but is outside of the ROW and at the eastern edge of the study area. No known occurrences of vulnerable threatened and endangered (VTE) species exist within the study area, according to the NHIC database, and none were observed during field investigations. Based on observations of conditions, there is low potential for VTE species.

Most of the woodlots potentially affected by the proposed road developments are early successional and highly disturbed by non-native invasive plant species, particularly Common Buckthorn and Garlic Mustard (*Alliaria petiolata*). Therefore most of the woodlots are considered low in quality from an ecological standpoint. The highest quality woodlots were those located at the Highway 402/401 junction and those east of Highbury Avenue, including the portion of PSW adjacent to the north side of the ROW. Although fragmented, these units contain mature forest habitat with a good diversity of native plant species.

5.2.1.4 Vegetation

Lane widening can be entirely accommodated within the existing ROW therefore no natural vegetation loss is required beyond the ROW. The PSW at the east end of the study area will be unaffected by proposed upgrades. There will be loss of the disturbed field vegetation and possibly some shrub thicket within the ROW.

The only vegetation to be removed at the three interchanges consists of ornamental tree plantings, mowed grass and hedgerow which are all low functioning from a natural habitat perspective. Where appropriate, barrier fencing will be placed along the drip line of trees to be retained to avoid incidental impacts.

5.2.1.5 Wildlife

The immediate roadside edge is largely avoided by many species of vertebrate wildlife because of noise, vibration and disturbance. The widening of the highway in the long term will reduce the distance between the highway and the wooded areas which may extend the edge effect further into the adjacent forest, thereby pushing the wildlife in. The impact to breeding birds is considered insignificant, at least in terms of amount of habitat loss. It is expected that the amount of traffic will increase resulting in somewhat greater noise generation. This, combined with an enlarged gap between the habitat on either side of the road, will make crossing more difficult. Since the vegetation outside the ROW is retained, there is no loss of wildlife habitat. Mortality to wildlife may increase with a wider highway carrying a greater volume of traffic. The culverts through Dingman Creek will continue to offer opportunities for wildlife to pass safely under the highway.

5.2.2 Socio-Economic Environment

5.2.2.1 Aesthetics

The proposed improvements to Highway 401 results in minor changes to the existing aesthetic quality of the vegetation cover along the study corridor. The following measures will be used to mitigate the aesthetic qualities of the highway through this area:

- Maintaining/enhancing and keeping vegetation removals to a minimum.
- Undertaking post-construction landscape planning and berming.

5.2.2.2 Noise

Based on the noise assessment undertaken for this study, there will be no significant noise impacts experienced by the residents and businesses adjacent to the highway as a result of road improvements to Highway 401. Sound level increases will be imperceptible since all of the recommended improvements result in less than a 5 dBA increase.

Therefore, based on the MTO / MOE Noise Protocol, noise mitigation is not required (refer to Appendix C for the Noise Assessment Report).

Construction Noise

Noise from construction activity, such as bulldozers and dump trucks, has the potential to be noticeable, particularly if construction occurs outside of normal weekday construction periods. Noticeable noise effects from heavy equipment are typically limited to within a few hundred metres of the construction site. As a result, noise effects will be most noticeable in the areas where the residences are in close proximity to the road.

Various mitigation measures are available to minimize noise impacts during construction, including:

- Maintenance of mufflers and other noise reduction devices on heavy equipment;
- Enforce construction codes of practice and local municipal noise by-laws and codes to provide means of limiting excessively noisy operations and equipment. If required, noise by-law exemptions will be obtained prior to construction;
- Specify hours of operation during construction;
- Monitor complaints on construction noise and investigate.

5.2.2.3 Residential

A total property taking of approximately 0.72 ha of residential property is required from two property owners at the southeast quadrant of the Highway 4 (Col. Talbot Road) interchange to accommodate the realignment of Tempo Road.
There are low impacts to community mobility for residents in the vicinity of Highway 4 (Col. Talbot Road) due to the realignment of Tempo Road and closure of Glanworth Drive. Local residences may experience a maximum out-of-way travel of 800 m.

5.2.2.4 Property Waste and Contamination

Based on the waste and contamination and excess material assessment conducted, none of the properties identified are impacted by the proposed improvements to Highway 401. Further, no environmental concerns were observed within the right-of-way. Numerous active farming operations are present along the right-of-way, but no specific issues of potential environmental concern were typically noted at the farm properties. However, farming operations typically include vehicle maintenance and refueling, historical waste disposal and fertilizer, herbicide and pesticide storage. Where farm properties are to be acquired that include the farm buildings (as opposed to fields) then the properties should be assessed on a case by case basis.

5.2.2.5 Agricultural

There will be a minor agricultural property taking along the Highway 401 right-of-way. The proposed improvements will not significantly impact agricultural operations since no agricultural buildings will be affected.

Where a temporary property taking of agricultural land is required to accommodate construction, fences removed during construction will be replaced and land will be restored to current conditions in consultation with the affected agricultural operator.

5.2.2.6 Commercial/Industrial

A total property taking of approximately 0.3 ha from commercial/industrial businesses abutting Highway 401 right-of-way will be required. These impacts are not considered significant since business operations are not greatly affected, therefore mitigation is not necessary.

There were safety concerns with the Glanworth Drive / Littlewood Road intersection and commercial access. Commercial access will be improved in the interim by providing traffic signals and illumination at the reconfigured intersection of Highway 4 and Littlewood Road. Under the long term scenario, direct access may be provided from the realigned Glanworth Drive. Details on access are to be determined during detail design in consultation with the City of London.

5.2.3 Cultural Environment

5.2.3.1 Archaeological Resources

The Stage 1 archaeological assessment for the proposed improvements to this section of the Highway 401 corridor and associated interchanges has determined that one archaeological site – Exeter Road (AfHh-80) has been registered within the Highway 401 – Wellington Road interchange area.

Based on the study area's proximity to water and historic land use patterns, there is potential for the identification of pre-contact and historic archaeological resources within the agricultural lands abutting the Highway 4 (Colonel Talbot Road) and Highbury Avenue interchange areas. It is therefore recommended that:

1.) Lands Beyond the limits of the existing disturbed right-of-way of Highway 401 or secondary roads, at Highway 4 (Colonel Talbot Road) and Highbury Avenue interchanges will be subject to a Stage 2 archaeological assessment.

2.) Lands beyond the limits of the existing disturbed Exeter Road westbound lane off-ramp at the Wellington Road interchange will be subject to a Stage 2 archaeological assessment.

3.) Additional lands beyond the limits of construction required for the construction of temporary interchanges, parking lots, stormwater management facilities, staging areas, storage areas, access road etc., will be subject to archaeological assessment prior to construction.

4.) In the event that deeply buried archaeological remains are encountered during construction activities, the office of the Regulatory and Operations Group, Ministry of Tourism, Culture and Recreation (MTCR) will be notified immediately.

5.) In the event that human remains are encountered during construction, both MTCR and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ministry of Consumer and Commercial Relations will be notified immediately.

5.2.3.2 Built Heritage Features

Historic research has revealed that roads within the study area have origins in nineteenth century survey and settlement. Field investigations were conducted in July 2001, the result of which identified 5 built heritage feature and 19 cultural landscape units.

Although the study area has been substantially altered by previous development, proposed interchange and roadway improvements to Highway 401 have the potential to introduce physical, visual, audible elements that are not in keeping with the original setting. The nature of impacts on built heritage feature and cultural landscape units are visual in nature (i.e. visual intrusion as a result of expanding the highway closer to built heritage features and the removal of vegetative screening) and are not expected to be significant. To mitigate negative aesthetic impacts within the Highway 401 corridor, a landscape plan will be developed during the detail design phase of this project.

A summary of commitments for mitigation to address specific concerns with the preferred alternatives is listed in Table 5.2.

5.3 Future Consultation and Commitments

The following is a summary of future environmental process, technical work, and consultation to be undertaken in subsequent stages.

5.3.1 Agency Consultation

During the detail design phase of this project, the Ontario Ministry of Natural Resources (MNR) and the Federal Department of Fisheries and Oceans will be consulted regarding the Harmful Alternation, Disruption or Destruction of fish habitat associated with the proposed improvements (approvals under Section 35 of the Federal Fisheries Act). Detailed mitigation measure and/ or fish habitat compensation will be determined at that time.

The Canadian Coast Guard has advised that Dingman Creek in the vicinity of Highway 401 is considered a navigable waterway, as such an application for approval under section 5(1) of the Navigable Waters Protection Act will be required for this undertaking. During the detail design phase of this project, the Canadian Coast Guard will be consulted regarding authorization under the Navigable Waters Protection Act.

During the detail design phase of this project, the City of London will be consulted in order to present and obtain comments on the detail design, recommended plan and construction staging issues. Issues regarding commercial access will be finalized during the detail design phase of this project.

5.3.2 Public Consultation

During detail design a Public Information Centre may be held (if necessary) to present the proposed improvements and detailed mitigation measures. Furthermore, Gentek will be consulted regarding a change to their access. A relocated entrance to Gentek will be designed in consultation with Gentek, the City of London and MTO.

5.3.3 Design and Construction Report / TESR Addendum

Design and Construction Report

During detail design, a Design and Construction Report will be prepared to provide information for compliance and monitoring purposes and to document existing conditions, potential impacts and mitigation measures. This report will also document how the commitments to future work identified in this Transportation Environmental Study Report have been addressed.

TESR Addendum

The Class Environmental Assessment for Provincial Transportation Facilities (2000) requires that where significant changes to the proposed improvements outlined in the Transportation Environmental Study Report (TESR) are identified, a TESR Addendum must be prepared. The TESR Addendum would be made available for a minimum 30-day public and agency review period including a bump-up opportunity. It should be noted that only the changes outlined in the TESR Addendum would be eligible for a bump-up.

TESR Review

If there is a sufficient time lag (five years or greater) between submission of the original TESR and commencement of construction, a TESR Review is required. The TESR Review would consider environmental and design changes that have taken place since the original TESR submission. If significant changes have occurred, a TESR Addendum will be prepared.

5.3.4 Environmental / Technical Work

The following summarizes the future additional environmental and technical study to be undertaken at subsequent design stages of this project for the purpose of identifying / confirming existing conditions, assessing impacts and

developing detailed mitigation measures / compensation strategies. Additional details of this work is outlined ni Section 5.2.

Natural Environment

- Complete a well survey, including taking water samples and measurements of background water levels in wells directly adjacent to highway construction activities;
- Supplemental fisheries and aquatic habitat assessment, including developing mitigation measures and compensation plans (where required) and verify approval requirements (i.e. authorization under Federal Fisheries Act) in consultation with the MNR.

Socio-Economic Environment

- Prepare a detailed landscaping plan;
- Develop noise control measures associated with construction activities for inclusion in contract documentation and obtain any noise by-law exemptions where required;
- Undertake supplemental property contamination assessment for properties identified as having potential for contamination;

Cultural Environment

- Conduct Stage 2 archaeological assessments on appropriate lands and conduct archaeological assessments prior to construction, where required;

5.3.5 Project Specific Class EA Process Monitoring

During the planning and design stage, MTO ensures compliance with the Class EA process before MTO issues "environmental clearance" for project implementation.

During construction, MTO ensures that external notification and consultations are consistent with any commitments that may have been made earlier. Following construction, monitoring will ensure that any follow-up information is provided to external agencies as per any outstanding environmental commitments.

5.3.6 Implementation of Environmental Monitoring Framework

During construction, MTO or its agent ensures that the implementation of the mitigating measures and key design features are consistent with the contract. Inspections will be undertaken throughout project implementation to ensure that measures outlined in the contract are undertaken appropriately / effectively as follows:

Inspection by Construction Staff

Construction is subject daily to general on-site inspection to ensure the execution of the environmental component of the work and to deal with environmental problems that develop during construction. This is the primary method for compliance monitoring.

Site Visits by Environmental Staff

Construction projects with significant mitigating measures/concerns are subject to periodic site visits by consultant environmental staff. The timing and frequency of such site visits are determined by the schedule of construction operations, the sensitivity of environmental concerns and the development of any unforeseen environmental problems during construction. MTO staff will be available should difficulties arise.

5.4 Summary of Environmental Effects and Mitigation

A summary of environmental effects and proposed mitigation measures is provided in Table 5.2

TABLE 5.2: SUMMARY OF ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

ID #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	ID #	Details/Mitigation
1.0	**Groundwater** Impacts to existing wells and groundwater discharge / recharge areas being affected.	MNR/MTO/ Property Owners	101 102	▪ Prior to construction a well survey will be completed including the monitoring of wells adjacent to the highway to establish baseline conditions for possible interference claims; ▪ If well interference occurs from highway construction, potential mitigation measures may include; the provision for an alternative temporary or permanent water supply, well deepening, or well replacement.
2.0	**Aquatic Features** Protection and enhancement of fish and aquatic habitats and species.	TRCA/MNR/MTO	 201 202 203	The following general mitigation measures, operational constraints (in the form of special provisions) will be developed during detail design and included in the contract: ▪ Glanworth Drive will be realigned at Highway 401 slightly to the west in order to avoid impacting the pond on the property at the southeast corner of Highway 401 and Glanworth Drive. ▪ An Environmental Inspector with a natural channel or biological background and construction experience should be employed for all instream works on permanent watercourses to ensure that mitigation and compensation measures are implemented as designed. ▪ Areas for refueling of machinery will be located well away from any watercourse or drainage ditch. ▪ Sediment and erosion controls will be implemented throughout the construction area, maintained frequently and in response to storm events. These controls will consist of sediment fences, check dams in swales and restoration of exposed soils with vegetative cover within 45 days of the start of work. On steeper slopes, geotextiles should be used to enhance slope stability and the growth of the vegetation. An Environmental Inspector should be employed to monitor the success of the sediment and erosion control methods used and to provide guidance on maintenance requirements. Sediment and erosion controls will remain in place and maintained until such time as the vegetation has taken sufficiently to provide adequate protection for the watercourses.

ID #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	ID #	Details/Mitigation
2.0	**Aquatic Features (cont'd)** Protection and enhancement of fish and aquatic habitats and species.	TRCA/MNR/MTO	204 205 206 207 208	▪ Restoration will take place within 45 days of the start of grading and disruption of soil, as weather conditions permit. The schedule for the completion of construction should coincide with a seasonally appropriate time to allow for the successful growth of vegetation. ▪ All construction debris and litter will be removed frequently. Stockpiles will not be permitted within the regulatory floodplain. All stockpiles will be removed upon completion of the works and the site restored under the location, as appropriate. ▪ Sediment laden water in the working area must be first pumped to a temporary sediment control basin or through a filter bag or dense vegetation prior to outletting to the floodplain or road side ditches. Additional measures such as straw bales or check dams may be required depending on the site specific conditions and as determined in the field by the Environmental Inspector. Dissipaters should be available to spread the pumped water out through the discharge zone. ▪ Flow through the watercourses where instream works are taking place shall be maintained and without excessive sedimentation or erosion. Flows may be diverted by piping or damming and pumping for short duration. In the event temporary channel bypass measures are required in areas known to contain fish species, all fish should be removed and transplanted upstream of construction activities prior to channel dewatering. ▪ Instream construction activities will be conducted in the "dry" during the summer season on watercourses identified as ephemeral drainages. This will limit the potential for sediment transport during construction activities. Watercourses that have been identified as containing permanent flows and / or baitfish populations should have specific construction timing windows applied (July 1 to March 31) to eliminate potential effects on fish spawning activity.

ID #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	ID #	Details/Mitigation
	Aquatic Features (cont'd) Protection and enhancement of fish and aquatic habitats and species.		**209**	**The following summarizes specific mitigation measures at watercourse crossings in the study area, refer to Section 5.2.1 for details.** **<u>Crossing 1-Fourine Drain</u>** ▪ General instream construction mitigation measures ▪ Instream construction window from July 1 to March 31 **<u>Crossing 2-Courtney Drain</u>** ▪ General instream construction mitigation measures ▪ Instream construction window from July 1 to March 31 **<u>Crossing 3-Number 1 Highway Drain</u>** ▪ General instream construction mitigation measures ▪ No specific timing window, work will be undertaken in the dry to take advantage of the natural ephemeral characteristics of the watercourse. **<u>Crossing 4-C B Smith Drain</u>** ▪ General instream construction mitigation measures ▪ No specific timing window, work will be undertaken in the dry to take advantage of the natural ephemeral characteristics of the watercourse. **<u>Crossing 5-Bannister-Johnson Drain</u>** ▪ General instream construction mitigation measures ▪ No specific timing window, work will be undertaken in the dry to take advantage of the natural ephemeral characteristics of the watercourse. **<u>Crossing 6-Dingman Creek</u>** ▪ The Ontario Ministry of Natural Resources (MNR) and the Federal Department of Fisheries and Oceans will be consulted regarding the Harmful Alternation, Disruption or Destruction of fish habitat associated with the proposed improvements (approvals under Section 35 of the Federal Fisheries Act). Detailed mitigation measure and/ or fish habitat compensation will be determined at that time. ▪ General mitigation measures will also be employed ▪ Instream construction window from July 1 to March 31

ID #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	ID #	Details/Mitigation
2.0	**Aquatic Features (cont'd)** Protection and enhancement of fish and aquatic habitats and species.	TRCA/MNR/MTO		**<u>Crossing 7-Murray Drain</u>** ▪ General instream construction mitigation measures ▪ Instream construction window from July 1 to March 31 **<u>Crossing 8-Murray Drain</u>** At this location, Murray Drain is not impacted by the proposed highway modifications. General construction mitigation measures are recommended to manage potential watercourse impacts from adjacent construction activities. **<u>Crossing 9-Elliot-Laidlaw Drain</u>** ▪ The Ontario Ministry of Natural Resources (MNR) and the Federal Department of Fisheries and Oceans will be consulted regarding the Harmful Alternation, Disruption or Destruction of fish habitat associated with the proposed improvements (approvals under Section 35 of the Federal Fisheries Act). Detailed mitigation measure and/ or fish habitat compensation will be determined at that time. ▪ General mitigation measures will also be employed ▪ Instream construction window from July 1 to March 31
3.0	**Terrestrial Features** Vegetation protection and restoration.	MNR/MTO/Property Owners	301 302	▪ Tree Protection Barriers will be erected along edge of vegetation removal areas to prevent incidental or accidental disturbance to retained vegetation. ▪ Stockpiled soil and other materials should be located outside of vegetated areas.
4.0	**Erosion Control** To minimize the potential for erosion of newly exposed cut and fill slopes.	MNR/MTO	401 402	▪ Limit the time, slopes are exposed prior to stabilization to 45 days from commencement of grading. Use erosion blankets on steeper slopes to enhance slope stability; ▪ Employ sediment fences and check dams where appropriate.
5.0	**Aesthetics** Impacts to vegetative screening along lot frontages.	MTO/Property Owners	501 502	▪ Maintain/enhancing and keeping the vegetation removals to a minimum ▪ Undertaking post-construction landscape planting with specific attention to lands in the vicinity of built heritage and cultural landscape features (refer to Section 4.1.3) where removals are required.
6.0	**Air Quality**	MTO	601 602	▪ Open burning will not be permitted ▪ Application of calcium chloride flakes and/or water to reduce dust

ID #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	ID #	Details/Mitigation
7.0	**Agricultural**	MTO	701 702	▪ Replace fences removed during construction; ▪ Areas used for temporary basis for construction will be restored to current conditions in consultation with the affected agricultural operator.
8.0	**Noise** Construction related noise.	MTO	801 802 803	▪ Maintain equipment, particularly mufflers; ▪ Enforce construction codes of practice and local municipal by-laws for noise to provide means of limiting excessively noisy operations and equipment. If required, a by-law exemption will be obtained prior to construction; ▪ Specify hours of operation during construction.
9.0	**Management of Excess Material**	MTO	901	▪ Disposal of excess material is controlled by a special provision in the contract.
10.0	**Heritage Resources**	MTO	1001	▪ Tree lines, fence lines and hedgerows will be retained along Highway 401 where possible. New tree and vegetation plantings will replace any removed to maintain the roadside character
11.0	**Archaeological Resources**	MTO	1101 1102	▪ A Stage Archaeological Assessment will be conducted during detail design for: ❖ Lands Beyond the limits of the existing disturbed right-of-way of Highway 401 or secondary roads, at Highway 4 (Colonel Talbot Road), and Highbury Avenue interchanges will be subject to a Stage 2 archaeological assessment. ❖ Lands beyond the limits of the existing disturbed Exeter Road westbound lane off-ramp at the Wellington Road interchange will be subject to a Stage 2 archaeological assessment. ❖ Additional lands beyond the limits of construction required for the construction of temporary interchanges, parking lots, stormwater management facilities, staging areas, storage areas, access road etc., will be subject to archaeological assessment prior to construction. ▪ In the event that deeply buried archaeological remains are encountered during construction activities, the office of the Regulatory and Operations Group, Ministry of Tourism, Culture and Recreation (MTCR) will be notified immediately.
12.0	**Navigable Waters Protection**		1201	▪ Approvals under Section 5(1) of Navigable Waters Protection Act will sought prior to construction. During detail design, the Canadian Coast Guard will be consulted as appropriate.