

**Environmental Impact Statement  
1420 Earl Armstrong Drive**

**Final Report  
August 13, 2014**

**Submitted To:**

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## **1.0 INTRODUCTION**

This report is an Environmental Impact Statement (EIS) written by Kilgour & Associates Ltd. (KAL) on behalf of Morguard Investments Limited in support of their proposed commercial development at 1420 Earl Armstrong Dr., near Limebank Rd. The trigger for this EIS is the presence of potential habitat for species-at-risk (SAR) including Bobolink, Eastern Meadowlark and Butternut, on and adjacent to the site.

This report documents natural environment information across the subject property and adjacent areas based on existing land cover data and site surveys for birds and general vegetation cover. It provides an assessment of the habitat potential for species at risk (SAR) based on site observations, previous SAR occurrence records (Element Occurrences) and habitat requirements for SARs known to occur in the region.

As per City of Ottawa EIS report guidelines, this report will also include a Tree Conservation Report. Details on tree species and locations are based on site surveys by the landscape architect for the project, as part of their development of the site landscape plan.

## **2.0 PROPERTY INFORMATION**

The land to be developed (Gloucester Concession 2 RF PT LOT;21 RP 4R25540 Parts 4 to 6; PIN: 043290236) is a 6.53 ha parcel owned by Morguard Investments Limited in the Osgoode Ward. The property is currently zoned for general mixed use (GM28) within the City of Ottawa Zoning Bylaw. The area is comprised of both current and regenerating former farm fields in various early successional stages.

## **3.0 SITE AND THE NATURAL ENVIRONMENT**

### **3.1 Initial Desktop Assessment Methodology**

Colour digital aerial photographs from Google Earth and geoOttawa were used initially to identify natural environment features on site. Ontario Base Map (OBM) layers for the area demarcating surface water and potential wetland features were overlaid on the aerial photographs to aid interpretation. This desktop review provided an initial assessment of habitat potential SAR on site.

### **3.2 Surface Water, Groundwater and Fish Habitat**

A small drainage feature flows northward through the western side of the property. Drainage in the area however has recently been altered with changes to surrounding roadways and the downstream connection to Mosquito Creek has been extensively culverted. The RVCA has accepted through the Riverside South Community Design Plan process that this feature will be removed, though a specific permit to remove the feature has not yet been issued. The RVCA has agreed that the application for this permit may be supported by existing studies on the feature undertaken for the CDP and that a headwater drainage feature for this feature will not be required.

The feature and much of the surrounding fields were inundated with meltwater during the peak of the spring freshet on April 8, 2014. By April 16 however, the fields were dry and the feature only retained

water because of the gravel check dam at the roadside culvert. On April 29, during the first site frog survey, only disparate puddles remained in the feature. On all subsequent field visits, the feature was dry.

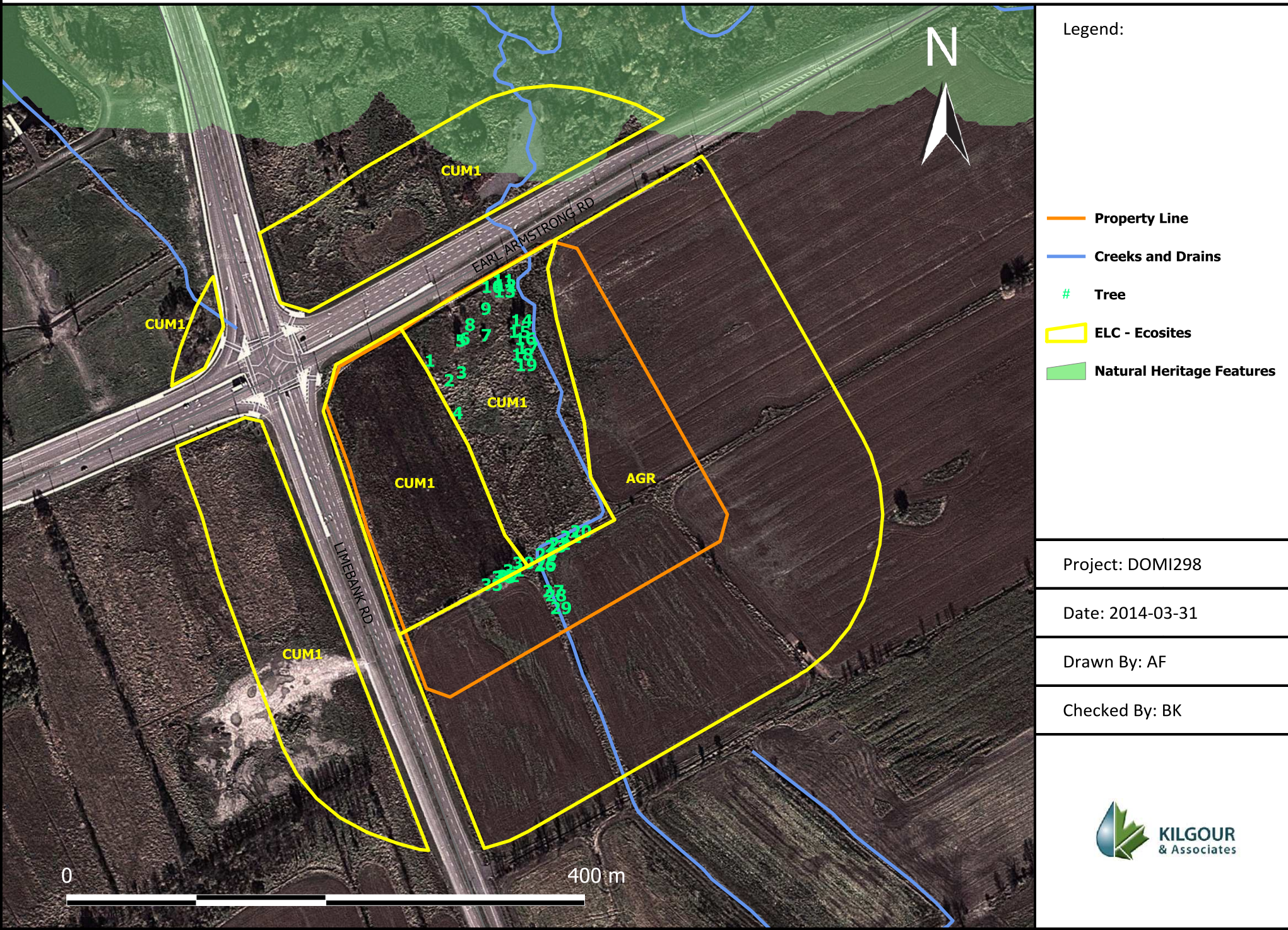
### **3.3 Landform, Soils and Geology**

Site topography is level to very gently sloping. Soils on site are neutral, moderately-fine textured modified marine materials (i.e. silty clay loam), interbedded with thin layers of silty sediments within 2 m of the surface (Marshall et al. 1979). No rocky outcrops are present on or adjacent to the site.

### **3.4 Vegetation and Land Cover**

The site consists of both active (AGR) and former agricultural fields in various stages of early successional regeneration (cultural meadow – CUM-1). Two equally sized former farm fields cover 4.0 ha of the northwest corner of the site. Both fields have been fallow for at least three (i.e. cultural meadow) years though the eastern side appears to have been left fallow for longer. The area is covered with tall forbs and grasses. Scattered trees (primarily Manitoba Maple, American Elm and willow species with dhbs from 12 to 30 cm) are growing at the north end of the eastern field. Historical air photos from the City of Ottawa geoOttawa mapping service suggest the oldest trees date from shortly before 1991, indicating no trees present are greater than 30 years of age. The remainder of the property captures a 50 m wide band of the adjacent farm fields to the east and south. These fields had been harvested last year and so began as bare topsoil this spring. The farm fields to the south had been under active agriculture for many years, but were left fallow this year. By late June, they were covered with tall grasses forbs. Fields to the east were planted with soybeans. Figure 1 shows the general vegetation coverage (ELC ecosites) present on the property.

Figure 1. Current Vegetation



Legend:

- Property Line
- Creeks and Drains
- # Tree
- ELC - Ecosites
- Natural Heritage Features

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Date: 2014-03-31

Drawn By: AF

Checked By: BK



### 3.5 Site Trees

#### 3.5.1 Trees and Hedgerows

The site tree survey was conducted by Lisa MacDonald (Certified Arborist ON-1513A) on January 18, 2014. All trees on site are species common to the area and none are over 50 cm DBH. Individual trees or tree clusters are listed in Table 1.

**Table 1. Trees and small tree clusters on the site.**

#	Species	Common Name	DBH (cm)	Condition	Comments
1	<i>Ulmus americana</i>	White Elm	22.8	Good	The tree is healthy and has good form, growing quite close to a chain link fence.
2	<i>Ulmus americana</i>	White Elm	12.9	Good	The tree is small, though healthy and has good form.
3	<i>Ulmus americana</i>	White Elm	17.4	Good	The tree is small, though healthy and has good form.
4	<i>Acer negundo</i>	Manitoba Maple	MS(2) 12.3 & 11.3	Moderate	The tree has codominant stems at 1m. The union is covered in ice, so the quality is unclear. The tree appears healthy, but is somewhat poorly formed.
5	<i>Acer saccharinum</i>	Silver Maple	MS (20)	Moderate	The tree is an extremely dense clump with at least 20 stems. The stems ranch in size from approximately 3 to 10 dbh, and are in such close proximity as to not be measurable, and to leave the quality of their union at the base unclear. The tree appears quite vigorous.
6	<i>Ulmus rubra</i>	Slippery Ash	43.2	Moderate	The tree has codominant stems at 1.8m above grade. The union is obscured by ice, but the tree overall appears healthy, though only moderately formed.
7	<i>Thuja occidentalis</i> (3)	Eastern White Cedar	2.5 - 3m HT	Good	These three Cedars are in good condition, each densely branched and very healthy. They are growing very close together, heavily intertwined.
8	<i>Fraxinus pensylvanica</i>	Green Ash	35.6	Poor	The tree begins branching approximately 50cm above grade, so the diameter was measured 40cm above grade. The tree has several large dead branches, and is in poor condition.
9	<i>Pinus banksiana</i>	Jack Pine	~20	Moderate	The tree is very irregularly shaped, with no clear leader and a somewhat twisted form. The foliage is somewhat sparse.
10	<i>Malus sp.</i>	Crabapple	35.1	Moderate	The tree is very densely branched, from approximately 50cm above grade, so the diameter was measured at approximately 40cm. The tree is moderately healthy, with several dead branches.
11	<i>Ulmus sp.</i>	Elm	N/A	Dead	The tree is dead.
12	<i>Acer negundo</i>	Manitoba Maple	MS(4) ~30 each	Poor	The tree splits into 4 codominant stems at approximately 60cm above grade. Each stem is leaning severely, and there are many dead branches on each stem. The union of the stems is buried under snow.
13	<i>Acer negundo</i>	Manitoba Maple	MS(3) ~30 each	Poor	The tree divides into 3 stems at approximately 50cm above grade, and one stem has failed, split away from the tree. There are many dead branches on the two remaining stems.
14	<i>Salix sp.</i>	Willow	N/A	Poor/Dead	The tree is failing or perhaps dead. The stems have fallen, lying prostrate. There is a large vertical crack in one of the stems and many dead branches.
15	<i>Salix sp.</i>	Willow	N/A	Dead	The tree is fallen and dead.
16	<i>Salix sp.</i>	Willow	~30	Poor	The tree is failing, leaning severely and likely to fall soon. The tree has several dead branches.
17	<i>Salix sp.</i>	Willow	N/A	Dead	The tree is fallen and dead.
18	<i>Salix sp.</i> (2)	Willow	~30	Poor	The two trees have been crushed by a fallen stem of tree #17. They have several broken/ dead branches and are leaning moderately.
19	<i>Ulmus sp.</i>	Elm	N/A	Dead	The tree is dead.
20	<i>Acer negundo</i>	Manitoba Maple	<10	Good	The tree is young, but well formed, and appears healthy.

21	<i>Ulmus americana</i>	White Elm	MS(4) <5 - ~20	Poor	The tree is poorly formed, with 4 stems growing from the base. One stem is dead, and another very small. The two remaining are branching densely from low on the trunk, and appear to be in moderately good health.
22	<i>Ulmus americana</i>	White Elm	MS(2) ~25 each	Moderate	The tree is poorly formed, with two codominant stems, growing from the base. The stems are growing in contact, the bark included, for the first 1.5m above grade. The health of the tree is moderate.
23	<i>Ulmus americana</i>	White Elm	MS(4) ~15 - 20	Moderate	The tree is poorly formed, with the 4 stems growing extremely close together from the base, with severely included bark. The tree appears healthy.
24	<i>Ulmus americana</i>	White Elm	13.4	Moderate	The tree is leaning slightly, but otherwise well-formed and appears healthy. There is ice formed around the base, indicating poor drainage.
25	<i>Fraxinus pensylvanica</i>	Green Ash	31.5	Moderate	The tree is well-formed and appears to be in good health. There is ice formed around the base, indicating poor drainage.
26	<i>Fraxinus pensylvanica</i>	Green Ash	13.1	Moderate	The tree is well-formed and appears to be in good health. There is ice formed around the base, indicating poor drainage.
27	<i>Fraxinus pensylvanica</i>	Green Ash	MS(4) 15.4 - 21.5	Moderate	The tree is poorly formed, and appears to be in somewhat poor health, the limbs and twigs appear somewhat dry and brittle.
28	<i>Fraxinus pensylvanica</i>	Green Ash	MS(4) 8 - 20.6	Moderate	The tree is poorly formed, with 4 stems and irregular branching. The tree appears otherwise healthy.
29	<i>Fraxinus pensylvanica</i>	Green Ash	16.2	Moderate	The tree is well-formed and appears to be in good health. There is ice formed around the base, indicating poor drainage.
30	<i>Fraxinus pensylvanica</i>	Green Ash	23.2	Moderate	The tree is well-formed and appears to be in good health. There is ice formed around the base, indicating poor drainage.
31	<i>Fraxinus pensylvanica</i>	Green Ash	49.1	Moderate	The tree is large, moderately well formed, and in moderate health. There is some discoloration of the bark, but no other signs of EAB. There is ice formed around the base of the tree, indicating poor drainage.
32	<i>Fraxinus pensylvanica</i>	Green Ash	MS(2) 34.0 - 36.4	Moderate	The tree has codominant stems, dividing from the base, but the union is obscured by ice formed around the base of the tree. The tree has what may be epicormic shoots throughout the trunks.
33	<i>Acer negundo</i>	Manitoba Maple	MS(3) 18.1 - 38.0	Moderate	The tree is poorly formed, but appears healthy.
34	<i>Acer negundo</i>	Manitoba Maple	MS(3) 20 - 25	Moderate	The tree is poorly formed, with dense branching and suckering. The tree appears moderately healthy.
35	<i>Fraxinus pensylvanica</i>	Green Ash	MS(5) 18.5 - 30.6	Moderate	The tree is poorly formed, and the bark appears loose and brittle in places. There are no other symptoms of EAB apparent.

### 3.5.2 Ecological Significance of Trees on the Site

No trees on site are large enough to be considered potential specimen trees (i.e. reasonably good health and > 50 cm DBH or regionally rare). The main ecological functions of the existing site trees are:

- To provide some cover, food (e.g., flowers, insects) and perching areas for field birds and small mammals that use the site.
- To provide shelter, shade, and a windbreak for birds and small mammals that use the site.



### **3.6 Species at Risk**

The MNR maintains lists of species of concern known to occur within each township. The Morguard property is located within the area described by the Gloucester Township SAR list. Table 2 indicates the habitat requirements of SAR (plus several other species that may soon be listed as SAR), potentially present within the area and whether the property may provide significant habitat. Western Chorus Frog, which is listed under the federal *Species at Risk Act* (SARA), is also included on the list. While SARA is not specifically incumbent upon non-federal agencies or projects, the City of Ottawa considers the habitat of SARA listed species to constitute significant wildlife habitat and attaches additional encumbrances upon projects seeking to proceed therein.

**Table 2. Species-at-risk potential**

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat Suitability	Concerns Associated with Habitat on Site
<b>Amphibians</b>				
Western Chorus Frog ( <i>Pseudacris triseriata</i> )	Threatened (Federally)  Not listed provincially	Any fishless pond with at least 10 centimetres of water, including quiet, shallow, usually temporary waterbodies with vegetation that is submerged or protrudes from the water, and especially in rain-flooded meadows and ditches, and in temporary ponds on floodplains.	Limited suitable habitat on site. Potential for presence.	Site to be searched if sufficient water is present during breeding season
<b>Birds</b>				
Bank Swallow ( <i>Riparia riparia</i> )	Threatened	Nest in banks or earthen walls cut by meandering streams and rivers, but artificial banks created by mining may also be used. Foraging occurs over fields, streams, wetlands, farmlands, and still water.	Limited potential for foraging areas, but no nesting habitat.	The species is not currently protected under the <i>ESA</i> . Limited potential for presence. Not a concern.
Barn Swallow ( <i>Hirundo rustica</i> )	Threatened	Terrestrial open & manmade structures for nesting.	Some potential for foraging areas, limited nesting habitat potential.	Limited potential for presence. Site to be searched.
Bobolink ( <i>Dolichonyx oryzivorus</i> )	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be > 10 ha, and preferably > 30 ha before bobolink are attracted to the site. Not near tall trees	Most of the site constitutes suitable habitat.	Site to be searched
Chimney Swift ( <i>Chaetura pelagica</i> )	Threatened	Nests in open chimneys and sometimes in tree hollows (tree > 60 cm dbh).	No likely nesting structures currently in place on the property. No trees appear to be sufficiently large to provide nest cavities (to be confirmed). No suitable habitat.	Negligible potential for presence. Not a concern.
Eastern Meadowlark ( <i>Sturnella magna</i> )	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be > 10 ha, and preferably > 30 ha before bobolink are attracted to the site. Not near tall trees	Most of the site constitutes suitable habitat.	Site to be searched

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat Suitability	Concerns Associated with Habitat on Site
Henslow's Sparrow ( <i>Ammodramus henslowi</i> )	Endangered	Expansive, fallow, tall grass/forb fields with ground mat formation and perches. Moist sites preferred	Suitable habitat is size limited. Unknown from the region for 20+ years. Presence very unlikely.	Very limited potential for presence, but site to be searched.
Least Bittern ( <i>Ixobrychus exilis</i> )	Threatened	Found in large quiet marshes and, usually near cattails.	No suitable habitat	Negligible potential for presence. Not a concern.
Loggerhead Shrike ( <i>Lanius ludovicianus</i> )	Endangered	Short, sparsely vegetated "pasture land" with scattered shrub species (hawthorn)	Limited potential for suitable. Presence very unlikely.	Very limited potential for presence, but site to be searched.
Rusty Blackbird ( <i>Euphagus carolinus</i> )	Not currently listed*	Wintering grounds (Eastern Ontario) are associated with wetlands, flooded forests, scrub along the edges of lakes, rivers and streams and beaver ponds.	Negligible suitable habitat	Negligible potential for presence. Not a concern.
Whip poor will ( <i>Caprimulgus vociferus</i> )	Threatened	Terrestrial mix of open and forested	No suitable habitat	Negligible potential for presence. Not a concern.
<b>Mammals</b>				
Little Brown Bat ( <i>Myotis lucifuga</i> )	Endangered	Widespread, roosting in trees and buildings. Hibernates in caves or abandoned mines.	Few trees are sufficiently large to provide nest cavities and no cavities observed. No hibernation habitat.	Not a concern.
Northern Long-eared Bat ( <i>Myotis septentrionalis</i> )	Endangered	Associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. Hibernates in caves or abandoned mines.	No suitable habitat.	Not a concern.
Eastern Small-footed Bat ( <i>Myotis leibii</i> )	Endangered	Coniferous forest in hilly country. Hibernates in smaller caves subject to air movement.	No suitable habitat.	Not a concern.
Eastern Pipistrelle ( <i>Pipistrellus subflavus</i> )	Not currently listed*	Forage over water courses or open fields with large trees nearby. They never forage in deep woods. Hibernates in caves or abandoned mines.	Few trees are sufficiently large to provide nest cavities and no cavities observed. No hibernation habitat.	Not a concern.
<b>Snakes</b>				
Milksnake ( <i>Lampropeltis triangulum</i> )	Special Concern*	Wide range of habitats, especially old fields and farm buildings where rodents are common.	Suitable foraging habitat on site. No hibernacula (to be confirmed).	The species is not currently protected under the ESA. Transient Presence is possible but unlikely. Individuals would move on and be unaffected.

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat Suitability	Concerns Associated with Habitat on Site
<b>Turtles</b>				
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	Threatened	Quiet lakes, streams, wetlands with abundant emergent vegetation and hummock development and associated upland areas. Hibernates in bogs.	No suitable habitat on site.	Negligible potential for presence. Not a concern.
Eastern Musk Turtle ( <i>Sternotherus odoratus</i> )	Threatened	Wetlands in shallow, well vegetated, clear water and part of, or closely associated with, larger aquatic systems	No suitable habitat on site.	Negligible potential for presence. Not a concern.
Northern Map Turtle ( <i>Graptemys geographica</i> )	Special Concern*	Generally associated with larger lakes and rivers	No suitable habitat on site.	Negligible potential for presence. Not a concern.
Spotted Turtle ( <i>Clemmys guttata</i> )	Endangered	Fens and bogs (Kemptville District)	No suitable habitat on site.	Negligible potential for presence. Not a concern.
<b>Vascular Plants</b>				
American Ginseng ( <i>Panax quinquefolius</i> )	Endangered	Rich, moist, relatively mature deciduous forests.	No suitable habitat on site.	Negligible potential for presence. Not a concern.
Butternut ( <i>Juglans cinerea</i> )	Endangered	Variable but typically on well-drained soils.	The entire the site constitutes suitable habitat.	No large trees are present on though the site will be search for saplings in in the spring.

\* Species status is, or will soon be, under review and thus may change in the near future.

Species initially deemed to have some habitat potential, thus requiring further study.

### 3.6.1 Bird Surveys

Three morning bird surveys were conducted by Rob Hallett on May 23<sup>rd</sup>, June 17<sup>th</sup> and July 9<sup>th</sup>, 2014. Surveys followed the MRN's draft protocol for Bobolink and Eastern Meadowlark, which overlaps with general bird survey protocols thereby providing both detection of other potential at-risk bird species and a listing of other birds. Table 3 provides details of all birds found on site.

**Table 3. Bird species observations**

CODE	FAMILY	Species	Common Name	S-Rank	Notes
AMGO	Fringillidae	<i>Carduelis tristis</i>	American Goldfinch	S5B	
ATSP	Emberizidae	<i>Spizella arborea</i>	American Tree Sparrow	S4B	
BOBO	Icteridae	<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	Four males resting Status: Threatened
COYE	Parulidae	<i>Geothlypis trichas</i>	Common Yellowthroat	S5B	
EAKI	Tyrannidae	<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B	
RWBL	Icteridae	<i>Agelaius phoeniceus</i>	Redwing Blackbird	S4	
SOSP	Emberizidae	<i>Melospiza melodia</i>	Song Sparrow	S5B	
TRES	Hirundinidae	<i>Tachycineta bicolor</i>	Tree Swallow	S4B	
TUVU	Cathartidae	<i>Cathartes aura</i>	Turkey Vulture	S5B	Flyover

Four male Bobolinks were observed on the third survey within the fallow agricultural fields to the south, but flying occasionally over the older cultural meadows to the north. No females were observed despite three hours of observation and no individuals of either sex had been observed in field-visits prior to that date. The males were not calling and spent most of their time resting. The MNR however considers the presence of multiple males within suitable habitat during breeding season to indicate the area as potential habitat.

No other listed bird species occur on site. Individuals and nests of most species present however, are protected under federal Migratory Birds Convention Act.

### 3.6.2 Butternut Surveys

The site tree survey, conducted in January, found no individual Butternuts taller than the ~75cm snow pack. The absence of small Butternut saplings was confirmed in the spring during the site bird surveys.

### 3.7 Wildlife

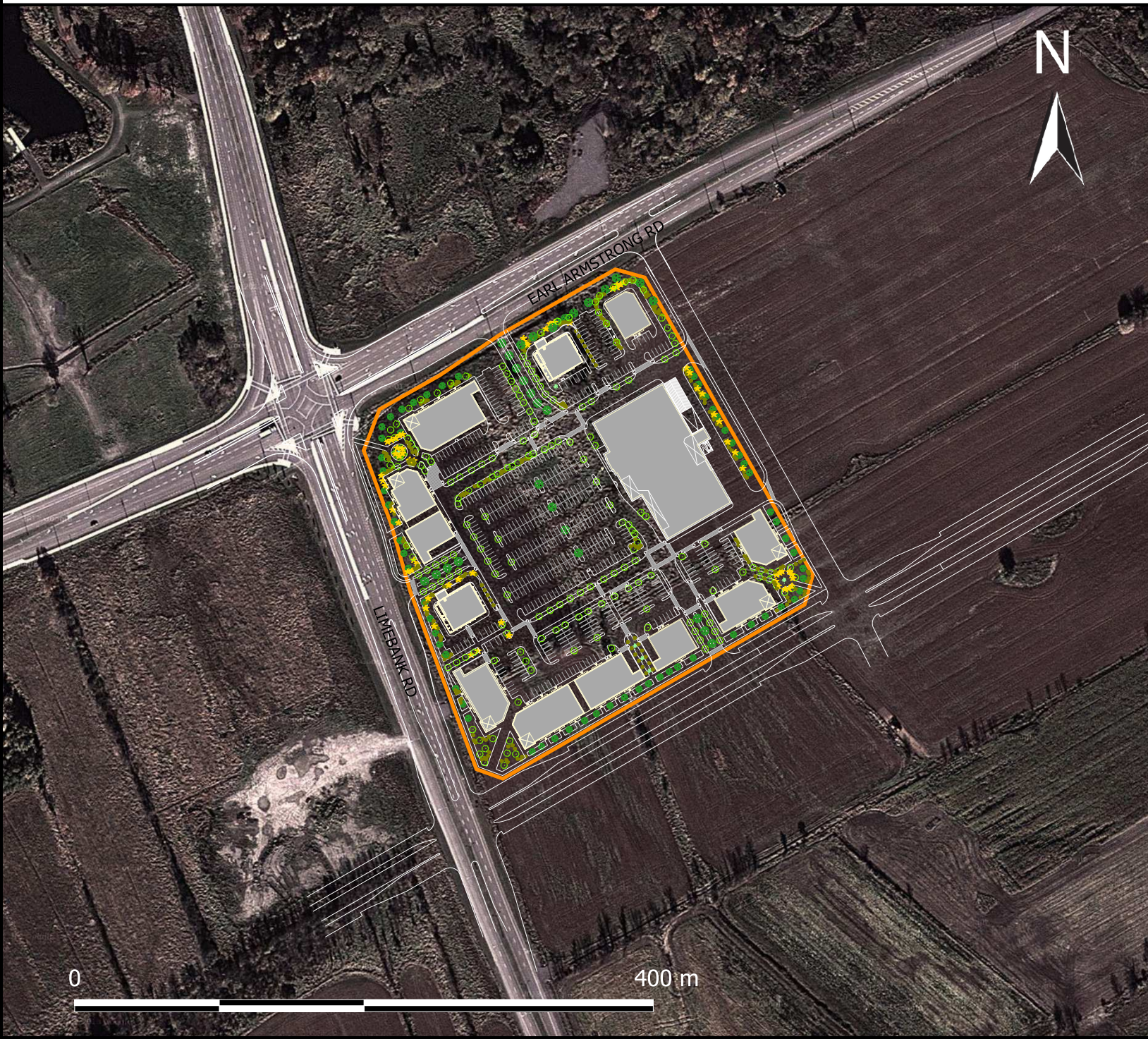
As an area of recently active agriculture with few trees present, the property is unlikely to provide any significant wildlife habitat though deer and small mammals may occasionally traverse the property. The surface water feature provides neither sufficient wet space (in terms of either surface area or seasonal duration), nor well vegetated riparian space, to provide either habitat or significant corridors for fish or frogs. Amphibian surveys following the Marsh Monitoring Protocol were conducted by Anthony Francis on April 29<sup>th</sup> and June 11<sup>th</sup> 2014. No frogs were found on site, though frogs could be heard calling within the Mosquito Creek corridor across Earl Armstrong Rd. A third, late-season frog survey was not conducted after finding the site dry during the second survey.

## **4.0 PROJECT DESCRIPTION**

The commercial development will include 13 buildings designed to house box store style retail units. The commercial units will be located around the perimeter of the site with parking in the middle. Servicing for the site is set to commence in 2015 with store openings beginning in 2015. The proposed development plan for the property is presented in Figure 2.

All existing site trees will be removed to accommodate site grading and construction. Removal of trees will require a tree removal permit from the City of Ottawa. The existing surface water feature will also be removed.

Figure 2. Proposed Development



Legend:

— Property Line

Project: DOMI298

Date: 2014-03-31

Drawn By: AF

Checked By: BK



## **5.0 IMPACT ASSESSMENT**

### **5.1 Impacts to Trees**

Construction and grading will require the removal of all 35 existing site trees. Landscaping around the perimeter of the site will include the planting of at least 100 trees around the perimeter of the site and on traffic islands within the center of the site.

### **5.2 Impacts to Species at Risk**

The site, excluding the eastern-most portion still under active agriculture, constitutes Bobolink habitat following MNR habitat descriptions. Eastern Meadowlark was not found to be using the area. Development of the area therefore constitutes a loss of Bobolink habitat. Replacement of that habitat area however, as per the site registration process following Ontario Regulation 242/08 Section 23.2, will effectively mitigate this loss, thereby preventing impacts to the species. No impacts to other species-at-risk are anticipated.

## **6.0 MITIGATIONS**

### **6.1 Mitigations for Trees**

No trees occur adjacent to the site and no trees on site will be retained. Therefore no specific measures are required to minimize impacts to area trees. However, as per standard due diligence, no clearing of vegetation should occur between April 15 and July 31, without first determining the absence of nesting birds prior to clearing.

While the final landscape plan has not yet been completed, the subject property will be planted with over 100 trees using appropriate native tree species as per City guidelines.

### **6.2 Mitigations for Species at Risk**

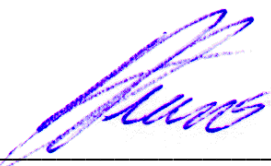
The development site has been registered with the MRN under Ontario Regulation 242/08 – Section 23.2. Morguard has agreed to provide compensation habitat for Bobolink through an agreement with the Rideau Valley Conservation Authority, which will develop new and augmented habitat space on their property at 3766 Regional Rd. 174 near Canaan Rd. The MNR has agreed on August 13, 2014 that Morguard's Bobolink compensation plan will meet the requirements of O. Reg 242/08.

Removal or disturbance of bobolink habitat cannot be carried out between May 1<sup>st</sup> and July 31<sup>st</sup> of any year. Areas under active construction however, no longer constitute bobolink habitat. Morguard must create new habitat for the species within twelve months of the commencement of the construction.



## 7.0 SUMMARY AND RECOMMENDATIONS

The small number of trees on this property provides limited ecological service to the area, the loss of which will be mitigated by the increased number of new tree plantings. Only one species-at-risk, Bobolink, was found to be present and compensation provisions as per O.Reg 242/08 will provide a net benefit for this species. **It is therefore my professional opinion that, if all mitigation measures indicated within this report are followed, no negative impacts are anticipated to listed species-at-risk under the proposed property development.**



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Anthony Francis, PhD  
KILGOUR & ASSOCIATES LTD.

**Appendix 1**  
**References**

Marshall, I.B., Dumanski, J., Huffman, E.C. and Lajoie, P.J. 1979. Soils, capability and land use in the Ottawa urban fringe. Land Resource Research Institute Research Branch, Agriculture Canada.

**Appendix 2**  
**Qualifications of Report Author**

**Anthony Francis, PhD**

Dr. Francis is an ecologist with over 14 years of experience in both terrestrial and aquatic projects. His doctoral thesis work on global plant diversity patterns included conducting tree surveys across North America. As a consulting ecologist he has worked on diverse ecological projects including literature reviews of forestry management and species-at-risk; environmental studies of contaminants (metals and suspended particulates); geomatic and statistical analyses for federal and provincial ministries as well as for private industry; and aquatic and terrestrial species inventories. He has contributed to environmental impact statements and federal environmental screening assessments for creek realignments and other infrastructure projects across Ontario.