# NATURAL ENVIRONMENT
# LEVEL 1 & 2 REPORT

Maes Pit
Komoka, Ontario

**Johnston Bros. (Bothwell) Limited**

**November 28, 2017**

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# 1.0 Introduction

BioLogic Incorporated has been retained by Johnston Bros. (Bothwell) Limited to prepare a Natural Environment Level 1 and Level 2 Report for a proposed aggregate pit, southwest of Komoka, Ontario. This report is part of their application for a Category 1, Class A Pit (Below Water) licence as required under the *Aggregate Resources Act* (ARA).

As per the requirements of the ARA, the study area for this Natural Environment Level 1 and Level 2 Report is defined as the proposed licence boundary plus an area extending 120m from this boundary (i.e., 120m adjacent lands) [Figure 1].

## 1.1 Purpose and Objectives

The purpose of a Natural Environment Level 1 Report is to determine whether any of the significant natural heritage features as identified by the Provincial Policy Statement (PPS) (2014) are located in and/or within 120m of the proposed licence boundary. To complete the Level 1 Report, BioLogic reviewed existing records and conducted site specific investigations to identify the following natural heritage features:

- habitats of endangered and threatened species
- wetlands
- woodlands
- valleylands
- wildlife habitats
- Areas of Natural and Scientific Interest (ANSI)
- fish habitats

If any of the above features were identified within the proposed licence boundary or within 120m, the Level 1 Report evaluates identified features for provincial significance using the criteria provided in the Natural Heritage Reference Manual (MNR, 2010) and the Significant Wildlife Habitat Criteria Schedules (MNRF, 2015) with support from the Significant Wildlife Habitat Technical Guide (MNR, 2000).

The purpose of a Natural Environment Level 2 Report is to conduct an impact assessment of the proposed aggregate extraction on the significant natural heritage features identified in the Level 1 Report. The impact assessment determines any negative impacts to the significant natural features or their ecological functions, and identifies preventative, mitigative or remedial measures.

The following legislation, policies, regulations, and guiding documents were reviewed and consulted for this Natural Environment Level 1 and Level 2 Report:

- *Aggregate Resources Act* (ARA) (1990)
- Provincial Policy Statement (PPS) (2014)
- *Endangered Species Act* (ESA) (2007)
- *Species at Risk Act* (SARA) (2002)
- *Migratory Birds Convention Act* (MBCA)(1994)
- *Fish and Wildlife Conservation Act* (FWCA) (1997)
- *Fisheries Act* (1985)
- *Conservation Authorities Act*: Ontario Regulation 157/06 (2006)
- Municipality of Middlesex Centre Zoning By-law (2005)
- Municipality of Middlesex Centre Official Plan (2015)
- Middlesex County Official Plan (2006)
- Natural Heritage Reference Manual (MNRF, 2010)
- Significant Wildlife Habitat Criteria Schedules - Ecoregion 7E (MNRF, 2015)
- Significant Wildlife Habitat Technical Guide (MNR, 2000)

## 1.2 Report Format

This report is organized in the following sections to conform to the requirements of the Aggregate Resources of Ontario Provincial Standards for Natural Environment Level 1 and Level 2 Reports, as required by the ARA.

**Section 2: Licence Boundary and Description:** This section describes the general area of the proposed aggregate extraction.

**Natural Environment Level 1 Report**

**Section 3: Records Review:** This section provides a review of existing records and supporting information collected by others (i.e., NHIC data, LIO mapping and other databases or reports) to identify any natural heritage features within the proposed licence boundary and its adjacent 120m.

**Section 4: Site Investigations:** This section summarizes findings from the site specific investigations and/or reconnaissance completed for the proposed licence boundary and its adjacent 120m. Any differences between the records and the site specific data are also noted in this section.

**Section 5:** **Significant Natural Heritage Features:** This section evaluates the provincial significance of all the natural heritage features that are located in or within 120m the proposed licence boundary.

## Natural Environment Level 2 Report

**Section 6:** **Environmental Impact Assessment:** The Natural Environment Level 2 report assesses potential impacts to the significant natural heritage features and their functions that were identified in the Level 1 Report. The Level 2 Report also provides recommendations for avoidance, mitigation, restoration and/or compensation, which shall be included in the licence application.

## 2.0 Licence Boundary Description and Surrounding Land Use

The location of the proposed 24.7 ha Category 1, Class A (Below Water) aggregate pit is described as Part Lots 1 and 2, Concession 2, Municipality of Middlesex Centre (formerly Township of Lobo), Middlesex County. The location is immediately east of Amiens Road, south of the CN rail line, and southwest of Komoka, Ontario [Figure 1].

The region is primarily agricultural with interspersed aggregate extraction pits and woodlands. The proposed licence boundary primarily consists of agricultural fields with several hedgerows [Figure 1]. A newly dug farm pond is located within the northeast end of the proposed licence boundary. To the immediate north and east of the proposed boundary is a large wooded area that contains the Komoka/South Strathroy Creek Wetland complex, several farm irrigation ponds and the Komoka Creek. To the south and west the surrounding land uses include agricultural fields with a small number of residences situated along Glendon Drive and Amiens Road.

# 3.0 Records Review

A review of existing records included the examination of existing databases, reports and literature to identify any natural heritage features within the proposed licence boundary and its adjacent 120m. The records that were searched and analyzed include:

a) Physical Environment Records
   - Quaternary Geology mapping
   - Physiography mapping
   - Soil Survey of Middlesex County (Hagerty and Kingston, 1992)
   - Topography mapping

b) Hydrology Records
   - Hydrogeological Level 1 and Level 2 Assessment Repot (Novaterra, 2017)

c) Provincial Government Records – Ministry of Natural Resources & Forestry (MNRF)
   - MNRF Make-a-Map: Natural Heritage Areas Application powered by Lands Information Ontario (LIO) (MNRF, 2017) which includes the NHIC database
   - Pre-Screening summary of species of provincial concern from NHIC and MNRF
   - Historic Forest Resource Inventory mapping (ODLR, 1952)

d) Local Municipality Records
   - Municipality of Middlesex Centre Official Plan (2015)
   - Municipality of Middlesex Centre Zoning By-law (2005)

e) The Upper Thames River Conservation Authority (UTRCA)
   - Regulated areas mapping that relates to Ontario Regulation 157/06

## 3.1 Physical Environment Records

### *3.1.1 Physiography and Geology*

Bedrock geology consists of limestone, dolostone and shale of the Hamilton Group (OGS, 1991) with the bedrock formation located more than 55m below surface (Novaterra, 2017). The site is located in the Caradoc Sand Plains and London Annex (Chapman and Putnam, 1984).

The surficial geologic setting for the area consists of late Wisconsin aeolian deposits (i.e., low dunes and

sand plains, former sandy deltaic, lacustrine and beach deposits) (Dreimanis, 1964). Modern alluvium (i.e., gravel, sand, and silt containing organic remains) is present along Komoka Creek within the adjacent lands to the northeast and east (Dreimanis, 1964).

#### *3.1.2 Soils*

Soils consists of the Plainfield series with the exception of the northeast corner of the 120m adjacent lands where there is a shallow humic organic deposit (Hagerty and Kingston, 1992). Plainfield soils are aeolian or wind-modified glaciolacustrine, fine sand to loamy fine sand with total sand content ranging between 80-90% (Hagerty and Kingston, 1992).

Within the proposed licence boundary, the near surface deposits consists of sand and gravel with trace amounts of silt, fine sand, and sandy silt (Novaterra, 2017) [Appendix A]. The sand and gravel thickness is relatively uniform across the licence boundary, varying between 9.2m and 10.7m. Beneath the aggregate material there are fine sand deposits with some silt, gravely silty sand and sandy silt (Novaterra, 2017).

#### *3.1.3 Topography*

Regional topography is nearly level to slightly sloping with an overall slope to the southeast towards the Thames River (Hagerty and Kingston, 1992). The Thames River is the defining valleyland within the region and is 1.4km southeast of the proposed licence boundary.

Topography within the study area (proposed license boundary plus 120m) is generally flat (239mASL). The exceptions to this general flatness are, a knoll located east of the newly constructed farm pond within the licence boundary (Novaterra, 2017) and the bank slopes associated with the CN rail line.

### 3.2 Hydrology Records

#### *3.2.1 Surface Water*

No watercourses are identified within the licence boundary. Komoka Creek is the nearest watercourse located 100m east of the proposed licence boundary [Figure 1]. This permanent watercourse, flows southerly to join the Thames River approximately 3 km downstream (see key plan on Figure 1). Komoka Creek is an effluent stream receiving groundwater inputs through diffusive discharge along the stream bottom and banks

(Novaterra, 2017). Temperature studies suggest the creek is a cool water system (Novaterra, 2017).

There are three farm irrigation ponds within the study area [Figure 1]. The west and central irrigation ponds, located just north of the proposed licence boundary, are active and as a result, these ponds experience large water level fluctuations over the growing season. The east pond is a newly constructed farm irrigation pond within the proposed license boundary that had not yet been used for irrigation at the time of our field work (i.e., stable water levels).

#### *3.2.2 Groundwater*

The sand and gravel layer is saturated to within 1.8 to 3.4 m of the surface and considered to be a water table aquifer (Novaterra, 2017). The groundwater flows through the study area in a southeast direction (Novaterra, 2017), away from the wetlands to the north. The licence boundary is within an area identified as a highly vulnerable aquifer (HVA) with a vulnerability score of 6 (TSRSPC, 2015).

### 3.3 Provincial Records

#### *3.3.1 Designated Natural Areas*

No Areas of Natural and Scientific Interest (ANSI) or Environmentally Significant Areas are located in the proposed licence boundary or the adjacent 120m (MNRF, 2017) [Figure 2]. The closest ANSI is the Komoka Park Reserve ANSI, located 2 km to the east within the Komoka Provincial Park.

Although no Provincially Significant Wetlands (PSWs) are located within the licence boundary, the Komoka/South Strathroy PSW is to the north and northeast within the adjacent 120m [Figure 2]. Historically, this wetland/wooded area was a mix of dry scrub, Aspen, Poplar, Black Cherry and Black Ash-White Elm-Red Maple communities (ODLR, 1952).

#### *3.3.2 Woodlands*

A small woodland pocket and a portion of a hedgerow are identified in MNRF mapping within the central portion of the proposed licence boundary (MNRF, 2017) [Figure 2]. There are large woodland features to the north and south of the proposed licence boundary but only the north feature falls within the 120m

adjacent land boundary [Figure 2]. A riparian woodland (also identified as a wetland) along Komoka Creek also exists within the adjacent 120m.

#### *3.3.3 Species at Risk and other Provincially Significant Species*

A Stage 1 Screening report was submitted to MNRF (March 16, 2017) which provided a summary of site observations and suggested list of species to consider [Appendix B]. MNRF response (June 12, 2017) provided a finalized list [Appendix B] which included a total of 11 species at risk (including SAR bats as one). There are also an additional 10 provincially significant species (SC and S1-S3) in the area with the potential to occur on or adjacent to the proposed licence boundary [Table 1].

Department of Fisheries and Oceans (DFO) mapping identified one or more threatened and endangered fish species that may be found within Komoka Creek (DFO, 2017). However, based on known population distributions (MNR, 2013a; Staton et al. 2010) only Eastern Sand Darter is likely for Komoka Creek.

### 3.4 Municipal Records

#### *3.4.1 Middlesex Centre Official Plan (2015)*

**Environmental Designations**

The small woodland feature within the proposed license boundary is identified as a "Significant Woodland" (Schedule B - Greenlands System) [Figure 3]. The much larger wooded feature to the north and along Komoka Creek to the northeast are also identified as 'Significant Woodland'.

**Land Use Designations**

The south portion of the proposed licence boundary is designated 'Settlement Employment' (Schedule A -2) [Figure 4]. There is a 'Natural Environment' designation to the north within the 120m adjacent lands and centrally in the proposed licence boundary, consistent with the Significant Woodland designation noted above. This natural environment area also falls within a broader 'Hazard Lands' designation.

'Natural Environment Enhancement Area' and 'Parks and Recreation' designations fill in the gaps between the 'Natural Environment' and 'Settlement Employment' areas. These added features partially fall within the licence boundary [Figure 4]. The goals of these designations are to either buffer existing natural heritage

**Table 1:Records Review of Significant Species**

| Scientific Name | Common Name | S-Rank | ESA Status | Habitat Protection | Source | |
|---|---|---|---|---|---|---|
| | | | | | Stage 1 Screening | MNRF |
| **Plants** | | | | | | |
| *Aletris farinosa* | Colic Root | S2 | THR | General | x | |
| *Tomostima reptans* | Creeping Draba | S3 | | | ✓ | |
| *Symphyotrichum prenanthoides* | Crooked-stem Aster | S2 | | | | ✓ |
| *Cornus florida* | Eastern Flowering Dogwood | S2? | END | Regulated | x | ✓ |
| *Valeriana edulis* | Edible Valerian | S1 | | | ✓ | |
| *Arisaema dracontium* | Green Dragon | S3 | SC | | ✓ | ✓ |
| *Lithospermum caroliniense* | Golden Puccoon | S3 | | | | ✓ |
| *Carex trichocarpa* | Hairy-fruited Sedge | S3 | | | ✓ | |
| *Zizia aptera* | Heart-leaved Alexanders | S1 | | | ✓ | |
| *Desmodium canescens* | Hoary Tick-trefoil | S2 | | | ✓ | |
| *Isotria verticillata* | Large Whorled Pogonia | S1 | END | General | x | |
| *Sanicula canadensis var. grandis* | Long-styled Canada Sanicle | S2 | | | ✓ | |
| *Cystopteris protrusa* | Lowland Brittle Fern | S2 | | | ✓ | |
| *Desmodium rotundifolium* | Prostrate Tick-trefoil | S2 | | | ✓ | |
| *Carex tetanica* | Rigid Sedge | S3 | | | ✓ | |
| *Dichanthelium sphaecocarpon* | Round Fruited Panic Grass | S3 | | | ✓ | |
| *Muhlenbergia tenuiflora* | Slim-flowered Muhly | S2 | | | ✓ | |
| *Monarda punctata* | Spotted Beebalm | S1 | | | ✓ | |
| *Genrianella quinquefolia* | Stiff Gentian | S2 | | | ✓ | |
| *Lupinus perennis* | Sundial Lupine | S3 | | | ✓ | |
| *Amoglossum plantagineum* | Tuberous Indian-plantain | S3 | SC | | ✓ | |
| *Pteorspora andromeda* | Woodland Pinedrops | S2 | | | ✓ | |
| *Spiranthes ochroleuca* | Yellow Ladies'-tresses | S2 | | | ✓ | |
| *Hypoxis hirsuta* | Yellow Stargrass | S3 | | | ✓ | |
| **Birds** | | | | | | |
| *Riparia riparia* | Bank Swallow | S4B | THR | General | added | ✓ |
| *Hirundo rustica* | Barn Swallow | S4B | THR | General | added | ✓ |
| *Dolichonyx oryzivorus* | Bobolink | S4B | THR | General | | ✓ |
| *Setophaga cerulea* | Cerulean Warbler | S3B | THR | General | x | |
| *Chaetura pelagica* | Chimney Swift | S4B | THR | General | | ✓ |
| *Sturnella magna* | Eastern Meadowlark | S4B | THR | General | | ✓ |
| *Contopus virens* | Eastern Wood-pewee | S4B | SC | | | ✓ |
| *Vermivora chrysoptera* | Golden-winged Warbler | S4B | SC | | | ✓ |
| *Ammodramus henslowii* | Henslow's Sparrow | SHB | END | General | x | |
| *Parkesia motacilla* | Louisiana Waterthrush | S3B | THR | General | x | ✓ |
| *Melanerpes erythrocephalus* | Red-headed Woodpecker | S4B | SC | | | ✓ |
| *Hylocichla mustelina* | Wood Thrush | S4B | SC | | | ✓ |
| *Icteria virens* | Yellow-breasted Chat | S2B | END | General | x | |
| **Reptiles** | | | | | | |
| *Emydoidea blandingii* | Blanding's Turtle | S3 | THR | General | | ✓ |
| *Heterodon platirhinos* | Eastern Hog-nosed Snake | S3 | THR | General | | ✓ |
| *Chelydra serpentina* | Snapping Turtle | S3 | SC | | | ✓ |
| *Lampropeltis triangulum* | Milksnake | S3 | | | | ✓ |
| **Butterflies and Odonate** | | | | | | |
| *Asterocampa celtis* | Hackberry Emperor | S2 | | | ✓ | |
| Asterocampa clyton | Tawny Emperor | S2S3 | | | ✓ | |
| **Mammals** | | | | | | |
| *Taxidea taxus* | American Badger | S2 | END | Regulated | | ✓ |
| *Perimyotis sp. & Myotis sp.* | SAR Bats | – | END | General | | ✓ |

Ontario ESA Listing: END - Endangered; THR - Threatened; SC - Special Concern
Habitat Protection: Only applies to END and THR species
✓- potential to occur within the study area; x - screening report suggested habitat not present; added - species observed in study area

features, enhance linkages, and/or create habitats as well as provide opportunities for compatible forms of public access and passive recreation uses, such as trails, wildlife viewing areas and outdoor education (Middlesex Centre Official Plan, 2015).

### *3.4.2 Middlesex Centre Zoning (2005)*

The entire proposed licence boundary and the adjacent 120m are within an 'A1 General Agriculture' zone. There is also a 'Fill Regulated Areas' overlay on this zone map that extends from the north and northeast (Schedule A - Key Map 67) which is consistent with the 'Hazard Lands' designation on Schedule A-2 of the Official Plan [Figure 4].

## 3.5 UTRCA Regulation

The UTRCA regulation limit reflects a wetland hazard associated with the Komoka/South Strathroy Creek PSW [Figure 5]. To the northeast along the edge of the licence boundary, the regulation limit also reflects an erosion hazard associated with Komoka Creek. While these features (Komoka Creek and the PSW) arel beyond the proposed licence boundary, the regulation limits associated with these features extends into the licence boundary.

## 3.6 Records Review Summary

Based on the records review, there is a small portion of 'Significant Woodland' (as per Official Plan) within central region of the proposed licence boundary. Portions of the 'Significant Woodland' and the Komoka/South Strathroy Creek PSW are within the adjacent 120m to the north and northeast.

There is potential for 3 Endangered species and several Endangered bat species, 8 Threatened species, 7 Special Concern species and S1 to S3 ranked species to be possibly present in the general area of the proposed licence boundary [Table 2].

Site investigations were conducted (Section 3) to address known species of provincial interest. The identified species and their potential habitats were given special consideration during site investigations. The results and analysis of the site investigations are discussed in Section 4. Some species have been added since completion of the field season as a result of the ESA screening process. These added species are discussed below in that context as well.

**Table 2: Records Review Summary**

| Natural Feature | Feature Identified in Records Review | Identifying Source |
|---|---|---|
| **Habitats of Endangered and/or Threatened Species** | potential for:<br>Eastern Flowering Dogwood (END)<br>American Badger (END)<br>Bats (END - select species)<br>Eastern Sand Darter (END)<br>Bank Swallow (THR)<br>Barn Swallow (THR)<br>Bobolink (THR)<br>Chimney Swift (THR)<br>Eastern Meadowlark (THR)<br>Louisiana Waterthrush (THR)<br>Blanding's Turtle (THR)<br>Eastern Hog-nosed Snake (THR) | MNRF NHIC Data<br>MNRF Natural Heritage Areas Mapping<br>DFO SAR Mapping<br>MNRF ESA Screening Correspondence |
| **Wetlands** | Komoka/South Strathroy Creek Wetland (PSW) | MNRF Natural Heritage Areas Mapping<br>MNRF ESA Screening Correspondence<br>Hydrogeological Report (Novaterra, 2017) |
| **Woodlands** | within adjacent 120m to the north and northeast | MNRF Natural Heritage Areas Mapping<br>Official Plan Schedules |
| **Valleylands** | Komoka Creek in adjacent 120m | Official Plan Schedules<br>UTRCA Regulation Mapping<br>Topography Mapping |
| **Wildlife Habitats** | potential for:<br>Green Dragon (SC)<br>Tuberous Indian-plantain (SC)<br>Eastern Wood-pewee (SC)<br>Golden-winged Warbler (SC)<br>Red-headed Woodpecker (SC)<br>Wood Thrush (SC)<br>Snapping Turtle (SC)<br>S1 to S3 ranked species | MNRF NHIC Data<br>MNRF ESA Screening Correspondence |
| **ANSI** | none | MNRF Natural Heritage Areas Mapping<br>MNRF ESA Correspondence |
| **Fish Habitat** | Komoka Creek in adjacent 120m | MNRF ESA Screening Correspondence<br>UTRCA Regulation Mapping<br>Hydrogeological Report (Novaterra, 2017) |

# 4.0 Site Investigations

Site investigations were conducted in 2016 [Table 3] to inventory the vegetation communities, flora and wildlife, assess the physical terrain characteristics, and to provide an assessment of the ecological features and functions within and adjacent to the proposed licence boundary.

**Table 3: Site Investigations Summary**

| Date | Site Investigation | Biologic Staff |
|---|---|---|
| April 20, 2016 | Amphibian Call Survey #1 | Laura McLennan |
| May 26, 2016 | ELC, Migratory Bird Survey; Spring Floral Survey #1 | Will Huys |
| May 27, 2016 | Amphibian Call Survey #2 | Laura McLennan |
| June 15, 2016 | ELC, Breeding Bird Survey #1; Spring Floral Survey #2 | Will Huys |
| June 24, 2016 | Amphibian Call Survey #3 | Laura McLennan |
| July 2, 2016 | ELC, Breeding Bird Survey #2; Summer Floral Survey #1 | Will Huys |
| August 22, 2016 | ELC, Summer Floral Survey #2 | Will Huys |
| October 7, 2016 | Fall Floral Survey | Will Huys |

Incidental observations of wildlife species, such as reptiles, insects and mammals were also recorded when encountered during all site visits. Site investigations were not completed for areas north of the CN rail line since permission to access was not granted. For that area, information for this report was collected through a combination of air photo interpretation and observations from the rail line edge.

## 4.1 Vegetation Communities

Vegetation communities were classified following the Ecological Land Classification (ELC) Protocol for Southern Ontario (Lee *et al.,* 1998). Vegetation community field investigations were conducted on May 26, June 15, July 2 and August 22, 2016 by Will Huys, certified to conduct ELC in Ontario. Dominant species cover, community structure, level of disturbance, presence of indicators species and other notable features were recorded by community.

### Findings:

The various vegetation communities are summarized in Table 4, illustrated on Figure 6 and discussed below. Detailed ELC field sheets are provided in Appendix C.

**Table 4: Ecological Land Classifications**

| Polygon | Area (ha) | ELC Code | Description |
|---|---|---|---|
| **Anthropogenic Communities** | | | |
| A1 | – | – | Agricultural Fields (corn and beans) - includes east pond (0.53ha) |
| A2 | 3.4 | – | Horse Pasture |
| H1 | – | – | Hedgerow - Spruce |
| H2 | – | – | Hedgerow - Willow |
| **Cultural Communities** | | | |
| 1 | 1.5 | CUT1 | Mineral Cultural Thicket Ecosite with FOD Deciduous Forest inclusion (0.48ha) with the 0.22ha west irrigation pond |
| 4 | 1.6 | CUP3 | Coniferous Plantation - White and Blue Spruce |
| 5 | 1.2 | CU | Cultural Community consisting of a cultural thicket (CUT), woodland (CUW), plantation (CUP) and the 0.18ha central irrigation pond |
| **Wetland Communities** | | | |
| 2 | 3.5 | SWD3-3 | Swamp Maple Mineral Deciduous Swamp Type |
| 3 | 3.4 | SWD7 | Birch-Poplar Organic Deciduous Swamp Type |

**Agricultural Fields**

The agricultural fields within and adjacent to the proposed licence boundary are used to grow cash crops and were planted with corn and beans in the 2016 growing season. There is a newly constructed 0.53ha farm irrigation pond in the northeastern portion of the licence boundary (i.e., east pond).

**Horse Pasture**

An active horse pasture is located within 120m of the proposed licence boundary to the east.

**Hedgerows**

There are various spruce hedgerows that transect the proposed licence boundary and the southern adjacent 120m. One Willow hedgerow is located within the southern adjacent120m. This hedgerow does not extend into the proposed licence boundary as the MNRF Natural Heritage woodland mapping suggests [Figure 2].

**CUT1 Mineral Cultural Thicket Ecosite**

Community 1 is a cultural thicket located near Amiens Road, north of the licence boundary. A small portion of its edge lies within the boundary [Figure 6]. Within this community there is evidence of historical earth moving works (vegetated dirt piles throughout), several bee hives and a maintained farm lane. Where dirt piles have been created there are young, regenerating Cottonwood Poplar (*Populus deltoides*) with a mix of Staghorn Sumac (*Rhus typhina*) and Willow (*Salix sp.*) species. The open, cleared areas are dominated with grasses and forbs. A small FOD deciduous forest inclusion (0.49ha) in the west end surrounds the 0.22ha west irrigation pond and is transected by a farm lane. The FOD inclusion has similar species to the

FOD/SWD community north of the rail line (Maple, Basswood, and Oak). Soils in the community are silty-fine sand with a moisture regime of 3 or very fresh.

**CUP3 Coniferous Plantation**

Community 4 is a planted coniferous community consisting of an older area (0.3ha) and a younger area (1.3ha). Within the proposed licence boundary is the younger (5-6 years old) Blue Spruce (*Picea pungens*) plantation that is regularly mowed between the rows. Within the adjacent 120m is an older (15-20 years old) White Spruce (*Picea glauca*) plantation with a dense canopy and sparse understorey and groundlayer.

**CU Cultural Communities**

Community 5 is a 1.2ha cultural area consisting of a cultural thicket (0.95ha), the central irrigation pond (0.15ha), smaller patches of a cultural plantation (0.06ha) and a cultural woodland (0.2ha) that is separated from the main feature by a farm lane.

Within the proposed licence boundary is a small portion of Community 5, which consists of a small grove of Cottonwood (*Populus deltoids*) and some Willow species (*Salix sp.*) surrounded by a thicket, largely dominated Staghorn Sumac (*Rhus typhina*). The groundlayer appeared to have been mowed or maintained irregularly which has suppressed groundlayer and successional growth. The feature is used to store equipment on occasion (farm wagon with drain tile and old implements at the time of the field surveys). This small feature is well separated from the larger woodland feature by a farm lane.

Adjacent to the licence boundary, and buffering a portion of Community 2 (SWD3-3), is the large portion of the cultural thicket (CUT), the pine plantation patch (CUP) and the 0.18ha central irrigation pond. The cultural thicket area is dominated by Staghorn Sumac, Goldenrod (*Solidago sp.*) and Aster species (*Syphyotrichum sp.*). A Quonset shed and piles of concrete rubble, lumber, old farm equipment, and retired trucks exist in the thicket area.

**SWD3-3 Swamp Maple Mineral Deciduous Swamp Type**

Community 2 is a forested swamp community located within the adjacent 120m. Composition is dominated by Silver (*Acer saccharinum*) and/or Red Maple (*Acer rubrum*) in the canopy and sub-canopy layers, with the occasional Black Cherry (*Prunus serotina*), Swamp White Oak (*Quercus bicolor*) and American Beech (*Fagus grandifolia*). The understory is fairly open with Elderberry (*Sambucus canadensis)*, Tatarian Honeysuckle (*Lonicera tatarica*), and Witch-hazel (*Hamamelis virginiana*). The ground layer is primarily ferns (*Osmunda cinnamomea, Osmunda regalis, Onoclea sensibilis, Dryopteris carthusiana, etc.*) but has

a good mix of False Solomon's Seal (*Maianthemum racemosum*), Baneberry (*Actea pachypoda*), and Wild Geranium (*Geranium maculatum*). In the northeast corner along the rail line a small patch (0.1ha) of a Sugar Maple (Acer saccharum) forest exists.

Overall, there is a mix of wetland and non-wetland species represented in this community. No standing or any evidence of vernal pooling was observed even though the community is generally lower than the surrounding topography. Soil cores were conducted which showed silty-fine sand with a moisture regime of 6 or very moist.

Site investigations have determined that the wetland community located centrally in the adjacent lands is larger than the wetland community mapped by the MNRF [Figure 2].

**SWD7 Birch-Poplar Organic Deciduous Swamp Type**

Community 3 is located within the adjacent 120m to the northeast with a small portion extending along the rail line. Poplar (*Populus deltoides, Populus tremuloides*) is the dominant canopy species with Manitoba Maple (*Acer negundo*) as a common associate with the occasional Basswood (*Tilia americana*) and Hackberry (*Celtis occidentalis*) The understory is dense with Dogwood (*Cornus foemina, Cornus stolonifera*), Willow (*Salix sp.*) and Elderberry (*Sambucus canadensis*). Skunk Cabbage (*Symplocarpus foetidus*) dominates the groundlayer with occasional Sensitive Fern (*Onoclea sensibilis*), Buttercup (*Ranunculus sp.*) and Wood Nettle (*Laportea canadensis*). Organic deposits up to 85cm deep were encountered during soil investigations. The portion along the rail line is the edge of a maintenance/ATV trail and is not really reflective of the overall swamp community.

**FOD/SWD Community North of Rail Line**

Observations were limited to approximately 30-40m north of the rail line. A mix of an FOD deciduous forest and SWD deciduous swamp community type, likely similar to those on the subject lands is present north of the rail line. Tree species observed were Bur Oak (*Quercus macrocarpa*), Basswood (*Tilia americana*), Swamp White Oak (*Quercus bicolor*), Silver, Red Maple and Sugar Maple (*Acer sp.*). Areas of clearing and/or wet meadow were also observed.

## 4.2 Potential Wildlife Habitat

### *4.2.1 Potential Habitat for Threatened and Endangered Species*

Based on the MNRF ESA screening process and vegetation communities present there is potential habitat for Threatened or Endangered species as well as SAR bats [Appendix D]. The following species and their potential habitat were given special consideration during site investigations:

- Eastern Flowering Dogwood (END)
- Bank Swallow (THR)
- Barn Swallow (THR)
- Bobolink (THR)
- Eastern Meadowlark (THR)
- Louisiana Waterthrush (THR)
- Eastern Sand Darter (END)

The following species were added to the list as part of the MNRF correspondence. Because this added list was, received after life science work was completed, these species are discussed with respect to habitat requirements.

- Eastern Hog-nosed Snake (THR)
- American Badger (END)
- Bats (END) * one or more of Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat

The following species were considered to be not present based on habitat requirements [see Appendix D].

- Chimney Swift (THR) - no man made structures to support species
- Blanding's Turtle (THR) - ponds are for irrigation and habitat is not suitable given unreliable water levels and no heavy vegetation growth around newly constructed irrigation pond within licence area.

### *4.2.2 Candidate Significant Wildlife Habitat*

The assessment for Significant Wildlife Habitat (SWH) is guided by SWH Criteria Schedules (MNRF, 2015). This evaluation process first uses ELC Ecosite codes and habitat criteria (e.g., size and/or location of the ELC polygon) to identify candidate significant wildlife habitats. Based on the Criteria Schedules for

Ecoregion 7E (MNRF, 2015) the following candidate SWH was identified for the proposed licence boundary and its adjacent 120m [Appendix E]:

1. Seasonal Concentration Areas of Animals for:
    - Bat Maternity Colonies
    - Turtle Wintering Areas
2. Specialized Habitat for Wildlife for:
    - Amphibian Breeding Habitat – Woodland
    - Amphibian Breeding Habitat – Wetland
3. Habitat of Species of Conservation Concern for:
    - Marsh Bird Breeding Habitat for Green Heron
    - Terrestrial Crayfish
    - Habitat for Species listed Special Concern and S1 to S3 ranked
4. Animal Movement Corridors for:
    - Amphibian Movement Corridors

The candidate SWH identified above, are evaluated further, following the life science inventory results, to determine the presence of SWH within the study area (Section 5).

## 4.3 Vascular Plant Inventories

Plant inventories were conducted May 26, June 15, July 2, Aug 22 and October 7, 2016 for the vegetation communities south of the rail line (i.e., CUT1, CU, SWD3-3 and SWD7) to capture the spring, summer and fall growing seasons. A comprehensive species list was compiled and each species was cross referenced with the Rare Vascular Plant List of Ontario (Oldham and Brinkler, 2009) and the MNRF Species at Risk in Ontario list for provincial significance.

**Findings:**

A total of 228 species of plants was recorded [Appendix F]. Of these, 168 (74%) are native species and 60 (26%) are exotic. Both cultural communities (Community 1: CUT and Community 5: CU) are comprised of approximately 60-65% native species, while in the natural communities (Community 2: SWD3-3 and Community 3: SWD7), 83 % are native species. The average Coefficient of Conservatism (CC) value for the study area is 4.20, which indicates a moderately high occurrence of species tolerant to disturbance.

No plants protected under the Endangered Species Act (i.e., species listed as Endangered or Threatened) nor provincially significant plant species (i.e., species listed Special Concern or ranked S1-S3) were found in or within 120m of the proposed licence boundary.

## 4.4 Wildlife Surveys

### *4.4.1 Amphibians*

Amphibian call surveys were completed according to the protocol outlined in the Marsh Monitoring Program (MMP) (BSC, 2009). In 2016, evening temperatures were below 5 $^0$C most nights until mid-April causing a delay in the startup of the first amphibian surveys. Again, evening temperatures were cool (less than 10 $^0$ C) until late May. Summer breeding surveys were a week later than the typical ideal timing to allow for 15 days between survey times. Amphibian monitoring station locations were established with the intention of surveying all suitable amphibian breeding habitats present within the proposed licence boundary and its adjacent 120m. Details on site conditions for the 2016 amphibian surveys are summarized in Table 5 or found in Appendix G.

**Table 5: Amphibian Call Survey Conditions**

| Date | Start | Finish | Temp.(°C) | Wind | Noise Index | Precipitation | Weather Condition |
|---|---|---|---|---|---|---|---|
| April 20, 2016 | 21:20 | 21:50 | 14 | 2 | 0 | None | hazy |
| May 27, 2016 | 22:45 | 23:15 | 20 | 0 | 0 | None | 80% cloud cover |
| June 24, 2016 | 21:45 | 22:15 | 21 | 0 | 0 | None | clear sky |

| Beaufort Wind Scale | | Noise Codes | |
|---|---|---|---|
| 0 | Calm; smoke rises vertically | 0 | No appreciable effect (i.e., owl calling) |
| 1 | Light air movement; smoke drifts | 1 | Slight affect (i.e., dog barking, 1 car passing) |
| 2 | Slight breeze; wind felt on face, leave rustle | 2 | Moderate affect (i.e., 2-5 cars passing) |
| 3 | Gentle breeze; leave and small twigs in motion | 3 | Serious affect (i.e., 6-10 cars passing) |
| 4 | Moderate breeze; small branches move, raises dust | 4 | Profound affect (i.e., continuous traffic) |

**Findings:**

Within the proposed licence boundary, amphibians were heard calling from the new east irrigation pond. Within the adjacent 120m lands, amphibians were heard calling from three locations: both west and central irrigation ponds and a woodland vernal pool just north of the rail line and east of Amiens Road [Table 6 and Appendix G].

The vernal pool to the northwest, within FOD/SWD, supported a full chorus of Spring peeper in the first visit and then on the second visit supported a full chorus of Western Chorus Frogs and Spring Peepers (level 2). On the third visit it supported a calling code level 2 for Gray Treefrog [Table 6 and Appendix G].

The west irrigation pond supported very little amphibian activity with just a few green frogs on one of the three visits. The central irrigation pond supported a number of Green Frogs plus some Spring Peepers (each a call level 2) in the first spring visit.

**Table 6: Amphibian Call Survey Data**

| Station | April 20, 2016 | May 27, 2016 | June 24, 2016 |
|---|---|---|---|
| FOD/SWD north of rail line | Spring Peeper (L3) | Spring Peeper (L2)<br>W. Chorus Frog (L3) | Gray Treefrog (L2) |
| West Irrigation Pond | none | Green Frog (L1) | none |
| Central Irrigation Pond | Spring Peeper (L1) | Green Frog (L2) | Green Frog (L2) |
| East Pond | none | W. Chorus Frog (L2) | Gray Treefrog (L2)<br>Green Frog (L2)<br>Bullfrog (L1) |

Calling Levels (BSC, 2009):
L1 = non-overlapping calls (a few individuals, can count individuals)
L2 = overlapping calls (moderate number of individuals, estimate of individuals)
L3 = full chorus (calls continuous and overlapping, can not reasonably estimate individuals)

The only open water feature within the licence boundary (the new farm irrigation pond), was also silent in the first visit but supported Western Chorus Frog (level 2) in May and then Grey Treefrog (level 2), Green Frog (level 2) and a single Bullfrog in June [Table 6 and Appendix G]. The east pond is a newly constructed irrigation pond that has not yet been used for irrigation, resulting in a permanent, reliable water feature when compared to the other active irrigation ponds north of the proposed licence boundary (i.e., fluctuating water levels). Based on the higher diversity in the east pond, even when only just constructed, it appears a stable water source is an important requirement for the local amphibian populations.

**Summary:** Amphibian populations were found within the proposed licence boundary in the east pond. Within the 120m adjacent lands, amphibians were concentrated within the vernal pool in the FOD/SWD north of the rail line. Smaller numbers were recorded within the west and central irrigation ponds; likely a result of fluctuating water levels from irrigation withdrawl.

### *4.4.2 Breeding Birds*

Breeding bird surveys were conducted on June 15 and July 2, 2016 [Table 7] according to the protocols outlined in the Ontario Breeding Bird Atlas (OBBA) (Cadman et al., 2007). Each survey followed a wandering transect so that both the proposed licence boundary and the adjacent 120m were appropriately covered.

**Table 7: Breeding Bird Survey Conditions**

| Date | Start | Finish | Duration | Temp.(°C) | Precipitation | Weather Condition |
|---|---|---|---|---|---|---|
| June 15, 2016 | 05:30 | 10:15 | 4.75hrs | 15 | None | 70% cloud cover, cool |
| July 2, 2016 | 07:00 | 10:00 | 3hrs | 18 | None | clear, still |

**Findings:**

A total of 38 bird species was recorded during the 2016 breeding bird surveys [Appendix F]. The majority of the birds were observed within the wooded communities north and east of the proposed licence boundary (Community 1: CUT, Community 2: SWD3-3, and Community 3: SWD7) with only two bird species recorded within the proposed licence boundary [Appendix G].

Bank Swallows [THR] were found nesting in a topsoil stockpile adjacent to the east pond during the first breeding bird visit. In the adjacent 120m, three Barn Swallows [THR] were observed inside the Quonset shed located in Community 5 (CU) during the first breeding bird survey.

Two Special Concern bird species (Eastern Wood Pewee and Wood Thrush) were noted inthe adjacent lands. The Eastern Wood Pewee was recorded in Community 1 (CUT1), Community 2 (SWD3-3) and Community 3 (SWD7) while the Wood Thrush was only recorded in Community 3 (SWD7).

No stick nests, no marsh breeding habitat, nor Green Herons specifically, were observed within the licence boundary or the adjacent 120m. All other bird species are ranked S4 (apparently secure) or S5 (secure) in Ontario.

**Summary:** Bank Swallows (THR), which are protected under the Endangered Species Act, were recorded within the proposed licence boundary.. Within the 120m adjacent lands, one bird species at risk (Barn Swallow - THR) and two Special Concern species were recorded (Eastern Wood-pewee and Wood Thrush).

### *4.4.3 Reptiles*

Snakes, turtles or signs of their presence were noted through incidental observations while conducting site visits. Cover objects (i.e., rocks, woody debris and anthropogenic debris) were also searched.

**Findings:**

One Eastern Garter Snake was observed in the CUT area of Community 5 in the adjacent 120m. No turtles or turtle nests were observed during field visits [Appendix G]. No reptile species at risk (i.e., species listed as Endangered or Threatened) or no provincially significant reptile species (i.e., species listed Special Concern or ranked S1-S3) were found in or within 120m of the proposed licence boundary.

ELC information [Appendix C] suggest the soils are very moist (not dry) and the amphibian call surveys [Section 4.4.1], did not find toads, a food source for the Eastern Hog-nosed snakes. As a result, habitat for this species is limited to non-existent. Numerous debris piles were observed throughout Community 2 (SWD3-3) but not considered hibernculum potential as the piles were at grade.

As targeted hognose snake surveys were not completed for this report, usage of the very limited habitat within Community 2 (SWD3-3) and the FOD/SWD north of the rail line could not be confirmed or refuted

The west and central irrigation ponds are used for irrigation and habitat is not suitable for turtles given unreliable water levels. The east pond also lacks habitat structure (i.e., no emergent vegetation, rocks, logs, etc.) and prey sources (i.e., crayfish, molluscs, fish, etc.) due to is new construction and would also not be suitable for turtles.

**Summary:** No reptile species at risk (i.e., species listed as Endangered or Threatened) or no provincially significant reptile species (i.e., species listed Special Concern or ranked S1-S3) were found in or within 120m of the proposed licence boundary. Very limited snake habitat features exists. No suitable habitat for turtles exists.

### *4.4.4 Insects*

Butterflies, dragonflies and damselflies were noted through incidental observations while conducting site visits.

**Findings:**

A total of seven butterflies and four dragonfly and damselfly species were observed within the study area [Appendix G]. All species observed are common and secure (S5) in Ontario.

**Summary:** Only common insect species were observed within the proposed licence boundary and the adjacent lands.

### *4.4.5 Mammals*

Mammals were noted through incidental observations while conducting site visits. Visual observations, including tracks, scat, or other signs.

**Findings:**

Observations documented the presence of six mammal species: Raccoon (*Procyon lotor*), Coyote (*Canis latrans*), Eastern Chipmunk (*Tamias striatus*), White-tailed Deer (*Odocoileus virginianus*), Gray Squirrel (*Sciurus carolinensis*) and Striped Skunk (*Mephitis mephitis*). These are all common in this part of Ontario.

There are no snag trees within the proposed licence boundary. However, there numerous dead trees (approximately 10 snag trees with dbh >25cm per ha) in Community 2 (SWD3-3) and possibly the FOD/SWD community north of the rail line, and as such, both of these communities could provide suitable roosting habitat for SAR or common bats. With potential habitats located outside the licence boundary, specific acoustic monitoring for bat usage was not conducted.

Two animal burrows were observed within Community 2 (SWD3-3). Both were newly constructed in 2016 and tracks leading in and out of the burrows were identified as Striped Skunk and Coyote. No evidence of American Badger burrows (i.e., elliptical hole shape, large spoil pile at hole entrance) was noted

**Summary:** Only common and secure (S5) mammal species were observed within the proposed licence boundary and its 120m adjacent lands. Potential habitat for bats (SAR and common species) exist within Community 2 and the FOD/SWD north of the rail line in the adjacent lands. No American Badger activity or dens were noted.

### *4.4.6 Fish*

The only aquatic feature present in the proposed licence boundary is the east pond, a newly constructed farm irrigation pond. Within the adjacent 120m are the two farm irrigation ponds (the west and central ponds) located to the north and Komoka Creek to the northeast. The irrigation ponds are man-made features that are not connected to any stream or natural waterway nor are they stocked with fish. However, fish and fish habitat exist in the Komoka Creek which is located 100m northeast from the proposed licence boundary.

Although no aquatic community sampling or no aquatic habitat mapping was conducted as part of this study, however fish including Largemouth Bass, Northern Pike, Brown Trout and Rainbow Trout have been recorded in Komoka Creek (UTRCA, 2012). Eastern Sand Darter (END) is known to occur within Thames River at the Komoka Creek outlet [Appendix D] and are potentially within Komoka Creek.

**Summary:** There is no fish habitat within the proposed licence boundary. Within the 120m adjacent lands, Komoka Creek provides fish habitat and is potential habitat for the Eastern Sand Darter (END).

### *4.4.7 Other Wildlife*

No terrestrial crayfish or their mounds were observed during site visits within the study area. [Appendix G].

# 5.0 Significant Natural Heritage Features

To determine if any significant natural heritage features are located in the proposed licence boundary or its adjacent 120m, the data gathered from the existing records (Section 3) and site investigations (Section 4) were evaluated for significance using the criteria provided in the Natural Heritage Reference Manual (MNR, 2010) and the Significant Wildlife Habitat Criteria Schedule - Ecoregion 7E (MNRF, 2015) with support from the Significant Wildlife Habitat Technical Guide (MNR, 2000).

Features that are confirmed or assumed provincially significant will require guidance and further consideration with respect to extraction activity, and are discussed in the Level 2 Report in more detail (Section 6 of this report).

## 5.1 Significant Habitat of Endangered and Threatened Species

The records review identified potential for Endangered or Threatened species to be present within the study area consisting of the proposed license boundary plus the 120m adjacent lands [Table 1]. During the 2016 field surveys [Appendix F and G], two species at risk were observed.

The two species at risk observed were:

- Bank Swallows (END) – within the licence boundary in the topsoil pile
- Barn Swallows (END) – within the adjacent 120m in the Quonset shed

Beyond the proposed licence boundary in Community 2 (SWD3-3) there are also potential habitats for the Eastern Hog-nosed snake and bat maternity roosting which could support Endangered bat species. Komoka Creek could be habitat for Eastern Sand Darter. Targeted surveys not completed for these three additional species.

Each species listed above are discussed in further detail below.

### *5.1.1 Bank Swallow*

Bank Swallows are designated Threatened and provided general habitat protection under the ESA. Within the licence boundary, approximately eighty Bank Swallows were observed in the topsoil stockpile.

**Confirmed habitat for Bank Swallows (THR) within the proposed licence boundary is considered further in the Level 2 Report.**

### *5.1.2 Barn Swallow*

Barn Swallows are designated Threatened and provided general habitat protection under the ESA. In the adjacent 120m, three Barn Swallows and one nest were observed in the Quonset shed located in Community 5.

**Confirmed habitat for Barn Swallows (THR) within the adjacent 120m.**

### *5.1.3 Eastern Sand Darter*

Eastern Sand Dater is designated as Endangered providing protection to it and its regulated habitat under the ESA. Regulated habitat for the Eastern Sand Darter protects the watercourse it inhabits and the riparian vegetation within 30m of watercourse (Ontario Regulation 242/08). As fish surveys were not completed for this report, it is assumed that the Eastern Sand Darter is present.

**Candidate habitat (no targeted studies) for the Eastern Sand Darter (END) and the 30m riparian zone protection (which falls within the adjacent 120m) is considered further in the Level 2 Report.**

### *5.1.4 Bats*

No potential bat maternity roosting habitat for Endangered bat species was observed within the licence boundary. Suitable habitat may be present within the FOD/SWD community north of the rail line and Community 2 (SWD3-3), both located within the adjacent 120m. As site specific acoustic monitoring was not conducted to determine habitat usage, it is assumed these potential habitats beyond the licence boundary are being used by Endangered Bat species.

**Candidate roosting habitat (no targeted studies) for Endangered bats within the adjacent 120m is considered further in the Level 2 Report.**

### *5.1.5 Eastern Hog-nosed Snake*

Eastern Hog-nosed Snakes are designated Threatened and provided general habitat protection under the ESA. Eastern Hog-nosed Snakes prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, and forest edges and usually only occurs where toads can be found (Kraus,

2011). Based on the vegetation communities present there is potential habitat within the Community 2 (SWD3-3) and within the FOD/SWD community north of the rail line. Based on ELC information [Appendix C] and the amphibian call surveys [Section 4.4.1; Appendix G], the soils are very moist (not dry) and site does not provide a food source for the Eastern Hog-nosed Snakes, resulting in very limited habitat. However, sa targeted snake surveys were not completed for this report, usage of the very limited habitat within Community 2 (SWD3-3) and the FOD/SWD north of the rail line could not be confirmed or refuted

**Candidate habitat ( habitat marginal but no targeted studies) for Eastern Hog-nosed Snake (THR) within the adjacent 120m is considered further in the Level 2 Report.**

## 5.2 Significant Wetlands

No PSWs are located within the proposed licence boundary, however records identified the Komoka/South Strathroy Creek PSW within the adjacent lands to the north and northeast [Figure 2]. Based on site investigations, the swamp community SWD3-3 (Community 2) to the north of the licence boundary along the rail line is larger than the wetland mapped by MNRF [Figure 2]. The east, central and west ponds are man made and are used for or intended for irrigation and would not be considered apart of the PSW.

**The significant wetland (Komoka/South Strathroy Creek PSW) within the 120m adjacent lands is considered further in the Level 2 Report.**

## 5.3 Significant Woodlands

As discussed in Section 3.2.1, the small patch of woodland within the proposed licence boundary and the larger woodlands north and northeast within the adjacent 120m are mapped as 'Significant Woodland' in the Municipality's Official Plan [Figure 3].

Based on site investigations, the small patch within the proposed licence boundary is a small CUW cultural woodland (0.2ha) surrounded by cultural thicket that is separated from the larger 'Significant Woodland' by a farm lane [Figure 6]. The cultural woodland patch (and its surrounding cultural thicket) does not provide habitats for significant plant or wildlife species [Appendix F and G] and given the level of disturbance and storage of equipment, it should not be considered part of the 'Significant Woodland' located north and northeast of the proposed licence boundary [Appendix H].

**The significant woodland (SWD3-3, SWD7 and FOD/SWD north of the rail line) adjacent to the licence boundary is considered further in the Level 2 Report.**

## 5.4 Significant Valleylands

Komoka Creek and its associated riparian vegetation located within the adjacent 120m would be considered a significant valleyland since it provides permanent surface water/sediment conveyance, groundwater release areas (i.e., wetlands and in-stream), habitat to common and provincially significant species (i.e., Wood Thrush and Eastern Sand Darter) and linkage to larger wooded areas north and south of the study area. **The significant valleyland (the Komoka Creek and its riparian vegetation (SWD7)) within the adjacent 120m is considered further in the Level 2 Report.**

## 5.5 Significant Wildlife Habitat

Criteria Schedules for Ecoregion 7E (January 2015) identify candidate SWH for the proposed licence boundary and its adjacent 120m;

1. Seasonal Concentration Areas of Animals for:
    - Bat Maternity Colonies
    - Turtle Wintering Areas
2. Specialized Habitat for Wildlife for:
    - Amphibian Breeding Habitat – Woodland
    - Amphibian Breeding Habitat – Wetland
3. Habitat of Species of Conservation Concern for:
    - Marsh Bird Breeding Habitat for Green Heron
    - Terrestrial Crayfish
    - Habitat for Species listed Special Concern and S1 to S3 ranked
4. Animal Movement Corridors for:
    - Amphibian Movement Corridors

Life science work (Section 4.3 and Section 4.4) were used to evaluate candidate SWH. Confirmed and assumed SWH are summarized below and presented on Figure 7.

### *5.5.1 Seasonal Concentration Areas of Animals*

**Bat Maternity Colonies**

Community 2 (SWD3-3), within the adjacent 120m, was identified as candidate SWH for Bat Maternity Colonies since there is more than 10 potential cavity trees per hectare were observed [Appendix E]. The

FOD/SWD north of the rail line in the adjacent 120m has potential to also have 10 cavity trees per hectare. Since site specific acoustic monitoring was not conducted, usage of the potential roosting habitat could not be confirmed.

**Candidate SWH (no targeted studies) within adjacent 120m - Community 2 (SWD3-3) and FOD/SWD north of rail line.**

**Turtle Wintering Areas**

The east pond within the proposed licence boundary and both the west and central irrigation ponds in the adjacent 120m were identified as candidate SWH since they are deep enough to support turtle wintering [Appendix E]. Since these ponds either have unreliable water levels, lack habitat structure (i.e., no emergent vegetation, rocks, logs, etc.) and prey sources (i.e., crayfish, molluscs, fish, etc.) they would not be suitable habitat for turtles. Wildlife surveys did not observe turtles within these ponds or evidence of turtle nests, therefore usage thresholds were not met.

**Not SWH (Confirmed).**

### *5.5.2 Specialized Habitat for Wildlife*

**Amphibian Breeding Habitat - Woodland**

Woodland amphibian breeding habitat includes features within a woodland or within 120m of a woodland. The west and central irrigation ponds plus the vernal pool meet this criterion [Appendix E]. To meet the threshold for SWH, two indicator species with: 1) at least 20 individuals or 2) a call code level 3 are needed. This threshold was not met in the west or central irrigation ponds but was met for the vernal pool to the north (FOD/SWD) [Appendix G].

**Confirmed SWH within the adjacent 120m - vernal pool north of rail line.**

**Amphibian Breeding Habitat - Wetland**

The east pond, within the licence boundary, was identified as a possible wetland habitat for amphibians. The east pond supports four different indicator amphibian species although none reached calling code three. However, a Bullfrog was heard in June. Without confirming successful breeding (egg masses), this Bullfrog calling deems the east pond as significant habitat [Appendix G].

**Confirmed SWH within the licence boundary - East pond.**

### *5.5.3 Habitat of Species of Conservation Concern*

**Marsh Bird Breeding Habitat for Green Heron**

Community 2 (SWD3-3) within the adjacent 120m was identified as candidate SWH for Marsh Bird Breeding habitat for Green Heron due to its adjacency to the central irrigation pond [Appendix E]. During breeding bird surveys no Green Herons or other marsh birds were observed within the proposed licence boundary or the adjacent 120m, therefore usage thresholds were not met.

**Not SWH (Confirmed).**

**Terrestrial Crayfish**

The SWD 3-3 (Community 2), SWD7 (Community 3) and the FOD/SWD north of the rail line was identified as candidate SWH for terrestrial crayfish [Appendix E]. During wildlife surveys, no terrestrial crayfish and/or their burrows were observed, therefore usage thresholds were not met.

**Not SWH (Confirmed).**

**Habitat for Species listed Special Concern and S1 to S3 ranked**

The records review identified potential for 7 Special Concern species and several S1 to S3 ranked species (17 plants, 1 snake and 2 insects) [Table 1]. During site investigations, none of the records review species were observed [Appendix F and G], except for two Special Concern bird species within the adjacent 120m: Eastern Wood Pewee and Wood Thrush. Eastern Wood Pewee was observed in Community 1 (CUT1), Community 2 (SWD3-3) and Community 3 (SWD7) while the Wood Thrush was observed in Community 3 (SWD7). There are likely many pairs of both species present within the larger forest block north of the rail line (FOD/SWD) adjacent to the proposed licence boundary.

**Confirmed SWH within the adjacent 120m - Eastern Wood Pewee (SC) and Wood Thrush (SC).**

### *5.5.4 Animal Movement Corridors*

**Amphibian Movement Corridors**

Due to potential wetland amphibian breeding habitat within the east pond, Amphibian Movement Corridors was identified as candidate SWH. The east pond is a newly constructed farm irrigation pond surrounded by agricultural fields. Active agricultural land and hedgerows to the larger woodland features to the north (SWD3-3 and FOD/SWD) and the northeast (SWD7) as well as Komoka Creek would act as corridors for amphibians in the area.

**Candidate SWH (no targeted studies) across farm field and along hedgerow toward Community 2 (SWD3-3), Community 3 (SWD7), FOD/SWD and Komoka Creek.**

#### *5.5.5 SWH Evaluation Summary*

Based on the evaluation, only SWH for wetland amphibian breeding habitat is present within the licence boundary in the east pond. Within the adjacent 120m there is SWH for Bat Maternity Colonies (Candidate), Woodland Amphibian Breeding (Confirmed), Amphibian Movement Corridor (Candidate), Eastern Wood Pewee (Confirmed), Wood Thrush (Confirmed) [Figure 7].

**Confirmed and Candidate SWH (targeted studies not completed) within the proposed license boundary as well as in adjacent lands is considered further in the Level 2 report.**

### 5.6 Areas of Natural and Scientific Interest (ANSI)

There are no ANSI's in or within 120m of the proposed licence boundary.

### 5.7 Fish Habitat

There is no fish habitat within the proposed licence boundary. Within the adjacent 120m, Komoka Creek provides fish habitat.

**Fish Habitat (Komoka Creek) within the adjacent 120m is considered further in the Level 2 Report.**

### 5.8 Level 1 Assessment Summary

Based on the records review, site investigations and the assessment of significance, the majority of the significant features are contained within the vegetation communities in the adjacent 120m (i.e., CUT1, SWD3-3, SWD7, and the FOD/SWD north of the rail line). Within the licence boundary, a topsoil stockpile provides habitat for Bank Swallows (THR) and the east pond provides SWH for wetland amphibian breeding.

Table 8 summarizes the significant natural heritage features associated with the proposed Maes Pit. The identified significant natural heritage features require further consideration in the Level 2 Report (Section 6).

**Table 8: Level 1Assessment Summary**

| Natural Feature | Present in Proposed Licence Boundary | Present in the Adjacent 120m |
|---|---|---|
| **Habitats of Endangered and/or Threatened Species** | | |
| • Eastern Sand Darter | No | **Candidate** |
| • Bank Swallow | **Yes** | No |
| • Barn Swallow) | No | **Yes** |
| • Endangered Bat Species | No | **Candidate** |
| • Eastern Hog-nosed Snake | No | **Candidate** |
| **Significant Wetlands** | | |
| • Komoka/South Strathroy Creek PSW | No | **Yes** |
| **Significant Woodlands** | No | **Yes** |
| **Significant Valleylands** | No | **Yes** |
| **Significant Wildlife Habitats** | | |
| • Bat Maternity Colonies | No | **Candidate** |
| • Amphibian Breeding Habitat - Woodland | No | **Yes** |
| • Amphibian Breeding Habitat - Wetland | **Yes** | No |
| • Species of Conservation Concern | | |
| *Eastern Wood Pewee and Wood Thrush* | No | **Yes** |
| • Amphibian Movement Corridor | No | **Candidate** |
| **Areas of Natural and Scientific Interest (ANSI)** | No | No |
| **Fish Habitat** | No | **Yes** |

# 6.0 Environmental Impact Assessment

Johnston Bros. (Bothwell) Limited is proposing a Category 1, Class A (Below Water) aggregate pit outside Komoka, Ontario. The proposed licence boundary (Maes Pit) is described as Part Lots 1 and 2, Concession 2, Municipality of Middlesex Centre, Middlesex County and is approximately 24.7ha in size [Figure 1]. The proposed extraction plans for the Maes Pit are provided in the Site Plans prepared by Wm. Bradshaw as part of the ARA application (Drawings 1 to 4).

The following sections provide a discussion of potential impacts on natural heritage features associated with the proposed Maes Pit and recommend mitigation measures.

## 6.1 Potential Environmental Impacts within the Licence Boundary

Within the proposed licence boundary there is habitat for Bank Swallows, a Threatened species protected by the ESA.

### *6.1.1 Bank Swallows*

The temporary topsoil stockpile within the proposed licence boundary is inhabited by Bank Swallows [Figure 7]. Bank Swallows receive general habitat protection under the ESA. For proposed aggregate extraction to proceed within the licence boundary loss and/or destruction of Bank Swallow nesting habitat will occur, resulting in contravention of the ESA, unless the Maes Pit satisfies the conditions of Subsection 23.14 under Ontario Regulation 242/08.

**Recommendation 1:** Prior to the commencement of operations, a Species at Risk (SAR) Mitigation and Monitoring Plan shall be developed and followed to ensure species at risk habitats within the licence boundary are protected and conditions of Subsection 23.14 under Ontario Regulation 242/08 are met to ensure extraction activities are not in contravention with the *Endangered Species Act* (2007).

The SAR mitigation and monitoring plan shall include the following to ensure the protection of Bank Swallow:

- Prior to removal of existing Bank Swallow habitat near the pond, an alternate nesting site will be created in the setback along the east boundary, near Komoka Creek. This habitat placement with vertical faces (soil stock pile 70-degrees or more) will be created before the nesting season. The existing spoil pile will be used as the source material and all remaining soil stockpiles will be leveled.
- Given the confirmed nesting in this location, aggregate pit activity will need to address potential Bank Swallow inhabitation of the pit operation. All excavations should retain shallow excavation faces to prevent Bank Swallow nesting.
- Operators should devote time at the end of the work day to remove vertical faces to prevent Bank Swallows from building nests in these faces overnight or over the weekend.
- In the event that Bank Swallow inhabit the pit operation area despite efforts, the nest area should be left until the end of the nesting season.

### *6.1.2 SWH - Wetland Amphibian Breeding Habitat*

The east pond within the proposed licence boundary is identified as significant wildlife habitat for wetland amphibian breeding [Appendix G] as a result of the presence of a single Bullfrog. The east pond also supported Western Chorus Frog (level 2) in May and then Grey Treefrog (level 2), Green Frog (level 2) and the single Bullfrog in June [Table 6 and Appendix G]. The east pond is a newly constructed irrigation pond that has not yet been used for irrigation, resulting in a permanent, reliable water feature when compared to the other active irrigation ponds north of the proposed licence boundary. For extraction to occur within the proposed Maes Pit, the east pond will essentially be expanded. To mitigate temporary impacts during the expansion, replicating the habitat it provides (i.e., stable water levels) in the central irrigation pond is recommended by terminating its use for irrigation. The west pond will remain for irrigation purposes.

**Recommendation 2:** Prior to extraction, rehabilitate the central irrigation pond and transfer amphibian species from the east pond to the central irrigation pond. Rehabilitation would include retiring the irrigation uses to create a permanent, reliable water feature. Enhancements shall include placement of woody debris along the banks to create structure for calling, foraging, escape, and concealment from predators. Once the central irrigation pond have been re-habilitated, amphibians and/or egg masses

inhabiting the east pond shall be transferred to the central pond by qualified biologists.

Once extraction is complete within the proposed Maes Pit, the resulting aggregate pond would create another permanent, reliable water source for amphibians. By creating marsh habitat (either along pond edges and/or on shallow aquatic benches) or by diversifying pond edges, the aggregate pond would provide a much expanded and suitable habitat for amphibians as well as for other wildlife (waterfowl, insects, odonate, and turtles).

**Recommendation 3:** Create shallow aquatic benches and/or sculpt pond edges at the locations shown on the Progressive and Final Rehabilitation Plan. Marsh habitats shall be created by planting rooted aquatic plants on these shallow benches and along shallow pond edges. Aquatic plants should include a mixture of Pickerel Weed, Arrowhead, Cattail, Great Bulrush and Burreed. Large woody debris shall also be placed in these areas.

#### *6.1.3 Vegetation Removal*

Any vegetation removal within the proposed licence boundary (cultural woodland or hedgerows) could result in the destruction of active nests (nests with eggs or young birds) or the wounding or killing of birds species protected under the *Migratory Birds Convention Act* (1994) and/or Regulations under the Act.

**Recommendation 4:** Avoid vegetation clearing within the licence boundary during the migratory bird breeding season (May 1 to August 15) to ensure that no active nests will be removed or disturbed in accordance with the *Migratory Birds Convention Act* (1994) and/or Regulations under the Act.

### 6.2 Potential Environmental Impacts within the Adjacent 120m

Within the adjacent 120m, the following significant natural heritage features have been identified:

1. **Habitat of Endangered and Threatened Species**
    i. Barn Swallow (THR)
    ii. Eastern Sand Darter (END) - assumed to be present within Komoka Creek

iii. Bats - maternity habitat located in Community 2 (SWD3-3) and the FOD/SWD north of the rail line

iv. Eastern Hog-nosed Snake (THR) - potential habitat located in Community 2 (SWD3-3) and the FOD/SWD north of the rail line

**2. Significant Wetlands**

- Komoka/South Strathroy Creek PSW contained within the SWD3-3, SWD7 and the FOD/SWD north of the rail line

**3. Significant Woodlands**

- consists of the Community 2 (SWD3-3), Community 3 (SWD7) and the FOD/SWD north of the rail line

**4. Significant Wildlife Habitat**

i. Bat Maternity Colonies

- assumed to be present within SWD3-3 and the FOD/SWD north of the rail line

ii. Woodland Amphibian Breeding Habitat

- FOD/SWD north of rail line

iii. Species of Conservation Concern

- confirmed for Eastern Wood Pewee (SC) in CUT1, SWD3-3 and SWD7

- confirmed for Wood Thrush (SC) in SWD7

iv. Amphibian Movement Corridors

- assumed in agricultural field and hedgerows towards Community 2(SWD3-3), Community 3 (SWD7) and the FOD/SWD north of rail line

**5. Fish Habitat**

- present within Komoka Creek

### *6.2.1 Barn Swallow*

The Quonset shed where the Barn Swallow nest was located is within the adjacent 120m [Figure 7]. No impacts to Barn Swallows or nests are anticipated since the Quonset will not be removed as part of the proposed Maes Pit extraction operation. Therefore, the proposed Maes Pit will not contravene the ESA. The resulting aggregate pond would provide insect foraging opportunities for Barn Swallows.

### *6.2.2 Eastern Sand Darter*

Candidate regulated habitat for the Eastern Sand Darter (no targeted studies) includes Komoka Creek and the riparian vegetation within 30m of the creek [Figure 7]. At its closest, the candidate regulated habitat (presence assumed) is 70m from the proposed licence boundary, which is sufficient to protect against potential encroachment, alteration and/or sedimentation impacts from the proposed Maes Pit.

Based on the Hydrogeological Assessment (Novaterra, 2017), any potential impacts to water quality or quantity of Komoka Creek are negligible due to the southeast groundwater flow direction, hydraulic gradient, and groundwater velocity of the area. Based on this hydrogeological assessment, it is concluded that regulated habitat of the Eastern Sand Darter will not be impacted by the proposed Maes Pit and therefore will not contravene the ESA.

### *6.2.3 Bats*

Suitable maternity roosting habitat for Endangered bat species is possible within the adjacent 120m in Community 2 (SWD3-3) and the FOD/SWD north of the rail line [Figure 7]. No impacts to bat maternity roosting habitat is anticipated as snag tree removal is not contemplated. Therefore, the proposed Maes Pit will not contravene the ESA . The resulting aggregate pond will provide insect foraging opportunities for bat species.

### *6.2.4 Eastern Hog-nosed Snake, Significant Wetlands, Woodlands and Wildlife Habitat*

Eastern Hog-nosed Snake potential habitat, the Komoka/South Strathroy Creek PSW, Significant Woodlands and Significant Wildlife Habitat for Bat Maternity Colonies, Woodland Amphibian Breeding, Amphibian Movement Corridors, Eastern Wood Pewee, and the Wood Thrush are contained in Community1 (CUT1), Community 2 (SWD3-3), Community 3 (SWD7) and/or the FOD/SWD north of the rail line. These communities are all adjacent to the proposed licence boundary.

The Hydrogeological Assessment (Novaterra, 2017) determined that during and after extraction, the proposed pit would not cause any groundwater drawdown for any significant distance from the immediate pond area (at the area of extraction, in the early phases of work, about 11 cm during the day with full recovery and 1cm during the day at near full build out). Impact to groundwater temperature to the north would be negligible due to the southeasterly groundwater flow direction, away from the PSW. Setbacks are not required to protect the hydrologic function of the PSW to the north.

To protect the potential Eastern Hog-nosed Snake habitat, significant woodlands, the PSW and associated significant wildlife habitats from potential encroachment, accidental vegetation/habitat removal, sedimentation, and potential species encounters the following recommendations are provided.

**Recommendation 5:** Establish a general 15m extraction setback along the north and east boundary [Figure 7].

**Recommendation 6:** Install Erosion and Sediment Control (ESC)/reptile exclusion fencing along the north and east licence boundary except where the licence boundary is directly adjacent to wetland communities (Community 2 and 3), the ESC/reptile exclusion fencing shall be installed along the 15m extraction setback line [Figure 7].

**Recommendation 7:** ESC/reptile exclusion fencing is to be installed according to the applicable standards established in the Ontario Provincial Standard Specification/Ontario Provincial Standard Drawings (OPSS/OPSD) documents and to the MNRF Reptile Exclusion Fencing Standards provided in the Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.1. Species at Risk Branch Technical Note.

**Note:** Excerpts from the from the Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.1. Species at Risk Branch Technical Note (MNR, 2013c) have been provided in Appendix I so that Site Plans can be updated with fencing details and renderings, if necessary.

**Recommendation 8:** Inspect ESC/reptile exclusion fencing prior to any site excavation to ensure proper installation.

**Recommendation 9:** Once ESC/reptile exclusion fencing is installed and inspected, the un-vegetated land between the existing vegetation edge and the 15m extraction setback shall be seeded with a native grass mixture to improve edge habitats and minimize erosion along the edge of extraction. The native grass mixture shall include a mixture of Virginia Wild Rye, Indian Grass, Little Blue Stem and Switch Grass with some wildflower mix (Milkweed, Aster, Tick-trefoil and Black-eyed Susan).

**Recommendation 10:** During excavation the ESC/reptile exclusion fencing is to be maintained to ensure proper function. Regular maintenance inspections shall occur and shall include a maintenance inspection immediately following snowmelt and heavy rain events.

**Recommendation 11:** Removal of ESC/reptile exclusion fencing can occur once all excavation activities and the rehabilitation are completed.

**Recommendation 12:** A field identification guide for snakes shall be made available to the staff and posted at the site office of the aggregate pit.

**Recommendation 13:** Should an Eastern Hognose snake or any other SAR reptiles be encountered during the operation of the aggregate pit, all extraction activities shall be halted. Any snake movement shall be monitored and vehicular traffic shall be redirected. MNR staff shall be notified immediately and the snake shall be relocated to an appropriate safe habitat by a qualified ecological professional or consultant (i.e., faunal biologist or expert). Once the snake is removed out of harms way, normal extraction activities may resume.

By providing a 15m extraction setback to wetland communities and naturalizing it with native grasses, the setback accommodates the goals of buffering existing natural heritage features, enhancing linkages and creating habitat as outlined in the Middlesex Centre's Official Plan "Natural Heritage Enhancement Area" designation. A grassland setback also provides opportunities for compatible forms of public access and passive recreation uses like trails, wildlife viewing areas and outdoor education, another goal of the Official Plan.

Although the woodland/wetland communities along the north and east boundary are protected by the 15m extraction setback and the installation of the ESC fencing, further measures to avoid disturbing the Wood Thrush and Eastern Wood-Pewee during their breeding season will also need consideration.

**Recommendation 14:** Topsoil stripping activities shall not take place within 30m of the north and east licence boundary during the breeding season of Wood Thrush and Eastern Wood-Pewee (i.e., May 1 to August 15). This activity can occur in the breeding window if a detailed survey for Wood Thrush and Eastern Wood-Pewee confirms no active nests within 30m of the boundary.

### *6.2.5 Fish Habitat*

Komoka Creek is 100m from the proposed licence boundary and as noted above, potential impacts to its water quality and quantity are negligible due to little to no drawdown and the southeasterly groundwater flow direction (Novaterra, 2017). No impacts to the fish habitat within Komoka Creek are anticipated.

## 6.3 Rehabilitation Opportunities

The rehabilitation plans for the aggregate pit provide an opportunity to create habitat which will compliment the adjacent retained features and functions and at the same time protect the proposed open water feature.

**Recommendation 15:** The pond slopes and lands beyond the pond slopes to the north and east sides not already vegetated shall be planted to establish grassland habitat [Figure 8]. The native grass mixture shall include a mixture of Virginia Wild Rye, Indian Grass, Little Blue Stem and Switch Grass with some wildflower mix (Milkweed, Aster, Tick-trefoil and Black-eyed Susan). The areas beyond the pond slopes on the west and south sides will be restored to agricultural land use.

Compared to the existing agricultural uses, the creation of the aggregate pond and naturalization of areas to the north and east will provide additional wildlife habitat and establish better linkage between the Komoka/South Strathroy Creek PSW and Komoka Creek adjacent to the Maes Pit, which is considered to be an overall net gain for natural heritage once completed.

# 7.0 Summary and Conclusions

Significant natural heritage features and functions are confirmed present within the proposed license boundary. Adjacent to the licence boundary there are confirmed or candidate (unevaluated) wildlife habitat. Within the proposed licence boundary there is confirmed habitat for Bank Swallows within the topsoil stockpile and confirmed Amphibian Breeding within the East Pond. Within the adjacent 120m to the north and east there is habitat for fish including the potential for the endangered Easter Sand Darter in Komoka Creek, potential bat maternity roosting habitat for endangered Bat species, Barn Swallow habitat in the Quonset shed, potential Eastern Hog-nosed Snake, a significant wetland (Komoka/South Strathroy Creek PSW), significant woodlands, significant valleylands and significant wildlife habitat for potential bat maternity colonies, confirmed woodland amphibian breeding and two special concern bird species (Eastern Wood Pewee and Wood Thrush).

The stockpile of soil next to the east irrigation pond will be moved to the east boundary, closer to Komoka Creek, to maintain Bank Swallow breeding habitat. Through the application of a 15m extraction setback from significant features and the installation of erosion and sediment control (ESC) fencing no impacts to significant natural heritage features are anticipated. This fencing will also function as exclusion fencing to prevent amphibians and reptiles from accessing the active pit. If the mitigation and rehabilitation measures recommended in Section 6, are followed, the proposed Maes Pit can proceed as proposed under the *Aggregate Resources Act* (ARA) (1990).

BioLogic Incorporated

Dave Hayman, M.Sc.
President

[rl]

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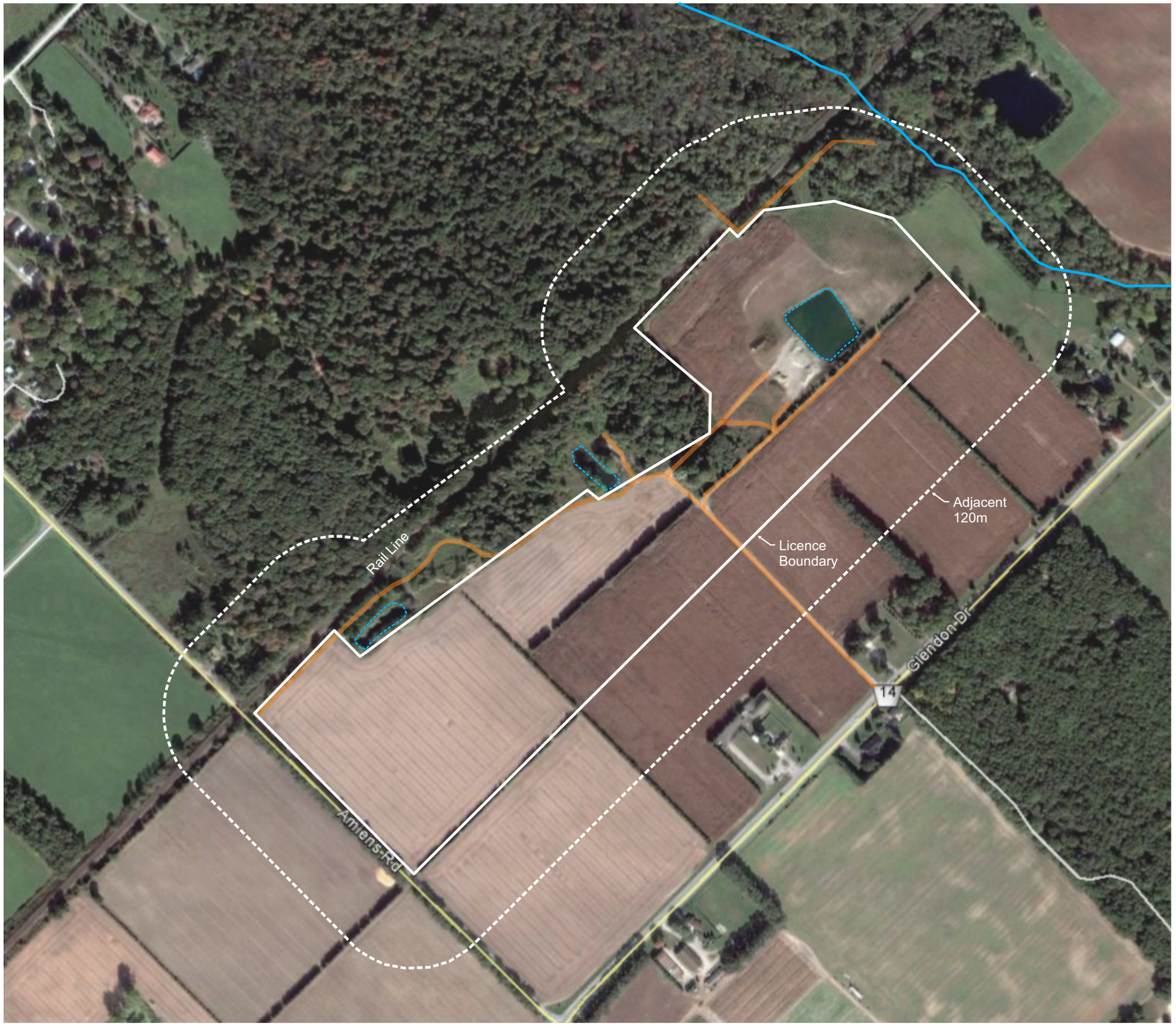
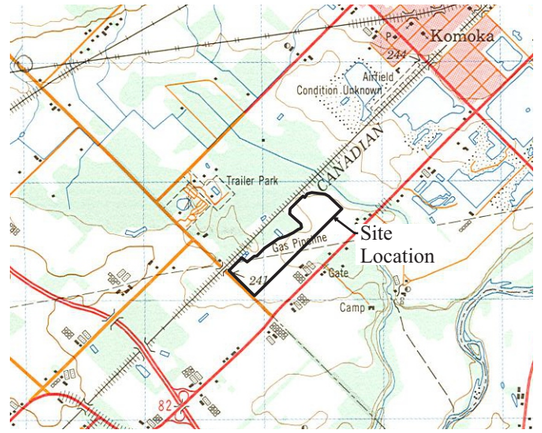



# Figure 1: Site Location

(2016 Google Air Photo)

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Key Plan

**Legend:**

- Komoka Creek
- Farm Irrigation Pond
- Farm Lane

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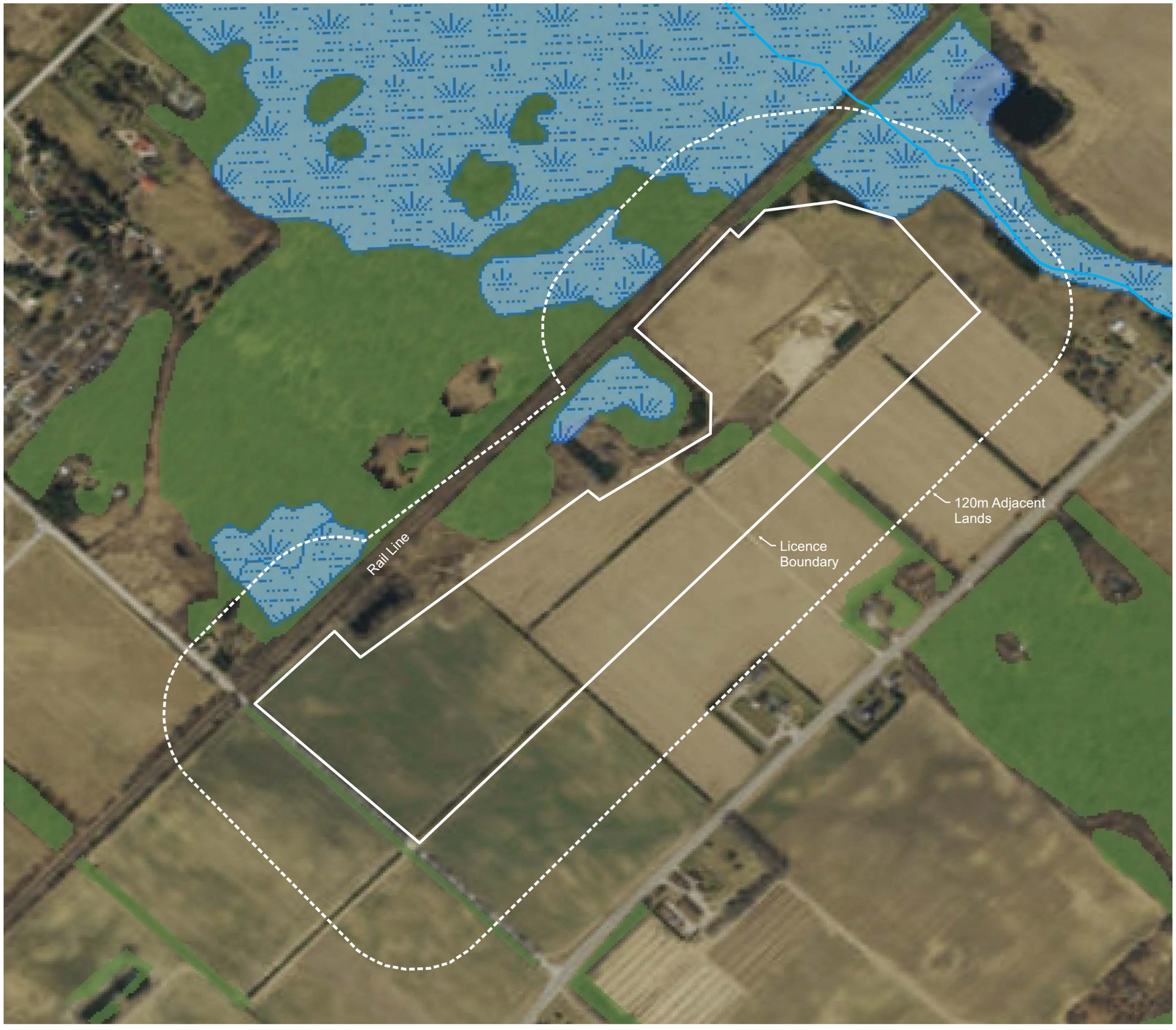
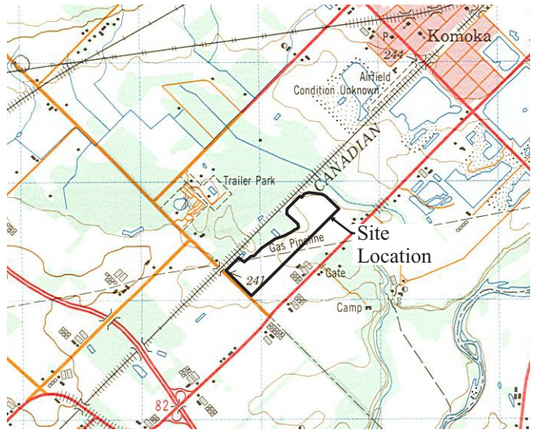
# Figure 2: MNRF Natural Heritage Mapping

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Key Plan

- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

**Wetland**

- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

**Area of Natural Heritage & Scientific Interest (ANSI)**

- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

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November 2017

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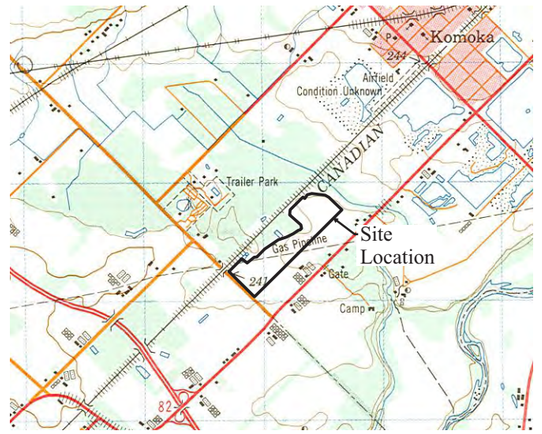
# Figure 3: Greenlands System

(Schedule B - Middlesex Centre Official Plan)

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Key Plan

**Legend**

- Area of Natural & Scientific Interest (ANSI)
- Significant Woodlands

NOTE: Schedules should be read in conjunction with applicable policies of the Plan and other Land Use Schedules.

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## Legend

- SPECIAL POLICY AREA #
- SETTLEMENT BOUNDARY
- AGGREGATE OVERLAY

**OFFICIAL PLAN DESIGNATION DESIGNATION**

- AGRICULTURE
- RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- VILLAGE CENTRE
- SETTLEMENT COMMERCIAL
- RURAL COMMERCIAL
- SETTLEMENT EMPLOYMENT
- STRATEGIC EMPLOYMENT AREA
- PARKS AND RECREATION
- NATURAL ENVIRONMENT
- NATURAL HERITAGE ENHANCEMENT AREA
- HAZARD LANDS

**COMMUNITY USE**

- CP COMMUNITY PARK
- NP NEIGHBOURHOOD PARK
- RECREATION FACILITY
- SCHOOL
- FUTURE SCHOOL SITE

**TRANSPORTATION:**

- ARTERIAL ROAD
- COLLECTOR ROAD
- FUTURE COLLECTOR ROAD
- FUTURE LOCAL ROAD CONNECTION
- COMMUNITY GATEWAY
- MULTI-USE TRAILS

**OTHER:**

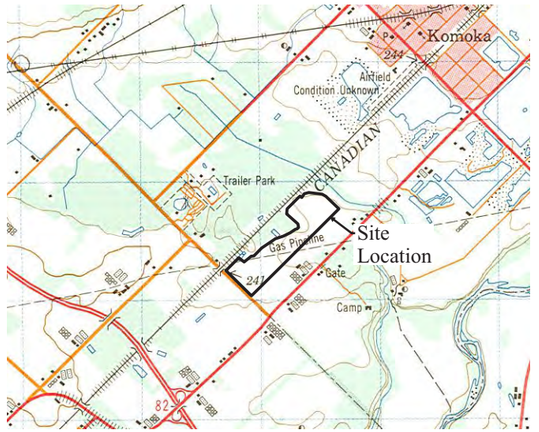
- WASTEWATER TREATMENT FACILITY
- STORMWATER MANAGEMENT

Adjacent 120m

Licence Boundary

# Figure 4: Land Use

(Schedule A-2 Middlesex Centre Official Plan)

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Key Plan

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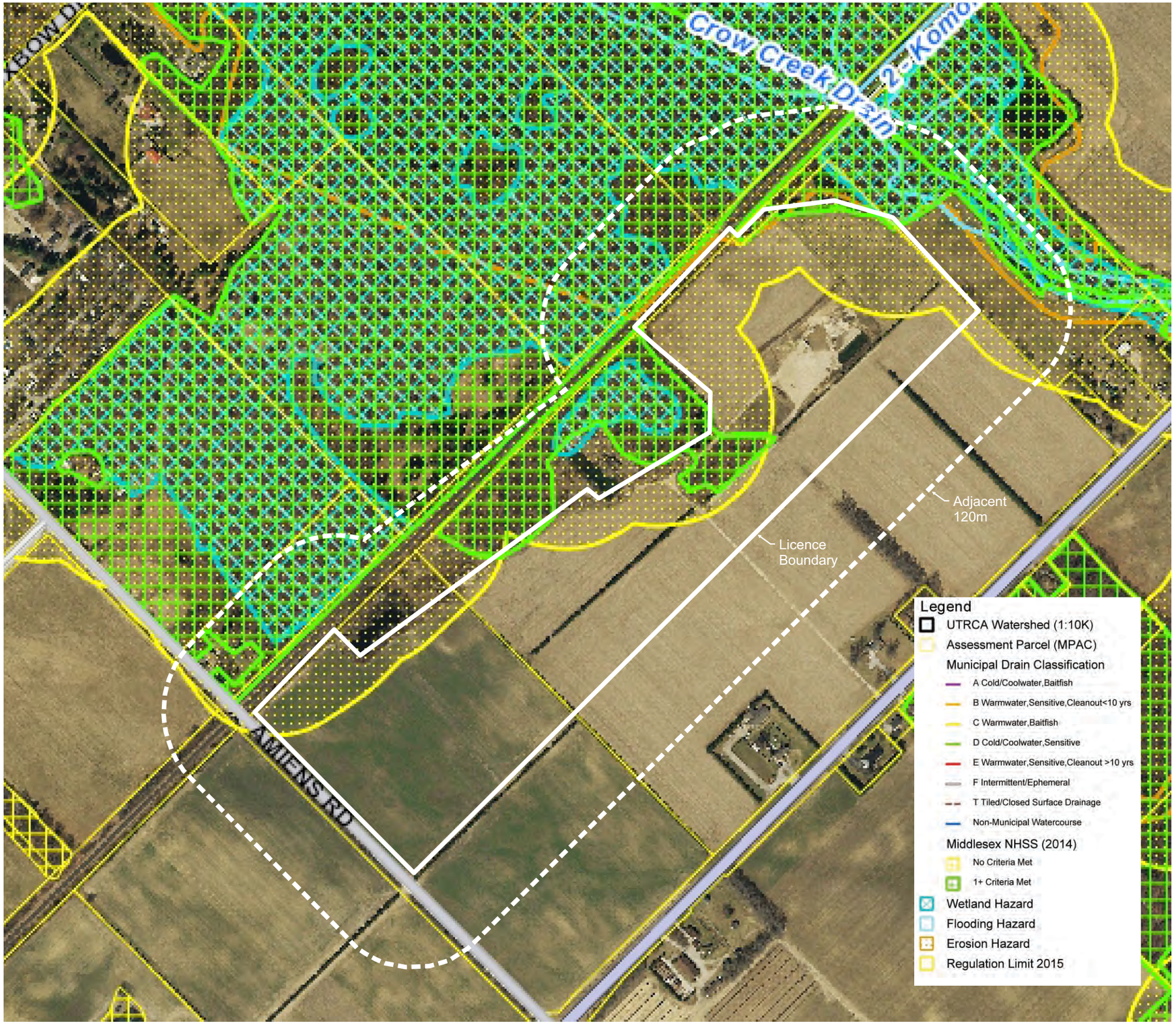
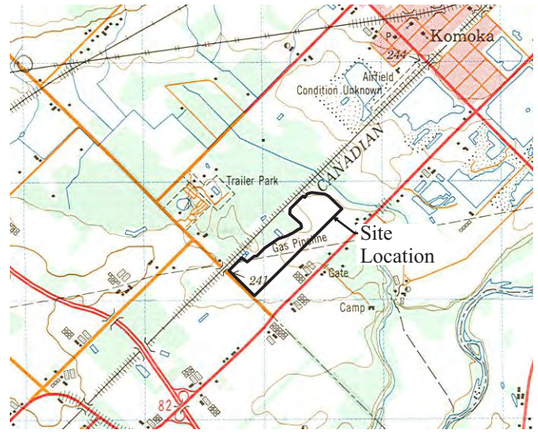
# Figure 5: UTRCA Regulations & MNHS

(2010 Google Air Photo)

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Key Plan

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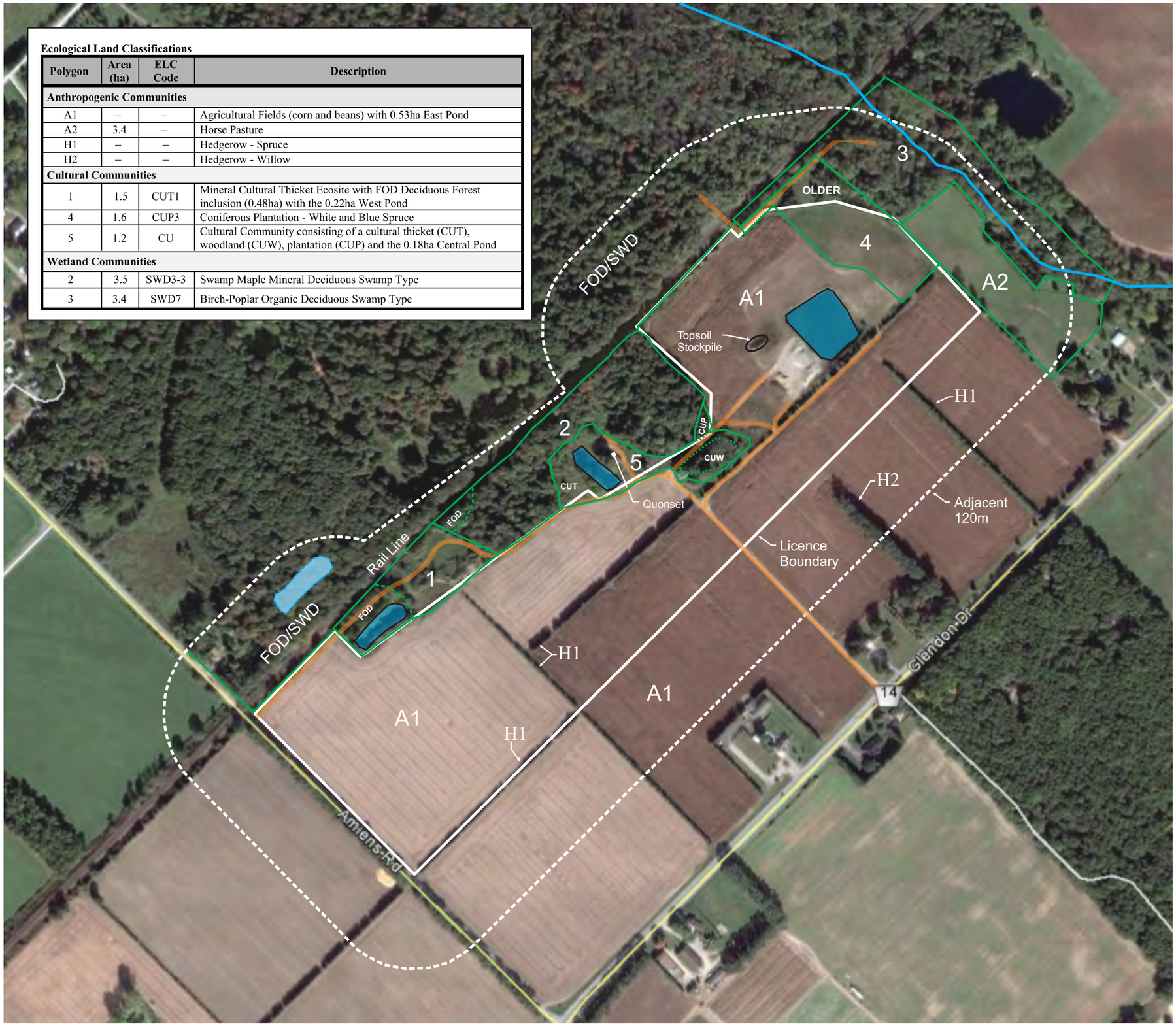
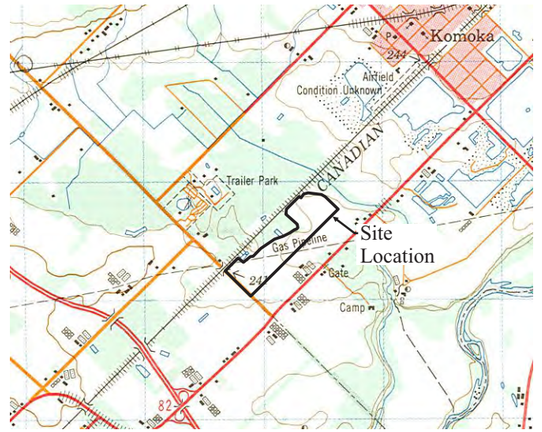
**Ecological Land Classifications**

| Polygon | Area (ha) | ELC Code | Description |
|---|---|---|---|
| **Anthropogenic Communities** | | | |
| A1 | – | – | Agricultural Fields (corn and beans) with 0.53ha East Pond |
| A2 | 3.4 | – | Horse Pasture |
| H1 | – | – | Hedgerow - Spruce |
| H2 | – | – | Hedgerow - Willow |
| **Cultural Communities** | | | |
| 1 | 1.5 | CUT1 | Mineral Cultural Thicket Ecosite with FOD Deciduous Forest inclusion (0.48ha) with the 0.22ha West Pond |
| 4 | 1.6 | CUP3 | Coniferous Plantation - White and Blue Spruce |
| 5 | 1.2 | CU | Cultural Community consisting of a cultural thicket (CUT), woodland (CUW), plantation (CUP) and the 0.18ha Central Pond |
| **Wetland Communities** | | | |
| 2 | 3.5 | SWD3-3 | Swamp Maple Mineral Deciduous Swamp Type |
| 3 | 3.4 | SWD7 | Birch-Poplar Organic Deciduous Swamp Type |




# Figure 6: Vegetation Communities

(2016 Google Air Photo)

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Key Plan

**Legend:**

- Komoka Creek
- Farm Irrigation Pond
- Vernal Pool (approximate)
- Farm Lane

Print on 11X17, Landscape Orientation

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Scale 1:5000

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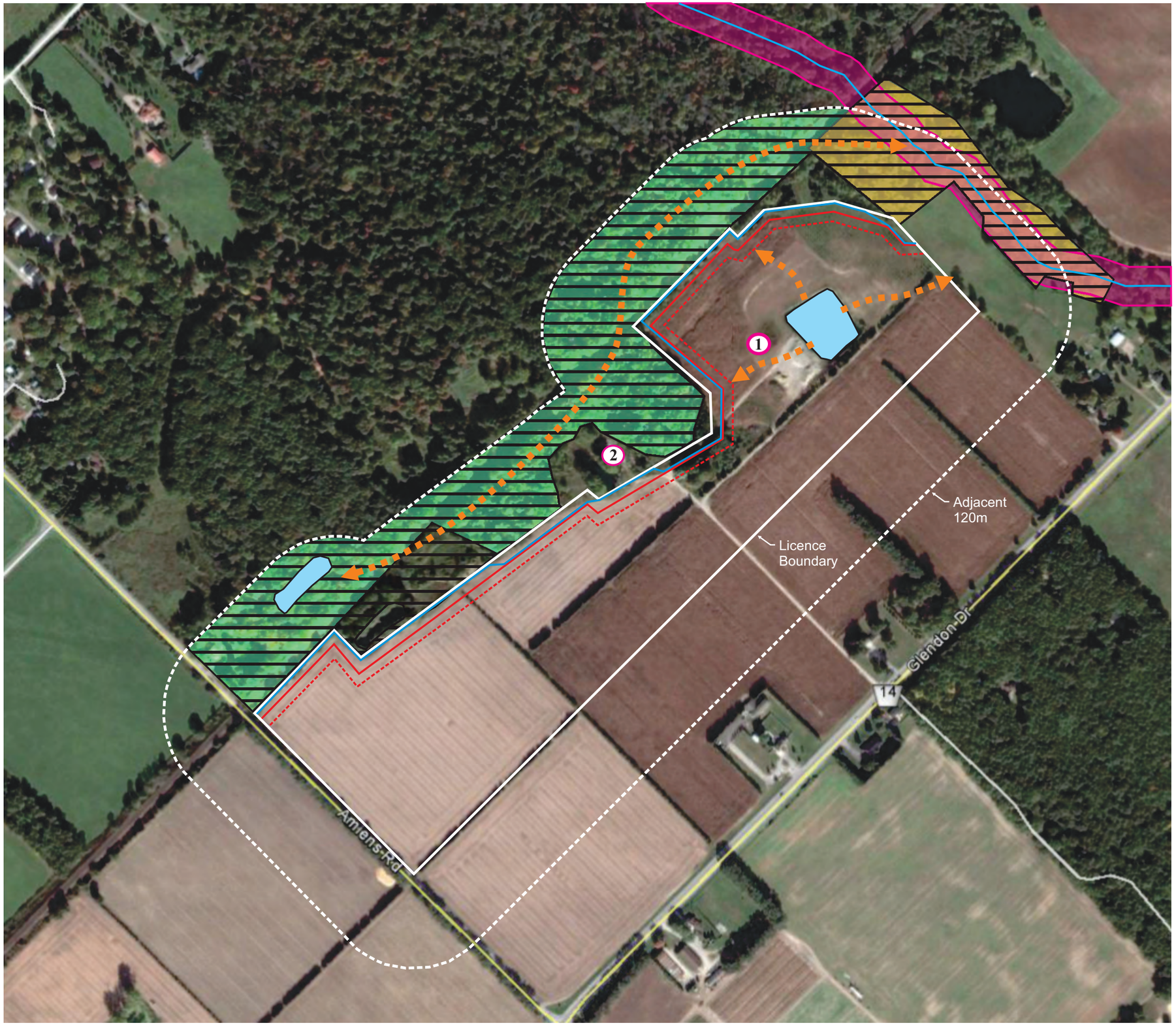
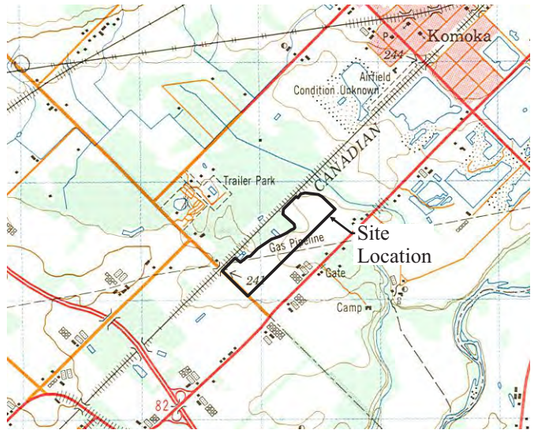
# Figure 7: Significant Natural Heritage Features and Extraction Limits

(2016 Google Air Photo)

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Key Plan

**Legend:**

- 15m Extraction Setback
- ESC/Reptile Exclusion Fencing
- 30m Special Concern Bird Timing Window Setback

**Significant Features**

**Endangered & Threatened Species Habitat**

- ① Bank Swallow
- ② Barn Swallow
- Eastern Sand Darter (Regulated Habitat)
- SAR Bat and Eastern Hog-nosed Snake Potential Habitat

**Significant Wildlife Habitat**

- Bat Maternity Roosting Habitat
- Special Concern Bird Habitat
- Amphibian Breeding Habitat
- Amphibian Movement Corridors

**Significant Wetlands & Woodlands**

**Significant Wetlands, Woodlands & Valleyland**

**Fish Habitat**

Print on 11X17, Landscape Orientation

0 100

Scale 1:5000

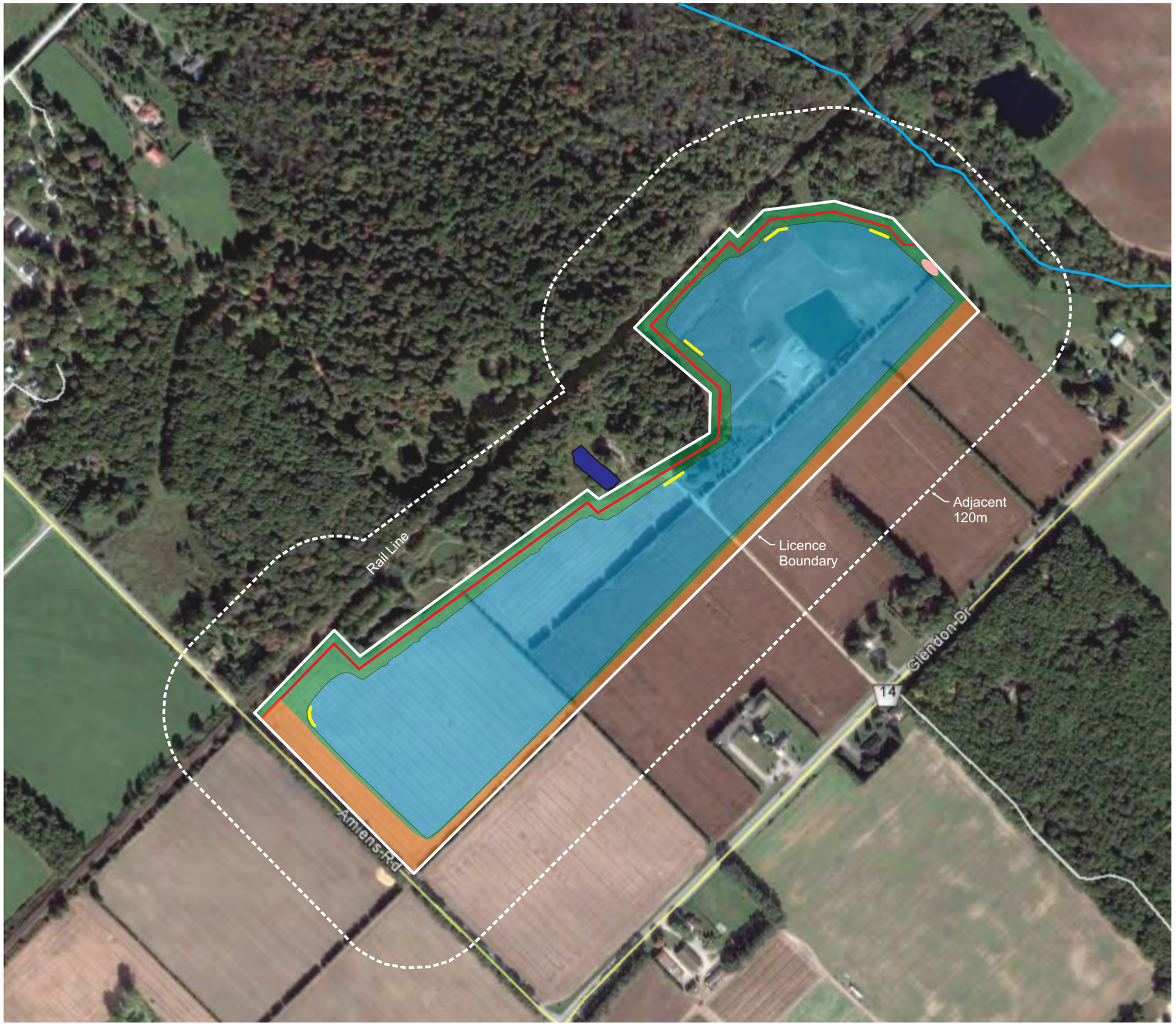
November 2017

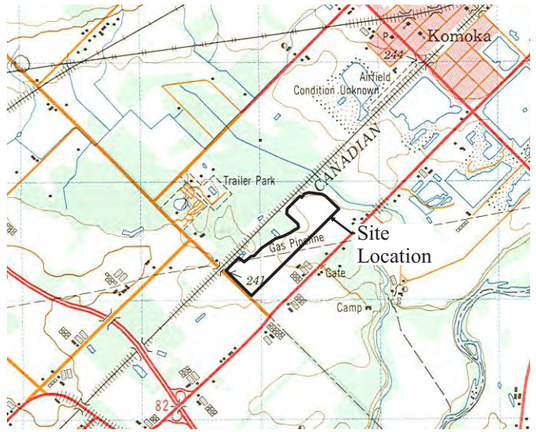
BioLogic

AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

# Figure 8: Rehabilitation

(2016 Google Air Photo)




0 1,000

Scale 1:50,000

Key Plan

**Legend:**

- Komoka Creek
- 15m Extraction Setback
- Open Aggregate Pond
- Native Grass Naturalization
- Agricultural Uses
- Rehabilitated Irrigation Pond
- Aquatic Bench Example
- Conceptual Replacement Topsoil Stockpile

Print on 11X17, Landscape Orientation

0 100

Scale 1:5000

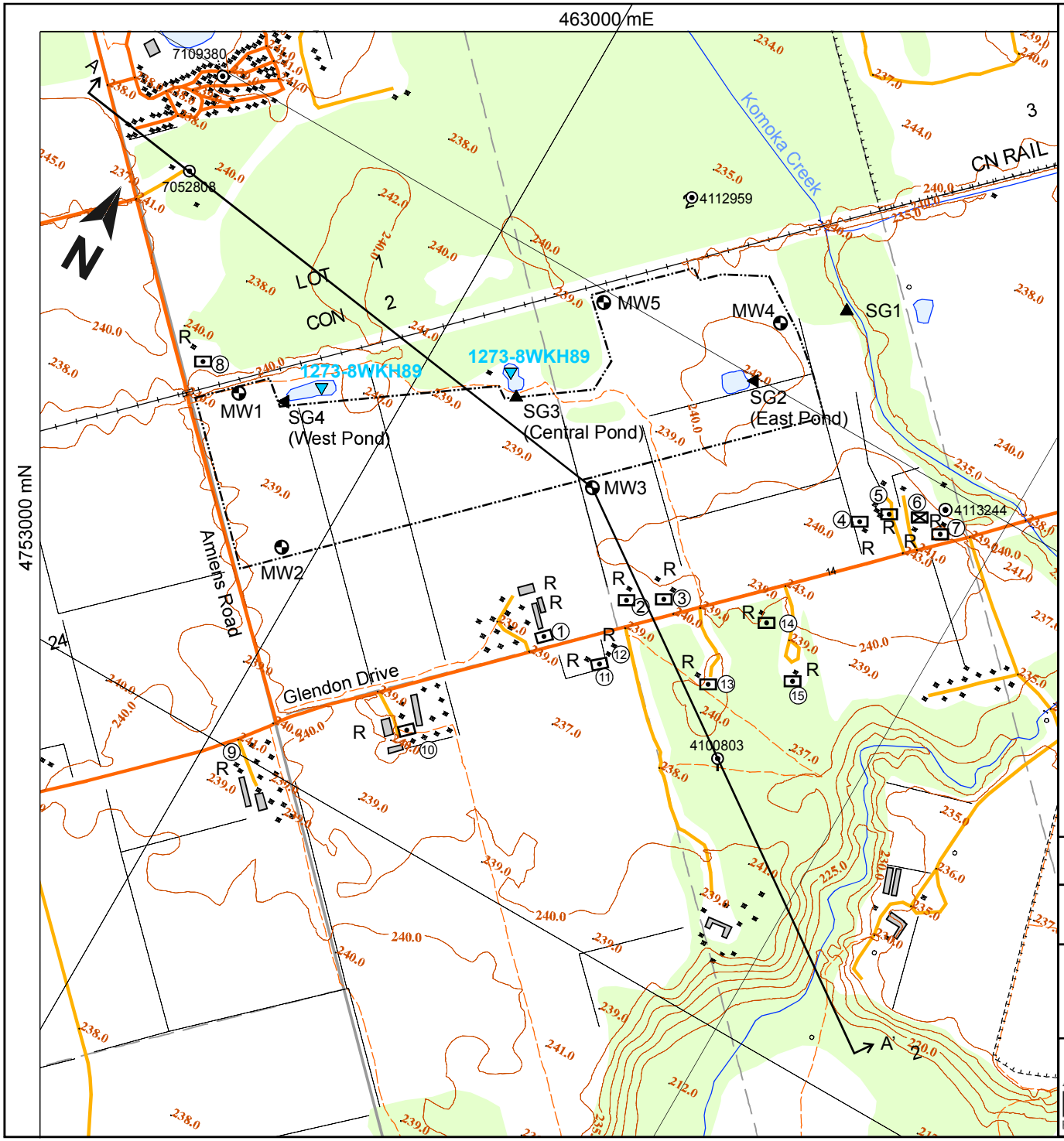
November 2017

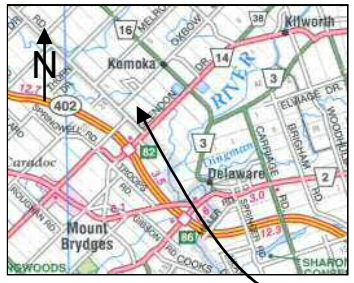
BioLogic

AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

# Appendix A

Hydrogeological Report Excerpts




**LEGEND**

- Licence pit boundary
- R — Residence
- 7052808 — Water well record number on file with MOECC
- Monitoring well
- Drilled well in overburden
- Drilled well in bedrock
- Bored welll
- Sand point
- ① — Domestic well designation (no record on MOECC files)
- A A' — Cross-section location
- Staff gauge
- Active PTTW with Number

SCALE 1:10,000

0 250 500 Metres

Based on OBM mapping from MNRF
NAD 1983; Contour Interval 5 m

Figure 1

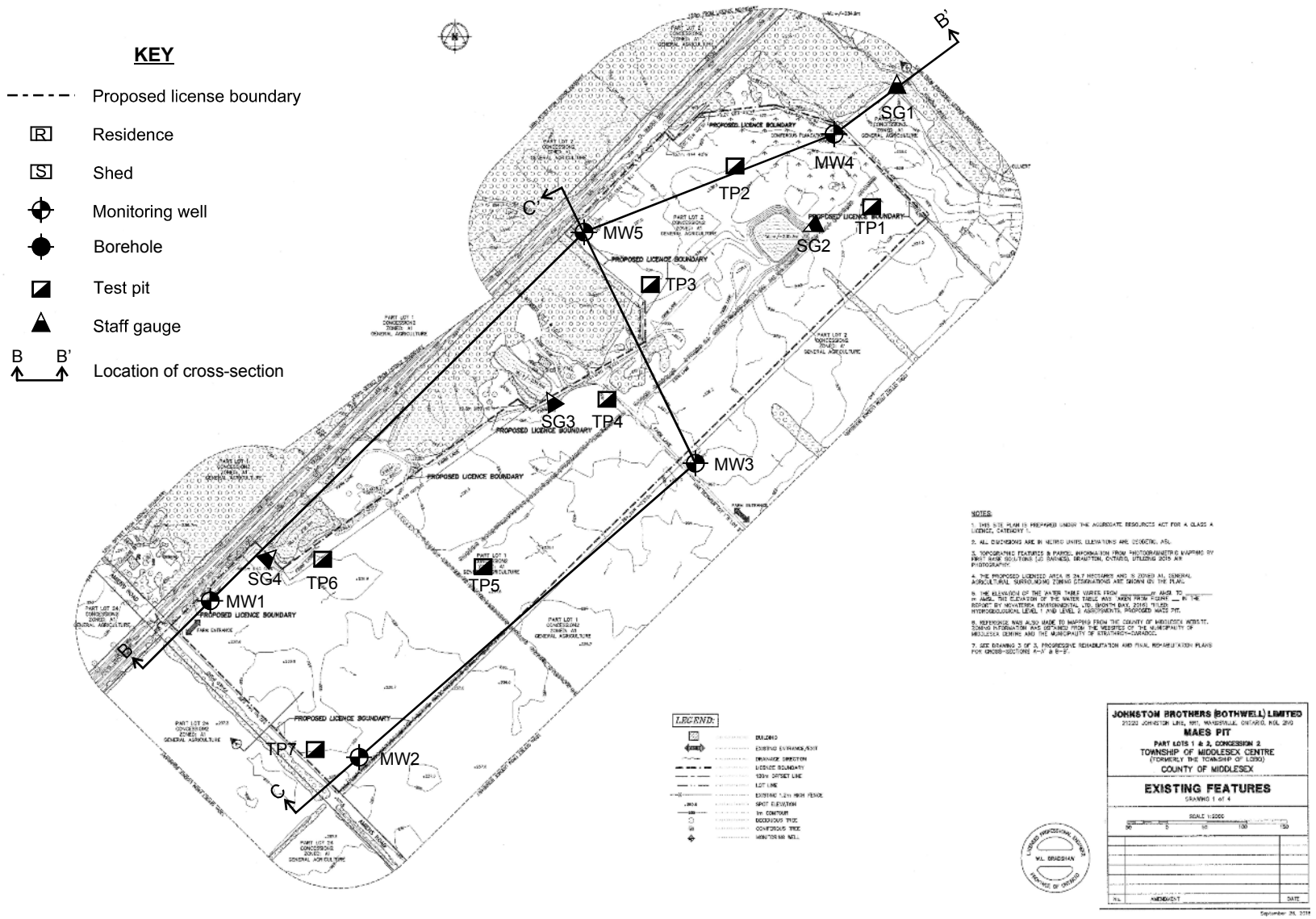
Subject site, well locations, topography and hydrology map

Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), County of Middlesex

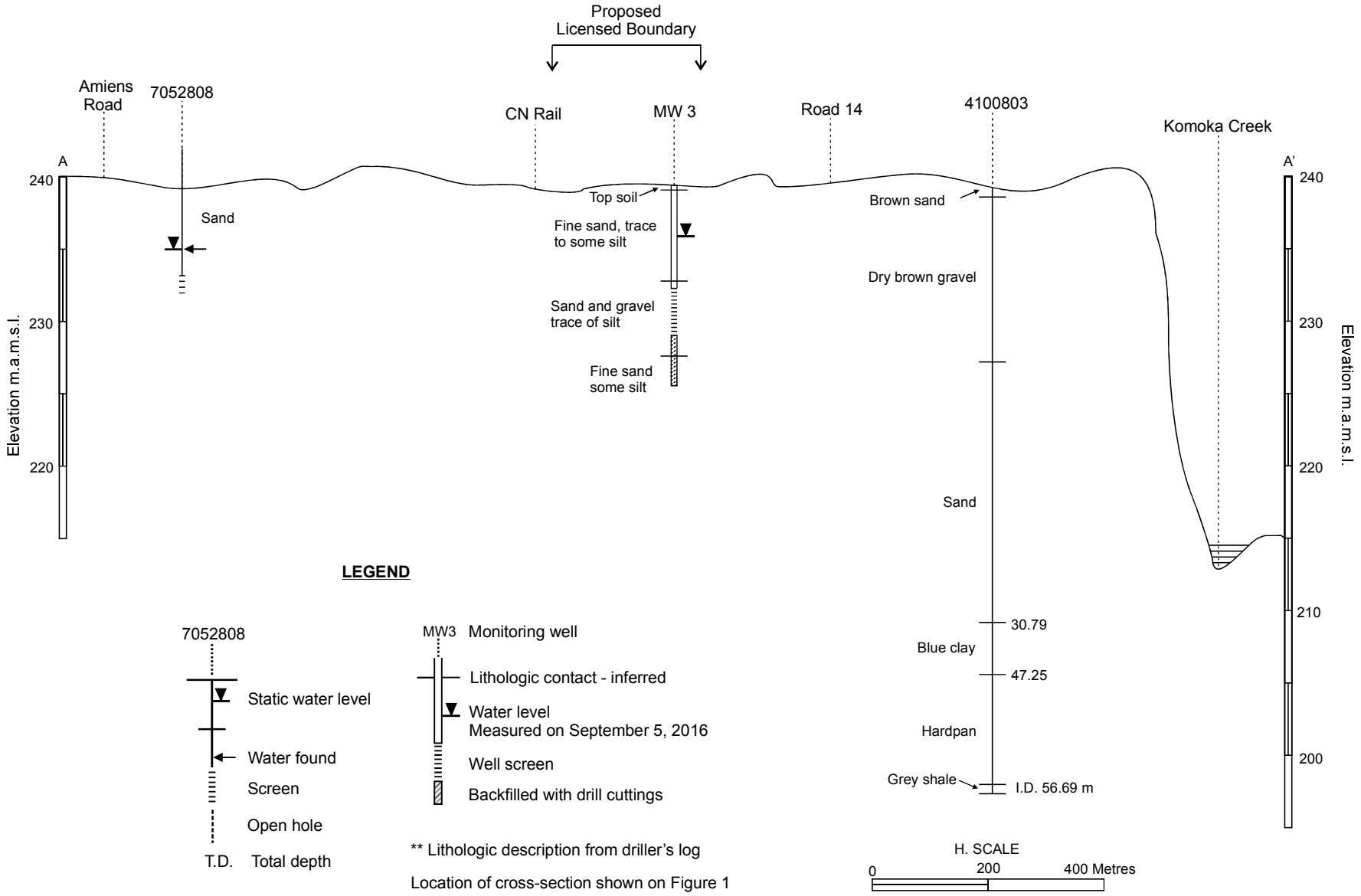
Novaterra ENVIRONMENTAL

Maes Pit
Johnston Brothers (Bothwell) Limited

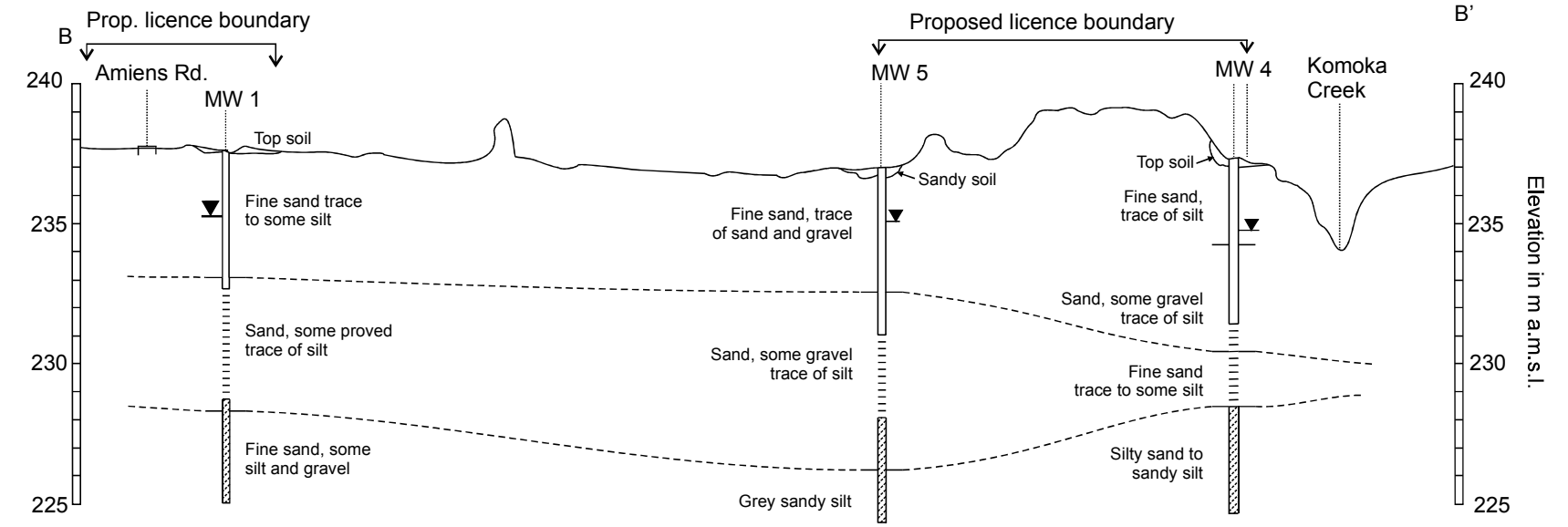
March 20, 2017

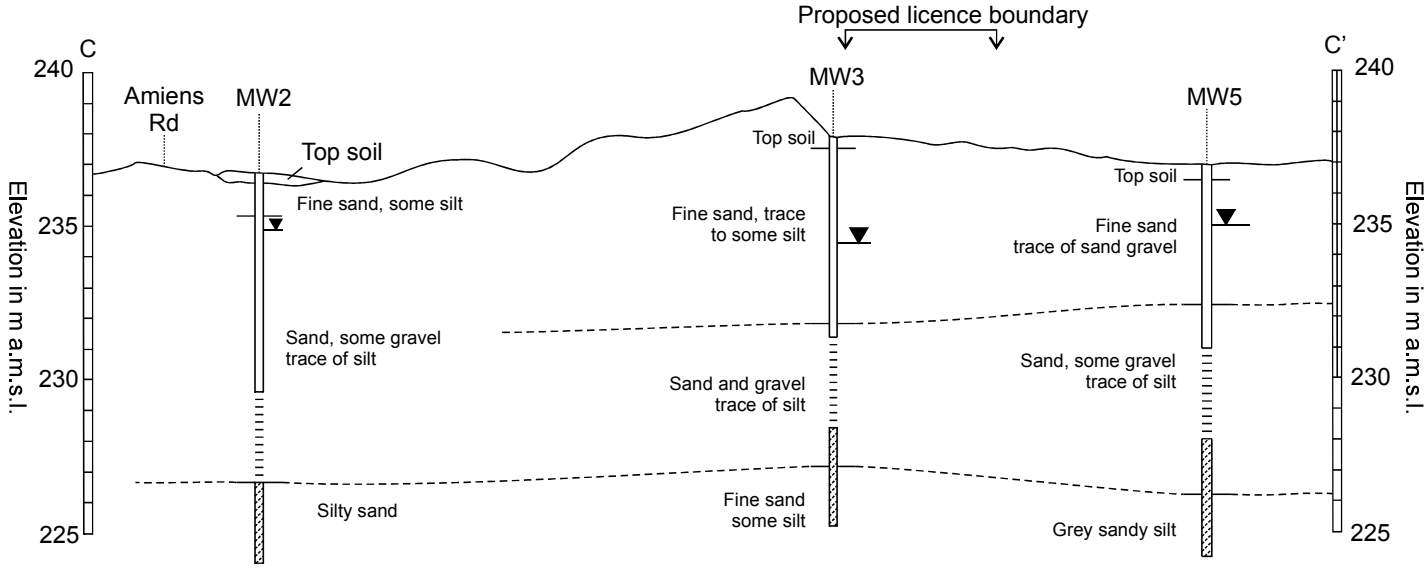



| | | |
|---|---|---|
| Novaterra ENVIRONMENTAL | EXISTING FEATURES | Figure 2 |
| | Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), Middlesex County | Maes Pit<br>Johnston Brothers (Bothwell) Ltd. |
| | | March 20, 2017 |



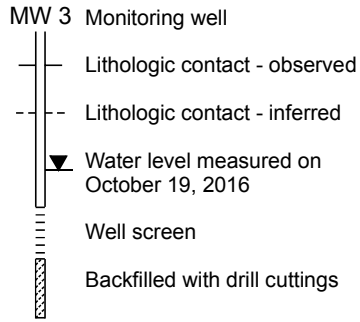

| | | |
|---|---|---|
| Novaterra ENVIRONMENTAL | REGIONAL CROSS-SECTION A-A'<br>Part Lots 1, 2 and 3 Concession 2, (Formerly Lobo Township),<br>Middlesex Centre, Middlesex County | Figure 4<br>Maes Pit<br>Johnston Brothers (Bothwell) Ltd.<br>March 20, 2017 |




Locations of cross-sections are shown in Figure 2

**LEGEND**




SCALE

0 100 200 Metres

Novaterra ENVIRONMENTAL

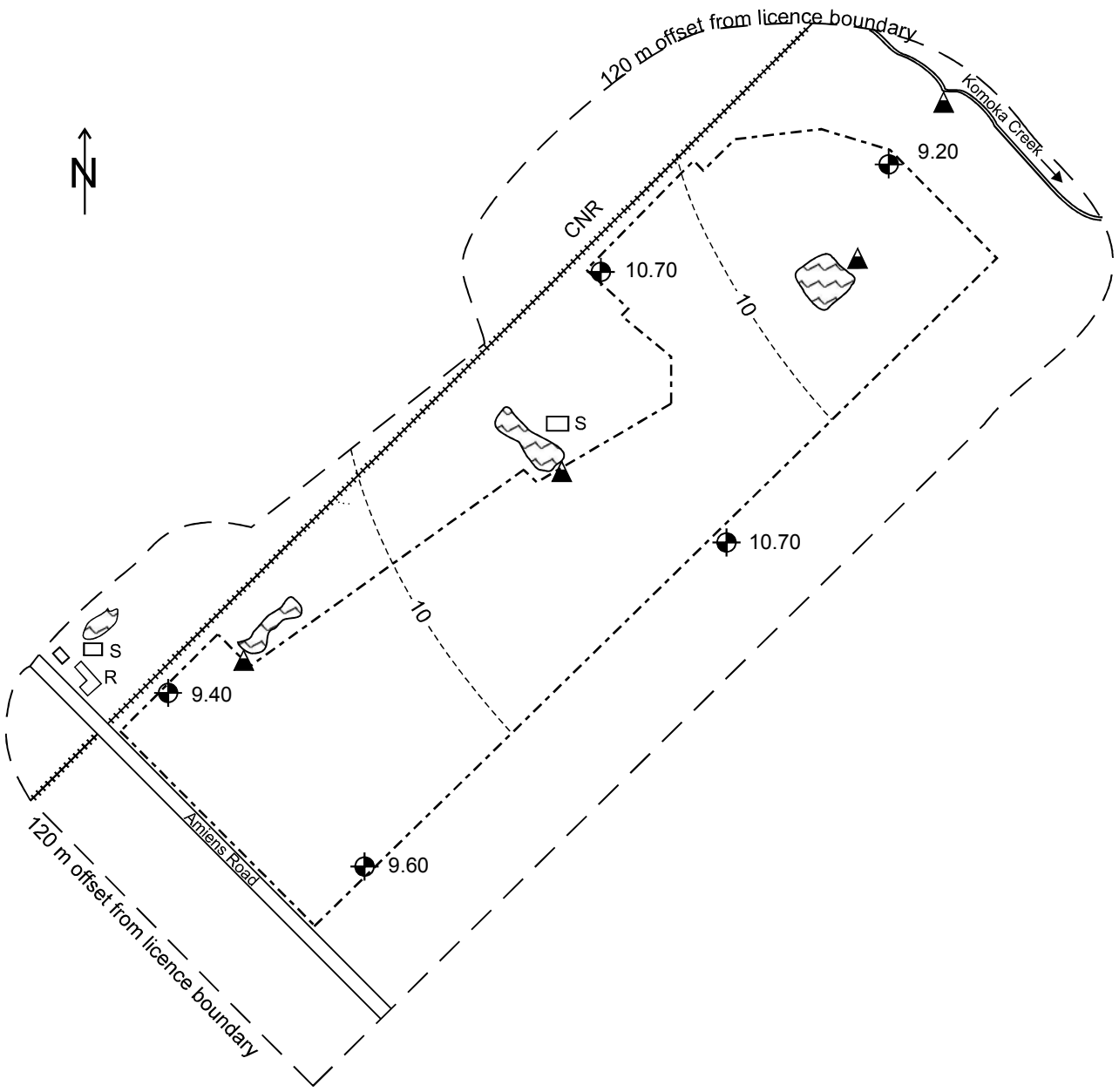
LOCAL VERTICAL CROSS SECTIONS B-B' AND C-C'

Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), Middlesex County

Figure 5

Maes Pit
Johnston Brothers (Bothwell) Ltd.

November 19, 2016




**LEGEND**

- Proposed license boundary
- R Residence
- S Shed
- Monitoring well
- Pond
- Test pit
- Staff gauge
- 10.70 Thickness of aggregate deposits at monitoring well (in metres) [1)]
- --8-- Inferred isopack line of aggregate deposits (including top soil) (m)

1) Silty sand and sandy silt present beneath sand gravel is excluded.

SCALE
0 50 100 150 Metres

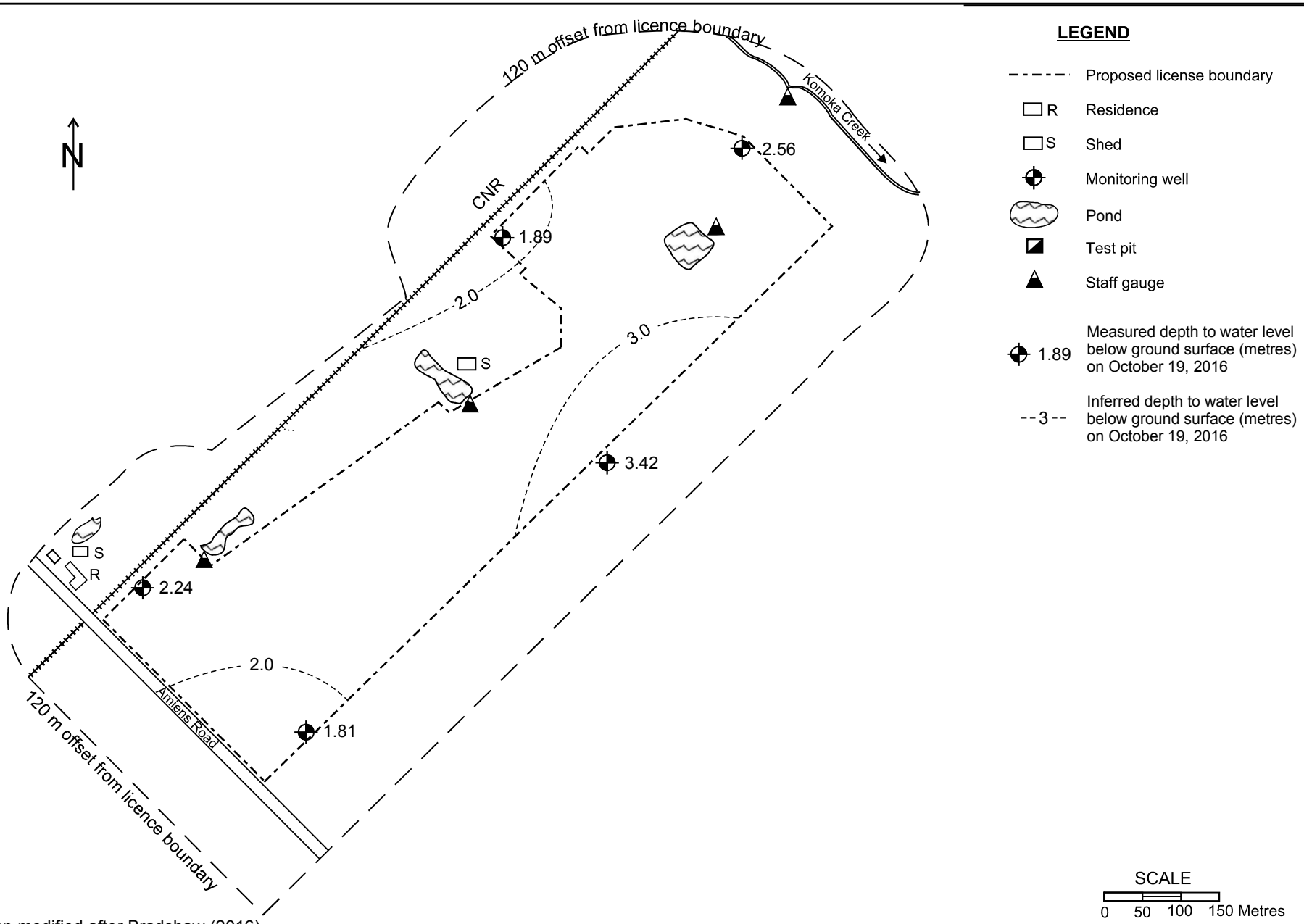
Base map modified after Bradshaw (2016)

Novaterra ENVIRONMENTAL

THICKNESS OF SAND AND GRAVEL

Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), Middlesex County

Figure 6
Maes Pit
Johnston Brothers (Bothwell) Ltd.
November 1, 2016




Base map modified after Bradshaw (2016)

Novaterra ENVIRONMENTAL

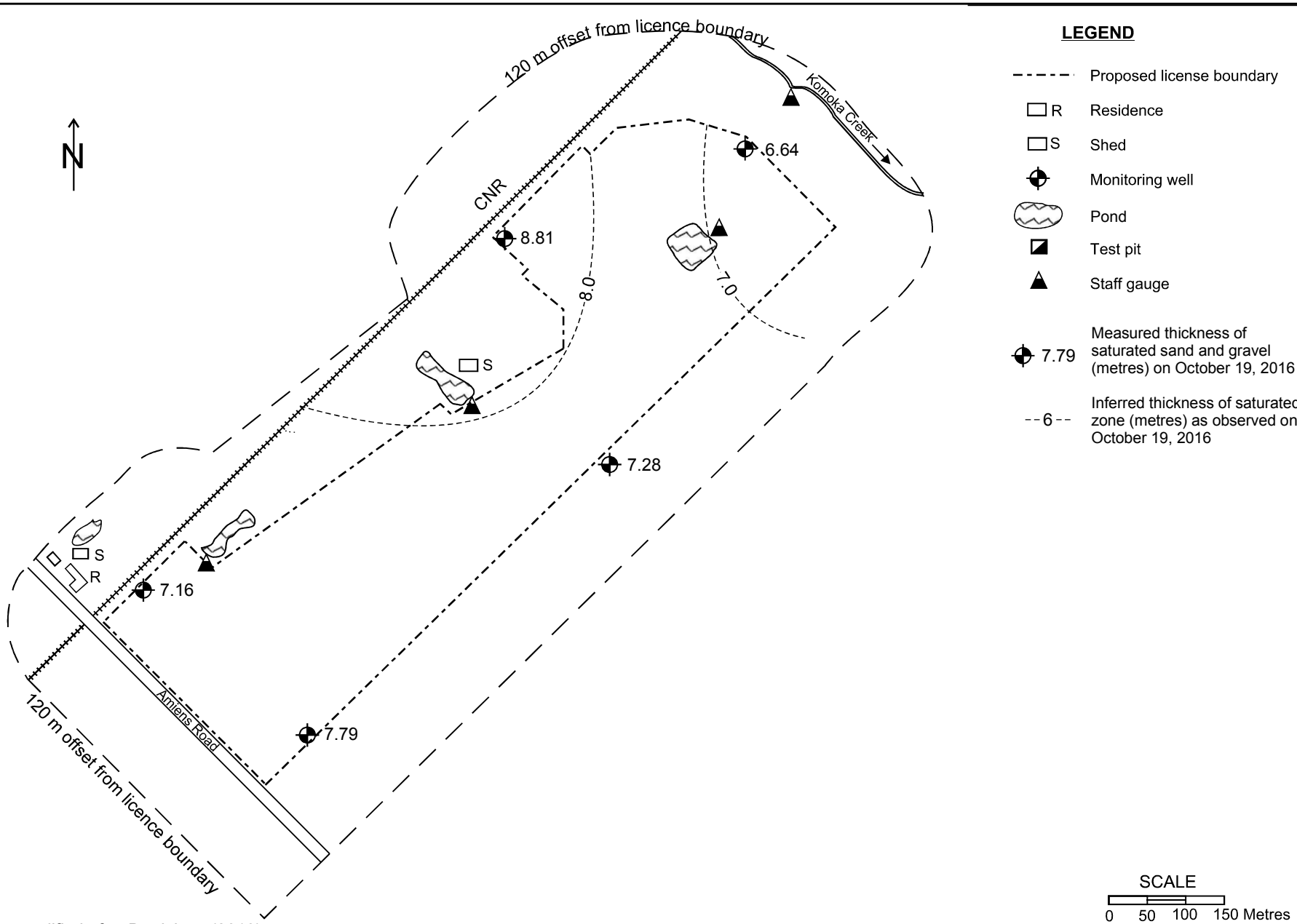
INFERRED DEPTH TO GROUNDWATER BELOW GROUND SURFACE

Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), Middlesex County

Figure 8

Maes Pit
Johnston Brothers (Bothwell) Ltd.

November 1, 2016




Base map modified after Bradshaw (2016)

Novaterra ENVIRONMENTAL

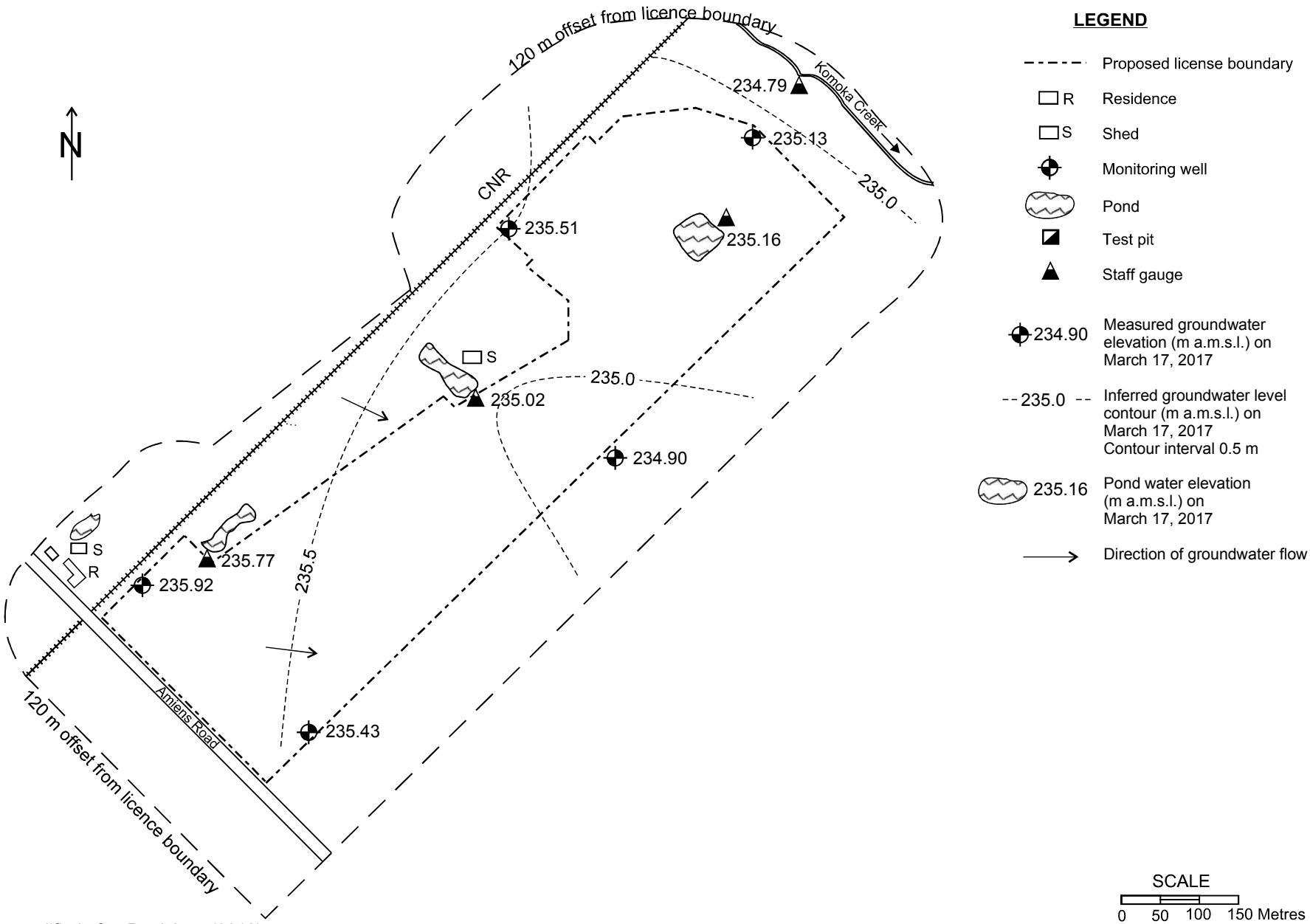
THICKNESS OF SATURATED SAND AND GRAVEL

Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), Middlesex County

Figure 9

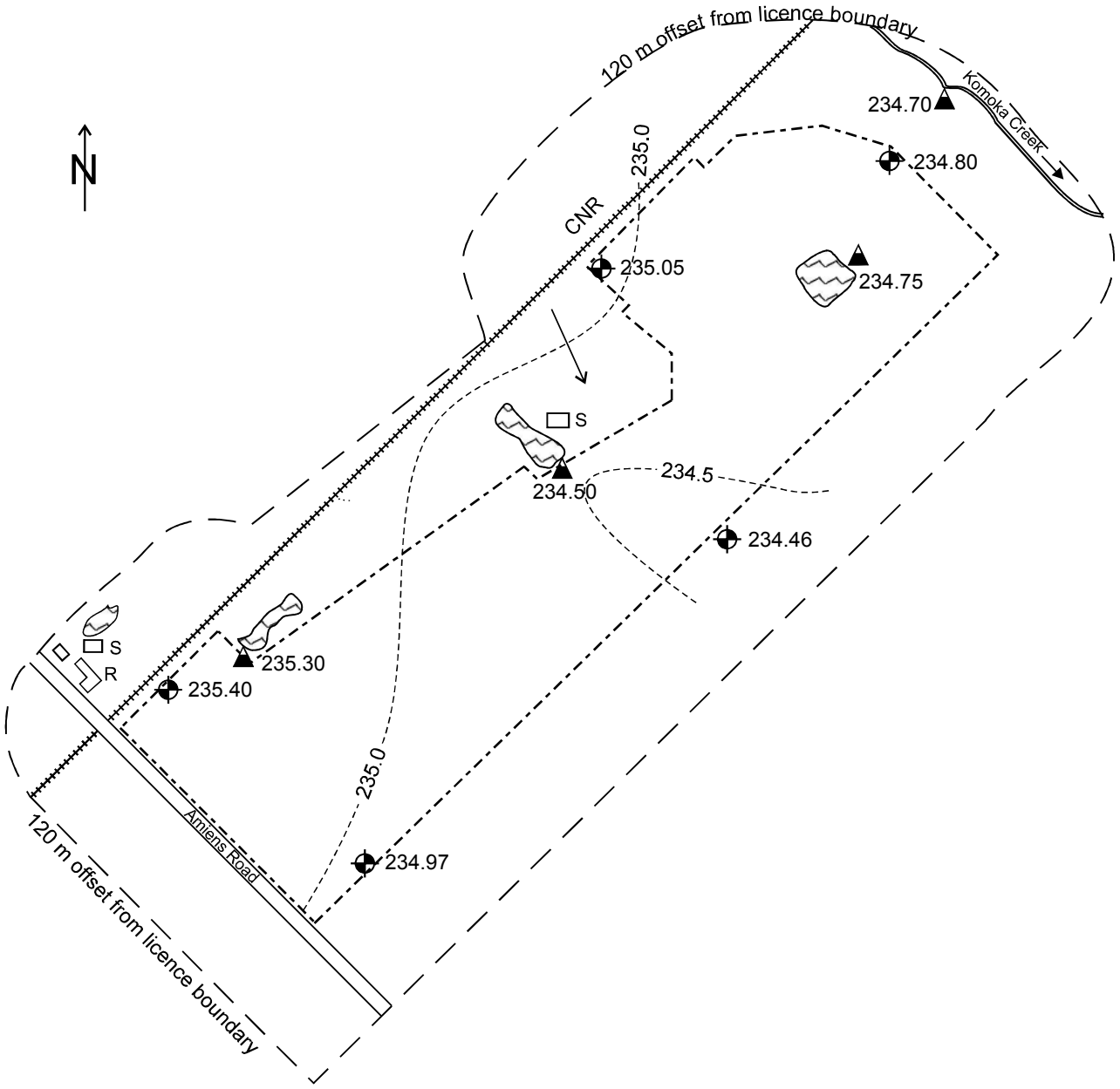
Maes Pit
Johnston Brothers (Bothwell) Ltd.

November 1, 2016




Base map modified after Bradshaw (2016)

| | | |
|---|---|---|
| Novaterra ENVIRONMENTAL | INFERRED GROUNDWATER TABLE CONFIGURATION (MARCH, 2017) | Figure 10 |
| | Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), Middlesex County | Maes Pit<br>Johnston Brothers (Bothwell) Ltd. |
| | | March 20, 2017 |




**LEGEND**

- Proposed license boundary
- R Residence
- S Shed
- Monitoring well
- Pond
- Test pit
- Staff gauge
- 234.46 Measured groundwater elevation (m a.m.s.l.) on October 19, 2016
- --234.50-- Inferred groundwater level contour (m a.m.s.l.) on October 19, 2016 Contour interval 0.5 m
- 234.75 Pond water elevation (m a.m.s.l.) on October 19, 2016
- Direction of groundwater flow

SCALE

0 50 100 150 Metres

Base map modified after Bradshaw (2016)

Novaterra ENVIRONMENTAL

INFERRED GROUNDWATER TABLE CONFIGURATION (OCTOBER, 2016)

Part Lots 1 and 2, Concession 2, Township of Middlesex Centre (formerly Township of Lobo), Middlesex County

Figure 11

Maes Pit
Johnston Brothers (Bothwell) Ltd.

November 1, 2016

# Appendix B

MNRF Correspondence

## Robyn Leppington

**From:** Diemer, Kristen (MNRF) <Kristen.Diemer@ontario.ca>
**Sent:** Monday, June 12, 2017 4:04 PM
**To:** Robyn Leppington
**Subject:** RE: Stage 1 Request for Proposed Aggregate Pit - Maes Pit
**Attachments:** JohnstonMaesPit Stage1Finalr.pdf

Hi Robyn,

MNRF provides the following natural heritage information in response to your request to inform a Natural Environment Report as part of a new ARA pit application for the Johnston Maes pit, with the draft license boundary at the location shown in the attached, described as Part Lots 1 & 2, Concession 2, Township of Middlesex Centre (Formerly Township of Lobo) Middlesex County.

**Species at Risk (SAR)**

The Species at Risk in Ontario (SARO) List Ontario Regulation 230/08 issued under the *Endangered Species Act*, *2007* (ESA). The ESA came into force on June 30, 2008, and provides both species protection (section 9) and habitat protection (section 10) to species listed as endangered or threatened on the SARO List. The current SARO List can be found on e-laws (http://www.ontario.ca/laws/regulation/080230).

An initial SAR screening (Endangered and Threatened species) has been completed for the identified area. MNRF recommends that the following species are considered to determine whether SAR or SAR habitat occurs/may occur on or adjacent to the site. If a proposed activity may contravene the ESA, the proponent should submit an Information Gathering Form to Aylmer MNRF for compliance advice and approvals at ESA.Aylmer@ontario.ca prior to proceeding (IGF; http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&TAB=PROFILE&ENV=WWE&NO=018-0180E)

**There are known occurrences of the following SAR in the area with the potential to occur on or adjacent to the site, including:**

- Blanding's Turtle – threatened with general habitat protection
- Eastern Hog-nosed Snake – threatened with general habitat protection
- Louisiana Waterthrush - threatened with general habitat protection (newly up-listed from special concern in June 2017)
- Eastern Flowering Dogwood – endangered with regulated habitat protection
- American Badger - endangered with regulated habitat protection
- SAR bats with species and habitat protection
- Bobolink – threatened with general habitat protection
- Eastern Meadowlark – threatened with general habitat protection
- Barn Swallow – threatened with general habitat protection
- Bank Swallow – threatened with general habitat protection
- Chimney Swift – threatened with general habitat protection
- The adjacent Komoka Creek to the northeast of the site is identified in DFO mapping (http://www.dfo-mpo.gc.ca/species-especes/images/maps-cartes/onsw-soon-19-eng.jpg) as an area within which one or more species at risk may be found

Please note that this is an initial screening for SAR and the absence of an element occurrence does not indicate the absence of species. The province has not been surveyed comprehensively for the presence or absence of SAR and MNRF data relies on observers to report sightings of SAR. Field assessments by a qualified professional may be necessary if there is a high likelihood for SAR species and/or habitat to occur within the project footprint and be impacted.

It is important to note the following:

- Changes may occur in both species and habitat protection which could affect whether proposed projects may have adverse effects on SAR.
- The Committee on the Status of Species at Risk in Ontario (COSSARO) meets regularly to evaluate new species for listing and/or re-evaluate species already on the SARO List. As a result, species designations may change, which could in turn change the level of protection they receive under the ESA 2007.
- Habitat protection provisions for a species may change if a species-specific habitat regulation comes into effect.

If an activity or project will result in adverse effects to endangered or threatened species and/or their habitat, additional action would need to be taken in order to remain in compliance with the ESA. Additional action could be applying for an authorization under section 17(2)(c) of the ESA, or completing an online registry for an ESA regulation, if the project is eligible (http://www.ontario.ca/environment-and-energy/natural-resources-approvals). Please be advised that applying for an authorization does not guarantee approval and the process can take several months.

**Significant Wildlife Habitat (SWH)**

**Candidate significant wildlife habitat (SWH) is likely present on or adjacent to (within 120 m) the above-noted subject lands** (e.g., consider categories such as Bat Maternity Colonies, Snake Hibernaculum, Amphibian Breeding Habitat, Woodland Area Sensitive Bird Breeding, Waterfowl Nesting Area, Turtle Nesting, Special Concern and Rare Wildlife, others as applicable).

Please consult the Significant Wildlife Habitat Technical Guide (SWHTG, OMNR 2000), the Natural Heritage Reference Manual (NHRM) and the Ecoregion Criteria Schedules for criteria on identifying and determining significance of wildlife habitat. SWH is identified by planning authorities using the criteria and processes recommended in the SWHTG and Ecoregion Criteria Schedules.

Link to the SWHTG: https://www.ontario.ca/environment-and-energy/guide-significant-wildlife-habitat
Link to Ecoregion 7E criteria schedule: https://www.ontario.ca/document/significant-wildlife-habitat-ecoregional-criteria-schedules-ecoregion-7e

The habitat of provincially rare (S1-S3, SH) and Special Concern species is considered SWH under the category of 'Special Concern and Rare Wildlife Species' in the SWHTG Ecoregion Criteria Schedules and consideration should be given to these species and whether their habitat occurs on or adjacent to the subject lands to address negative impacts.

**There are known occurrences of the following S-ranked and Special Concern (SC) species in the area with the potential to occur in or adjacent to the study area, or known occurrences where noted, including:**

- Snapping Turtle – SC; there are **known occurrences** in Komoka/South Strathroy Creek PSW (SC 9) complex that is on/adjacent to the site
- Wood Thrush – SC; there is a **known occurrence** of the species in the woodland feature north of the site
- Golden-winged Warbler – SC; there is a **known occurrence** of the species in the woodland feature north of the site
- Eastern Wood-pewee – SC
- Red-headed Woodpecker – SC
- Milksnake - S3
- Golden Puccoon – S3
- Green Dragon – SC
- Crooked-stem Aster – S2

**Areas of Natural and Scientific Interest (ANSIs)**

There are no ANSIs within or adjacent to the study area.

**Significant Woodlands**

**There appears to be woodland located within and/or adjacent to the study area that would meet criteria for significant woodland.** The Natural Heritage Reference Manual contains information and criteria for determining significant woodlands.

**Significant Wetlands**

**There appears to be evaluated wetland within and/or adjacent to the study area: the Komoka/South Strathroy Creek Provincially Significant Wetland (SC 9).** Wetland mapping can be accessed through Land Information Ontario.

**Significant Valleylands**

MNRF does not possess significant valleylands mapping. We suggest you contact the applicable conservation authorities to find out if they have information pertaining to significant valleylands. The NHRM also provides guidance on evaluation criteria for determining significant valleylands.

**Fish and Fish Habitat**

**Fish and fish habitat is present within and/or adjacent to the study area.**

MNRF provides the following available Aquatic Resource Area (ARA) data which can be accessed through LIO for the nearest adjacent reach of Komoka Cree northeast of the site:

- Thermal regime: Cold based on fish species present
- Fish species summary: Iowa darter,blackside darter,bluegill,bluntnose minnow,brassy minnow,brook stickleback,brook trout,brown bullhead,brown trout,central mudminnow,central stoneroller,coho salmon,common carp,common shiner,creek chub,eastern blacknose dace,fathead minnow,golden shiner,green sunfish,greenside darter,johnny darter,johnny darter/tesselated darter,largemouth bass,least darter,longnose dace,northern pike,northern redbelly dace,pearl dace,pumpkinseed,rainbow darter,rainbow trout,rock bass,smallmouth bass,spotfin shiner,striped shiner,white sucker

We recommend you contact the appropriate conservation authority and DFO for up-to-date fisheries, mussel, and drain information if needed.

Conservation Authorities and Official Plans may provide additional natural heritage information for this study.

Please be advised that it is your responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

Please send future information requests to ESA.Aylmer@ontario.ca.

If you have any questions or require additional information, please feel free to contact me.

Sincerely,

**Kristen Diemer** | Management Biologist
Ministry of Natural Resources & Forestry
P-519.773.4751 F-519.773.9014
615 John St N Aylmer ON N5H 2S8
kristen.diemer@ontario.ca

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**From:** Robyn Leppington [mailto:rleppington@biologic.ca]
**Sent:** March-16-17 4:32 PM
**To:** Hernould, Cara (MNRF)
**Subject:** Stage 1 Request for Proposed Aggregate Pit - Maes Pit

Hi Cara,

Attached is a Stage 1 Request form for a proposed Aggregate Pit (Maes Pit) located just outside of Komoka.

If you have any questions, please don't hesitate in contacting me.

Thanks,

Robyn Leppington, B.Sc.
Biologist

BioLogic Incorporated
110 Riverside Drive
London, ON
N6H 4S5

Tel: 519-434-1516 ext. 105
Fax: 519-434-0575

# Appendix C

ELC Data Sheets

KOMOKA PIT

**ELC** — COMMUNITY DESCRIPTION & CLASSIFICATION

| | | | |
|---|---|---|---|
| SITE: Johnston-Ameins Rd | | POLYGON: 1 | |
| SURVEYOR(S): WH | DATE: May 26/16 Aug. 22, 16 | TIME: start | 10:30 |
| | | finish | 12:00 |
| UTMZ: 17 | UTME: | UTMN: | |

## POLYGON DESCRIPTION

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

| SITE | COVER |
|---|---|
| [ ] OPEN WATER | [x] OPEN |
| [ ] SHALLOW WATER | [ ] SHRUB |
| [x] SURFICIAL DEP. | [ ] TREED |
| [ ] BEDROCK | |

## 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 | 1 | POPdelt > ACEsacc > PRUsero |
| 2 | SUB-CANOPY | 2 | 3 | POPdelt > RHUtyph > ACEsacc |
| 3 | UNDERSTOREY | 2 | 3 | PHRaust > SALamyg |
| 4 | GRD. LAYER | 5 | 4 | POAprat = DACglom = LOTcorn > VICvil |

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 | R | 10 - 24 | O | 25 - 50 | N | > 50 |
| STANDING SNAGS: | R | < 10 | R | 10 - 24 | N | 25 - 50 | N | > 50 |
| DEADFALL / LOGS: | O | < 10 | O | 10 - 24 | R | 25 - 50 | R | > 50 |

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

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

## SOIL ANALYSIS:

| | | | | |
|---|---|---|---|---|
| TEXTURE: | SiFS | DEPTH TO MOTTLES / GLEY | g = 999 | G= 999 |
| MOISTURE: | 3 | DEPTH OF ORGANICS: | 0 | (cm) |
| HOMOGENEOUS / VARIABLE | | DEPTH TO BEDROCK: | 999 | (cm) |

## COMMUNITY CLASSIFICATION:

| | | ELC CODE |
|---|---|---|
| COMMUNITY CLASS: | CULTURAL | CU |
| COMMUNITY SERIES: | CULTURAL MEADOW / THICKET | CUM / CUT |
| ECOSITE: | MINERAL CULTURAL THICKET | CUT1 |
| VEGETATION TYPE: | | |
| INCLUSION | AGRICULTURAL POND | AGP |
| COMPLEX | | |

Notes:

**ELC** — STAND CHARACTERISTICS

SITE: KOMOKA PIT
POLYGON: 1
DATE:
SURVEYOR(S): WH

TREE TALLY BY SPECIES:

PRISM FACTOR 2M

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

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

# ELC

SOILS ONTARIO

SITE: KOMOKA PIT
POLYGON: 1
DATE: Aug 22, 2016
SURVEYOR(S): WH

| | P/A | PP | Dr | Position | Slope Aspect | Slope % | Type | Class | Z | UTM EASTING | UTM NORTHING |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ^ | | | 4 | 110 | 2 | | | 17 | 462927 | 4753679 |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |

| SOIL | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| TEXTURE x HORIZON | SiFS / 45 / fS | | | | |
| A TEXTURE | SiFS | | | | |
| COURSE FRAGMENTS | 999 | | | | |
| B TEXTURE | fS | | | | |
| COURSE FRAGMENTS | 999 | | | | |
| C TEXTURE | 999 | | | | |
| COURSE FRAGMENTS | 999 | | | | |
| EFFECTIVE TEXTURE | SiFS | | | | |
| SURFACE STONINESS | no | | | | |
| SURFACE ROCKINESS | no | | | | |
| DEPTH TO / OF MOTTLES | 999 | | | | |
| GLEY | 999 | | | | |
| BEDROCK | 999 | | | | |
| WATER TABLE | 999 | | | | |
| CARBONATES | 0 | | | | |
| DEPTH OF ORGANICS | 0 | | | | |
| PORE SIZE DISC #1 | 999 | | | | |
| PORE SIZE DISC #2 | 999 | | | | |
| MOISTURE REGIME | 3 | | | | |
| SOIL SURVEY MAP | | | | | |
| LEGEND CLASS | | | | | |

# ELC PLANT SPECIES LIST

SITE: Ameins Rd / KOMOKA PIT
POLYGON: 1
DATE: May 26/16, Jun 15/16
SURVEYOR(S): WH

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. |
|---|---|---|---|---|---|
| ALLpet | | | | A | |
| POPdelt | O | O | O | O | |
| PLAlanc | | | | A | |
| VITripa | | | O | | |
| PINRanst | | | | O | |
| BRAnigr | | | | O | |
| ACESacc | R | R | | | |
| MEDlupu | | | | D | |
| POAprat | | | | A | |
| DAUcaro | | | | A | |
| RUBocci | | | | O | |
| TARoffi | | | | O | |
| HESmatr | | | | O | |
| CELocci | | R | | | |
| PRUvirg | | | O | | |
| CIRvulg | | | | A | |
| QUErubr | R | O | | | |
| LONtata | | | O | | |
| ULMamer | | O | O | | |
| TUSfarf | | | | O | |
| JUGnigr | | O | O | | |
| GALapar | | | | O | |
| CORalte | | | R | | |
| ACESacc | O | O | | | |
| ARItrip | | | | R | |
| LEOcard | | | | A | |
| PRUsero | O | O | | | |
| MORalba | | R | R | | |
| DACglom | | | | A | |
| ELYrepe | | | | A | |
| RHUtyph | | O | O | | |

| SPECIES CODE | LAYER 1 | 2 | 3 | 4 | COL. |
|---|---|---|---|---|---|
| PICabie | | R | | | |
| ECHloba | | | | O | |
| QUEmacr | | R | | | |
| GERmacu | | | | O | |
| SALamyg | | | O | | |
| CORstol | | | O | | |
| RIBamer | | | O | O | |
| RUBidae | | | | O | |
| NEPcate | | | | R | |
| RUMcris | | | | R | |
| CARblan | | | | R | |
| ERIannu | | | | O | |
| EQUarve | | | | O | |
| EQUhyme | | | | R | |
| ERIphil | | | | O | |
| PLAmajo | | | | O | |
| ROBpsen | | R | | | |
| LAMpurp | | | | R | |
| MALrace | | | | O | |
| OXAstri | | | | O | |
| AQUcana | | | | O | |
| PTEaqui | | | | O | |
| TRIgran | | | | R | |
| MAIstel | | | | O | |
| LOTcorn | | | | A | |
| ROSmult | | | | O | |
| CHRleuc | | | | O | |
| AGRgiga | | | | A | |
| TRIprat | | | | A | |
| RUMcris | | | | O | |
| BARvulg | | | | O | |

# ELC
PLANT SPECIES LIST

SITE: KOMOKA PIT
POLYGON: 1
DATE: Jn 15/16, July 2, Aug 22, Oct 7
SURVEYOR(S): WH

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. |
|---|---|---|---|---|---|
| LYCalba | | | | O | |
| BERinca | | | | O | |
| PHYamer | | | | O | |
| VICvill | | | | A | |
| ANEcana | | | | O | |
| SISalti | | | | O | |
| RUDhirt | | | | O | |
| APOandr | | | | O | |
| CARbebb. | | | | O | |
| LATlati | | | | O | |
| SILglaum | | | | O | |
| PHLprat | | | | O | |
| HIEarve | | | | O | |
| TRAprat | | | | O | |
| FESarun | | | | O | |
| CARvulp | | | | O | |
| ASCtube | | | | R | |
| CARdewe | | | | O | |
| CARstri | | | | O | |
| CARbrun | | | | R | |
| BROpube | | | | R | |
| SOLcana | | | | A | |
| SECglabri | | | | O | |
| CIRlute | | | | O | |
| IMPpall | | | | O | |
| PHYamer | | | | O | |
| URTdioi | | | | O | |
| CLEvir | | | | O | |
| SILcucu | | | | O | |
| LYTsali | | | | O | |
| EUPperf | | | | O | |

| SPECIES CODE | LAYER 1 | 2 | 3 | 4 | COL. |
|---|---|---|---|---|---|
| PRKpers | | | | O | |
| SALexig | | | O | | |
| EUTgram | | | | O | |
| OENparv | | | | O | |
| UENbien | | | | O | |
| CONcana | | | | O | |
| RUBlidae | | | | O | |
| AGAtenu | | | | O | |
| MENspic | | | | R | |
| SPIcern | | | | R | |
| PRUvulg | | | | O | |
| CIRarve | | | | | |
| FRAamer | | | | | |
| HYPperf | | | | | |
| ASTeric | | | | | |
| ASTnova | | | | | |
| ASTpilo | | | | | |
| ASTlate | | | | | |
| ACHmil | | | | | |
| PILpumi | | | | | |
| MUHmexi | | | | | |
| SAPoffi | | | | | |
| LINvulg | | | | | |
| ~~BERalte~~ | | | | | |



# ELC
WILDLIFE

SITE: KOMOKA PIT
POLYGON: 1
DATE: Jn 15,16
SURVEYOR(S): WH
START TIME: 5:30 END TIME: 6:47

TEMP (°C): 15° CLOUD (10th): 70 WIND: 1 PRECIPITATION: no
CONDITIONS: part cloud, cool, still

POTENTIAL WILDLIFE HABITAT:

| | | | |
|---|---|---|---|
| | VERNAL POOLS | X | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

SPECIES LIST:

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| B | AMRO | FY | | 4 |
| B | YWAR | P | | 2 |
| B | AMGO | P | | 4 |
| B | INBU | P | | 4 |
| B | RWBL | FY | | 8 |
| B | AMRE | SM | | 1 |
| B | BAOR | SM | | 2 |
| B | HOWR | SM | | 2 |
| B | NOCA | D | | 3 |
| B | SOSP | P | | 3 |
| B | BCCH | D | | 4 |
| B | GCFL | T | | 1 |
| B | CHSP | SM | | 1 |
| B | GRCA | T | | 2 |
| B | BHCO | P | | 3 |
| | | | | |
| | | | | |
| | | | | |

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| O | Y. SULPHUR | | | |

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

WILDLIFE

SITE: KOMOKA PIT
POLYGON: 1
DATE: July 2, 2016
SURVEYOR(S): WN
START TIME: 7:00 END TIME: 10:00

| TEMP (°C): 18 | CLOUD (10th): 0 | WIND: 0 | PRECIPITATION: no |
|---|---|---|---|

CONDITIONS: clear, warm, still

**POTENTIAL WILDLIFE HABITAT:**

| | | | |
|---|---|---|---|
| | VERNAL POOLS | X | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

**SPECIES LIST:**

| TY | SP. CODE | EV | NOTES | # | TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|---|---|---|---|---|
| B | AMCR | FY | | 4 | | | | | |
| B | WBNU | SM | | 2 | | | | | |
| B | REVI | SM | | 1 | | | | | |
| B | SOSP | FY | | 2 | | | | | |
| B | BAOR | FY | | 2 | | | | | |
| B | BCCH | SM | | 2 | | | | | |
| B | BHCO | P | | 2 | | | | | |
| B | AMGO | P | | 4 | | | | | |
| B | DBWO | T | | 1 | | | | | |
| B | RBGR | SM | | 1 | | | | | |
| B | EAWP | SM | | 1 | | | | | |
| B | AMRO | FY | | 4 | | | | | |
| B | GRCA | SM | | 1 | | | | | |
| B | WITU | FY | | 1 | | | | | |
| B | NOFL | FY | | 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

MANAGEMENT / DISTURBANCE

SITE: KOMOKA PIT
POLYGON: 1
DATE: MAY 26/16
SURVEYOR(S): WN

| DISTURBANCE EXTENT | 0 | 1 | 2 | 3 | SCORE † |
|---|---|---|---|---|---|
| TIME SINCE LOGGING | > 30 YRS | 15 - 30 YRS | 5 - 15 YRS | 0 - 5 YEARS | 2 |
| INTENSITY OF LOGGING | NONE | FUEL WOOD | SELECTIVE | DIAMETER LIMIT | 9 |
| EXTENT OF LOGGING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| SUGAR BUSH OPERATIONS | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF OPERATIONS | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| GAPS IN FOREST CANOPY | NONE | SMALL | INTERMEDIATE | LARGE | 0 |
| EXTENT OF GAPS | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| LIVESTOCK (GRAZING) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF LIVESTOCK | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| ALIEN SPECIES | NONE | OCCASIONAL | ABUNDANT | DOMINANT | 6 |
| EXTENT OF ALIEN SPECIES | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| PLANTING (PLANTATION) | NONE | OCCASIONAL | ABUNDANT | DOMINANT | 0 |
| EXTENT OF PLANTING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| TRACKS AND TRAILS | NONE | FAINT TRAILS | WELL MARKED | TRACKS OR | 3 |
| EXTENT OF TRACKS/TRAILS | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| DUMPING (RUBBISH) | NONE | LIGHT | MODERATE | HEAVY | 2 |
| EXTENT OF DUMPING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| EARTH DISPLACEMENT | NONE | LIGHT | MODERATE | HEAVY | 6 |
| EXTENT OF DISPLACEMENT | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| RECREATIONAL USE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF RECR. USE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| NOISE | NONE | SLIGHT | MODERATE | INTENSE | 0 |
| EXTENT OF NOISE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| DISEASE/DEATH OF TREES | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF DISEASE / DEATH | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| WIND THROW (BLOW DOWN) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF WIND THROW | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| BROWSE (e.g. DEER) | NONE | LIGHT | MODERATE | HEAVY | 4 |
| EXTENT OF BROWSE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| BEAVER ACTIVITY | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF BEAVER | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| FLOODING (pools & puddling) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF FLOODING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| FIRE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF FIRE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| ICE DAMAGE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF ICE DAMAGE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| OTHER ..... | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |

† INTENSITY x EXTENT = SCORE

## ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: KOMOKA PIT | POLYGON: 2

SURVEYOR(S): WH | DATE: May 26/16 Jun 15, Jul 4, Aug 22 | TIME: start 14:57 finish 21:30

UTMZ: 17 | UTME: 463206 | UTMN: 4753871

### POLYGON DESCRIPTION

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

| SITE | COVER |
|---|---|
| ☐ OPEN WATER | ☐ OPEN |
| ☐ SHALLOW WATER | ☐ SHRUB |
| ☒ SURFICIAL DEP. | ☒ TREED |
| ☐ BEDROCK | |

### 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 | 1 | 4 | ACERsp >> PRUsero > QUERbic > FAGgran |
| 2 | SUB-CANOPY | 2 | 3 | ACERsp > PRUsero |
| 3 | UNDERSTOREY | 3 | 3 | SAMcana > CORtata > HAMvirg > VIBacer |
| 4 | GRD. LAYER | 5 | 4 | OSMcinna > MAIrace > ONOsens > OSMmacu |

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: ACERsacc 42 QUERmacr 14 ACERsasa 14 ACERrubr 13 | BA: 25

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

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

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

### SOIL ANALYSIS:

| | | | |
|---|---|---|---|
| TEXTURE: SiFS | DEPTH TO MOTTLES / GLEY | g = 25 | G= 35 |
| MOISTURE: 6 | DEPTH OF ORGANICS: 30 | | (cm) |
| HOMOGENEOUS / ~~VARIABLE~~ | DEPTH TO BEDROCK: 999 | | (cm) |

### COMMUNITY CLASSIFICATION:

| | | ELC CODE |
|---|---|---|
| COMMUNITY CLASS: | SWAMP | SW |
| COMMUNITY SERIES: | DECIDUOUS | SWD |
| ECOSITE: | MAPLE MINERAL | SWD3 |
| VEGETATION TYPE: | SWAMP MAPLE ~~MINERAL~~ DECIDUOUS SWAMP | SWD3-3 |
| 2a INCLUSION | AG POND / CULTURAL ~~THICKET~~ | AGP / CUT |
| 2b COMPLEX | DRY-FRESH SUGAR MAPLE DECIDUOUS | FOD5-1 |

Notes: INCLUSION

## ELC STAND CHARACTERISTICS

SITE: KOMOKA PIT | POLYGON: 2 | DATE: Aug 22, 2016 | SURVEYOR(S): WH

### TREE TALLY BY SPECIES:

PRISM FACTOR 2m

| SPECIES | TALLY 1 | TALLY 2 | TALLY 3 | TALLY 4 | TALLY 5 | TOTAL | REL. AVG |
|---|---|---|---|---|---|---|---|
| QUERmacr | 2.5 | 3 | 0 | | | 5.5 | 14 |
| ACERsasa | 2.5 | 2 | 1 | | | 5.5 | 14 |
| ACERsacc | 2.5 | 5 | 8.5 | | | 16 | 42 |
| QUERbico | 0 | 3 | 1 | | | 4 | 11 |
| ACERrubr | 0 | 3 | 2 | | | 5 | 13 |
| PRUsero | 0 | 1 | 1 | | | 2 | 5 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| TOTAL | 7.5 | 17 | 13.5 | | | 38 | 100 |
| BASAL AREA (BA) | 15 | 34 | 27 | | | 76 | 25 |
| DEAD | 3.5 | 0 | 2 | | | 5.5 | 13 |

STAND COMPOSITION: ACERsacc 42 QUERmacr 14 ACERsasa 14 ACERrubr 13

COMMUNITY PROFILE DIAGRAM

Notes:

# ELC

SOILS ONTARIO

SITE: KOMOKA PIT
POLYGON: 2
DATE: Aug 22, 2016
SURVEYOR(S): WH

| | P/A | PP | Dr | Position | Aspect | Slope % | Type | Class | UTM Z | EASTING | NORTHING |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A | | | 5 | 10 | 3 | | | 17 | 463014 | 4753716 |
| 2 | A | | | 4 | 30 | 2 | | | 17 | 463081 | 4753854 |
| 3 | A | | | 5 | 190 | 3 | | | 17 | 463206 | 4753871 |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |

| SOIL | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| TEXTURE x HORIZON | SiFS 20 / Oh 65 / SiFS | LFS 30 / SiFS | SiFS | | |
| A TEXTURE | SiFS | LFS | SiFS | | |
| COURSE FRAGMENTS | 999 | 999 | 999 | | |
| B TEXTURE | Oh | SiFS | 999 | | |
| COURSE FRAGMENTS | 999 | 999 | 999 | | |
| C TEXTURE | SiFS | 999 | 999 | | |
| COURSE FRAGMENTS | 999 | 999 | 999 | | |
| EFFECTIVE TEXTURE | SiFS | SiFS | SiFS | | |
| SURFACE STONINESS | no | no | 999 | | |
| SURFACE ROCKINESS | no | no | 999 | | |
| DEPTH TO / OF MOTTLES | 70* | 55 | 25 | | |
| GLEY | 70* | 35 | 35 | | |
| BEDROCK | 999 | 999 | 999 | | |
| WATER TABLE | 999 | 999 | 50 | | |
| CARBONATES | 0 | 999 | 999 | | |
| DEPTH OF ORGANICS | 65* | 0 | 30 | | |
| PORE SIZE DISC #1 | 999 | 999 | 999 | | |
| PORE SIZE DISC #2 | 999 | 999 | 999 | | |
| MOISTURE REGIME | 6 | 6 | 6 | | |
| SOIL SURVEY MAP | | | | | |
| LEGEND CLASS | | | | | |

# ELC
PLANT SPECIES LIST

SITE: Komoka Pit
POLYGON: 2
DATE: May 26, Jun 15
SURVEYOR(S): WH

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. |
|---|---|---|---|---|---|
| ACEsacc | D | D | O | | |
| PRUsero | O | O | O | | |
| CARinth | | | | O | |
| POPdelt | | | | O | |
| OSMclay | | | | D | |
| OSMvirg | | | | O | |
| ONOsens | | | | O | |
| ATHfeli | | | | A | |
| CARgrac | | | | O | |
| ARAnudi | | | | R | |
| RUBocci | | | | O | |
| MALrace | | | | A | |
| PRUpenn | | | | R | |
| TRIgran | | | | O | |
| ARBmicr | | | | O | |
| QUErubr | R | R | | | |
| ACEsacc | R | O | | | |
| GERmacr | | | | A | |
| ARItrip | | | | O | |
| HESmatr | | | | O | |
| ALLpeti | | | | O | |
| QUEalba | R | | | | |
| SAMcana | | | O | | |
| LONtata | | | O | | |
| VIBacer | | | O | | |
| TOXradi | | | | O | |
| ACTpach | | | | O | |
| SMIlasi | | | | R | |
| TRIaura | | | | R | |
| PARinse | | | | O | |
| MALcana | | | | O | |

| SPECIES CODE | LAYER 1 | 2 | 3 | 4 | COL. |
|---|---|---|---|---|---|
| FAGgran | R | R | R | | |
| RANabor | | | | O | |
| GALeDR | | | | O | |
| DRYcart | | | | R | |
| MATstru | | | | R | |
| RUBcana | | | | O | |
| RUBalle | | | | O | |
| FRApenn | | | O | | |
| RUMobtu | | | | R | |
| RHUtyph | | | R | | |
| RHAcath | | | R | | |
| SOLdulc | | | | R | |
| ERYamer | | | | R | |
| GERrobe | | | | R | |
| URTdioi | | | | O | |
| HAMvirg | | | O | | |
| ANEquin | | | | O | |
| SYMfoet | | | | R | |
| QUEbico | O | | | | |
| IRIsp | | | | R | |
| CONmaja | | | | R | |
| MALstel | | | | A | |
| PHYamer | | | | R | |
| CRYcana | | | | O | |
| EUPmacu | | | | O | |
| SOLdulc | | | | O | |
| POTrect | | | | D | |
| ACErubr | A | A | | | |
| AGRgiga | | | | O | |
| MEDlupu | | | | O | |
| VICvill | | | | O | |

# ELC
PLANT SPECIES LIST

SITE: KOMOKA PIT
POLYGON: 2
DATE: Jn 15, July 2, AUG 22, OCT 7
SURVEYOR(S): WH

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. |
|---|---|---|---|---|---|
| ECHvulg | | | | R | |
| CARlenc | | | | O | |
| DESglut | | | | R | |
| CIRlute | | | | A | |
| CARlupu | | | | O | |
| ACEfree | A | A | A | | |
| RUBhisp | | | | O | |
| CARradi | | | | O | |
| CARdewe | | | | O | |
| CARstric | | | | O | |
| RUBpube | | | | O | |
| CARcrin | | | | O | |
| CARintu | | | | O | |
| CARlaxc | | | | R | |
| SPIalba | | | | | |
| POLvirg | | | | | |
| CARbebb | | | | | |
| LOBcard | | | | | |
| BOEcyli | | | | | |
| LINbenz | | | | | |
| OSMclay | | | | | |
| HYPpunc | | | | | |
| AGRgryp | | | | | |
| PYRchlo | | | | | |
| IMPcape | | | | | |
| GALcirc | | | | | |
| BIDfron | | | | | |
| ASTeric | | | | | |
| SAPoffi | | | | | |
| EUTgram | | | | | |
| PANcapi | | | | | |

| SPECIES CODE | LAYER 1 | 2 | 3 | 4 | COL. |
|---|---|---|---|---|---|
| ECHvulg | | | | | |
| CONcan | | | | | |
| PHYamer | | | | | |
| GENclau | | | | | |
| ASTlate | | | | | |
| SALdisc | | | | | |
| SOLrugo | | | | | |
| ACHmill | | | | | |
| QUEmich | | | | | |
| CELocci | | | | | |
| ASCexul ? | | | | | |
| MENcana | | | | | |
| BETalle | | | | | |
| COMM 3 | | | | | |
| ASTlanc | | | | | |



# ELC
WILDLIFE

SITE: KOMOKA PIT
POLYGON: 2
DATE: Jn 15
SURVEYOR(S): WH
START TIME: 6:47 END TIME: 8:00

TEMP (°C): 15 CLOUD (10th): 10 WIND: 1 PRECIPITATION: nil
CONDITIONS: partcloud, warm, still

POTENTIAL WILDLIFE HABITAT:

| | | | |
|---|---|---|---|
| | VERNAL POOLS | X | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

SPECIES LIST:

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| B | NOFL | SM | | 1 |
| B | INBU | P | | 4 |
| B | CHSP | SM | | 1 |
| B | HAWO | T | | 1 |
| B | AMCR | T | | 3 |
| B | RWBL | P | | 4 |
| ~~B~~ | ~~INBU~~ | ~~T~~ | | |
| B | BCCH | P | | 2 |
| B | GCFL | SM | | 1 |
| B | SOSP | T | | 2 |
| B | CEDW | P | | 3 |
| B | REVI | SM | | 1 |
| B | BEKI | P | NEST NEAR BANS | 2 |
| B | DOWO | SM | | 1 |
| B | ~~BAOR~~ | SM | | 2 |
| B | AMRO | FY | | 4 |
| B | NOCA | P | | 2 |
| B | BARS | NY | INSIDED | 3 |

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| B | BANS | NE | IN FIELD | 80 |
| M | RACCOON | OB | YOUNG | |
| M | COYOTE | TK | | |
| O | B.SW.TAIL | OB | | |
| M | E.CHIP | OB | | |

May 26

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

## WILDLIFE

SITE: KUMOKA PIT
POLYGON: 2
DATE: July 2 / 2016
SURVEYOR(S): WH
START TIME: 7:30 END TIME: 10:00

| TEMP (°C): 18 | CLOUD (10th): 10 | WIND: 0 | PRECIPITATION: no |
|---|---|---|---|
| CONDITIONS: | | | |

**POTENTIAL WILDLIFE HABITAT:**

| | | | |
|---|---|---|---|
| X | VERNAL POOLS | X | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

**SPECIES LIST:**

| TY | SP. CODE | EV | NOTES | # | TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|---|---|---|---|---|
| B | RBGR | P | | 2 | | | | | |
| B | INBU | FY | | 3 | | | | | |
| B | GCFL | T | | 2 | | | | | |
| B | AMGO | P | | 3 | | | | | |
| B | HOWR | SM | | 2 | | | | | |
| B | BLJA | FY | | 2 | | | | | |
| B | BHCO | P | | 2 | | | | | |
| B | RSVI | SM | | 2 | | | | | |
| B | NOCA | P | | 2 | | | | | |
| B | AMRO | FY | | 2 | | | | | |
| B | RBWO | SM | | 1 | | | | | |
| B | YRSA | SM | | 1 | | | | | |
| B | GRCA | SM | | 1 | | | | | |
| B | EAWP | SM | | 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

## MANAGEMENT / DISTURBANCE

SITE: KOMOKA PIT
POLYGON: 2
DATE: MAY 26 / 16
SURVEYOR(S): WH

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

† INTENSITY x EXTENT = SCORE

## ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

| | | | |
|---|---|---|---|
| SITE: Komoka Pit | | POLYGON: 3 | |
| SURVEYOR(S): WH | DATE: May 26/16 Aug 22, 16 | TIME: start | 3:00 |
| | | finish | 4:30 |
| UTMZ: 17 | UTME: 463654 | UTMN: 4754181 | |

### POLYGON DESCRIPTION

| SYSTEM | SUBSTRATE | TOPOGRAPHIC FEATURE | HISTORY | PLANT FORM | COMMUNITY |
|---|---|---|---|---|---|
| ☐ TERRESTRIAL | ☐ ORGANIC | ☐ LACUSTRINE | ☑ NATURAL | ☐ PLANKTON | ☐ LAKE |
| ☑ WETLAND | ☑ MINERAL SOIL | ☐ RIVERINE | ☐ CULTURAL | ☐ SUBMERGED | ☐ POND |
| ☐ AQUATIC | ☐ PARENT MIN. | ☐ BOTTOMLAND | | ☐ FLOATING-LVD. | ☐ RIVER |
| | ☐ ACIDIC BEDRK. | ☐ TERRACE | | ☐ GRAMINOID | ☐ STREAM |
| SITE | ☐ BASIC BEDRK. | ☐ VALLEY SLOPE | | ☐ FORB | ☐ MARSH |
| ☐ OPEN WATER | ☐ CARB. BEDRK. | ☒ TABLELAND | COVER | ☐ LICHEN | ☒ SWAMP |
| ☐ SHALLOW WATER | | ☐ ROLL. UPLAND | | ☐ BRYOPHYTE | ☐ FEN |
| ☒ SURFICIAL DEP. | | ☐ CLIFF | ☐ OPEN | ☒ DECIDUOUS | ☐ BOG |
| ☐ BEDROCK | | ☐ TALUS | ☐ SHRUB | ☐ CONIFEROUS | ☐ BARREN |
| | | ☐ CREVICE / CAVE | ☑ TREED | ☐ MIXED | ☐ MEADOW |
| | | ☐ ALVAR | | | ☐ PRAIRIE |
| | | ☐ ROCKLAND | | | ☐ THICKET |
| | | ☐ BEACH / BAR | | | ☐ SAVANNAH |
| | | ☐ SAND DUNE | | | ☐ WOODLAND |
| | | ☐ BLUFF | | | ☐ FOREST |
| | | | | | ☐ 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 | 4 | ACEnegu >> POPdelt > CELocci > TILamer |
| 2 | SUB-CANOPY | 3 | 4 | ACEnegu > POPdelt > TILamer |
| 3 | UNDERSTOREY | 3 | 3 | CORfoem = SALalba = SAMcana ≥ VIBlent |
| 4 | GRD. LAYER | 5 | 4 | SYMPoet >> ONOsens > RANhisp > LAPcana |

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: POPdelt 51 ACEnegu 32 SALalba 7 CELocci 5 — BA: 14

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

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

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

### SOIL ANALYSIS:

| | | | | | |
|---|---|---|---|---|---|
| TEXTURE: | 0 m | DEPTH TO MOTTLES / GLEY | g = | 0 | G= 0 |
| MOISTURE: | 7 | DEPTH OF ORGANICS: | 85 | | (cm) |
| HOMOGENEOUS / ~~VARIABLE~~ | | DEPTH TO BEDROCK: | 999 | | (cm) |

### COMMUNITY CLASSIFICATION:

| | | ELC CODE |
|---|---|---|
| COMMUNITY CLASS: | SWAMP | SW |
| COMMUNITY SERIES: | DECIDUOUS SWAMP | SWD |
| ECOSITE: | BIRCH/POPLAR ORGANIC DECID. | SWD7 |
| VEGETATION TYPE: | BIRCH-POPLAR ORGANIC DECIDUOUS SWAMP ECOSITE | SWD |
| INCLUSION | | |
| COMPLEX | | |

Notes:

## ELC — STAND CHARACTERISTICS

SITE: Komoka Pit
POLYGON: 3
DATE: Aug 22, 2016
SURVEYOR(S): WH

### TREE TALLY BY SPECIES:

PRISM FACTOR 2m

| SPECIES | TALLY 1 | TALLY 2 | TALLY 3 | TALLY 4 | TALLY 5 | TOTAL | REL. AVG |
|---|---|---|---|---|---|---|---|
| SALalba | 1.5 | 0 | 0 | | | 1.5 | 7 |
| ACEnegu | 3 | 1 | 2.5 | | | 6.5 | 32 |
| POPdelt | 1.5 | 3 | 6.0 | | | 10.5 | 51 |
| CELocci | 0 | 1 | 0 | | | 1 | 5 |
| ACESacc | 0 | 1 | 0 | | | 1 | 5 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| TOTAL | 6 | 6 | 8.5 | | | 20,5 | 100 |
| BASAL AREA (BA) | 12 | 12 | 17 | | | 41 | 14 |
| DEAD | 0 | 0 | 0 | | | 0 | 0 |

STAND COMPOSITION: POPdelt 51 ACEnegu 32 SALalba 7 CELocci 5

COMMUNITY PROFILE DIAGRAM

Notes:

# ELC
SOILS ONTARIO

SITE: Komoka Pit
POLYGON: 3
DATE: Aug 22, 2016
SURVEYOR(S): WH

| | P/A | PP | Dr | Position | Aspect | Slope % | Type | Class | UTM Z | EASTING | NORTHING |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A | | | 5 | 142 | 0 | | | 17 | 463654 | 4754181 |
| 2 | A | | | 5 | 160 | 1 | | | 17 | 463671 | 4754135 |
| 3 | A | 0 | | 5 | 160 | 1 | | | 17 | 463528 | 4754194 |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |

| SOIL | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| TEXTURE x HORIZON | | | | | |
| A TEXTURE | >2mm | SiFS | >2mm | | |
| COURSE FRAGMENTS | 0 | 0 | 0 | | |
| B TEXTURE | 999 | 999 | 999 | | |
| COURSE FRAGMENTS | 999 | 999 | 999 | | |
| C TEXTURE | 999 | 999 | 999 | | |
| COURSE FRAGMENTS | 999 | 999 | 999 | | |
| EFFECTIVE TEXTURE | >2mm | SiFS | >2mm | | |
| SURFACE STONINESS | no | no | no | | |
| SURFACE ROCKINESS | no | no | yes | | |
| DEPTH TO / OF | | | | | |
| MOTTLES | 0 | 0 | 0 | | |
| GLEY | 0 | 0 | 10 | | |
| BEDROCK | 999 | 999 | 999 | | |
| WATER TABLE | 999 | 999 | 999 | | |
| CARBONATES | 999 | 999 | 999 | | |
| DEPTH OF ORGANICS | 85 | 60 | 40 | | |
| PORE SIZE DISC #1 | 999 | 999 | 999 | | |
| PORE SIZE DISC #2 | 999 | 999 | 999 | | |
| MOISTURE REGIME | 7 | 6 | 7 | | |
| SOIL SURVEY MAP | | | | | |
| LEGEND CLASS | | | | | |

# ELC
PLANT SPECIES LIST

SITE: Komoka Pit
POLYGON: 3
DATE: May 26/16, Jn Aug 22, Oct 7
SURVEYOR(S): WH

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. |
|---|---|---|---|---|---|
| ACEnegla | D | D | O | | |
| CRAspec | | O | | | |
| PICglau | R | R | | | |
| HESmatr | | | | O | |
| LEOcard | | | | O | |
| POAcump | | | | A | |
| CARblan | | | | O | |
| TAROff. | | | | O | |
| ARRmina | | | | O | |
| RHAcath | | | R | O | |
| ARItrip | | | | O | |
| ALLpeti | | | | O | |
| GALapar | | | | A | |
| SYMfoet | | | | D | |
| POPdelt | O | O | | | |
| ACEsacc | O | O | | | |
| ONOsens | | | | A | |
| VIOsoro | | | | O | |
| PARinse | | | O | | |
| CARpens | | | | O | |
| CLEvir | | | | O | |
| THAdio | | | | O | |
| ZIZaure | | | | O | |
| GLEhede | | | | A | |
| BANhisp | | | | A | |
| ~~CAVator~~ | | | | O | |
| MAIstel | | | | O | |
| CARintu | | | | O | |
| CICmacu | | | | R | |
| VIOpube | | | | R | |
| RUBhisp | | | | A | |

| SPECIES CODE | LAYER 1 | 2 | 3 | 4 | COL. |
|---|---|---|---|---|---|
| POPtrem | | O | | | |
| CELocci | R | R | | | |
| ATHfeli | | | | O | |
| VITripa | | | O | | |
| POBpelt | | | | R | |
| GERmacu | | | | O | |
| RIBamer | | | | O | |
| VIBlent | | | O | | |
| LAPcana | | | | A | |
| CARvulp | | | | O | |
| SAMcana | | | O | O | |
| SALalba | O | O | O | | |
| PHAarun | | | | R | |
| TILamer | R | R | | | |
| CORpoem | | | O | | |
| ALLtrictri | | | | R | |
| TRIgran | | | | R | |
| PHRaust | | | | R | |
| ANEcana | | | | R | |
| AGRstol | | | | O | |
| GLYstri | | | | O | |
| LEEvirg | | | | O | |
| ERIphil | | | | A | |
| ANGatro | | | | R | |
| CALpalu | | | | R | |
| LYScili | | | | R | |
| TRIaura | | | | R | |
| CHRleuc | | | | O | |
| MORalba | R | O | O | | |
| CRYcana | | | | O | |
| GEUcana | | | | A | |

# ELC
## PLANT SPECIES LIST

SITE: Komoka Pit
POLYGON: 3
DATE: Jn 15/16, Aug 22, 16
SURVEYOR(S): LW LH

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. |
|---|---|---|---|---|---|
| ANScana | | | | O | |
| EUPmacu | | | | O | |
| Sodulc | | | | O | |
| CELocci | O | O | O | | |
| ACEsasa | R | | | | |
| QUErubr | R | | | | |
| POTrect | | | | O | |
| PRUsero | O | R | | | |
| PRUvirg | | | O | | |
| SCIvali | | | | O | |
| PILpumi | | | | O | |
| SUGnigr | R | R | | | |
| Splalba | | | O | | |
| THAdasy | | | | O | |
| CORalti | | | R | | |
| VERanag | | | | R | |
| IRIpseu | | | | R | |
| TOXradi | | | | R | |
| BERthun | | | | R | |
| AMElaev | | R | R | | |
| MIMring | | | | R | |
| CIRinte | | | | R | |
| ALNplan | | | | O | |
| HYPperf | | | | O | |
| LYScili | | | | O | |
| AGRgryp | | | | O | |
| PRUvulg | | | | O | |
| LAPcomm | | | | R | |
| GLEvulg | | | | O | |
| CARstip | | | | A | |
| CARstric | | | | O | |

| SPECIES CODE | LAYER 1 | 2 | 3 | 4 | COL. |
|---|---|---|---|---|---|
| EQUalep | | | | O | |
| GALpalu | | | | O | |
| RUBhisp | | | | O | |
| CARbrun | | | | | |
| KOEmacr | | | | | |
| VIBlent | | | | | |
| JUNeffu | | | | | |
| POLvirg | | | | | |
| PILpumi | | | | | |
| RUDlaci | | | | | |
| AGRgryp | | | | | |
| SCUpile | | | | | |
| EUPmacu | | | | | |
| SOLrugo | | | | | |
| BIDfron | | | | | |
| IMPcape | | | | | |
| EUPperf | | | | | |
| VERhast | | | | | |
| ECHcrus | | | | | |
| ELYvirg | | | | | |
| SOLgiga | | | | | |
| BOEcyli | | | | | |
| LOBsiph | | | | | |
| VERurti | | | | | |
| LYCamer | | | | | |
| PHYamer | | | | | |
| SCIpend | | | | | |
| MENcana | | | | | |
| ERIannu | | | | | |
| POApalu | | | | | |
| ASTlate | | | | | |



# ELC
## WILDLIFE

SITE: Komoka Pit
POLYGON: 3
DATE: Jn 15/16
SURVEYOR(S): LW LH
START TIME: 8:00am END TIME: 10:00

TEMP (°C): 15 CLOUD (10th): 10 WIND: 2 PRECIPITATION: 25
CONDITIONS: overcast, warm, breezy

POTENTIAL WILDLIFE HABITAT:

| | | | |
|---|---|---|---|
| X | VERNAL POOLS | X | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

SPECIES LIST:

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| B | BAOR | P | | 2 |
| B | AMRO | P | | 5 |
| B | SOSP | P | | 3 |
| B | NOFL | SM | | 1 |
| B | BCCH | P | | 2 |
| B | BHCO | P | | 2 |
| B | NOCA | P | | 3 |
| B | INBU | P | | 4 |
| B | RBGR | SM | | 1 |
| B | GRCA | T | | 5 |
| B | CEDW | P | | 3 |
| B | GHOW | SH | | 1 |
| B | EAWP | SM | | 1 |
| B | COGR | OB | | 1 |
| B | RBWO | T | | 1 |
| B | DOWO | T | | 1 |
| B | BLJA | OB | | 1 |
| B | COYE | SM | | 1 |

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| B | GCFL | SM | | 1 |
| B | AMRE | P | | 2 |
| B | WAVI | SM | | 1 |
| B | BGGN | SM | | 1 |
| B | MODO | P | | 3 |
| B | CHSP | SM | | 1 |
| O | C.WO. NYMPH | | | |
| O | M. CLOAK | | | |
| L | E. Jewel WING | | | |

May 26

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

## WILDLIFE

SITE: Komoka Pit
POLYGON: 3
DATE: July 2, 2016
SURVEYOR(S): WH
START TIME: 9:00 END TIME: 10:00

| TEMP (°C): | CLOUD (10th): | WIND: | PRECIPITATION: |
|---|---|---|---|
| CONDITIONS: | | | |

**POTENTIAL WILDLIFE HABITAT:**

| | | | |
|---|---|---|---|
| X | VERNAL POOLS | X | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

**SPECIES LIST:**

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| B | AMRO | FY | | 6 |
| B | NOFL | SM | | 1 |
| B | AMGO | P | | 5 |
| B | MODO | P | | 3 |
| B | GRCA | FY | | 4 |
| B | BHCO | P | | 3 |
| B | DOWO | SM | | 2 |
| B | COYE | SM | | 2 |
| B | INBU | FY | | 4 |
| B | ~~BHCO~~ | | | |
| B | CEDW | P | | 2 |
| B | RBGR | SM | | 2 |
| B | BCCH | SM | | 2 |
| B | EAWP | SM | | 1 |
| B | AMRE | SM | | 1 |
| B | SOSP | FY | | 3 |
| B | WBNU | SM | | 1 |
| B | BLJA | FY | | 3 |

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| B | WOTH | SM | | 1 |
| B | HAWO | T | | 1 |
| B | BAOR | D | | 2 |
| | PR | | | |

**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
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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

## MANAGEMENT / DISTURBANCE

SITE: Komoka Pit
POLYGON: 3
DATE: May 26/16
SURVEYOR(S): WH

| DISTURBANCE EXTENT | 0 | 1 | 2 | 3 | SCORE † |
|---|---|---|---|---|---|
| TIME SINCE LOGGING | > 30 YRS | 15 - 30 YRS | 5 - 15 YRS | 0 - 5 YEARS | 1 |
| INTENSITY OF LOGGING | NONE | FUEL WOOD | SELECTIVE | DIAMETER LIMIT | 1 |
| EXTENT OF LOGGING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| SUGAR BUSH OPERATIONS | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF OPERATIONS | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| GAPS IN FOREST CANOPY | NONE | SMALL | INTERMEDIATE | LARGE | 2 |
| EXTENT OF GAPS | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| LIVESTOCK (GRAZING) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF LIVESTOCK | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| ALIEN SPECIES | NONE | OCCASIONAL | ABUNDANT | DOMINANT | 3 |
| EXTENT OF ALIEN SPECIES | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| PLANTING (PLANTATION) | NONE | OCCASIONAL | ABUNDANT | DOMINANT | 0 |
| EXTENT OF PLANTING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| TRACKS AND TRAILS | NONE | FAINT TRAILS | WELL MARKED | TRACKS OR | 6 |
| EXTENT OF TRACKS/TRAILS | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| DUMPING (RUBBISH) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF DUMPING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| EARTH DISPLACEMENT | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF DISPLACEMENT | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| RECREATIONAL USE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF RECR. USE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| NOISE | NONE | SLIGHT | MODERATE | INTENSE | 0 |
| EXTENT OF NOISE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| DISEASE/DEATH OF TREES | NONE | LIGHT | MODERATE | HEAVY | 2 |
| EXTENT OF DISEASE / DEATH | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| WIND THROW (BLOW DOWN) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF WIND THROW | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| BROWSE (e.g. DEER) | NONE | LIGHT | MODERATE | HEAVY | 4 |
| EXTENT OF BROWSE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| BEAVER ACTIVITY | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF BEAVER | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| FLOODING (pools & puddling) | NONE | LIGHT | MODERATE | HEAVY | 4 |
| EXTENT OF FLOODING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| FIRE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF FIRE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| ICE DAMAGE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF ICE DAMAGE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| OTHER ..... | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |

† INTENSITY x EXTENT = SCORE

## ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

| | | | |
|---|---|---|---|
| SITE: Komoka Pit | | POLYGON: 5 | |
| SURVEYOR(S): WH | DATE: May 26 Aug 22, 16 | TIME: start | |
| | | finish | |
| UTMZ: 17 | UTME: | UTMN: | |

### POLYGON DESCRIPTION

| SYSTEM | SUBSTRATE | TOPOGRAPHIC FEATURE | HISTORY | PLANT FORM | COMMUNITY |
|---|---|---|---|---|---|
| ☑ TERRESTRIAL | ☐ ORGANIC | ☐ LACUSTRINE | ☐ NATURAL | ☐ PLANKTON | ☐ LAKE |
| ☐ WETLAND | ☒ MINERAL SOIL | ☐ RIVERINE | ☒ CULTURAL | ☐ SUBMERGED | ☐ POND |
| ☐ AQUATIC | ☐ PARENT MIN. | ☐ BOTTOMLAND | | ☐ FLOATING-LVD. | ☐ RIVER |
| | ☐ ACIDIC BEDRK. | ☐ TERRACE | | ☐ GRAMINOID | ☐ STREAM |
| | ☐ BASIC BEDRK. | ☐ VALLEY SLOPE | | ☐ FORB | ☐ MARSH |
| | ☐ CARB. BEDRK. | ☒ TABLELAND | | ☐ LICHEN | ☐ SWAMP |
| | | ☐ ROLL. UPLAND | | ☐ BRYOPHYTE | ☐ FEN |
| | | ☐ CLIFF | | ☒ DECIDUOUS | ☐ BOG |
| SITE | | ☐ TALUS | COVER | ☒ CONIFEROUS | ☐ BARREN |
| | | ☐ CREVICE / CAVE | | ☐ MIXED | ☐ MEADOW |
| ☐ OPEN WATER | | ☐ ALVAR | | | ☐ PRAIRIE |
| ☐ SHALLOW WATER | | ☐ ROCKLAND | ☒ OPEN | | ☒ THICKET |
| ☒ SURFICIAL DEP. | | ☐ BEACH / BAR | ☒ SHRUB | | ☐ SAVANNAH |
| ☐ BEDROCK | | ☐ SAND DUNE | ☒ TREED | | ☒ WOODLAND |
| | | ☐ BLUFF | | | ☐ FOREST |
| | | | | | ☒ 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 | 2 | POPdelT > ACEnegu > ACErubr |
| 2 | SUB-CANOPY | 2 | 3 | PICglau > ACEnegu > ACErubr |
| 3 | UNDERSTOREY | 3 | 3 | RHItyph > SAMcana > LONtata |
| 4 | GRD. LAYER | 5 | 4 | SOLcana > ASTnova > DACglom > AGRgig |

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 |
|---|---|---|---|---|---|
| | | X | | | |

### 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: | CULTURAL | CU |
| COMMUNITY SERIES: | | |
| ECOSITE: | | |
| VEGETATION TYPE: | | |
| INCLUSION | | |
| COMPLEX | | |

Notes: MIX OF CULTURAL COMMUNITIES THICKET, WOODLAND AND PLANTATION (SPRUCE)

## ELC — MANAGEMENT / DISTURBANCE

SITE: Komoka PIT
POLYGON: 5
DATE: Jn 15 2016
SURVEYOR(S): WH

| DISTURBANCE EXTENT | 0 | 1 | 2 | 3 | SCORE † |
|---|---|---|---|---|---|
| TIME SINCE LOGGING | ~~> 30 YRS~~ | 15 - 30 YRS | 5 - 15 YRS | 0 - 5 YEARS | 0 |
| INTENSITY OF LOGGING | NONE | FUEL WOOD | SELECTIVE | DIAMETER LIMIT | 0 |
| EXTENT OF LOGGING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| SUGAR BUSH OPERATIONS | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF OPERATIONS | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| GAPS IN FOREST CANOPY | NONE | SMALL | INTERMEDIATE | LARGE | 9 |
| EXTENT OF GAPS | NONE | LOCAL | WIDESPREAD | ~~EXTENSIVE~~ | |
| LIVESTOCK (GRAZING) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF LIVESTOCK | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| ALIEN SPECIES | NONE | OCCASIONAL | ABUNDANT | DOMINANT | 6 |
| EXTENT OF ALIEN SPECIES | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| PLANTING (PLANTATION) | NONE | OCCASIONAL | ABUNDANT | DOMINANT | 1 |
| EXTENT OF PLANTING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| TRACKS AND TRAILS | NONE | FAINT TRAILS | WELL MARKED | TRACKS OR | 6 |
| EXTENT OF TRACKS/TRAILS | NONE | LOCAL | ~~WIDESPREAD~~ | EXTENSIVE | |
| DUMPING (RUBBISH) | NONE | LIGHT | MODERATE | HEAVY | 4 |
| EXTENT OF DUMPING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| EARTH DISPLACEMENT | NONE | LIGHT | MODERATE | HEAVY | 4 |
| EXTENT OF DISPLACEMENT | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| RECREATIONAL USE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF RECR. USE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| NOISE | NONE | SLIGHT | MODERATE | INTENSE | 0 |
| EXTENT OF NOISE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| DISEASE/DEATH OF TREES | NONE | LIGHT | MODERATE | HEAVY | 2 |
| EXTENT OF DISEASE / DEATH | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| WIND THROW (BLOW DOWN) | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF WIND THROW | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| BROWSE (e.g. DEER) | NONE | LIGHT | MODERATE | HEAVY | 4 |
| EXTENT OF BROWSE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| BEAVER ACTIVITY | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF BEAVER | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| FLOODING (pools & puddling) | NONE | LIGHT | MODERATE | HEAVY | 2 |
| EXTENT OF FLOODING | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| FIRE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF FIRE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| ICE DAMAGE | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT OF ICE DAMAGE | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |
| OTHER ..... | NONE | LIGHT | MODERATE | HEAVY | 0 |
| EXTENT | NONE | LOCAL | WIDESPREAD | EXTENSIVE | |

† INTENSITY x EXTENT = SCORE

| ELC PLANT SPECIES LIST | SITE: Komoka Pit |
|---|---|
| | POLYGON: 5 |
| | DATE: May 26, Jun 15, July 2, Aug 22, Oct 7/2016 |
| | SURVEYOR(S): WH |

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. |
|---|---|---|---|---|---|
| ACEsacc | | | | | |
| POPpelt | | | | | |
| ONOsens | | | | | |
| OSMcihn | | | | | |
| RUBocci | | | | | |
| MALrace | | | | | |
| TRIgran | | | | | |
| ARCminu | | | | | |
| GERmacu | | | | | |
| ARItrip | | | | | |
| HESmatr | | | | | |
| ALLpeti | | | | | |
| SAMcana | | | | | |
| CONtata | | | | | |
| VIBacer | | | | | |
| TOXrati | | | | | |
| ACTpach | | | | | |
| SMIlasi | | | | | |
| PARinse | | | | | |
| MALcana | | | | | |
| RANabor | | | | | |
| GALcir2 | | | | | |
| RUBalle | | | | | |
| ERApenn | | | | | |
| RHUtyph | | | | | |
| RHAcath | | | | | |
| SOLdulc | | | | | |
| GERrobe | | | | | |
| URTdioi | | | | | |
| PHYamer | | | | | |
| CRYcana | | | | | |

| SPECIES CODE | LAYER 1 | 2 | 3 | 4 | COL. |
|---|---|---|---|---|---|
| EUPmacu | | | | | |
| POTrect | | | | | |
| ACErubr | | | | | |
| AGRgiga | | | | | |
| MEDlupo | | | | | |
| VICvill | | | | | |
| ECHvulg | | | | | |
| CHRleuc | | | | | |
| CIRlute | | | | | |
| CARlupo | | | | | |
| ACEfree | | | | | |
| RUBhisp | | | | | |
| POLvir | | | | | |
| CARbebb | | | | | |
| HYPperf | | | | | |
| DACglom | | | | | |
| ELYrepe | | | | | |
| IMPcape | | | | | |
| AGRgryp | | | | | |
| BIDfron | | | | | |
| ASTeric | | | | | |
| EUTgram | | | | | |
| PANcapi | | | | | |
| CONcana | | | | | |
| ASTlate | | | | | |
| SALdisc | | | | | |
| SOLcana | | | | | |
| SAPoffi | | | | | |
| ASTnova | | | | | |
| ACHmill | | | | | |
| | | | | | |



| ELC PLANT SPECIES LIST | SITE: Komoka Pit |
|---|---|
| | POLYGON: 5 |
| | DATE: May 26, Jun 15, July 2, Aug 22, Oct 7/2016 |
| | SURVEYOR(S): WH |

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. |
|---|---|---|---|---|---|
| | | | | | |

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

## ELC

### WILDLIFE

| | |
|---|---|
| SITE: | Komoka Pit |
| POLYGON: | 5 |
| DATE: | Jun 15 |
| SURVEYOR(S): | WN |
| START TIME: | 6:47 |
| END TIME: | 8:00 am |

| | | | |
|---|---|---|---|
| TEMP (°C): 15 | CLOUD (10th): 10 | WIND: 1 | PRECIPITATION: no |
| CONDITIONS: Part cloud, warm, still | | | |

**POTENTIAL WILDLIFE HABITAT:**

| | | | |
|---|---|---|---|
| | VERNAL POOLS | | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

**SPECIES LIST:**

| TY | SP. CODE | EV | NOTES | # | TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|---|---|---|---|---|
| B | BARS | NY | INSHED | 3 | | | | | |
| B | INBU | P | | 2 | | | | | |
| B | AMCR | T | | 2 | | | | | |
| B | RWBL | P | | 4 | | | | | |
| B | BCCH | P | | 3 | | | | | |
| B | SOSP | T | | 1 | | | | | |
| B | BOAR | P | | 2 | | | | | |
| B | AMRO | FY | | 3 | | | | | |
| B | NOCA | P | | 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:
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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

### WILDLIFE

| | |
|---|---|
| SITE: | Komoka Pit |
| POLYGON: | 5 |
| DATE: | July 2, 2016 |
| SURVEYOR(S): | WN |
| START TIME: | 7:30 |
| END TIME: | 10:00 |

| | | | |
|---|---|---|---|
| TEMP (°C): 18 | CLOUD (10th): 10 | WIND: 0 | PRECIPITATION: no |
| CONDITIONS: | | | |

**POTENTIAL WILDLIFE HABITAT:**

| | | | |
|---|---|---|---|
| | VERNAL POOLS | | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | | | |

**SPECIES LIST:**

| TY | SP. CODE | EV | NOTES | # | TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|---|---|---|---|---|
| B | INBU | P | | 2 | | | | | |
| B | AMGO | P | | 3 | | | | | |
| B | BLJA | SM | | 1 | | | | | |
| B | BHCO | P | | 3 | | | | | |
| B | NOCA | SH | | 1 | | | | | |
| B | AMRO | FY | | 3 | | | | | |
| B | GRCA | T | | 1 | | | | | |

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

**EVIDENCE CODES (EV):**

BREEDING BIRD - POSSIBLE:
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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 D

Potential Habitat for Threatened and Endangered Species Review

## Potential Habitat of Threatened and Endangered Species Review

Johnston - Maes Pit

| Species | ESA Listing | Habitat Description | Habitat Potential in Study Area |
|---|---|---|---|
| **Plants** | | | |
| Eastern Flowering Dogwood | END | Grows as an understory species in mid-aged open deciduous or mixed forests located on floodplains, slopes, bluffs, in ravines, along forest edges, and sometimes along roadsides and fence rows (Bickerton and Thompson-Black, 2010). | CUT1, SWD3-3, SWD7, CU, FOD/SWD |
| **Birds** | | | |
| Bank Swallow | THR | Require foraging, nesting and roosting habitat. Foraging habitat consists of open terrestrial and aquatic habitats including wetlands, open water, riparian woodlands, grasslands, scrubland and agricultural areas. A veritcal or near-vertical bank of suitable substrate (typically fine sand or silt) is required for nesting. Large wetlands, reed or cane beds, or other dense vegetation over water are typical roosting sites. (Falconer et al., 2016). | Foraging - Agricultural Fields<br>Nesting - topsoil stockpile<br>Roosting - No Potential |
| Barn Swallow | THR | Require foraging, nesting and roosting habitat. Foraging habitat consists of semi-open habitats including grasslands, farmland (farmyards, pastures), open wetlands, open water, savannah and other clear right-of- ways. Nesting occurs on or in human sturctures like culverts, bridges, barns and other buildings. Reed or cane beds or other dense vegetation in or near water are typical roosting sites. (Heagy et al. 2014). | Foraging - Agricultural Fields<br>Nesting - Quonset Shed<br>Roosting - No Potential |
| Bobolink | THR | An obligate-grassland species. Inhabits a variety of natural grasslands as well as remnant prairie and savannahs but nest more commonly in hayfields and pastures (McCracken et al., 2013). | Adjacent horse pasture (A2) |
| Chimney Swift | THR | Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures (i.e., silos). They also tend to stay close to water as this is where the flying insects they eat congregate (COSEWIC, 2007). | No Potential |
| Eastern Meadowlark | THR | An obligate-grassland species. Inhabits a variety of natural grasslands, pastures, remnant prairies and savannahs (McCracken et al., 2013). | Adjacent horse pasture (A2) |
| Louisiana Waterthrush | THR | A strong preference for nesting and wintering along relatively pristine headwater streams and wetlands situated in large tracts of mature forest. Although it prefers running water (especially clear, coldwater streams), it also inhabits heavily wooded swamps with vernal or semi-permanent pools (COSEWIC, 2015). | SWD3-3, SWD7, FOD/SWD |
| **Reptiles** | | | |
| Blanding's Turtle | THR | Inhabits shallow water, usually in large wetlands and shallow lakes, with an organic substrate and high density of aquatic vegetation (COSEWIC, 2005). | No Potential |
| Eastern Hog-nosed Snake | THR | Specializes in hunting and eating toads, and usually only occurs where toads can be found. Eastern Hog-nosed Snakes prefer sandy, well-drained habitats such as beaches and dry forests where they can lay their eggs and hibernate. They use their up-turned snout to dig burrows below the frost line in the sand where eggs are deposited (Kraus, 2011). | SWD3-3, SWD7, CU, FOD/SWD |

| Species | ESA Listing | Habitat Description | Habitat Potential in Study Area |
|---|---|---|---|
| **Mammals** | | | |
| American Badger | END | Preferred areas include natural and undisturbed grasslands, shrubby areas and woodlots but also associated with old fields, pastureland, the edges of agricultural fields and orchards, scrubland, wooded ravines and woodlots. Badgers require sandy or other friable soils in which to create dens for resting, rearing young and overwintering. Soils should be coarse enough to resist collapse when wet but contain enough organic matter and be sufficiently adhesive to prevent collapse under dry conditions (such as would be the case with pure sands) (OABRT, 2010). | CUT1, SWD3-3, SWD7, CU, FOD/SWD, and along agricultural field edges |
| SAR bats | END | SAR bats include Eastern Small-footed (Myotis leibii), Little Brown (Myotis lucifugus), Northern long-eared (Myotis septentrionalis) and Tri-colored (Perimyotis subflavus). All four species overwinter in cold and humid hibernacula (caves/mines). Summer maternity colonies are established often in buildings (mainly Myotis lucifugus and M. leibii), or large-diameter trees. Foraging occurs over water (mainly M. lucifugus, P. subflavus), along waterways, forest edges, and in gaps in the forest (mainly M. septentrionalis). Large open fields or clearcuts generally are avoided (COSEWIC, 2013; Ontario.ca) | SWD3-3, SWD7, FOD/SWD |
| **Fish** | | | |
| Eastern Sand Darter | END | Inhabits streams, rivers and sandy shoals in lakes, and is typically strongly associated with fine sandy substrates and fine gravel (greater than 90% sand). Known to occur within the Thames River at Komoka Creek outlet (MNR, 2013). | Komoka Creek |

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# Appendix E

Candidate Significant Wildlife Habitat Evaluation

**Table 1.1 – Seasonal Concentration Areas**

| Wildlife Habitat | Required ELC Ecosite Codes | Required Habitat Criteria Evaluation | Candidate SWH |
|---|---|---|---|
| **Waterfowl Stopover and Staging Areas (Terrestrial)** | • CUT1<br>• agricultural fields | • no flooding or sheet water or waste grains in agricultural fields during spring present.<br>**Habitat criteria not met.** | No. |
| **Waterfowl Stopover and Staging Areas (Aquatic)** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • SWD3-3 has adjacent farm irrigation pond<br>• no standing water was observed in SWD3-3 or SWD7<br>• some standing water in FOD/SWD north of rail line near Aimes Road<br>• communities not large enough to support the required numbers of breeding waterfowl.<br>**Habitat Criteria not met.** | No. |
| **Shorebird Migratory Stopover Area** | • none present | • No shorelines of lakes, rivers, wetlands, beaches, sand bars, seasonally flooded, muddy un-vegetated shorelines present.<br>**Habitat Criteria not met.** | No. |
| **Raptor Wintering Area** | • CUT1<br>• SWD3-3<br>• SWD7<br>• FOD/SWD<br>• CU community (CUT/CUW/CUP) | • all communities present are contiguous, thus >30ha however, very little upland CUT or CUW (upland habitat) exists.<br>• communities not on shoreline areas adjacent to large rivers or adjacent to lakes with open water.<br>**Habitat criteria not met.** | No. |
| **Bat Hibernacula** | • none present | • no caves, mine shafts, underground foundations or Karsts present.<br>**Habitat criteria not met.** | No. |
| **Bat Maternity Colonies** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • Based on prism sweeps, there are eleven (11) large diameter snag trees/ha in SWD3-3.<br>**Habitat criteria met for SWD3-3 and potentially in FOD/SWD.** | **Yes.** |
| **Turtle Wintering Areas** | • SWD3-3<br>• SWD7<br>• FOD/SWD<br>• Komoka Creek<br>• all irrigation ponds | • no standing water present in SWD3-3 and SWD7<br>• the standing water in FOD/SWD north of rail line near Aimes Road and Komoka Creek not deep enough for wintering turtles<br>• all farm irrigation ponds deep enough to provide suitable wintering habitat<br>**Habitat criteria met for all farm irrigation ponds.** | **Yes**. |
| **Reptile Hibernaculum** | • habitat may be found in any ecosite other than very wet ones. | • no old stone fences, and abandoned crumbling foundations are present<br>• all rock piles/debris piles were on the ground surface<br>• two burrows were found, however they were active<br>• No suitable hibernacula sites were identified during site investigations.<br>**Habitat criteria not met.** | No. |
| **Colonially-Nesting Bird Breeding Habitat (Bank / Cliff)** | • Eroding bank on stockpile<br>• CUT1<br>• CU community (CUT/CUW/CUP) | • no steep slopes of eroding soil in CUT1 or CU communities<br>• One stockpile is located adjacent to the East irrigation pond, however this stockpile has recent disturbance (i.e., disturbance in the last 2yrs) and would not be considered SWH.<br>**Habitat criteria not met.** | No. |
| **Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs)** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • Although communities are present and SWD3-3 has dead standing trees, no stick nests were observed.<br>**Habitat criteria not met.** | No. |

**Table 1.1 – Seasonal Concentration Areas**

| Wildlife Habitat | Required ELC Ecosite Codes | Required Habitat Criteria Evaluation | Candidate SWH |
|---|---|---|---|
| **Colonially-Nesting Bird Breeding Habitat (Ground)** | • CUT1<br>• CU community (CUT/CUW/CUP) | • no rocky islands or peninsulas associated with open water or in marshy areas.<br>• CUT and CU communities are not in close proximity to streams and irrigation ditches.<br>**Habitat criteria not met.** | No. |
| **Migratory Butterfly Stopover Areas** | • FOD/SWD<br>• CUT1<br>• CUP3<br>• CU community (CUT/CUW/CUP) | • There is a combination of woodland and upland communities that is >10ha however, not located within 5km of Lake Erie or Lake Ontario.<br>**Habitat criteria not met.** | No. |
| **Land Bird Migratory Stopover Areas** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • Communities present are contiguous and would be >5 ha., however not located within 5 km of Lake Erie and Lake Ontario.<br>**Habitat criteria not met** | No. |
| **Deer Winter Congregation Areas** | • SWD3-3<br>• SWD7<br>• FOD/SWD<br>• CUP3 | • no deer yarding areas have been identified by MNRF<br>**Habitat criteria not met.** | No. |

**Table 1.2.1 – Rare Vegetation Communities**

| Wildlife Habitat | Required ELC Ecosite Codes | Required Habitat Criteria | Candidate SWH |
|---|---|---|---|
| **Cliffs and Talus Slopes** | • none present | • No cliff or talus slopes present in the study area.<br>**Habitat criteria not met.** | No. |
| **Sand Barren** | • none present | • No sand barren ecosites present in the study area.<br>**Habitat criteria not met.** | No. |
| **Alvar** | • none present | • No alvar ecosites present in the study area.<br>**Habitat criteria not met.** | No. |
| **Old Growth Forest** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • No trees in the study area >140yrs old.<br>**Habitat criteria not met.** | No. |
| **Savannah** | • none present | • No savannahs present in the study area.<br>**Habitat criteria not met.** | No. |
| **Tallgrass Prairie** | • none present | • No tallgrass prairie present in the study area.<br>• **Habitat criteria not met.** | No. |
| **Other Rare Vegetation** | • none present | • No rare vegetation communities present in the study area.<br>**Habitat criteria not met.** | No. |

**Table 1.2.2 – Specialized Habitat for Wildlife**

| Wildlife Habitat | Required ELC Ecosite Codes | Required Habitat Criteria | Candidate SWH |
|---|---|---|---|
| **Waterfowl Nesting Area** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • wooded areas are adjacent to agricultural fields and some upland habitat (CUT1 and CU communities), however not large enough to support the required number of breeding waterfowl.<br>**Habitat criteria not met.** | No.. |
| **Bald Eagle and Osprey Nesting, Foraging, Perching** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • Communities present are adjacent to irrigation ponds and/or Komoka Creek, however no large stick nest were present in the study area<br>**Habitat criteria not met.** | No. |
| **Woodland Raptor Nesting Habitat** | • SWD3-3<br>• SWD7<br>• FOD/SWD<br>• CUP3 | • Communities south of the rail line (SWD3-3, SWD7 and CUP3) are the forest edge of the large FOD/SWD north of the rail line<br>• Although the communities present would be >30ha however would not have interior habitat (i.e., 200m from edge)<br>• No stick nests were found in the study area.<br>**Habitat criteria not met.** | No. |
| **Turtle Nesting Areas** | • none present | • Exposed mineral soil within agricultural fields but not adjacent to required ELC ecosites.<br>**Habitat criteria not met.** | No. |
| **Springs and Seeps** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • No springs or seeps were found within the study area.<br>**Habitat criteria not met.** | No. |
| **Amphibian Breeding Habitat (Woodland)** | • SWD3-3<br>• SWD7<br>• FOD/SWD<br>• west and central ponds | • west and central ponds within 120m to SWD3-3 or FOD/SWD<br>• east pond greater than 120m from woodland<br>• some standing water in FOD/SWD north of rail line near Aimes Road<br>**Habitat criteria met for SWD3-3, SWD7 and FOD/SWD.** | **Yes**. |
| **Amphibian Breeding Habitat (Wetlands)** | • SWD3-3<br>• SWD7<br>• FOD/SWD<br>• all irrigation ponds | • west and central ponds not isolated from woodlands<br>• east pond is an open pond >120m from woodlands<br>• SWD3-3, SWD7 and FOD/SWD not isolated from woodlands<br>**Habitat criteria met for East Pond.** | **Yes.** |
| **Woodland Area-Sensitive Bird Breeding Habitat** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • All communities are contiguous and >30ha however no interior habitat (i.e., 200m from edge) present within the study area<br>**Habitat criteria not met.** | No. |

**Table 1.3 – Habitats of Species of Conservation Concern (not END or THR species)**

| Wildlife Habitat | Required ELC Ecosite Codes | Required Habitat Criteria | Candidate SWH |
|---|---|---|---|
| **Marsh Bird Breeding Habitat** | For Green Heron:<br>• SWD3-3<br>• SWD7<br>• FOD/SWD | • SWD3-3 has adjacent farm irrigation pond<br>• no standing water was observed in SWD3-3 or SWD7<br>• some standing water in FOD/SWD north of rail line near Aimes Road, however not deep enough to support emergent vegetation needed.<br>**Habitat criteria met for SWD3-3.** | **Yes**. |
| **Open Country Bird Breeding Habitat** | • none present | • No abandoned fields, mature hayfields or pasture land >30ha present<br>• Horse pasture present however, active agriculture and pasturing not considered SWH<br>**Habitat criteria not met.** | No.. |
| **Shrub/Early Successional Bird Breeding Habitat** | • CUT1<br>• CU community (CUT/CUW/CUP)<br>• horse pasture | • CUT1 and CU communities are not >10ha in size<br>• Horse pasture is active and active agriculture and pasturing not considered SWH<br>**Habitat criteria not met.** | No. |
| **Terrestrial Crayfish** | • SWD3-3<br>• SWD7<br>• FOD/SWD | • Swamp communities present<br>• Agricultural fields with crayfish burrows are not considered SWH<br>**Habitat criteria met for SWD3-3, SWD7 and FOD/SWD.** | **Yes.** |
| **Special Concern and Rare Wildlife Species (NHIC and MNRF pre-consultation)** | n/a | Element occurrences for:<br>• Tuberous Indian-plantain (SC)<br>• Louisiana Waterthrush (SC)<br>• S1, S2 and S3 ranked species (17 plants and 2 insects)<br>**Habitat possible for element occurrences within the study area.** | **Yes.** |

**Table 1.4 – Animal Movement Corridors**

| Wildlife Habitat | Required ELC Ecosite Codes | Required Habitat Criteria | Candidate SWH |
|---|---|---|---|
| **Amphibian Movement Corridors** | Corridors may be found in all ecosites associated with water. | • corridors would be present in large wetland/woodland communities to the north and north east of the east pond (SWD3-3, SWD7 and FOD/SWD north of rail line)<br>**Habitat criteria met for SWD3-3, SWD7 and FOD/SWD.** | **Yes.** |

**Table 1.5 – SWH Exceptions for Ecodistrict 7E-2**

| Wildlife Habitat | Required ELC Ecosite Codes | Required Habitat Criteria | Candidate SWH |
|---|---|---|---|
| **Bat Migrtory Stopover Area** | No specific ELC types. | • Long Point is a significant stop-over area for fall migrating bats<br>• study area not located in Eco-district 7E-2<br>**Habitat criteria not met.** | No. |

# Appendix F
Vascular Plant List

# FLORAL SURVEY INFORMATION SUMMARY SHEET

Project: Johnston - Maes Komoka Pit

Collector(s): William Huys

| | Date | Start | Finish | Weather |
|---|---|---|---|---|
| Visit 1 | 26-May-16 | 9:30 AM | 3:30 | part cloud, warm, breezy |
| Visit 2 | 15-Jun-16 | 5:30 | 10:15am | part cloud, warm, still |
| Visit 3 | 2-Jul-16 | 7:00am | 10:00 | clear, warm, still |
| Visit 4 | 22-Aug-16 | 10:30 | 4:30 PM | warm , still, part cloud |

| FAMILY | ACRONYM | C | W | WETNESS | OWES* | PHYSIOG. | SCIENTIFIC NAME | COMMON NAME | ESA Listing | S-Rank | Community | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 1 | 2 | 3 | 5 |
| ACERAC | ACENEGU | 0 | -2 | FACW- | W | N Tree | Acer negundo | BOX ELDER | | | | | x | |
| ACERAC | ACERUBR | 4 | 0 | FAC | W | N Tree | Acer rubrum | RED MAPLE | | | | x | | x |
| ACERAC | ACESACC | 5 | -3 | FACW | I | N Tree | Acer saccharinum | SILVER MAPLE | | | x | x | x | x |
| ACERAC | ACESACCSAC | 4 | 3 | FACU | | N Tree | Acer saccharum ssp. saccharum | SUGAR MAPLE;HARD MAPLE | | | x | x | x | x |
| COMPOS | ACHMILLMIL | * | 3 | FACU | | A Forb | ACHILLEA MILLEFOLIUM SSP. MILLEFOLIU | YARROW | | | | | | x |
| RANUNC | ACTPACH | 6 | 5 | UPL | | N Forb | Actaea pachypoda | WHITE BANEBERRY;DOLL'S-EYES | | | | x | | x |
| SCROPH | AGATENU | 7 | -3 | FACW | W | N Forb | Agalinis tenuifolia (Gerardia t.) | COMMON GERARDIA | | | x | | | |
| ROSACE | AGRGRYP | 2 | 2 | FACU+ | | N Forb | Agrimonia gryposepala | TALL AGRIMONY | | | | x | x | x |
| GRAMIN | AGRGIGA | * | 0 | FAC | | A Grass | AGROSTIS GIGANTEA | REDTOP | | | x | x | | x |
| GRAMIN | AGRSTOL | 0 | -3 | FACW | W | N Grass | Agrostis stolonifera | CREEPING BENT | | | | | x | |
| ALISMA | ALIPLAN | 3 | -5 | OBL | I | N Forb | Alisma plantago-aquatica | WATER-PLANTAIN | | | | | x | |
| CRUCIF | ALLPETI | * | 0 | FAC | | A Forb | ALLIARIA PETIOLATA (A. OFFICINALIS) | GARLIC MUSTARD | | | x | | x | x |
| LILIAC | ALLBURD | 9 | 3 | FACU | | N Forb | Allium tricoccum var. tricoccum | WILD LEEK | | | | | x | |
| ROSACE | AMELAEV | 5 | 5 | UPL | | N Tree | Amelanchier laevis | SMOOTH SHADBUSH | | | | | x | |
| RANUNC | ANECANA | 3 | -3 | FACW | W | N Forb | Anemone canadensis | CANADA ANEMONE | | | x | | x | |
| RANUNC | ANEQUIN | 7 | 0 | FAC | | N Forb | Anemone quinquefolia | WOOD ANEMONE | | | | x | | |
| UMBELL | ANGATRO | 6 | -5 | OBL | I | N Forb | Angelica atropurpurea | ANGELICA | | | | | x | |
| APOCYN | APOANDR | 3 | 5 | UPL | | N Forb | Apocynum androsaemifolium | SPREADING DOGBANE | | | x | | | |
| RANUNC | AQUCANA | 5 | 1 | FAC- | | N Forb | Aquilegia canadensis | WILD COLUMBINE | | | x | | | |
| ARALIA | ARANUDI | 4 | 3 | FACU | | N Forb | Aralia nudicaulis | WILD SARSAPARILLA | | | | x | | |
| COMPOS | ARCMINU | * | 5 | UPL | | A Forb | ARCTIUM MINUS | COMMON BURDOCK | | | | x | x | x |
| ARACEA | ARITRIP | 5 | -2 | FACW- | W | N Forb | Arisaema triphyllum | JACK-IN-THE-PULPIT;INDIAN-TURNIP | | | x | x | x | x |
| ASCLEP | ASCTUBE | 8 | 5 | UPL | | N Forb | Asclepias tuberosa | BUTTERFLY-WEED | | | x | | | |
| DRYOPT | ATHFILI | 4 | 0 | FAC | W | N Fern | Athyrium filix-femina | LADY FERN | | | | x | x | |
| BRASSI | BARVULG | * | 0 | FAC | | A Forb | BARBAREA VULGARIS | YELLOW ROCKET | | | x | | | |
| BERBER | BERTHUN | * | 4 | FACU- | | A Shrub | BERBERIS THUNBERGII | JAPANESE BARBERRY | | | | | x | |
| CRUCIF | BERINCA | * | 5 | UPL | | A Forb | BERTEROA INCANA | HOARY ALYSSUM | | | x | | | |
| ASTERA | BIDFRON | 3 | -3 | FACW | I | N Forb | Bidens frondosa | COMMON BEGGAR-TICKS | | | | x | x | x |
| URTICA | BOECYLI | 4 | -5 | OBL | I | N Forb | Boehmeria cylindrica | FALSE NETTLE | | | | x | x | |
| BRASSI | BRANIGR | * | 5 | UPL | | A Forb | BRASSICA NIGRA | BLACK MUSTARD | | | x | | | |
| POACEA | BROPUBE | 7 | 3 | FACU | | N Grass | Bromus pubescens | HAIRY WOOD BROME GRASS | | | x | | | |
| RANUNC | CALPALU | 5 | -5 | OBL | I | N Forb | Caltha palustris | MARSH-MARIGOLD;COWSLIP | | | | | x | |
| CYPERA | CARBEBB | 3 | -5 | OBL | I | N Sedge | Carex bebbii | BEBB'S SEDGE | | | x | x | | x |
| CYPERA | CARBLAN | 3 | 0 | FAC | | N Sedge | Carex blanda | WOODLAND SEDGE | | | x | | x | |
| CYPERA | CARBRUN | 7 | -3 | FACW | I | N Sedge | Carex brunnescens | BROWNISH SEDGE | | | x | | x | |
| CYPERA | CARCRIN | 6 | -4 | FACW+ | I | N Sedge | Carex crinita | FRINGED SEDGE | | | | x | | |
| CYPERA | CARDEWE | 6 | 4 | FACU- | | N Sedge | Carex deweyana | SHORT-SCALE SEDGE | | | x | x | | |
| CYPERA | CARGRAC | 4 | 3 | FACU | W | N Sedge | Carex gracillima | GRACEFUL SEDGE | | | | x | | |
| CYPERA | CARINTU | 6 | -4 | FACW+ | I | N Sedge | Carex intumescens | BLADDER SEDGE | | | | x | x | |
| CYPERA | CARLAXM | 7 | 5 | UPL | | N Sedge | Carex laxiculmis | SEDGE | | | | x | | |
| CYPERA | CARLUPU | 6 | -5 | OBL | I | N Sedge | Carex lupulina | HOP SEDGE | | | | x | | |
| CYPERA | CARPENS | 5 | 5 | UPL | | N Sedge | Carex pensylvanica | PENNSYLVANIA SEDGE | | | | | x | |
| CYPERA | CARRADI | 4 | 5 | UPL | W | N Sedge | Carex radiata (C. rosea) | STELLATE SEDGE | | | | x | | |
| CYPERA | CARSTIP | 3 | -5 | OBL | I | N Sedge | Carex stipata | STALK-GRAIN SEDGE | | | | | x | |
| CYPERA | CARSTRI | 4 | -5 | OBL | I | N Sedge | Carex stricta | TUSSOCK SEDGE | | | x | x | x | |

| FAMILY | ACRONYM | C | W | WETNESS | OWES* | PHYSIOG. | SCIENTIFIC NAME | COMMON NAME | ESA Listing | S-Rank | Community | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 1 | 2 | 3 | 5 |
| CYPERA | CARVULP | 3 | -5 | OBL | I | N Sedge | Carex vulpinoidea | FOX SEDGE | | | x | | x | |
| ULMACE | CELOCCI | 8 | 1 | FAC- | | N Tree | Celtis occidentalis | HACKBERRY | | | | | x | |
| ASTERA | CHRLEUC | * | 5 | UPL | | A Forb | CHRYSANTHEMUM LEUCANTHEMUM | OX-EYE DAISY | | | x | x | x | x |
| UMBELL | CICMACU | 6 | -5 | OBL | I | N Forb | Cicuta maculata | WATER HEMLOCK | | | | | x | |
| ONAGRA | CIRLUTE | 3 | 3 | FACU | | N Forb | Circaea lutetiana (C. quadrisulcata) | ENCHANTER'S-NIGHTSHADE | | | x | x | x | x |
| ASTERA | CIRARVE | * | 3 | FACU | | A Forb | CIRSIUM ARVENSE | CANADIAN-THISTLE | | | x | | | |
| ASTERA | CIRVULG | * | 4 | FACU- | | A Forb | CIRSIUM VULGARE | BULL-THISTLE | | | x | | | |
| RANUNC | CLEVIRG | 3 | 0 | FAC | W | N Vine | Clematis virginiana | VIRGIN'S BOWER | | | x | | | |
| RANUNC | CLEVIRG | 3 | 0 | FAC | W | N Vine | Clematis virginiana | VIRGIN'S BOWER | | | | | x | |
| LABIAT | CLIVULG | 4 | 5 | UPL | | N Forb | Clinopodium vulgare | WILD BASIL | | | | | x | |
| LILIAC | CONMAJA | * | 5 | UPL | | A Forb | CONVALLARIA MAJALIS | LILY-OF-THE-VALLEY | | | | x | | |
| ASTERA | CONCANA | 0 | 1 | FAC- | | N Forb | Conyza canadensis (Erigeron c.) | HORSEWEED | | | x | | | x |
| CORNAC | CORALTE | 6 | 5 | UPL | | N Tree | Cornus alternifolia | ALTERNATE-LEAVED DOGWOOD | | | | | x | |
| CORNAC | CORFOEM | 2 | -2 | FACW- | W | N Shrub | Cornus foemina (C. racemosa) | GRAY DOGWOOD | | | | | x | |
| CORNAC | CORSTOL | 2 | -3 | FACW | I | N Shrub | Cornus stolonifera | RED-OSIER DOGWOOD | | | x | | | |
| ROSACE | CRAPUNC | 4 | 5 | UPL | | N Tree | Crataegus punctata | DOTTED HAWTHORN | | | | | x | |
| UMBELL | CRYCANA | 5 | 0 | FAC | | N Forb | Cryptotaenia canadensis | HONEWORT | | | | x | x | x |
| GRAMIN | DACGLOM | * | 3 | FACU | | A Grass | DACTYLIS GLOMERATA | ORCHARD GRASS | | | x | | | x |
| UMBELL | DAUCARO | * | 5 | UPL | | A Forb | DAUCUS CAROTA | WILD CARROT;QUEEN-ANNE'S-LACE | | | x | | | |
| FABACE | DESGLUT | 6 | 5 | UPL | | N Forb | Desmodium glutinosum | CLUSTERED-LEAVED TICK-TREFOIL | | | | x | | |
| DRYOPT | DRYCART | 5 | -2 | FACW- | W | N Fern | Dryopteris carthusiana (D. spinulosa) | SPINULOSE WOODFERN | | | | x | | |
| GRAMIN | ECHCRUS | * | -3 | FACW | W | A Grass | ECHINOCHLOA CRUSGALLI | BARNYARD GRASS | | | | | x | |
| CUCURB | ECHLOBA | 3 | -2 | FACW- | W | N Vine | Echinocystis lobata | WILD CUCUMBER | | | x | | | |
| BORAGI | ECHVULG | * | 5 | UPL | | A Forb | ECHIUM VULGARE | VIPER'S BUGLOSS | | | | x | | x |
| GRAMIN | ELYREPE | * | 3 | FACU | | A Grass | ELYMUS REPENS (AGROPYRON R.) | QUACK GRASS | | | x | | | x |
| GRAMIN | ELYVIRG | 5 | -2 | FACW- | W | N Grass | Elymus virginicus | VIRGINIA WILD-RYE | | | | | x | |
| EQUISE | EQUARVE | 0 | 0 | FAC | W | N Fern | Equisetum arvense | COMMON or FIELD HORSETAIL | | | x | | | |
| EQUISE | EQUHYEM | 2 | -2 | FACW- | W | N Fern | Equisetum hyemale | SCOURING RUSH | | | x | | | |
| ASTERA | ERIANNU | 0 | 1 | FAC- | | N Forb | Erigeron annuus | ANNUAL FLEABANE | | | x | | x | |
| ASTERA | ERIPHIL | 1 | -3 | FACW | W | N Forb | Erigeron philadelphicus | MARSH FLEABANE | | | x | | x | |
| LILIAC | ERYAMER | 5 | 5 | UPL | | N Forb | Erythronium americanum | YELLOW TROUT LILY | | | | x | | |
| ASTERA | EUPMACU | 3 | -5 | OBL | I | N Forb | Eupatorium maculatum | JOE-PYE WEED | | | | x | x | x |
| ASTERA | EUPPERF | 2 | -4 | FACW+ | I | N Forb | Eupatorium perfoliatum | COMMON BONESET | | | x | | x | |
| ASTERA | EUTGRAM | 2 | -2 | FACW- | | N Forb | Euthamia graminifolia (Solidago g.) | FLAT-TOP FRAGRANT GOLDENROD | | | x | | | x |
| FAGACE | FAGGRAN | 6 | 3 | FACU | | N Tree | Fagus grandifolia | AMERICAN BEECH | | | | x | | |
| GRAMIN | FESARUN | * | 2 | FACU+ | | A Grass | FESTUCA ARUNDINACEA | TALL FESCUE | | | x | | | |
| OLEACE | FRAAMER | 4 | 3 | FACU | | N Tree | Fraxinus americana | WHITE ASH | | | x | | | |
| OLEACE | FRAPENN | 3 | -3 | FACW | W | N Tree | Fraxinus pennsylvanica | RED ASH | | | | x | | x |
| RUBIAC | GALAPAR | 4 | 3 | FACU | | N Forb | Galium aparine | ANNUAL BEDSTRAW | | | x | | x | |
| RUBIAC | GALCIRC | 7 | 4 | FACU- | | N Forb | Galium circaezans | WHITE WILD LICORICE | | | | x | | x |
| RUBIAC | GALPALU | 5 | -5 | OBL | I | N Forb | Galium palustre | MARSH BEDSTRAW | | | | | x | |
| GERANI | GERMACU | 6 | 3 | FACU | | N Forb | Geranium maculatum | WILD GERANIUM | | | x | x | x | x |
| GERANI | GERROBE | * | 5 | UPL | | A Forb | GERANIUM ROBERTIANUM | HERB ROBERT | | | | x | | x |
| ROSACE | GEUALEP | 2 | -1 | FAC+ | W | N Forb | Geum aleppicum | YELLOW AVENS | | | | | x | |
| ROSACE | GEUCANA | 3 | 0 | FAC | W | N Forb | Geum canadense | WHITE AVENS | | | | | x | |
| LABIAT | GLEHEDE | * | 3 | FACU | | A Forb | GLECHOMA HEDERACEA | GROUND IVY | | | | | x | |
| GRAMIN | GLYSTRI | 3 | -5 | OBL | I | N Grass | Glyceria striata | FOWL MANNA GRASS | | | | | x | |
| HAMAME | HAMVIRG | 6 | 3 | FACU | | N Shrub | Hamamelis virginiana | WITCH-HAZEL | | | | x | | |
| CRUCIF | HESMATR | * | 5 | UPL | | A Forb | HESPERIS MATRONALIS | DAME'S ROCKET | | | x | x | x | x |
| GUTTIF | HYPPERF | * | 5 | UPL | | A Forb | HYPERICUM PERFORATUM | COMMON ST. JOHN'S-WORT | | | x | | x | x |
| GUTTIF | HYPPUNC | 5 | -1 | FAC+ | W | N Forb | Hypericum punctatum | SPOTTED ST. JOHN'S-WORT | | | | x | | |
| BALSAM | IMPCAPE | 4 | -3 | FACW | I | N Forb | Impatiens capensis | SPOTTED TOUCH-ME-NOT | | | | x | x | x |
| BALSAM | IMPPALL | 7 | -3 | FACW | W | N Forb | Impatiens pallida | PALE TOUCH-ME-NOT | | | x | | | |
| IRIDAC | IRIPSEU | * | -5 | OBL | I | A Forb | IRIS PSEUDACORUS | YELLOW FLAG | | | | | x | |
| JUGLAN | JUGNIGR | 5 | 3 | FACU | | N Tree | Juglans nigra | BLACK WALNUT | | | x | | x | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 1 | 2 | 3 | 5 |
| JUNCAC | JUNEFFU | 4 | -5 | OBL | I | N Forb | Juncus effusus | SOFT-STEMMED RUSH | | | | | x | |
| GRAMIN | KOEMACR | 10 | 5 | UPL | | N Grass | Koeleria macrantha (K. cristata) | JUNE GRASS | | | | | x | |
| LAMIAC | LAMPURP | * | 5 | UPL | | A Forb | LAMIUM PURPUREUM | PURPLE DEAD-NETTLE | | | x | | | |
| URTICA | LAPCANA | 6 | -3 | FACW | W | N Forb | Laportea canadensis | WOOD NETTLE | | | | | x | |
| ASTERA | LAPCOMM | * | 5 | UPL | | A Forb | LAPSANA COMMUNIS | NIPPLEWORT | | | | | x | |
| FABACE | LATLATI | * | 5 | UPL | | A Forb | LATHYRUS LATIFOLIUS | PERENNIAL or EVERLASTING PEA | | | x | | | |
| GRAMIN | LEEVIRG | 6 | -3 | FACW | W | N Grass | Leersia virginica | WHITE GRASS | | | | | x | |
| LABIAT | LEOCARD | * | 5 | UPL | | A Forb | LEONURUS CARDIACA | MOTHERWORT | | | x | | x | |
| LAURAC | LINBENZ | 6 | -2 | FACW- | W | N Shrub | Lindera benzoin | SPICEBUSH | | | | x | | |
| CAMPAN | LOBCARD | 7 | -5 | OBL | I | N Forb | Lobelia cardinalis | CARDINAL FLOWER | | | | x | | |
| CAMPAN | LOBSIPH | 6 | -4 | FACW+ | I | N Forb | Lobelia siphilitica | GREAT BLUE LOBELIA | | | | | x | |
| CAPRIF | LONTATA | * | 3 | FACU | | A Shrub | LONICERA TATARICA | SMOOTH TARTARIAN HONEYSUCKLE | | | x | x | | x |
| FABACE | LOTCORN | * | 1 | FAC- | | A Forb | LOTUS CORNICULATA | BIRDFOOT TREFOIL | | | x | | | |
| LABIAT | LYCAMER | 4 | -5 | OBL | I | N Forb | Lycopus americanus | COMMON WATER HOREHOUND | | | | | x | |
| PRIMUL | LYSCILI | 4 | -3 | FACW | W | N Forb | Lysimachia ciliata | FRINGED LOOSESTRIFE | | | | | x | |
| LYTHRA | LYTSALI | * | -5 | OBL | I | A Forb | LYTHRUM SALICARIA | PURPLE LOOSESTRIFE | | | x | | | |
| LILIAC | MAICANA | 5 | 0 | FAC | | N Forb | Maianthemum canadense | CANADA MAYFLOWER;LILY-OF-THE-VALLEY | | | | x | | x |
| LILIAC | MAIRACE | 4 | 3 | FACU | | N Forb | Maianthemum racemosum ssp. Racemosum | FALSE SOLOMAN'S-SEAL | | | x | x | | x |
| LILIAC | MAISTEL | 6 | 1 | FAC- | | N Forb | Maianthemum stellatum (Smilacina stellata) | STARRY FALSE SOLOMON-SEAL | | | x | x | x | |
| DRYOPT | MATSTRU | 5 | -3 | FACW | W | N Fern | Matteuccia struthiopteris | OSTRICH FERN | | | | x | | |
| FABACE | MEDLUPU | * | 1 | FAC- | | A Forb | MEDICAGO LUPULINA | BLACK MEDICK | | | x | x | | x |
| MENISP | MENCANA | 7 | 0 | FAC | W | N Vine | Menispermum canadense | CANADA MOONSEED | | | | | x | |
| LAMIAC | MENSPIC | * | -4 | FACW+ | W | A Forb | MENTHA SPICATA | SPEARMINT | | | x | | | |
| SCROPH | MIMRING | 6 | -5 | OBL | I | N Forb | Mimulus ringens | MONKEY-FLOWER | | | | | x | |
| MARACE | MORALBA | * | 0 | FAC | | A Tree | MORUS ALBA | RUSSIAN or WHITE MULBERRY | | | x | | | |
| MARACE | MORALBA | * | 0 | FAC | | A Tree | MORUS ALBA | RUSSIAN or WHITE MULBERRY | | | | | x | |
| LABIAT | NEPCATA | * | 1 | FAC- | | A Forb | NEPETA CATARIA | CATNIP | | | x | | | |
| ONAGRA | OENBIEN | 0 | 3 | FACU | | N Forb | Oenothera biennis | COMMON EVENING-PRIMROSE | | | x | | | |
| ONAGRA | OENPARV | 1 | 3 | FACU | | N Forb | Oenothera parviflora | EVENING-PRIMROSE | | | x | | | |
| DRYOPT | ONOSENS | 4 | -3 | FACW | I | N Fern | Onoclea sensibilis | SENSITIVE FERN | | | | x | x | x |
| OSMUND | OSMCINN | 7 | -3 | FACW | I | N Fern | Osmunda cinnamomea | CINNAMON FERN | | | | x | | x |
| OSMUND | OSMCLAN | 7 | -1 | FAC+ | W | N Fern | Osmunda claytoniana | INTERRUPTED FERN | | | | x | | |
| OSMUND | OSMREGA | 7 | -5 | OBL | I | N Fern | Osmunda regalis | ROYAL FERN | | | | x | | |
| OXALID | OXASTRI | 0 | 3 | FACU | | N Forb | Oxalis stricta (O. fontana in part, O. europaea | UPRIGHT YELLOW WOOD-SORREL | | | x | | | |
| POACEA | PANCAPI | 0 | 0 | FAC | | N Grass | Panicum capillare | WITCH GRASS | | | | | | x |
| VITACE | PARINSE | 3 | 3 | FACU | | N Vine | Parthenocissus inserta (P. vitacea) | THICKET CREEPER | | | | x | x | x |
| GRAMIN | PHAARUN | 0 | -4 | FACW+ | W | N Grass | Phalaris arundinacea | REED CANARY GRASS | | | | | x | |
| GRAMIN | PHLPRAT | * | 3 | FACU | | A Grass | PHLEUM PRATENSE | TIMOTHY | | | x | | | |
| GRAMIN | PHRAUST | 0 | -4 | FACW+ | W | N Grass | Phragmites australis (P. communis) | REED;GIANT BULRUSH | | | x | | x | |
| NYCTAG | PHYAMER | 3 | 1 | FAC- | | N Forb | Phytolacca americana | POKEWEED;INKBERRY | | | x | x | x | x |
| PINACE | PICABIE | * | 5 | UPL | | A Tree | PICEA ABIES | NORWAY SPRUCE | | | x | | | |
| PINACE | PICGLAU | 6 | 3 | FACU | W | N Tree | Picea glauca | WHITE SPRUCE | | SH | | | x | |
| URTICA | PILPUMI | 5 | -3 | FACW | I | N Forb | Pilea pumila | CLEARWEED | | | | | x | |
| PLANTA | PLALANC | * | 0 | FAC | | A Forb | PLANTAGO LANCEOLATA | ENGLISH PLANTAIN;RIBGRASS | | | x | | | |
| PLANTA | PLAMAJO | * | -1 | FAC+ | | A Forb | PLANTAGO MAJOR | COMMON PLANTAIN | | | x | | | |
| POACEA | POACOMP | 0 | 2 | FACU+ | | N Grass | Poa compressa | CANADA BLUEGRASS | | | | | x | |
| POACEA | POAPALU | 5 | -4 | FACW+ | I | N Grass | Poa palustris | FOWL MEADOW GRASS | | | | | x | |
| POACEA | POAPRAT | 0 | 1 | FAC- | | N Grass | Poa pratensis | KENTUCKY BLUEGRASS | | | x | | | |
| MENISP | PODPELT | 5 | 3 | FACU | | N Forb | Podophyllum peltatum | MAY APPLE;MANDRAKE | | | | x | x | x |
| POLYGO | POLPERS | * | -3 | FACW | W | A Forb | POLYGONUM PERSICARIA | LADY'S THUMB;HEART'S-EASE | | | x | | | |
| POLYGO | POLVIRM | 6 | 0 | FAC | | N Forb | Polygonum virginianum (Tovara v.) | JUMPSEED | | | | x | x | x |
| DRYOPT | POLACRO | 5 | 5 | UPL | | N Fern | Polystichum acrostichoides | CHRISTMAS FERN | | | | x | | |
| SALICA | POPDELT | 4 | -1 | FAC+ | | N Tree | Populus deltoides | COTTONWOOD | | | x | | x | |
| SALICA | POPTREM | 2 | 0 | FAC | | N Tree | Populus tremuloides | QUAKING ASPEN | | | | | x | |
| ROSACE | POTRECT | * | 5 | UPL | | A Forb | POTENTILLA RECTA | ROUGH-FRUITED CINQUEFOIL | | | | x | x | x |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 1 | 2 | 3 | 5 |
| LABIAT | PRUVULGLAN | 5 | 5 | UPL | W | N Forb | Prunella vulgaris ssp. lanceolata | HEAL-ALL | | | x | | x | |
| ROSACE | PRUSERO | 3 | 3 | FACU | | N Tree | Prunus serotina | WILD BLACK CHERRY | | | x | x | x | |
| ROSACE | PRUVIRG | 2 | 1 | FAC- | | N Shrub | Prunus virginiana | CHOKE CHERRY | | | x | | x | |
| DENNST | PTEAQUI | 2 | 3 | FACU | | N Fern | Pteridium aquilinum | BRACKEN FERN | | | x | | | |
| PYROLA | PYRCHLO | 6 | 3 | FACU | | N Forb | Pyrola chlorantha (P. virens) | SHINLEAF | | | | x | | |
| FAGACE | QUEALBA | 6 | 3 | FACU | | N Tree | Quercus alba | WHITE OAK | | | | x | | |
| FAGACE | QUEBICO | 8 | -4 | FACW+ | I | N Tree | Quercus bicolor | SWAMP WHITE OAK | | | | x | | |
| FAGACE | QUEMACR | 5 | 1 | FAC- | W | N Tree | Quercus macrocarpa | BUR OAK; MOSSY-CUP OAK | | | x | | | |
| FAGACE | QUERUBR | 6 | 3 | FACU | | N Tree | Quercus rubra | NORTHEN RED OAK | | | x | x | x | |
| RANUNC | RANABOR | 2 | -2 | FACW- | | N Forb | Ranunculus abortivus | SMALL-FLOWERED BUTTERCUP | | | | x | | x |
| RANUNC | RANHISPCAR | 5 | -5 | OBL | I | N Forb | Ranunculus hispidus var. caricetorum (R. sep | SWAMP BUTTERCUP | | | | | x | |
| RHAMNA | RHACATH | * | 3 | FACU | W | A Tree | RHAMNUS CATHARTICA | COMMON BUCKTHORN | | | | x | x | x |
| ANACAR | RHUTYPH | 1 | 5 | UPL | | N Tree | Rhus typhina | STAGHORN SUMAC | | | x | x | | x |
| GROSSU | RIBAMER | 4 | -3 | FACW | W | N Shrub | Ribes americanum | WILD BLACK CURRANT | | | x | | x | |
| FABACE | ROBPSEU | * | 4 | FACU- | | A Tree | ROBINIA PSEUDOACACIA | BLACK LOCUST | | | x | | | |
| ROSACE | ROSMULT | * | 3 | FACU | | A Shrub | ROSA MULTIFLORA | JAPANESE or MULTIFLORA ROSE | | | x | | | |
| ROSACE | RUBALLE | 2 | 2 | FACU+ | | N Shrub | Rubus allegheniensis | COMMON BLACKBERRY | | | | x | | x |
| ROSACE | RUBCANA | 7 | 5 | UPL | | N Shrub | Rubus canadensis | BRAMBLE;DEWBERRY | | | | x | | |
| ROSACE | RUBHISP | 6 | -3 | FACW | W | N Shrub | Rubus hispidus | SWAMP DEWBERRY | | | | x | x | x |
| ROSACE | RUBIDAE | 0 | -2 | FACW- | | N Shrub | Rubus idaeus (R. strigosus) | WILD RED RASPBERRY | | | x | | | |
| ROSACE | RUBOCCI | 2 | 5 | UPL | | N Shrub | Rubus occidentalis | BLACK RASPBERRY | | | x | x | | x |
| ROSACE | RUBPUBE | 4 | -4 | FACW+ | I | N Forb | Rubus pubescens | DWARF RASPBERRY | | | | x | | |
| ASTERA | RUDHIRT | 0 | 3 | FACU | | N Forb | Rudbeckia hirta | BLACK-EYED SUSAN | | | x | | | |
| ASTERA | RUDLACI | 7 | -4 | FACW+ | W | N Forb | Rudbeckia laciniata | CUT-LEAVED CONEFLOWER | | | | | x | |
| POLYGO | RUMCRIS | * | -1 | FAC+ | W | A Forb | RUMEX CRISPUS | SOUR or CURLY DOCK | | | x | | | |
| POLYGO | RUMOBTU | * | -3 | FACW | W | A Forb | RUMEX OBTUSIFOLIUS | BITTER DOCK | | | | x | | |
| SALICA | SALALBA | * | -3 | FACW | W | A Tree | SALIX ALBA | WHITE WILLOW | | | | | x | |
| SALICA | SALAMYG | 6 | -3 | FACW | W | N Tree | Salix amygdaloides | PEACH-LEAVED WILLOW | | | x | | | |
| SALICA | SALEXIG | 3 | -5 | OBL | W | N Shrub | Salix exigua (S. interior) | SANDBAR WILLOW | | | x | | | |
| CAPRIF | SAMCANA | 5 | -2 | FACW- | W | N Shrub | Sambucus canadensis | ELDERBERRY;COMMON ELDER | | | | x | x | x |
| CARYOP | SAPOFFI | * | 3 | FACU | | A Forb | SAPONARIA OFFICINALIS | BOUNCING BET;SOAPWORT | | | | | | x |
| CYPERA | SCIPEND | 3 | -5 | OBL | I | N Sedge | Scirpus pendulus | BULRUSH | | | | | x | |
| CYPERA | SCIVALI | 5 | -5 | OBL | I | N Sedge | Scirpus validus (Schoenoplectus tabernaemo | SOFTSTEM BULRUSH | | | | | x | |
| LAMIAC | SCULATE | 5 | -5 | OBL | I | N Forb | Scutellaria lateriflora | MAD-DOG SKULLCAP | | | | | x | |
| GRAMIN | SETPUMI | * | 0 | FAC | | A Grass | SETARIA PUMILA (S. GLAUCA) | YELLOW FOXTAIL | | | x | | | |
| CARYOP | SILPRAT | * | 5 | UPL | | A Forb | SILENE PRATENSIS | WHITE COCKLE;WHITE CATCHFLY | | | x | | | |
| CARYOP | SILVULG | * | 5 | UPL | | A Forb | SILENE VULGARIS (S. CUCUBALUS) | BLADDER CAMPION | | | x | | | |
| CRUCIF | SISALTI | * | 3 | FACU | | A Forb | SISYMBRIUM ALTISSIMUM | TUMBLE MUSTARD | | | x | | | |
| SMILAX | SMILASI | 5 | 5 | UPL | | N Vine | Smilax lasioneura | CARRION-FLOWER | | | | x | | x |
| SOLANA | SOLDULC | * | 0 | FAC | W | A Vine | SOLANUM DULCAMARA | CLIMBING NIGHTSHADE | | | | x | x | x |
| ASTERA | SOLCANA | 1 | 3 | FACU | | N Forb | Solidago canadensis | CANADA GOLDENROD | | | x | | | x |
| ASTERA | SOLGIGA | 4 | -3 | FACW | W | N Forb | Solidago gigantea | LATE GOLDENROD | | | | | x | |
| ASTERA | SOLRUGO | 4 | -1 | FAC+ | W | N Forb | Solidago rugosa | ROUGH GOLDENROD | | | | | x | |
| ROSACE | SPIALBA | 3 | -4 | FACW+ | I | N Shrub | Spiraea alba | NARROW-LEAVED MEADOWSWEET | | | | x | x | |
| ORCHID | SPICERN | 5 | -2 | FACW- | W | N Forb | Spiranthes cernua | NODDING LADIES'-TRESSES | | | x | | | |
| ASTERA | SYMERIC | 4 | 4 | FACU- | | N Forb | Symphyotrichum ericoides var. ericoides | WHITE HEATH ASTER | | | | | | x |
| ARACEA | SYMFOET | 7 | -5 | OBL | I | N Forb | Symplocarpus foetidus | SKUNK-CABBAGE | | | | x | x | |
| ASTERA | SYMLATE | 3 | -2 | FACW- | W | N Forb | Symphyotrichum lateriflorum var. lateriflorum | SIDE-FLOWERING ASTER;CALICO ASTER | | | | | | x |
| ASTERA | SYMNOVA | 2 | -3 | FACW | | N Forb | Symphyotrichum novae-angliae | NEW ENGLAND ASTER | | | | | | x |
| ASTERA | TAROFFI | * | 3 | FACU | | A Forb | TARAXACUM OFFICINALE | BROWN-SEED DANDELION | | | x | | x | |
| RANUNC | THADASY | 8 | -2 | FACW- | W | N Forb | Thalictrum dasycarpum | PURPLE MEADOW-RUE | | | | | x | |
| RANUNC | THADIOI | 5 | 2 | FACU+ | | N Forb | Thalictrum dioicum | EARLY MEADOW-RUE | | | | | x | |
| TILIAC | TILAMER | 4 | 3 | FACU | | N Tree | Tilia americana | LINDEN;BASSWOOD | | | | | x | |
| ASTERA | TRAPRAT | * | 5 | UPL | | A Forb | TRAGOPOGON PRATENSIS | COMMON GOAT'S BEARD | | | x | | | |
| FABACE | TRIPRAT | * | 2 | FACU+ | | A Forb | TRIFOLIUM PRATENSE | RED CLOVER | | | x | | | |

| FAMILY | ACRONYM | C | W | WETNESS | OWES* | PHYSIOG. | SCIENTIFIC NAME | COMMON NAME | ESA Listing | S-Rank | Community | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 1 | 2 | 3 | 5 |
| LILIAC | TRIGRAN | 5 | 5 | UPL | | N Forb | Trillium grandiflorum | COMMON TRILLIUM | | | x | x | x | x |
| CAPRIF | TRIAURA | 7 | 5 | UPL | | N Forb | Triosteum aurantiacum (T. perfoliatum var. a. | HORSE-GENTIAN | | | | x | x | |
| ANACAR | TOXRADI | 0 | 0 | FAC | | N Vine | Toxicodendron radicans | POISON-IVY | | | | x | x | x |
| ASTERA | TUSFARF | * | 3 | FACU | W | A Forb | TUSSILAGO FARFARA | COLTSFOOT | | | x | | | |
| ULMACE | ULMAMER | 3 | -2 | FACW- | W | N Tree | Ulmus americana | WHITE or AMERICAN ELM | | | x | | | |
| URTICA | URTDIOIDIO | * | -1 | FAC+ | | A Forb | URTICA DIOICA SSP. DIOICA | NETTLE | | | x | | | x |
| URTICA | URTDIOIGRA | 2 | -1 | FAC+ | W | N Forb | Urtica dioica ssp. gracilis | NETTLE | | | | x | | |
| VERBEN | VERHAST | 4 | -4 | FACW+ | I | N Forb | Verbena hastata | BLUE VERVAIN | | | | | x | |
| VERBEN | VERURTI | 4 | -1 | FAC+ | W | N Forb | Verbena urticifolia | WHITE VERVAIN | | | | | x | |
| SCROPH | VERANAG | * | -5 | OBL | I | A Forb | VERONICA ANAGALLIS-AQUATICA | WATER SPEEDWELL; BROOK-PIMPERNELL | | | | | x | |
| CAPRIF | VIBACER | 6 | 5 | UPL | | N Shrub | Viburnum acerifolium | MAPLE-LEAVED ARROW-WOOD | | | | x | | x |
| CAPRIF | VIBLENT | 4 | -1 | FAC+ | W | N Shrub | Viburnum lentago | NANNYBERRY;SHEEPBERRY | | | | | x | |
| FABACE | VICVILL | * | 5 | UPL | | A Forb | VICIA VILLOSA | HAIRY VETCH | | | x | x | | x |
| VIOLAC | VIOPUBE | 5 | 4 | FACU- | | N Forb | Viola pubescens (V. eriocarpa, V. pensylvanic | YELLOW VIOLET | | | | | x | |
| VIOLAC | VIOSORO | 4 | 1 | FAC- | W | N Forb | Viola sororia | COMMON BLUE VIOLET | | | | | x | |
| VITACE | VITRIPA | 0 | -2 | FACW- | | N Vine | Vitis riparia | RIVERBANK GRAPE | | | x | | | |
| VITACE | VITRIPA | 0 | -2 | FACW- | | N Vine | Vitis riparia | RIVERBANK GRAPE | | | | | x | |
| UMBELL | ZIZAURE | 7 | -1 | FAC+ | W | N Forb | Zizia aurea | GOLDEN ALEXANDERS | | | | | x | |

# Appendix G
Wildlife Survey Data

**WILDLIFE SURVEY SUMMARY SHEET**

Project: Johnston - Maes Komoka Pit

| Common Name | Scientific Name | S Rank | ESA Status | Notes |
|---|---|---|---|---|
| **Amphibians** | | | | |
| Bullfrog | Lithobates catesbeianus | S4 | | only found in East Pond |
| Gray Treefrog | Hyla versicolor | S5 | | |
| Green Frog | Lithobates clamitans | S5 | | |
| Spring Peeper | Pseudacris crucifer | S5 | | |
| Western Chorus Frog | Pseudacris ctriseriata | S4 | | |
| **Birds** | | | | |
| American Crow | Corvus brachyrhynchos | S5 | | |
| American Goldfinch | Carduelis tristis | S5 | | |
| American Redstart | Setophaga ruticilla | S5 | | |
| American Robin | Turdus migratorius | S5 | | |
| Bank Swallow | Riparia riparia | S4 | THR | in stockpile |
| Baltimore Oriole | Icterus galbula | S4 | | |
| Barn Swallow | Hirundo rustica | S4 | THR | in barn (Community 5) |
| Black-capped Chickadee | Poecile atricapillus | S5 | | |
| Belted Kingfisher | Megaceryle alcyon | S4 | | |
| Blue-gray Gnatcatcher | Polioptila caerulea | S4 | | |
| Brown-headed Cowbird | Molothrus ater | S4 | | |
| Blue Jay | Cyanocitta cristata | S5 | | |
| Cedar Waxwing | Bombycilla cedrorum | S5 | | |
| Chipping Sparrow | Spizella passerina | S5 | | |
| Common Grackle | Quiscalus quiscula | S5 | | |
| Common Yellowthroat | Geothlypis trichas | S5 | | |
| Downy Woodpecker | Picoides pubescens | S5 | | |
| Eastern Wood-Pewee | Contopus virens | S4 | SC | Communities 1, 2 &3 |
| Great Crested Flycatcher | Myiarchus crinitus | S4 | | |
| Great Horned Owl | Bubo virginianus | S4 | | |
| Gray Catbird | Dumetella carolinensis | S4 | | |
| Hairy Woodpecker | Picoides villosus | S5 | | |
| House Wren | Troglodytes aedon | S5 | | |
| Indigo Bunting | Passerina cyanea | S4 | | |
| Mourning Dove | Zenaida macroura | S5 | | |
| Northern Cardinal | Cardinalis cardinalis | S5 | | |
| Northern Flicker | Colaptes auratus | S4 | | |
| Rose-breasted Grosbeak | Pheucticus ludovicianus | S4 | | |
| Red-bellied Woodpecker | Melanerpes carolinus | S4 | | |
| Red-eyed Vireo | Vireo olivaceus | S5 | | |
| Red-winged Blackbird | Agelaius phoeniceus | S4 | | |
| Song Sparrow | Melospiza melodia | S5 | | |
| Warbling Vireo | Vireo gilvus | S5 | | |
| White-breasted Nuthatch | Sitta carolinensis | S5 | | |
| Wild Turkey | Meleagris gallopavo | S5 | | |
| Wood Thrush | Hylocichla mustelina | S4 | SC | Community 3 |
| Yellow-bellied Sapsucker | Sphyrapicus varius | S5 | | |
| Yellow Warbler | Setophaga petechia | S5 | | |
| **Reptiles** | | | | |
| Eastern Gartersnake | Thanophis sitralis sirtalis | S5 | | Community 5 in the CUT inclusion |
| **Butterflies** | | | | |
| Meadow Fritillary | Boloria bellona | S5 | | |
| Orange Sulphur | Colias eurytheme | S5 | | |
| Cabbage White | Pieris rapae | SNA | | |
| Northern Crescent | Phyciodes cocyta | S5 | | |
| Mourning Cloak | Nymphalis antiopa | S5 | | |
| Common Wood-Nymph | Cercyonis pegala | S5 | | |
| Black Swallowtail | Papilio polyxenes | S5 | | |
| **Damselflies & Dragonflies** | | | | |
| Bluet species | n/a | -- | | |
| Ruby Meadowhawk | Sympetrum rubicundulum | S5 | | |
| Twelve-spotted Skimmer | Libellula pulchella | S5 | | |
| Ebony Jewelwing | Calopteryx maculata | S5 | | |
| **Mammals** | | | | |
| Raccoon | Procyon lotor | S5 | | |
| Coyote | Canis latrans | S5 | | tracks & den in Community 2 |
| Eastern Chipmunk | Tamias striatus | S5 | | |
| White-tailed Deer | Odocoileus virginianus | S5 | | |
| Eastern Gray Squirrel | Sciurus carolinensis | S5 | | |
| Striped Skunk | Mephitis mephitis | S5 | | tracks & den in Community 1 |

# GENERAL SITE INFORMATION FIELD SHEET

Project: Johnston MAES Komoka
Date: April 20, 2016 Project Manager: LM
Collector(s): LM Visit #: 1
Time started: 9:20 Time finished: 9:50 Combined collectors' hours:
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

| WEATHER CONDITIONS | | | | | WIND SCALE | |
|---|---|---|---|---|---|---|
| Temp. 14°C | Wind: Slight | 21 | Cloud Cover (%) | Precipitation | 0 | Calm |
| | Direction: N | | hazy | Today: None | 1 | Smoke Drifts |
| | | | | Yesterday: None | 2 | Wind Felt on Face |
| | | | | | 3 | Leaves in constant motion |
| | | | | | 4 | Wind raises dust and paper |
| | | | | | 5 | Small trees sway |
| | | | | | 6 | Large branches sway |
| | | | | | 7 | Lots of resistance when walking into |
| | | | | | 8 | Limbs breaking off trees |

| DATA FOCUS | | | | | |
|---|---|---|---|---|---|
| ☐ | Birds 1__ 2__ | ☐ | ELC's | ☐ | Dripline |
| ☐ | Mammals | ☐ | Floral V__ S__ A_ | ☐ | Aquatic - Physical |
| ☑ | Amphibians (1) 2_ 3_ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | | |

| FEATURES (with GPS co-ordinates where applicable) | Mapped | Follow-up Req'd | | |
|---|---|---|---|---|
| | | Yes | No | Who |
| **Man-made Structures:** ☐ None observed | | | | |
| ☐ Barns/Footings/Wells/other(list) | | | | |
| ☐ Rock Piles | | | | |
| ☐ Garbage | | | | |
| **Natural Vegetation:** ☐ None observed | | | | |
| ☐ Fallen Logs outside woods (#'s) | | | | |
| ☐ Brush Piles | | | | |
| ☐ Snags (raptor perch) | | | | |
| ☐ Tree Cavities (nesting) | | | | |
| ☐ Sentinel Trees | | | | |
| ☐ Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| **Wildlife Features:** ☐ None observed | | | | |
| ☐ Waterfowl nesting (large #'s, # of species) | | | | |
| ☐ Exposed Banks (nesting swallows) | | | | |
| ☐ Stick Nests | | | | |
| ☐ Animal Burrows (>10cm) | | | | |
| ☐ Heronry | | | | |
| ☐ Crayfish mounds | | | | |
| ☐ Sand/gravel on site | | | | |
| ☐ Marsh/open country/shrub | | | | |
| ☐ Winter Deer yards | | | | |
| ☐ Corridor from pond to woods (ampibian movement) | | | | |
| ☐ Bat corridor (shorelines, escarpments) | | | | |
| ☐ Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| **Aquatic Features:** | | | | |
| ☐ Perm. pond in woodland ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ Perm. pond in open ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ Water in woodland ☐ pools ☐ flowing ☐ dry | | | | |
| ☐ Waterways flowing dry pools | | | | |
| ☐ natural stream ☐ ☐ ☐ | | | | |
| ☐ swale ☐ ☐ ☐ ☐ None observed | | | | |
| ☐ open drain ☐ ☐ ☐ | | | | |
| ☐ Seeps/Springs ☐ ☐ ☐ | | | | |
| **Incidental Observations:** | | | | |

Graphic ☐ Attached or Name Checked by Project Manager ☐ Date:

# GENERAL SITE INFORMATION FIELD SHEET

Project: Johnston - Comoka Pit
Date: May 26, 2016 Project Manager: LM
Collector(s): WH Visit #: 1
Time started: 9:30 Time finished: 3:30 Combined collectors' hours: 6.0
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

| WEATHER CONDITIONS | | | | |
|---|---|---|---|---|
| Temp. | Wind: | 3 | Cloud Cover (%) | Precipitation |
| 18 | Direction: | W | 50 | Today: no<br>Yesterday: |

| WIND SCALE | |
|---|---|
| 0 | Calm |
| 1 | Smoke Drifts |
| 2 | Wind Felt on Face |
| 3 | Leaves in constant motion |
| 4 | Wind raises dust and paper |
| 5 | Small trees sway |
| 6 | Large branches sway |
| 7 | Lots of resistance when walking into |
| 8 | Limbs breaking off trees |

**DATA FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| ☒ | Birds 1__ 2__ Mig☒ | ☒ | ELC's | ☐ | Dripline/Tree Survey |
| ☐ | Mammals | ☒ | Floral V_☒S_ _A_ | ☐ | Aquatic - Physical |
| ☐ | Amphibians 1_ 2_ 3_ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | ☐ | Other - see notes |

| FEATURES (with GPS co-ordinates where applicable) | Mapped | Follow-up Req'd | | |
|---|---|---|---|---|
| | UTM | Yes | No | Who |
| **Man-made Structures:** ☐ None observed | | | | |
| **Yes No** | | | | |
| ☒ ☐ Barns/Footings/Wells/other(list) | no | | | |
| ☒ ☐ Rock Piles | no | | | |
| ☒ ☐ Garbage | no | | | |
| **Natural Vegetation:** ☐ None observed | | | | |
| ☒ ☐ Fallen Logs outside woods (#'s) | | | | |
| ☒ ☐ Brush Piles | | | | |
| ☒ ☐ Snags (raptor perch) | | | | |
| ☒ ☐ Tree Cavities (nesting) | | | | |
| ☐ ☒ Sentinel Trees | | | | |
| ☐ ☒ Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| **Wildlife Features:** ☐ None observed | | | | |
| ☐ ☒ Waterfowl nesting (large #'s, # of species) | | | | |
| ☒ ☐ Exposed Banks (nesting swallows) | | | | |
| ☐ ☒ Stick Nests | | | | |
| ☒ ☐ Animal Burrows (>10cm) | | | | |
| ☐ ☒ Heronry | | | | |
| ☐ ☒ Crayfish mounds | | | | |
| ☒ ☐ Sand/gravel on site | | | | |
| ☐ ☒ Marsh/open country/shrub | | | | |
| ☐ ☒ Winter Deer yards | | | | |
| ☒ ☐ Corridor from pond to woods (ampibian movement) | | | | |
| ☒ ☐ Bat corridor (shorelines, escarpments) rail line | | | | |
| ☐ ☒ Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| **Aquatic Features:** | | | | |
| ☒ ☐ Perm. pond in woodland ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ ☐ Perm. pond in open ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ ☐ Water in woodland ☒ pools ☐ flowing ☐ dry | | | | |
| ☒ ☐ Waterways flowing dry pools | | | | |
| ☒ natural stream ☒ ☐ ☐ | | | | |
| ☐ swale ☐ ☐ ☐ ☐ None observed | | | | |
| ☐ open drain ☐ ☐ ☐ | | | | |
| Seeps/Springs ☐ ☐ ☐ | | | | |

**Incidental Observations/Notes:**

Bank Swallow (80+ holes) and Belted Kingfisher pair noted as nesting in stockpile and GPS - 463364, 4753957 near recent extraction

Graphic ☐ Attached or Name Checked by Project Manager ☐ Date:

# GENERAL SITE INFORMATION FIELD SHEET

Project: Johnston MAES Komoka
Date: May 27, 2016 Project Manager: LM
Collector(s): LM Visit #:
Time started: 10:45 Time finished: 11:15 Combined collectors' hours:
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

| WEATHER CONDITIONS | | | | |
|---|---|---|---|---|
| Temp. | Wind: N/A | | Cloud Cover (%) | Precipitation |
| 20°C | Direction: N/A | Calm | 80% | Today: N/A<br>Yesterday: N/A |

| WIND SCALE | |
|---|---|
| 0 | Calm |
| 1 | Smoke Drifts |
| 2 | Wind Felt on Face |
| 3 | Leaves in constant motion |
| 4 | Wind raises dust and paper |
| 5 | Small trees sway |
| 6 | Large branches sway |
| 7 | Lots of resistance when walking into |
| 8 | Limbs breaking off trees |

**DATA FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| ☐ | Birds 1__ 2__ Mig__ | ☐ | ELC's | ☐ | Dripline/Tree Survey |
| ☐ | Mammals | ☐ | Floral V__ S__ A_ | ☐ | Aquatic - Physical |
| ✓ | Amphibians 1_ 2✓ 3_ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | ☐ | Other - see notes |

| FEATURES (with GPS co-ordinates where applicable) | Mapped | Follow-up Req'd | | |
|---|---|---|---|---|
| | UTM | Yes | No | Who |
| **Man-made Structures:** ☐ None observed | | | | |
| **Yes No** | | | | |
| ☐ ☐ Barns/Footings/Wells/other(list) | | | | |
| ☐ ☐ Rock Piles | | | | |
| ☐ ☐ Garbage | | | | |
| **Natural Vegetation:** ☐ None observed | | | | |
| ☐ ☐ Fallen Logs outside woods (#'s) | | | | |
| ☐ ☐ Brush Piles | | | | |
| ☐ ☐ Snags (raptor perch) | | | | |
| ☐ ☐ Tree Cavities (nesting) | | | | |
| ☐ ☐ Sentinel Trees | | | | |
| ☐ ☐ Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| **Wildlife Features:** ☐ None observed | | | | |
| ☐ ☐ Waterfowl nesting (large #'s, # of species) | | | | |
| ☐ ☐ Exposed Banks (nesting swallows) | | | | |
| ☐ ☐ Stick Nests | | | | |
| ☐ ☐ Animal Burrows (>10cm) | | | | |
| ☐ ☐ Heronry | | | | |
| ☐ ☐ Crayfish mounds | | | | |
| ☐ ☐ Sand/gravel on site | | | | |
| ☐ ☐ Marsh/open country/shrub | | | | |
| ☐ ☐ Winter Deer yards | | | | |
| ☐ ☐ Corridor from pond to woods (ampibian movement) | | | | |
| ☐ ☐ Bat corridor (shorelines, escarpments) | | | | |
| ☐ ☐ Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| **Aquatic Features:** | | | | |
| ☐ ☐ Perm. pond in woodland ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ ☐ Perm. pond in open ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ ☐ Water in woodland ☐ pools ☐ flowing ☐ dry | | | | |
| ☐ ☐ Waterways flowing dry pools | | | | |
| ☐ natural stream ☐ ☐ ☐ | | | | |
| ☐ swale ☐ ☐ ☐ ☐ None observed | | | | |
| ☐ open drain ☐ ☐ ☐ | | | | |
| Seeps/Springs ☐ ☐ ☐ | | | | |
| **Incidental Observations/Notes:** | | | | |

Graphic ☐ Attached or Name Checked by Project Manager ☐ Date:

# GENERAL SITE INFORMATION FIELD SHEET

Project: Johnston - Komoka Pit
Date: Jan 15, 2016 Project Manager: LM
Collector(s): WH Visit #: 2
Time started: 5:30 Time finished: 10:15 Combined collectors' hours: 4.75
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

**WEATHER CONDITIONS**

| Temp. | Wind: | | Cloud Cover (%) | Precipitation |
|---|---|---|---|---|
| 15 | Direction: | E | 70 | Today: no<br>Yesterday: no |

**WIND SCALE**

| | |
|---|---|
| 0 | Calm |
| 1 | Smoke Drifts |
| 2 | Wind Felt on Face |
| 3 | Leaves in constant motion |
| 4 | Wind raises dust and paper |
| 5 | Small trees sway |
| 6 | Large branches sway |
| 7 | Lots of resistance when walking into |
| 8 | Limbs breaking off trees |

**DATA FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| ☒ | Birds 1☒ 2__ Mig__ | ☐ | ELC's | ☐ | Dripline/Tree Survey |
| ☐ | Mammals | ☒ | Floral V_☒_S__A_ | ☐ | Aquatic - Physical |
| ☐ | Amphibians 1_ 2_ 3_ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | ☐ | Other - see notes |

**FEATURES (with GPS co-ordinates where applicable)**

| Yes | No | | Mapped UTM | Follow-up Req'd Yes | No | Who |
|---|---|---|---|---|---|---|
| | | **Man-made Structures:** ☐ None observed | | | | |
| ☒ | ☐ | Barns/Footings/Wells/other(list) | | | | |
| ☒ | ☐ | Rock Piles | | | | |
| ☒ | ☐ | Garbage | | | | |
| | | **Natural Vegetation:** ☐ None observed | | | | |
| ☒ | ☐ | Fallen Logs outside woods (#'s) | | | | |
| ☒ | ☐ | Brush Piles | | | | |
| ☒ | ☐ | Snags (raptor perch) | | | | |
| ☒ | ☐ | Tree Cavities (nesting) | | | | |
| ☐ | ☒ | Sentinel Trees | | | | |
| ☐ | ☒ | Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| | | **Wildlife Features:** ☐ None observed | | | | |
| ☐ | ☒ | Waterfowl nesting (large #'s, # of species) | | | | |
| ☒ | ☐ | Exposed Banks (nesting swallows) | | | | |
| ☐ | ☒ | Stick Nests | | | | |
| ☒ | ☐ | Animal Burrows (>10cm) | | | | |
| ☐ | ☒ | Heronry | | | | |
| ☐ | ☒ | Crayfish mounds | | | | |
| ☒ | ☐ | Sand/gravel on site | | | | |
| ☐ | ☒ | Marsh/open country/shrub | | | | |
| ☐ | ☒ | Winter Deer yards | | | | |
| ☒ | ☐ | Corridor from pond to woods (ampibian movement) | | | | |
| ☒ | ☐ | Bat corridor (shorelines, escarpments) | | | | |
| ☐ | ☒ | Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| | | **Aquatic Features:** | | | | |
| ☒ | ☐ | Perm. pond in woodland ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ | ☐ | Perm. pond in open ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ | ☐ | Water in woodland ☒ pools ☐ flowing ☐ dry | | | | |
| ☒ | ☐ | Waterways flowing dry pools | | | | |
| ☒ | | natural stream ☒ ☐ ☐ | | | | |
| ☐ | | swale ☐ ☐ ☐ ☐ None observed | | | | |
| ☐ | | open drain ☐ ☐ ☐ | | | | |
| | | Seeps/Springs ☐ ☐ ☐ | | | | |

**Incidental Observations/Notes:**

Bank Swallow and Belted Kingfisher still present

Graphic ☐ Attached or Name Checked by Project Manager ☐ Date:

# GENERAL SITE INFORMATION FIELD SHEET

Project: Johnstone Maes Komoka
Date: June 24, 2016 Project Manager: LM
Collector(s): LM Visit #: 3
Time started: 9:45pm Time finished: 10:15pm Combined collectors' hours: _____
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

| WEATHER CONDITIONS | | | | |
|---|---|---|---|---|
| Temp. | Wind: | | Cloud Cover (%) | Precipitation |
| 21°C | Direction: | Calm | Clear | Today: None<br>Yesterday: None |

| WIND SCALE | |
|---|---|
| 0 | Calm |
| 1 | Smoke Drifts |
| 2 | Wind Felt on Face |
| 3 | Leaves in constant motion |
| 4 | Wind raises dust and paper |
| 5 | Small trees sway |
| 6 | Large branches sway |
| 7 | Lots of resistance when walking into |
| 8 | Limbs breaking off trees |

**DATA FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| ☐ | Birds 1__ 2__ Mig__ | ☐ | ELC's | ☐ | Dripline/Tree Survey |
| ☐ | Mammals | ☐ | Floral V__ S__ A_ | ☐ | Aquatic - Physical |
| ✓ | Amphibians 1_ 2_ 3✓ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | ☐ | Other - see notes |

**FEATURES (with GPS co-ordinates where applicable)**

| | | Mapped | Follow-up Req'd | | |
|---|---|---|---|---|---|
| | | UTM | Yes | No | Who |
| **Man-made Structures:** | ☐ None observed | | | | |
| Yes No | | | | | |
| ☐ ☐ | Barns/Footings/Wells/other(list) | | | | |
| ☐ ☐ | Rock Piles | | | | |
| ☐ ☐ | Garbage | | | | |
| **Natural Vegetation:** | ☐ None observed | | | | |
| ☐ ☐ | Fallen Logs outside woods (#'s) | | | | |
| ☐ ☐ | Brush Piles | | | | |
| ☐ ☐ | Snags (raptor perch) | | | | |
| ☐ ☐ | Tree Cavities (nesting) | | | | |
| ☐ ☐ | Sentinel Trees | | | | |
| ☐ ☐ | Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| **Wildlife Features:** | ☐ None observed | | | | |
| ☐ ☐ | Waterfowl nesting (large #'s, # of species) | | | | |
| ☐ ☐ | Exposed Banks (nesting swallows) | | | | |
| ☐ ☐ | Stick Nests | | | | |
| ☐ ☐ | Animal Burrows (>10cm) | | | | |
| ☐ ☐ | Heronry | | | | |
| ☐ ☐ | Crayfish mounds | | | | |
| ☐ ☐ | Sand/gravel on site | | | | |
| ☐ ☐ | Marsh/open country/shrub | | | | |
| ☐ ☐ | Winter Deer yards | | | | |
| ☐ ☐ | Corridor from pond to woods (ampibian movement) | | | | |
| ☐ ☐ | Bat corridor (shorelines, escarpments) | | | | |
| ☐ ☐ | Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| **Aquatic Features:** | | | | | |
| ☐ ☐ | Perm. pond in woodland ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ ☐ | Perm. pond in open ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ ☐ | Water in woodland ☐ pools ☐ flowing ☐ dry | | | | |
| ☐ ☐ | Waterways flowing dry pools | | | | |
| | ☐ natural stream ☐ ☐ ☐ | | | | |
| | ☐ swale ☐ ☐ ☐ ☐ None observed | | | | |
| | ☐ open drain ☐ ☐ ☐ | | | | |
| | Seeps/Springs ☐ ☐ ☐ | | | | |
| **Incidental Observations/Notes:** | | | | | |

Graphic ☐ Attached or Name Checked by Project Manager ☐ Date: _____

# GENERAL SITE INFORMATION FIELD SHEET

Project: Johnston - Komoka Pit
Date: July 2, 2016 Project Manager: LM
Collector(s): WH Visit #: 3
Time started: 7:00 Time finished: 18:00 Combined collectors' hours: 3
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

| WEATHER CONDITIONS | | | | |
|---|---|---|---|---|
| Temp. | Wind: | 6 | Cloud Cover (%) | Precipitation |
| 18 | Direction: | — | 0 | Today: no<br>Yesterday: no |

| WIND SCALE | |
|---|---|
| 0 | Calm |
| 1 | Smoke Drifts |
| 2 | Wind Felt on Face |
| 3 | Leaves in constant motion |
| 4 | Wind raises dust and paper |
| 5 | Small trees sway |
| 6 | Large branches sway |
| 7 | Lots of resistance when walking into |
| 8 | Limbs breaking off trees |

**DATA FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| ☒ | Birds 1__ 2☒ Mig__ | ☐ | ELC's | ☐ | Dripline/Tree Survey |
| ☐ | Mammals | ☒ | Floral V_ _ S☒_ A_ | ☐ | Aquatic - Physical |
| ☐ | Amphibians 1_ 2_ 3_ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | ☐ | Other - see notes |

| FEATURES (with GPS co-ordinates where applicable) | Mapped | Follow-up Req'd | | |
|---|---|---|---|---|
| | UTM | Yes | No | Who |
| **Man-made Structures:** ☐ None observed | | | | |
| **Yes No** | | | | |
| ☒ ☐ Barns/Footings/Wells/other(list) | | | | |
| ☒ ☐ Rock Piles | | | | |
| ☒ ☐ Garbage | | | | |
| **Natural Vegetation:** ☐ None observed | | | | |
| ☒ ☐ Fallen Logs outside woods (#'s) | | | | |
| ☒ ☐ Brush Piles | | | | |
| ☒ ☐ Snags (raptor perch) | | | | |
| ☒ ☐ Tree Cavities (nesting) | | | | |
| ☐ ☒ Sentinel Trees | | | | |
| ☐ ☒ Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| **Wildlife Features:** ☐ None observed | | | | |
| ☐ ☒ Waterfowl nesting (large #'s, # of species) | | | | |
| ☒ ☐ Exposed Banks (nesting swallows) | | | | |
| ☐ ☒ Stick Nests | | | | |
| ☒ ☐ Animal Burrows (>10cm) | | | | |
| ☐ ☒ Heronry | | | | |
| ☐ ☒ Crayfish mounds | | | | |
| ☒ ☐ Sand/gravel on site | | | | |
| ☐ ☒ Marsh/open country/shrub | | | | |
| ☐ ☒ Winter Deer yards | | | | |
| ☒ ☐ Corridor from pond to woods (ampibian movement) | | | | |
| ☒ ☐ Bat corridor (shorelines, escarpments) | | | | |
| ☐ ☒ Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| **Aquatic Features:** | | | | |
| ☒ ☐ Perm. pond in woodland ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ ☐ Perm. pond in open ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ ☐ Water in woodland ☒ pools ☐ flowing ☐ dry | | | | |
| ☒ ☐ Waterways flowing dry pools | | | | |
| ☒ natural stream ☒ ☐ ☐ | | | | |
| ☐ swale ☐ ☐ ☐ ☐ None observed | | | | |
| ☐ open drain ☐ ☐ ☐ | | | | |
| Seeps/Springs ☐ ☐ ☐ | | | | |
| **Incidental Observations/Notes:** | | | | |

Graphic ☐ Attached or Name Checked by Project Manager ☐ Date:_____

# GENERAL SITE INFORMATION FIELD SHEET

Project: Johnston - Komoka Pit
Date: Aug. 22, 2016 Project Manager: LM
Collector(s): JH Visit #: 4
Time started: 10:30 Time finished: 4:30 Combined collectors' hours: 6.0
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

| WEATHER CONDITIONS | | | | |
|---|---|---|---|---|
| Temp. | Wind: | 1 | Cloud Cover (%) | Precipitation |
| 26° | Direction: | NW | 40 | Today: no<br>Yesterday: yes |

| WIND SCALE | |
|---|---|
| 0 | Calm |
| 1 | Smoke Drifts |
| 2 | Wind Felt on Face |
| 3 | Leaves in constant motion |
| 4 | Wind raises dust and paper |
| 5 | Small trees sway |
| 6 | Large branches sway |
| 7 | Lots of resistance when walking into |
| 8 | Limbs breaking off trees |

**DATA FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| ☐ | Birds 1__ 2__ Mig__ | ☒ | ELC's | ☐ | Dripline/Tree Survey |
| ☐ | Mammals | ☒ | Floral V__ S_☒A_ | ☐ | Aquatic - Physical |
| ☒ | Amphibians 1_ 2_ 3_ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | ☐ | Other - see notes |

| FEATURES (with GPS co-ordinates where applicable) | | | Mapped | Follow-up Req'd | | |
|---|---|---|---|---|---|---|
| | | | UTM | Yes | No | Who |
| **Man-made Structures:** | | ☐ None observed | | | | |
| **Yes** | **No** | | | | | |
| ☒ | ☐ | Barns/Footings/Wells/other(list) | | | | |
| ☒ | ☐ | Rock Piles | | | | |
| ☒ | ☐ | Garbage | | | | |
| **Natural Vegetation:** | | ☐ None observed | | | | |
| ☒ | ☐ | Fallen Logs outside woods (#'s) | | | | |
| ☒ | ☐ | Brush Piles | | | | |
| ☒ | ☐ | Snags (raptor perch) | | | | |
| ☒ | ☐ | Tree Cavities (nesting) | | | | |
| ☐ | ☒ | Sentinel Trees | | | | |
| ☐ | ☒ | Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| **Wildlife Features:** | | ☐ None observed | | | | |
| ☐ | ☒ | Waterfowl nesting (large #'s, # of species) | | | | |
| ☒ | ☐ | Exposed Banks (nesting swallows) | | | | |
| ☐ | ☒ | Stick Nests | | | | |
| ☒ | ☐ | Animal Burrows (>10cm) | | | | |
| ☐ | ☒ | Heronry | | | | |
| ☐ | ☒ | Crayfish mounds | | | | |
| ☒ | ☐ | Sand/gravel on site | | | | |
| ☐ | ☒ | Marsh/open country/shrub | | | | |
| ☐ | ☒ | Winter Deer yards | | | | |
| ☒ | ☐ | Corridor from pond to woods (ampibian movement) | | | | |
| ☒ | ☐ | Bat corridor (shorelines, escarpments) | | | | |
| ☐ | ☒ | Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| **Aquatic Features:** | | | | | | |
| ☒ | ☐ | Perm. pond in woodland ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ | ☐ | Perm. pond in open ☒ emergents/submergents/logs ☐ temp. | | | | |
| ☒ | ☐ | Water in woodland ☒ pools ☐ flowing ☐ dry | | | | |
| ☒ | ☐ | Waterways flowing dry pools | | | | |
| | ☐ | natural stream ☒ | | | | |
| | ☐ | swale ☐ ☐ ☐ ☐ None observed | | | | |
| | ☐ | open drain ☐ ☐ ☐ | | | | |
| | | Seeps/Springs ☐ ☐ ☐ | | | | |
| **Incidental Observations/Notes:** | | | | | | |

Graphic ☐ Attached or Name Checked by Project Manager ☐ Date:_____

# GENERAL SITE INFORMATION FIELD SHEET

Project: Komoka Pit
Date: Oct 7, 2016 Project Manager: LM
Collector(s): WH Visit #:
Time started: 9:00am Time finished: 2:00pm Combined collectors' hours: 5.0
☐ NHIC List ☐ MNR EO's ☐ none ☐ not provided to collector

**WEATHER CONDITIONS**

| Temp. | Wind: | | Cloud Cover (%) | Precipitation |
|---|---|---|---|---|
| 16 | Direction: | S | 0 | Today: no<br>Yesterday: no |

**WIND SCALE**

| | |
|---|---|
| 0 | Calm |
| 1 | Smoke Drifts |
| 2 | Wind Felt on Face |
| 3 | Leaves in constant motion |
| 4 | Wind raises dust and paper |
| 5 | Small trees sway |
| 6 | Large branches sway |
| 7 | Lots of resistance when walking into |
| 8 | Limbs breaking off trees |

**DATA FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| ☐ | Birds 1__ 2__ Mig__ | ☐ | ELC's | ☐ | Dripline/Tree Survey |
| ☐ | Mammals | ☒ | Floral V__ S__ A☒ | ☐ | Aquatic - Physical |
| ☐ | Amphibians 1_ 2_ 3_ | ☐ | Wetland | ☐ | Aquatic - Biological |
| ☐ | Reptiles | ☐ | Butternut | ☐ | Faunal Habitat |
| ☐ | Inverterbrates | ☐ | other SAR | ☐ | Other - see notes |

**FEATURES (with GPS co-ordinates where applicable)**

| | | Mapped | Follow-up Req'd | | |
|---|---|---|---|---|---|
| Yes | No | UTM | Yes | No | Who |
| **Man-made Structures:** ☐ None observed | | | | | |
| ☐ | ☐ Barns/Footings/Wells/other(list) | | | | |
| ☐ | ☐ Rock Piles | | | | |
| ☐ | ☐ Garbage | | | | |
| **Natural Vegetation:** ☐ None observed | | | | | |
| ☐ | ☐ Fallen Logs outside woods (#'s) | | | | |
| ☐ | ☐ Brush Piles | | | | |
| ☐ | ☐ Snags (raptor perch) | | | | |
| ☐ | ☐ Tree Cavities (nesting) | | | | |
| ☐ | ☐ Sentinel Trees | | | | |
| ☐ | ☐ Mast Trees (6E) ☐ Berry Shrubs (6E) | | | | |
| **Wildlife Features:** ☐ None observed | | | | | |
| ☐ | ☐ Waterfowl nesting (large #'s, # of species) | | | | |
| ☐ | ☐ Exposed Banks (nesting swallows) | | | | |
| ☐ | ☐ Stick Nests | | | | |
| ☐ | ☐ Animal Burrows (>10cm) | | | | |
| ☐ | ☐ Heronry | | | | |
| ☐ | ☐ Crayfish mounds | | | | |
| ☐ | ☐ Sand/gravel on site | | | | |
| ☐ | ☐ Marsh/open country/shrub | | | | |
| ☐ | ☐ Winter Deer yards | | | | |
| ☐ | ☐ Corridor from pond to woods (ampibian movement) | | | | |
| ☐ | ☐ Bat corridor (shorelines, escarpments) | | | | |
| ☐ | ☐ Bat hibernacula (caves, mines, crevices, etc.) | | | | |
| **Aquatic Features:** | | | | | |
| ☐ | ☐ Perm. pond in woodland ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ | ☐ Perm. pond in open ☐ emergents/submergents/logs ☐ temp. | | | | |
| ☐ | ☐ Water in woodland ☐ pools ☐ flowing ☐ dry | | | | |
| ☐ | ☐ Waterways flowing dry pools | | | | |
| | ☐ natural stream ☐ ☐ ☐ | | | | |
| | ☐ swale ☐ ☐ ☐ ☐ None observed | | | | |
| | ☐ open drain ☐ ☐ ☐ | | | | |
| | Seeps/Springs ☐ ☐ ☐ | | | | |

**Incidental Observations/Notes:**

Graphic ☐ Attached or Name



Checked by Project Manager ☐ Date:

# AMPHIBIAN BREEDING SURVEY INFORMATION FIELD SHEET

Project: Johnston MAES Kamloka — Page 1 of 1

Station Name: _____ Watercourse Name: _____

Darinage Sys.: _____ GPS Coordinates: _____

**Visit 1** Date: April 20/16 — Start: 9:20 — End: 9:50

Weather: hazy

Water °C: — Wind: 2 — Noise: 0 — Today- Rain: 0 — Max °C:

Air °C: 14°C — Cloud%: haze — Yesterday- Rain: 0 — Max °C:

Control Site: Y(N) — Were Frogs Calling: Y/N — Where: — Collector(s): LM

Amphibian Data:

| Field Note Community: | | (1) | | (2) | | (3) | | Adjacent wetland | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ELC Community: | | | | | | | | | | | | | | | | | |
| Species | Season | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # |
| Wood Frog | e. spring | | / | | | | / | | | | | | | | | | |
| Spring Peeper | e. spring | | | 1 | ~4 | | | 3 | — | | | | | | | | |
| Western Chorus Frog | e. spring | | / | | | | / | | | | | | | | | | |
| Boreal Chorus Frog | e. spring | | | | | | | | | | | | | | | | |
| American Toad | spring | | / | | | | / | | | | | | | | | | |
| Northern Leopard Frog | spring | | / | | | | / | | | | | | | | | | |
| Pickerel Frog | spring | | / | | | | / | | | | | | | | | | |
| Gray Treefrog | spring | | / | | | | / | | | | | | | | | | |
| Fowler's Toad | spring | | / | | | | / | | | | | | | | | | |
| Mink Frog | summer | | / | | | | / | | | | | | | | | | |
| Green Frog | summer | | / | | | | / | | | | | | | | | | |
| Bullfrog | summer | | / | | | | / | | | | | | | | | | |

**Visit 2** Date: May 27/16 — Start: 10:45 — End: 11:15

Weather: calm, cloudy

Water °C: — Wind: 0 — Noise: 0 — Today- Rain: 0 — Max °C:

Air °C: 20°C — Cloud%: 80% — Yesterday- Rain: 0 — Max °C:

Control Site: Y(N) — Were Frogs Calling: Y/N — Where: — Collector(s): LM

Amphibian Data:

| | | (1) | | (2) | | (3) | | Adjacent | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species | Season | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # |
| Wood Frog | e. spring | | | | | | | | | | | | | | | | |
| Spring Peeper | e. spring | | | | | | | 2 | ~10 | | | | | | | | |
| Western Chorus Frog | e. spring | | | | | 2 | | 3 | — | | | | | | | | |
| Boreal Chorus Frog | e. spring | | | | | | | | | | | | | | | | |
| American Toad | spring | | | | | | | | | | | | | | | | |
| Northern Leopard Frog | spring | | | | | | | | | | | | | | | | |
| Pickerel Frog | spring | | | | | | | | | | | | | | | | |
| Gray Treefrog | spring | | | | | | | | | | | | | | | | |
| Fowler's Toad | spring | | | | | | | | | | | | | | | | |
| Mink Frog | summer | | | | | | | | | | | | | | | | |
| Green Frog | summer | 1 | 2 | 2 | ~10 | | | | | | | | | | | | |
| Bullfrog | summer | | | | | | | | | | | | | | | | |

**Visit 3** Date: June 24/16 — Start: 9:45 — End: 10:15

Weather: Calm, clear

Water °C: — Wind: 0 — Noise: 0 — Today- Rain: 0 — Max °C:

Air °C: 21°C — Cloud%: 0 — Yesterday- Rain: 0 — Max °C:

Control Site: Y(N) — Were Frogs Calling: Y/N — Where: — Collector(s): LM

Amphibian Data:

| | | (1) | | (2) | | (3) | | Adjacent | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species | Season | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # | CC | # |
| Wood Frog | e. spring | | / | | | | | | | | | | | | | | |
| Spring Peeper | e. spring | | | | | | | | | | | | | | | | |
| Western Chorus Frog | e. spring | | | | | | | | | | | | | | | | |
| Boreal Chorus Frog | e. spring | | / | | | | | | | | | | | | | | |
| American Toad | spring | | | | | | | | | | | | | | | | |
| Northern Leopard Frog | spring | | / | | | | | | | | | | | | | | |
| Pickerel Frog | spring | | | | | | | | | | | | | | | | |
| Gray Treefrog | spring | | | | | 2 | ~10 | 2 | ~10 | | | | | | | | |
| Fowler's Toad | spring | | | | | | | | | | | | | | | | |
| Mink Frog | summer | | | | | | | | | | | | | | | | |
| Green Frog | summer | | / | 2 | ~10 | 2 | ~10 | | | | | | | | | | |
| Bullfrog | summer | | | | | 1 | 1 | | | | | | | | | | |


3
2
Adjacent
1
Glendon Dr
14
Google earth
© 2016 Google

## BREEDING BIRD SURVEY INFORMATION SUMMARY SHEET

Project: Johnston - Maes Komoka Pit
Collector(s): William Huys

| | Date | Start | Finish | Weather |
|---|---|---|---|---|
| **Visit 1** | 15-Jun-16 | 5:30 AM | 10:15 | clear, cool, overcast |
| **Visit 2** | 2-Jul-16 | 7:00 | 10:00 AM | clear warm still |

**Community 1 - CUT1**

| Species Code | Species Name | Evidence Code vis 1 | Evidence Code vis 2 | No. vis 1 | No. vis 2 | S Rank | ESA Status | PIF Status | Notes |
|---|---|---|---|---|---|---|---|---|---|
| WITU | Wild Turkey | - | FY | 0 | 4 | S5 | - | | common species |
| DOWO | Downy Woodpecker | - | T | 0 | 1 | S5 | | | common species |
| NOFL | Northern Flicker | - | FY | 0 | 1 | S4 | | RC | limited habitat |
| EAWP | Eastern Wood-Pewee | - | SM | 0 | 1 | S4 | SC | RC | some potential breeding habitat |
| GCFL | Great Crested Flycatcher | T | - | 1 | 0 | S4 | - | | limited habitat |
| REVI | Red-eyed Vireo | - | SM | 0 | 1 | S5 | | | limited habitat |
| AMCR | American Crow | - | FY | 0 | 4 | S5 | | | common species |
| BCCH | Black-capped Chickadee | P | SM | 4 | 2 | S5 | - | | common species |
| HOWR | House Wren | SM | - | 2 | 0 | S5 | | | common species |
| AMRO | American Robin | FY | FY | 4 | 4 | S5 | | | common species |
| GRCA | Gray Catbird | T | SM | 2 | 1 | S4 | | | common species |
| YWAR | Yellow Warbler | P | - | 2 | 0 | S5 | | | common species |
| AMRE | American Redstart | SM | - | 1 | 0 | S5 | | | common species |
| CHSP | Chipping Sparrow | SM | - | 1 | 0 | S5 | | | common species |
| SOSP | Song Sparrow | P | FY | 3 | 2 | S5 | | | common species |
| NOCA | Northern Cardinal | P | - | 3 | 0 | S5 | | | common species |
| RBGR | Rose-breasted Grosbeak | - | SM | 0 | 1 | S4 | | RS | limited habitat |
| INBU | Indigo Bunting | P | SM | 4 | 2 | S4 | | | common species |
| RWBL | Red-winged Blackbird | FY | - | 8 | 0 | S4 | | | common species |
| BHCO | Brown-headed Cowbird | P | SM | 3 | 2 | S4 | | | common species |
| BAOR | Baltimore Oriole | SM | FY | 2 | 2 | S4 | | RC,RS | common species |
| AMGO | American Goldfinch | P | P | 4 | 4 | S5 | | | common species |

**Community 2 - SWD3-3**

| Species Code | Species Name | Evidence Code vis 1 | Evidence Code vis 2 | No. vis 1 | No. vis 2 | S Rank | ESA Status | PIF Status | Notes |
|---|---|---|---|---|---|---|---|---|---|
| BEKI | Belted Kingfisher | P | - | 2 | 0 | S4 | | RC | nesting in stockpile beside C2 |
| RBWO | Red-bellied Woodpecker | - | SM | 0 | 1 | S4 | - | | good habitat |
| YBSA | Yellow-bellied Sapsucker | - | SM | 0 | 1 | S5 | - | | single bird only, uncommon breeder in this area |
| DOWO | Downy Woodpecker | SM | - | 1 | 0 | S5 | | | common species |
| HAWO | Hairy Woodpecker | T | - | 1 | 0 | S5 | | | common species |
| NOFL | Northern Flicker | SM | - | 1 | 0 | S4 | | RC | good habitat |
| EAWP | Eastern Wood-Pewee | - | SM | 0 | 1 | S4 | SC | RC | good habitat |
| GCFL | Great Crested Flycatcher | SM | T | 1 | 2 | S4 | - | | good habitat |
| REVI | Red-eyed Vireo | SM | SM | 1 | 2 | S5 | | | good habitat |
| BLJA | Blue Jay | - | FY | 0 | 2 | S5 | | | common species |
| AMCR | American Crow | T | - | 3 | 0 | S5 | | | common species |
| BANS | Bank Swallow | NE | - | 80 | 0 | S4 | THR | RS | located in stockpile beside east irrigation pond |
| BCCH | Black-capped Chickadee | P | - | 2 | 0 | S5 | - | | common species |
| HOWR | House Wren | - | SM | 0 | 2 | S5 | | | common species |
| AMRO | American Robin | FY | FY | 4 | 2 | S5 | | | common species |
| GRCA | Gray Catbird | - | SM | 0 | 1 | S4 | | | common species |
| CEDW | Cedar Waxwing | P | - | 3 | 0 | S5 | | | good habitat |
| CHSP | Chipping Sparrow | SM | - | 1 | 0 | S5 | | | common species |
| SOSP | Song Sparrow | T | - | 2 | 0 | S5 | | | common species |
| NOCA | Northern Cardinal | P | P | 2 | 2 | S5 | | | common species |
| RBGR | Rose-breasted Grosbeak | - | P | 0 | 2 | S4 | | RS | good habitat |
| INBU | Indigo Bunting | P | FY | 4 | 3 | S4 | | | common species |
| RWBL | Red-winged Blackbird | P | - | 4 | 0 | S4 | | | common species |
| BHCO | Brown-headed Cowbird | - | P | 0 | 2 | S4 | | | common species |
| BAOR | Baltimore Oriole | SM | - | 2 | 0 | S4 | | RC,RS | common species |
| AMGO | American Goldfinch | - | P | 0 | 3 | S5 | | | common species |

**Community 3 - SWD7**

| Species Code | Species Name | Evidence Code vis 1 | Evidence Code vis 2 | No. vis 1 | No. vis 2 | S Rank | ESA Status | PIF Status | Notes |
|---|---|---|---|---|---|---|---|---|---|
| MODO | Mourning Dove | P | P | 3 | 3 | S5 | | | common species |
| GHOW | Great Horned Owl | SH | - | 1 | 0 | S4 | | | good habitat |
| RBWO | Red-bellied Woodpecker | T | - | 1 | 0 | S4 | - | | good habitat |
| DOWO | Downy Woodpecker | T | SM | 1 | 2 | S5 | | | common species |
| HAWO | Hairy Woodpecker | - | T | 0 | 1 | S5 | | | common species |
| NOFL | Northern Flicker | SM | SM | 1 | 1 | S4 | | RC | good habitat |
| EAWP | Eastern Wood-Pewee | SM | SM | 1 | 1 | S4 | SC | RC | good habitat |
| GCFL | Great Crested Flycatcher | SM | - | 1 | 0 | S4 | - | | good habitat |
| WAVI | Warbling Vireo | SM | - | 1 | 0 | S5 | | | good habitat |
| BLJA | Blue Jay | OB | FY | 1 | 3 | S5 | | | common species |
| BCCH | Black-capped Chickadee | P | SM | 2 | 2 | S5 | - | | common species |
| WBNU | White-breasted Nuthatch | - | SM | 0 | 1 | S5 | - | | common species |
| BGGN | Blue-gray Gnatcatcher | SM | - | 1 | 0 | S4 | | | good habitat |
| WOTH | Wood Thrush | - | SM | 0 | 1 | S4 | SC | CC | good habitat; only one bird seen |
| AMRO | American Robin | FY | FY | 5 | 6 | S5 | | | common species |
| GRCA | Gray Catbird | T | FY | 5 | 4 | S4 | | | common species |
| CEDW | Cedar Waxwing | P | P | 3 | 2 | S5 | | | common species |
| AMRE | American Redstart | P | SM | 2 | 1 | S5 | | | common species |
| COYE | Common Yellowthroat | SM | SM | 1 | 2 | S5 | - | | good habitat |
| CHSP | Chipping Sparrow | SM | - | 1 | 0 | S5 | | | common species |
| SOSP | Song Sparrow | P | FY | 3 | 3 | S5 | | | common species |
| NOCA | Northern Cardinal | P | - | 3 | 0 | S5 | | | common species |
| RBGR | Rose-breasted Grosbeak | SM | SM | 1 | 2 | S4 | | RS | good habitat |
| INBU | Indigo Bunting | P | FY | 4 | 4 | S4 | | | common species |
| COGR | Common Grackle | OB | - | 1 | 0 | S5 | | | common species |
| BHCO | Brown-headed Cowbird | P | P | 2 | 3 | S4 | | | common species |
| BAOR | Baltimore Oriole | P | P | 2 | 2 | S4 | | RC,RS | common species |
| AMGO | American Goldfinch | - | P | 0 | 5 | S5 | | | common species |

**Evidence Codes:**

**Breeding Bird - Possible**
SH=Suitable Habitat SM=Singing Male

**Breeding Bird - Probable**
T=Territory A=Anxiety Behaviour D=Display N=Nest Building P=Pair V=Visiting Nest

**Breeding Bird - Confirmed**
DD=Distraction NE=Eggs AE=Nest Entry NU=Nest Used NY=Nest Young FY=Fledged Young FS=Food/Faecal Sack

**Other Wildlife Evidence**
OB=Observed DP=Distinctive Parts TK=Tracks VO=Vocalization HO=House/Den FE=Feeding Evidence CA=Carcass
Fy=Eggs or Young SC=Scat SI=Other Signs(specify)

## BREEDING BIRD SURVEY INFORMATION SUMMARY SHEET

Project: Johnston - Maes Komoka Pit
Collector(s): William Huys

| | Date | Start | Finish | Weather |
|---|---|---|---|---|
| **Visit 1** | 15-Jun-16 | 5:30 AM | 10:15 | clear, cool, overcast |
| **Visit 2** | 2-Jul-16 | 7:00 | 10:00 AM | clear warm still |

**Community 5 - CU (which includes CUT, CUW and CUP)**

| Species Code | Species Name | Evidence Code | | No. | | S Rank | ESA Status | PIF Status | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | vis 1 | vis 2 | vis 1 | vis 2 | | | | |
| BARS | Barn Swallow | NU | - | 3 | 0 | S4 | THR | | one nest in shed, 3 adults observed in shed |
| INBU | Indigo Bunting | P | P | 2 | 2 | S4 | | | common species |
| AMCR | American Crow | T | FY | 2 | 0 | S5 | | | common species |
| RWBL | Red-winged Blackbird | P | - | 4 | 0 | S4 | | | common species |
| BCCH | Black-capped Chickadee | P | - | 3 | 0 | S5 | - | | common species |
| SOSP | Song Sparrow | T | - | 1 | 0 | S5 | | | common species |
| BAOR | Baltimore Oriole | P | - | 2 | 0 | S4 | | RC,RS | common species |
| AMRO | American Robin | FY | FY | 3 | 3 | S5 | | | common species |
| HOWR | House Wren | SM | - | 2 | 0 | S5 | | | common species |
| NOCA | Northern Cardinal | P | SH | 2 | 1 | S5 | | | common species |
| AMGO | American Goldfinch | - | P | 0 | 3 | S5 | | | common species |
| BLJA | Blue Jay | - | SM | 0 | 1 | S5 | | | common species |
| BHCO | Brown-headed Cowbird | - | P | 0 | 3 | S4 | | | common species |
| GRCA | Gray Catbird | - | T | 0 | 1 | S4 | | | common species |

**Evidence Codes:**

**Breeding Bird - Possible**

SH=Suitable Habitat SM=Singing Male

**Breeding Bird - Probable**

T=Territory A=Anxiety Behaviour D=Display N=Nest Building P=Pair V=Visiting Nest

**Breeding Bird - Confirmed**

DD=Distraction NE=Eggs AE=Nest Entry NU=Nest Used NY=Nest Young FY=Fledged Young FS=Food/Faecal Sack

**Other Wildlife Evidence**

OB=Observed DP=Distinctive Parts TK=Tracks VO=Vocalization HO=House/Den FE=Feeding Evidence CA=Carcass

Fy=Eggs or Young SC=Scat SI=Other Signs(specify)

| ELC | SITE: Johnston - Komoka Pit | |
|---|---|---|
| | POLYGON: All communities | |
| | DATE: May 26, June 15, July 2, Aug 22, Oct. 7, 2016 | |
| WILDLIFE | SURVEYOR(S): Will Huys | |
| | START TIME: | END TIME: |

| TEMP (°C): | CLOUD (10TH): | WIND: | PRECIPITATION: |
|---|---|---|---|
| CONDITIONS: | | | |

POTENTIAL WILDLIFE HABITAT:

| | | | |
|---|---|---|---|
| | VERNAL POOLS | X | SNAGS |
| | HIBERNACULA | X | FALLEN LOGS |
| | _____ | | _____ |

SPECIES LIST:

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| O | Yellow Sulphur | OB | | |
| O | Black Swallowtail | OB | | |
| O | Common Wood Nymph | OB | | |
| O | Mourning Cloak | OB | | |
| O | Cabbage White | OB | | |
| O | Northern Crescent | OB | | |
| O | Meadow Fritillary | | | |
| | | | | |
| M | Raccoon | OB | | |
| M | Coyote | TK/HO | | |
| M | Eastern Chipmunk | OB | | |
| M | Virginia Whitetail | OB | | |
| M | Gray Squirrel | OB | | |
| M | Skunk | TK/HO | | |
| | | | | |
| | | | | |
| | | | | |

| TY | SP. CODE | EV | NOTES | # |
|---|---|---|---|---|
| L | Ebony Jewelwing | OB | | |
| L | 12 Spot Skimmer | OB | | |
| L | Ruby Meadowhawk | OB | | |
| L | Bluet sp. | OB | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| H | Eastern Garter Snake | OB | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |

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
- A = ANXIETY BEHAVIOUR
- D = DISPLAY
- N = NEST BUILDING
- P = PAIR
- V = VISITING NEST

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

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

# Appendix H
Significant Woodland Evaluation

**Significant Woodland Evaluation Criteria and Standards for Johnston - Maes Pit**

| Criteria Comments | Significance Standard | SWD3-3, SWD7 and FOD/SWD north of rail line | | CUW patch | |
|---|---|---|---|---|---|
| | | Woodland Description | Standard Met | Woodland Description | Standard Met |
| **1. Woodland Size** | | | | | |
| need to consider the woodland cover to determine what size of woodland should be considered significant | where woodlands cover is 5-15% of the land cover, woodlands 4 ha or greater should be considered for significance. | • Middlesex County has 12.3% Forest Cover<br>• SWD3-3, SWD7 and the FOD.SWD north of the rail line are contiguous and >4ha | Yes. | • Middlesex County has 12.3% Forest Cover<br>• CUW patch is 0.2ha surrounded by cultural thicket and separated from SWD3-3 by farm lane | No. |
| **2. Ecological Functions** (applies if size threshold is met) | | | | | |
| **a. Woodland Interior** | | | | | |
| presence of interior habitat | any interior habitat where woodland cover is less than 15% land cover | • SWD3-3, SWD7 and the FOD.SWD north of the rail line are contiguous<br>• interior habitat is present outside the 120m adjacent lands north of the rail line | Yes. | • size threshold not met<br>• no interior habitat present, only provides edge habitat | No. |
| **b. Proximity to other woodlands/habitat** | | | | | |
| close distance between woodlands/habitat | woodlands that are close (less than 120m) to other significant natural heritage feature or fish habitat receiving benefit from woodlands more valuable then those that are not | • forested areas are associated with the Komoka/Strathroy Creek PSW | Yes. | • size threshold not met<br>• in proximity to SWD3-3 however separated by farm lane and cultural thicket | No. |
| **c. Linkages** | | | | | |
| woodland provides an important connection for movement between habitats | provides a connecting link between two other significant features that meet minimum thresholds | • forested area is part of a defined natural heritage system | Yes. | • size threshold not met<br>• CUW does not connect or link SWD3-3 to other woodlands | No. |
| **d. Water Protection** | | | | | |
| source water protection and maintenance of hydrological processes are important | woodland is within 50 m of groundwater discharge/recharge, watercourse, or fish habitat | • apart of a Komoka/South Strathroy Creek PSW | Yes. | • size threshold not met<br>• adjacent to Komoka/South Strathroy Creek PSW | No. |
| **e. Woodland Diversity** | | | | | |
| some reduced woodland species need special consideration, and native diversity is more valuable | woodland with naturally occurring composition that has declined or a high native diversity | • community is common and secure in Ontario | No.. | • size threshold not met<br>• not diverse, common species, cultural woodland, only provides edge habitat | No. |
| **3. Uncommon Characteristics** (applies if size threshold is met) | | | | | |
| uncommon and older woodlands should be considered for protection | a unique species composition, provincial ranked community (S1-S3), habitat of a rare, uncommon or restricted woodland plants, characteristic old woodland, woodland with large tree size | • Special Concern Species present (Wood Thrush and EasternWood Pewee)<br>• potential SAR bat habitat | Yes. | • size threshold not met<br>• no significant species present | No. |
| **4. Economic and Social Function** (applies if size threshold is met) | | | | | |
| Economic and/or important value, serve special service | high productivity of valuable products, important for appreciation and high value in services - air quality, recreation compatible with long-term retention | • There are recreation uses possible as identified by the OP. | Yes. | • size threshold not met | No. |
| | **Overall Evaluation** | **Significant** | | **Not Significant** | |

# Appendix I

Reptile and Amphibian Exclusion Fencing Best Practices Technical Note Excerpts

**Table 1. Recommended burial depth and height requirements of exclusion fencing for reptiles and amphibians. Recommended height is the height of the fence after it has been installed including the buried components and any installed overhangs or extended lips.**

| SPECIES | RECOMMENDED DEPTH OF FENCE BURIED (cm) * | RECOMMENDED HEIGHT OF FENCE (cm) ** |
|---|---|---|
| Turtles – general | 10 – 20 | 60 |
| Eastern Musk Turtle, Wood Turtle | 10 – 20 | 50 |
| Massasauga, Eastern Hog-nosed Snake, Butler's Gartersnake, Queensnake | 10 – 20 | 60 |
| Gray Ratsnake & Eastern Foxsnake | 10 – 20 | 200 |
| Fowler's Toad | 10 – 20 | 50 |
| Snakes - general | 10 – 20 | 100 |
| Common Five-lined Skink | 10 – 20 | unknown |
| Salamanders | 10 – 20 | 30 |

*** does not include the 10 cm horizontal lip that should extend outward an additional 10 – 20 cm (see Figure 2)**
**** the height of fencing has been provided as an approximate. Fencing materials may in fact not be available in proportions that would allow for these precise measurements. It is most effective, if the height and burial depth recommendations are met.**

## DURATION OF ACTIVITIES & DEGREE OF ANTICIPATED DISTURBANCE

The type of disturbance, the proximity to disturbance, and the planned fence longevity are factors that influence which type of exclusion fence is most effective. For short-term activities (i.e. 1 to 6 months) such as minor road repairs, a light-duty geotextile fence is appropriate. Longer term or permanent fencing projects, however, require more durable materials such as – heavy-duty geotextile, wood, concrete, woven-wire, sheet metal, vinyl panels, or galvanized mesh.

## GEOTEXTILE FENCES

Geotextile fences (e.g. silt fences) come in many types and qualities. They can be very effective for the temporary exclusion of reptiles and amphibians. For the purposes of this document, temporary use ranges from a few months up to 2-3 years. Winter weather is generally damaging to geotextile materials and the cost of maintenance over the long-term should be considered during the planning phase. Depending upon the quality, geotextile can be resistant to UV degradation and the bio-chemical soil environment.

### Light-duty Geotextile Fencing:

Light-duty geotextile fencing is made of nylon material and is typically purchased with wooden stakes pre-attached at 2 m to 3 m intervals (Plate 1). It can also come without pre-attached stakes. Light-duty geotextiles are largely intended for projects with shorter durations of only a few months in duration and up to one season.

**Geotextile fencing with nylon mesh lining should be avoided due to the risk of entanglement by snakes.**

there are no gaps where animals can squeeze through.

**Plate 7. A wood turtle travelling through a dry eco-passage. Ecopassages such as this help to ensure the long-term connectivity of seasonal habitat for this and other reptile and amphibian species (photo credit: Amy Mui).**

## GENERAL BEST PRACTICES:

- To deter digging, bury the fence 10 cm down with an additional 10 cm horizontal lip (Figure 2).
- Backfill and compact soil along the entire length on both sides of the fence (Figure 2).
- Once the fence is installed, a survey should be done to ensure that no individuals have been trapped inside (speak with MNR for survey advice).
- Exclusion fencing intended to exclude snakes should have the stakes installed on the activity side (opposite the normal requirement for sediment control fencing) to prevent snakes from using the stakes to maneuver over the fencing.
- For snakes and toads, the fence should have an overhanging lip on the species side (Figure 2).
- Fences should be inspected after spring thaw and at regular intervals throughout the active season, especially following heavy rain events. This is particularly important for geotextile fences. Any damage that affects the integrity of the fence (e.g. tears, loose edges, collapses, etc.) should be fixed promptly.
- Tall or woody vegetation on the species side of the fence should be managed if there is a risk that it may enable the animals to climb over. This is most important during spring and fall. Proceed cautiously to not harm animals protected plant species during vegetation removal.
- When installing an eco-passage, fencing or exclusion walls should be used as a guiding system to direct animals to passage openings.
- Natural screens such as trees or shrubs can help to reduce road access and can be combined with fencing to provide protection of individuals from predation.
- Install fences with a turn-around at the ends furthest from the wetland habitat and at any access areas to assist in redirecting animals away from any fence openings (Figure 1).
- Curving the ends of the fencing inward (i.e. away from the road or construction site) may help to reduce access to these locations. The ends may also be tied off to natural features on the landscape such as trees or rock cuts.

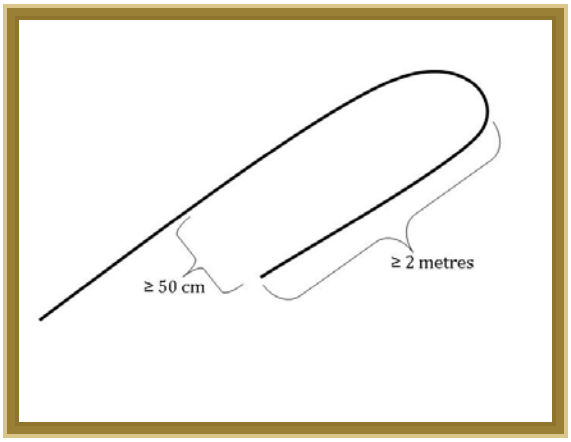


**Figure 1. Diagram of the ends of the fence designed to curve inward in order to direct animals away from the area of exclusion.**

**WATER MOVEMENT & DRAINAGE**

- In areas where surface water run-off may erode a soil-based backfill, consider using rocks or sand bags. Ensure these materials cannot be used by animals to climb over the fence.
- Where possible, minimize the number of water crossings: when necessary, it should occur where flow is minimal.
- Fence posts in waterways or areas prone to seasonal flooding should be driven rather than dug – unless following established best practices.
- Fencing should be placed above the high water mark anticipated for high water events such as spring freshet or periods of heavy or continuous rainfall.

**TOPOGRAPHY:**

- Fence posts should be closer together in undulating topography.
- Fences installed on slopes have a different effective height depending upon whether the animal will be approaching from the up or down slope. The fence height can be adjusted accordingly.

**Improvements or questions regarding exclusion fencing can be brought to the local MNR Species at Risk Biologist or other MNR staff.**

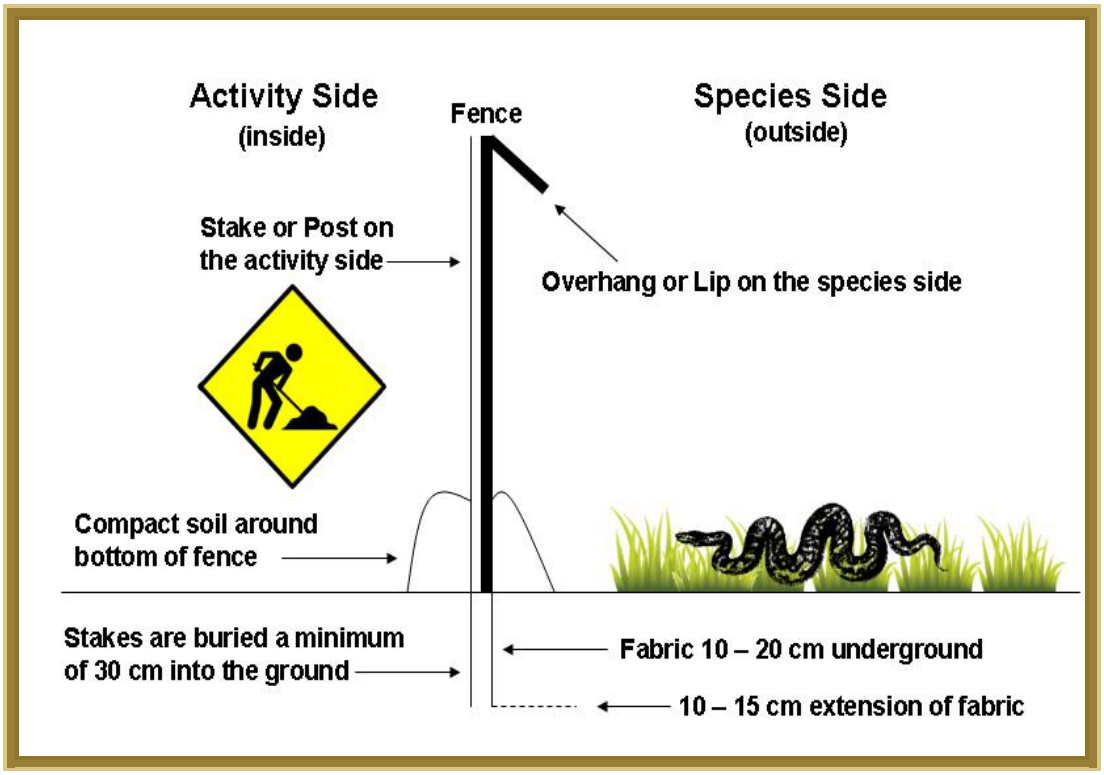


**Figure 1. A side view of a basic exclusion fence including an overhang or flexible lip to deter animals from climbing or jumping over the fence. Placement of the stake on the Activity Side or on the inside of excluded area is also illustrated. This is particularly important for snake species which may use the stakes to maneuver over the fence.**

# Appendix J
Curriculum Vitae

BioLogic Incorporated
AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

**DAVE HAYMAN, M.Sc.**
Senior Biologist/President

## Education

**2002**
Masters of Aquatic Biology , University of Waterloo
Waterloo, ON

**1981**
Honours Bachelor of Science, Marine Biology
University of Guelph
Guelph, ON

## Career History

**1995 - present**
Senior Biologist/President
BioLogic Incorporated,
London, ON

**1986 - 1995**
Water Quality Program Coordinator
Upper Thames River Conservation Authority,
London, ON

**1983 - 1986**
Water Quality Evaluator/Biologist
Upper Thames River Conservation Authority,
London, ON

**1982 - 1983**
Water Quality Evaluator/Biologist
Ministry of Environment, Science and Technology Branch, Toronto, ON

**1978 - 1981**
Bio-Technician
Ministry of Environment, West Central Region,
Hamilton, ON

## Certificates/Training

Certified Inspector of Sediment and Erosion Control - IECA
Certified Wetland Evaluator
MTO/DFO/MNR Certified Fisheries Specialist
ROM Freshwater Fish ID
Freshwater Mussel ID
Class 1 Electrofishing
Fluvial Geomorphology - Newbury

## Areas of Professional Experience

Mr. Hayman is an Senior Biologist and President of BioLogic Incorporated. He has over 15 years experience conducting environmental assessments that characterize the environmental condition of properties utilized for various residential, commercial and industrial purposes. His expertise integrates land use change with terrestrial, wetland and aquatic environments based on thorough and effective monitoring, assessment, restoration and design for public and private sector proponents. He has coordinated approvals in compliance with provincial and federal natural heritage policies/acts, in particular the Ontario Planning Act, Federal Fisheries Act, Ontario Aggregate Resources Act, Ontario Water Resources Act and Environmental Assessment Act, to implement projects across southwestern Ontario.

## Recent Project Experience

**Aggregate Act Level 1 & 2 Natural Environment Reports**

- West Elgin Pit, Johnston Brothers (Bothwell) Limited, 2011
- Erwin Pit, Johnston Brothers (Bothwell) Limited, 2011
- Municipality of West Elgin Gravel Pit, Municipality of West Elgin, 2011
- Blanshard Pit, 1537763 Ontario Inc. (Cofo Aggregate), on-going
- Cope Pit, Cope Construction and Contracting Co. Inc., on-going

**Environmental Impact Studies and Natural Heritage Studies**

- Drewlo Centre Street Subdivision (White Property), London ON, 2011
- Beaver Creek Solar Farm, St.Thomas ON, 2011
- Flowerburn Solar Farm, St. Thomas ON, 2011
- St. Clair Collage EIS and SAR Assessment, Windsor ON, 2010
- Water Street Student Residence, Peterborough ON, 2011
- Seaside Waterfront Natural Heritage Study , Port Glasgow ON, 2011
- Nipigon Feasibility Study, Township of Nipigon ON, 2010
- Maitland Falls Resort (Crich Lands), Goderich ON, 2010
- Southwinds Drive (Bilyea Property), London ON, 2010
- Applewood Estates (Comfort Property), London ON, 2010
- Applewood Estates (Sergautis Property), London ON, 2009

**Fisheries and Aquatic Habitat Assessment, Monitoring**

- Peterbourogh Gun Club Water Quality Monitoring, Peterbourogh ON, on-going
- Headwater Assessment, Bolton ON, on-going
- Detroit River Shoreline Improvements Species at Risk Monitoring, Windsor ON, on-going
- Lake Margaret Water Quality and Streamflow Assessment, St.Thomas ON, 2008 - present
- Pelee Island West Shore Fisheries Investigations, Essex Region CA, 2010

**LAURA MCLENNAN**
Biologist

## Education

**2002**
Environmental Assessment
Lakehead University
Thunder Bay, ON

**1995**
Honours Bachelor of Science, Biology
Lakehead University
Thunder Bay, ON

## Career History

**2006 - present**
Biologist
BioLogic Incorporated,
London, ON
**2001 - 2002**
Research Coordinator
Parks Canada,
Thunder Bay, ON
**1999 - 2001**
Project Coordinator
Ministry of Tourism, Culture & Recreation/Northern Tourism Marketing Corp.
Thunder Bay, ON
**1996 - 2000**
Managing Director/Owner
Blue Loon Adventures,
Thunder Bay, ON
**1994 - 1995**
Laboratory Assistant
Environmental Technician (Abatement)
Ministry of Environment & Climate Change,
Thunder Bay, ON
**1992, 1993, 1994**
Field Technician
Contract,
Ministry of Natural Resources & Forestry
Thunder Bay, ON

## Certificates/Training

Municipal Class Environmental Assessment training
(through the Municipal Engineers Association)

Class 1 Electrofishing

Project Management
(through PMI)

## Areas of Professional Experience

Ms . McLennan is a Biologist with BioLogic Incorporated. She is part of a team that reviews historical data and/or collects study specific floral, faunal and aquatic inventories to analyze natural environmental conditions. She manages data compilation and analysis to provide environmental planning, monitoring, assessment, restoration, design and approval services for private and public sector proponents. Approvals are coordinated in compliance with provincial and federal natural heritage policies/acts including Ontario Planning Act, Endangered Species Act, Aggregate Resources Act, Ontario Water Resources Act and Environmental Assessment Act. Ms. McLennan also has valued experience coordinating management plans and establishing collaborative strategies through partnership development and public consultation.

## Recent Project Experience

**Environmental Assessment**

- Seaside Waterfronts Inc., Municipal Class EA - Stormwater and Waste Water Servicing - Phase 2 and Phase 3, Port Glasgow, current
- Spiet Associates, Municipal Class EA - Realignment of Edison Drive/Old Mill Line Line, Municipality of Bayham, 2016
- Stantec, Municipal Class EA - Dingman Stormwater Management, London, 2015
- IBI Group, Municipal Class EA - Hyde Park Road Widening, London, 2011
- Spiet Associates, Municipal Class EA - Dexter Line (County Road 24) Realignment, 2008

**Environmental Impact Studies and Natural Heritage Studies**

- Drewlo Holdings, Edge Valley East Subdivision, London, 2016
- Southside Group, South Winds Drive, London, 2016
- Sifton Properties, Harrisview Subdivision, Ingersoll, 2015
- Old Oak Properties, Richmond Street, London, 2015
- Lighthouse Developments, Port Glasgow, 2014
- York Developments, Foxwood Crossing, London, 2014
- Sifton Properties, Timberwalk Subdivision, Ilderton, 2014
- EXP, University of Western, London, 2013
- Sheridan College Master Plan, Oakville, 2013
- Johnstone Homes, Exeter Road, London, 2012
- Lupine Developments, Glendon Dr & Adelaide Rd Mount Brydges, 2012
- Auburn Developments, Colonel Talbot Subdivision, London, 2012
- Seaside Waterfronts, Natural Heritage Study, Port Glasgow, 2011
- Nipigon Feasibility Study, Economic Benefits of Watershed Enhancements, Township of Nipigon, 2010

**Renewable Energy**

Environmental Activity Sector Registration (O.Reg 350/12)

- Ullswater Muskoka Solar Facility, Municipality of Muskoka Lakes
- Port Carling Solar Facility, Municipality of Muskoka Lakes

Renewable Energy Approval (O.Reg 359/09)

- Beaver Creak and Flowerburn Solar Facility, Municipality of Central Elgin
- Kent Breeze Wind Farm, Municipality of Chatham-Kent
- MacLeod Windmill Project, Municipality of Chatham-Kent
- Dover Windfarm, Municipality of Chatham-Kent
- Raleigh Windfarm, Municipality of Chatham-Kent

**Research Projects and Monitoring**

- Amphibian and turtle monitoring
- Forest management practice and reproductive success in songbirds and mammals in areas of boreal cut over, MNRF
- Habitat assessments and nesting behaviours in waterfowl, MNRF
- Lake Superior shoreline monitoring, Park Establishment - Parks Canada

BioLogic Incorporated
AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

**WILL HUYS**
Plant and Wildlife Technician
ISA Certified Arborist #ON-1183A

## Education

**2012**
Basic Surveying
Fanshawe College
London, ON

**2007**
Certfied Arborist
Interenational Society of Aboriculture

**2000**
Landscape Design
Fanshawe College
London ON

## Career History

**2011 to present**
Arborist/Terrestrial Ecologist
BioLogic Incorporated
London, ON

**2005 - 2011**
Landscape Designer /AutoCad Technician
BioLogic Incorporated,
London, ON

**2001 - 2005**
Landscape Designer /AutoCad Technician
Whitney Engineering
London, ON

**1999 - 2000**
Landscape Designer
Ron Koudys Landscape Architect
London, ON

## Certificates/Training

ISA TRAQ
Ontario Wetland Evaluation
Butternut Health Assessor
Electrofishing Class 1
Ecological Land Classification
Standard First Aid & CPR

## Affiliations

Field Botanists of Ontario
Ontario Field Ornithologists

## Areas of Professional Experience

Will Huys main responsibilities include the life science studies to support Environmental Impact Studies and Environmental Assessments. This involves completion of three season plant inventories, vegetation classification using Ecological Land Classifications (ELC) according to ELC for southern Ontario and wetland evaluations according to Ontario Wetland Evaluation System (OWES). He also performs field evaluation of trees to prepare tree risk assessment surveys, tree preservation reports, and tree identification /health assessments. Will also is responsible for design, tendering, site supervision and post-construction inspection of habitat creation, enhancement or creation. Will has also developed an expertise in bird identification by site and song to provide a breeding bird inventory surveys. Other duties include the design and production of report graphics, maps and digital drawings.

## Recent Project Experience

**Aggregate Act Level 1 & 2 Natural Environment Field Work**

- Erwin Pit #2, Johnston Bros. Ltd., Putnam, 2016
- Millian Pit, McCann Redi-Mix Inc., Auburn, 2015
- Hamilton Road Pit, AAROC Aggregates Ltd., Putnam, 2014
- Clendinging Pit, Thames Valley Aggregates Inc., Banner, 2014
- Erwin Pit, Johnston Bros. Ltd., Putnam, 2012
- Tote Road Pit, Johnston Brothers, London, 2012
- JCL Staff 2 Pit, Jennison Construction Ltd., Staffa, 2012
- Blanshard Pit, Cofo Aggregate, St.Marys, 2012

**Natural Heritage Studies Field Work**

- DairyLane, Egremont Drive Lobo, 2014
- York Developments, Foxwood Crossing, London, 2014
- Sifton Properties, Timberwalk Subdivision, Ilderton, 2014
- Johnstone Homes, Exeter Road London, 2012
- Kaizen Homes, Elviage Drive London, 2013
- EXP - University of Western Ontario, London, 2013
- Sheridan College Master Plan, Oakville, 2013
- Spriet County Road 24/Dexter Line Class EA, Elgin County, 2012
- Auburn Developments - Colonel Talbot Subdivision, London, 2012

**Renewable Energy**

- Beaver Creek Solar Farm, St. Thomas, 2011
- Flowerburn Solar Farm, St. Thomas, 2011
- Petewawa Renewable Energy, various sites 2013
- Kent Breeze Suncor - Post Construction Monitoring, 2011- 2014