Prince and Bonnefield Properties, 4th Line, Melancthon Township

Level 1/2 Natural Environment Assessment and Environmental Impact Study

Prepared for:

Strada Aggregates Inc.
30 Floral Parkway
Concord, Ontario
L4K 4R1

Project No. 1748 | May 2017

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Prince and Bonnefield Properties, 4th Line, Melancthon Township

Level 1/2 Natural Environment Assessment and Environmental Impact Study

Project Team:

Ryan Archer	Terrestrial & Wetland Biologist, Project Manager
Elaine Gosnell	Senior Biologist, Project Advisor
Andrew Dean	Terrestrial & Wetland Biologist
Todd Hagedorn	Terrestrial & Wetland Biologist
Laura Hockley	GIS Analyst

Report submitted on May 12, 2017

Ryan Archer
Project Manager
Terrestrial and Wetland Biologist

TABLE OF CONTENTS

List of Tables

List of Maps

List of Appendices

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained in April 2016 by Strada Aggregates Inc. to complete a combined Level 1/Level 2 Natural Environment Assessment (NEA) and Environmental Impact Study (EIS) for proposed "pit above water" aggregate extraction facilities located on 2 properties fronting 4th Line in Melancthon Township, Dufferin County. Both properties are owned by Strada Aggregates and each contain a residence and farm under tenancy to Strada. For the purposes of this report, each property is referred to by the name of its former landowner; the northernmost property is referred to as the Prince Property, and the southernmost property is referred to as the Bonnefield Property (Map 1). Collectively, these properties are referred to as the "subject properties". The subject properties, and areas within 120m of each property, are collectively referred to as the "study area".

The Prince Property is located immediately north of Strada's operational Melancthon Pit #1(Licence #129167), while the Bonnefield Property is located immediately south of Melancthon Pit #1 and north of Strada's operational Melancthon Pit #2 (Licence #625155). Both subject properties are in active agricultural cultivation, with the Prince property containing a mix of row crop, hayfield and cattle pasture, and the Bonnefield property containing row crop in 2016. Both properties contain rear-property deciduous woodlots. The Prince property woodlot is the more mature of the 2 woodlots. The Prince property also contains an approximately 30-year old pine plantation. With the exception of the aforementioned adjacent Strada aggregate facilities, the subject properties are primarily surrounded by agricultural lands as well as 2 additional aggregate pits under other ownerships. It is NRSI's understanding that agricultural land and woodland on the property immediately east of and contiguous with the Prince Property woodland are licenced for aggregate extraction in the future by the owners of the adjacent St. Mary's Kasaks Pit.

Woodlots on the subject properties are identified as part of Dufferin County's Preliminary Natural Heritage System in Schedule E1 of the County Official Plan (County of Dufferin 2015). Schedule E of the Township Official Plan identifies each woodlot as Significant Woodland, defined primarily as woodlands over 20ha in size (Map 1). The woodlots on

each property are considered Environmental Conservation features as shown in Schedule A of the Township Official Plan (Township of Melancthon 2014). The MNRF has identified the presence of unevaluated wetland on both properties within the woodlots, as shown in online Land Information Ontario mapping (MNRF 2015a) and as shown on Map 1. Wetland features and their adjacent lands are regulated by the Nottawasaga Valley Conservation Authority (NVCA).

The proponent is proposing to licence portions of each property for mineral aggregate extraction use under the terms of a provincial license that covers both properties. Each aggregate facility would comprise a pit with a maximum extraction depth of 1.5m above the water table and would operate under the terms of an Operational Plan. Aggregate facilities on each property would be integrated with existing Strada operations at Melancthon Pits #1 and #2, such as through use of the existing scalehouse to service both properties and haulage routes that would connect each property to one another. Extraction limits will be maintained outside of the existing deciduous woodlots on each property. See Appendix X for the site plan and sequence of operations proposed for each property.

Level 1 and 2 NEA reporting is required for each of these properties as part of an application to the Ontario Ministry of Natural Resources and Forestry (MNRF) under the provincial *Aggregate Resources Act*. In order to address the requirements of the *Planning Act* and the NVCA's Ontario Regulation 172/06, these reports will also be completed to satisfy the County, Township and NVCA requirements for an EIS. The results of these Level 1 and 2 studies have been integrated into a single report for both of these properties collectively as they will be submitted as a single license application. The requirement for a Level 2 study for each property is based on the known presence of significant woodland and potential wetland on each of these properties. An EIS is required to ensure that the proposed aggregate facilities will not negatively impact the adjacent natural features or ecological functions on and adjacent to each property.

Technical studies, relevant to other aspects of the NEA/EIS such as planning and hydrological/hydrogeological assessment, have been prepared by the study team and

have been used to supplement the natural feature characterization and inform the impact assessment. Other members of the study team comprise the following:

- Strada Aggregates (proponent)
- MHBC Planning
- Whitewater Hydrogeology Ltd.
- Aercoustics
- Archaeological Services Inc.

This report summarizes background information on natural heritage features, as well as results of field surveys completed within the subject properties. This information was used to define natural features as development constraints based on significance and sensitivity of the features, to inform planning of proposed aggregate extraction limits on each property. An impact assessment has been completed based on the comparison of the existing natural features to the site plan details. Recommendations have been provided to avoid, or otherwise minimize or mitigate impacts to the adjacent natural features.

1.1 Project Scoping

1.1.1 Background Information Review

In order to determine a study approach for the NEA/EIS, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are known or have potential to occur within the study area. Existing background information was requested from the MNRF Midhurst District and the NVCA. Written responses to these information requests were not received by NRSI. However, members of the study team met with staff of the MNRF on June 14, 2016, and with staff of the NVCA on September 15, 2016 to discuss the planned aggregate license application and the associated natural environment studies as stated below.

Background information on the natural environment features within the study area vicinity was also gathered from the MNRF Natural Heritage Information Centre significant species database (MNRF 2015a), the MNRF's Land Information Ontario, and relevant taxa-specific databases, as listed below. NRSI's Level 1 and 2 NEA Reports for

the then-proposed Melancthon Pit #2 (NRSI 2008, 2010), as prepared for Strada Aggregates, were also referenced as a source of existing natural heritage information for adjacent lands.

Initial wildlife species lists were compiled to provide information on species reported from the vicinity of the study area (10km radius) using various atlases including the Ontario Mammal Atlas (Dobbyn 1994), the Ontario Reptile and Amphibian Atlas (Ontario Nature 2015), the Ontario Butterfly Atlas (McNaughton et al. 2016), and the Ontario Odonata Atlas (MNRF 2016a). Data on breeding birds in the area was extracted from the Ontario Breeding Bird Atlas (BSC et al. 2008). Since this atlas provides data based on 10x10km survey squares, information on breeding birds from the square that overlaps the study area (17NJ68) was compiled. These initial species lists were used to guide the scope and type of field surveys required as outlined in the following sections.

Other information sources that were reviewed to inform project scoping included the following:

- Dufferin County Official Plan (County of Dufferin 2015)
- Melancthon Township Official Plan (Township of Melancthon 2014)
- Pre-consultation between the study team and MNRF Midhurst District staff held on June 14, 2016, and with NVCA staff on September 15, 2016.

Species At Risk Screening

SAR are those listed on the Species at Risk in Ontario List (MNRF 2016b). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed as Endangered or Threatened are protected by the provincial *Endangered Species Act* (ESA), which includes protection of their habitat.

Provincial species of Special Concern are included in the definition of Species of Conservation Concern (SCC), which includes the following:

- species designated provincially as Special Concern,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre, and

- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO. These species are protected by the federal *Species at Risk Act* but not provincially by the *Endangered Species Act*.

Habitats of SCC are considered a form of Significant Wildlife Habitat (SWH) (OMNR 2010) which is afforded protection under the Provincial Policy Statement (OMMAH 2014) and various municipal natural heritage protection policies. For the purposes of this report, the term "SAR" will refer to provincially Threatened and Endangered species regulated under the ESA while provincial species of Special Concern will be considered SCC and addressed in the context of SWH.

Based on the results of preliminary background information review, SAR with occurrence records within 10km of the subject property were identified. Based on the habitat preferences/requirements for these species (e.g., OMNR 2000) and an assessment of existing subject property habitat features based on initial NRSI site investigations, a screening for suitable habitats was completed for each subject property. This preliminary screening information further informed the surveys required as part of the NEA/EIS scope, described below.

Based on the results of the preliminary screening, the following SAR and SCC were identified as having potential for suitable habitat on one or both subject properties:

- Chimney Swift (*Chaetura pelagica*) – provincially and federally Threatened
- Eastern Wood-Pewee (*Contopus virens*) – provincial species of Special Concern; designated Special Concern nationally by COSEWIC
- Bobolink (*Dolichonyx oryzivorus*) – provincially Threatened; designated nationally Threatened by COSEWIC
- Barn Swallow (*Hirundo rustica*) - provincially Threatened; designated nationally Threatened by COSEWIC
- Wood Thrush (*Hylocichla mustelina*) – provincial species of Special Concern; designated nationally Threatened by COSEWIC

- Bank Swallow (*Riparia riparia*) (foraging habitat only) – provincially Threatened; designated nationally Threatened by COSEWIC
- Eastern Meadowlark (*Sturnella magna*) - provincially Threatened; designated nationally Threatened by COSEWIC
- Western Chorus Frog (*Pseudacris triseriata*) (Great Lakes/St. Lawrence – Canadian Shield Population) (*Bonnefield property only*) – federally Threatened
- Little Brown Myotis (*Myotis lucifugus*) – provincially and federally Endangered
- Northern Myotis (*Myotis septentrionalis*) – provincially and federally Endangered

Since initial project scoping, Tri-colored Bat (*Perimyotis subflavus*) has been up-listed to Endangered in Ontario by COSSARO (MNRF 2016b), and this species is also considered Endangered federally (Government of Canada 2017). Suitable habitat for Tri-colored Bat also exists within the study area.

Significant Wildlife Habitat Screening

A preliminary screening for the presence of Significant Wildlife Habitat (SWH) was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNRF considers significant in Ontario as well as criteria to identify these habitats for Ecoregion 6E (OMNR 2000, MNRF 2015b). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of Species of Conservation Concern (SCC), and animal movement corridors.

Based on the results of this preliminary screening exercise, the following SWH types were initially considered Candidate SWH for one or both of the subject properties and required further assessment through the field work and analysis in the NEA/EIS:

- Bat Maternity Colonies
- Snake Hibernaculum
- Turtle Nesting Area (*Bonnefield property only*)
- Seeps and Springs
- Amphibian Breeding Habitat (Woodland) (*Bonnefield property only*)
- Terrestrial Crayfish (*Bonnefield property only*)
- Habitat for Special Concern and Rare Wildlife

Based on the scoping exercises described above, a Terms of Reference (TOR) for the NEA/EIS was prepared by NRSI. The TOR was forwarded by MHBC to the MNRF Midhurst District on July 5, 2016. Based on comments provided by the MNRF during the June 14, 2016 pre-consultation meeting, the TOR contained a detailed description of survey methodologies and a summary of pertinent fieldwork results collected to date. The TOR was also submitted to the NVCA and County by MHBC prior to the September 15, 2016 pre-consultation with those agency staff. Written comments were received from the NVCA on October 20, 2016. The TOR, and associated NVCA comments, are included in Appendix II.

1.1.2 Relevant Policies, Legislation, and Regulations

Table 1 provides an overview of natural heritage-based policies, legislation and regulations that were considered and which informed the field program and analysis. To help inform site planning and identify areas to be protected, inventoried natural features were evaluated against relevant policies, legislation, and regulations outlined in the following sections. The specific implications of these policies to the study are discussed further in Section 4.0.

Table 1. Relevant Policies, Legislation and Regulations

Policy/Legislation	Description	Project Relevance
Provincial Policy Statement (OMMAH 2014).	• Issued under the authority of Section 3 of the Planning Act and came into effect on April 30, 2014, replacing the 2005 PPS (OMMAH 2005). • Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. • The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, MNRF 2015b) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	• Natural features that occur or may occur within the study area, and which receive protection under the PPS, include: o Significant Woodlands, o Significant Wetlands, o Fish habitat o Significant Wildlife Habitat, and o Habitat for Endangered and Threatened species. • Section 2.1.4 of the PPS states that development or site alteration shall not be permitted in Significant Wetlands located in Ecoregion 6E. • Section 2.1.5 of the PPS states that development or site alteration shall not be permitted in Significant Wildlife Habitat or Significant Woodland in Ecoregion 6E unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions. • Section 2.1.6 of the PPS states that development or site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements. • Section 2.1.7 of the PPS states that development or site alteration shall not be permitted in habitat of Endangered or Threatened species except in accordance with provincial or federal requirements. • Section 2.1.2 of the PPS states that the connectivity of natural features in an area should be maintained, restored, or where possible, improved.
Endangered Species Act	• The original ESA, written in 1971, underwent a year-long review which resulted in a number of changes which came into force in 2007.	• Based on a preliminary analysis, several SAR were identified as having the potential to occur within the study area based on presence of potential suitable habitat.

Policy/Legislation	Description	Project Relevance
	• The ESA prohibits killing, harming, harassing or capturing SAR and protects their habitats from damage and destruction.	
Migratory Birds Convention Act	• Prohibits the disturbance, destruction, or taking of a nest or eggs of migratory birds.	• Any vegetation removal required for conversion of the lands to aggregate extraction uses must have regard for this legislation in the form of timing window restrictions or other suitable mitigation measures.
Dufferin County Official Plan (County of Dufferin 2015)	• The County Official Plan identifies known natural heritage features, including features protected under provincial plans within the county that form the basis of a preliminary County Natural Heritage System. This framework will be updated through the completion of a formal Natural Heritage System Strategy for the County. • The County Official Plan describes and outlines protection policies for the Preliminary Natural Heritage System in Dufferin County.	• The study area has been identified as containing "woodlands" as mapped on Schedule E of the Official Plan. • The study area has been identified as containing "County Preliminary Natural Heritage System" features on Schedule E1 of the Official Plan, which correspond to the woodlands mapped on Schedule E. • Section 5.3.4 of the Official Plan states that woodlands should be conserved under the policies of the Plan, and incompatible land uses that deter their long-term benefits prohibited. Development and site alteration within or adjacent to Significant Woodlands will not be permitted unless it can be demonstrated through an EIS that no negative impacts to the feature or its functions will occur.
Melancthon Township Official Plan (Township of Melancthon 2014)	• The natural heritage system within the Township is primarily comprised of features designated Environmental Protection or with an Environmental Conservation overlay designation as illustrated on the Official Plan schedules. • The Township Official Plan describes the Natural Heritage policies for the protection of natural areas within the Township.	• Schedule A-5 of the Official Plan maps the study area as containing "Environmental Conservation" overlay associated with woodlands on the properties. • Schedule D of the Official Plan shows the northeastern edge of the Prince Property as containing a small area of "Locally Significant and Unevaluated Wetland". • Schedule E of the Official Plan shows the presence of "Significant Woodlands – Primarily 20+ Hectares" on both subject properties. • Section 5.5.2 of the Official Plan states that development and site alteration within or adjacent to

Policy/Legislation	Description	Project Relevance
		the Environmental Conservation overlay (e.g., Significant Woodlands, Locally Significant Wetlands) are subject to the findings of an EIS that demonstrate no negative impact to the features or their ecological functions.
NVCA O. Reg. 172/06	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990. • Through this regulation, the NVCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes).	• NVCA regulation mapping shows no regulated lands within the study area. However, any confirmed wetlands within the study area and their adjacent lands will fall under the regulation of the NVCA. • Permitting from the NVCA must be obtained for proposed works within any regulated features that may occur within the subject properties. • As a condition of permit approval, an EIS is required to demonstrate that the proposed site alteration will result in no negative impact to the regulated natural features and their ecological functions, should they occur on the subject properties.

2.0 Field Methods

The EIS field survey methodology was described in the TOR as submitted to the MNRF, County and NVCA. Please refer to the TOR (Appendix II) for details of the survey methodology undertaken to inform this study. Additional description is provided below for survey methodology that was initiated during the course of the fieldwork season and was not described in the TOR. Table 2 provides a summary of field surveys undertaken on the subject properties, which were completed over 9 site visits during the period April-July 2016. See Maps 2a and 2b for survey point and transect locations.

Table 2. Field Survey Summary

Survey Type	Surveyor	Dates
Ecological Land Classification	Lee et al. 1998	April 21, 2016; June 8, 2016
Amphibian Call Surveys	BSC 2009	April 21, 2016; May 24, 2016; June 20, 2016
Vegetation Inventories	Comprehensive search by ELC polygon	April 21, 2016; June 8, 2016; July 6, 2016
Snake Emergence Surveys	Comprehensive search of identified potential hibernaculum habitat	May 5, 2016; May 9, 2016; May 10, 2016
Breeding Bird Surveys/Bobolink and Eastern Meadowlark Surveys/Barn Swallow Surveys	BSC 2001, MNRF 2015c, Buck 2012	June 8, 2016; June 20, 2016; July 6, 2016
Bat Cavity Tree Assessment	OMNR 2011a	April 21, 2016; May 5, 2016

NRSI biologists undertook a thorough examination of the building exteriors for the presence of Barn Swallow nests. The interior of the barn and other outbuildings on the Prince property were also searched for the presence of nesting Barn Swallows. Due to confirmation of active Barn Swallow nests on/in these structures during the June 20 site visit, Barn Swallow survey point counts were established on both properties as shown on Maps 2a and 2b, and surveyed on June 20 and July 6. Station BARS-001 was also surveyed during the June 8 site visit to assess Barn Swallow activity around the barn and adjacent potential nesting locations. Surveys comprised 10 minute point counts and were situated to observe the confirmed nest location and adjacent areas used for foraging, following guidelines provided by MNRF Guelph District Management Biologist

Graham Buck (Buck 2012). Surveys were completed between 8:00am-10:00am in accordance with MNRF guidelines.

3.0 Existing Conditions

3.1 Physical, Hydrological and Hydrogeological Conditions

The subject properties are located within a physiographic region known as the Horseshoe Moraines. These moraines are associated with a system of spillways with broad gravel and sand terraces. The properties contain soils of the Caledon and Honeywood Series. The on-site soils are well-drained and have developed on gravelly materials. Quaternary deposits within the subject property vicinity comprise ice-contact stratified deposits, which are described as mainly medium-grained sand with some gravel, pebbly sand and boulder sand. The unconsolidated sand and gravel is underlain by a clay till deposit, which may represent the regionally extensive Tavistock Till formation (Whitewater Hydrogeology 2017).

The subject properties contain gently rolling to hummocky terrain. The Prince property ranges in elevation from 513masl to 504masl between the northeast and western property boundaries, while the Bonnefield property ranges from 509masl to 498masl between the northern property boundary and the southeastern property corner (Whitewater Hydrogeology 2017).

The subject properties are located within the Nottawasaga River watershed, and the Boyne River subwatershed, which is a major tributary to the Nottawasaga River. The properties are located near the drainage divide between the Boyne River and Pine River subwatersheds. The subject properties do not contain any permanent watercourses or distinct drainage channels, and most topographically low depression areas in the 2 property woodlands were observed to be dry during NRSI field studies, which is indicative of the high degree of infiltration that occurs within the pervious soils. Within the Bonnefield property, a localized drainage catchment primarily located within the rear-property woodlot contributes seasonal surface water to a hydrologically perched shallow-water wetland feature and small vernal pool, which are further discussed below. This drainage catchment is illustrated on Figure 12 of the hydrogeological assessment report (Whitewater Hydrogeology 2017).

Two principle aquifers were identified below the subject properties in the hydrogeological study: the overburden aquifer and the contact zone (upper fractured bedrock) (Whitewater Hydrogeology 2017). Hydrogeological studies completed on the subject properties found the groundwater table generally reflects the surface-level topography, and that a northeasterly flow was likely predominant in the shallow groundwater. However, local groundwater flow patterns are likely influenced by the presence of a bedrock valley, which has led to a complex subsurface flow pattern. Most groundwater generally flows in an easterly direction under the subject properties, although some northerly flow occurs under the Bonnefield property as a result of the bedrock valley system (see Figure 9 in Whitewater Hydrogeology 2017). Groundwater levels are notably varied between the 2 subject properties. Within the Prince property the overburden is dry and the water table is located within the bedrock aquifer, which is driven by a primarily downward hydrological gradient on the property. Across the overburden monitoring wells on both properties, groundwater levels varied seasonally, ranging from a high of 501masl to a low of 491masl during the spring, then dropping 2-4m over the following months (Whitewater Hydrogeology 2017). Additional groundwater level monitoring is required to confirm the spring-based seasonally high water table level on the subject properties.

3.2 Vegetation

3.2.1 Vegetation Communities

Natural features in the study area are dominated by deciduous forest communities located at the east end of each property. These forest communities extend off-property in both cases. The Prince Property also contains a large area of relatively young (approximately 30-year old) pine plantation adjacent to the deciduous forest community. Smaller areas of pine plantation also exist within/adjacent to the forest community on the Bonnefield Property. A shallow marsh wetland feature was confirmed as occurring within the Bonnefield Property woodland during site investigations, as was the presence of a small vernal pool. Although wetland is mapped on the Prince Property in the background information (LIO), field studies confirmed the absence of any wetland habitat within that property woodland. The Bonnefield Property also contains a centrally located hill that is currently uncultivated and has regenerated as cultural meadow with isolated tree growth.

The remainder of the study area is dominated by active agricultural lands and rural residential areas that contain scattered tree plantings and deciduous hedgerows (the latter specific to the Bonnefield property). Agricultural land use on the Prince Property in 2016 included 2 hayfields, located at the north and south ends of the property, separated by a row crop field as shown on Map 2a. From south to north these fields are referred to as Fields 1, 2 and 3. A grassy back-property area is used as cattle pasture, which slopes toward the adjacent pine plantation. Grasses and forbs within this pasture area have been kept short through regular cattle grazing. A grassy berm aligning the south boundary of the Prince property, bordering the adjacent Strada aggregate pit, is also used for cattle grazing. Agricultural land fields on the Bonnefield property were entirely cultivated in winter wheat row crops in 2016.

A summary of ELC vegetation communities identified within the study area is provided in Table 3 and shown on Maps 2a and 2b.

Table 3. Vegetation Communities within the Study Area

ELC Ecosite Type	ELC Description	Environmental Characteristics
FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest Type	This vegetation community occurs within both the Prince and Bonnefield properties. Topography within this feature on both properties is characterized as rolling upland habitat. Human use and disturbance of these communities is minimal and limited to recreational activity (i.e. walking trails, hunting). *Prince Property* The canopy and sub-canopy are dominated by Sugar Maple (*Acer saccharum ssp. saccharum*), with fewer Black Cherry (*Prunus serotina*), and American Beech (*Fagus grandifolia*). The understorey layer is characterized by Alternate-leaved Dogwood (*Cornus alternifolia*), Sugar Maple, and Red Elderberry (*Sambucus racemosa ssp. pubens*). Groundcover vegetation is comprised of Pale Touch-me-not (*Impatiens pallida*), Blue Cohosh (*Caulophyllum giganteum*), and Alternate-leaved Dogwood. Native species are predominant in this community on the Prince property, with only 7 non-native species (representing 11% of all inventoried species within the feature) observed. *Bonnefield Property* The canopy and sub-canopy are dominated by Sugar Maple, with fewer Black Cherry and American Beech. The understorey layer is characterized by Sugar Maple, Alternate-leaved Dogwood, and Red Elderberry. Groundcover vegetation is comprised of Blue Cohosh, Yellow Trout Lily (*Erythronium americanum ssp. americanum*), and Dewey's Sedge (*Carex deweyana*). Two distinct habitat inclusions exist within this vegetation community on the Bonnefield property: White Pine Coniferous Plantation (CUP3-2), and Shallow Marsh (MAS). The CUP3-2 habitat inclusion occurs in two locations within the property, and is dominated by Eastern White Pine (*Pinus strobus*). The MAS habitat inclusion is dominated by Reed Canary Grass (*Phalaris arundinacea*), and

ELC Ecosite Type	ELC Description	Environmental Characteristics
		Lesser Duckweed (*Lemna minor*). A small vernal pool feature, estimated 10m x 10m, was identified within the southwest portion of this community. Wetland vegetation was not observed within the vernal pool, and minimal surface water was present during all visits to the property. This feature was observed to be almost dry by the July 6 site visit.
CUP3-2	White Pine Coniferous Plantation Type	This young-aged vegetation community occurs within the Prince property and is actively used as cattle pasture. Topography within the feature is characterized as rolling upland habitat. Human and agricultural-related disturbances were evident within the feature, namely garbage/debris dumping, and broken tree limbs from occupant cattle. Due to these disturbances, vascular species observed consist mainly of non-native species (approximately 79%). Dominant tree species include Eastern White Pine, and Norway Spruce (*Picea abies*). Groundcover vegetation is sparse due to cattle activity and dense shading within the feature, and is comprised of Herb Robert (*Geranium robertianum*), Common Dandelion (*Taraxacum officinale*), White Bedstraw (*Galium mollugo*), and Nodding Thistle (*Carduus nutans ssp. nutans*).
CUM	Cultural Meadow	This vegetation community occurs centrally within the Bonnefield property. Topography within the feature is characterized by rolling upland habitat. Human use and disturbance of this feature is limited to edge effects resulting from the adjacent active agricultural activity. A relatively small treed area exists at the south of the community, characterized by Manitoba Maple (*Acer negundo*), White Spruce (*Picea glauca*), Common Apple (*Malus domestica*), Tartarian Honeysuckle (*Lonicera tatarica*), and Thimble-berry (*Rubus occidentalis*), and Common Lilac (*Syringa vulgaris*). Groundcover vegetation within this community is comprised of Smooth Brome (*Bromus inermis ssp. inermis*), White Bedstraw, and Canada Goldenrod (*Solidago canadensis*).
Hedgerow	Deciduous Hedgerow	Multiple east-west and north-south oriented hedgerows occur on the Bonnefield property, effectively partitioning the agricultural field into 3

ELC Ecosite Type	ELC Description	Environmental Characteristics
		discrete units and delineating the north and south property boundaries. The hedgerows have collectively been considered a single ELC unit. The portions of hedgerow located in a north-south direction appear to be more naturalized and are comprised of Black Cherry, Sugar Maple, hawthorn (*Crataegus* spp.), White Elm (*Ulmus americana*), Alternate-leaved Dogwood, and Choke Cherry (*Prunus virginiana*), with Canada Goldenrod, Orchard Grass (*Dactylis glomerata*), Awnless Brome (*Bromus inermis*), Virginia Waterleaf (*Hydrophyllum virginianum*), and Wild Strawberry (*Fragaria virginiana*). The portions of hedgerow located in an east-west direction are less naturalized in comparison, with areas of deciduous and coniferous row planting, likely to delineate the property boundary. It is characterized by Carolina Poplar (*Populus X canadensis*), Norway Spruce, White Elm, White Ash (*Fraxinus americana*), Manitoba Maple, Thimble-berry, Red-osier Dogwood (*Cornus stolonifera*), and Tartarian Honeysuckle, with White Bedstraw, Orchard Grass, Awnless Brome, Canada Goldenrod, and White Sweet-clover (*Melilotus alba*).

3.2.1 Vascular Flora

A total of 154 vegetation species was identified during site investigations across study area vegetation communities. A complete list of these species is appended to this report (Appendix III). A large proportion of the inventoried species was associated with the Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1) communities located on both properties, and their associated inclusions. The coefficient of conservatism (CC), a value ranging from 0 (low) to 10 (high) and is based on a species' tolerance of disturbance and fidelity to a specific habitat integrity (Oldham et al. 1995), was relatively high for several species associated with the woodland and wetland communities. This included 9 species with CC values of ≥7, which are indicative of species more sensitive to specific environmental conditions and less tolerant of disturbance. Several of the inventoried non-native and invasive species (the latter quantified by the Weediness Index, between invasiveness values of -3 (high) to -1 (low) (Oldham et al. 1995)) were documented within the pine plantation, cultural meadow and deciduous hedgerows, which is indicative of historic and ongoing human disturbance. Overall, species assemblage was similar on both properties with the exception of wetland-associated species on the Bonnefield property.

No federally, provincially or regionally significant vegetation species were inventoried in the study area (Government of Canada 2017, MNRF 2016b, Riley 1989).

3.3 Wildlife

3.3.1 Birds

A total of 91 bird species was reported from within 10km of the study area based on the OBBA (BSC *et al.* 2008). Sixty-one (61) of these species were documented within the study area during field surveys. Of these, 45 species displayed evidence of possible, probable or confirmed breeding within the study area based on OBBA breeding evidence codes (OBBA 2001). A total of 38 bird species was observed with breeding evidence on the Prince property, while 28 were observed with breeding evidence on the Bonnefield property. Refer to Appendix IV for a list of bird species recorded within in the study area and vicinity.

Appendix I of the TOR (NEA/EIS Appendix II) provides a summary of provincially significant bird species known to occur or observed in the study area and vicinity, their current status ranks, and preferred habitats. Five of these species were observed within the study area:

SAR:

- Barn Swallow (Threatened in Ontario) – confirmed as nesting on both the Prince and Bonnefield properties
- Bank Swallow (Threatened in Ontario) – observed foraging over both the Prince and Bonnefield properties; no nesting habitat occurs on either property
- Bobolink (Threatened in Ontario) – confirmed as breeding on the Prince property
- Eastern Meadowlark (Threatened in Ontario) – observed with evidence of probable breeding on the Prince property

SCC:

- Eastern Wood-Pewee (Special Concern in Ontario) – observed with evidence of probable breeding on both the Prince and Bonnefield properties

Barn Swallow

Barn Swallow often nests on man-made structures and is adaptable to human presence. Investigation of buildings/structures on the subject properties confirmed the presence of 2 active nests and 2 inactive nests on the Prince property, and 1 active nest on the Bonnefield property. The 2 active nests on the Prince Property were located within the main barn, situated on horizontal beams supporting the ground floor ceiling. The active nest on the Bonnefield property was located on the exterior of the shed and protected under a roof overhang. See Maps 3a and 3b for nest site locations. Multiple Barn Swallows were also observed during point count surveys (up to 7 individuals during a single point count) as foraging over the subject properties. Foraging Barn Swallows were recorded during the May 5, May 9, May 10, June 8, June 20, and July 6 site visits. Individuals were observed visiting and sitting on the active nests, and foraging around the immediate vicinity of the nesting structures.

Bank Swallow

Bank Swallows were observed foraging over the Prince property on June 20 and July 6 (up to 5 individuals during 1 point count), and foraging over the Bonnefield property on July 6 (up to 13 individuals during 1 point count). Suitable Bank Swallow nesting habitat does not exist on either property. However, abundant suitable nesting habitat occurs within the 2 adjacent Strada aggregate pits, as well as within other nearby aggregate pits (e.g., west of 4th Line; east of the Prince Property). It is anticipated that the observed individuals originate from nesting colonies within one or more of these surrounding aggregate pits.

Bobolink

Several Bobolink individuals were observed within the 2 hayfields on the Prince property during the June 8, June 20, and July 6 site visits. Bobolink were not observed within the row crop field (Field 2) or the pasture on the Prince property, nor were any observed on the Bonnefield property. Up to 5 male Bobolinks were observed within Field 1, and up to 3 males in Field 3, with additional numbers of females, across surveys. By the July 6 site visit, only 1 male individual was observed on the property, indicating that most individuals had left the field following fledging of young by that date. Bobolinks are a ground nesting bird, and nests are difficult to observe due to dense cover and NRSI biologists did not attempt to approach or locate nest sites through surveys. Due to the number of individuals and repeated observations within the on-site hayfields suggesting active breeding territories, it is assumed that Bobolink were actively nesting within the Prince property. The methods used to confirm Bobolink nesting were in accordance with the standard MNRF protocol (MNRF 2015c) described in the TOR (Appendix II).

Eastern Meadowlark

A single individual Eastern Meadowlark was observed at the southwest end of the Prince property across multiple site visits (April 21, May 9, June 8, and June 20). Observation of an individual at the same location across multiple visits suggests the potential for a breeding territory, including observation of the male in its preferred breeding habitat in April prior to the breeding period. This species was consistently observed at the southwest corner of Field 1, near the road and adjacent property boundary berm. The

survey observations are indicative of probable breeding by the species on the subject property.

Eastern Wood-Pewee

This species can be found in a wide variety of forested habitats, but prefers open, deciduous, mixed or coniferous forest predominated by oak, with little understory, forest clearings, edges, farm woodlots, and parks (McCarty 1996). One singing Eastern Wood-Pewee male was observed within the Prince property FOD5-1 woodland community during the June 8, June 20, and July 6 site visits. One singing male was also observed within the Bonnefield property FOD5-1 community during each of the June 20 and July 6 site visits. Repeated observations of a singing male within each of these woodland communities is evidence of a probable nesting due to an established breeding territory within each of these woodlands.

Other provincially significant species that were initially screened as having suitable habitat in the study area (Chimney Swift and Wood Thrush; Appendix II) were not observed during field surveys.

3.3.2 Herpetofauna

According to the Ontario Amphibian and Reptile Atlas (Ontario Nature 2015), 12 species of herpetofauna are known from within 10km of the study area. Of these, 6 species were observed within the study area, all of which occurred on the Bonnefield property. With the exception of Eastern Gartersnake (*Thamnophis sirtalis sirtalis*), all observed herpetofauna were anuran species associated with the on-site wetland feature.

Snake Emergence Surveys

The initial site characterization completed on April 21, 2016 included confirmation of various features that represent potential snake hibernaculum habitat. These included several large, long-established rock piles on both properties as well as potential access points (e.g., cracks) along the foundations of buildings on each property (Maps 2a, 2b). Despite thorough area searches of these potential hibernaculum locations, only 1 individual Eastern Gartersnake (*Thamnophis sauritus septentrionalis*) was observed. No snakes were observed during any subsequent site visit within the subject properties.

Amphibian Call Surveys

Based on the results of anuran call surveys, 5 anuran species were recorded within the Shallow Marsh (MAS) wetland on the Bonnefield property surveyed by station ANR-002 (Map 2b) as listed in Appendix V. Three species were heard calling at full chorus during surveys: Spring Peeper (*Pseudacris crucifer*) (during 2 surveys), Wood Frog (*Lithobates sylvatica*), and Gray Treefrog (*Hyla versicolor*). American Toad (*Anaxyrus americana*) and Green Frog (*Lithobates clamitans melanota*) occurred in small numbers, with 2 recorded individuals each. No species were recorded within the vernal pool surveyed by station ANR-001 during any survey.

Significant Species

None of the recorded herpetofauna species are considered SAR or SCC in Ontario. One species that was initially screened as having suitable habitat in the study area, Eastern Milksnake (*Lampropeltis taylori triangulum*) (Appendix II), was not observed during field investigations. Eastern Milksnake has since been down-listed from Special Concern to Not at Risk in Ontario (MNRF 2016b).

The NVCA, in its comments following review of the EIS TOR, stated the potential for the provincially Endangered Jefferson Salamander (*Ambystoma jeffersonianum*) to occur within the shallow marsh wetland or vernal pool on the Bonnefield property due to occurrence records for the species at Mono Cliffs Provincial Park (approximately 16km to the south) and the Pretty River Nature Reserve (approximately 30km to the north) (Appendix II). Although these known sites are too far away to be considered as a source of Jefferson Salamander migrating to the subject properties, they show that the study area is within the distribution range of this species, and the water bodies should be assessed for their potential as suitable habitat.

Four criteria must be met for a wetland/pond feature to function as suitable Jefferson Salamander habitat:

1. Suitable hydroperiod (surface water persisting to late July or early August) at least once in 5 years;
2. Amphibian breeding occurring in the pond (mating, calling, eggs or larvae);

3. No predatory fish in the pond;
4. Egg attachment sites present (G. Buck, MNRF, pers. comm., January 2011).

The Shallow Marsh (MAS) does meet criteria 1, 2 and 4 for suitability as Jefferson Salamander habitat. It was not investigated for the presence of predatory fish. However, if it were assumed that no predatory fish occur within the wetland, this feature is suitable.

The vernal pool does meet criteria 3 and 4, and likely does not meet criteria 1 and 2. It was not assessed for the presence of egg masses, but no breeding anuran calling activity was recorded within the feature in 2016, which would indicate no amphibian breeding present. Although the hydroperiod for the vernal pool was likely insufficient in 2016 (relatively little standing water remained as of the July 6 site visit), up to 4 additional years of observation would be required to rule out sufficient hydroperiod. Based on the lack of documented anuran breeding within the vernal pool, this feature is considered unlikely to provide habitat for Jefferson Salamander.

Previous NRSI salamander survey work was undertaken for Strada Aggregates on the Melancthon Pit #2 property, within wetland and pond features to the immediate south of the Bonnefield property (NRSI 2010). No Jefferson Salamanders or other salamanders were captured through trapping completed as part of that survey work. Brook Stickleback (*Culaea inconstans*), a predatory fish, was trapped at one of the survey locations, indicating potential for this species to also occur within the Bonnefield property wetland. Based on these results, it is considered unlikely for Jefferson Salamanders to occur within the immediately adjacent wetland on the Bonnefield property.

3.3.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 17 mammal species are reported from within 10km of the study area. Of these, evidence of 7 species was observed within the study area. All observed species are relatively common and ubiquitous on the surrounding landscape, and have secure populations in Ontario. A complete list of mammals reported from the study area vicinity, based on background information and observations made as part of this study is included in Appendix VI.

Two bat SAR, Little Brown Myotis and Northern Myotis, were initially screened as having potentially suitable habitat within the study area. Tri-colored Bat is also considered to have potentially suitable habitat as described above. Based on the results of the cavity tree assessment, 8 suitable cavity trees were identified on the Prince property, including 7 within the FOD5-1 community and 1 near the roadside adjacent to the house (Map 3a). Six suitable cavity trees were identified on the Bonnefield property, including 4 the within the relatively young FOD5-1 community and 2 within property hedgerows (Map 3b). Potentially suitable habitat for these bat SAR may therefore occur on the subject properties. However, as discussed below, potential significant habitat for bat SAR is considered to be limited to the woodland communities on each property.

3.3.4 Insects

According to the Ontario Butterfly Atlas (McNaughton et al. 2016), 5 butterfly species are known to occur within 10km of the subject property. One butterfly species, Cabbage White (*Pieris rapae*), was observed during site investigations. This species is considered common in Ontario. A complete list of butterfly species observed and reported from the study area and vicinity is provided in Appendix VII.

According to the Ontario Odonate Atlas (MNRF 2016a), 24 odonate species are known to occur within 10km of the study area. None of these species were observed within the study area during site visits. A complete list of odonate species reported from the subject property vicinity is provided in Appendix VIII.

4.0 Natural Environment Development Constraints

The natural environment constraints analysis is used to identify natural features that are sensitive to disturbance based on the rarity or significance of the feature or species, or the functions/processes and/or policies prohibiting development within them. These areas are identified as "constraints" to the proposed development, and are discussed in the context of natural heritage policies governing their protection. Conversely, opportunities for development may occur outside of these natural environment constraints within the subject properties. Development or site alteration within certain natural feature constraints may be permitted by the regulatory agencies subject to permitting and/or implementation of recommended measures to appropriately mitigate anticipated impacts as discussed below.

Results of this analysis have been provided as input to the proposed site plan and aggregate extraction limits in order to avoid impacts to natural features and functions. A summary of this analysis for the study area is discussed below. Natural features identified as constraints to site alteration are shown on Maps 3a and 3b.

4.1 Significant Natural Features and Habitats

As detailed above, the study area contains woodland features and functions that are afforded significance under the Township and County official plans, and also contain unevaluated wetland that is regulated by the NVCA. The following is a summary of the significance and sensitivity of the study area natural features and how the natural heritage policies and legislation described in Section 2.0 inform the identification of constraints for the proposed development.

4.1.1 Significant Woodland

Woodlands on both the Prince and Bonnefield properties are mapped as Significant Woodland in the Township Official Plan (Township of Melancthon 2014). These features are also considered part of the Preliminary Natural Heritage System for Dufferin County (County of Dufferin 2015). Under County and Township policies, development is not permitted within or adjacent to Significant Woodland unless it can be demonstrated through an EIS that no negative impacts to the natural features or their functions will occur.

The Township Official Plan states that most significant woodlands in the Township are deemed as such due to their size being ≥20ha. The Official Plan also states that woodlands <20ha in size may be considered significant due to other important features such as a location near other woodlands, in a headwater area, or in a linkage feature between other natural heritage features and areas (Township of Melancthon 2014).

Three discrete woodland communities have been identified within the study area: the FOD5-1 deciduous forest and CUP3-2 pine plantation communities on the Prince property, and the FOD5-1 deciduous forest community on the Bonnefield property. The FOD5-1 forest on the Prince property extends onto adjacent properties north and east of the subject property. It is NRSI's understanding that the portion of the FOD5-1 forest community that occurs on the property to the immediate east falls within a licensed aggregate extraction area (St. Mary's Kasaks Pit) and will be removed. When excluding the area of FOD5-1 forest that will be removed, the on-site FOD5-1 and CUP3-2 communities are separated by a distance of approximately 20m based on air photo interpretation. A gap of 20m is considered the minimum spatial separation to consider 2 woodland areas as spatially separate and not contiguous (OMNR 2010).

Each of these 3 woodlands falls under the Township's size criterion for woodland significance (≥20ha). The following woodland area sizes include contiguous areas that extend off-property, but in the case of the Prince property FOD5-1 community, excludes the portion of woodland to be removed on the adjacent property to the east:
Prince Property FOD5-1: 10.20ha
Prince Property CUP3-2: 3.04ha
Bonnefield Property FOD5-1: 8.27ha

Although the size criterion is not met for these woodlands, other aspects of woodland condition and functional importance may render these features as significant under Township policies (Township of Melancthon 2014). For other aspects of woodland significance, the Township Official Plan refers to the MNRF's Natural Heritage Reference Manual (OMNR 2010), which describes various woodland significance criteria.

The FOD5-1 deciduous forest communities on both subject properties do meet several of the woodland significance criteria as laid out in the NHRM (OMNR 2010), and will be retained in their entirety as part of the proposed site plans, as further described below. For the purposes of this EIS, these forest communities are assumed to represent Significant Woodland as mapped in the Township Official Plan, and as shown on Map 1.

The CUP3-2 community was assessed against the County definition of forest and the NHRM criteria for significant woodland. Within the County Official Plan, woodlands are defined, in part, as features that are identified as "forest" under the ELC system (County of Dufferin 2015). Under this definition, the plantation is not a woodland and would not be considered in an analysis of Significant Woodland under County policies. Various other aspects of woodland significance, as defined in the Natural Heritage Reference Manual, are not met by the CUP3-2 community based on the character of the feature. For example:

- the plantation does not contain a high diversity of species relative to the adjacent deciduous forest communities and as a near monoculture of White Pine, it does not reflect an ecologically natural system or provide a high level of ecological value;
- the plantation contains a high proportion and abundance of non-native/invasive species relative to the adjacent deciduous forest communities;
- the plantation does not offer as many habitat opportunities as the adjacent natural forest communities, and was found to contain fewer inventoried wildlife species;
- the plantation does not contain any interior habitat and has undergone disturbance through historic dumping of refuse, cattle grazing, trampling and damage and contains a very large rock pile;
- the plantation does not represent part of a linkage system between adjacent natural features;
- the plantation does not contain any rare or significant species or uncommon features.

For these reasons and its relatively small size (3.04ha) in comparison to Township size criteria (20ha), the plantation is not considered to represent Significant Woodland as defined by the County or Township, or the NHRM.

4.1.2 Wetland

The presence of unevaluated wetland was confirmed on the Bonnefield property through NRSI's site investigations documenting the shallow marsh (MAS) within the woodland. This wetland, and surrounding areas of up to 120m that may hydrologically influence the wetland, are subject to the NVCA's O. Reg. 172/06 *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Under this regulation, development or site alteration within the regulated lands is prohibited unless permitted by the NVCA. NVCA permitting is subject to an EIS demonstrating that the proposed site alteration will not negatively impact the regulated features or their ecological functions.

The MAS wetland was not evaluated using the Ontario Wetland Evaluation System (MNRF 2014a) as part of this study. For the purposes of this EIS, the wetland is considered to be potentially significant, which is to be reflected in necessary buffer widths and development setbacks. This approach was also taken on Strada's Melancthon Pit #2 property, where existing wetlands were assumed to be provincially significant from an impact mitigation standpoint. In the Melancthon Pit #2 Level 2 NEA, it was stated by the NVCA that the local complex of unevaluated wetlands, including wetlands on the Melancthon Pit #2 property, if evaluated, would likely meet criteria for provincial significance and would be complexed with wetlands in the headwaters of the North Boyne River (NRSI 2010). Based on MNRF criteria for wetland complexing identified in the Ontario Wetland Evaluation System (MNRF 2014a), it is anticipated the Bonnefield property wetland would also meet criteria for incorporation into the provincially significant wetland complex, and should be considered potentially significant.

4.1.3 Species at Risk Habitat

As described in Section 3.3, habitat for 4 SAR was confirmed on the subject properties while potential habitat for bat SAR occurs within the woodland communities. The

following is a summary of SAR habitats confirmed or potentially occurring on the subject properties.

4.1.3.1 Barn Swallow

Barn Swallow is listed as Threatened provincially and nationally by COSEWIC (MNRF 2016b, COSEWIC 2016). Consequently, this species and its general habitat are protected under the ESA.

Two structures were confirmed as providing Barn Swallow nesting habitat: the large barn on the Prince property and the shed on the Bonnefield property. The general habitat of Barn Swallow that is protected under the ESA includes an area within a 200m radius of the nest. This habitat area is defined based on studies that have determined that the majority of Barn Swallow foraging activity is within 200m of the nest (MNRF undated (a)). Suitable Barn Swallow foraging habitat comprises a wide range of natural and anthropogenic open habitats, including grazed pastures, row crop fields, open water and riparian areas, road right-of-ways, and rural residential properties (Heagy et al. 2014). Woodlands are not considered suitable foraging habitat. Foraging habitat 5-200m from the nest is considered the most tolerant of site alteration and is referred to as Category 3 habitat by the MNRF. The Barn Swallow nest itself is considered least tolerant of site alteration and is referred to as Category 1 habitat (MNRF undated (a)). See Maps 3a and 3b for the location of ESA-protected Barn Swallow habitat on the subject properties.

4.1.3.2 Bank Swallow

Bank Swallow is designated as Threatened in Ontario and is considered Threatened nationally by COSEWIC (MNRF 2016b, COSEWIC 2016). Consequently, this species and its general habitat are protected under the ESA.

No Bank Swallow nesting habitat occurs on either subject property and it is anticipated that this species is nesting within the exposed banks of one or more of the adjacent aggregate pits. However, Bank Swallows were observed foraging over both properties during site visits. A formal habitat description for Bank Swallows has not been developed by the MNRF. However, it is known through prior NRSI correspondence with the MNRF Guelph District related to separate development proposals that ESA-

protected Bank Swallow habitat includes both the nesting habitat and the foraging habitat. Bank Swallow foraging habitat is tolerant of some degree of site alteration without negatively affecting the species (G. Buck, MNRF, pers. comm., December 2015) depending on the extent of the disturbance and the type of land cover the habitat is converted to.

The observed Bank Swallows may have originated from nest colony sites on any of 5 discrete sites of aggregate extraction or materials stockpiling that occur within 1km (the typical foraging distance for the species (Falconer et al. 2016)) of either property. Specifically, these include 2 distinct sites located on the property immediately east of the Prince property, the 2 adjacent operational Strada aggregate pits, and an aggregate pit immediately west of Strada's Melancthon Pit #1 (see Map 1 for these surrounding sites, although the recently developed Melancthon Pit #2 is not shown south of the Bonnefield property).

The extent of suitable foraging habitat protected under the ESA may be considered to extend up to 1km from the confirmed nesting colony location, which is consistent with the recommended Bank Swallow habitat regulation as stated in the Recovery Strategy (Falconer et al. 2016). The entirety of the open habitats on the subject properties are therefore considered to represent Bank Swallow foraging habitat (Maps 3a, 3b).

4.1.3.3 Bobolink and Eastern Meadowlark

Due to the similar habitat requirements and consistent policy protections afforded to these species under the ESA, Bobolink and Eastern Meadowlark are discussed together for the purposes of understanding development implications. Bobolink and Eastern Meadowlark are each designated as Threatened in Ontario and are considered Threatened nationally by COSEWIC (MNRF 2016b, COSEWIC 2016). Consequently, these species and their general habitats are protected under the ESA.

Fields 1 and 3 on the Prince property were identified as confirmed breeding habitat for Bobolink. Following a conservative approach, Field 1 on the Prince property is also considered confirmed breeding habitat for Eastern Meadowlark. The MNRF defines habitat for these species as suitable habitat extending up to 300m from a nest site or

approximated centre of defended habitat (MNRF undated (b) (c)). Therefore, each of Hayfield 1 and 3 in their entirety would be considered protected SAR habitat. Habitats for these species have been categorized according to their tolerance to site alteration:

Bobolink:
Category 1 – The nest and area within 10m of the nest; least tolerant of alteration;
Category 2 – The area between 10-60m of the nest or approximate centre of defended territory; moderately tolerant of site alteration;
Category 3 – The area of continuous suitable habitat between 60-300m from the nest or approximate centre of defended territory; most tolerant of site alteration.

Eastern Meadowlark:
Category 1 - The nest and area within 10m of the nest; least tolerant of alteration;
Category 2 - The area between 10-100m of the nest or approximate centre of defended territory; moderately tolerant of site alteration;
Category 3 - The area of continuous suitable habitat between 100-300m from the nest or approximate centre of defended territory; most tolerant of site alteration.

Suitable habitat for both species comprise hayfields, pastures, old or abandoned fields, remnant prairies and savannahs (MNRF undated (b), (c)). Suitable habitat on the Prince property is limited to the 2 hayfields in which the species were observed. Although pasture occurs on the property, the herbaceous vegetation is maintained at a short height through regular cattle grazing. Bobolinks and Eastern Meadowlarks tend to avoid pasture areas that are heavily grazed and/or contain relatively short grass height (McCracken et al. 2013). See Map 3a for the area of ESA-protected Bobolink and Eastern Meadowlark habitat on the Prince property.

4.1.3.4 Bat Species at Risk

Three bat SAR with potentially suitable on-site habitat, Northern Myotis, Little Brown Myotis and Tri-colored Bat, are known to occur within approximately 10km of the study area and/or have range distributions that include all of southern Ontario (Dobbyn 1994, Environment Canada 2014). Potential habitat for these species is considered present wherever live or dead trees with suitable cavities occur to provide maternity colony or

roosting functions (OMNR 2011a, MNRF 2016c). Suitable bat habitat may also be provided by buildings, such as in attics, and particularly those that are unoccupied and/or not actively maintained (MNRF 2014b).

NRSI biologists identified the presence of suitable bat maternity colony/roosting trees (i.e., "cavity trees") within each subject property FOD5-1 woodland, as well as a few isolated/hedgerow trees outside the woodland on each property as described above. Due to the presence of cavity trees within each FOD5-1 woodland community, NRSI consulted with MNRF Midhurst District staff during the meeting of June 14, 2016 about whether these woodland features should be considered to contain significant bat SAR habitat. It is NRSI's understanding that assessments of bat SAR habitat presence are determined by the MNRF on a case by case basis based primarily on the density of suitable bat cavity trees within the surrounding woodland (i.e., the degree of bat SAR habitat function provided by the woodland). NRSI's bat cavity tree assessment results were submitted to the MNRF Midhurst District as part of the TOR dated July 4, 2016. For the purposes of this report, the woodlands are considered "potential bat SAR habitat" as shown on Maps 3a and 3b.

Based on the results of the bat cavity tree assessments and previous NRSI correspondence with MNRF staff for other developments, the hedgerows and isolated trees present within the subject properties outside of the woodlands are not considered habitat for SAR bats that requires protection under Section 10(1) of the ESA. This is based on the low density of suitable cavity trees found within these areas and the presence of woodlands on the surrounding landscape that bats would more likely preferentially utilize for habitat. Isolated and hedgerow trees located outside of the woodlands are therefore not considered significant bat SAR habitat. However, following a precautionary approach, it is recommended that removal of these trees be subject to mitigative measures as described below. Bats may also use buildings and other enclosed human structures as habitat, such as for roosting or overwintering. Suitable structures need to be appropriately sheltered from outside elements and provide appropriate access for the individuals. Although bats can occur in house attics, they are less likely to access well maintained structures than barns or other outbuildings.

4.1.4 Significant Wildlife Habitat

Based on the results of field surveys, 2 SWH categories were confirmed as occurring within the study area:

- Amphibian Breeding Habitat (Woodland) – Bonnefield property only
- Habitat for the SCC Eastern Wood-Pewee – both properties

Various other Candidate SWH types were identified during the initial SWH screening exercise as described in the TOR (Appendix II). By the time of TOR completion (dated July 4, 2016), initial NRSI field investigations had already begun, and the majority of these Candidate SWH types had been assessed and found not occurring within the subject properties, including the following:

- Bat Maternity Colonies
- Snake Hibernaculum
- Turtle Nesting Area
- Seeps and Springs

Please refer to the TOR and its SWH screening appendix for more information on the rationale used to consider these SWH as absent within the subject properties.

SWH is subject to the protection policies of the PPS, and County and Township Official Plans (OMMAH 2014, County of Dufferin 2015, Township of Melancthon 2014). Under these policies, development within SWH is prohibited unless it can be demonstrated that the development will not negatively impact the form and ecological function of the SWH. The following is a summary of SWH confirmed within the subject properties.

<u>Amphibian Breeding Habitat (Woodland)</u>

Amphibians require aquatic habitats to reproduce, and concentrate in breeding ponds during spring. Suitable aquatic habitats must be unpolluted, shallow, and maintain surface water long enough through the spring for juveniles to mature. Woody debris and vegetation are also important components to provide calling sites and egg-laying structures (OMNR 2011b). Amphibians disperse into adjacent terrestrial areas following breeding. These terrestrial habitats must provide dense canopy coverage, moist

conditions and cover habitat. Breeding ponds must be sufficiently close to summer habitats to provide habitat function.

Full choruses (>20 individuals) of 3 anuran species (Spring Peeper, Wood Frog, and Gray Treefrog) were recorded within the MAS shallow marsh on the Bonnefield property during amphibian call surveys. The presence of at least 2 of these recorded species calling at full chorus renders this wetland and the adjacent FOD5-1 forest community within a 230m radius (which encompasses the entire feature) as SWH for woodland amphibian breeding (MNRF 2015b) as shown on Map 3b. The CUP3-2 coniferous plantation inclusions within the FOD5-1 feature are not included in the SWH designation as they do not provide suitable terrestrial habitat conditions for amphibians. Plantations are not listed among candidate ELC communities that may be considered SWH for this category (MNRF 2015b).

Eastern Wood-Pewee Habitat

NRSI biologists identified the presence of a breeding territory for the SCC Eastern Wood-Pewee within the FOD5-1 deciduous forest communities on each of the subject properties (Maps 3a and 3b). Evidence of a breeding territory was based on observation of this species within the same vegetation community during 2 or more of the breeding bird surveys. As a SCC (a provincial species of Special Concern), habitat for this species is considered SWH and is subject to provincial and municipal protection policies (OMMAH 2014, County of Dufferin 2015, Township of Melancthon 2014). SWH for this species includes the small CUP3-2 coniferous plantation inclusion that is embedded within the FOD5-1 deciduous forest community on the Bonnefield property.

4.2 Buffers

Buffers are required for natural heritage features such as woodlands and wetlands to protect them from impacts during site alteration and operation. Buffers are considered a form of development constraint, and represent an important component of a larger suite of recommended measures to mitigate impacts to the adjacent natural features (see Section 5.0). Based on the characterization of the natural features on and adjacent to the subject properties, woodland and wetland buffers warrant consideration in defining the limit of aggregate extraction on the properties. PSWs are typically afforded 30m

buffers to protect their form and ecological functions. Since the Bonnefield property wetland has been assumed to be significant, it has been afforded a 30m buffer. However, because the wetland is located >30m from the woodland edge, a wetland buffer would be entirely contained within the woodland and has therefore not been mapped. As described below, confirmed or potential habitats for provincially or locally significant wildlife species will be protected within the recommended buffer.

Woodland buffers are prescribed based on protecting the trees and their root zones as well as providing associated open habitats required by forest wildlife species or for movement. Buffers from woodland driplines are important in maintaining the condition and function of trees within the woodland while protecting them from impacts of adjacent site alteration.

It is recommended that 10m buffers be established from the dripline boundaries of the FOD5-1 woodland edges on both properties facing the proposed extraction areas (Maps 3a and 3b). The recommended 10m buffer reflects the assumed significance of the woodland communities. The lands within these 10m buffer zones are currently in agricultural cultivation, resulting in relatively abrupt transitions between the agricultural fields and the woodland edges as well as ongoing disturbances caused by agricultural land use. The retention of these 10m zones as woodland buffer therefore provide the opportunity to allow for natural revegetation of these areas out from the existing woodland edges, supplemented through some native vegetation plantings, ultimately allowing for a more natural woodland edge transition, as discussed in Section 5.6. The integrity of these woodland edge areas will therefore be improved relative to their existing conditions.

Trees within the woodland edge will be maintained and protected by fencing as discussed below. As such, a 10m buffer from the dripline should adequately protect the woodland from aggregate extraction on the property.

The woodlands also provide SWH for Eastern Wood-Pewee and amphibian breeding habitat (on the Bonnefield property). As mentioned above, the woodland habitat will be maintained and a 10m buffer provided to exclude the removal of trees within this habitat.

Natural revegetation of the buffers with targeted plantings is expected to help buffer the more interior woodland and wetland areas from adjacent disturbances caused by aggregate extraction on the property (e.g., reducing woodland edge effects such as through additional visual screening for wildlife). It is concluded that the 10m setback will provide ample buffer to protect the form and function of the Significant Woodland.

The 10m woodland buffer boundary on the Prince property has not been extended along the edge of the off-site portion of the woodland, which corresponds to the east subject property boundary (Map 3a). As described above, it is understood that this off-site woodland area will be removed in conjunction with future expansion of the adjacent St. Mary's Kasaks Pit.

5.0 Impact Assessment

5.1 Description of the Proposed Undertaking

Strada Aggregates Inc. is filing license applications with the MNRF for an *Aggregate Resources Act* Category 3, "Class A" Pit Above Water license to undertake aggregate extraction on the Prince and Bonnefield lands that are under Strada's ownership. The provincial license would cover both properties and would jointly operate under the terms of an Operational Plan. The Prince and Bonnefield pits would be fully integrated with Strada's existing Melancthon Pits #1 and #2. This would include shared use of the scale and scale house, and refueling area currently located on the Melancthon Pit #1 property. The Prince and Bonnefield pits would be accessed via existing haulage routes on the Melancthon Pit #1 and #2, which would be integrated across the 3 licensed pit areas. Truck access to the proposed pits will be through the existing access at Melancthon Pit #1. The existing road accesses to the Prince and Bonnefield properties will only be maintained for agricultural purposes. The existing Prince property house will be retained and used as an office. The barn and other agricultural outbuildings on the Prince property will be removed, as will the house and shed on the Bonnefield property, to accommodate the pit operations. The setback at the common boundary between Melancthon Pit #2 and the Bonnefield property will be removed.

Aggregate within the Bonnefield and Prince pits will be extracted to a depth of no greater than 1.5m from the groundwater table, as per the proposed license conditions and in conformance with the existing licenses for the Melancthon Pits #1 and #2. Aggregate extraction will be spatially and temporally phased across the 2 subject properties, with extraction beginning on the Bonnefield property (identified as "Phase 4" when integrated with extraction plans for the Melancthon Pits #1 and #2, as shown on the Operational Sequencing Plan (MHBC 2017a)). Extraction will then occur within the southern third of the Prince property (Phase 5), followed by the middle-third and the northern third of the Prince property (Phases 6 and 7, respectively). See Appendix I for details of the Operational Sequence Plan and proposed extraction limits (MHBC 2017a). Each of the subject property extraction areas will be rehabilitated to an agricultural land use following completion of extraction operations in the future, as defined within the Site Rehabilitation

Plan. All of the Strada aggregate pits will be progressively rehabilitated, beginning with Melancthon Pits #1 and #2, in accordance with their approved Rehabilitation Plans.

5.2 Approach to Impact Assessment

Potential impacts arising from the proposed aggregate extraction are determined by comparing the details of the proposed undertaking with the characteristics of the existing natural features and their functions. Where the extraction limits overlap with the natural features or indirectly affect their functions, impacts may arise. The following is a description of the types of impacts which will be discussed.

- Direct impacts to the natural features within the subject properties associated with natural feature removal and associated effects on ecological function caused by the actual proposed 'footprint' of the undertaking, including impacts caused by the removal of features within the proposed extraction limits.
- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality, and effects of aggregate pit operation on the adjacent natural features.
- Cumulative impacts associated with the spatial and temporal implications of this proposal in conjunction with land uses on the surrounding properties.

5.3 Direct Impacts and Mitigations

5.3.1 Vegetation Removal

The proposed site plans have been designed to avoid direct impacts to the Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1) Significant Woodland communities on both subject properties by maintaining the extraction limits outside of the recommended 10m buffers from these feature boundaries (Maps 4a and 4b). These woodlands, including the wetland features within the Bonnefield property woodland, will therefore be retained in their current condition, while provision of the 10m buffer will allow for woodland edge restoration opportunities as described below.

The proposed extraction limits will require the removal of the White Pine Coniferous Plantation (CUP3-2) on the Prince property as well as the hedgerows and the Cultural Meadow (CUM) on the Bonnefield property. Various planted trees will also require removal, including on the lawn area surrounding the Bonnefield property house, along the tractor path on the Prince property and some tree removal to the rear of the Prince property house. Collectively, these areas do not represent ecologically sensitive or significant natural features, and do not contain federally, provincially or regionally significant vegetation species. These communities were observed to contain several non-native species indicative of ecologically disturbed conditions, or native species that are generally ubiquitous on the surrounding landscape. The removal of these features is not anticipated to represent a negative ecological impact relative to the woodland/wetland features to be retained on the properties.

5.3.2 Impacts to Wildlife and their Habitats

5.3.2.1 Barn Swallow Habitat

Two active Barn Swallow nests were observed in the Prince property barn, while 1 active nest was observed on the exterior of the Bonnefield property shed in 2016. Both of these structures will be removed as part of site preparation for aggregate extraction. However, the timing of site alteration on the Prince and Bonnefield properties is anticipated to be several years into the future. It is therefore recommended that updated Barn Swallow nest searches be completed around/in these structures closer to the timing of removal to verify the use and abundance of nesting Barn Swallows within these buildings.

Assuming these structures will continue to provide Barn Swallow nesting habitat in the future, they are considered to represent protected SAR habitat and their removal is prohibited under the ESA unless authorized by the MNRF. However, activities that would impact Barn Swallow habitat are exempt from ESA permitting requirements under Ontario Regulation 242/08 Section 23.5. Under this regulation, the proponent (Strada Aggregates or an assigned representative) must register the activity that would remove the Barn Swallow habitat by submitting a Notice of Activity to the MNRF. Before the habitat is removed a Barn Swallow Mitigation and Restoration Record must be prepared, which identifies the plan for mitigating impacts to the species and monitoring the

effectiveness of implemented measures. Since the existing habitats will be permanently removed, replacement nesting structures with nesting cups will be required to be installed prior to the start of the following nesting season (May 1) after the habitat was removed. Nesting structures may represent stand-alone wooden structures that provide the appropriate nesting conditions (e.g., horizontal ledges, rough vertical surfaces with a sheltered overhang; allowing unhindered entry/exit from nests, etc.). Alternatively, suitable structures that will continue to exist on the properties could be modified to provide suitable conditions for nest cups installed on the exterior of the building.

A minimum of 1 nest cup will need to be provided on the replacement habitat structure for each active Barn Swallow nest removed. The replacement nest cups must be monitored for a period of 3 years to record the number of individuals using the nests and structure. The monitoring information is to be documented in the Mitigation and Restoration Record report and submitted to the MNRF upon request. In order to avoid impacts to nesting Barn Swallows, the structures should be demolished outside the nesting period of May 1-July 31. See Appendix IX for an excerpt of O. Reg. 242/08 Section 23.5 pertaining to Barn Swallows.

5.3.2.2 Bobolink and Eastern Meadowlark Habitat

Because the regulatory protections afforded to Bobolink and Eastern Meadowlark are the same for both species, and because Bobolink habitat completely overlaps Eastern Meadowlark habitat on the Prince property, these species are addressed together for the purposes of the impact assessment and associated requirements under the ESA.

The proposed development will require the removal of 19.2ha of confirmed Bobolink/Eastern Meadowlark breeding habitat. This represents the entirety of suitable breeding habitat on the Prince property. Removal of this habitat, unless permitted by the MNRF, would represent a contravention of the ESA.

Since <30ha of habitat will be removed, it is understood that the proposed aggregate extraction on the subject properties would fall under the regulatory exemption from permitting that would otherwise be required under Section 17(2)(c) of the ESA. This regulatory permitting exemption is described under Section 23.6 of O. Reg. 242/08. The

activity that would cause the habitat removal (i.e., vegetation removal and site excavation) can proceed provided the following conditions are met:

- The activity that would cause the habitat removal is registered with the MNRF through submission of a Notice of Activity;
- A Habitat Management Plan is prepared, which outlines the requirements for compensation habitat creation/enhancement including habitat management requirements over a 5-year period;
- The Minister of Natural Resources and Forestry is provided a written undertaking which allows the MNRF to continue management of created/enhanced habitat over a period of up to 20 years, or until such time that the area of original habitat removal has been restored to suitable Bobolink and Eastern Meadowlark habitat.
- Retain a copy of the Habitat Management Plan for at least 5 years after the habitat removal activity is complete, and submit a copy to the MNRF upon request;
- Habitat removal is maintained outside the period May 1-July 31 of any year.
- Compensation habitat, comprising new habitat that is created for Bobolink/Eastern Meadowlark or existing habitat that is enhanced to meet Regulation specifications, is to be completed within 12 months of the commencement of the habitat removal activity.
- The compensation habitat must be managed and monitored according to the specifications of the Regulation for a period of 5 years

A central requirement of the habitat management plan is the identification of habitat compensation lands to be created or enhanced for use by Bobolink and Eastern Meadowlark. These lands must be larger in area than the habitat areas to be removed. Because the area of Bobolink/Eastern Meadowlark habitat removal totals 19.2ha, the compensation lands must be at least 20ha in size. The compensation lands can be located anywhere within provincial Ecoregion 6E, which roughly comprises all of south-central and eastern Ontario excluding the Greater Toronto Area and the southern Carolinian zone. The compensation lands can also comprise multiple individual parcels, provided that no individual parcel is <4ha in size or is <200m wide in any area. The compensation lands must be created or enhanced to contain a majority cover of grass species, and cannot be harvested, cut or mown during the period of April 1-July 31 of

any year. The compensation lands may also be used for livestock pasture subject to the conditions of the Regulation. Various other land management conditions must be met, as described in Ont. Reg. 242/08 Section 23.6. The proponent/landowner will have responsibility for undertaking management of the compensation lands for a period of 5 years post-habitat creation/enhancement. A text excerpt of Ont. Reg. 242/08 Section 23.6 has been included as Appendix X for reference.

As noted in Section 5.3.2.1, site alteration within these properties may be several years into the future. It is therefore recommended that an updated assessment of Bobolink and Eastern Meadowlark habitat be completed for the properties closer to the date of site alteration to determine whether further actions, as described above, are required.

5.3.2.3 Bank Swallow Habitat

The proposed site alterations will result in the removal of existing foraging habitat for the species. Information on Bank Swallow foraging habitat preferences in Ontario is limited (Falconer et al. 2016), although this species is known to forage over areas that are utilized by its aerial insect prey. It is anticipated that, as vegetatively sterile areas that usually lack natural water bodies, aggregate pits do not act as a source of insect prey and therefore do not provide important foraging habitat for Bank Swallows.

The extent of suitable foraging habitat protected under the ESA may be considered to extend up to 1km from the confirmed nesting colony location, which is consistent with the recommended Bank Swallow habitat regulation as stated in the Recovery Strategy (Falconer et al. 2016). When considering these spatial foraging areas around each of the 5 potential nesting sites, review of satellite imagery shows that the majority of these lands are used for agriculture. Suitable foraging habitat is therefore abundant on the surrounding landscape. New foraging habitat will be created as the pit properties are progressively returned to agricultural production during their rehabilitation stages. New nesting habitat will also likely be created as the new pits are developed on the Bonnefield and Prince properties, including in areas of the new pits that are adjacent to nearby agricultural foraging lands. The proposed undertaking is therefore not expected to cause a negative impact to Bank Swallows.

5.3.2.4 Other Wildlife Habitat

Potential bat SAR habitat, and confirmed SWH for woodland amphibian breeding and the SCC Eastern Wood-Pewee are all associated with the woodland and wetland areas of the properties that will be retained as part of the proposed site alterations. These features will not be directly impacted and will be protected through implementation of a 10m woodland buffer that will provide opportunity for woodland edge enhancement. The proposed aggregate extraction activities are not expected to negatively affect the significant habitat function provided by the retained woodland and wetland features. See Section 5.4.4 below for discussion regarding maintenance of the hydrological regime to continue supporting wetland habitat functions on the Bonnefield property.

Although the cavity trees located outside of the woodlands on the Prince and Bonnefield properties are not considered to represent significant habitat for SAR, use of these trees as temporary roosting habitat for male SAR bats cannot be ruled out. Therefore, in order to avoid potential injury, mortality or harassment of SAR bats that may use the trees, it is recommended that removal of these trees be timed to occur outside of the bat active season (i.e., outside of April 30-September 1) when they may be using these trees for habitat purposes. However, this timing may need to be confirmed with the MNRF. Note that the tree removal window should also avoid the migratory bird nesting period described below.

Other wildlife species observed within the subject properties, including bird species with evidence of probable breeding, are considered common with secure or apparently secure populations within Ontario (MNRF 2015a). Suitable habitat will continue to be provided for woodland-associated species that were observed within the deciduous forest communities on the properties, such as White-breasted Nuthatch (*Sitta carolinensis*), Least Flycatcher (*Empidomax minimus*), Yellow-rumped Warbler (*Dendroica coronata*), and Porcupine (*Erethizon dorsatum*). The majority of documented wildlife species were observed within the woodland communities that will be retained. A smaller number of wildlife species that are typically associated with open habitats, such as Eastern Kingbird (*Tyrannus tyrannus*) and Savannah Sparrow (*Passerculus sandwichensis*) will likely be displaced from the subject properties, although this will occur in stages as the agricultural fields are gradually removed in line with site extraction

phasing. However, suitable habitat for these species is abundant on the surrounding landscape, and will be restored once the pit lands are progressively rehabilitated to agricultural land uses. No impacts to local species populations are therefore anticipated.

The subject properties do not provide provincially significant wildlife movement corridors. The subject property natural features represent portions of a discontinuous corridor of woodland and wetland communities that extend between the Prince property in the north through to existing woodland and swamp habitat on/adjacent to the Melancthon Pit #1 property, and further south beyond County Road 17. These natural features do not provide a continuous wooded linkage. This fragmented pattern excludes the potential for larger landscape-level movement corridors for species that require moist or wooded habitats, such as amphibians. However, tolerant and mobile species such as deer may potentially move between these habitats by traversing open sections of agricultural lands that occur adjacent to these woodlands. The proposed aggregate extraction areas are outside of any potential landscape-level linkage that may occur; consequently no impacts to wildlife movement corridors are anticipated to occur.

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation clearing including trees, shrubs and ground vegetation should therefore occur outside the bird nesting season (April 15-August 15) so as to limit disturbances to nesting activities of birds within the open field/meadow habitats and isolated/hedgerow trees, and to avoid destruction of active nests. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*, 1994.

5.4 Indirect Impacts and Mitigations

The proposed aggregate extraction has potential to cause indirect impacts on the surrounding natural features and functions if not mitigated appropriately. Recommended mitigation measures are provided for each potential impact below.

5.4.1 Disturbance to Adjacent Natural Features and Wildlife Habitats

Vegetation clearing, topsoil stripping and subsequent aggregate extraction activities have the potential to inadvertently destroy, damage and degrade the edges of existing vegetation communities outside of the defined extraction limits unless the boundaries of those limits are clearly marked. By respecting the recommended 10m woodland buffers, inadvertent impacts to woodland edge tree root zones will be avoided. Furthermore, the lands within the 10m buffer zones are currently in active agricultural production with woodland edges set-back from the buffer limit. Therefore, potential for inadvertent damage to woodland edge trees is unlikely. Machinery should be maintained outside of the 10m buffer zones to avoid damage to woodland edge vegetation and to avoid soil compaction within tree rooting zones.

To limit ecological impacts during site excavation and to preserve the recommended woodland buffer, clearly defined license boundary limits will be demarcated with fencing.

Designated truck haul routes and areas equipment storage/staging, and materials stockpiling should not be located immediately adjacent to the retained woodland features and their buffers so as to limit potential to indirectly impact the adjacent natural features.

Potential indirect impacts to natural features and wildlife may also arise from noise, vibrations, human presence, artificial lighting and dust associated with construction activities.

During construction activities such as vegetation clearing and grubbing, dust can potentially result in the following:

- Changes in vegetation due to increased heat absorption and decreased transpiration,
- Immediate visual impacts.

Impacts due to dust should be mitigated for in accordance with prescribed conditions.

Aggregate extraction operations can cause disturbances to wildlife in adjacent natural features, such as through excessive noise, vibrations, artificial lighting and human

presence, if not appropriately mitigated. These impacts can be mitigated by incorporating time-of-day restrictions on extraction operations (e.g., no nighttime work). Artificial lighting should be shielded or directed away from adjacent natural features. The proposed spatial and temporal phasing of pit extraction within the 2 properties will lessen the extent and intensity of potential disturbances associated with the proposed activities, and with consideration for future rehabilitation of the older Melancthon Pits #1 and #2, the proposed undertaking is not expected to significantly impact local wildlife species.

Such impacts resulting from dust, noise, and vibrations are expected to be temporary, minimal and localized during the construction of the proposed development. Significant effects on wildlife are not anticipated and it is expected that displaced wildlife species will return to the vicinity of the subject properties following construction.

5.4.2 Sedimentation and Erosion

During topsoil stripping and grading of the site, areas of bare soil will be exposed which have the potential to erode and pollute adjacent natural features. In the event of a heavy rain, sediment laden runoff can enter adjacent natural areas by way of overland flow. In order to protect adjacent natural features from potential impacts due to sediment, a Sediment and Erosion Control Plan must be developed prior to any topsoil stripping activities on the site.

The following actions are recommended to limit potential for erosion and sedimentation from active excavation areas:

- installation of erosion control silt fencing along the limits of the 10m woodland buffers;
- inspection and monitoring of all erosion control measures by the site inspector, with repairs completed as required;
- operation and storage of all materials and equipment in a manner that prevents any deleterious substance from leaving the site;
- stripping and strategic placement of topsoil stockpiles away from natural feature boundaries to avoid potential for runoff into adjacent sensitive areas.

5.4.3 Water Quality Changes

An existing dedicated vehicle and equipment re-fueling area, located within the Melancthon Pit #1 site, will continue to be used. No vehicle/machinery refueling should be undertaken adjacent to the natural features or on areas of the pit floor that are within 1.5m of the groundwater table. See the Hydrogeological Assessment report (Whitewater Hydrogeology 2017) for additional recommendations to mitigate water quality impacts associated with the proposed aggregate site operation.

A spill response plan (SRP) should be developed and implemented as required under the *Aggregate Resources Act*.

Provided these measures are implemented, water quality impacts to the adjacent natural features are not anticipated.

5.4.4 Changes to Hydrologic Regime

5.4.4.1 Impacts to Groundwater Infiltration

A water balance analysis was completed by Whitewater Hydrogeology to ensure that the proposed pit excavations would not negatively impact the existing groundwater and surface water regimes that support natural feature form and function both within and outside of the subject property boundaries. As described in Section 3.1, the subject properties contain coarse soil types that promote rapid infiltration of stormwater. A pre-extraction water balance assessment of the subject properties determined that infiltration/groundwater recharge is the predominant hydrological path that stormwater follows when it reaches the ground as precipitation, is released as snowmelt, etc. (Whitewater Hydrogeology 2017). A smaller proportion runs-off, such as to the wetland at the rear of the Bonnefield property or off-property via drainage ditches. A summary of the pre-extraction infiltration rates and total volume of water recharging the groundwater regime was presented in Table 3 of the Hydrogeological Assessment report with which to compare post-extraction values.

Due to the removal of aggregate within the pits, which exposes highly permeable materials, flattens the slope of the land, and creates an internally drained system, the

volume of groundwater recharge is anticipated to be greater under the post-extraction condition than the pre-extraction condition (see Table 4). The proposed aggregate extraction will maintain or slightly enhance groundwater recharge volume across the pit floor by 4% (Whitewater Hydrogeology 2017). Therefore, anticipated changes to groundwater infiltration rates will not negatively affect the groundwater regime, such as by lowering the local groundwater table.

5.4.4.2 Impacts to Wetland and Vernal Pool

The Bonnefield property wetland and vernal pool are anticipated to be hydrologically perched above the shallow groundwater layer, which is consistent with wetlands located within 500m to the south on the Melancthon Pit #2 property. The groundwater elevations are at least 4m below the base of the wetland and vernal pool, indicating that these features are surface water-fed (Whitewater Hydrogeology 2017). Figure 12 of the Hydrogeological Assessment report delineates the approximately 17ha surface water catchment area that contributes drainage toward the Bonnefield property wetland and vernal pool. The proposed site alteration is expected to remove 1.3ha of this catchment area on the property, which corresponds to the far eastern end of the Bonnefield agricultural field that will fall within the extraction limits.

However, due to the highly permeable nature of the soils and the hummocky topography of the Bonnefield woodland feature, it is likely that the surface catchments surrounding the wetland and vernal pool are actually smaller than the outer catchment limit shown on Figure 12 of the Hydrogeological Assessment (Whitewater Hydrogeology 2017). It is therefore anticipated that precipitation that lands on the outer catchment area that is to be removed (i.e., the eastern end of the Bonnefield agricultural field) does not actually contribute surface water runoff to the wetland and vernal pool. Rather, it is expected that surface runoff generated from this location readily infiltrates into the soil along the surface flow path before reaching the wetland or vernal pool. This likelihood is supported by the lack of streams or other discernable surface water drainage features within the subject property woodland community. Due to the high permeability of the soils, surface water infiltrated within the Bonnefield agricultural field will move vertically as shallow groundwater recharge, rather than horizontally as shallow soil interflow that re-expresses within the wetland (Whitewater Hydrogeology 2017). Therefore, the

proposed removal of lands within the Bonnefield agricultural field is not expected to negatively affect the localized surface water catchments that sustain the Bonnefield property wetland and vernal pool. Based on the conservative catchment delineation approach, the majority (92%) of the surface water catchment will be maintained, while localized catchment areas immediately surrounding the wetland vernal pool will be protected and buffered within the retained woodland feature.

Based on the wetland water balance assessment results and knowledge of the local hydrogeological regime and soil types, the proposed undertaking is not expected to negatively impact the hydrological regime of the wetland, or by extension, the amphibian breeding SWH that it provides. Furthermore, if the wetland is used by Jefferson Salamander as breeding habitat, no impacts to the feature or to the surrounding terrestrial woodland community are anticipated.

5.4.4.3 Interference with Groundwater Flow

The license application for the proposed pits requires that aggregate be extracted to a depth of no greater than 1.5m above the groundwater table. The proposed aggregate extraction will therefore not interfere with the direction or flow of the existing shallow overburden groundwater regime. Furthermore, the small potential enhancement in pit floor infiltration is not expected to cause a measurable increase in water table elevation across this site, therefore not necessitating a water management or pit de-watering plan for the pits (Whitewater Hydrogeology 2017).

5.5 Cumulative Impacts

In order to evaluate the potential for cumulative impacts resulting from the proposed site alterations, it is necessary to look beyond the boundaries of the properties to the neighbouring lands. This approach looks at the character and potential changes that are occurring or may occur in the future on surrounding lands. Cumulative impacts may arise as a result of impacts from a number of sources adding up (or combining) if they overlap in space, overlap in time, occur at some receiver spatially removed from the undertaking, or at some future point in time. Cumulative impacts may also arise from

more than one development that may not actually overlap in time or space, but affects the same component of the ecosystem.

Of primary consideration in the assessment of cumulative impacts is the integrity of the subject property woodlands, the Bonnefield property wetland, and the habitat functions that they provide. The Prince property woodland extends on to adjacent properties to the north and east. The woodland area that falls within the property to the east is anticipated to be removed as part of the existing licensed St. Mary's Kasaks Pit. The portions of woodland that extend to the north and northeast are anticipated to remain intact as these lands are expected to continue in agricultural production. Therefore, the overall area of this woodland is expected to be reduced once off-site portions to the east are removed. Efforts have been made by the proponent to avoid impact to the Prince property woodland by retaining and buffering the feature from proposed aggregate extraction limits. Therefore, the proposed undertaking is not expected to cause direct cumulative impacts to this woodland despite anticipated future off-property impact to the feature.

Proposed pit creation and expansion to the west and east of the Prince property woodland (associated with the proposed undertaking and the extraction of the St. Mary's Pit, respectively) can potential cause cumulative impacts to the quality of the woodland as wildlife habitat due to increased sensory disturbances (e.g., noise, vibration, artificial light, proximal human activity) or habitat quality degradation (e.g., dust, erosion and sedimentation of low-lying features) if not appropriately mitigated. Recommendations have been made to effectively mitigate disturbance-related impacts to the woodland from the proposed Prince property pit creation as described in Section 5.4.1. It is anticipated that the existing St. Mary's Pit license is subject to similar mitigation considerations under the *Aggregate Resources Act* (e.g., dust suppression program, Erosion and Sediment Control Plan, time-of-day activity restrictions, etc.). The planned removal of a portion of the existing woodland on the St. Mary's Kasaks Pit property will result in temporary disturbances to wildlife within the woodland that may cause wildlife to temporarily avoid or reduce use of the feature. In combination with phased approach and mitigation measures proposed for the proposed Strada undertaking, and the temporary nature of the expected woodland removal disturbance on the adjacent St.

Mary's property, and with consideration for future rehabilitation of the adjacent Melancthon Pit #1 and #2 properties, long-term negative impacts to local wildlife species or their habitats is not anticipated.

The Bonnefield property woodland also extends off-property to the north (within Strada's ownership of the Melancthon Pit #1 property) and the east. Woodland on the Melancthon Pit #1 property has been retained outside of the extraction limits and will not be removed as part of future site use. The property to the east is expected to remain in agricultural production for the foreseeable future. Therefore, no direct impacts to this woodland are anticipated. Furthermore, no future impacts to the off-site surface water catchment sustaining the Bonnefield wetland are expected, such as through future excavation.

As the proposed pits will be maintained above the groundwater table, excavation of these sites will not contribute to alteration of groundwater flows or a lowering of the groundwater table that could impact downstream receivers. Furthermore, the proposed site alterations are expected to increase (by 4%) groundwater recharge volumes within the excavated pit floors. Annual operational-stage hydrogeological monitoring has demonstrated that Strada's existing Melancthon Pits #1 and #2 have not caused negative impacts to the groundwater table (Whitewater Hydrogeology 2017). Therefore, when considered with adjacent existing aggregate pit operations, the proposed site alterations will not cause cumulative impact to local groundwater resources or affect downstream receivers that rely on the existing groundwater regime.

5.6 Restoration and Enhancement of Natural Features

The 10m woodland buffers will be allowed to passively naturalize. Targeted native species plantings will be established to help facilitate natural re-growth within the buffers. These targeted plantings will be designed to complement the existing woodland community species composition. Ultimately, these buffer areas will develop into natural transition areas between the licensed pit area (to be restored to agriculture in future years) and the established woodland areas. This will help to enhance the integrity of the

existing woodland boundaries, which currently represent relatively abrupt interfaces between the agricultural fields and mature edge trees.

As a condition of the proposed pit license, the Prince and Bonnefield property pits will eventually be rehabilitated to agricultural production following the end of their pit lifespans. Restoration of pit license areas on these properties will be completed in accordance with the rehabilitation plan. Site rehabilitation may include opportunities to increase native tree cover on the properties to further enhance the existing woodland features and the local landscape connectivity. Planting plans should be coordinated and integrated across Strada's adjacent properties as they enter site rehabilitation stages over time. It is recommended that the rehabilitation plan include opportunities to enhance natural feature connectivity between the woodland and wetland communities located between the Prince, Melancthon Pit #1, Bonnefield, and Melancthon Pit #2 properties. This may be achieved through implementation of targeted native tree and shrub plantings according to a natural corridor plan, while allowing for natural regeneration from adjacent seed sources to gradually naturalize this feature over time. 3:1 pit sideslope areas, which will not be suitable for farming during the rehabilitation phase, will also be planted with native species and will effectively bulk up and connect with linkage plantings between the properties. See the planting area concept presented in Appendix XI (MHBC Planners 2017b). The resulting cross-property corridor will help further buffer the core woodland and wetland areas from adjacent agricultural land uses while enhancing wildlife habitat connectivity across features relative to the existing conditions. The long-term goal of this restoration plan would be to facilitate natural feature linkages and integration across properties that results in a locally significant woodland/wetland complex (through connectivity to existing deciduous swamp habitat on/adjacent to the Melancthon Pit #2 property and the internal Bonnefield property wetland) providing movement corridors and breeding habitat for a variety of species.

5.7 Monitoring

A monitoring program is required to ensure that protected natural features are not impacted as a result of the proposed site alterations and that recommended mitigation measures are functioning as intended. As described in Section 8.0 of the

Hydrogeological Assessment report, a compliance groundwater monitoring program has been proposed which continues ongoing monitoring activities on the Melancthon Pit #1 and #2 (initiated in 2001 and 2007, respectively) and the Prince and Bonnefield properties (initiated in 2017), while streamlining the program to reflect the operation as a single, integrated aggregate operation rather than as individual pits (Whitewater Hydrogeology 2017). The compliance groundwater monitoring program will continue to monitor background conditions (up-gradient locations) in both the overburden and bedrock aquifers as well as monitor potential impacts caused by the aggregate operation at down-gradient locations. Groundwater quality parameters would be measured from selected up-gradient wells to understand background conditions relative to down-gradient wells to identify potential water quality impacts as caused by the pit operations. See the Hydrogeological Assessment report for additional details of proposed water quality monitoring (Whitewater Hydrogeology 2017). Ongoing hydrogeological monitoring will also be completed in 2017 to further refine the seasonal (spring-based) high groundwater levels within the Prince and Bonnefield properties.

It is recommended that the Bonnefield wetland be added to the wetland water level monitoring program that is currently in place on the Melancthon Pit #2 site. This monitoring will be helpful to ensure that negative impacts to the wetland are not occurring that may be attributed to the aggregate pit operations. Wetland water level monitoring should be completed on a regular basis to ensure that hydrological impacts are not occurring. This should include pre-extraction stage water level monitoring to understand baseline conditions. Monitoring events should be seasonally timed to understand the hydroperiod of the wetland feature prior to and following aggregate extraction commencement. Surface water samples should also be collected on an annual basis for measurement of standard water quality parameters.

Amphibian breeding activity level monitoring should also be continued within the Bonnefield property wetland to monitor the biotic function of this feature as amphibian breeding SWH. Amphibian call monitoring, using the Marsh Monitoring Program protocol (BSC 2009), will build on NRSI results from 2016 and complement the hydrological monitoring. This approach is consistent with the approved monitoring program that has been implemented on the Melancthon Pit #2 property to monitor

surface water levels and breeding amphibians within the wetland communities on that property

5.7.1 Pre-Extraction

- Prior to building removal, Barn Swallow surveys to determine if nesting is continuing. Complete an updated assessment of Bobolink/Eastern Meadowlark habitat on the properties prior to site alteration. Based on results, register the impact of habitat removal with the MNRF as a Notice of Activity, and implement appropriate mitigation measures.
- Ensure birds and their nests are protected if vegetation removal is to occur in the nesting season.
- Ensure vegetation removal and building demolition is outside of bat active season.
- Amphibian monitoring to track continued presence of SWH Amphibian Breeding Habitat (woodland).

On-site inspections of the following are recommended to ensure proper installation:

- Extraction limit/buffer limit fencing.
- Sediment and erosion control measures according to a Sediment and Erosion Control Plan.

5.7.2 During Pit Operation

- Periodic monitoring of the above measures to ensure maintenance and effectiveness.
- Inspection of 10m woodland buffers to ensure no unauthorized vehicle encroachments, vegetation damage, or other disturbances.
- Inspection of buffer plantings to monitor success and determine if any replacements or re-planting is required.
- Biological and hydrological monitoring of the wetland as described above including wetland water levels and amphibian monitoring.

6.0 Summary

NRSI was retained by Strada Aggregates Inc. to complete a combined Level 1/Level 2 NEA and EIS for 2 proposed above-water table aggregate extraction pits located on Strada's Prince and Bonnefield properties in Melancthon Township. These proposed pits would be integrated with Strada's existing Melancthon Pits #1 and #2 located on adjacent lands. This report has been prepared in association with Strada's application for an *Aggregate Resources Act* Category 3 Class A Pit Above Water license that would apply to both pits. This report has also been prepared to meet requirements under the *Planning Act* and the NVCA's O. Reg. 172/06 to demonstrate that the proposed site alterations will not negatively impact the existing Natural Heritage System and NVCA-regulated features and ecological functions. This report provides a comprehensive characterization of the existing natural features on each subject property, and identifies significant and sensitive natural features and species habitats to inform the site extraction limits. Potential impacts to natural features and habitats were assessed based on site plan details provided by MHBC Planning and existing hydrogeological and soil characteristics provided by Whitewater Hydrogeology Ltd. Recommendations were provided to avoid, minimize or mitigate these impacts, including consideration for SAR mitigation requirements under O. Reg. 242/08.

Natural features on the subject properties are primarily comprised of Sugar Maple-dominated deciduous forest communities at the rear of each property, while the Bonnefield property also contains a shallow marsh inclusion and small vernal pool. An approximately 30-year old White Pine plantation is located in the southeast corner of the Prince property, while a centrally-located cultural meadow occurs centrally within the Bonnefield property. The Bonnefield property is subdivided into 3 separate agricultural fields by perimeter hedgerows, and isolated tree plantings on the Prince property are primarily located around the existing house and barn. Woodlands on the subject properties have been mapped as Significant Woodlands in the Township's Official Plan, and have been identified as components of the County's Preliminary Natural Heritage System as mapped in the County Official Plan. The deciduous woodland communities will be retained outside of the proposed aggregate extraction limits and for the purposes of this study have been assumed to represent Significant Woodland as mapped by the Township. 10m woodland buffers have been recommended to protect these features

and mitigate impacts from adjacent extraction activities while offering opportunity to restore and enhance the existing woodland edges.

The Bonnefield property wetland is an unevaluated feature. The wetland will be maintained within the Bonnefield property woodland and buffered by >30m from the proposed extraction limits.

The woodland and wetland communities were confirmed as woodland amphibian breeding (Bonnefield property only) and SCC Eastern Wood-Pewee breeding (both properties) SWH, while both property woodlands are considered potential bat SAR habitat. The proposed site alterations will not directly impact these SWH features. Based on field investigations, the small vernal pool is not considered a significant habitat feature.

Aggregate extraction within the subject properties will result in a 4% increase in groundwater recharge volume within the pit floors. As the pit floors will be maintained at least 1.5m above the water table, no negative effects on the groundwater table or overburden flow patterns within the subject property or at downstream receivers are anticipated. Aggregate extraction on the Bonnefield property will require removal of approximately 7.6% of the defined surface water catchment that sustains the wetland and vernal pool. However, it is expected that surface water runoff to these features are likely highly localized within the woodland community. Based on the proposed extraction limits, negative hydrological impact to the wetland and vernal pool, and their ecological functions, are not anticipated.

The proposed aggregate extraction will require removal of existing SAR Bobolink and Eastern Meadowlark breeding habitat (Prince property only), as well as nesting and foraging habitat for the SAR Barn Swallow (both properties). The proposed undertaking is exempt from ESA permitting requirements for these species under O. Reg. 242/08 provided that the requirements of the Regulation are met. Habitat removal activities must be registered with the MNRF through a Notice of Activity and Mitigation Plans must be prepared according to the Regulation. The Mitigation Plans must identify the means by which impacts to the species will be effectively mitigated, and describe the strategy

for habitat compensation, management and monitoring that is required by the Regulation. Although Bank Swallow foraging habitat will be removed through the proposed undertaking, due to anticipated creation of new nesting opportunities in the proposed pits and the abundance of foraging habitat on the surrounding landscape, no impacts to this species are anticipated.

Recommendations have been provided to avoid, minimize or otherwise mitigate impacts that may occur through creation of the aggregate pits on the properties. These include recommendations to mitigate direct and indirect impacts that may arise through the proposed site alterations. Recommendations have been provided to enhance the retained on-site woodland edges through establishment of native tree and shrub plantings within the woodland buffers. Monitoring recommendations have been provided to ensure that construction-stage mitigations are functioning appropriately and construction limits are being respected. A monitoring plan outline has also been proposed that continues ongoing hydrogeological monitoring on the subject properties and adjacent Strada pits, as well as water level and amphibian monitoring within the Bonnefield wetland community. The proposed undertaking is not anticipated to cause negative impacts to the existing natural features and their ecological functions provided that recommended mitigation measures are implemented and monitored.

6.1 Summary of Recommendations

The following is a summary of recommendations and mitigation measures that are to be incorporated into the Operational Plan for the proposed Prince and Bonnefield property pits:

- Implement 10m buffers from the retained woodland edges, which will be allowed to renaturalized and supplemented with targeted native species plantings. Machinery and materials must be maintained outside of the woodland buffers.
- Complete updated habitat assessments for the Species at Risk Barn Swallow, Bobolink and Eastern Meadowlark prior to site alteration. If it is determined that there is habitat for these species, habitat removal activities must be registered with the MNRF through a Notice of Activity and Mitigation Plans must be prepared according to the Regulation. The Mitigation Plans must identify the means by which impacts to the species will be effectively mitigated, and describe

the strategy for habitat compensation, management and monitoring that is required by the Regulation.

- All vegetation clearing shall occur outside of the bird nesting period April 15-August 15. Identified cavity trees shall be removed outside the bat active season (April 30-September 1) or as determined by the MNRF.
- Structures that may provide bat habitat shall be removed outside the bat active season (April 30-September 1) or as determined by the MNRF.
- Truck haul routes, and materials and soils stockpiling shall not be located immediately adjacent to the retained woodland features or their buffers.
- Dust impacts will be mitigated according to standard measures.
- Artificial lighting shall be shielded or directed away from adjacent natural features.
- Silt fencing shall be established along the limits of the 10m woodland buffers in accordance with an Erosion Sediment Control Plan.
- Inspect all Erosion Sediment Control measures according to an Erosion Sediment Control Plan and complete repairs when required.
- Operate and store all materials and equipment in a manner that prevents any deleterious substance from leaving the site.
- Vehicles and equipment must be re-fueled in the designated area away from the retained natural features and buffers.
- Develop and implement a Spill Response Plan as required under the *Aggregate Resources Act*.
- Develop and implement a monitoring program, pre- and during extraction operations, that includes the following components:
    - Groundwater monitoring in conjunction with ongoing monitoring at the Melancthon Pit #1 and #2 sites;
    - Surface water level monitoring and amphibian breeding monitoring within the Bonnefield property wetland, in conjunction with ongoing monitoring at Melancthon Pit #2;
    - Inspect the woodland buffers during pit operation to ensure disturbances are not occurring; and,
    - Inspect the health and survival of buffer plantings.

7.0 References

Bird Studies Canada (BSC). 2001. Guide for Participants. Atlas Management Board, Federation of Ontario Naturalists, Don Mills.

Bird Studies Canada (BSC), Environment Canada's Canadian Wildlife Service, Ontario Nature, Ontario Field Ornithologists and Ontario Ministry of Natural Resources. 2008. Ontario Breeding Bird Atlas Database. http://www.birdsontario.org/atlas/aboutdata.jsp?lang=en

Bird Studies Canada (BSC). 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. 2009 Edition. Published by Bird Studies Canada in Cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

Buck, G. 2012. Email Correspondence from Graham Buck, Species at Risk Biologist, Ontario Ministry of Natural Resources, Guelph District. June 29, 2012.

Committee for the Status on Endangered Wildlife in Canada (COSEWIC). 2016. Canadian Wildlife Species at Risk. http://www.cosewic.gc.ca/eng/sct1/searchdetail_e.cfm. Last updated Nov. 4, 2016.

County of Dufferin. 2015. Dufferin County Official Plan. County Council Adopted: September 11, 2014. MMAH Approved: March 27, 2015.

Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Don Mills, Federation of Ontario Naturalists.

Environment Canada. 2015. Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. ix + 1 10 pp.

Falconer, M., K. Richardson, A. Heagy, D. Tozer, B. Stewart, J. McCracken and R. Reid. 2016. Recovery Strategy for the Bank Swallow (*Riparia riparia*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. ix+70pp.

Government of Canada. 2017. Species at Risk Public Registry. Last updated Mar. 8, 2017. http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1

Heagy, A., D. Badzinski, D. Bradley, M. Falconer, J. McCracken, R.A. Reid and K. Richardson. 2014. Draft. Recovery Strategy for the Barn Swallow (*Hirundo rustica*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vii+64pp.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

MacNaughton, A., R. Layberry, C. Jones and B. Edwards. 2016. Ontario Butterfly Atlas Online. Last Updated January 2016.

McCarty, John P. 1996. Eastern Wood-Pewee (*Contopus virens*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online.

McCracken. J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier. 2013. Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 88pp.

MHBC Planners. 2017a. Sequence of Operations. Prepared for Strada Aggregates Inc.

MHBC Planners. 2017b. Conceptual Planting Areas. Prepared for Strada Aggregates Inc.

Natural Resource Solutions Inc. (NRSI). 2008. Natural Environment Level 1 Assessment. Strada Aggregates Inc., Melancthon Pit. Prepared for Strada Aggregates Inc. January 28, 2008.

Natural Resource Solutions Inc. (NRSI). 2010. Melancthon Pit Natural Environment Level 2 Assessment. Prepared for Strada Aggregates Inc. January 2010.

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

Ontario Ministry of Municipal Affairs and Housing (OMMAH). 2014. Provincial Policy Statement. Queen's Printer for Ontario, 2014.

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. October 2000.

Ontario Ministry of Natural Resources (OMNR). 2010. Natural Heritage Reference Manual for Policies of the Provincial Policy Statement, Second Edition. March 18, 2010.

Ontario Ministry of Natural Resources (OMNR). 2011a. Bats and Bat Habitats Guidelines for Wind Power Projects. July 2011.

Ontario Ministry of Natural Resources (OMNR). 2011b. Significant Wildlife Habitat Mitigation Support Tool. Version 4.0. April 2011.

Ontario Ministry of Natural Resources and Forestry. 2014. Ontario Wetland Evaluation System. Southern Manual. 3rd Edition, Version 3.3. 2014

Ontario Ministry of Natural Resources and Forestry (MNRF). 2014b. Use of Buildings and Isolated Trees by Species at Risk Bats. Survey Methodology. Ontario Ministry of Natural Resources and Forestry, Guelph District. October 2014.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2015a. Natural Heritage Information Centre (NHIC): Biodiversity Explorer, Land Information Ontario.

Ontario Ministry of Natural Resources (MNRF). 2015b. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January 2015.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2015c. Bobolink/Eastern Meadowlark Survey Methodology. Ontario Ministry of Natural Resources and Forestry, Aurora District.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2016a. Ontario Odonata Atlas Database. Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry. Species list from atlas square 17NJ68 queried on Dec 13, 2016 by R. Craig.

Ontario Ministry of Natural Resources (MNRF). 2016b. Species at Risk in Ontario (SARO) List. Last updated June 20, 2016. http://www.ontario.ca/environment-and-energy/species-risk-ontario-list

Ontario Ministry of Natural Resources and Forestry (MNRF). 2016c. Bat and Bat Habitat Surveys of Treed Habitats. Ministry of Natural Resources and Forestry – Guelph District. Updated: August 2016.

Ontario Ministry of Natural Resources and Forestry (MNRF). Undated (a). General Habitat Description for the Barn Swallow (*Hirundo rustica*).

Ontario Ministry of Natural Resources and Forestry (MNRF). Undated (b). General Habitat Description for the Bobolink (*Dolichonyx oryzivorus*).

Ontario Ministry of Natural Resources and Forestry (MNRF). Undated (c). General Habitat Description for the Eastern Meadowlark (*Sturnella magna*).

Ontario Nature. 2015. Reptiles and Amphibians of Ontario Range Maps. Last Updated June 2015. http://www.ontarioinsects.org/herpatlas/herp_online.html.

Riley, J.L. 1989. Distribution and status of the vascualr plants of Central Region. Ontario Ministry of Natural Resources. Parks and Recreational Areas Section, OMNR, Open File Ecological Report SR8902, Central Region, Richmond Hill, Ontario. Xix + 110 pages.

Township of Melancthon. 2014. Township of Melancthon Official Plan. August 2014.

Whitewater Hydrogeology Ltd. 2017. Combined Level 1 and 2 Hydrogeological Assessment, Proposed Bonnefield and Prince Pits. Draft. Prepared for Strada Aggregates. January 2017.

MAPS

560400 560800 561200 561600 562000 562400

4888800 4888400 4888000 4887600

Prince Property

Strada Melancthon Pit #1 (Operational)

Bonnefield Property

Strada Melancthon Pit #2 (Operational)

4TH LINE

3RD LINE

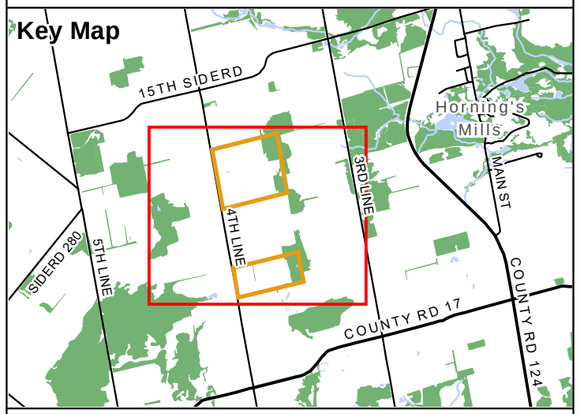
Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map1_StudyArea_7K_2017_03_09_OL.mxd

Map 1

Prince and Bonnefield Properties NEA

Study Area

Key Map



Legend

- Subject Property
- Significant Woodland - Melancthon Township
- Coniferous Plantation
- Removed (Approximate)
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Wetland (Non-PSW) - MNRF

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: March 9, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:7,000

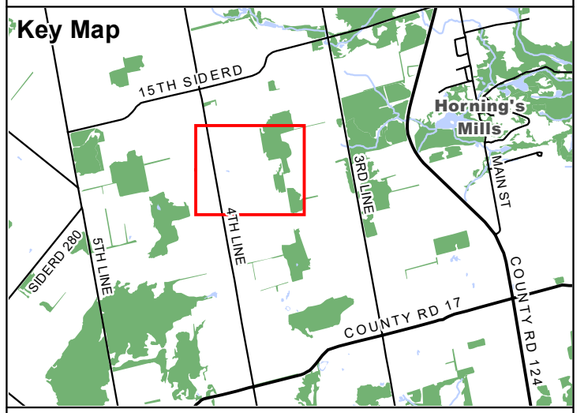
N

0 100 200 300 400 Metres

Map 2a

Prince and Bonnefield Properties NEA

Vegetation Communities



Legend

- Subject Property
- Barn Swallow Point Count Location (BARS)
- Rock Pile
- Bobolink/Eastern Meadowlark Transect and Point Count Locations (BB)
- Bat Cavity Tree Transect Path
- Comprehensive Cavity Tree Search Area
- Ecological Land Classification (ELC)

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: March 9, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:3,500

0 50 100 150 200 Metres

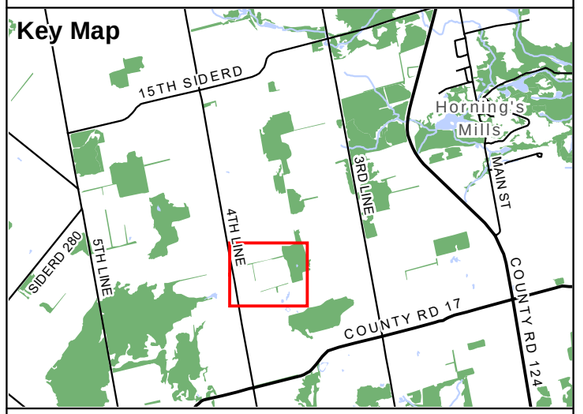
N

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map2a_PrinceELC_4K_2017_03_09_OL.mxd

Map 2b

Prince and Bonnefield Properties NEA

Vegetation Communities



Legend

- Subject Property
- Barn Swallow Point Count Location (BARS)
- Amphibian Survey Station
- Rock Pile
- Bobolink/Eastern Meadowlark Transect and Point Count Locations (BB)
- Bat Cavity Tree Transect Path
- Comprehensive Cavity Tree Search Area
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

(MAS) Shallow Marsh

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: March 13, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:2,500

0 40 80 120 160 Metres

N

561200 561400 561600 561800

4887800 4887600 4887400

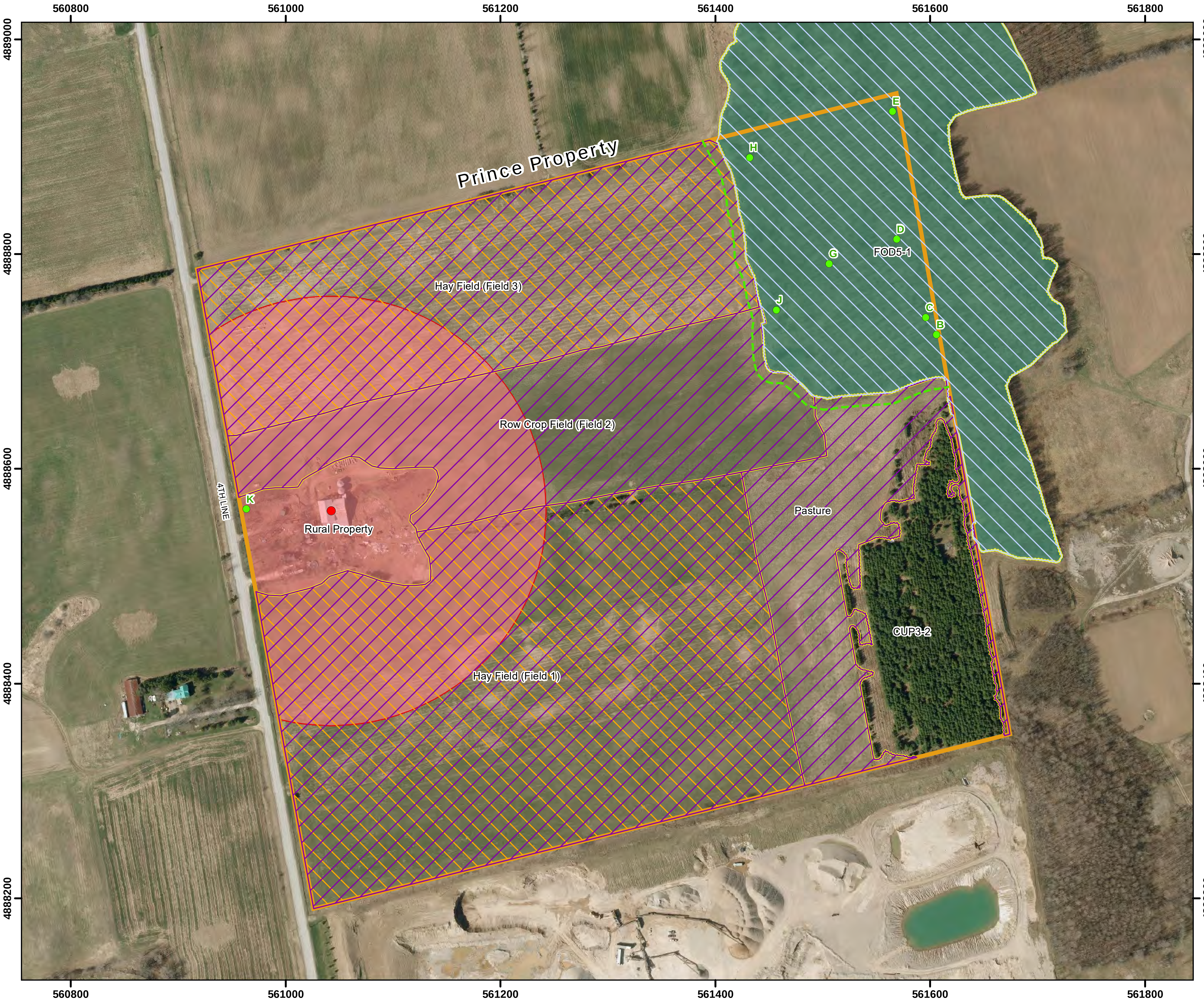
Bonnefield Property
Hedgerow
FOD5-1
MAS
CUP3-2
CUM
Winter Wheat Field
Rural Property
BARS-002
4TH LINE
BB-07
BB-08
BB-09
BB-10
BB-11

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map2b_BonnefieldELC_3K_2017_03_09_OL.mxd

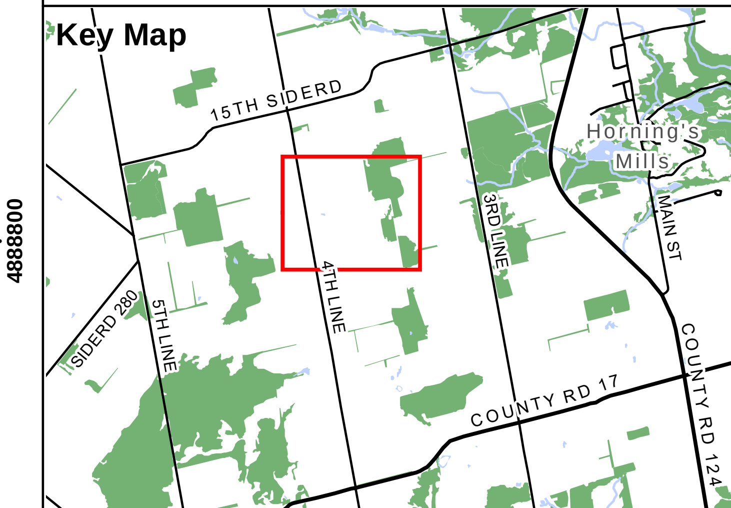
Map 3a

Prince and Bonnefield Properties NEA

Natural Environment Constraints



Key Map



Legend

- Subject Property
- 10m Woodland Buffer
- Bat Cavity Tree
- Barn Swallow Nesting Location
- Barn Swallow Foraging Habitat
- Bank Swallow Foraging Habitat
- Bobolink/Eastern Meadowlark Habitat
- Potential Bat SAR Habitat
- Eastern Wood-Pewee SWH
- Ecological Land Classification (ELC)

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: March 13, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:3,500

0 50 100 150 200 Metres

N

561200 561400 561600 561800

4887800 4887600 4887400

Bonnefield Property

Hedgerow

MAS

FOD5-1

CUP3-2

CUM

Winter Wheat Field

Rural Property

4TH LINE

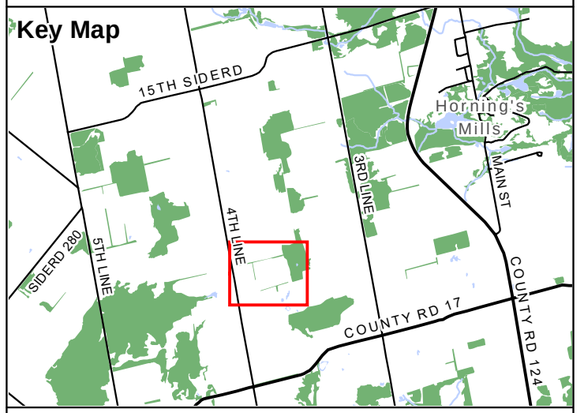
A B C D E F G

Map 3b

Prince and Bonnefield Properties NEA

Natural Environment Constraints

Key Map



Legend

- Subject Property
- 10m Woodland Buffer
- Vernal Pool
- Bat Cavity Tree
- Barn Swallow Nesting Location
- Barn Swallow Foraging Habitat
- Bank Swallow Foraging Habitat
- Potential Bat SAR Habitat
- Eastern Wood-Pewee SWH
- Woodland Amphibian Breeding Habitat SWH (Confirmed)
- Unevaluated Wetland
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

(MAS) Shallow Marsh

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: March 13, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:2,500

0 40 80 120 160 Metres

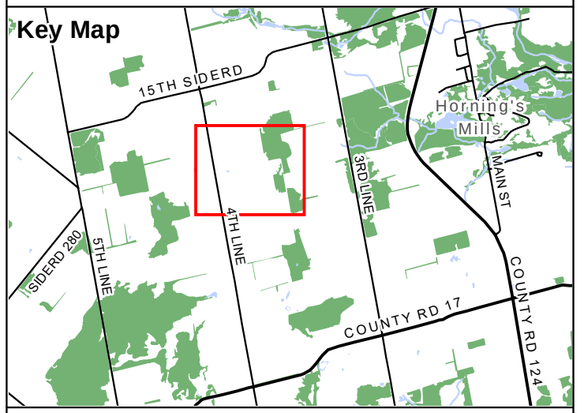
N

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map3b_BonnefieldEnvConstraints_3K_2017_03_13_OL.mxd

Map 4a

Prince and Bonnefield Properties NEA

Proposed Site Plan



Legend

- Subject Property
- Extraction Limit
- 10m Woodland Buffer
- Retained House
- Ecological Land Classification (ELC)

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: May 5, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:3,500

0 50 100 150 200 Metres

N

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map4a_PrincePropSitePlan_4K_2017_05_05_JAS.mxd

Map 4b

Prince and Bonnefield Properties NEA

Proposed Site Plan

561200 561400 561600 561800

4887800 4887600 4887400

Bonnefield Property

General Location of Existing Entrance

Hedgerow

FOD5-1

MAS

CUP3-2

CUM

Phase 4

Winter Wheat Field

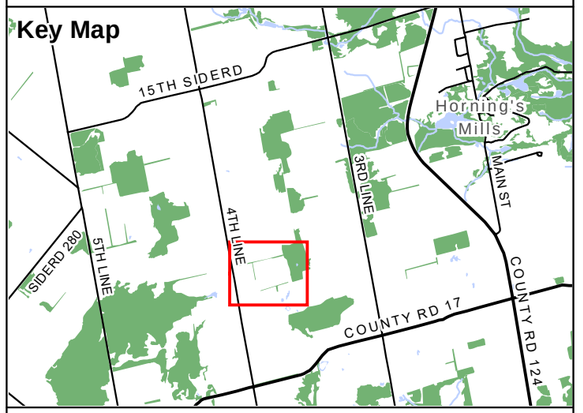
Rural Property

4TH LINE

Existing Entrance

General Direction of Excavation

Key Map



Legend

- Subject Property
- Extraction Limit
- 10m Woodland Buffer
- Vernal Pool
- Eastern Wood-Pewee SWH
- Unevaluated Wetland
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

(MAS) Shallow Marsh

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: May 8, 2017

NAD83 - UTM Zone 17
Size: 11x17"
1:2,500

0 40 80 120 160 Metres

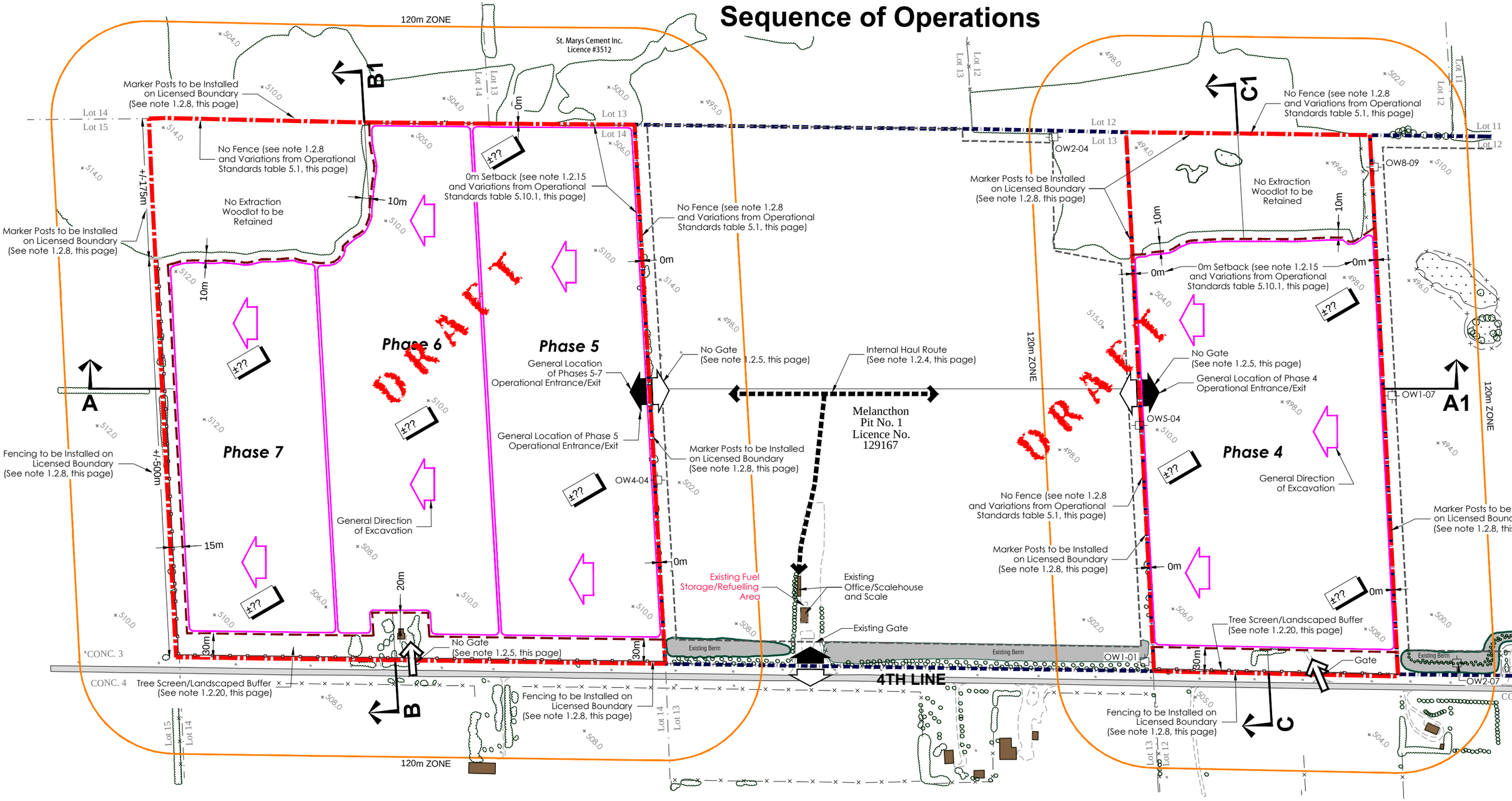
N

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map4b_BonnefieldSitePlan_3K_2017_05_08_JAS.mxd

APPENDIX I

Site Plan and Sequence of Operations (MHBC 2017)

Sequence of Operations



APPENDIX II

EIS/NEA Terms of Reference and NVCA Comments

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

1748

July 4, 2016

Kim Benner
Ontario Ministry of Natural Resources and Forestry, Midhurst District
2284 Nursery Road
Midhurst, Ontario L0L 1X0

Dear Ms. Benner,

Re: Proposed Strada Aggregate Pit Developments; Prince and Bonnefield Properties
4th Line, Melancthon Township
Terms of Reference for Natural Environment Assessment/Environmental Impact Study

On behalf of Natural Resource Solutions Inc. (NRSI) I am pleased to provide the following Terms of Reference (TOR) for Level 1 and 2 Natural Environment Assessment (NEA) studies for two properties that are proposed for future above-water table aggregate extraction by Strada Aggregates Inc. The two properties, referred to as the Prince and Bonnefield properties, are currently privately owned but are expected to be purchased by Strada Aggregates in the near future for aggregate development. Both properties are located adjacent to existing Strada-owned licensed properties currently used for aggregate extraction (see Map 1).

Background
Level 1 and 2 NEA reporting is required for each of these properties as part of an application under the provincial *Aggregate Resources Act*. In order to address the requirements of the *Planning Act*, these reports will also be completed to satisfy the County, Township and Nottawasaga Valley Conservation Authority (NVCA) requirements for an Environmental Impact Study (EIS). The results of these Level 1 and 2 studies will be integrated into a single report for both of these properties collectively as they will be submitted as a single license application. The requirement for a Level 2 study for each property is based on the known presence of woodland on each of these properties including features mapped as Significant Woodland in the Township Official Plan (Township of Melancthon 2014). Unevaluated wetland has also been identified by NRSI within the Bonnefield property through initial site investigations (see below).

The properties are primarily active agricultural lands with farm buildings, but contain woodlands at the rear of each property. The wooded natural features on both properties are included in the study area. The limit of aggregate extraction on the subject properties is to be determined based on the results of natural feature constraint analyses and impact assessments completed in the NEA/EIS and any other constraints. Existing structures on both properties will be removed as part of the development, with the exception of the Prince property house, which will be retained. Road access to both properties will be via Strada Aggregates' existing Melancthon Pit #1. Aggregate

extraction will be maintained above the water table on both properties and is subject to hydrogeological studies to be completed by Whitewater Hydrogeology Ltd.

Planning Context

Schedule E1 of the Dufferin County Official Plan identifies the subject properties as containing woodlands that are part of the County's Preliminary Natural Heritage System (Dufferin County 2015). Schedule A-5 of the Melancthon Township Official Plan identifies the subject properties as containing lands designated Environmental Protection. Schedule E of the Township Official Plan further maps the presence of Significant Woodland on and adjacent to the Prince and Bonnefield properties (Township of Melancthon 2014). However, Township Significant Woodland mapping is based on a size criterion (woodlands >20ha) which was likely determined through desktop-level mapping exercises. This study includes a refined assessment of woodland significance on each subject property based on County and Township policies and criteria. For example, it is known that an off-site portion of the Prince property woodland is located within a licensed aggregate site and will be removed. The woodland limits will be assessed and mapped to clarify the size, as one component of the significance analysis. County and Township Official Plan policies prohibit development or site alteration within Significant Woodlands unless it can be demonstrated through an EIS that no negative impacts to the natural features or their ecological functions will occur.

In addition to woodlands, the Bonnefield property contains an unevaluated wetland feature that is regulated by the NVCA. Development and site alteration within non-provincially significant wetlands is prohibited under County and Township policies unless it can be demonstrated that no negative impacts to the feature or its ecological functions will result, in conjunction with the NVCA.

Due to the presence of natural features on the subject properties, NRSI was retained by MHBC, on behalf of Strada Aggregates, to undertake the combined Level 1/2 NEA studies and EIS for both properties in conformance with requirements of the *Aggregate Resources Act*, *Planning Act*, and applicable regulatory policies.

Completed Field Work

Prior to preparation of this TOR, various field surveys were undertaken by NRSI to meet seasonally-based timing requirements. Surveys completed to date are listed in Table 1 and were carried on both properties concurrently unless otherwise indicated.

Table 1. Field Surveys Completed To Date As Of Draft Terms of Reference Submission

Survey Type	Protocol	Date
Ecological Land Classification	Lee et al. (1998)	April 21, 2016; June 8, 2016
Amphibian Call Surveys	BSC 2009	April 21, 2016; May 24, 2016
Vegetation Inventories	Comprehensive search by ELC polygon	April 21, 2016; June 8, 2016
Snake Emergence Surveys	Comprehensive search of identified potential hibernaculum habitat	May 5, 2016; May 9, 2016; May 10, 2016
Breeding Bird Surveys/Bobolink and Eastern Meadowlark Surveys	BSC 2001	June 8, 2016; June 20, 2016
Bat Cavity Tree Assessment	OMNR 2011a	April 21, 2016; May 5, 2016

The approach to this study considers the results of background review and field surveys completed to date by NRSI. This approach includes the following:

- Completion of background review and information requests;
- Assessment of field survey results and natural feature characterization;
- Determination of the significance and sensitivity of study area natural features and functions, and confirmation of natural environment constraints;
- Impact assessment and recommendation of measures to avoid, minimize or mitigate these impacts.

Proposed Strada Aggregate Pit Developments
Prince and Bonnefield Properties
4th Line, Melancthon Township
Natural Environment Assessment/Environmental Impact Study
Terms of Reference
July 4, 2016

Subject Properties and Existing Natural Features

The subject properties are located on 4th Line, Melancthon Township, and are immediately north (Prince property) and south (Bonnefield property) of Strada Aggregates' operational Melancthon Pit #1. Strada Aggregates' operational Melancthon Pit #2/Shelburne South Pit is located immediately south of the Bonnefield property. Both properties are dominated by actively cultivated agricultural fields and contain rural residences and associated barns/outbuildings. In 2016, the Prince property fields are cultivated for hay as well as lands used for livestock pasture. The Bonnefield property agricultural fields contain winter wheat in 2016 (Map 2a, 2b). Note that the Bonnefield property was previously referred to as the "Garner" property; the former property name is still shown on the attached maps but subsequent report mapping will refer to this property as the "Bonnefield" property.

Vegetation community mapping was completed by NRSI using Ecological Land Classification (ELC) (Lee et al. 1998) as described below. The Prince property contains two distinct woodlands at the rear of the property that are separated by a distance of >20m (excluding woodland on the adjacent property to the east which will be removed for future aggregate extraction). The northeast property corner contains Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1) characterized with uneven, rolling terrain, which extends off-property to the north and east. As noted, the off-property portion of this community to the east falls within licensed aggregate extraction limits and will be removed. The southeast portion of the property contains a relatively young (approximately 30-year old) homogeneous White Pine (*Pinus strobus*) plantation (CUP3-2) (Map 2a).

The east end of the Bonnefield property contains a Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1), with smaller inclusions of White Pine coniferous plantation (CUP3-2). This woodland also contains a wetland feature characterized as a Shallow Marsh (MAS) within the interior. Deciduous forest on the Bonnefield property is relatively younger than that of the Prince property. Agricultural areas on the property are bordered by narrow deciduous hedgerows (Map 2b).

Background Review

In order to determine a study approach, existing natural heritage information was gathered and reviewed to identify key natural heritage features and species that are known, or have the potential to occur within the subject properties and the adjacent natural habitats within 1km. The following background information sources have been reviewed or consulted.

- NVCA;
- MNRF, Midhurst District;
- Natural Heritage Information Centre database (MNRF 2014);
- Dufferin County Official Plan;
- Melancthon Township Official Plan;

- Ontario Breeding Bird Atlas (Bird Studies Canada et al. 2008);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2015);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (TEA 2015),
- Ontario Odonata Atlas (OMNR 2005); and,
- Previous NRSI reporting for the immediate study area vicinity, including the Melancthon Pit #2 Level 1 and 2 NEA Reports (NRSI 2008, 2010).

Background information requests were submitted to the NVCA and MNRF Midhurst District office on May 17, 2016. At the time of writing these information requests are still pending a response.

This background information will be compiled and integrated with NRSI field survey data to inform the characterization of each subject property's natural features.

Significant Species Screening

SAR are those listed on the Species at Risk in Ontario List (MNRF 2016). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed as Endangered or Threatened are protected by the *Endangered Species Act*, 2007, which includes protection to their habitat.

Based on the results of preliminary background information review, SAR with occurrence records within 10km of the subject property were identified. Based on the habitat preferences/requirements for these species (e.g., OMNR 2000) and an assessment of existing subject property habitat features based on initial NRSI site investigations, a screening for suitable habitats was completed for each subject property. Note that this preliminary review and screening may be updated based on input provided by the MNRF Midhurst District or other information sources. This preliminary screening information further informed the surveys required as part of the EIS scope, described below.

Based on the results of the preliminary screening, the following SAR were identified as having potential for suitable habitat on one or both subject properties:

- Chimney Swift (*Chaetura pelagica*) – provincially and federally Threatened
- Eastern Wood-Pewee (*Contopus virens*) – provincial species of Special Concern; designated Special Concern nationally by COSEWIC
- Bobolink (*Dolichonyx oryzivorus*) – provincially Threatened; designated nationally Threatened by COSEWIC
- Barn Swallow (*Hirundo rustica*) - provincially Threatened; designated nationally Threatened by COSEWIC
- Wood Thrush (*Hylocichla mustelina*) – provincial species of Special Concern; designated nationally Threatened by COSEWIC
- Bank Swallow (*Riparia riparia*) (foraging habitat only) – provincially Threatened; designated nationally Threatened by COSEWIC
- Eastern Meadowlark (*Sturnella magna*) - provincially Threatened; designated nationally Threatened by COSEWIC
- Eastern Milksnake (*Lampropeltis taylori triangulum*) – provincial and federal species of Special Concern
- Western Chorus Frog (*Pseudacris triseriata*) (Great Lakes/St. Lawrence – Canadian Shield Population) (*Bonnefield property only*) – federally Threatened

- Little Brown Myotis (*Myotis lucifugus*) – provincially and federally Endangered
- Northern Myotis (*Myotis septentrionalis*) – provincially and federally Endangered

The results of this screening are provided in Appendix I of this TOR. See below for preliminary results assessing the presence of these SAR on the subject properties.

Significant Wildlife Habitat Screening

A preliminary screening for the presence of Significant Wildlife Habitat (SWH) was also completed for the subject properties. The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNRF considers significant in Ontario as well as criteria to identify these habitats for Ecoregion 6E (OMNR 2000, MNRF 2015a). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of Species of Conservation Concern (SCC), and animal movement corridors. SCC are defined as including the following:

- species designated provincially as Special Concern,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre, and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO. These species are protected by the federal *Species at Risk Act* but not provincially by the *Endangered Species Act*.

The results of the SWH screening have informed surveys required to confirm such habitat within or adjacent to the subject properties.

Based on the results of this preliminary screening exercise, the following SWH types were initially considered Candidate SWH for one or both of the subject properties and will be further assessed through the field work and analysis in the NEA/EIS:

- Bat Maternity Colonies
- Snake Hibernaculum
- Turtle Nesting Area (*Bonnefield property only*)
- Seeps and Springs
- Amphibian Breeding Habitat (Woodland) (*Bonnefield property only*)
- Terrestrial Crayfish (*Bonnefield property only*)
- Habitat for Special Concern and Rare Wildlife

See below for preliminary results assessing the presence of candidate or confirmed SWH on the subject properties. Appendix II provides the preliminary SWH assessment for the subject properties based on the results of desktop- and field-based investigation completed to date.

Field Survey Methodology and Preliminary Findings

Field surveys were initiated in April 2016 and will continue through to August 2016 to adequately characterize the subject properties' natural features and ecological functions for the purposes of the NEA/EIS. The following is a description of the surveys that have been or will be conducted, as well as preliminary findings derived from those surveys:

Vegetation Community Characterization

A desktop-level vegetation community delineation using the ELC system for southern Ontario (Lee et al. 1998) was initially completed based on aerial photo interpretation and the results of previous NRSI characterization of natural features within the

subject property vicinity (NRSI 2008). ELC mapping was ground-truthed and refined through field-based investigation completed on April 21 and June 8, 2016. Vegetation community characterization included comprehensive spring-based vegetation inventories of each ELC polygon as well as surficial soil sampling. See Maps 2a and 2b for the results of vegetation community mapping of the subject properties.

Vascular Flora Inventories

A two-season vegetation inventory will be conducted to record all species of vascular flora within the subject properties. A spring-based vegetation inventory was completed during site visits on April 21 and June 8, 2016. A follow-up summer-based inventory will be completed during August 2016. During these site investigations the subject properties' natural features will be comprehensively searched for plant species and any rare species or vegetation communities and their location(s) will be recorded with a handheld GPS unit.

To date, no federally or provincially significant vegetation species have been identified within the subject properties.

Bat Cavity Tree Assessments

The SAR bats Little Brown Myotis and Northern Myotis have provincial population ranges that extend into the subject property vicinity (Naughton 2012). These species all use cavities in large diameter trees for roosting or raising their young. A comprehensive search of all trees >10cm diameter-at-breast-height (DBH) on each subject property was completed to identify any trees that provide suitable roosting or maternity colony habitat. Although the MNRF guidance document *Bats and Bat Habitats: Guidelines for Wind Power Projects, July 2011* (OMNR 2011) specifies trees ≥25 cm DBH, all trees ≥10 cm DBH were scanned for cavities as a means of thoroughly searching for any potential bat habitat.

Trees were inspected for features (e.g., cavities, crevices) that provide suitable maternity colony/roosting habitat for bats based on guidelines provided by the MNRF (OMNR 2011). The cavity tree inspection was completed by staff familiar with the MNRF bat habitat assessment guidelines. All observed cavity trees were flagged with flagging tape, georeferenced with a hand-held GPS unit, photographed, and described on standardized field forms (e.g., DBH, tree height, tree species, percent canopy cover). In addition, the cavities themselves were described, including the number of cavities per tree, and height above ground.

The cavity tree assessment was completed by undertaking systematic transect searches within the FOD5-1 forest communities on each property, while hedgerows and other isolated trees on the subject properties were comprehensively searched. Only the on-property portions of each woodland were targeted for the assessment. Woodland transects were spaced approximately 25m apart, and trees within the intervening areas were searched for the presence of suitable bat habitat features. See Maps 2a and 2b for the location of woodland transects and comprehensive area search locations on each subject property.

As shown on Map 3a, 8 suitable cavity trees were identified on the Prince property, including 7 within the FOD5-1 community and 1 near the roadside adjacent to the house. As shown on Map 3b, 6 suitable cavity trees were identified on the Bonnefield

property, including 4 the within the relatively young FOD5-1 community and 2 within property hedgerows.

The portion of the FOD5-1 woodland that falls within the Prince property boundaries totals 4.16ha. Cavity tree density within the FOD5-1 woodland on the Prince property therefore equals 1.68 cavity trees/ha. This density falls below the threshold of 10 suitable wildlife trees/ha that are required to be considered candidate Bat Maternity Colony SWH (MNRF 2015a). The portion of the FOD5-1 woodland that falls within the Bonnefield property totals 2.79ha. Cavity tree density within the FOD5-1 woodland on the Bonnefield property therefore equals 1.43 cavity trees/ha. Cavity tree density in the Bonnefield property woodland therefore also falls below the threshold to be considered candidate Bat Maternity Colony SWH (MNRF 2015a).

Due to the presence of suitable bat maternity colony/roosting trees within each subject property FOD5-1 woodland, NRSI consulted with MNRF Midhurst District staff during the meeting of June 14, 2016 on whether these woodland features should be considered to contain potential bat SAR habitat. It is NRSI's understanding that assessments of bat SAR habitat presence are determined by the MNRF on a case by case basis based primarily on the density of suitable bat cavity trees within the surrounding woodland (i.e., the degree of bat SAR habitat function provided by the woodland). The information provided in this TOR is provided to MNRF to further consult on whether bat SAR habitat functions are present within the subject property woodlands and whether removal of the identified cavity trees would or would not represent a predicted negative impact to SAR bats.

Based on the results of the bat cavity tree assessments and previous NRSI correspondence with MNRF staff for other developments, the hedgerows and isolated trees present within the subject properties are not considered important habitat for SAR bats. This is based on the low density of suitable cavity trees found within these areas and the presence of woodlands on the surrounding landscape that bats would more likely preferentially utilize for habitat.

Breeding Bird Surveys

Three early morning breeding bird surveys will be completed between late May and early July 2016 in accordance with Ontario Breeding Bird Atlas (OBBA) protocol (BSC 2001). Due to the presence of potentially suitable habitat for the SAR Bobolink and Eastern Meadowlark on each property, each survey was designed to conform to the most recent survey protocol received from the MNRF (Aurora District, 2015). This includes transect-based surveys established length-wise through fields providing suitable habitat for the species, spaced ≤250m apart within fields that provide potentially suitable habitat and with 10-minute point count stations established up to 250m apart along transect lines. See Maps 2a and 2b for the location of Bobolink/Eastern Meadowlark survey transects and point count locations.

Natural features within the subject properties will be comprehensively surveyed through area searches within each vegetation community during each of the three bird survey visits. All species seen or heard will be recorded on standardized forms including breeding evidence descriptions according to codes established for the Ontario Breeding Bird Atlas (BSC 2001).

Based on the results of the first bird survey, the following SAR birds have been observed on the Prince property:

- Bobolink; confirmed breeding on the Prince property showing evidence of breeding territories within Fields 1 and 3
- Eastern Meadowlark; showing evidence of possible breeding through observation of a singing male in Field 1
- Barn Swallow; showing evidence of possible breeding through observation of foraging over Fields 1 and 2 and in proximity to a barn/agricultural outbuildings

No SAR birds have been observed to date on the Bonnefield property.

The remaining breeding bird surveys will serve to further refine the abundance and territory sizes/locations of Bobolinks and Eastern Meadowlarks on the Prince property. Comprehensive searches of the barn/outbuildings on the Prince and Bonnefield properties will also be completed to confirm the presence of any nesting Barn Swallows within the subject properties. Surveys will be completed to document the presence of nesting Barn Swallows in accordance with the standard protocol provided by the MNRF Guelph District (G. Buck, MNRF, pers. comm., June 2012).

Amphibian Call Surveys

Three amphibian call surveys will be completed in accordance with the Marsh Monitoring Program amphibian call survey protocol (BSC 2009). Two of these surveys have been completed to date at two survey stations established on the Bonnefield property as shown on Map 2b. Station ANR-002 surveys the MAS Shallow Marsh wetland, while ANR-001 surveys a woodland vernal pool that was not classified separately as wetland.

Based on the results of the first two surveys, two species, Wood Frog (*Lithobates sylvatica*) and Spring Peeper (*Pseudacris crucifer*) have been recorded at full chorus within the MAS Shallow Marsh wetland (ANR-002). Based on significance criteria established for Amphibian Breeding Habitat (Woodland) SWH, the wetland and surrounding deciduous woodland within a 230m radius is considered SWH (MNRF 2015a) (see Map 3b).

Snake Emergence Surveys

The initial site characterization completed on April 21, 2016 included confirmation of various features that represent potential snake hibernaculum habitat. These included several large, long-established rock piles on both properties as well as potential access points (e.g., cracks) along the foundations of buildings on each property (Maps 2a, 2b). Each property was therefore identified as containing candidate SWH for Snake Hibernacula as listed in Appendix II. Following consultation with the Midhurst District MNRF, it was recommended that multiple snake emergence surveys be completed on the subject properties in appropriate weather (J. Benvenuti, MNRF, pers. comm., April 2016).

Three snake emergence surveys were completed during the spring emergence period as listed in Table 1. Surveys comprised thorough area searches of potential snake hibernaculum features. These included any locations of cracked building foundations as well as rock piles and other features as shown on Maps 2a and 2b.

During these surveys only one individual Eastern Gartersnake (*Thamnophis sauritus septentrionalis*) was observed. Based on these results, Snake Hibernaculum SWH is considered absent on the subject properties.

Habitat Assessments and Documentation of Other Wildlife

During all site visits, NRSI biologists will assess wildlife habitats within the subject property. Any features that may be indicative of SWH or habitat for SAR will be documented in detail, photographed, and georeferenced using a hand-held GPS unit. Any incidental observations of all wildlife will be recorded during all field surveys including reptiles, amphibians, butterflies, odonates, and mammals. In addition to direct observations, any evidence such as dens, tracks, and scat will also be documented.

Natural Feature Characterization and Constraints Assessment

The significance and sensitivity of the on-site natural features will be assessed based on the integration of background review and field-based surveys. Significant biological features will be identified as constraints based on current federal and provincial species and habitat status listings. As well, the sensitivity of species and habitats will be documented based on current ecological trends, research and professional experience/expertise, and input from local agency staff. Significant and sensitive natural features will be identified as constraints to land development that will be addressed within the impact assessment.

The constraints assessment will include an assessment of woodland significance based on criteria provided in the County and Township Official Plans. Both County and Township Official Plans also refer to provincial criteria in evaluating woodland significance, as listed in the MNRF Natural Heritage Reference Manual (OMNR 2010). Woodlands on both properties will therefore be assessed against the woodland significance criteria listed in Table 7-2 of the Natural Heritage Reference Manual. The significance evaluation will include all contiguous portions of each woodland that extends off-property where information is available, but will not include portions of the FOD5-1 community on the Prince property that occur on the adjacent property to the east where woodland will be removed for future licensed aggregate extraction. Further pre-application consultation with MNRF on woodland significance is included in the work plan for this project.

Other significant features to be addressed will include confirmed Woodland Amphibian Breeding Habitat SWH on the Bonnefield property, and SAR habitat for Bobolink, Eastern Meadowlark and Barn Swallow on the Prince property.

Impact Assessment

The details of the proposed development including the proposed aggregate extraction limits and construction/disturbance limits and the results of hydrological/hydrogeological studies, to be completed by Whitewater Hydrogeology Ltd, will be reviewed and compared to the existing natural features on the subject properties. Anticipated impacts will be discussed where there are any areas of conflict between significant features and the development.

The assessment of potential development impacts will be divided into:

- Direct impacts associated with natural feature removal or wildlife displacement caused by the actual proposed 'footprint' of the development.

- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality.

- Induced impacts associated with post-construction stresses on the natural features caused by operation of the aggregate facilities.

Recommendations to avoid, or otherwise minimize or mitigate impacts to the natural features will be made and opportunities for enhancement will be highlighted. Where applicable, negative impact on significant natural heritage features will be assessed taking into account planned rehabilitation. Site-specific restoration needs, as well as recommended monitoring, will also be provided.

Based on the June 14, 2016 initial meeting, SAR birds could be dealt with at the time of licencing by ESA registration or site plan conditions requiring further survey and registration (if required) prior to disturbance.

A technical report summarizing the results of the natural feature characterization, constraints analysis, impact assessment and recommendations will be provided. Species lists and maps showing natural features and any associated development constraints will be included in the NEA/EIS report.

We trust that these Terms of Reference adequately describe the scope and methods required to complete the NEA/EIS to the satisfaction of the review agencies. Please contact the undersigned with any comments or questions for clarification.

Sincerely,
Natural Resource Solutions Inc.

Ryan Archer
Terrestrial and Wetland Biologist

References

Bird Studies Canada (BSC). 2001. Ontario Breeding Bird Atlas: Guide for Participants. Published by Bird Studies Canada in Cooperation with the Federation of Ontario Naturalists, Ontario Field Ornithologists, Environment Canada and the Ontario Ministry of Natural Resources.

Bird Studies Canada (BSC), Environment Canada's Canadian Wildlife Service, Ontario Nature, Ontario Field Ornithologists and Ontario Ministry of Natural Resources. 2008. Ontario Breeding Bird Atlas Database, 31 January 2008. http://www.birdsontario.org/atlas/aboutdata.jsp?lang=en

Bird Studies Canada (BSC). 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. 2009 Edition. Published by Bird Studies Canada in Cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2016. Database of Wildlife Species Assessed by COSEWIC. Last updated February 9, 2016 http://www.cosewic.gc.ca/eng/sct1/searchform_e.cfm (accessed April 2016).

Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Don Mills, Federation of Ontario Naturalists. 120p.

Dufferin County. 2015. Dufferin County Official Plan. County Council Adopted: September 11, 2014. MMAH Approved: March 27, 2015.

Government of Canada. 2016. Species at Risk Public Registry: Species Index. Last updated May 29, 2015. http://www.sararegistry.gc.ca/sar/index/default_e.cfm (Accessed April 2016)

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Michigan Flora Online. 2011. http://michiganflora.net/.

Naughton, D. 2012. The Natural History of Canadian Mammals. Canadian Museum of Nature. University of Toronto Press. 784 pp.

Natural Resource Solutions Inc. (NRSI). 2008. Natural Environment Level 1 Assessment. Strada Aggregates Inc., Melancthon Pit. Prepared for Strada Aggregates Inc. January 28, 2008.

Natural Resource Solutions Inc. (NRSI). 2010. Melancthon Pit Natural Environment Level 2 Assessment. Prepared for Strada Aggregates Inc. January 2010.

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. October 2000.

Ontario Ministry of Natural Resources (OMNR). 2010. Natural Heritage Reference Manual for Policies of the Provincial Policy Statement, Second Edition. March 18, 2010.

Ontario Ministry of Natural Resources (OMNR). 2011. Bats and Bat Habitats Guidelines for Wind Power Projects. July 2011.

Ontario Ministry of Natural Resources and Foresty (MNRF). 2014. Natural Heritage Information Centre: Biodiversity Explorer. Last updated January 28, 2015. http://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map (Accessed April 2016).

Ontario Ministry of Natural Resources and Forestry (MNRF). 2015a. Significant Wildlife Habitat Ecoregion 6E Criterion Schedule: Addendum to Significant Wildlife Habitat Technical Guide. MNRF, January 2015.

Ontario Ministry of Natural Resources. 2015b. Species at Risk by Area – Dufferin County. https://www.ontario.ca/environment-and-energy/species-risk-region?name=Dufferin (accessed April 2016).

Ontario Ministry of Natural Resources and Forestry (MNRF). 2016. Species at Risk in Ontario (SARO) List: http://www.ontario.ca/environment-and-energy/species-risk-ontario-list. Last updated June 16, 2016 (Accessed June 2016).

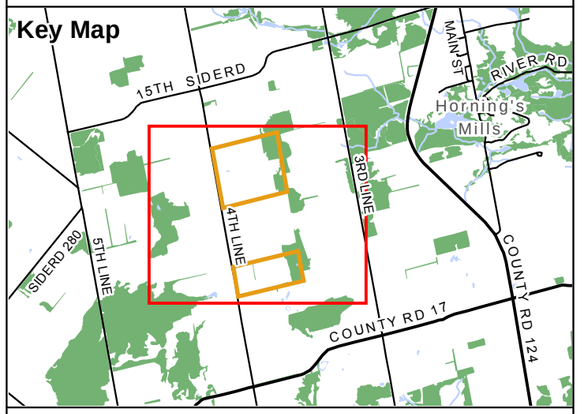
Ontario Nature. 2015. Reptiles and Amphibians of Ontario Range Maps. Last Updated April 19, 2015. http://www.ontarioinsects.org/herpatlas/herp_online.html (Accessed April 2016).

Township of Melancthon. 2014. Township of Melancthon Official Plan. August 2014.

Map 1

Prince and Garner Properties NEA

Study Area



Legend

- Subject Property
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Other Wetland (Non-PSW)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748 Date: June 15, 2016	NAD83 - UTM Zone 17 Size: 11x17" **1:7,000**

0 100 200 300 400 Metres

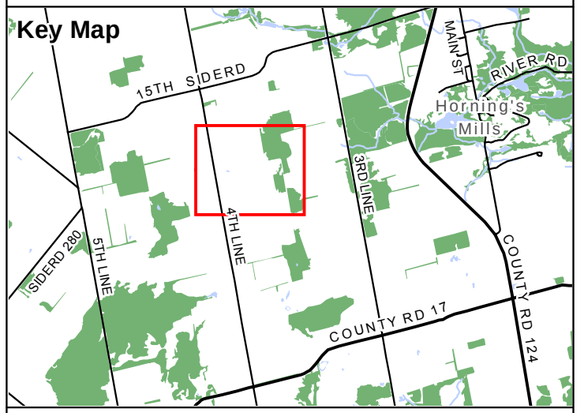
N

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map1_PrinceStudyArea_4K_2016_06_15_JSF.mxd

Map 2a

Prince and Garner Properties NEA

Vegetation Communities



Legend

- Subject Property
- Rock Pile
- Bobolink/Eastern Meadowlark Transect and Point Count Locations (BB)
- Bat Cavity Tree Transect Path
- Comprehensive Cavity Tree Search Area
- Ecological Land Classification (ELC)

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: June 20, 2016

NAD83 - UTM Zone 17
Size: 11x17"
1:3,500

0 50 100 150 200 Metres

N

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map2a_PrinceELC_4K_2016_06_20_JSF.mxd

561200 561400 561600 561800

4887800 4887600 4887400

FOD5-1
Hedgerow
MAS
BB-10
BB-11
CUP3-2
CUM
Winter Wheat Field
FOD5-1
BB-09
CUP3-2
Winter Wheat Field
4TH LINE
Rural Property
BB-08
Winter Wheat Field
Hedgerow
BB-07

561200 561400 561600 561800

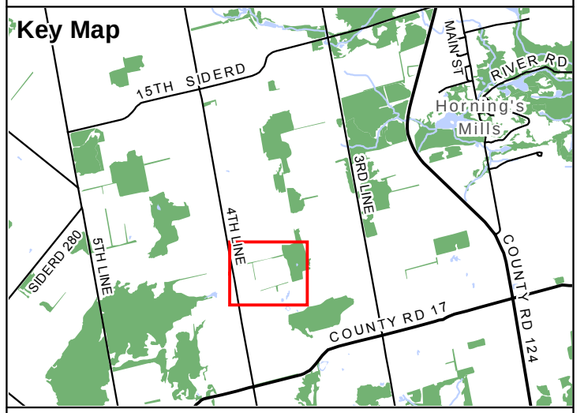
Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map2b_GarnerELC_3K_2016_06_20_JSF.mxd

Map 2b

Prince and Garner Properties NEA

Vegetation Communities

Key Map



Legend

- Subject Property
- Amphibian Survey Station
- Rock Pile
- Bobolink/Eastern Meadowlark Transect and Point Count Locations (BB)
- Bat Cavity Tree Transect Path
- Comprehensive Cavity Tree Search Area
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

(MAS) Shallow Marsh

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: June 20, 2016

NAD83 - UTM Zone 17
Size: 11x17"
1:2,500

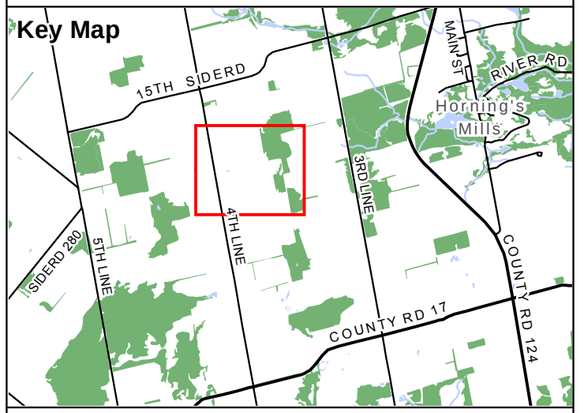
N

0 40 80 120 160 Metres

Map 3a

Prince and Garner Properties NEA

Potential and Confirmed Significant Features



Legend

- Bat Cavity Tree
- Subject Property
- Ecological Land Classification (ELC)

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: June 20, 2016

NAD83 - UTM Zone 17
Size: 11x17"
1:3,500

0 50 100 150 200 Metres

N

Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map3a_PrinceSigFeatures_4K_2016_06_20_JSF.mxd

561200 561400 561600 561800

4887800 4887600 4887400

FOD5-1
F
G
Hedgerow
MAS
CUP3-2
D
CUM
Winter Wheat Field
FOD5-1
C
Winter Wheat Field
CUP3-2
4TH LINE
Rural Property
Winter Wheat Field
A
B
Hedgerow

561200 561400 561600 561800

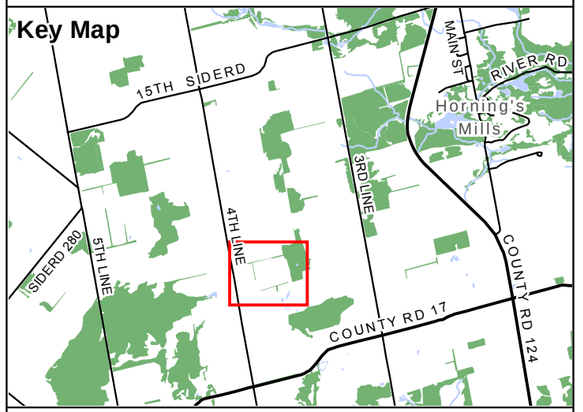
Path: X:\1748_PrinceGarnerPropertiesNEA\NRSI_1748_Map3b_GarnerSigFeatures_3K_2016_06_20_JSF.mxd

Map 3b

Prince and Garner Properties NEA

Potential and Confirmed Significant Features

Key Map



Legend

- Subject Property
- Bat Cavity Tree
- Woodland Amphibian Breeding Habitat SWH (Confirmed)
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow

(CUP3-2) White Pine Coniferous Plantation Type

(FOD5-1) Dry-Fresh Sugar Maple Deciduous Forest Type

(MAS) Shallow Marsh

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1748
Date: June 20, 2016

NAD83 - UTM Zone 17
Size: 11x17"
1:2,500

N

0 40 80 120 160 Metres

APPENDIX I

Species at Risk Screening

Federally, Provincially and Regionally Significant Species Known from the Study Area and Vicinity

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitat within Prince Property	Suitable Habitat within Garner Property
Vascular Flora									
Asplenium scolopendrium var. americanum	Hart's-tongue	S3	SC	SC	Schedule 1	Lower portions of large mossy dolomite boulders in moist deciduous forest understories, usually on talus below low escarpments or ridges, sometimes on the mossy sides of fissures in similar rich hardwood settings	MNRF 2015	No	No
Birds									
Ammodramus henslowii	Henslow's Sparrow	SHB	END	E	Schedule 1	Large, fallow, grassy area with ground mat of dead vegetation, dense herbaceous vegetation, ground litter and some song perches; neglected weedy fields; wet meadows; cultivated uplands; a moderate amount of moisture needed; requires a minimum tract of grassland of 40 ha, but usually in areas >100 ha.	MNRF 2015	No	No
Asio flammeus	Short-eared Owl	S2N, S4B	SC	SC	Schedule 3	Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 - 125 ha; requires 75-100 ha of contiguous open habitat.	MNRF 2015	No	No
Caprimulgus vociferus	Eastern Whip-poor-will	S4B	THR	T	Schedule 1	Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaflitter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100ha forests.	MNRF 2015	No	No
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	Interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30ha.	BSC et al. 2008	No	No
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	BSC et al. 2008	Yes	Yes

Federally, Provincially and Regionally Significant Species Known from the Study Area and Vicinity

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitat within Prince Property	Suitable Habitat within Garner Property
Childonias niger	Black Tern	S3B	SC	NAR	--	Wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to same area to nest each year in loose colonies; must have shallow (0.5 to 1m deep) water and areas of open water near nests; requires marshes >20 ha in size; feeds over adjacent grasslands.	MNRF 2015	No	No
Contopus virens	Eastern Wood-pewee	S4B	SC	SC	--	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	BSC et al. 2008, MNRF 2015	Yes	Yes
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	--	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	BSC et al. 2008, MNRF 2015, MNRF 2014	Yes	Yes (marginal)
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	SC	NAR	--	Require large continuous area of deciduous or mixed woods around large lakes, rivers; require area of 255 ha for nesting, shelter, feeding, roosting; prefer open woods with 30 to 50% canopy cover; nest in tall trees 50 to 200m from shore; require tall, dead, partially dead trees within 400 m of nest for perching.	MNRF 2015	No	No
Hirundo rustica	Barn Swallow	S4B	THR	T	--	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	BSC et al. 2008, MNRF 2015	Yes	Yes
Hylocichla mustelina	Wood Thrush	S4B	SC	T	--	Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12m.	BSC et al. 2008, MNRF 2015	Yes	Yes
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	Thickets, tall tangles of shrubbery beside streams, ponds; requires tracts of grassland >50 ha overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	MNRF 2015	No	No

Federally, Provincially and Regionally Significant Species Known from the Study Area and Vicinity

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitat within Prince Property	Suitable Habitat within Garner Property
Ixobrychus exilis	Least Bittern	S4B	THR	T	Schedule 1	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance.	MNRF 2015	No	No
Lanius ludovicianus	Loggerhead Shrike	S2B	END	E	Schedule 1	Grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to Canadian Shield; greatest threat is fragmentation of suitable habitat due to natural succession; probably needs at least 25 ha of suitable habitat.	MNRF 2015	No	No
Parkesia motacilla	Louisiana Waterthrush	S3B	SC	SC	Schedule 1	Prefers wooded ravines with running streams; also woodlands swamps; large tracts of mature deciduous or mixed forests; canopy cover is essential; has strong affinity to nest sites; nests on ground.	MNRF 2015	No	No
Riparia riparia	Bank Swallow	S4B	THR	T	--	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water.	BSC et al. 2008	Yes (foraging habitat only)	Yes (foraging habitat only)
Sturnella magna	Eastern Meadowlark	S4B	THR	T	--	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	BSC et al. 2008, MNRF 2015	Yes	Yes (marginal)
Herpetofauna									
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	Schedule 1	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs.	MNRF 2015	No	No
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites.	MNRF 2015	No	No

Federally, Provincially and Regionally Significant Species Known from the Study Area and Vicinity

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitat within Prince Property	Suitable Habitat within Garner Property
Emydoidea blandingii	Blanding's Turtle (*Great Lakes/St Lawrence pop.*)	S3	THR	T	Schedule 1	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks.	MNRF 2015	No	No
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water; home range size is larger for females (about 70ha) than males (about 30ha) and includes hibernation, basking, nesting and feeding areas; aquatic corridors (e.g. stream) are required for movement.	MNRF 2015	No	No
Lampropeltis taylori triangulum	Eastern Milksnake	S3	SC	SC	Schedule 1	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings.	MNRF 2015	Yes	Yes
Pseudacris triseriata pop. 2	Western Chorus Frog *(Great Lakes/St. Lawrence - Canadian Shield Pop.)*	S3	NAR	T	Schedule 1	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools.	Ontario Nature 2015, MNRF 2015	No	Yes
Sistrurus catenatus catenatus pop. 1	Eastern Massasauga Rattlesnake (*Great Lakes/St. Lawrence population*)	S3	THR	T	Schedule 1	Upland, old field in summer; marsh, shrub swamp or bog; rivers or streams that provide low vegetative growth in fall or winter	Ontario Nature 2015	No	No
Thamnophis butleri	Butler's Gartersnake	S2	END	E	Schedule 1	wet meadows, pastures, margins of marshes and streams, and open country	MNRF 2015	No	No
Thamnophis sauritus septentrionalis	Eastern Ribbonsnake	S3	SC	SC	Schedule 1	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, lakes or streams.	Ontario Nature 2015, MNRF 2015	No	No
Mammals									

Federally, Provincially and Regionally Significant Species Known from the Study Area and Vicinity

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Habitat Preference[5,6,7,8]	Background Source	Suitable Habitat within Prince Property	Suitable Habitat within Garner Property
Myotis leibii	Eastern Small-footed Bat	S2S3	END			Roosts in caves, mines shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; forages in forests	Naughton 2012	No	No
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	Dobbyn 1994	Yes	Yes
Myotis septentrionalis	Northern Myotis	S3	END	E	Schedule 1	hibernates during winter in mines or caves; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy	Naughton 2012	Yes	Yes
Insects									
Ophiogomphus carolus	Riffle Snaketail	S2S3				Clear, rapid, sandy or rocky streams and rivers	MNRF 2014	No	No

[1]MNRF 2014; [2]MNRF 2016; [3]COSEWIC 2016; [4]Government of Canada 2016; [5]OMNR 2000; [6]Michigan Flora Online 2011; [7]Layberry et al. 2001; [8]Dunkle 2000

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SNA Unranked
B Breeding
N Non-breeding
S#? Rank Uncertain
COSSARO/COSEWIC
END/E Endangered
THR/T Threatened
SC/SC Special Concern
NAR Not at Risk
SARA Schedule
Schedule 1 Officially Protected under SARA
Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1

APPENDIX II

Significant Wildlife Habitat Screening

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST[cxlix] Index #25 provides development effects and mitigation measures.	Suitable habitat not present on the Prince property. Wetland on the Garner property is too small (<0.5 ha) to provide significant habitat **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi], ccvii. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant[ccvii] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	Suitable habitat not present within the subject properties. Not located near a major river. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Woodlands on either property do not contain suitably large areas of interior forest haibtat. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Wetland habitat not present on the Prince property. Suitable sun-exposed sandy/gravelly areas not present adjacent to wetland habitat on the Garner property. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	No seeps or springs observed on either subject property. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Suitable habitat not present on the Prince property. Wetland habitat present within the Garner property woodland. Based on amphibian call surveys, full choruses of Spring Peeper and Wood Frog were detected, therefore meeting significance criteria. **Confirmed SWH on the Garner property**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)[lxxi, lxxiii], or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys[cviii] will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #15 provides development effects and mitigation measures.	Suitable habitat not present within the subject properties. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix] • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Woodlands on neither subject property contain suitable areas of interior forest habitat. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMiST[cxlix] Index #21 provides development effects and mitigation measures.	Vegetation community type not present within the subject properties. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[i]. • SWHMiST[cxlix] Index #20 provides development effects and mitigation measures.	Vegetation community type not present within the subject properties. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Alvar					
Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleochairs compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5 ha in size[lxxv]. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species[lxxv, cxlix] at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMiST[cxlix] Index #17 provides development effects and mitigation measures.	Vegetation community type not present within the subject properties. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii] • The stand will have experienced no recognizable forestry activities[cxlviii] • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand[lxxviii] • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	Vegetation community type not present within the subject properties. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Savannah					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST[cxlix] Index #18 provides development effects and mitigation measures.	Vegetation community type not present within the subject properties. Not SWH

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST[cxlix] Index #19 provides development effects and mitigation measures.	Vegetation community type not present within the subject properties. **Not SWH**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii] The OMNR/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Rare vegetation community types not expected to occur within the subject properties. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST[cxlix] Index #25 provides development effects and mitigation measures.	Suitable habitat not present on the Prince property. Wetland on the Garner property is too small (<0.5 ha) to provide significant habitat **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi], ccvii. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant[ccvii] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	Suitable habitat not present within the subject properties. Not located near a major river. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Woodlands on either property do not contain suitably large areas of interior forest haibtat. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Wetland habitat not present on the Prince property. Suitable sun-exposed sandy/gravelly areas not present adjacent to wetland habitat on the Garner property. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	No seeps or springs observed on either subject property. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Suitable habitat not present on the Prince property. Wetland habitat present within the Garner property woodland. Based on amphibian call surveys, full choruses of Spring Peeper and Wood Frog were detected, therefore meeting significance criteria. **Confirmed SWH on the Garner property**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)[lxxi, lxxiii], or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys[cviii] will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #15 provides development effects and mitigation measures.	Suitable habitat not present within the subject properties. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix] • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Woodlands on neither subject property contain suitable areas of interior forest habitat. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[í]. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[í]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi]. • SWHMiST[cxlix] Index #35 provides development effects and mitigation measures	Suitable habitat not present on the Prince property. Wetland habitat on the Garner property is too small to support the target species. **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[i]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv]	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #32 provides development effects and mitigation measures.	Suitable habitat not present within the subject properties. **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha[cxiv] in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[l]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [cxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[l]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMiST[cxlix] Index #33 provides development effects and mitigation measures.	Suitable habitat not present within the subject properties. **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. [ccii]	Chimney or Digger Crayfish: (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish: (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci] • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult[cci] • SWHMiST[cxlix] Index #36 provides development effects and mitigation measures.	Suitable habitat not present within the Prince property. Suitable habitat may occur around the periphery of the Garner property wetland. **Candidate SWH on the Garner property**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Potentially suitable habitat may occur on the subject properties for the following Special Concern/rare wildlife species: Field surveys may be requried to assess the presence/absence of these species on the subject properties **Candidate SWH**

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	Suitable habitat not present on the Prince property. Corridor features do not occur between breeding and summer habitat on the Garner property. Upland forest areas surrounding the wetland likely provide summer habitat for anurans. **Not SWH**

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule[i]. • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix]. Shorter corridors are more significant than longer corridors[cxlix] • SWHMiST[cxlix] Index #39 provides development effects and mitigation measures.	Suitable linkage habitat does not occur on either subject property. The subject property woodlands are isolated from nearby natural features. **Not SWH**

Subject: FW: Strada Aggregates - Pre-Consultation Meeting, Thursday September 15
From: Dave Barrett <dbarrett@mhbcplan.com>
Date: 10/20/2016 4:01 PM
To: Tecia White <tecia@white-water.ca>, Ryan Archer <rarcher@nrsi.on.ca>
CC: "Grant Horan (Grant Horan)" <GHoran@Strada-Aggregates.com>

Hi Tecia and Ryan,

Please see below comments from the NVCA following our pre-application meeting on September 15th. Please let me know if you have any comments or concerns.

Thanks,
Dave

From: Timothy Salkeld [mailto:tsalkeld@nvca.on.ca]
Sent: October-20-16 3:54 PM
To: Denise Holmes; James Parkin; Dave Barrett
Cc: Bluewater Geoscience; Chris Hibberd; Chris Jones; Lee Bull; Ryan Post; Dave Featherstone
Subject: RE: Strada Aggregates - Pre-Consultation Meeting, Thursday September 15

Hi everyone.

Further to our pre-consultation meeting on September 15, 2016, the NVCA provides the following preliminary comments on the material that was supplied to us before the meeting.

Whitewater Hydrogeological Assessment Terms of Reference

- The proposed Bonnefield and Prince aggregate extraction areas will consists of a category 3, class A above water table extraction.
- The delineation of the water table position will be completed by monitoring an additional 5 boreholes around the perimeter of the Prince property and 2 on the Bonnefield property. Each location will have a multi level - a deep bedrock well and a shallow water table well. In addition, 7 proposed GW MW will be added to the existing monitoring program at the Shelburne north and south pits.
- It is understood that the use of the Shelburne pit wells and the existing pit north of the Bonnefield property wells will be used to augment the delineation of the Bonnefield water table plane elevation (and by extension, Prince).
- It is noted that the Shelburne site will consist of monthly and continuous water level measurements- it is recommended that the same frequency will be applied to the Bonnefield and Prince sites to capture the water table plane and the seasonal variation (section 2.1.2).
- It is encouraged that the proponent undertake a water balance of pre/during/post extraction periods. Impacts to proximal wetlands need to be considered.

Please advise if a proximal private well survey has been or will be undertaken, if there will be fuel storage on site, and if there will be a wash facility on site.

NRSI Natural Environment Assessment/Environmental Impact Study Terms of Reference

The NVCA believes the scope of the Natural Heritage evaluation is adequate however we would like additional assessment of the following items.

- Though the maps/sampling stations referred to in the NRSI.pdf are missing, the vegetation survey findings of NRSI is consistent with our remote interpretation of property imagery. The shallow marsh and vernal pool embedded in the forest in the south property could support significant habitat for breeding amphibians including salamanders. We understand that amphibian calling surveys have been conducted but were salamander breeding/egg mass surveys conducted here? Jefferson salamander have recently been documented in areas proximal to the Escarpment at Mono Cliffs Provincial Park (south of properties) and at Pretty River Nature Reserve (north of properties) – potentially present in suitable habitats between these parks.
- Western chorus frogs were identified by NVCA staff along proximal roadways (20th Sideroad and 5th Line) as part of our review of the former applications. Spring peepers (full chorus?) were observed at that time along the Boyne River tributary along 15th Sideroad. Aside from information gathered from this review effort, NVCA staff have no additional natural heritage information directly pertaining to the properties.
- The forest on the south (Bonnefield) property is connected to the existing Strada pit to the south – as part of existing pit review, NVCA noted connectivity of wetlands on the pit property to the forest on the Bonnefield property. Restoration/enhancement planning in the northeast portion of the existing pit included connectivity to the Bonnefield forest as a key component. This should be considered as part of review.

Trusting these comments are of assistance. Regards;

Tim Salkeld | **Resource Planner**

Nottawasaga Valley Conservation Authority
8195 8th Line, Utopia, ON L0M 1T0
T 705-424-1479, ext. 233 | **F** 705-424-2115
tsalkeld@nvca.on.ca | **nvca.on.ca**

From: Denise Holmes [mailto:dholmes@melancthontownship.ca]
Sent: September-12-16 2:26 PM
To: Chris Jones; Bluewater Geoscience; Timothy Salkeld; Chris Hibberd
Subject: FW: Strada Aggregates - Pre-Consultation Meeting, Thursday September 15

Please see attached information for Thursday's Strada meeting.

Thank you.

Regards,

Denise

Denise B. Holmes, AMCT | Chief Administrative Officer/Clerk | Township of Melancthon | dholmes@melancthontownship.ca | PH: 519-925-5525 ext 101 | FX: 519-925-1110 | www.melancthontownship.ca |

From: Dave Barrett [mailto:dbarrett@mhbcplan.com]

Sent: Monday, September 12, 2016 2:11 PM
To: Denise Holmes
Cc: James Parkin; Grant Horan; Mario Pietrolungo (mpietrolungo@strada-aggregates.com)
Subject: Strada Aggregates - Pre-Consultation Meeting, Thursday September 15

Good afternoon Denise,

Please find attached our proposed agenda for the pre-consultation meeting scheduled for this Thursday September 15th at 2:00pm.

I have also attached a location map and Terms of Reference for the Natural Environment Assessment/EIS and Hydrogeological Assessment.

Thanks,
Dave

DAVID R. BARRETT, BES, MCIP, RPP | Planner

MHBC **Planning, Urban Design & Landscape Architecture**
540 Bingemans Centre Drive, Suite 200 | Kitchener | ON | N2B 3X9 | T 519 576 3650 X 722 | F 519 576 0121 | dbarrett@mhbcplan.com

Follow us: Webpage | Linkedin | Facebook | Twitter | Vimeo

Email Signature Banner Template - 2015
DRAFT 3

Attachments:

strada_props_melancthon.jpg 1.8 MB

APPENDIX III

Plant Species Recorded Within the Subject Properties

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	CC	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Wellington/ Dufferin County	NRSI Observed	
									Prince Property	Bonnefield Property
Pteridophytes	**Ferns & Allies**									
Dryopteridaceae	**Wood Fern Family**									
Athyrium filix-femina var. angustum	Northern Lady Fern	4		S5				X	X	X
Dryopteris carthusiana	Spinulose Wood Fern	5		S5				X	X	X
Dryopteris intermedia	Evergreen Wood Fern	5		S5				X	X	X
Matteuccia struthiopteris var. pensylvanica	Ostrich Fern	5		S5				X	X	
Onoclea sensibilis	Sensitive Fern	4		S5				X	X	X
Equisetaceae	**Horsetail Family**									
Equisetum arvense	Field Horsetail	0		S5				X	X	X
Gymnosperms	**Conifers**									
Pinaceae	**Pine Family**									
Picea abies	Norway Spruce		-1	SE3				X	X	X
Picea glauca	White Spruce	6		S5				X		X
Pinus resinosa	Red Pine	8		S5				X		X
Pinus strobus	Eastern White Pine	4		S5				X	X	X
Dicotyledons	**Dicots**									
Aceraceae	**Maple Family**									
Acer negundo	Manitoba Maple	0		S5				X		X
Acer saccharum ssp. saccharum	Sugar Maple	4		S5				X	X	X
Anacardiaceae	**Sumac or Cashew Family**									
Toxicodendron rydbergii	Poison-ivy	0		S5				X		X
Apiaceae	**Carrot or Parsley Family**									
Daucus carota	Wild Carrot		-2	SE5				X		X
Apocynaceae	**Dogbane Family**									
Apocynum androsaemifolium ssp. androsaemifolium	Spreading Dogbane	3		S5				X		X
Aristolochiaceae	**Duchman's-pipe Family**									
Asarum canadense	Wild Ginger	6		S5				X		X
Asclepiadaceae	**Milkweed Family**									
Asclepias syriaca	Common Milkweed	0		S5				X	X	X
Asteraceae	**Composite or Aster Family**									
Achillea millefolium ssp. millefolium	Common Yarrow		-1	SE?				X	X	X
Arctium minus ssp. minus	Common Burdock		-2	SE5				X	X	X
Carduus nutans ssp. nutans	Musk Thistle		-1	SE?				X		X
Cirsium arvense	Canada Thistle		-1	SE5				X	X	X
Cirsium vulgare	Bull Thistle		-1	SE5				X	X	
Erigeron annuus	Daisy Fleabane	0		S5				X	X	X
Eupatorium maculatum ssp. maculatum	Spotted Joe-pye-weed	3		S5				X		X
Hieracium caespitosum ssp. caespitosum	Field Hawkweed		-2	SE5					X	X
Inula helenium	Elecampane		-2	SE5				X	X	
Leucanthemum vulgare	Ox-eye Daisy		-1	SE5				X	X	X
Onopordum acanthium	Scotch Thistle			SE4				X	X	
Solidago canadensis	Canada Goldenrod	1		S5				X		X
Symphyotrichum lanceolatum	Panicled Aster	3		S5						X
Symphyotrichum lateriflorum var. lateriflorum	Calico Aster	3		S5				X	X	
Taraxacum officinale	Common Dandelion		-2	SE5				X	X	X
Tragopogon pratensis ssp. pratensis	Meadow Goat's-beard		-1	SE5				X		X
Tussilago farfara	Coltsfoot		-2	SE5				X		X
Balsaminaceae	**Touch-me-not Family**									
Impatiens pallida	Pale Touch-me-not	7		S5				X	X	
Berberidaceae	**Barberry Family**									
Caulophyllum giganteum	Blue Cohosh			S5					X	X
Betulaceae	**Birch Family**									
Betula alleghaniensis	Yellow Birch	6		S5				X	X	X
Ostrya virginiana	Hop Hornbeam	4		S5				X	X	X
Boraginaceae	**Borage Family**									
Cynoglossum officinale	Hound's-tongue		-1	SE5				X	X	
Lithospermum officinale	Common Gromwell		-1	SE5				X		X
Myosotis scorpioides	Mouse-ear Scorpion-grass			SNA				X		X
Brassicaceae	**Mustard Family**									
Cardamine diphylla	Two-leaved Toothwort	7		S5				X		X
Dentaria laciniata	Cutleaf Toothwort							X	X	X
Hesperis matronalis	Dame's Rocket		-3	SE5				X	X	
Caprifoliaceae	**Honeysuckle Family**									
Lonicera tatarica	Tartarian Honeysuckle		-3	SE5				X	X	X
Sambucus racemosa ssp. pubens	Red-berried Elderberry	5		S5				X	X	X
Viburnum opulus	Guelder Rose		-1	SE4					X	X
Caryophyllaceae	**Pink Family**									
Cerastium fontanum	Larger Mouse-ear Chickweed		-1	SE5				X	X	
Saponaria officinalis	Bouncing-bet		-3	SE5				X		X
Silene latifolia	Bladder Campion			SE5				X		X

Scientific Name	Common Name	CC	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Wellington/ Dufferin County	NRSI Observed	
									Prince Property	Bonnefield Property
Cornaceae	**Dogwood Family**									
Cornus alternifolia	Alternate-leaved Dogwood	6		S5				X	X	X
Cornus stolonifera	Red-osier Dogwood	2		S5				X		X
Euphorbiaceae	**Spurge Family**									
Euphorbia cyparissias	Cypress Spurge		-2	SE5				X	X	
Fabaceae	**Pea Family**									
Lotus corniculatus	Bird's-foot Trefoil		-2	SE5				X		X
Medicago lupulina	Black Medick		-1	SE5				X	X	X
Melilotus alba	White Sweet-clover		-3	SE5				X		X
Trifolium pratense	Red Clover		-2	SE5				X	X	X
Trifolium repens	White Clover		-1	SE5				X	X	
Vicia cracca	Tufted Vetch		-1	SE5				X	X	X
Fagaceae	**Beech Family**									
Fagus grandifolia	American Beech	6		S5				X	X	X
Quercus rubra	Red Oak	6		S5				X	X	
Geraniaceae	**Geranium Family**									
Geranium maculatum	Spotted Crane's-bill	6		S5				X		X
Geranium robertianum	Herb Robert		-2	SE5				X	X	X
Grossulariaceae	**Currant Family**									
Ribes cynosbati	Prickly Gooseberry	4		S5				X	X	X
Ribes rubrum	Red Currant		-2	SE5				X		X
Ribes vulgare	Red Garden Currant									X
Guttiferae	**St. John's-wort Family**									
Hypericum punctatum	Corymbed St. John's-wort	5		S5				X		X
Hydrophyllaceae	**Water-leaf Family**									
Hydrophyllum virginianum	Virginia Water-leaf	6		S5				X	X	X
Lamiaceae	**Mint Family**									
Clinopodium vulgare	Wild Basil	4		S5				X		X
Leonurus cardiaca ssp. cardiaca	Common Motherwort		-2	SE5				X	X	X
Nepeta cataria	Catnip		-2	SE5				X	X	
Malvaceae	**Mallow Family**									
Malva neglecta	Cheeses		-1	SE5						X
Oleaceae	**Olive Family**									
Fraxinus americana	White Ash	4		S5				X	X	X
Syringa vulgaris	Common Lilac		-2	SE5				X		X
Onagraceae	**Evening-primrose Family**									
Circaea lutetiana ssp. canadensis	Yellowish Enchanter's Nightshade	3		S5				X	X	X
Oenothera biennis	Common Evening-primrose	0		S5				X		X
Oxalidaceae	**Wood Sorrel Family**									
Oxalis stricta	Upright Yellow Wood-sorrel	0		S5				X	X	X
Plantaginaceae	**Plantain Family**									
Plantago lanceolata	Ribgrass		-1	SE5				X	X	
Polygonaceae	**Smartweed Family**									
Rumex obtusifolius ssp. obtusifolius	Bitter Dock		-1	SE5				X	X	
Portulacaceae	**Purslane Family**									
Claytonia virginica	Virginia Spring Beauty	5		S5				X	X	X
Primulaceae	**Primrose Family**									
Lysimachia ciliata	Fringed Loosestrife	4		S5				X		X
Ranunculaceae	**Buttercup Family**									
Actaea pachypoda	White Baneberry	6		S5				X	X	X
Anemone canadensis	Canada Anemone	3		S5				X		X
Anemone americana	Round-lobed Hepatica	6		S5				X	X	X
Anemone quinquefolia var. quinquefolia	Wood Anemone	7		S5				X	X	
Clematis virginiana	Virgin's-bower	3		S5				X		X
Ranunculus abortivus	Kidney-leaf Buttercup	2		S5				X	X	X
Ranunculus acris	Tall Buttercup		-2	SE5				X	X	X
Ranunculus recurvatus var. recurvatus	Hooked Buttercup	4		S5				X	X	X

Scientific Name	Common Name	CC	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Wellington/ Dufferin County	NRSI Observed	
									Prince Property	Bonnefield Property
Rosaceae	**Rose Family**									
Crataegus species	Hawthorn species								X	X
Fragaria virginiana	Wild Strawberry			S5				X	X	X
Geum aleppicum	Yellow Avens	2		S5				X		X
Geum canadense	White Avens	3		S5				X	X	
Malus domestica	Apple									X
Potentilla recta	Rough-fruited Cinquefoil		-2	SE5					X	
Prunus avium	Cherry Plum		-2	SE4						X
Prunus serotina	Black Cherry	3		S5					X	X
Prunus virginiana ssp. virginiana	Choke Cherry	2		S5				X	X	X
Rubus allegheniensis	Alleghany Blackberry	2		S5				X	X	
Rubus idaeus ssp. melanolasius	Wild Red Raspberry	0		S5				X	X	X
Rubus occidentalis	Thimble-berry	2		S5				X	X	X
Sorbus americana	American Mountain-ash	8		S5				X		X
Sorbus aucuparia	European Mountain-ash		-2	SE4				X		X
Rubiaceae	**Madder Family**									
Galium mollugo	White Bedstraw		-2	SE5				X	X	X
Mitchella repens	Creeping Partridge-berry	6		S5				X		X
Salicaceae	**Willow Family**									
Populus tremuloides	Trembling Aspen	2		S5				X	X	
Populus X canadensis	Carolina Poplar			SE1						X
Saxifragaceae	**Saxifrage Family**									
Tiarella cordifolia	False Mitrewort	6		S5				X	X	X
Scrophulariaceae	**Figwort Family**									
Verbascum thapsus	Common Mullein		-2	SE5				X	X	X
Veronica serpyllifolia ssp. serpyllifolia	Thyme-leaved Speedwell	0		SE5				X	X	
Solanaceae	**Nightshade Family**									
Solanum dulcamara	Bitter Nightshade		-2	SE5				X	X	X
Thymelaeaceae	**Mezereum Family**									
Dirca palustris	Leatherwood	7		S4?				X	X	X
Tiliaceae	**Linden Family**									
Tilia americana	American Basswood	4		S5				X	X	X
Ulmaceae	**Elm Family**									
Ulmus americana	White Elm	3		S5				X	X	X
Valerianaceae	**Valerian Family**									
Valeriana officinalis	Common Valerian		-1	SE3				X		X
Verbenaceae	**Vervain Family**									
Verbena urticifolia	White Vervain	4		S5				X		X
Violaceae	**Violet Family**									
Viola canadensis	Canada Violet	6		S5				X	X	X
Viola pubescens	Downy Yellow Violet	5		S5				X	X	X
Vitaceae	**Grape Family**									
Parthenocissus vitacea	Woodbine	3		S5				X	X	
Vitis riparia	Riverbank Grape	0		S5				X	X	
Monocotyledons	**Monocots**									
Araceae	**Arum Family**									
Arisaema triphyllum	Jack-in-the-pulpit	5		S5				X	X	X
Cyperaceae	**Sedge Family**									
Carex albursina	White Bear Sedge	7		S5				X	X	X
Carex arctata	Drooping Wood Sedge	5		S5				X	X	X
Carex blanda	Woodland Sedge	3		S5				X		X
Carex cephaloidea	Thin-leaved Sedge	6		S5				X	X	X
Carex deweyana	Dewey's Sedge	6		S5				X	X	X
Carex gracillima	Graceful Sedge	4		S5				X		X
Carex hirtifolia	Pubescent Sedge	5		S5				X		X
Carex hitchcockiana	Hitchcock's Sedge	6		S5				X	X	
Carex intumescens	Bladder Sedge	6		S5				X	X	X
Carex leptonervia	Finely-nerved Sedge	5		S5				X	X	X
Carex peckii	Peck's Sedge	6		S5				X		X
Carex pedunculata	Long-stalked Sedge	5		S5				X	X	X
Carex pensylvanica	Pennsylvania Sedge	5		S5				X	X	
Carex plantaginea	Plantain-leaved Sedge	7		S5				X	X	X
Carex rosea	Stellate Sedge	5		S5				X	X	X
Carex sprengelii	Long-beaked Sedge	6		S5				X		X
Carex stipata	Awl-fruited Sedge	3		S5				X		X
Lemnaceae	**Duckweed Family**									
Lemna minor	Lesser Duckweed	2		S5				X		X

Scientific Name	Common Name	CC	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Wellington/ Dufferin County	NRSI Observed	
									Prince Property	Bonnefield Property
Liliaceae	**Lily Family**									
Allium tricoccum	Wild Leek	7		S5				X	X	X
Erythronium americanum ssp. americanum	Yellow Dog's-tooth Violet	5		S5				X	X	X
Maianthemum canadense	Wild Lily-of-the-valley	5		S5				X		X
Maianthemum racemosum ssp. racemosum	False Solomon's Seal	4		S5				X	X	X
Maianthemum stellatum	Star-flowered Solomon's Seal	6		S5				X		X
Trillium erectum	Purple Trillium	6		S5				X	X	
Trillium grandiflorum	White Trillium	5		S5				X	X	X
Orchidaceae	**Orchid Family**									
Epipactis helleborine	Common Helleborine		-2	SE5				X		X
Poaceae	**Grass Family**									
Bromus inermis ssp. inermis	Awnless Brome		-3	SE5				X	X	X
Dactylis glomerata	Orchard Grass		-1	SE5				X	X	X
Elymus repens	Quack Grass		-3	SE5				X	X	
Phalaris arundinacea	Reed Canary Grass	0		S5				X		X
Poa pratensis ssp. pratensis	Kentucky Bluegrass	0		S5				X	X	X
Gentianaceae	**Gentian Family**									
Hypericum perforatum	Common St. John's-wort		-3	SE5				X		X

[1]MNRF 2014; [2]MNRF 2016a; [3]COSEWIC 2016; [4]Government of Canada 2016

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SNA Rank Not Applicable
SE Exotic Species
S#? Rank Uncertain

APPENDIX IV

Bird Species Reported From the Subject Properties and Vicinity

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	OBBA[5] 17NJ68	NHIC Data[1]	NRSI Observed	
								Prince Property	Bonnefield Property
Anatidae	**Ducks, Geese & Swans**								
Branta canadensis	Canada Goose	S5				FY			
Aix sponsa	Wood Duck	S5				T			X
Anas platyrhynchos	Mallard	S5				FY			X
Anas discors	Blue-winged Teal	S4				H			
Oxyura jamaicensis	Ruddy Duck	S4B, S4N				P			
Phasianidae	**Partridges, Grouse & Turkeys**								
Bonasa umbellus	Ruffed Grouse	S4				H			
Meleagris gallopavo	Wild Turkey	S5				FY		X	
Ardeidae	**Herons & Bitterns**								
Ardea herodias	Great Blue Heron	S4B				AE		X	
Butorides virescens	Green Heron	S4B				H			
Cathartidae	**Vultures**								
Cathartes aura	Turkey Vulture	S5B				P		H	X
Accipitridae	**Hawks, Kites, Eagles & Allies**								
Circus cyaneus	Northern Harrier	S4B	NAR	NAR		T			
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR				X	
Buteo platypterus	Broad-winged Hawk	S5B				A			
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR		H		P	H
Rallidae	**Rails, Gallinules & Coots**								
Porzana carolina	Sora	S4B				S			
Charadriidae	**Plovers**								
Charadrius vociferus	Killdeer	S5B, S5N				P		T	H
Scolopacidae	**Sandpipers, Phalaropes & Allies**								
Actitis macularia	Spotted Sandpiper	S5				S			
Gallinago delicata	Wilson's Snipe	S5B							H
Scolopax minor	American Woodcock	S4B				S			
Laridae	**Gulls, Terns & Skimmers**								
Larus delawarensis	Ring-billed Gull	S5B, S4N						X	X
Larus argentatus	Herring Gull	S5B, S5N						X	
Columbidae	**Pigeons & Doves**								
Columba livia	Rock Pigeon	SNA				T		X	
Zenaida macroura	Mourning Dove	S5				T		P	T
Strigidae	**Typical Owls**								
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR		S			
Apodidae	**Swifts**								
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	T			
Trochilidae	**Hummingbirds**								
Archilochus colubris	Ruby-throated Hummingbird	S5B				H			
Alcedinidae	**Kingfishers**								
Megaceryle alcyon	Belted Kingfisher	S4B				CF		X	X
Picidae	**Woodpeckers**								
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B				D			
Picoides pubescens	Downy Woodpecker	S5				H		X	
Picoides villosus	Hairy Woodpecker	S5				S			
Colaptes auratus	Northern Flicker	S4B				S		X	S
Dryocopus pileatus	Pileated Woodpecker	S5				H		X	
Falconidae	**Caracaras & Falcons**								
Falco sparverius	American Kestrel	S4				T			
Tyrannidae	**Tyrant Flycatchers**								
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		S		T	T
Empidonax alnorum	Alder Flycatcher	S5B				T			
Empidonax traillii	Willow Flycatcher	S5B				S			
Empidonax minimus	Least Flycatcher	S4B				H		S	X
Sayornis phoebe	Eastern Phoebe	S5B				AE		X	
Myiarchus crinitus	Great Crested Flycatcher	S4B				S		S	
Tyrannus tyrannus	Eastern Kingbird	S4B				T			T
Vireonidae	**Vireos**								
Vireo gilvis	Warbling Vireo	S5B				T		S	
Vireo olivaceus	Red-eyed Vireo	S5B				T		T	T
Corvidae	**Crows & Jays**								
Cyanocitta cristata	Blue Jay	S5				P		A	A
Corvus brachyrhynchos	American Crow	S5B				FY		T	T
Corvus corax	Common Raven	S5						H	X

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	OBBA[5] 17NJ68	NHIC Data[1]	NRSI Observed Prince Property	NRSI Observed Bonnefield Property
Hirundinidae	**Swallows**								
Tachycineta bicolor	Tree Swallow	S4B				AE			H
Riparia riparia	Bank Swallow	S4B	THR	T		AE		P	H
Petrochelidon pyrrhonota	Cliff Swallow	S4B						H	
Hirundo rustica	Barn Swallow	S4B	THR	T		AE		AE	AE
Paridae	**Chickadees & Titmice**								
Poecile atricapillus	Black-capped Chickadee	S5				CF		S	S
Sittidae	**Nuthatches**								
Sitta carolinensis	White-breasted Nuthatch	S5				CF		H	H
Troglodytidae	**Wrens**								
Troglodytes aedon	House Wren	S5B				T		S	
Troglodytes hiemalis	Winter Wren	S5B				S			
Regulidae	**Kinglets**								
Regulus satrapa	Golden-crowned Kinglet	S5B				S			
Turdidae	**Thrushes**								
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR		AE			
Catharus fuscescens	Veery	S4B				T			
Catharus guttatus	Hermit Thrush	S5B				S			
Hylocichla mustelina	Wood Thrush	S4B	SC	T		A			
Turdus migratorius	American Robin	S5B				CF		T	
Mimidae	**Mockingbirds, Thrashers & Allies**								
Dumetella carolinensis	Gray Catbird	S4B				T		X	
Toxostoma rufum	Brown Thrasher	S4B				S			H
Sturnidae	**Starlings**								
Sturnus vulgaris	European Starling	SNA				CF		T	V
Bombycillidae	**Waxwings**								
Bombycilla cedrorum	Cedar Waxwing	S5B				P		H	
Parulidae	**Wood Warblers**								
Seiurus aurocapillus	Ovenbird	S4B				T			
Parkesia noveboracensis	Northern Waterthrush	S5B				S			
Mniotilta varia	Black-and-white Warbler	S5B				FY			
Oreothlypis ruficapilla	Nashville Warbler	S5B				S			X
Geothylpis philadelphia	Mourning Warbler	S4B				T			
Geothylpis trichas	Common Yellowthroat	S5B				DD			
Setophaga ruticilla	American Redstart	S5B				D		S	S
Setophaga fusca	Blackburnian Warbler	S5B				T			
Setophaga petechia	Yellow Warbler	S5B				T		T	H
Setophaga pensylvanica	Chestnut-sided Warbler	S5B				S		S	
Setophaga caerulescens	Black-throated Blue Warbler	S5B				S			
Setophaga pinus	Pine Warbler	S5B				T		S	
Setophaga coronata	Yellow-rumped Warbler	S5B				CF		S	
Setophaga virens	Black-throated Green Warbler	S5B				T			
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	A			
Emberizidae	**New World Sparrows & Allies**								
Spizella passerina	Chipping Sparrow	S5B				A		S	T
Passerculus sandwichensis	Savannah Sparrow	S4B				T		T	
Ammodramus savannarum	Grasshopper Sparrow	S4B		SC		S			
Melospiza melodia	Song Sparrow	S5B				FY		V	T
Melospiza georgiana	Swamp Sparrow	S5B				A			
Zonotrichia albicollis	White-throated Sparrow	S5B				S		H	
Zonotrichia leucophrys	White-crowned Sparrow	S4B						X	X
Cardinalidae	**Cardinals, Grosbeaks & Allies**								
Piranga olivacea	Scarlet Tanager	S4B				S			
Cardinalis cardinalis	Northern Cardinal	S5				FY		H	X
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B				S			S
Passerina cyanea	Indigo Bunting	S4B				T		T	T
Icteridae	**Blackbirds**								
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	T	X	T	
Agelaius phoeniceus	Red-winged Blackbird	S4				CF		A	S
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	T	X	T	
Quiscalus quiscula	Common Grackle	S5B				CF		H	H
Molothrus ater	Brown-headed Cowbird	S4B				S		X	S
Icterus galbula	Baltimore Oriole	S4B				D		T	S
Fringillidae	**Finches & Allies**								
Carpodacus mexicanus	House Finch	SNA				S			
Spinus tristis	American Goldfinch	S5B				T		P	P
Passeridae	**Old World Sparrows**								
Passer domesticus	House Sparrow	SNA				CF		X	X

[1]MNRF 2015; [2]MNRF 2016a; [3]COSEWIC 2016; [4]Government of Canada 2016; [5]BSC et al. 2008

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
SNA Unranked
SX Presumed Extirpated
SH Possibly Extirpated (Historical)
S#? Rank Uncertain
COSSARO
END Endangered
THR Threatened
SC Special Concern
NAR Not at Risk
DD Data Deficient
EXP Extirpated
COSEWIC
E Endangered
T Threatened
SC Special Concern
NAR Not at Risk
DD Data Deficient
XT Extirpated
SARA Schedule
Schedule 1 Officially Protected under SARA

Breeding Evidence Codes
Observed
X Species observed in its breeding season with no evidence of breeding
Possible
H Species observed in its breeding season in suitable nesting habitat
S Singing male present of breeding calls heard in breeding season in suitable nesting habitat
Probable
P Pair observed in their breeding season in suitable nesting habitat
T Permanent territory presumed through registration of territorial song on at least 2 days, one week or more apart at the same place
D Courtship or display between a male and female or 2 males including courtship feeding and copulation
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult
B Brood patch on adult female or cloacal protuberance on adult male
N Nest building or excavation of nest site
Confirmed
DD Distraction display or injury feigning
NU Used nest or egg shell found (occupied/laid this season)
FY Recently fledged young or downy young
AE Adults leaving or entering nest site in circumstances indicating occupied nest
FS Adult carrying faecal sac
CF Adult carrying food for young
NE Nest containing eggs
NY Nest with young seen or heard

APPENDIX V

Herpetofauna Species Reported From the Subject Properties and Vicinity

Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	Ontario Reptile and Amphibian Atlas[#]	NHIC Data[1]	NRSI Observed	
							Prince Property	Bonnefield Property
Snakes								
Sistrurus catenatus catenatus pop. 1	Eastern Massasauga Rattlesnake (*Great Lakes/St. Lawrence population*)	S3	THR	T	X			
Storeria occipitomaculata occipitomaculata	Northern Red-bellied Snake	S5			X			
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5			X			X
Salamanders								
Notophthalmus viridescens viridescens	Red-spotted Newt	S5			X			
Plethodon cinereus	Eastern Red-backed Salamander	S5			X			
Toads and Frogs								
Anaxyrus americanus	American Toad	S5			X			X
Hyla versicolor	Tetraploid Gray Treefrog	S5			X			X
Pseudacris triseriata pop. 2	Western Chorus Frog *(Great Lakes/St. Lawrence - Canadian Shield Population)*	S3	NAR	T	X			
Pseudacris crucifer	Spring Peeper	S5			X			X
Lithobates clamitans melanota	Northern Green Frog	S5			X			X
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	X			
Lithobates sylvatica	Wood Frog	S5			X			X

[1]MNRF 2015; [2]MNRF 2016a; [3]COSEWIC 2016; [4]Government of Canada 2016; [5]Ontario Nature 2015

Legend
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
SNA Unranked
SX Presumed Extirpated
SH Possibly Extirpated (Historical)
S#? Rank Uncertain
OMNR
END Endangered
THR Threatened
SC Special Concern
NAR Not at Risk
DD Data Deficient
EXP Extirpated
COSEWIC
E Endangered
T Threatened
SC Special Concern
NAR Not at Risk
DD Data Deficient
XT Extirpated

APPENDIX VI

Mammal Species Reported From the Subject Properties and Vicinity

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Mammal Atlas[5]	NRSI Observed	
							Prince Property	Bonnefield Property
Insectivora	**Shrews and Moles**							
Condylura cristata	Star-nosed Mole	S5				X		
Chiroptera	**Bats**							
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	X		
Lagomorpha	**Rabbits and Hares**							
Lepus americanus	Snowshoe Hare	S5				X		
Sylvilagus floridanus	Eastern Cottontail	S5				X	X	
Rodentia	**Rodents**							
Castor canadensis	Beaver	S5				X		
Erethizon dorsatum	Porcupine	S5				X		X
Marmota monax	Woodchuck	S5				X	X	
Ondatra zibethicus	Muskrat	S5				X		
Sciurus carolinensis	Eastern Gray Squirrel	S5				X		
Tamiasciurus hudsonicus	Red Squirrel	S5				X	X	
Tamias striatus	Eastern Chipmunk	S5				X	X	X
Carnivora	**Carnivores**							
Canis latrans	Coyote	S5				X		
Mephitis mephitis	Striped Skunk	S5				X		
Mustela vison	American Mink	S4				X		
Procyon lotor	Northern Raccoon	S5				X	X	X
Vulpes vulpes	Red Fox	S5				X		
Artiodactyla	**Deer and Bison**							
Odocoileus virginianus	White-tailed Deer	S5				X	X	X

[1]MNRF 2015; [2]MNRF 2016a; [3]COSEWIC 2016; [4]Government of Canada 2016; [5]Dobbyn 1994

Legend
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
SNA Unranked
SX Presumed Extirpated
SH Possibly Extirpated (Historical)
S#? Rank Uncertain
OMNR
NAR Not at Risk
SC Special Concern
THR Threatened
END Endangered
EXP Extirpated
DD Data Deficient
COSEWIC
NAR Not at Risk
SC Special Concern
T Threatened
E Endangered
XT Extirpated
DD Data Deficient
SARA Schedule
Schedule 1 Officially Protected under SARA

APPENDIX VII

Butterfly Species Reported From the Subject Properties and Vicinity

Butterfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Butterfly Atlas[5]	NRSI Observed	
							Prince Property	Bonnefield Property
Hesperiidae	**Skippers**							
Polites origenes	Crossline Skipper	S4				X		
Polites themistocles	Tawny-edged Skipper	S5				X		
Pieridae	**Whites and Sulphurs**							
Pieris rapae	Cabbage White	SNA				X	X	
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**							
Celastrina ladon	Spring Azure	S5				X		
Nymphalidae	**Brush-footed**							
Vanessa atalanta	Red Admiral	S5				X		

[1]MNRF 2015; [2]MNRF 2016a; [3]COSEWIC 2016; [4]Government of Canada 2016; [5]McNaughton et al. 2016

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SNA Unranked

APPENDIX VIII

Odonate Species Reported From the Subject Properties and Vicinity

Dragonfly and Damselfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Odonata Atlas[5]	NRSI Observed
Calopterygidae	**Broadwinged Damselflies**						
Calopteryx aequabilis	River Jewelwing	S5				X	
Calopteryx maculata	Ebony Jewelwing	S5				X	
Lestidae	**Spreadwings**						
Lestes dryas	Emerald Spreadwing	S5				X	
Coenagrionidae	**Narrow-winged Damselflies**						
Amphiagrion saucium	Eastern Red Damsel	S4				X	
Enallagma annexum	Northern Bluet	S4				X	
Enallagma boreale	Boreal Bluet	S5				X	
Ischnura posita	Fragile Forktail	S4				X	
Ischnura verticalis	Eastern Forktail	S5				X	
Nehalennia irene	Sedge Sprite	S5				X	
Aeshnidae	**Darners**						
Aeshna canadensis	Canada Darner	S5				X	
Aeshna constricta	Lance-tipped Darner	S5				X	
Aeshna eremita	Lake Darner	S5				X	
Aeshna umbrosa	Shadow Darner	S5				X	
Anax junius	Common Green Darner	S5				X	
Gomphidae	**Clubtails**						
Ophiogomphus carolus	Riffle Snaketail	S2S3				X	
Cordulegasteridae	**Spiketails**						
Cordulegaster maculata	Twin-spotted Spiketail	S4				X	
Corduliidae	**Emeralds**						
Cordulia shurtleffii	American Emerald	S5				X	
Epitheca canis	Beaverpond Baskettail	S5				X	
Somatochlora williamsoni	Williamson's Emerald	S4				X	
Libellulidae	**Skimmers**						
Leucorrhinia proxima	Red-waisted (Belted) Whiteface	S5				X	
Libellula pulchella	Twelve-spotted Skimmer	S5				X	
Sympetrum costiferum	Saffron-bordered Meadowhawk	S4				X	
Sympetrum obtrusum	White-faced Meadowhawk	S5				X	
Sympetrum vicinum	Yellow-legged (Banded) Meadowhawk	S5				X	

[1]MNRF 2015; [2]MNRF 2016a; [3]COSEWIC 2016; [4]Government of Canada 2016; [5]MNRF 2016b

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure

APPENDIX IX

Ontario Regulation 242/08 Section 23.5 – Barn Swallows

Barn swallow

23.5 (1) In this section,

"barn swallow active season" means the period of each year when barn swallow carry out life processes relating to breeding, nesting and rearing, and that begins around the beginning of May and ends around the end of August, the exact dates varying according to the area of the Province in which the barn swallow are located and the climate conditions of each year; ("saison active de l'hirondelle rustique")

"nest cup" means a container, receptacle or vessel that may be used as a nest by barn swallow. ("nid artificiel") O. Reg. 176/13, s. 14.

(2) Clause 9 (1) (a) and subsection 10 (1) of the Act do not apply to a person who harms or harasses a barn swallow, or who damages or destroys its habitat, while carrying out the maintenance, repair, modification, replacement or demolition of a building or structure that provides barn swallow habitat, if the person satisfies the conditions set out in subsections (3) to (12). O. Reg. 176/13, s. 14.

(3) The following are the conditions that a person who carries on an activity described in subsection (2) must satisfy for the purposes of subsection (2):

1. Before commencing the activity, the person must,

i. give the Minister notice of the activity by submitting a notice of activity form available on the Registry to the Minister through the Registry,

ii. ensure that the notice includes,

A. a description of the activity,

B. the proposed start and end dates for the activity,

C. the location of the building or structure that will be the object of the activity, and

D. notice of the fact that the activity will impact barn swallow habitat,

iii. prepare a barn swallow mitigation and restoration record in accordance with subsection (4).

2. The person must follow the requirements of section 23.3 with respect to the completion of the notice of activity form referred to in subparagraph 1 i, the keeping of records relating to the notice of activity form and the updating of the information on the Registry.

3. Before, during and after carrying out the activity described in subsection (2), the person must,

i. follow the steps set out in subsections (5) to (9) to minimize the adverse effects of the activity on barn swallow and its habitat, and

ii. update the barn swallow mitigation and restoration record to include the steps referred to in subparagraph i.

4. The person must carry out the monitoring and record keeping activities described in subsections (10) to (12).

5. Every year that the person is required to monitor barn swallow habitat under subsection (10), the person must notify the Ministry of barn swallow observed during the monitoring by completing, within three months following the completion of the monitoring, the Natural Heritage Information Centre Rare Species Reporting Form available on the Ministry website detailing the species, number of barn swallows, the date and location of observation and any other information requested on that form. O. Reg. 176/13, s. 14.

(4) A barn swallow mitigation and restoration record referred to in subparagraph 1 iii of subsection (3) shall, when first prepared, include the following information:

1. The name and contact information of the person who is proposing to carry out an activity described in subsection (2).

2. A description of the activity the person proposes to carry out, including the proposed start and completion dates.

3. A description of the building or structure that is the object of the activity.

4. The number, location, and description of barn swallow nests located on the building or structure, and the amount of area suitable for nesting that the building or structure provides. O. Reg. 176/13, s. 14.

(5) The following are the measures a person who proposes to carry out an activity described in subsection (2) must follow to minimize the adverse effects of the activity on barn swallow and its habitat:

1. If any part of the activity is to be carried out during the barn swallow active season, the person must ensure that barn swallow are excluded from any part of the building or structure that is the object of the activity by doing the following before the barn swallow active season begins:

i. removing from the building or structure any existing barn swallow nests that may be impacted by the activity, and

ii. installing tarps and netting or taking other such measures to prevent barn swallow from accessing any part of the building or structure that is the object of the activity.

2. If, despite following the measures described in paragraph 1, barn swallow enter the building or structure to establish nests, any part of the activity that would harm or harass barn swallow while nesting must be suspended until the end of the barn swallow active season.

3. If, as a result of carrying out the activity or the requirements of paragraph 1, barn swallow nests on a building or structure will be removed, damaged or destroyed, the person must create habitat for barn swallow as follows:

i. for each nest that was removed, damaged or destroyed, the person must substitute one nest cup,

ii. the substitute nest cup must be installed,

A. in the building or structure that was the object of the activity and in any area of the building or structure that continues to provide conditions that are suitable for barn swallow nesting,

B. in any building or structure that exists within one kilometre of the building or structure that was the object of the activity if it provides conditions that are suitable for barn swallow nesting, or

C. in any building or structure that the person constructs within one kilometre of the building or structure that was the object of the activity, that meets the requirements of subsection (8),

iii. the substitute nest cup must be installed within the time period set out in subsection (6).

4. The person must create habitat for barn swallow in accordance with subsections (7), (8) and (9) and within the time period set out in subsection (6) if, as a result of carrying out the activity, a building or structure that provides barn swallow habitat,

i. will be destroyed, or

ii. will be altered so that it no longer provides suitable conditions for barn swallow nesting or provides a smaller area for barn swallow nesting.

5. The person must maintain a building or structure constructed or modified under paragraph 4 for a period of three years after the habitat is created. O. Reg. 176/13, s. 14.

(6) A person who proposes to carry out an activity described in subsection (2) must create habitat for barn swallow under paragraph 3 or 4 of subsection (5) within one of the following time frames:

1. If the activity will begin outside of the barn swallow active season, before the beginning of the next barn swallow active season.
2. If the activity will begin during the barn swallow active season, before the beginning of that barn swallow active season. O. Reg. 176/13, s. 14.

(7) A person who is required to create habitat for barn swallow under paragraph 4 of subsection (5) must do so,

(a) in one of the following ways:

(i) by constructing one or more structures that meet the requirements of subsection (8), or

(ii) by modifying one or more existing buildings or structures that do not provide habitat for barn swallow so that they meet the requirements of subsection (8); and

(b) in a location that is within one kilometre of the building or structure that will be the object of the activity described in subsection (2) and within 200 metres of an area that provides suitable foraging conditions for barn swallow and that is accessible to barn swallow. O. Reg. 176/13, s. 14; O. Reg. 323/13, s. 3.

(8) A building or structure constructed or modified under clause (7) (a) must provide suitable conditions for barn swallow nesting and must,

(a) provide horizontal ledges or rough vertical surfaces with a sheltered overhang;

(b) provide surface areas suitable for nest attachment at a height that minimizes disturbances to barn swallow and in a location that minimizes predation;

(c) allow barn swallow to freely enter and exit nests;

(d) provide suitable area to accommodate appropriate spacing between nests; and

(e) be structurally sound and capable of providing habitat for barn swallow on a long term basis. O. Reg. 176/13, s. 14.

(9) The amount of habitat provided by a building or structure constructed or modified under clause (7) (a) must be greater than the amount of habitat that was lost in the building or structure that was the object of the activity described in subsection (2). O. Reg. 176/13, s. 14.

(10) For a period of three years after a person has created habitat for barn swallow under paragraph 3 or 4 of subsection (5), the person shall monitor the use of the habitat by barn swallow during the barn swallow active season of each year and shall record information collected during monitoring, including the following information:

1. The number, description and location of new nests created by barn swallow.

2. An estimate of the number of barn swallow using the building or structure. O. Reg. 176/13, s. 14.

(11) A person who carries out an activity described in subsection (2) shall retain the barn swallow mitigation and restoration record created under subsection (4) for a period of two years after the monitoring required under subsection (10) is completed and shall update the record from time to time to include the following information:

1. A description of the steps followed by the person in accordance with subsection (5) to minimize the adverse effects of the activity on barn swallow and its habitat, including details of,

i. nest cups installed on buildings or structures in accordance with paragraph 3 of subsection (5), and

ii. buildings or structures constructed or modified in accordance with paragraph 4 of subsection (5), the amount of nesting area created in the buildings or structures and their location.

2. The information recorded during monitoring activities described in subsection (10).

3. Any change to the information included in the record under subsection (4). O. Reg. 176/13, s. 14.

(12) A person who carries out an activity described in subsection (2) shall provide a copy of the barn swallow mitigation and restoration record to the Ministry within 14 days of receiving a request for it. O. Reg. 176/13, s. 14.

APPENDIX X

Ontario Regulation 242/08 Section 23.6 – Bobolink and Eastern Meadowlark

Bobolink, eastern meadowlark

23.6 (1) This section applies with respect to any activity to develop land, such as the construction of buildings, structures, roads or other infrastructure and the excavation and landscaping of land, in an area that is the habitat of bobolink or eastern meadowlark, but does not apply to an activity to which section 23.2 applies. O. Reg. 176/13, s. 14.

(2) Clause 9 (1) (a) and subsection 10 (1) of the Act do not apply to a person who, while carrying out an activity described in subsection (1), kills, harms, harasses, captures or takes a bobolink or an eastern meadowlark, or damages or destroys its habitat, if,

(a) the size of the area of habitat of bobolink or eastern meadowlark that is damaged or destroyed by the activity is equal to or less than 30 hectares; and

(b) the person satisfies all of the conditions set out in subsection (4). O. Reg. 176/13, s. 14.

(3) Subclauses 9 (1) (b) (i) and (ii) of the Act do not apply to the possession or transport of a bobolink or an eastern meadowlark if, pursuant to subsection (2), clause 9 (1) (a) of the Act did not apply with respect to the bobolink or eastern meadowlark. O. Reg. 176/13, s. 14.

(4) The following are the conditions that a person who carries out an activity described in subsection (1) must satisfy for the purposes of clause (2) (b):

1. Before commencing the activity, the person must,

i. give the Minister notice of the activity by submitting a notice of activity form available on the Registry to the Minister through the Registry,

ii. prepare a habitat management plan in accordance with subsections (5) and (6), and

iii. give the Minister a written undertaking to continue, after the end of the five-year period referred to in paragraph 7, to manage any habitat created or enhanced in accordance with paragraph 6 by carrying out the measures described in subsection (9) until the earlier of,

A. the end of the 20-year period that follows the creation or enhancement of the habitat under paragraph 6, or

B. if the area of habitat that was destroyed by the activity is eventually returned to a suitable state to be used by bobolink or eastern meadowlark, the day on which the area reaches that state.

2. The person must ensure that the notice of activity form submitted under subparagraph 1 i includes,

i. a description of the activity,

ii. the proposed start and end dates of the activity and the area in which it will be carried out, and

iii. an indication as to whether the activity will be carried out on land that is habitat for bobolink, for eastern meadowlark, or for both, as the case may be.

3. The person must follow the requirements of section 23.3 with respect to the completion of the notice of activity form, the keeping of records relating to the notice of activity form and the updating of the information on the Registry.

4. Once a habitat management plan is prepared under subparagraph 1 ii, the person must,

i. comply with any provisions in the habitat management plan with respect to the manner in which,

A. the activity should be carried out, and

B. the habitat for bobolink or eastern meadowlark referred to in paragraph 6 should be created or enhanced, as the case may be, and managed,

ii. retain a copy of the habitat management plan for at least five years after the activity is complete, and

iii. provide a copy of the habitat management plan to the Ministry within 14 days of receiving a request for it.

5. While carrying out the activity, the person must,

i. not perform any part of the activity that is likely to damage or destroy the habitat of bobolink or eastern meadowlark or kill, harm or harass bobolink or eastern meadowlark, between May 1 and July 31 of any year, and

ii. take reasonable steps to minimize adverse effects of the activity on bobolink and eastern meadowlark, including, if applicable, routing access roads along existing fencerows or hedgerows if possible.

6. The person must either create new habitat for bobolink or eastern meadowlark or enhance an already existing habitat for bobolink or eastern meadowlark as follows:

i. the area of the new or enhanced habitat must,

A. be located outside of the area where the activity is carried out but within the same ecoregion as that area or in an ecoregion that is adjacent to that area, and

B. meet the requirements of subsection (7) with respect to its size and dimensions,

ii. within 12 months after the day the activity described in subsection (1) is commenced, the work of creating or enhancing the habitat must be completed in a manner that ensures that the habitat meets the requirements of subsection (8) with respect to the types of vegetation it provides.

7. For five years after habitat is created or enhanced in accordance with paragraph 6, the person must do the following annually:

i. manage the habitat by carrying out the measures described in subsection (9), and

ii. monitor the area in which the habitat was created or enhanced by conducting at least three surveys every year at a time when bobolink or eastern meadowlark are likely to be present, to determine if the species are in fact present and, if so, to assess fledgling success.

8. The person must prepare and maintain a record in respect of the activity and the habitat created or enhanced under paragraph 6 and ensure that the record meets the requirements of subsection (10) and the person must,

i. retain the record until December 31 of the final year of the five-year period during which the person must manage and monitor the new or enhanced habitat, and

ii. provide a copy of the record to the Ministry within 14 days of receiving a request for it. O. Reg. 176/13, s. 14.

(5) A habitat management plan shall be prepared by one or more persons with expertise in relation to bobolink or eastern meadowlark, or both, as the case may be, using the best available information on steps that may help minimize or avoid adverse effects on the species to which the plan relates, which includes consideration of information obtained from the Ministry, aboriginal traditional knowledge and community knowledge if it is reasonably available. O. Reg. 179/14, s. 3.

(6) A habitat management plan shall include the following information:

1. The name and contact information of the person on whose behalf the activity described in subsection (1) is being carried out.
2. With respect to the area of bobolink or eastern meadowlark habitat that is likely to be damaged or destroyed by the activity described in subsection (1),

i. a description of the area’s location, including a detailed map,

ii. the ecoregion in which the area is located, and

iii. the size of the area in hectares.

3. With respect to the activity described in subsection (1) that the person proposes to carry out,

i. a description of the activity, and

ii. the proposed start date of the activity,

4. With respect to the area intended as new or enhanced habitat under paragraph 6 of subsection (4),

i. a description of the area's location, including a detailed map,

ii. the ecoregion in which the area is located,

iii. the size of the area in hectares,

iv. the composition of the soils covering the area, and

v. the percentage of the area covered by grass species at the time the habitat management plan is prepared.

5. A description of how the area intended as new or enhanced habitat under paragraph 6 of subsection (4) will be created or enhanced and managed for eastern meadowlark or bobolink, including,

i. a description of the areas to be seeded, and of the composition of the seed mixture such as the species and their relative percentage within the seed mixture,

ii. phasing and times of the year for site preparation, planting, seeding, tending and maintenance, and

iii. a description of the practices that will be undertaken for site preparation, planting, seeding, tending and maintenance, including the requirements set out in subsections (8) and (9). O. Reg. 176/13, s. 14.

(7) An area that will be converted into new or enhanced habitat for bobolink or eastern meadowlark must meet the following requirements as to its size and dimensions:

1. The area must be larger than the area of the habitat for bobolink or eastern meadowlark that is damaged or destroyed by the activity.
2. The area may be made up of separate parcels of land, but the minimum size of any individual parcel must be no less than four hectares.

3. No portion of the area shall be less than 200 metres in width. O. Reg. 176/13, s. 14.

(8) Habitat for bobolink or eastern meadowlark that has been created or enhanced under paragraph 6 of subsection (4) must meet the following requirements with respect to the types of vegetation it provides:

1. A minimum of 60 to 80 per cent of the habitat must be covered with at least three different grass species and any remaining part of the habitat that is not covered with grass species must be covered with forbs or legumes.
2. Among the grass species referred to in paragraph 1, at least one must grow greater than 50 centimetres high under normal growing conditions. O. Reg. 176/13, s. 14.

(9) The following are the requirements to manage habitat for bobolink or eastern meadowlark that has been created or enhanced under paragraph 6 of subsection (4):

1. The area shall not be harvested, mowed or cut between April 1 and July 31 of any year.
2. If the habitat is used for pasture, grazing farm animals must be excluded from at least 50 per cent of the habitat from April 1 until July 31 of each year.
3. In each of the five years following the creation or enhancement of the habitat, take such actions as are necessary to maintain the grass species, forbs and legumes in the area in the proportions described in paragraph 1 of subsection (8) and remove woody vegetation and invasive species. O. Reg. 176/13, s. 14.

(10) The record required under paragraph 8 of subsection (4) shall,

(a) document the steps taken by the person under subparagraph 5 ii of subsection (4) to minimize adverse effects of the activity described in subsection (1) on bobolink or eastern meadowlark;

(b) document the steps taken by the person to create or enhance habitat under paragraph 6 of subsection (4) and to manage that habitat under subparagraph 7 i of subsection (4);

(c) include photographs of the area created or enhanced as habitat under paragraph 6 of subsection (4) that show the area prior to and after the habitat is created or enhanced;

(d) include data and information collected during monitoring under subparagraph 7 ii of subsection (4); and

(e) include details of any encounters with the species. O. Reg. 176/13, s. 14.

APPENDIX XI

Conceptual Planting Areas (MHBC Planners 2017b)

St. Marys Cement Inc.
Licence #3512

Lot 14
Lot 15
Lot 13
Lot 14
Lot 13
Lot 14
Lot 12
Lot 13
Lot 12
Lot 13
Lot 11
Lot 12
Lot 11
Lot 12

No Extraction
Woodlot to be
Retained

Plantings

3:1 Sideslope
Area

No Extraction
Woodlot to be
Retained

3:1 Sideslope
Area

OW2-04

OW8-09

OW1-07

OW5-04

OW4-04

OW1-01

OW2-07

Prince Property

Melancthon
Pit No. 1
Licence No.
129167

Bonnefield
Property

Melancthon
Pit No. 2
Licence No.
625155

Existing Berm

Existing Berm

Existing Berm

CONC. 3

CONC. 4

4TH LINE

CONC. 3

CONC. 4