



BURNSIDE

**Environmental Impact Study
Langen Property
5520 Eighth Line & 5552 Eighth Line
Town of Erin, Wellington County**

**Mattamy (Erin) Limited and
2779181 Ontario Inc.**



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Langen Property
5520 Eighth Line & 5552 Eighth Line,
Town of Erin, Wellington County**

**Mattamy (Erin) Limited and 2779181
Ontario Inc.**

**R.J. Burnside & Associates Limited
128 Wellington Street West Suite 301
Barrie ON L4N 8J6 CANADA**

**June 2022 (updated October 2023)
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Environmental Impact Study
June 2022 (updated October 2023)

Distribution List

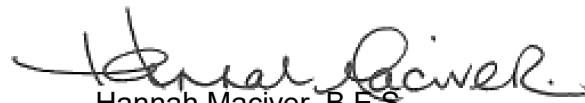
No. of Hard Copies	PDF	Email	Organization Name
0	Yes	Yes	Eric Mueller, Mattamy (Erin) Limited
0	Yes	Yes	Tom Baskerville, 2779181 Ontario Inc.
0	Yes	Yes	John Tjeerdsma, DSEL

Record of Revisions

Revision	Date	Description
0	June 9, 2022	Initial Draft Report to Client for Review
1	June 21, 2022	Final Draft Report to Client
2	June 27, 2022	Final Draft Report to Agencies for Review
3	October 19, 2023	Second Submission - Revised Report to Address Agency Comments

R.J. Burnside & Associates Limited

Report Prepared By:


Hannah Maciver, B.E.S.
Project Coordinator / Senior Ecologist
HM:js

Report Reviewed By:



Jennifer Szczerbak, B.Sc., E.M.P.D.
Vice President Ecology, Land Development
JS:js

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1.0 Introduction

1.1 Background and Purpose

R.J. Burnside & Associates Limited (Burnside) has been retained by Mattamy (Erin) Limited and 2779181 Ontario Inc. ('the Client') to complete an Environmental Impact Study (EIS) for the Langen Property at 5520 Eighth Line and 5552 Eighth Line (herein referred to as the "subject lands"), in support of their Draft Plan submissions. Both properties are covered in this report and are in the Town of Erin (Town), County of Wellington (County). 5520 Eighth Line and 5552 Eighth Line are approximately 36.02 ha and 27.14 ha in size, respectively, and are bounded by Eighth Line and existing residential properties to the east, agricultural lands to the west, forest to the south, and Sideroad 17 and existing residential properties to the north (see Figure 1). Portions of the subject lands are identified as woodlands, with units of the West Credit River Provincially Significant Wetland (PSW) Complex located in the northeast, southwest, and central-eastern portions of the subject lands and Unevaluated Wetlands located in the central portion. The site is in the West Credit River Subwatershed.

The subject lands are proposed to be developed for residential and related purposes. A portion of the original study area limits are now designated as "Lands to be Retained" and will continue to be used as a principal residence for the landowner on this parcel. The existing house and barns/sheds in this parcel will remain.

The first draft of the EIS report was originally submitted for agency review in June 2022; it has been updated to address agency comments and reflect David Schaeffer Engineering Limited's (DSEL) updated Functional Servicing and Stormwater Management Report (FSR) (October 2023).

1.2 Scope of Work

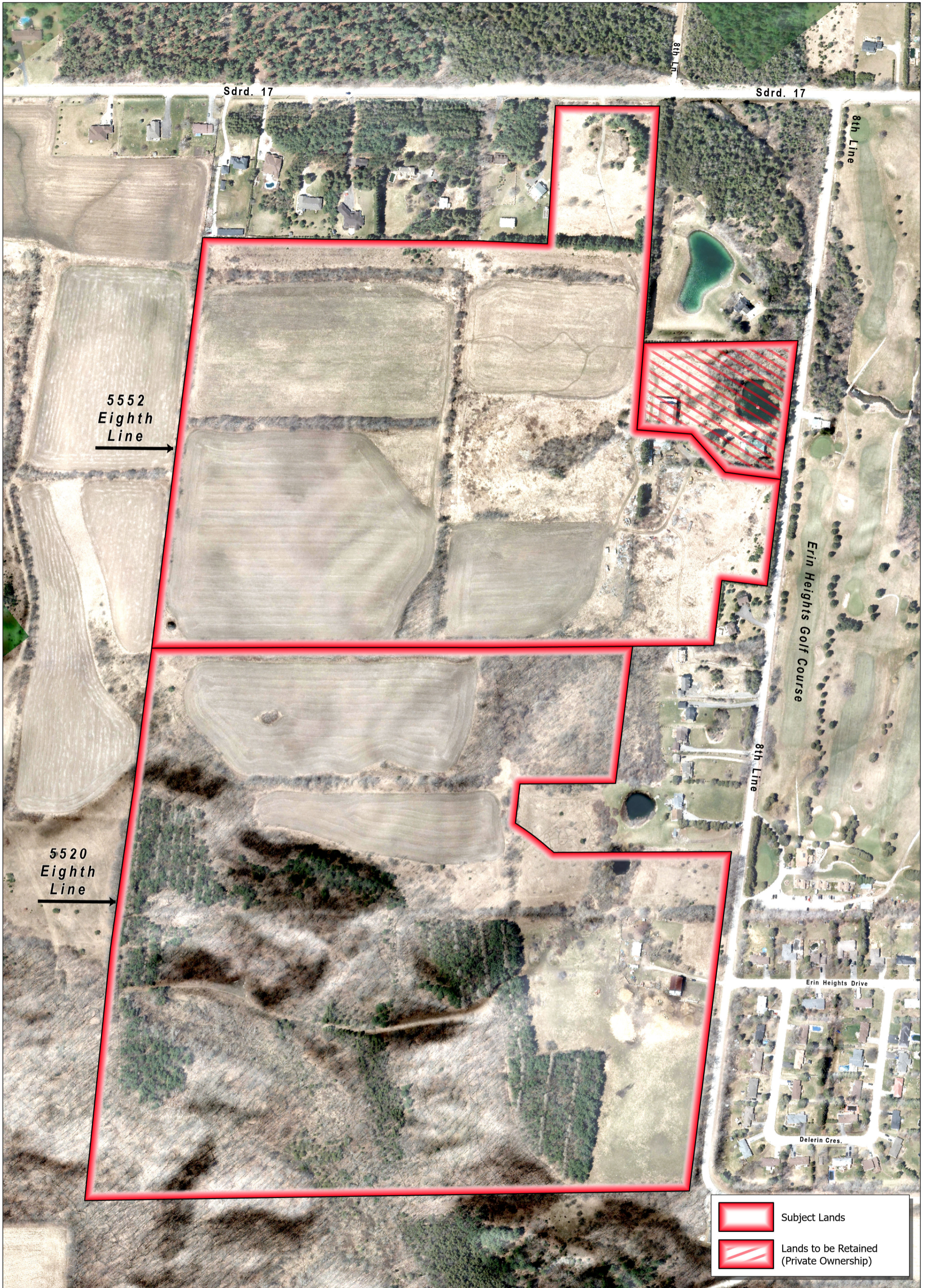
This document was prepared in accordance with the approved TOR (Appendix A), Section 2.1 (Natural Heritage) of the Provincial Policy Statement (PPS; MMAH, 2020), the Natural Heritage Reference Manual (NHRM) for Natural Heritage Policies of the PPS, 2005 (MNR, 2010) and the Significant Wildlife Habitat Technical Guide (SWHTG; MNR, 2000). As such, the EIS includes:

- A review of applicable environmental policies and regulations affecting the subject lands.
- A review of existing secondary source data to identify any known natural features.
- Pre-submission consultation with various agencies to identify additional features and to confirm field study methodologies.
- A summary of detailed field assessments that were conducted.

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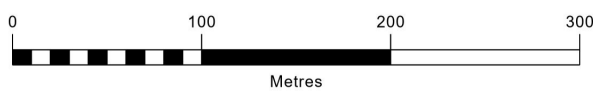
- A description of the proposed development, including conceptual servicing and stormwater management measures.
- An assessment of potential impacts resulting from the proposed development.
- Recommended mitigating measures that will allow development to proceed in a manner that is consistent with local, regional, provincial, and federal policies and regulations.

The EIS is organized according to this approach. Each of the report sections corresponds with the above objectives.



	Subject Lands
	Lands to be Retained (Private Ownership)

Datum: North American 1983 CSRS
 Coord. System: NAD 1983 CSRS UTM Zone 17N
 Projection: Transverse Mercator
 Central Meridian: 81°00.00"W
 False Easting: 500,000m | False Northing: 0m
 Page Orientation: -52° | Scale Factor: 0.99960



Client
**MATTAMY (ERIN) LIMITED
 AND 2779181 ONTARIO INC.**

Map Title
**LANGEN PROPERTY EIS
 SUBJECT LANDS**

Drawn	Checked	Date	Figure No. 1
PS	HM	2023/10/04	
Scale	Project No. 300052075		
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2.0 Planning and Environmental Policy Considerations

The following policies, Acts and regulations apply to features present on the subject lands.

2.1 Federal Species at Risk Act, 2002

The *Species at Risk Act, 2002* (SARA), provides protection for Species at Risk (SAR) and their habitat. Schedule 1 of SARA is considered the official list of wildlife SAR that receive legal protection under the Act and includes species that have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COESWIC) as Extirpated, Endangered, Threatened or Special Concern (Government of Canada, 2017).

To ensure the protection of SAR, Section 32(1) and (2) of the SARA states:

(1) No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species, or a threatened species

(2) No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual

And Section 33 of the SARA states:

No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered or threatened species, or that is listed as an extirpated species if a recovery strategy has recommended reintroduction of the species into the wild in Canada

SARA prohibitions pertaining to private lands include:

- Aquatic species listed on Schedule 1 as Endangered, Threatened or Extirpated.
- Migratory birds listed in the Migratory Bird Convention Act (MBCA) and listed on Schedule 1 as Endangered, Threatened or Extirpated.
- May apply through an order, to other species listed on Schedule 1 (i.e., not an aquatic or migratory bird species) as Endangered, Threatened or Extirpated, if provincial/territorial legislation or voluntary measures do not adequately protect the species and its habitat.

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Although Environment and Climate Change Canada (ECCC) is the overall administrator of SARA, responsibility for implementation of the Act is shared by ECCC and the Canadian Wildlife Service, Parks Canada and Department of Fisheries and Oceans (DFO). On private lands, ECCC oversees matters related to migratory birds, while DFO oversees matters related to aquatic species. In most cases pertaining to non-aquatic species on private lands, provincial laws (e.g., the *Endangered Species Act, 2007*) provide protection for critical habitat (i.e., habitat that is necessary for the survival or recovery of a listed endangered, threatened, or extirpated species). Alternatively, SARA prohibitions can be applied by an order, as described above, or through federal legislation (including SARA).

2.2 Federal Fisheries Act, 1985

Construction activities that have the potential to impact fish or fish habitat must be constructed and operated in compliance with the federal *Fisheries Act*. If the “death of a fish by means other than fishing”, or the “harmful alteration, disruption or destruction of fish habitat” will likely result from a project, the proponent responsible for the activities is required to obtain an *Authorization* from DFO as per Paragraph 34.4(2) and 35(2)(b) of the *Fisheries Act*.

2.3 Federal Migratory Birds Convention Act, 1994

The *Migratory Birds Convention Act, 1994* and the Migratory Bird Regulations (MBR) are federal legislative requirements that are binding on members of the public and all levels of government, including federal and provincial governments. The legislation protects certain species¹, controls the harvest of others and prohibits commercial sale of all species.

The MBCA has recently updated and modernized the MBR. The new MBR came into force on July 30, 2022. Further regulatory amendments are planned.

The previous regulations protected the nests of all migratory birds, at all times, for as long as they existed, which meant that many nests were protected when they no longer benefited migratory birds. The new MBR provides protection to migratory bird nests when they are considered to have a high conservation value for migratory birds.

The nests of all migratory bird species are protected when they contain a live bird or a viable egg. The nests of 18 species (listed in Schedule 1 of the regulations), whose

¹ Bird species not regulated under the Act include: Rock Dove, American Crow, Brown-headed Cowbird, Common Grackle, House Sparrow, Red-winged Blackbird, and European Starling. In addition, raptors are not regulated under the MBCA. However, they are protected under provincial legislation which restricts and regulates the taking or possession of eggs and nests. Furthermore, if the species identified is protected under Ontario’s ESA or the federal SARA, additional restrictions may apply.

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nests are reused by migratory birds, continue to have year-round nest protection, unless they have been shown to be abandoned. To be considered abandoned:

- Minister must be notified, via an online registration system ([Notice: Abandoned Nest Registry - Canada.ca](#)) that the nest does not contain a live bird or viable egg; and
- Nest is to remain unused by migratory birds during the designated wait time for that species.
- Of the 18 species, three are known to commonly breed in Southern Ontario: Great Blue Heron, Green Heron, and Pileated Woodpecker.

Permits are available under limited circumstances and mostly relate to egg or nest destruction or relocation “for the purpose of reducing the danger that they are causing or are likely to cause to human health or public safety or the damage they are causing or are likely to cause to agricultural, environmental or other interests.”

2.4 Provincial Planning Act, 1990 and Provincial Policy Statement, 2020

The PPS (MMAH, 2020) provides general policies on land use patterns, resources, and public health and safety that guide development across Ontario. This report will address Section 2.1 of the PPS (Natural Heritage).

Note: *The Province is currently seeking input on a proposed PPS that would replace the existing PPS and A Place to Grow Plan (2020). The proposed PPS, 2023 will form a single province-wide land use planning policy document to support the achievement of Provincial housing objectives.*

On June 16, 2023, proposed updated natural heritage policies and related definitions were released by the government. It appears that there are very few changes proposed. The date when the proposed policies will come into effect remains unknown. For now, the current PPS remains in effect.

Eight types of natural heritage features are identified in Sections 2.1.4 and 2.1.5 of the PPS, where development and site alteration are not permitted unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions:

1. Significant Wetlands in Ecoregions 5E, 6E, and 7E.
2. Significant Coastal Wetlands.
3. Significant Wetlands in the Canadian Shield, north of Ecoregions 5E, 6E, and 7E.
4. Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River).

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5. Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River).
6. Significant Wildlife Habitat (SWH).
7. Significant Areas of Natural and Scientific Interest (ANSIs).
8. Coastal wetlands in Ecoregions 5E, 6E, and 7E that are not subject to policy 2.1.4(b).
9. Sections 2.1.6, 2.1.7, and 2.1.8 identify three additional development and site alteration prohibitions and exemptions, as follows:
 - a) Fish habitat, except in accordance with Provincial and Federal requirements.
 - b) Habitat of Endangered and Threatened species, except in accordance with provincial and federal requirements.
 - c) On adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6, unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The presence, or potential presence, of these features as well as the policy and planning implications of these features for development, are discussed in detail in this report.

2.5 Provincial Endangered Species Act, 2007

The Endangered Species Act, 2007 (ESA) provides protection for SAR and their habitat. The ESA is now administered by the Ministry of the Environment, Conservation and Parks (MECP) and provides policies for the protection of Extirpated, Endangered and Threatened species, as well as species of Special Concern. These four categories of species form the Species at Risk in Ontario (SARO) List, which are classified by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is also responsible for maintaining criteria for assessing and classifying SAR.

The ESA helps protect species (Section 9) and their habitat (Section 10). Section 9(1)(a) of the ESA states:

no person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species

Section 10(1)(a) of the ESA states:

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no person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species

The ESA includes general habitat regulations, as well as species-specific habitat regulations. Species uplisted to Endangered or Threatened automatically receive general habitat protection under the ESA. The province is then required to prepare a species recovery strategy and establish a habitat regulation according to requirements of the ESA.

The SARO List is updated from time to time; therefore, it is the proponent's responsibility to practice due diligence to ensure that the ESA and its regulations are not violated. It is also the proponent's responsibility to be apprised of any amendments to the Act that may come into force for the duration of this project.

2.6 Provincial Greenbelt Plan, 2017

The Greenbelt Plan (Government of Ontario, 2017) establishes the Protected Countryside designation to enhance the extent of protected lands covered by the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP), while also improving linkages between these areas and the surrounding major lake systems and watersheds. The Greenbelt Plan sets out three geographic specific policies that apply within the Protected Countryside designation: the Agricultural System, the Natural System and Settlement Areas, as well as general policies that apply throughout the Protected Countryside.

The Natural System of the Protected Countryside is made up of a Natural Heritage System (NHS) and a Water Resource System that together protect ecologically and hydrologically significant features, areas, and functions.

The NHS is an overlay that applies to prime agricultural area and rural lands designations contained in official plans. As such, permitted uses are those set out within the prime agricultural area and rural lands policies and designations of official plans, subject to the Natural System policies of the Greenbelt Plan. The Greenbelt Plan also identifies Towns / Villages and Hamlets of varying sizes and urban river valleys, which support the achievement of healthier and safer communities that are more resilient to a changing climate (Region of Peel, 2019).

The entirety of the subject lands is within a designated Settlement Area in the Protected Countryside of the Greenbelt Area, as per the Greenbelt Plan (2017).

2.7 Credit Valley Conservation Authority

2.7.1 Ontario Regulation 160/06

The PPS (MMAH, 2020), described in Section 2.4 of this report, also outlines policies for managing development within, or adjacent to, natural hazard prone lands. Portions of the subject lands are located within Credit Valley Conservation (CVC) Regulation limits. CVC administers Ontario Regulation 160/06: Development, Interference with Wetlands and Alterations to Shorelines and Watercourses under Section 28 of the *Conservation Authorities Act, 1990*. Through this regulation, CVC can prohibit development in all areas within the jurisdiction of the Authority that are delineated as the “Regulation Limit” including:

- Adjacent to, or close to the shoreline of, the Great Lakes – St. Lawrence River System or to inland lakes that may be affected by flooding, erosion, or dynamic beaches.
- In river or stream valleys that have depressional features associated with a river or stream, whether they contain a watercourse.
- In hazardous lands.
- In wetlands.
- In other areas where development could interfere with the hydrologic function of a wetland, including areas within 120 m of all PSW’s and wetlands greater than 2 ha in size, and areas within 30 m of wetlands less than 2 ha in size.
- Require permission to develop in the aforementioned areas if, in the opinion of CVC, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development.

CVC will assess any permit applications to determine if the proposed works will affect regulated features, in accordance with their programs and policies. Section 10.0 of this report provides recommendations to ensure that regulated features, located within or adjacent to the subject lands, are not negatively impacted and, where applicable, recommends mitigation measures.

2.7.2 CVC Guidelines and Policies

2.7.2.1 Watershed Planning and Regulation Policies

CVC Watershed Planning and Regulation Policies (WPRP) (2010) apply to the NHS and regulated areas. Natural Features identified under Section 5.3 of the WPRP include valleylands, Environmentally Significant Areas (ESAs), ANSIs, woodlands, wetlands, watercourses, and fish habitat. Section 6.2.1 of the WPRP refers to the required buffers that must be applied to the limit of the natural heritage features, including applicable erosion access allowances. Under Section 6.2.1 b) features have the following buffers:

- i) 10 m from the limit of flood hazards.

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- ii) 10 m from the limit of erosion hazards.
- iii) 10 m from the limit of dynamic beach hazards.
- iv) 10 m from the drip line of significant woodlands.
- v) 10 m from the limit of other wetlands.
- vi) 30 m from the limit of provincially significant wetlands.
- vii) 30 m from the bankfull flow location of watercourses.
- viii) A distance to be determined through the completion of a comprehensive environmental study or technical report, to the satisfaction of CVC, from the limit of the following:
 - (a) Significant wildlife habitat.
 - (b) Significant habitat of threatened species and endangered species.
 - (c) Regionally and provincially significant life science ANSIs.
 - (a) ESAs.
 - (b) Significant habitat of Species of Conservation Concern (SCC).

2.7.2.2 Natural Heritage System Strategy

CVC developed a methodology for identifying a Credit River Watershed NHS, integrating terrestrial and aquatic components that captures CVC's existing natural cover and adds other lands strategically to improve connectivity and resilience (Phase 3, 2015). Additionally, CVC provides recommendations for implementing the NHS Strategy (Phase 4, 2015). The NHS is a science-based, integrated system based on CVC's natural heritage data and technical expertise and consists of natural heritage features and their buffers, and natural heritage areas that are connected and function together as an integrated NHS. Natural heritage features include valleylands, wetlands, woodlands, aquatic habitat, and the Lake Ontario shoreline, SWH, and habitat of Endangered and Threatened species. These features are further classified into three major categories: High Functioning, Supporting and Contributing. Minimum buffer widths have been mapped in the NHS, at a landscape scale, and must be further evaluated through the planning process on site. Evaluations are to consider the function and sensitivity of the feature and the nature of the adjoining land use to evaluate appropriate buffer width and composition (2015).

According to Figure A19 of the Strategy, the subject lands feature the following NHS categories: highly supporting eco function and supporting eco function (valleylands, wetlands, woodlands, watercourses).

2.7.2.3 Other CVC Guidelines

CVC has published several other important guideline documents that provide direction on natural heritage considerations during the planning and development phase, as well as stormwater management planning design criteria including Fish and Wildlife Crossing Guidelines (2017), Ecosystem Offsetting Guidelines (2020), SWM Guideline (updated July 2022), SWM Planting Guidelines (2014) and Plant Selection Guideline (2018). These guidelines are referenced in this report, where applicable.

2.8 Municipal Official Plans

2.8.1 County of Wellington

According to the County of Wellington Official Plan (OP) (September 2023) and Schedules A2 (County Growth Structure), B2 (Land Use – Erin), and B2-1 (Greenbelt Plan) the subject lands fall within the Erin Primary Urban Centre–Designated Greenfield Area, the Urban System and Settlement Areas of the Greenbelt designations, respectively (see Section 2.6). A Designated Greenfield Area means the area within a settlement area that is not a built-up area. The policies in Part 7 (The Urban System) of the OP apply to the subject lands. As stated in Section 7.4.13, the Greenbelt System policies established in the County’s OP apply within the Primary Urban Centre; as depicted on Schedule B2, the subject lands are outside the Primary Urban Centre as they are outside the built boundary. Per Section 9.9.7 of the OP, the Towns/Villages within the boundaries shown on Schedules B2-1 continue to be governed by the County’s OP and other local OPs and related programs or initiatives and are not subject to the policies of the Greenbelt Plan, except for the Urban River Connections policies in Section 9.9.5. There are no Urban River Connections on the subject property.

The County has published a document titled “The Mapping of an NHS in the County of Wellington – Final Report” (GRCA, 2018). This document indicates the County NHS is comprised of two main component types: Natural Heritage Components and Stewardship Components. The County NHS identifies linkages between NHS features and potential areas for enhancement. These components have the potential to connect and enhance the overall ecological and hydrological functions of the Wellington County NHS. The subject lands have been identified in the County NHS as featuring existing NHS components and enhancement woodlands. Protection of these features is discussed in Section 7.0.

2.8.2 County of Wellington Private Tree By-Law

The County’s *Conservation and Sustainable Use of Woodlands By-law 5115-09* applies to tree removal on private lands. A County permit is required before the cutting or destruction of trees in a forested area greater than 1 ha (woodlands). A permit is not required for the removal of linear hedgerows, or for successional areas that are dominated by trees that have a diameter of less than 10 cm. The By-law is applicable throughout the County; however, any tree removal should not occur on-site until such time that the Town, County, CVC and MECP (where applicable) are satisfied.

A Tree Inventory and Preservation Plan has been prepared under separate cover by Jackson Arboriculture Inc. (May 26, 2022; revised October 16, 2023).

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2.8.3 Town of Erin

According to the Town of Erin OP (January 2023) and Schedules A1 and A-2, the subject lands are designated as Residential, Greenlands and Core Greenlands. The subject lands are within the Urban Centre, but outside the Built Boundary. The Greenlands and Core Greenlands areas are generally coincident with the forest and wetland features observed on-site and apply to a variety of natural heritage resource features found in the Town. These features have varying levels of significance or sensitivity. The Greenland designation includes a Core Greenlands component, where no development is permitted, and a Greenlands portion where some development may occur subject to the preparation of an EIS satisfactory to the Town, the applicable Conservation Authority, and other applicable agencies.

A portion of the subject lands (5552 Eighth Line) are also part of “Deferral Area 2”. Per the County’s Committee Report (October 8, 2020), the County received a request from the Town to remove Deferral #2 in the Town of Erin OP and approve the proposed Residential and Core Greenlands designations on the property. Since the establishment of Deferral #2 (through the approval of the Town of Erin OP by the County in 2004), there have been several significant studies completed by the Town related to servicing and growth in the community. The Town has completed a Servicing and Settlement Master Plan (B.M. Ross, 2014), an Urban Centre Wastewater Servicing Class Environmental Assessment (Ainsley Group, 2018), and a Growth Management Strategy (Dillon, 2019) and a Wastewater Servicing Financing Options Study (Watson and Associates, 2019). The Langen property, and surrounding lands, have been identified in these studies as an area to be serviced with municipal wastewater (sewage) and a priority area for residential development. A Draft Further Approval document was prepared that removes Deferral #2 from Schedule A-2 of the Town’s OP. With the removal of the deferral, the County effectively approved the proposed Residential and Core Greenlands designations (Committee Report, October 8, 2020, Attachment 1).

It is noted that the Town does not have a tree cutting by-law.

2.8.4 Town of Erin Growth Management Study

On behalf of the Town, Dillon Consulting authored a Growth Management Study (GMS) (2019), which outlines a high-level phasing strategy for growth within the two Urban Centres (Hillsburgh and Erin) and provides a recommended framework for growth to 2041. The GMS looked at vacant lands designated for residential and / or employment uses within the Built Boundary, and outside of the Built Boundary but within the Urban Centres, to consider where to allocate growth. Lands were identified for potential future development and assessed for development feasibility and infrastructure requirements. Based on this analysis, a recommended framework was provided for growth to 2041.

In addition to recommending the resolution of “Deferral Area 2”, Section 4.2, Figure 4 of the GMS identifies the subject lands as a potential development area (“Area C”).

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Furthermore, the preferred growth scenario based on the evaluation framework includes Area C as a priority for future population growth.

3.0 Background Records and Agency Consultation

A comprehensive desktop assessment was completed to review existing natural heritage information available for the subject lands. All areas within 120 m of the subject lands were reviewed as part of the high-level assessment to identify significant natural heritage features located within, or directly adjacent to the subject lands, that may be impacted by future development (herein referred to as “adjacent lands”).

Information reviewed included, but was not limited to, the following sources:

- Aerial photographic imaging and 1:10,000 Ontario Base Mapping (OBM).
- DFO Aquatic SAR mapping.
- Ministry of Natural Resources and Forestry (MNRF) Make a Map: Natural heritage Areas to identify natural heritage features and Natural Heritage Information Centre (NHIC) data of rare wildlife species on, and in the vicinity of, the subject lands: 1x1 km² Squares: 17NJ7346, NJ7247, NJ7347, NJ7447, NJ7246, NJ7245, NJ7345, NJ7445 and NJ7446.
- MNRF Land Information Ontario (LIO) database.
- MNRF Aquatic Resource Area (ARA) summary data.
- MNRF Online GeoHub Search (Nesting Sites, White-tailed Deer Wintering Areas).
- MNRF West Credit River PSW Complex Evaluation (1994), and applicable wetland file updates for the subject lands (2016).
- Ontario Hydrology Network (OHN) mapping.
- The Ontario Breeding Bird Atlas (OBBA) 2001-2005 – 10x10 km² Square 17NJ74.
- Ontario Reptile and Amphibian Atlas (ORAA) – 10x10 km² Square 17NJ74.
- iNaturalist records.
- CVC Regulated Areas and features mapping.
- Credit River Fisheries Management Plan (2002a).
- West Credit River Subwatershed Study Characterization Report (1998).
- CVC Guidelines, Policies and Strategies (various documents).
- CVC Regional and Local Rarity Flora and Fauna lists.
- County of Wellington Official Plan (September 2023).
- Town of Erin Official Plan (January 2023).
- Town of Erin Growth Management Strategy - Final (2019).
- Credit River Watershed and Region of Peel Natural Areas Inventory (NAI) – “Eighth Line - Sideroad 17” NAI #6497 and “Trafalgar-22 Sideroad” NAI #6498 (Volume 3, April 2014).

The subject lands are in the jurisdiction of CVC and MNRF Guelph District Office. Species protected under the ESA are administered by MECP, Species at Risk Branch.

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Online CVC Regulation mapping shows portions of the subject lands are regulated by CVC. These areas are associated with wetlands (evaluated and unevaluated) and the West Credit River (Erin Branch).

The following is a summary of agency correspondence background data requests and replies to date:

- An information data request was sent to MECP via email on April 16, 2021; Burnside received a reply on May 7, 2021, from Lisa McShane, Management Biologist, Permissions and Compliance Section, Species at Risk Branch.
- An information data request was also sent via email to MNRF, Darren Unger, Management Biologist, Guelph District on April 19, 2021; Burnside received a reply on June 15, 2021. Additional information pertaining to the West Credit River PSW Complex Evaluation was received on June 15, 2021, and August 31, 2021.
- A Terms of Reference (TOR) and information data request was sent to CVC via email to Lisa Hosale, Planner, Planning and Development Services, on April 28, 2021; a comment-response and revised TOR was subsequently issued to CVC on June 24, 2021; Burnside received confirmation of CVC's approval of the final TOR on July 7, 2021 (via email).

Copies of agency correspondence are found in Appendix A and Appendix B.

3.1 Terrestrial Habitat

3.1.1 Wildlife

Preliminary wildlife surveys were completed by AWS Environmental in 2016 in support of an EIS, however no formal EIS report was submitted as part of any application. Burnside completed additional surveys to site-confirm existing conditions in 2020 as part of the due diligence phase and prior to an approved TOR for the EIS phase.

The following is a summary of potential wildlife habitat identified on the subject lands based on a review of background aerial imagery, databases, reports, and data collected during the due diligence phase:

- Turtle overwintering and nesting habitat.
- Amphibian breeding habitat.
- Breeding bird habitat (e.g., anthropogenic structures, grassland, wetland, forest).
- Raptor nesting habitat.
- Bat maternity roosting habitat.
- MNRF Deer Wintering Area (Stratum 2).
- Wildlife linkages and corridors.
- SWH.
- SAR and SCC.

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SAR and SWH confirmed during Burnside's field investigations are summarized further in Section 6.0. SAR and SWH screening tables are provided in Appendix C and Appendix D.

3.1.2 Vegetation Communities and Species

Based on a review of CVC, NHIC and MNRFC mapping, portions of the subject lands are identified as wetlands with units of the West Credit River PSW Complex located in the northeast, southwest, and central-eastern portions of the subject lands, and Unevaluated Wetlands located in the central portion of the subject lands. As stated above, MNRFC provided a copy of the West Credit River PSW Complex Evaluation and associated mapping and background studies.

Similar to Section 3.1.1, preliminary Ecological Land Classification (ELC) surveys were completed by AWS Environmental in 2016. Burnside completed additional surveys to site confirm these vegetation communities in 2020, prior to an approved TOR for the EIS phase.

The following is a summary of potential vegetation communities identified on the subject lands based on a review of background aerial imagery, databases, reports, and data collected during the due diligence phase:

- Wetland communities (meadow marsh, graminoid meadow, shallow aquatic, swamp).
- Cultural habitats (constructed pond, hedgerow, meadow, savannah, woodland, thicket).
- Coniferous plantation.
- Deciduous forest.
- Open pasture, row crops, orchard.
- Locally rare flora.
- SAR and Species of Conservation Concern (SCC).

Locally rare flora confirmed on the subject lands is summarized in Section 5.4. SWH and SAR confirmed during Burnside's field investigations are summarized and discussed further in Section 6.5 and Section 6.6. SAR and SWH Screening Tables are provided in Appendix C and Appendix D, respectively.

3.2 Aquatic Habitat

The Erin Branch of the West Credit River (the watercourse) flows generally from northwest to southeast, bisecting the corner of Sideroad 17 and Eighth Line on the adjacent lands immediately north of the subject lands. It is associated with the West Credit PSW Complex. The watercourse is classified as a cold water thermal regime with a diverse assemblage of fish species (NDMNRFC, 2019). A summary of documented fish species in the immediate vicinity of the subject lands is outlined in Table 1 below.

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Table 1: Fish Species Historically Observed in the West Credit River in the Vicinity of the Subject Lands

Species Name	Scientific Name	Thermal Regime
Blacknose Dace	<i>Rhinichthys spp.</i>	Cool
Bluntnose Minnow	<i>Pimephales notatus</i>	Warm
Brook Trout	<i>Salvelinus fontinalis</i>	Cold
Brook Stickleback	<i>Culaea inconstans</i>	Cool
Common Shiner	<i>Luxilus cornutus</i>	Cool
Creek Chub	<i>Semotilus atromaculatus</i>	Cool
Golden Shiner	<i>Notemigonus crysoleucas</i>	Cool
Largemouth Bass	<i>Micropterus salmoides</i>	Warm
Longnose Dace	<i>Rhinichthys cataractae</i>	Cool
Mottled Sculpin	<i>Cottus bairdii</i>	Cold
White Sucker	<i>Catostomus commersonii</i>	Cool

The MNRF ARA layer for spawning habitat does not identify any occurrences or documentation in the immediate vicinity, although that does not preclude spawning potential in the vicinity of the subject lands. Aquatic SAR were not identified on the subject lands based on review of the DFO aquatic SAR screening tool and NHIC mapping.

The West Credit Subwatershed Study Characterization Report (CVC, 1998) indicates the area proximal to the subject lands is a regional groundwater recharge area, with groundwater discharge areas identified upstream of Sideroad 17. Notably, the West Credit River contains wild, self-sustaining populations of Brook Trout. On the main branch of the West Credit River, groundwater discharges directly or almost directly into the stream around Hillsburgh, below the Town of Erin and from Belfountain to the Forks-of-the-Credit. These reaches of stream are associated with the best cold-water sections for brook trout, although populations inhabit the reach adjacent to, and upstream, of the subject lands (CVC, 2018). Overall, the West Credit River provides one of the few remaining recreational brook trout fisheries in Southern Ontario; in large part due to groundwater conditions throughout the subwatershed, as well as a relatively healthy riparian and supporting NHS.

3.3 Headwater Drainage Features

3.3.1 Background and HDF Management

Headwater drainage features (HDF) are small zero-order and first order intermittent and ephemeral streams, swales and connected headwater wetlands (TRCA & CVC, 2014). HDFs can have many hydrological and ecological functions which help to maintain watershed health, such as water quality, flow attenuation, season habitat for fish, insects and amphibians, sediment influences and allochthonous input from organic material. In many cases, these features may qualify as “watercourses” under the *Conservation*

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Authorities Act, which are described as “identifiable depressions in the ground in which flow of water regularly or continuously occurs”. Land use activities associated with urbanization and agriculture, such as drainage, piping, and channelization, may result in impacts to HDFs that reduce their ability to perform their natural functions. This can have negative effects on a watershed, particularly when many HDFs in the watershed are altered, because of the cumulative effects that may occur. Individually, their importance is often overlooked due to their small size and intermittent flow regimes, particularly in the summer when monitoring of streams typically occurs. Because of this, they are often not part of typical watershed monitoring programs.

In 2014, the Toronto Region Conservation Authority (TRCA) and CVC finalized and adopted the Evaluation, Classification, and Management of Headwater Drainage Features (HDF Guidelines). This document, in conjunction with supporting modules from the Ontario Stream Assessment Protocol (OSAP, 2017), outlines a process for assessing and classifying natural drainage features. This procedure identifies the contribution of these drainage systems on the watershed and enables the development of mitigation and management procedures if disruption is proposed, or impacts are anticipated.

During the background review, ephemeral drainage features were identified on aerial photos as potential HDFs that convey water into the downstream habitat of the West Credit River (Erin Branch). Further study of mapped 1st and 2nd order watercourses was recommended through the HDF assessment and classification framework to provide additional information on the function and form of previously unknown features. The annual flow regime and hydrological contributions of these HDFs would also be assessed during the EIS field investigations to determine potential impacts of development to downstream habitat. The assessment, classification and management recommendations following the HDF Guidelines (TRCA & CVC, 2014) are described in Section 5.10.

4.0 Field Methodology

4.1 Vegetation Communities and Species

Per the approved TOR for the EIS, detailed surveys to characterize vegetation communities and species was conducted by Burnside for the entirety of the subject lands, plus 50 m into the adjacent lands. All species herein are described according to nomenclature and S-ranks provided by the NHIC, current to March 18, 2021. Where nomenclature differs between databases or rarity lists, the Database of Vascular Plants of Canada (VASCAN) (Canadensys, 2021) was used as a reference for synonyms of plant names to current taxonomic standards.

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4.1.1 Ecological Land Classification and Botanical Inventory

Surveys for ELC and botanical inventory were undertaken on June 24, June 29, and June 30, 2021. Previously reported vegetation communities and species surveyed by AWS Environmental in 2016 and Burnside in 2020 were verified and modified, as required, to describe the current conditions on the subject lands. Vegetation communities were assessed and described using the Ecological Land Classification System for Southern Ontario (Lee et al., 1998), utilizing updated Second Approximation 2008 codes (Lee, 2008). Species nomenclature is described according to the NHIC database (2021). All plant species observed on the subject lands, and immediately adjacent, have been analyzed for species rarity based on:

- Species' status as listed on the SARO list (updated November 9, 2020), under the ESA.
- Species status, as determined by COSEWIC and listed under SARA, 2002.
- Species S-rank, as provided by the NHIC species lists (updated March 18, 2021).
- Rarity for CVC, as listed in the "Plants of the Credit River Watershed" (CVC, 2002b).
- Rarity for CVC, as listed in "The Vascular Plant Flora of the Region of Peel and the Credit River Watershed" (Kaiser, 2001).
- Rarity for the GTA, as listed in "The Distribution and Status of the Vascular Plants of the Greater Toronto Area" (Varga et al., 2000).

A feature staking with CVC occurred on July 5 and 19, 2021. The limits of the woodland features (dripline) and wetlands were delineated in the field and surveyed. Any unevaluated wetlands within 750 m of existing PSWs were assessed under the Ontario Wetland Evaluation System (OWES) protocols for their potential to be complexed into the existing PSW (based on the OWES system that states "any wetland within the same watershed and 750 m of a PSW may be added to the PSW complex by amending the wetland file"). Please see Section 6.1 for a more detailed description of the OWES exercise.

The moist cultural meadow (CUM1-1) surrounding the Willow Deciduous Swamp (SWDM4-1) was staked with CVC on July 5 and 19, 2021. The meadow contained >50% species that were not wetland plants; it was generally agreed with CVC during the exercise that this feature does not constitute a wetland. CVC requested soil samples to be taken to provide further information regarding the moisture regime.

Burnside ecologists obtained three hand augers for soils throughout the CUM1-1 unit. The soils throughout this location have been repeatedly manipulated over time. Materials such as stone, gravel, sand, cement blocks and tractor ruts are found throughout. Wellington County historical mapping indicates that tractors have been moving / dumping material in the area for some time. Two of the three augers taken had soil horizons that could not be created naturally: there were layers of loams overlying organics, overlying lenses of gravel/sand, overlying organic rich soil, with repeating

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units. These layers were not put down naturally, nor are able to accurately tell us how the moisture has affected the appearance of the soil horizons. As such, these two augers could not be used to accurately determine the moisture regime. One auger appeared to be relatively undisturbed in nature. This auger had a sample depth of 97 cm, an effective texture of Silty Clay, and mottles present at 31 cm. No gley or water table was encountered. This would make the Moisture Regime 5-Moist; therefore, it is Burnside's opinion that this feature is a moist meadow, not a wetland. The field data sheets for the soil auger are included in Appendix E.

4.2 Avifauna

4.2.1 Breeding Bird Surveys

Standard breeding bird surveys were completed by Burnside staff, in combination with targeted surveys for SAR grassland birds (i.e., Eastern Meadowlark (EAME), and Bobolink (BOBO)). Surveys were conducted according to the *Ontario Breeding Bird Atlas (OBBA) Guide for Participants* (Bird Studies Canada March 2001) and MNR's *Survey Protocol for Eastern Meadowlark in Ontario* (August 2013), tailored to the needs of this project. Surveys were conducted at designated point counts, shown in Figure 2, that captured the different vegetation communities present. The methodology for these surveys is summarized below and in Table 2.

Eastern Meadowlark and Bobolink are listed as Threatened, under the ESA. These species were identified as having potential to be on the subject lands based on background databases and reports, correspondence with agencies and the presence of suitable grassland/cultural meadow habitat. Both species have similar habitat requirements and were surveyed concurrently.

- Surveys were conducted between May 21 and July 3, which is the recommended date range for surveying for EAME and BOBO (August 2013).
- Surveys for EAME and BOBO were conducted three times and were evenly spaced throughout the survey period, between 7 to 10 days apart. Surveys were completed on May 25, June 8 and June 22, 2020.
- Surveys were completed at a total of 30-point count locations per survey period, including eight targeted EAME and BOBO stations and six targeted Marsh breeding bird stations.
- Surveys were conducted under the following weather condition requirements: counts were not completed if it was raining, there was thick fog, or if winds were greater than 19 km per hour (i.e., >3 on the Beaufort scale). Generally, weather conditions were conducive for auditory and visual surveys, with winds less than 19 km per hour, and no precipitation.
- Targeted EAME / BOBO point count locations were chosen based on good visibility of the surrounding fields / open areas (B1, B2, B4, B9, B10, B11, B13, B15). Per the

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protocol, the surveyor completed 10 minutes of passive observation and recorded all species observed or heard.

- All birds recorded, including level of breeding evidence, are summarized in Appendix F.
- Field data was collected using a mobile data collection application (Fulcrum) on an iOS device.

Table 2: Summary of Breeding Bird Survey Weather Conditions

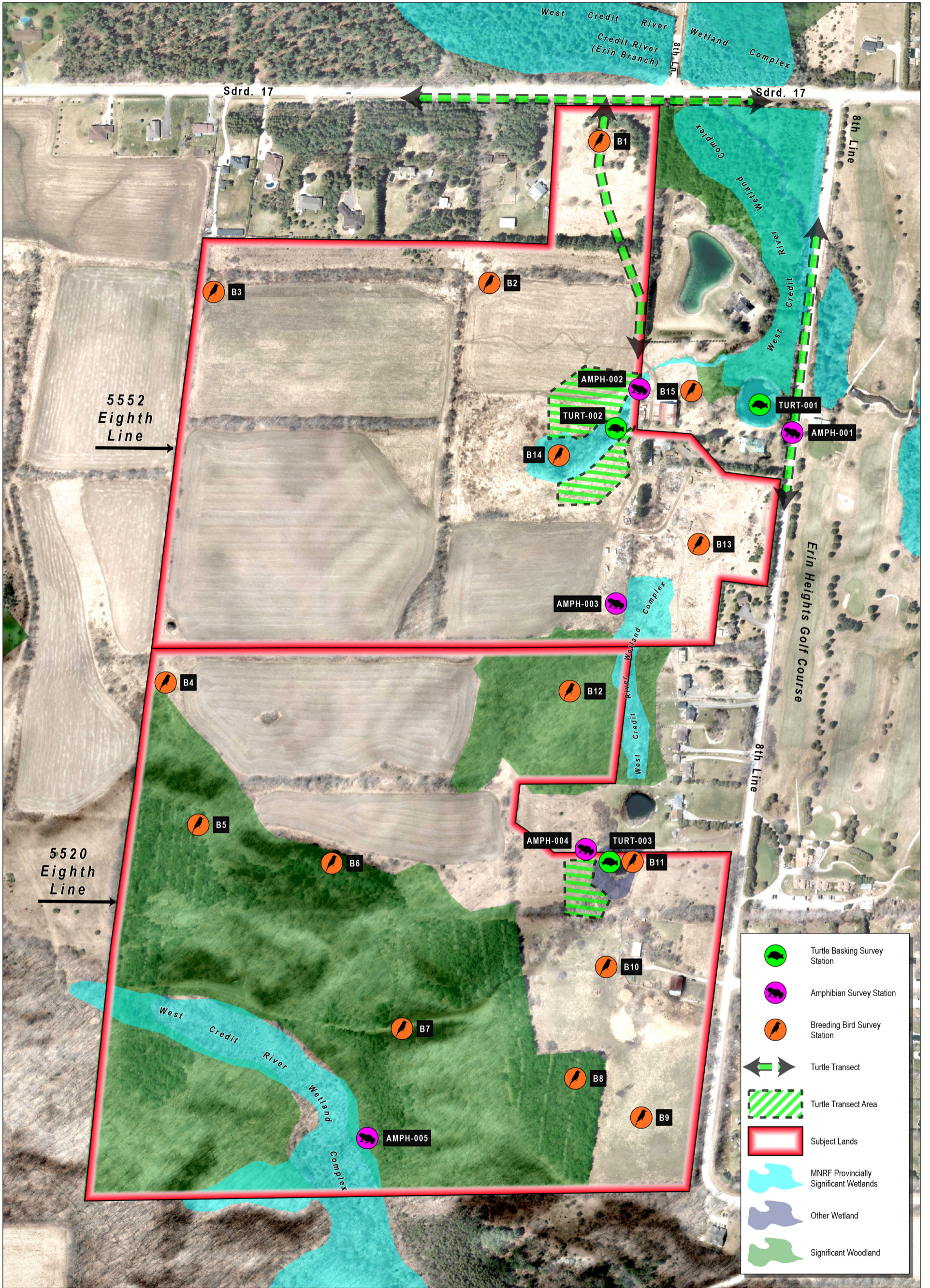
Survey Date	Observers	Time of Day (Start/End) (24 hours)	Weather Conditions
			(Air Temp °C/Beaufort Sky Code ¹ /Wind Scale ²)
May 24, 2021	Hannah Maciver	06:00 – 11:00	Start: 9°C; End: 17°C Sky: 1 Wind: 0
June 10, 2021	Hannah Maciver	06:00 – 11:00	Start: 14°C; End: 22°C Sky: 0 Wind: 0
June 24, 2021	Hannah Maciver	06:03 – 10:36	Start: 15°C; End: 22°C Sky: 1 Wind: 1

¹NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

²Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2 km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3 = Gentle breeze, leaves & twigs in constant motion (12-19)
4 = Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5 = Fresh breeze, small trees begin to sway (31-39)
6 = Strong breeze, large branches in motion (40-50)

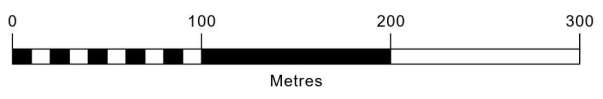


	Turtle Basking Survey Station
	Amphibian Survey Station
	Breeding Bird Survey Station
	Turtle Transect
	Turtle Transect Area
	Subject Lands
	MNRF Provincially Significant Wetlands
	Other Wetland
	Significant Woodland

Datum: North American 1983 CSRS
 Coord. System: NAD 1983 CSRS UTM Zone 17N
 Projection: Transverse Mercator
 Central Meridian: 81°0'0.00"W
 False Easting: 500,000m | False Northing: 0m
 Page Orientation: -52° | Scale Factor: 0.99960



Map Title
LANGEN PROPERTY EIS
FAUNA SURVEYS



Client
**MATTAMY (ERIN) LIMITED
 AND 2779181 ONTARIO INC.**

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Scale	Project No. 300052075		

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4.2.2 Barn Swallow and Chimney Swift Structure Surveys

At the time of the surveys, Barn Swallow (*Hirundo rustica*) and Chimney Swift (*Chaetura pelagica*) were listed as Threatened under the ESA. Both species are known to nest in anthropogenic structures (i.e., barns, sheds, uncapped brick chimneys). Structure surveys were completed to identify potential habitat for Barn Swallow, Chimney Swift, and SAR bats. Barn Swallow was reclassified as Special Concern on January 25, 2023 on the Species at Risk in Ontario List (Ontario Regulation 230/08). The change in classification means that the prohibitions in subsections 9 (1) and 10 (1) of the ESA that apply in respect of Endangered and Threatened species and their habitats no longer apply to Barn Swallow. As a result, the conditional exemptions for Barn Swallow set out in Part III of Ontario Regulation 830/21 no longer apply to this project. However, habitat for Barn Swallow is now considered SWH, as discussed in Section 6.5.

Survey investigations identified seven main structures present on the subject lands (see Figure 3). At the northeast portion of the subject lands there is a large residential dwelling (S1), a large stone chimney attached to the dwelling with two clay flues (S2), a wooden shed by the pond (S3), a large wooden barn with lean-to (S4), and a large wooden storage shed with lean-to (S5) [Note: at the time of the surveys, S3 and S4 were located in the development limits; these are now part of the “Lands to be Retained” and will continue to be used as a principal residence for the landowner on this parcel. See Section 9.0.

At the southeast portion of the subject lands, there is a small bungalow-style dwelling with a small brick chimney with one clay flue (S6) and a large wooden barn with lean-to (S7). Other miscellaneous, dilapidated trailers and small shed-like structures are scattered around the eastern side of the subject lands. Inspections of the exterior and interior (where accessible) of these structures provided additional information on whether nesting or candidate roosting habitat is present. Based on the results of these inspections, the structures were surveyed again during the active window. For Barn Swallow, nest counts were completed concurrently during the breeding bird surveys.

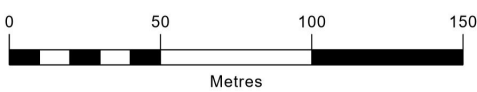
If a chimney is determined to be capped or lined, it is considered unsuitable habitat for Chimney Swift and no further investigations are required. If a chimney is uncapped or not lined, or it cannot be determined whether it is capped or lined, further surveys would be required. This may include either a more thorough inspection of the base of the chimney inside the structure, if access is possible, or additional presence / absence survey(s) to confirm evidence of Chimney Swift activity (i.e., roosting / nesting).



Datum: North American 1983 CSRS
 Coord. System: NAD 1983 CSRS UTM Zone 17N
 Projection: Transverse Mercator
 Central Meridian: 81°00.00"W
 False Easting: 500,000m False Northing: 0m
 Page Orientation: -52° Scale Factor: 0.99960



Grid North



Client

**MATTAMY (ERIN) LIMITED
 AND 2779181 ONTARIO INC.**

Map Title

LANGEN PROPERTY EIS

EXISTING STRUCTURES

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Figure No.
3

4.3 Amphibian Breeding Call Surveys

Burnside staff conducted amphibian breeding call surveys, following the *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (BSC, 2009), during the 2021 season. Surveys were conducted between April and June by qualified ecologists, to detect potential early, mid, and late-season amphibian breeding activity in Central Ontario.

Four survey stations were chosen to provide information on potential amphibian breeding sites within representative wetland communities, located throughout the subject lands: AMPH-001, AMPH-002, AMPH-003 and AMPH-004. See Figure 2. These stations were also surveyed in 2020 during preliminary field investigations on the subject lands. A deep man-made test pit that has filled with water along the western edge of the subject lands was deemed unsuited for overwintering turtles and was not monitored.

The Marsh Monitoring Program guidelines state that three call surveys should be completed a minimum of 15 days apart when nighttime air temperatures are greater than 5°C, 10°C and 17°C, respectively and when wind strength is less than 19 km/h (<3 on the Beaufort Scale). Weather conditions during the surveys are outlined in Table 3.

Amphibian calls are used to identify species presence and are quantified by assigning a Call Level Code and an Abundance Count. The purpose of the breeding amphibian surveys was to identify wildlife habitat, as well as any potential SWH on the subject lands.

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Table 3: Amphibian Breeding Call Survey Weather Conditions

Survey Date	Observers	Start Time (24 hr)	Weather Conditions		
			Sky Code ¹	Air Temp. (°C)	Wind (Beaufort Scale) ²
April 8, 2021	Sylvia Radovic Paul Stubbert	20:41 - 22:17	0	16	2
May 16, 2021	Hannah Maciver Paul Stubbert	21:18 - 22:35	0	12-14	0
June 17, 2021	Hannah Maciver Paul Stubbert	21:42 - 22:38	0	20	2

¹NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

²Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3 = Gentle breeze, leaves & twigs in constant motion (12-19)
4 = Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5 = Fresh breeze, small trees begin to sway (31-39)
6 = Strong breeze, large branches in motion (40-50)

4.4 Reptiles

4.4.1 Turtle Basking Surveys

Visual encounter surveys for turtles were conducted in the spring, based on MNRF's *Survey Protocol for Blanding's Turtle in Ontario* (MNRF, 2015), tailored to the needs of this project. While Blanding's Turtle is not expected for this area, this protocol provides a comprehensive method for surveying generally for turtle overwintering/basking habitat for species expected in this location (i.e., Midland Painted Turtle (*Chrysemys picta marginata*) and Snapping Turtle (*Chelydra serpentina*)).

As per the Protocol, a minimum of five surveys were conducted at the wetland communities on the subject lands. Surveys were spread over five weeks (i.e., after ice melt) between April and June between 08:00 and 17:00 on clear, sunny days with air temperatures above 5°C, or on cloudy or overcast days with air temperatures above 15°C. The surveyor used high quality binoculars to ensure that vegetation was surveyed appropriately. Survey site conditions are summarized below in Table 4.

Three survey stations were established where open water was present: TURT-001, TURT-002 and TURT-003. See Figure 2. These stations were also surveyed in 2020 during preliminary field investigations on the subject lands. A deep man-made test pit that has filled with water along the western edge of the subject lands was deemed unsuited for overwintering turtles and was not monitored.

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Table 4: Turtle Basking Survey Weather Conditions

Survey Date	Observers	Start Time (24 hr)	Weather Conditions		
			Sky Code ¹	Air Temp. (°C)	Wind (Beaufort Scale) ²
April 5, 2021	Meredith Meeker	12:20-13:45	2	15	1
April 8, 2021	Meredith Meeker	10:06-11:46	0	13-16	1
April 23, 2021	Meredith Meeker	14:42-15:33	0	15	3
May 6, 2021	Meredith Meeker Tom Exton	14:04-15:31	1	12	1
May 12, 2021	Meredith Meeker Ariana Burgener	12:33-15:27	0	11	3

¹NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

²Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3= Gentle breeze, leaves & twigs in constant motion (12-19)
4= Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5= Fresh breeze, small trees begin to sway (31-39)
6= Strong breeze, large branches in motion (40-50)

4.4.2 Turtle Nesting Surveys

Turtle nesting surveys were based on the MNRG Guelph District's *Blanding's Turtle Nest and Nesting Survey Guidelines* (May 2016). Survey site conditions are summarized in Table 5, below.

Surveys were completed within areas suitable for nesting (i.e., friable soils dominated by sand and gravel and exposed to sun and warmth), with a focus on south-facing slopes and areas in proximity to the wetland communities on the subject lands, depicted in Figure 2 (TURT-001, TURT-002 and TURT-003). These areas were surveyed by walking systematic, repetitive transects. The gravel road edges of Eighth Line and Sideroad 17 were also surveyed as a control site.

As per the Protocol, nesting surveys are to commence when the first sign of Midland Painted Turtle or Snapping Turtle nesting in the area has begun and continues for three weeks. The first survey was conducted on June 10, 2021, to search for evidence of nesting. A mailing list for turtle nesting notifications was reviewed daily to determine when surveys should commence (this list was organized by Heather Fotherby, Terrestrial and Wetland Biologist, Natural Resource Solutions Inc.). On May 25, 2021, commencement of Midland Painted Turtle and Snapping Turtle nesting was reported in a

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variety of geographic locations in Southern Ontario as far north as Parry Sound District. Therefore, turtle nesting surveys on the subject lands could commence.

Surveys were completed the day after an evening of suitable weather conditions: warm, humid nights with air temperatures above 14°C. All signs of turtle nesting were noted, including test scrapes, tracks and trails made by commuting turtles, freshly laid nests, predated nests, and the presence of turtles laying eggs or commuting to/from nesting sites. Survey site conditions are summarized below in Table 5.

Table 5: Turtle Nesting Survey Weather Conditions

Survey Date	Observers	Start Time (24 hr)	Weather Conditions		
			Sky Code ¹	Air Temp. (°C)	Wind (Beaufort Scale) ²
June 10, 2021	Meredith Meeker Ariana Burgener	15:09-16:35	1	23	2
June 17, 2021	Meredith Meeker	17:20-19:17	0	25	1
June 22, 2021	Meredith Meeker	10:36-12:00	1	12	2
June 24, 2021	Hannah Maciver	6:03-10:36	1	15-22	1
June 30, 2021	Ariana Burgener	16:30-18:30	2	23	2
July 12, 2021	Meredith Meeker Ariana Burgener	17:30-19:00	1	21	1

¹NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

²Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3 = Gentle breeze, leaves & twigs in constant motion (12-19)
4 = Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5 = Fresh breeze, small trees begin to sway (31-39)
6 = Strong breeze, large branches in motion (40-50)

4.5 Bats

4.5.1 Leaf-off Surveys

Leaf-off surveys are best performed during the fall to early spring, before leaves have started growing again, when visibility of cracks or crevices in tree snags is greatest. Leaf-off surveys were conducted on April 6, 2021, to identify potential bat maternity roosting habitat for Little Brown Myotis and Northern Myotis.

The following criteria were considered when identifying a candidate maternity roosting tree during this survey:

- Snag Height

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- Presence of habitat characteristics
- Diameter at Breast Height (DBH)
- Within 10 m of another tree and / or snag
- Amount of peeling bark
- Cavity height
- Species
- Percent canopy cover
- Decay class

For each candidate tree, the above information was collected using ArcGIS Collector and marked with a GPS waypoint.

4.5.2 Leaf-on Surveys

Leaf-on surveys focus on identifying potential maternity roosting habitat of Tri-colored Bat. These surveys are conducted during late spring and summer when leaves have reached maximum growth and when dead branches and leaf-clusters are easily located.

A leaf-on survey was conducted on June 6, 2021. According to the protocol, the following candidate trees are to be surveyed to determine suitability for maternity roosting habitat:

- Any Oak trees ≥ 10 cm DBH
- Any Maple trees ≥ 10 cm DBH if the tree included dead/dying leaf clusters
- Any Maple trees ≥ 25 cm DBH

Any such tree identified is assessed based on the following criteria:

- DBH
- Species
- Dead and dying leaf clusters (or snapped branch)

As with leaf-off surveys, for each candidate tree the above information was collected using ArcGIS Collector and marked with a GPS waypoint.

4.5.3 Structure Surveys

As discussed in Section 4.2.2, structure surveys were completed to identify potential habitat for Barn Swallow, Chimney Swift, and SAR bats. The seven main structures on the subject lands (S1 to S7) were surveyed to identify any that exhibited features that may be accessed by roosting bats, such as entry and exit points (holes, cracks, broken windows, etc.). Of these seven structures all were identified as candidate bat roosting habitat and requiring acoustic monitoring (exit surveys). See Figure 3.

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4.5.4 Exit Surveys

Burnside staff completed two acoustic exit surveys on June 28 and July 12, 2021, to confirm SAR bat roosting habitat at the eight structures identified as candidate habitat. Both surveys followed the methodology described in the MNRF Guelph District's *Use of Buildings and Isolated Trees by Species at Risk Bats: Survey Methodology* (October 2014), described below. The structures were surveyed for a total of 90 minutes, from one half hour before sunset to one hour after sunset. Surveys took place during favourable weather conditions (i.e., during periods of low wind and no rain).

Four stations were established to survey the eight structures (see Figure 4):

- Station 1 observed the Large Barn (S4) and Shed (S3).
- Station 2 observed the Small Barn (S8) and its attached Garage (S5).
- Station 3 observed the House (S1) and Chimney (S2).
- Station 4 observed the Barn (S7) and House and Chimney (S6).

Surveyors were positioned within viewing distance of potential exit points on the structures. If bats were observed exiting a structure, the number of bats were recorded. Between the four stations, two Echo Meter Touch 2 Pro Bat Call Detectors (heterodynes) were used to record calls; therefore, for a surveyor without a detector, species were recorded by the closest surveyor with a detector. The purpose of the acoustic surveys is to identify the species of bat present, while the purpose of the visual observations is to identify how the bats are using the subject lands (i.e., roosting or foraging). Survey conditions are summarized in Table 6, below.

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Table 6: Exit Survey Weather Conditions

Station ID	Survey Date	Observers	Start Time (24 hr)	Weather Conditions		
				Sky Code ¹	Air Temp. (°C)	Wind (Beaufort Scale) ²
1-3	June 28, 2021	Ariana Burgener, Paul Stubbert, Sarah Yoshida	20:36-22:06	1	27	0
4	June 28, 2021	Meredith Meeker, Sylvia Radovic	20:36-22:06	1	27	0
1-2	July 12, 2021	Ariana Burgener, Matthew Moote	20:32-22:02	1	21	1
3	July 12, 2021	Data not available.	-	-	-	-
4	July 12, 2021	Meredith Meeker, Sarah Yoshida	20:32-22:02	1	21	1

¹NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

²Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3 = Gentle breeze, leaves & twigs in constant motion (12-19)
4 = Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5 = Fresh breeze, small trees begin to sway (31-39)
6 = Strong breeze, large branches in motion (40-50)

4.5.5 Passive Acoustic Surveys

Burnside staff completed passive acoustic surveys to assess the use of snags and treed habitat on the subject lands. Seven stations were chosen, spread across the entirety of the subject lands at the various hedgerows and along the perimeter of the significant woodlands (NHS). One additional acoustic station was set up in the NHS, in the large woodland located in the southwest portion of the subject lands, to assess for the presence of SWH.

Each station was located adjacent to a candidate maternity roosting tree identified as having a relatively high potential to function as bat maternity roost habitat, or a cluster of tree species with attributes preferred by the Tri-colored Bat. At each station, a Wildlife Acoustics Song Meter SM4BAT FS bioacoustics recorder, with an omnidirectional

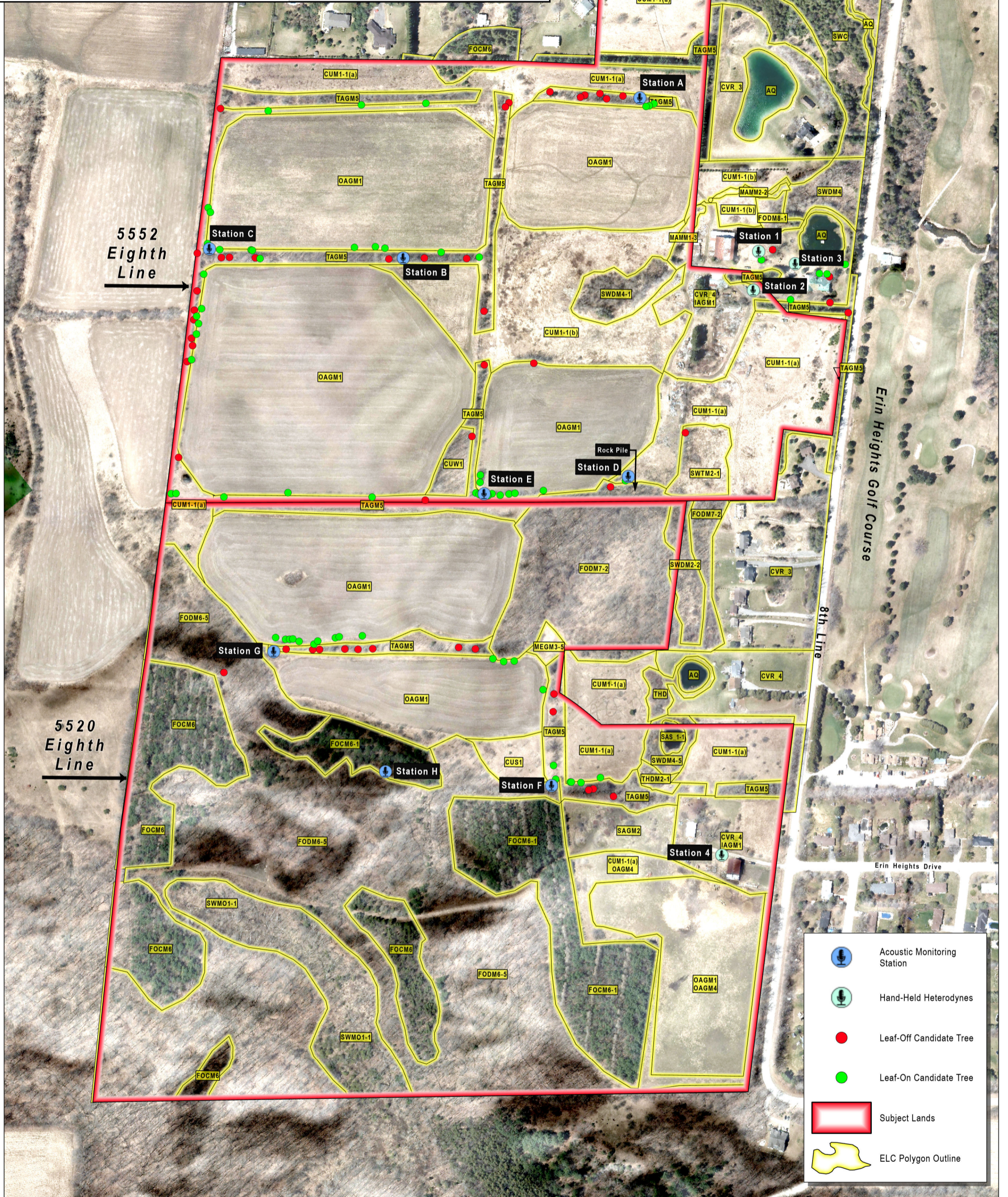
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SMM-U1 external microphone, was deployed and programmed to record automatically from 30 minutes before sunset to 30 minutes after sunrise with the following adjustable settings:

- Gain: 12 dB
- Sample Rate: 256 kHz
- Minimum Trigger Frequency: 15 kHz

The eight recorders (Stations A-H in Figure 4) were deployed from June 28, 2021, until July 21, 2021, for a total of 23 nights (i.e., sunset to sunrise), to ensure the required ten days of suitable weather conditions (i.e., ambient temperatures above 10° C and no rain) per MNRF protocols (MNRF, 2017). Table 7 lists weather conditions during the survey periods, according to the Environment Canada weather station at Fergus Shand Dam. Historic weather data records the rain in a 24-hour period and does not necessarily represent an accurate picture of rainfall that would affect bats. As such, Burnside considers days with less than 10 mm of rain in a 24-hour period to be minor events that do not impact bat surveys.

ELC Code Description	ELC Code Description
(AQ) Aquatic System	(MEGM3-5) Smooth Brome Graminoid Meadow
(CUM1-1(a)) Dry - Moist Old Field Meadow Type	(OAGM1) Annual Row Crops
(CUM1-1(b)) Dry - Moist Old Field Meadow Type	(OAGM4) Open Pasture
(CUS1) Mineral Cultural Savannah Ecosite	(SAGM2) Orchard
(CUW1) Mineral Cultural Woodland Ecosite	(SAS_1-1) Pondweed Submerged Shallow Aquatic
(CVR_3) Single Family Residential	(SWC) Coniferous Swamp
(CVR_4) Rural Property	(SWDM2-2) Green Ash Mineral Deciduous Swamp
(FOCM6) Naturalized Coniferous Plantation	(SWDM4) Mineral Deciduous Swamp Ecosite
(FOCM6-1) Dry - Fresh White Pine Naturalized Coniferous Plantation Type	(SWDM4-1) Willow Mineral Deciduous Swamp Type
(FODM6-5) Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type	(SWDM4-5) Poplar Mineral Deciduous Swamp Type
(FODM7-2) Fresh - Moist Green Ash - Hardwood Lowland Deciduous Forest Type	(SWMO1-1) White Cedar - Hardwood Organic Mixed Swamp Type
(FODM8-1) Fresh - Moist Poplar Deciduous Forest Type	(SWTM2-1) Red-osier Dogwood Mineral Deciduous Thicket Swamp Type
(IAGM1) Agricultural Buildings	(TAGM5) Fencerow
(MAMM1-3) Reed-canary Grass Graminoid Mineral Meadow Marsh Type	(THD) Deciduous Thicket
(MAMM2-2) Panicked Aster Mineral Meadow Marsh Type	(THDM2-1) Sumach Deciduous Shrub Thicket Type
	(WOCM1-3) Dry - Fresh White Pine Coniferous Woodland Type



Datum: North American 1983 CSRS
 Coord. System: NAD 1983 CSRS UTM Zone 17N
 Projection: Transverse Mercator
 Central Meridian: 81°00.00"W
 False Easting: 500,000m
 False Northing: 0m
 Page Orientation: -52°
 Scale Factor: 0.99960



Grid North



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Map Title
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**BAT ACOUSTIC STATIONS
 AND CANDIDATE BAT HABITAT**

Drawn	Checked	Date	Figure No.
PS	HM	2023/10/04	4
Scale		Project No.	
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Table 7: Bat Acoustic Survey Weather Conditions

Survey Date	Maximum Temperature (°C)	Minimum Temperature (°C)	Total Precipitation (mm)
June 28, 2021	27.5	20.5	0.2
June 29, 2021	30	19.5	2.4
June 30, 2021	25	19.5	0.6
July 1, 2021	24.5	15.5	1
July 2, 2021	22.5	14	0
July 3, 2021	25	12	0
July 4, 2021	26	13	0
July 5, 2021	30	15	0
July 6, 2021	29.5	19	10.8
July 7, 2021	23	17.5	4.2
July 8, 2021	20	13	5.8
July 9, 2021	17.5	13.5	0.4
July 10, 2021	24	11	0
July 11, 2021	20	13.5	0
July 12, 2021	25	15	0
July 13, 2021	27	18	6.3
July 14, 2021	27.5	17	0
July 15, 2021	27.5	17	3.2
July 16, 2021	23.5	15	0.2
July 17, 2021	22	16	0
July 18, 2021	28	16.5	0
July 19, 2021	28	16	0
July 20, 2021	28	16	12.4

Burnside used the automatic identification feature of Wildlife Acoustics Kaleidoscope Pro v. 4.3.2 software to analyze all ultrasonic recordings. The analysis applied classifiers for eight bat species previously recorded from Ontario, including the four SAR bat species (Table 8). Only calls verified by Kaleidoscope Pro v. 4.3.2 are considered in determining absence / presence of SAR bats.

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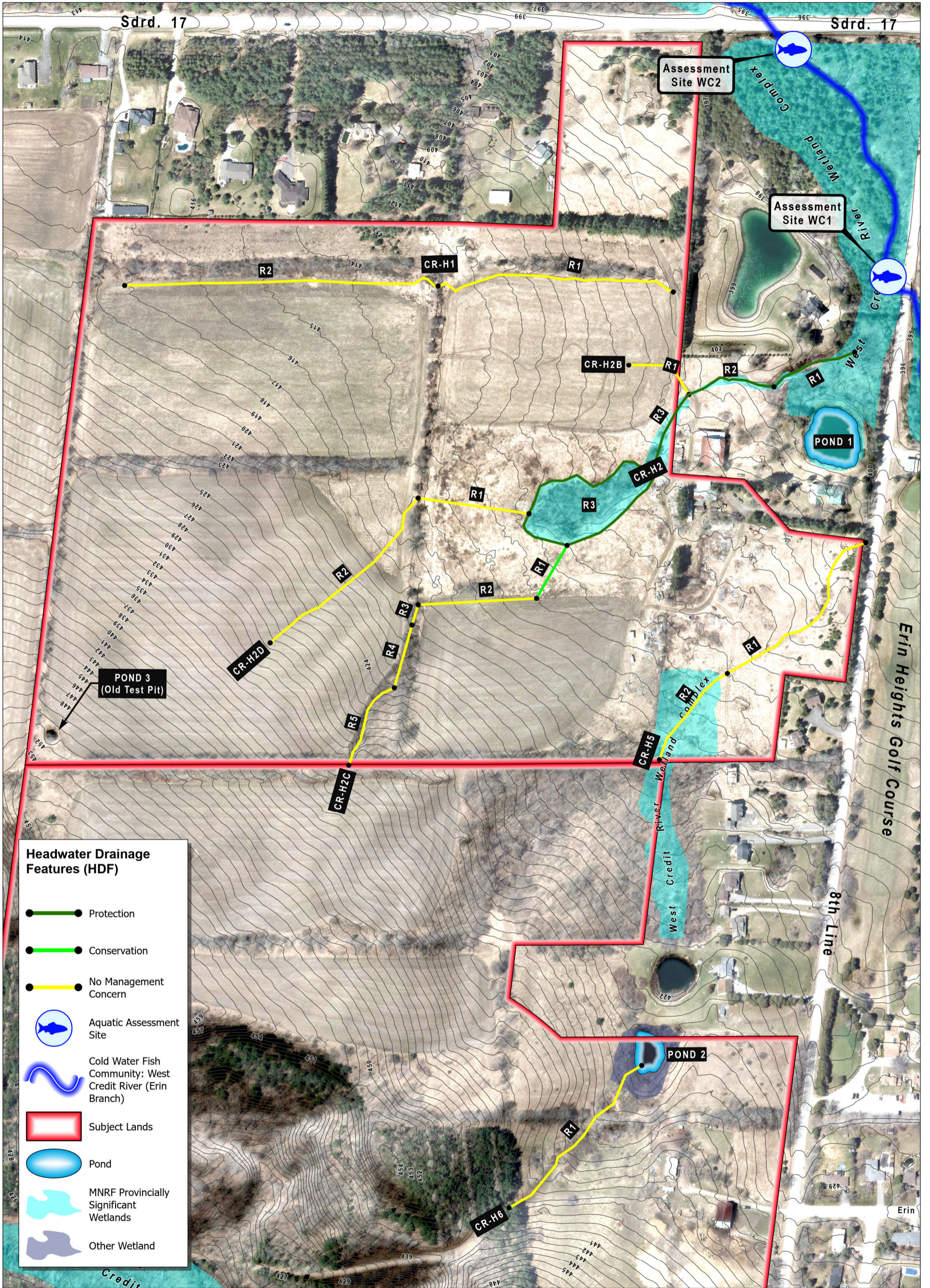
Table 8: Bat Species Previously Recorded in Ontario

Species		Status	
Common Name	Scientific Name	Species at Risk in Canada (SARA)	Species at Risk in Ontario (SARO)
Big Brown Bat	<i>Eptesicus fuscus</i>	-	-
Eastern Red Bat	<i>Lasiurus borealis</i>	-	-
Eastern Small-footed Myotis	<i>Myotis leibii</i>	Endangered	Endangered
Hoary Bat	<i>Lasiurus cinereus</i>	-	-
Little Brown Myotis	<i>Myotis lucifugus</i>	Endangered	Endangered
Northern Myotis	<i>Myotis septentrionalis</i>	Endangered	Endangered
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	-	-
Tri-colored Bat	<i>Perimyotis subflavus</i>	Endangered	Endangered

A Burnside ecologist manually reviewed recorded events classified as ambient noise to confirm that the Kaleidoscope Pro v. 4.3.2 software filters functioned as intended.

4.6 Aquatic Habitat Assessment

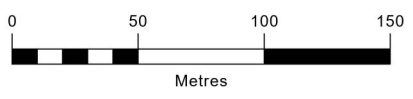
Through background review, no known watercourses were identified on the subject lands. However, the West Credit River (Erin Branch) is found immediately adjacent to the subject lands, which may be influenced through indirect means (e.g., stormwater). In addition, three residential / agricultural ponds were noted on the property. As such, Burnside completed general aquatic habitat assessment investigations on July 21, 2021, using Burnside's Standard Operating Procedures (SOP's), based on the Ministry of Transportation Environmental Guide for Fish and Fish Habitat (2009) (The Guide), and supplemented by standard assessment methods and channel morphology observations at two representative locations adjacent to the subject lands, identified as WC1 and WC2, as well as residential Ponds 1, 2 and 3 (See Figure 5). Overall health, form and function were documented at these assessment locations. Additional details, such as transects, substrates composition, channel geomorphic units and limiting or critical habitat features, were noted during the field assessment.



Headwater Drainage Features (HDF)

- Protection
- Conservation
- No Management Concern
- Aquatic Assessment Site
- Cold Water Fish Community: West Credit River (Erin Branch)
- Subject Lands
- Pond
- MNR Provincial Significant Wetlands
- Other Wetland

Datum: North American 1983 CSRS
 Coord. System: NAD 1983 CSRS UTM Zone 17N
 Projection: Transverse Mercator
 Central Meridian: 81°0'0.00"W
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Map Title
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**AQUATIC AND HEADWATER
 DRAINAGE FEATURES**

Drawn	Checked	Date	Figure No.
PS	HM	2023/10/18	5
Scale		Project No.	
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4.7 Headwater Drainage Features Assessments

Field investigations were conducted based on procedures outlined in the TRCA (2014) guidance document, as well as supporting OSAP Section 4: Module 10 (S4:M10) and Section 4: Module 11 (OSAP, 2017). Accessibility to sites within the subject lands enabled a reach-based approach primarily utilizing S4:M11. A background review of existing hydrolayer mapping, ArchHydro data, LIDAR and satellite imagery were utilized to identify potential HDF features from desktop. Each potential HDF location was investigated during the initial site visit on April 9, 2021, with the subsequent monitoring visit completed at sites based on observations from previous visits.

The evaluation methods outlined in the HDF Guidelines utilize flow conditions, riparian vegetation, fish and fish habitat and terrestrial assessments as components in the determination of HDF classification. The HDF assessment protocol implemented was primarily based on the “Standard Survey Type”, with exception to seasonal fish sampling, given the readily documented fish assemblage in the downstream Credit River. Additional investigations were also conducted in support of this EIS to supplement amphibian species and vegetation composition.

Since HDF’s can vary significantly on a seasonal basis, multiple site visits are needed to correctly assess their hydrology and riparian conditions. Headwater drainage features were evaluated through a series of three site visits in 2021, which were timed to coincide with late winter / early spring, late spring, and summer conditions, as outlined in the HDF Guide (TRCA & CVC, 2014). Table 9 provides a summary of field investigation dates and recommended sampling periods.

Table 9: HDF Recommended Timing and Field Investigation Dates

Site Visit	Guidelines Assessment Period	Field Investigation Date
1	Spring Freshet (Early April to Mid-April)	April 9, 2021
2	Late April to May	May 12, 2021
3	July to August	July 21, 2021

Following field investigations, findings of the HDF evaluations were then translated into a classification of the HDF, with respect to the hydrology and the riparian vegetation conditions of the features. See Figure 5.

4.8 Incidental Wildlife Observations

General wildlife surveys were conducted concurrently with all field investigations. All observations and signs of species were recorded (e.g., tracks/trails, scat, burrows, dens, browse, vocalizations). The results are summarized in Section 5.11.

4.9 Anthropogenic Features

Aside from structures that may be habitat for SAR birds and bats (as discussed above), anthropogenic features may be present on the subject lands that could provide suitable habitat for other wildlife, such as snakes. Additional searches for man-made features (e.g., rock piles or rock fences extending into the ground) were conducted during all site investigations and inspected for evidence of wildlife use.

Anthropogenic features as they relate to other wildlife are discussed in Section 5.12.

5.0 Existing Conditions

5.1 Physiography and Topography

The subject lands are located entirely within the Guelph Drumlin Field Physiographic Region and are characterized by drumlins, or groups of drumlins, edged with gravel terraces and swampy valleys. The till in these drumlins is loamy and calcareous, mostly derived from dolostone of the Amabel Formation exposed along the Niagara cuesta, with fragments of the underlying red shale exposed below the escarpment. The topographic high on the subject lands is 459 m above sea level (masl), which occurs on the ridge of a drumlin running west-east that divides the property. South of the ridge, the topography follows a steep drop towards the West Credit River PSW Complex outletting to the property to the south, at an elevation of 417 masl. North of the drumlin ridge, the property slopes down towards the north, reaching an elevation of 397 masl along the north property lines (Burnside, 2022; Chapman and Putnam, 1984 and 2007).

5.2 Geology

The subject lands are located on the Amabel Formation, which consists of thick bedded dolostone rich in fossils (Armstrong and Dodge, 2007). The surficial geology is composed mainly of glaciofluvial deposits in the north and east of the subject lands; till which is stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain in the central portion of the lands; and ice-stratified deposits of sand and gravel with minor silt, clay and till in the southwest.

5.3 Soils and Infiltration Conditions

According to Burnside's Hydrogeological Assessment (2023), a total of ten boreholes were drilled and completed as monitoring wells in May 2021 to determine the local stratigraphy and site-specific soil and groundwater conditions of the subject lands. The boreholes indicated that the overburden stratigraphy is generally composed of layers of sand and gravel and silty sand till that are underlain by a finer grained clay, with silt and stones. The more prevalent till deposits were generally composed of sandy silt to silty sand, with varying amounts of clay and gravel and cobbles. Some layers of clay and silt may have developed in the till to form localized, low permeability layers or lenses.

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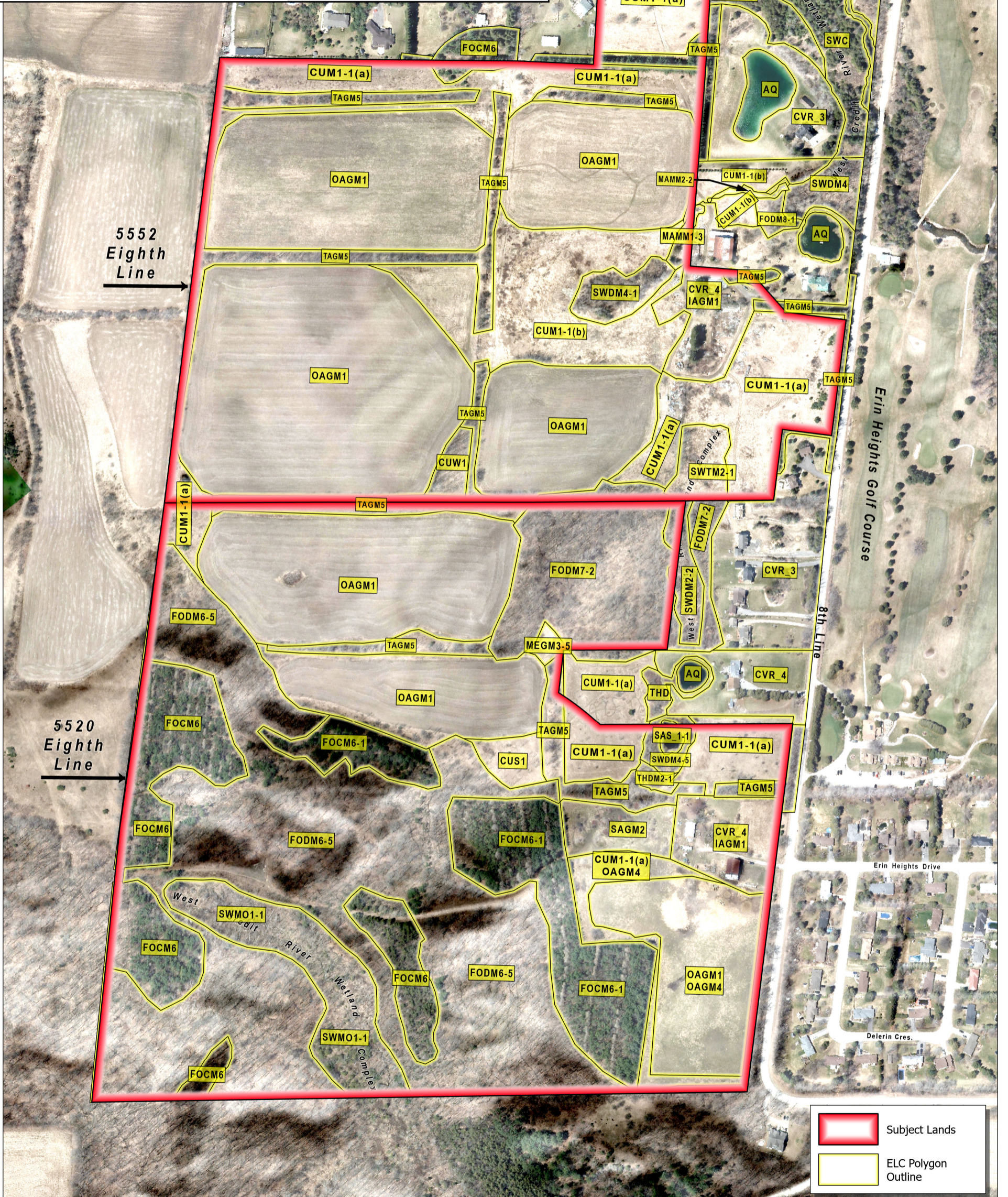
The north end of the site is comprised of a connected network of four main wetlands and an aquatic feature that form part of the PSW Complex (SWDM4-1, MAMM1-3, MAMM2-2, SWDM4). The wetland features at the north end of the subject lands appear to be supported by groundwater discharge but are also fed by surface water. The central portion of the site is comprised of SWTM2-1 and SWDM2-2 that also form part of the PSW Complex. The southern portion of the site features a dug pond that is comprised of two wetland units that are not hydrologically connected to the PSW units and are considered 'other wetlands', SAS1-1 and SWDM4-5. These features do not receive regional groundwater support and appear to be surface water fed; ponding may occur from local groundwater due to high clay content in the soil. Interpreted groundwater flow and recharge / discharge conditions are described in detail in Burnside's Hydrogeological Assessment (2023).

5.4 Vegetation Communities and Species

5.4.1 Ecological Land Classification

The subject lands are dominated by Agricultural Row Crops (OAGM1) and Rural Residential parcels (CVR_4). Hedgerows (TAGM5) divide the lands into several agricultural fields. Mineral Cultural Meadows (CUM1-1) are found along the margins abutting the rural residences and surrounding a Willow Mineral Deciduous Swamp (SWDM4-1) in the center of the subject lands, that drains via riparian marshes to a Mineral Deciduous Swamp (SWDM4) in the PSW complex. The central east portion of the subject lands feature a Red-osier Dogwood Mineral Deciduous Thicket Swamp (SWTM2-1) and Green Ash Mineral Deciduous Swamp (SWDM2-2), which are part of the PSW complex adjacent to Fresh Moist Green Ash - Hardwood Lowland Deciduous Forest (FODM7-2). A large portion of the southwest corner of the subject lands is a woodland, comprised of a mix of FODM6-5 and FOCM6 (Fresh-Moist Sugar Maple – Hardwood Deciduous Forest and Naturalized Coniferous Plantation). A unit of White Cedar - Hardwood Organic Mixed Swamp (SWMO1-1), part of the PSW Complex, is found in the woodland. Vegetation communities are described in Table 10 below and depicted in Figure 6. ELC data sheets can be found in Appendix G.

ELC Code Description	ELC Code Description
(AQ) Aquatic System	(MEGM3-5) Smooth Brome Graminoid Meadow
(CUM1-1(a)) Dry - Moist Old Field Meadow Type	(OAGM1) Annual Row Crops
(CUM1-1(b)) Dry - Moist Old Field Meadow Type	(OAGM4) Open Pasture
(CUS1) Mineral Cultural Savannah Ecosite	(SAGM2) Orchard
(CUW1) Mineral Cultural Woodland Ecosite	(SAS_1-1) Pondweed Submerged Shallow Aquatic
(CVR_3) Single Family Residential	(SWC) Coniferous Swamp
(CVR_4) Rural Property	(SWDM2-2) Green Ash Mineral Deciduous Swamp
(FOCM6) Naturalized Coniferous Plantation	(SWDM4) Mineral Deciduous Swamp Ecosite
(FOCM6-1) Dry - Fresh White Pine Naturalized Coniferous Plantation Type	(SWDM4-1) Willow Mineral Deciduous Swamp Type
(FODM6-5) Fresh - Moist Sugar Maple - Hardwood Deciduous Forest Type	(SWDM4-5) Poplar Mineral Deciduous Swamp Type
(FODM7-2) Fresh - Moist Green Ash - Hardwood Lowland Deciduous Forest Type	(SWMO1-1) White Cedar - Hardwood Organic Mixed Swamp Type
(FODM8-1) Fresh - Moist Poplar Deciduous Forest Type	(SWTM2-1) Red-osier Dogwood Mineral Deciduous Thicket Swamp Type
(IAGM1) Agricultural Buildings	(TAGM5) Fencerow
(MAMM1-3) Reed-canary Grass Graminoid Mineral Meadow Marsh Type	(THD) Deciduous Thicket
(MAMM2-2) Panicked Aster Mineral Meadow Marsh Type	(THDM2-1) Sumach Deciduous Shrub Thicket Type
	(WOCM1-3) Dry - Fresh White Pine Coniferous Woodland Type

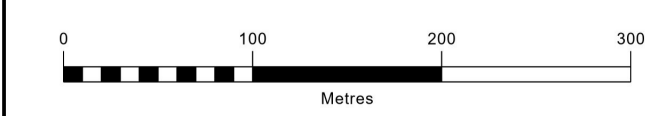


Subject Lands
 ELC Polygon Outline

Datum: North American 1983 CSRS
 Coord. System: NAD 1983 CSRS UTM Zone 17N
 Projection: Transverse Mercator
 Central Meridian: 81°00.00"W
 False Easting: 500,000m
 False Northing: 0m
 Page Orientation: -52°
 Scale Factor: 0.99960



Map Title
LANGEN PROPERTY EIS
 ECOLOGICAL LAND CLASSIFICATION



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 AND 2779181 ONTARIO INC.**

Drawn	Checked	Date	Figure No.
PS	HM	2023/10/04	6
Scale		Project No.	
H 1:4,000		300052075	

Table 10: ELC Descriptions

ELC Code	ELC Name	Canopy Layer Species	Subcanopy Layer Species	Shrub Layer Species	Ground Layer Species	Comments
Cultural						
CUM1-1(a)	Dry – Moist Old Field Meadow Type	<ul style="list-style-type: none"> Norway Maple (<i>Acer platanoides</i>) Red Maple (<i>Acer rubrum</i>) Scots Pine (<i>Pinus sylvestris</i>) Little-leaved Linden (<i>Tilia cordata</i>) 	<ul style="list-style-type: none"> White Spruce (<i>Picea glauca</i>) White Cedar (<i>Thuja occidentalis</i>) White Pine (<i>Pinus strobus</i>) Common Apple (<i>Malus sp.</i>) European Buckthorn (<i>Rhamnus cathartica</i>) 	<ul style="list-style-type: none"> Red-osier Dogwood (<i>Cornus sericea</i>) Pussy Willow (<i>Salix discolor</i>) Riverbank Grape (<i>Vitis riparia</i>) Rose (<i>Rosa sp.</i>) 	<ul style="list-style-type: none"> Common Yarrow (<i>Achillea millefolium</i>) Common Milkweed (<i>Asclepias syriaca</i>) Smooth Brome (<i>Bromus inermis</i>) Bull Thistle (<i>Cirsium vulgare</i>) Orchard Grass (<i>Dactylis glomerata</i>) Wild Carrot (<i>Daucus carota</i>) Field Horsetail (<i>Equisetum arvense</i>) Philadelphia Fleabane (<i>Erigeron philadelphicus</i>) Wild Strawberry (<i>Fragaria virginiana</i>) Rough Bedstraw (<i>Galium asprellum</i>) Common St. John's-wort (<i>Hypericum perforatum</i>) Oxeye Daisy (<i>Leucanthemum vulgare</i>) Tall Ryegrass (<i>Lolium arundinaceum</i>) Garden Bird's-foot Trefoil (<i>Lotus corniculatus</i>) Black Medick (<i>Medicago lupulina</i>) White Sweet-clover (<i>Melilotus albus</i>) Common Evening-primrose (<i>Oenothera biennis</i>) Reed Canarygrass (<i>Phalaris arundinacea</i>) Common Timothy (<i>Phleum pratense</i>) English Plantain (<i>Plantago lanceolata</i>) Kentucky Bluegrass (<i>Poa pratensis</i>) Sulphur Cinquefoil (<i>Potentilla recta</i>) Common Buttercup (<i>Ranunculus acris</i>) Curled Dock (<i>Rumex crispus</i>) Purple Crown-vetch (<i>Securigera varia</i>) Bladder Campion (<i>Silene vulgaris</i>) Canada Goldenrod (<i>Solidago canadensis</i>) Panicled Aster (<i>Symphotrichum lanceolatum</i>) New England Aster (<i>Symphotrichum novae-angliae</i>) Common Dandelion (<i>Taraxacum officinale</i>) White Clover (<i>Trifolium repens</i>) Common Valerian (<i>Valeriana officinalis</i>) Common Mullein (<i>Verbascum thapsus</i>) Tufted Vetch (<i>Vicia cracca</i>) 	<p>Several units of this type. All varied in composition, some are more grass dominated, some are more forb dominated.</p> <p>This unit contains the following locally rare species:</p> <ul style="list-style-type: none"> Yellow Sedge (<i>Carex flava</i>) Necklace Sedge (<i>Carex projecta</i>) Hanging Bulrush (<i>Scirpus pendulus</i>) Strict Blue-eyed-grass (<i>Sisyrinchium montanum</i>) Clammy Ground-cherry (<i>Physalis heterophylla</i>)

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ELC Code	ELC Name	Canopy Layer Species	Subcanopy Layer Species	Shrub Layer Species	Ground Layer Species	Comments
CUM1-1(b)	Dry – Moist Old Field Meadow Type	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Meadow Willow (<i>Salix petiolaris</i>) Pussy Willow Red-osier Dogwood 	<ul style="list-style-type: none"> European Reed (<i>Phragmites australis</i> subsp. <i>australis</i>) Reed Canary Grass (<i>Phalaris arundinacea</i>) Common Viper's bugloss (<i>Echium vulgare</i>) Goldenrod species (<i>Solidago</i> sp.) White Panicked Aster (<i>Symphotrichum lanceolatum</i>) Oxeye Daisy Wild Chicory (<i>Cichorium intybus</i>) Field Horsetail Philadelphia Fleabane Curled Dock Wild Carrot Common St. John's Wort White Clover White Sweet-clover Common Valerian Yellow Sedge (<i>Carex flava</i>) Coltsfoot (<i>Tussilago farfara</i>) Wild Basil (<i>Clinopodium vulgare</i>) Black-eyed Susan (<i>Rudbeckia hirta</i>) Strict Blue-eyed Grass (<i>Sisyrinchium montanum</i>) Common comfrey (<i>Symphytum officinale</i>) Common Speedwell (<i>Veronica officinalis</i>) White Musk Mallow (<i>Malva moschata</i> f. <i>alba</i>) 	
CUS1	Mineral Cultural Savannah Ecosite	<ul style="list-style-type: none"> Green Ash (<i>Fraxinus pennsylvanica</i>) Sugar Maple (<i>Acer saccharum</i>) 	<ul style="list-style-type: none"> Green Ash White Pine White Cedar 	<ul style="list-style-type: none"> Red-osier Dogwood 	<ul style="list-style-type: none"> Same as CUM1-1 	
CUW1	Mineral Cultural Woodland	<ul style="list-style-type: none"> Green Ash* White Elm (<i>Ulmus americana</i>) 	<ul style="list-style-type: none"> Green Ash 	<ul style="list-style-type: none"> European Buckthorn Riverbank Grape Chokecherry (<i>Prunus virginiana</i>) Alternate-leaved Dogwood (<i>Cornus alternifolia</i>) 	<ul style="list-style-type: none"> Canada Avens (<i>Geum canadense</i>) Yellow Avens (<i>Geum aleppicum</i>) Common Dandelion Thicket Creeper (<i>Parthenocissus vitacea</i>) 	
CVR_3	Single Family Residential	<ul style="list-style-type: none"> Ornamental Trees 	<ul style="list-style-type: none"> Ornamental Trees 	<ul style="list-style-type: none"> Ornamental Shrubs 	<ul style="list-style-type: none"> Mowed Lawn of ornamental grasses 	Residential properties.
CVR_4	Rural Property	<ul style="list-style-type: none"> Manitoba Maple (<i>Acer negundo</i>) White Spruce White Pine Norway Spruce (<i>Picea abies</i>) 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Mowed CUM1-1 species 	Residential properties.
FODM11	Naturalized Deciduous Hedgerow	<ul style="list-style-type: none"> Sugar Maple White Cedar White Ash (<i>Fraxinus americanum</i>) White Spruce 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> European Buckthorn Red Raspberry (<i>Rubus idaeus</i>) Red-osier Dogwood 	<ul style="list-style-type: none"> Goldenrod (<i>solidago</i> sp.) Common Dandelion European Wood-sorel (<i>Oxalis stricta</i>) Orchard Grass Thicket Creeper 	
IAGM1	Agricultural Buildings	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	Barns and temporary structures.
OAGM1	Annual Row Crops	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Annual Row Crops 	Planted with soy at the time of surveys.
OAGM4	Open Pasture	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Same as CUM1-1 Graminoid dominated 	Horse pasture being actively grazed at time of survey.

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ELC Code	ELC Name	Canopy Layer Species	Subcanopy Layer Species	Shrub Layer Species	Ground Layer Species	Comments
SAGM2	Orchard	<ul style="list-style-type: none"> Cultivated Fruit Trees Common Apple White Ash Manitoba Maple 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Same as CUM1-1 	Abandoned Orchard found in OAGM4 complex.
SAS_1-1	Pondweed Submerged Shallow Aquatic Type	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Pondweed (<i>Potamogeton sp.</i>)* 	Naturalized pond.
TAGM5	Fencerow	<ul style="list-style-type: none"> White Pine White Spruce Blue Spruce (<i>Picea pungens</i>) White Cedar Basswood (<i>Tilia americana</i>) White Ash Sugar Maple Manitoba Maple White Elm Black Cherry (<i>Prunus sericea</i>) 	<ul style="list-style-type: none"> White Cedar Manitoba Maple Common Apple Staghorn Sumac (<i>Rhus typhina</i>) 	<ul style="list-style-type: none"> European Buckthorn Riverbank Grape Alternate-leaved Dogwood Multiflora Rose (<i>Rosa multiflora</i>) Virginia Creeper (<i>Parthenocissus quinquefolia</i>) 	<ul style="list-style-type: none"> Same as CUM1-1 	<p>Several of these units are found across the subject lands.</p> <p>Two Category 1 (non-retainable) and one Category 2 Butternut (<i>Juglans cinerea</i>) (END) were found in one of these units.</p>
<ul style="list-style-type: none"> Natural 						
FOCM6	Naturalized Coniferous Plantation Ecosite	<ul style="list-style-type: none"> White Spruce White Pine Scots Pine Trembling Aspen Black Cherry White Ash 	<ul style="list-style-type: none"> European Buckthorn 	<ul style="list-style-type: none"> European Buckthorn Riverbank Grape 	<ul style="list-style-type: none"> Same as CUM1-1 	Several of these units are found within the southern NHS.
FOCM6-1	Dry – Fresh White Pine Naturalized Coniferous Plantation Type	<ul style="list-style-type: none"> White Pine* White Ash Tamarack (<i>Larix laricina</i>) Sugar Maple 	<ul style="list-style-type: none"> Common Apple 	<ul style="list-style-type: none"> European Buckthorn Riverbank Grape Chokecherry Alternate-leaved Dogwood 	<ul style="list-style-type: none"> Herb-Robert (<i>Geranium robertianum</i>) Graceful Sedge (<i>Carex gracillima</i>) Bottlebrush Rye (<i>Elymus hystrix</i>) Large False Solomon's Seal (<i>maianthemum racemosum</i>) 	
FODM6-5	Fresh – Moist Sugar Maple – Hardwood Deciduous Forest Type	<ul style="list-style-type: none"> Sugar Maple* White Ash Basswood White Pine 	<ul style="list-style-type: none"> Eastern Hop-hornbeam (<i>Ostrya virginiana</i>) Dotted Hawthorn (<i>Crataegus punctata</i>) 	<ul style="list-style-type: none"> Alternate-leaved Dogwood Chokecherry European Buckthorn Riverbank Grape Virginia Creeper 	<ul style="list-style-type: none"> Downy Yellow Violet (<i>Viola pubescens</i>) Herb-Robert Rosy Sedge (<i>Carex rosea</i>) Virginia Waterleaf (<i>Hydrophyllum virginianum</i>) 	<p>This unit contains the following locally rare species:</p> <ul style="list-style-type: none"> Long-headed Anemone (<i>Anemone cylindrica</i>) Loose-flowered Sedge (<i>Carex laxiflora</i>) Sprengel's sedge (<i>Carex sprengelii</i>)
FODM7-2	Fresh – Moist Green Ash – Hardwood Lowland Deciduous Forest Type	<ul style="list-style-type: none"> Green Ash* White Ash Basswood Manitoba Maple Black Cherry 	<ul style="list-style-type: none"> European Mountain-ash (<i>Sorbus aucuparia</i>) Sugar Maple White Ash Sweet Cherry (<i>Prunus avium</i>) 	<ul style="list-style-type: none"> European Buckthorn Riverbank Grape Chokecherry Alternate-leaved Dogwood 	<ul style="list-style-type: none"> Canada Goldenrod Canada Enchanter's Nightshade (<i>Circaea canadensis</i>) Calico Aster (<i>Symphotrichum lateriflorum</i>) Woodland Sedge (<i>Carex blanda</i>) 	<p>This unit contains the following locally rare species:</p> <ul style="list-style-type: none"> Pale Jewelweed (<i>Impatiens pallida</i>)
FODM8-1	Fresh – Moist Poplar Deciduous Forest Type	<ul style="list-style-type: none"> Balsam Poplar (<i>Populus balsamifera</i>)* Trembling Aspen (<i>Populus tremuloides</i>)* Manitoba Maple 	<ul style="list-style-type: none"> White Cedar 	<ul style="list-style-type: none"> Red Raspberry (<i>Rubus idaeus</i>) Alternate-leaved Dogwood Chokecherry Cranberry Viburnum (<i>Viburnum opulus</i>) 	<ul style="list-style-type: none"> Jewel Weed (<i>Impatiens capensis</i>) Goldenrod Yellow Avens Canada Enchanter's Nightshade 	
		<ul style="list-style-type: none"> . 	<ul style="list-style-type: none"> . 	<ul style="list-style-type: none"> . 	<ul style="list-style-type: none"> . 	

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ELC Code	ELC Name	Canopy Layer Species	Subcanopy Layer Species	Shrub Layer Species	Ground Layer Species	Comments
MAMM1-3	Reed-Canary Grass Graminoid Mineral Meadow Marsh Type	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Bebb's Willow (<i>Salix bebbiana</i>) White Willow (<i>Salix alba</i>) Manitoba Maple 	<ul style="list-style-type: none"> Red-osier Dogwood 	<ul style="list-style-type: none"> Reedcanary Grass* Tufted Vetch (<i>Vicia cracca</i>) Panicled Aster Dark-green Bulrush (<i>Scirpus atrovirens</i>) Awl-fruited Sedge (<i>Carex stipata</i>) Fox Sege (<i>Carex vulpinoidea</i>) Jewel Weed 	
MAMM2-2	Panicled Aster Mineral Meadow Marsh Type	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Red-osier Dogwood 	<ul style="list-style-type: none"> Panicled Aster* Field Horsetail Jewel Weed Soft Rush (<i>Juncus effusus</i>) Canada Goldenrod Purple-stemmed Aster (<i>Symphotrichum puniceum</i>) Reed Canarygrass 	
MEGM3-5	Smooth Brome Graminoid Meadow	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Smooth Brome* 	
SWDM2-2	Green Ash Mineral Deciduous Swamp Type	<ul style="list-style-type: none"> Green Ash* Trembling Aspen White Elm 	<ul style="list-style-type: none"> Serviceberry (<i>Amelanchier sp.</i>) European Buckthorn 	<ul style="list-style-type: none"> European Buckthorn Red-osier Dogwood Alternate-leaved Dogwood Allegheny Blackberry (<i>Rubus allegheniensis</i>) 	<ul style="list-style-type: none"> Yellow Avens Canada Goldenrod Rough-stemmed Goldenrod (<i>Solidago rugosa</i>) Graceful Sedge 	
SWDM4	Mineral Deciduous Swamp Ecosite	<ul style="list-style-type: none"> White Ash Manitoba Maple Trembling Aspen Balsam Poplar 	<ul style="list-style-type: none"> White Cedar Tamarack 	<ul style="list-style-type: none"> Virginia Clematis (<i>Clematis virginiana</i>) Chokecherry Red-osier Dogwood Currant (<i>Ribes sp.</i>) 	<ul style="list-style-type: none"> Field Horsetail Jewel Weed Canada Enchanter's Nightshade Yellow Avens Canada Avens Goldenrod Rough-stemmed Goldenrod 	<p>This unit contains the following locally rare species:</p> <ul style="list-style-type: none"> Black Ash (<i>Fraxinus nigra</i>) Star Sedge (<i>Carex echinata</i>) Common Spikerush (<i>Eleocharis palustris</i>) Water Avens (<i>Geum rivale</i>)
SWDM4-1	Willow Mineral Deciduous Swamp Type	<ul style="list-style-type: none"> White Willow* Hybrid White Willow (<i>Salix xfragilis</i>) 	<ul style="list-style-type: none"> Manitoba Maple Balsam Poplar Trembling Aspen White Cedar 	<ul style="list-style-type: none"> Virginia Clematis Red-osier Dogwood Bebb's Willow Cottony Willow (<i>Salix eriocephala</i>) 	<ul style="list-style-type: none"> Reedcanary Grass European Reed (<i>Phragmites australis</i> subsp. <i>australis</i>) Spotted Joe Pye Weed (<i>Eutrochium maculatum</i>) Canada Goldenrod Purple-stemmed Aster Soft Rush Soft-stemmed Bulrush (<i>Schoenoplectus tabernaemontani</i>) Woolly-fruited Sedge (<i>Carex lasiocarpa</i>) Field Horsetail 	<p>This unit contains the following locally rare species:</p> <ul style="list-style-type: none"> Woolly-fruit Sedge (<i>Carex lasiocarpa</i>) Star Sedge (<i>Carex echinata</i>) Yellow Sedge Necklace Sedge Silky Dogwood (<i>Cornus obliqua</i>) Three-petalled Bedstraw (<i>Galium trifidum</i> ssp. <i>trifidum</i>) Alpine Rush (<i>Juncus alpinoarticulatus</i>) Crack Willow (<i>Salix euxina</i>) Shining Willow (<i>Salix lucida</i>) Hanging Bulrush
SWDM4-5	Poplar Mineral Deciduous Swamp	<ul style="list-style-type: none"> Balsam Poplar* White Willow Sugar Maple 	<ul style="list-style-type: none"> Green Ash Tamarack 	<ul style="list-style-type: none"> Riverbank Grape Red-osier Dogwood 	<ul style="list-style-type: none"> Canada Goldenrod Field Horsetail Narrow-leaved Cattail (<i>Typha angustifolia</i>) Northern Water-horehound <i>Lycopus uniflorus</i>) 	

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ELC Code	ELC Name	Canopy Layer Species	Subcanopy Layer Species	Shrub Layer Species	Ground Layer Species	Comments
SWTM2-1	Red-osier Dogwood Mineral Deciduous Thicket Swamp Type	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> White Willow 	<ul style="list-style-type: none"> Red-osier Dogwood* Meadow Willow (<i>Salix petiolaris</i>) Bebb's Willow Pussy Willow 	<ul style="list-style-type: none"> Kentucky Bluegrass Redtop (<i>Agrostis gigantea</i>) Tall Ryegrass (<i>Lolium arundinaceum</i>) Bottlebrush Sedge (<i>Carex hystericina</i>) Common Buttercup (<i>Ranunculus acris</i>) Tufted Vetch (<i>Vicia cracca</i>) Spotted Joe Pye Weed 	This unit contains the following locally rare species: <ul style="list-style-type: none"> Yellow Sedge Woolly-fruit Sedge Silky Dogwood Shining Willow Strict Blue-eyed-grass
THD2-1	Sumac Deciduous Shrub Thicket	<ul style="list-style-type: none"> Manitoba Maple 	<ul style="list-style-type: none"> Staghorn Sumac* 	<ul style="list-style-type: none"> Alternate-leaved Dogwood European Buckthorn 	<ul style="list-style-type: none"> Yellow Avens Canada Goldenrod Field Horsetail Common Dandelion Canada Enchanter's Nightshade 	
WOCM1-3	Dry – Fresh White Pine Coniferous Woodland Type	<ul style="list-style-type: none"> White Pine* White Cedar White Spruce 	<ul style="list-style-type: none"> Red Cedar (<i>Juniperus virginianum</i>) Common Crab-apple (<i>Malus sp.</i>) White Ash European Mountain-ash 	<ul style="list-style-type: none"> European Buckthorn Riverbank Grape Chokecherry 	<ul style="list-style-type: none"> Kentucky Bluegrass Orchard Grass Canada Thistle (<i>Cirsium arvense</i>) Goldenrod 	

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5.4.2 Botanical Inventory

A detailed list of plants identified on the subject lands can be found in Appendix G. The following summarizes the flora observed on the subject lands and on the adjacent lands (approximately 50 m) within the NHS by AWS Environmental in 2016 and Burnside in 2020 and 2021:

- Of the 294 plant taxa observed, 284 were identified to a species, or subspecies level.
- Of those species, 178 (63%) were native and 106 (37%) were non-native to Ontario.
- Three Butternut (*Juglans cinerea*) (Endangered) were observed on the subject lands and within the Hedgerow (TAGM5) feature at the north end of the property. These specimens were assessed by certified Butternut Health Assessors. Details regarding Butternut can be found in Section 6.6.2.
- Black Ash (*Fraxinus nigra*) was found on the subject lands. It is ranked as Threatened by COSEWIC and as Endangered by COSSARO. On January 26, 2022, this species was officially listed as Endangered under SARO. It is not currently protected under the ESA. The Ministry suspended protection for Black Ash for a period of two years from the time the species was added to the Species at Risk in Ontario List (O. Reg. 230/08). During this time, proponents will not need to seek authorizations for activities that impact Black Ash and its habitat. No Black Ash will be impacted by the development.
- All native species except three are considered 'apparently secure' (uncommon but not rare) (S4) or 'secure' (common, widespread, and abundant) (S5) in Ontario. Two species are ranked as S2 and S2? – 'imperiled':
 - Honey Locust (*Gleditsia triacanthos*)
 - Butternut

The Honey Locust observed on the subject lands was a thornless horticultural varietal (var. *inermis*), planted as a shade tree in a meadow adjacent to a rural residence. This is a very commonly cultivated tree throughout Ontario. Only native occurring wild varieties should be considered rare.
- Seventeen (17) species were observed that are considered rare (R) or uncommon (U) to the Greater Toronto Area (GTA) (Varga et al., 2000):
 - Long-headed Anemone (*Anemone cylindrica*) R
 - Star Sedge (*Carex echinata*) R
 - Yellow Sedge (*Carex flava*) R
 - Woolly-fruit Sedge (*Carex lasiocarpa*) R
 - Pale Sedge (*Carex pallescens*) R
 - Pointed Broom Sedge (*Carex scoparia*) R
 - Sprengel's Sedge (*Carex sprengelii*) R
 - Silky Dogwood (*Cornus obliqua*) R
 - Water Avens (*Geum rivale*) R
 - Pale Jewelweed (*Impatiens pallida*) R

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- Black Walnut (*Juglans nigra*) R
- Alpine Rush (*Juncus alpinoarticulatus*) R3
- Eastern Red Cedar (*Juniperus virginiana*) R4
- Common Evening-primrose (*Oenothera biennis*) U
- Virginia Creeper (*Parthenocissus quinquefolia*) R7
- Clammy Ground-cherry (*Physalis heterophylla*) R7
- Hanging Bulrush (*Scirpus pendulus*) U

Black Walnut and Eastern Red Cedar are commonly planted landscaping trees, which are known to escape from manicured gardens in suburban and rural areas. Black Walnut was found commonly in forests, cultural woodlands, and hedgerows throughout the site. These are not naturally occurring mature populations and as such, should not be considered rare in a modified agricultural landscape.

- Twenty-two (22) species were observed that are considered rare to the CVC (2002) jurisdiction, and of those, nine are also considered rare by Kaiser 2001:
 - Long-headed Anemone (Kaiser, 2001)
 - White Bear Sedge (*Carex albursina*)
 - Star Sedge (Kaiser, 2001)
 - Loose-flowered Sedge (*Carex laxiflora*)
 - Pale Sedge (Kaiser, 2001)
 - Necklace Sedge (*Carex projecta*)
 - Pointed Broom Sedge
 - Sprengel's Sedge (Kaiser, 2001)
 - Silky Dogwood (Kaiser, 2001)
 - Common Spikerush (*Eleocharis palustris*)
 - Water Horsetail (*Equisetum fluviatile*)
 - Common Bedstraw (*Galium aparine*)
 - Three-petalled Bedstraw (*Galium trifidum* ssp. *trifidum*)
 - Water Avens (Kaiser, 2001)
 - Pale Jewelweed
 - Black Walnut (Kaiser, 2001)
 - Alpine Rush
 - Eastern Red Cedar
 - Virginia Creeper (Kaiser, 2001)
 - Clammy Ground-cherry
 - Shining Willow (*Salix lucida*)
 - Strict Blue-eyed-grass (*Sisyrinchium montanum*)

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Virginia Creeper is common in edge environments throughout Ontario. In some situations, it can be considered invasive. As such, it should not be considered rare in a modified agricultural landscape. Recent taxonomic changes have also resulted in a reorganization of the *Parthenocissus* genus in Ontario (FNA, 2016), which may have included a much narrower description at the time Kaiser, 2001 was published.

5.5 Avifauna

5.5.1 Breeding Bird Surveys

Sixty-two (62) resident bird species, exhibiting some level of breeding evidence (possible, probable, or confirmed), were observed on the subject lands during targeted breeding bird surveys in 2021 (see Appendix F).

Six species were observed on the subject lands during the breeding bird window, but no breeding evidence (i.e., suitable breeding habitat or breeding behavior) was recorded: Canada Goose (*Branta canadensis*), Great Blue Heron (*Ardea herodias*), Green Heron (*Butorides virescens*), Merlin (*Falco columbarius*), Red-tailed Hawk (*Buteo jamaicensis*) and Turkey Vulture (*Cathartes aura*).

According to MNRF's Significant Wildlife Habitat Technical Guide (MNR, 2000), "area-sensitive" species are defined as species that require large areas of suitable habitat for long term population survival. Fragmentation of essential habitats can result in overall declines in populations. Seven "area-sensitive" bird species, as defined by MNRF, were observed exhibiting breeding evidence on the subject lands during the breeding bird surveys: American Redstart (*Setophaga ruticilla*), Hairy Woodpecker (*Picoides villosus*), Pileated Woodpecker (*Dryocopus pileatus*), Savannah Sparrow (*Passerculus sandwichensis*), Scarlet Tanager (*Piranga olivacea*), White-breasted Nuthatch (*Sitta carolinensis*), and Yellow-bellied Sapsucker (*Sphyrapicus varius*). Except for Savannah Sparrow, the remaining six species were recorded in the NHS.

Four bird species, listed as both provincially and federally significant, were observed on the subject lands during breeding bird surveys: Barn Swallow (Special Concern), Eastern Wood-pewee (*Contopus virens*) (Special Concern), Wood Thrush (*Hylocichla mustelina*) and Eastern Meadowlark (Threatened). SAR and SWH Screening Tables for the subject lands are included in Appendix C and Appendix D. The significance of these species is discussed in more detail in Section 6.5 and 6.6.

Habitat for raptors may be present in the woodlands contained within the NHS and in the mature hedgerows. However, no breeding evidence of raptors was recorded during any field investigations on the subject lands, including early spring surveys during turtle basking surveys. Two raptors were recorded on-site as incidental observations only (Red-tailed Hawk and Merlin). A stick nest was observed in early spring along the edge of the forested NHS at the south end of the subject lands during leaf-off conditions, but it

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was not active (i.e., no birds sitting on the nest, no territorial behaviour in vicinity). Confirmed breeding evidence of Common Raven (observed with nest building material and copulating on April 8, 2021) and American Crow (fledged young) were recorded on the subject lands, suggesting that the stick nest may have been a *Corvus* sp., or an inactive nest from previous years. As part of best management practices, future early spring raptor surveys are recommended during detailed design, if encroachments into candidate breeding habitat are proposed, to ensure that any confirmed raptor nesting habitat is protected.

5.5.2 Barn Swallow and Chimney Swift Structure Surveys

Survey investigations identified a total of seven main structures present on the subject lands (see Figure 3). At the northeast portion of the lands, there is a large residential dwelling (S1), a large stone chimney attached to the dwelling with two clay flue liners (S2), a wooden shed by the pond (S3), a large wooden barn with a lean-to (S4), and large wooden storage shed with a lean-to (S5). At the southeast portion of the subject lands, there is a small bungalow-style dwelling with a small brick chimney with one clay flue (S6), and a large wooden barn with a lean-to (S7). Other miscellaneous, dilapidated trailers and small shed-like structures are scattered around the eastern side of the subject lands. Inspections of the exterior and interior (where accessible) of these structures provided additional information on whether nesting or candidate roosting habitat is present. Based on the results of these inspections, the structures were surveyed again during the active window. For Barn Swallow, nest counts were completed concurrently during the breeding bird surveys.

The following structures had confirmed Barn Swallow nests: S3 – 3 nests; S4 – 10 nests; and S7 – 1 nest (based on observations of pair entering/exiting the structure). These findings are discussed further in Section 6.5. [Note: at the time of the surveys, S3 and S4 were located in the development limits; these are now part of the “Lands to be Retained” and will continue to be used as a principal residence for the landowner on this parcel. See Section 9.0].

Neither of the two structures with chimneys (S2 and S6) are suitable for Chimney Swift. The clay liners in the large stone chimney on S2 and S6 make the chimneys unsuitable for Chimney Swift; additionally, one of the clay liners on S2 had a metal cap on top. If a chimney is determined to be capped or lined, it is considered unsuitable habitat for Chimney Swift and no further investigations are required. Chimney Swift were not observed during the breeding bird surveys, or any other surveys completed on the site during the active window. Therefore, no further actions are required under the ESA for this species.

5.6 Amphibian Breeding Call Surveys

In total, four anuran species were identified on the subject lands during targeted amphibian breeding call surveys: Green Frog (*Lithobates clamitans*), American Toad (*Anaxyrus americanus*), Spring Peeper (*Pseudacris crucifer*) and Wood Frog (*Lithobates sylvaticus*). All these species are ranked as S5 (Secure) in Ontario and considered common and widespread in the province.

Spring Peeper was the most common species recorded across the stations, heard in both the early- and mid-season surveys. Early-season surveys detected Wood Frog, while late-season surveys detected Green Frog. During targeted surveys, call level codes ranged from a single individual (Code 1) to simultaneous calls, where the number of individuals could not be reliably estimated (Code 3).

During the May 16 surveys, a full chorus of American Toad were heard offsite, from the large pond on the adjacent property to the northeast of the subject lands. Four Gray Treefrogs (*Hyla versicolor*) were heard calling from the vegetation around the same offsite pond. At the small pond located offsite from the central west boarder of the subject lands, a full chorus of Spring Peepers and American Toads were heard.

The only station with no confirmed amphibian breeding was AMPH-003. Confirmed SWH amphibian breeding habitat was recorded at AMPH-004, where both Spring Peeper and American Toad were heard at a Call Code of 3. All four species of anurans found on the subject lands were detected at this station. Additionally, Green Frog tadpoles and two Eastern Newts (*Notophthalmus viridescens*) were observed in the pond. AMPH-004 is located at a shallow dug pond, situated in a Poplar Mineral Deciduous Swamp pocket (SWDM4-5). It is largely surrounded by cultural meadow, but a portion of the Poplar swamp connects to the hedgerows. See Table 11 for a summary of results in 2021. SWH is discussed further in Section 6.5 and Appendix D.

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Table 11: Amphibian Breeding Call Survey Results

Survey Date	Station ID	Species Observed	No. of Individuals
April 8, 2021	AMPH-001	None	0
	AMPH-002	Spring Peeper	Calls continuous, overlapping, cannot be counted
	AMPH-003	None	0
	AMPH-004	Wood Frog	4
		Spring Peeper	Calls continuous, overlapping, cannot be counted
	AMPH-005	Wood Frog	4
		Spring Peeper	Calls continuous, overlapping, cannot be counted
	May 16, 2021	AMPH-001	Spring Peeper
AMPH-002		Spring Peeper	1
AMPH-003		None	0
AMPH-004		Spring Peeper	Calls continuous, overlapping, cannot be counted
		American Toad	Calls continuous, overlapping, cannot be counted
AMPH-005		None	0
June 17, 2021		AMPH-001	Green Frog
	AMPH-002	None	0
	AMPH-003	None	0
	AMPH-004	Green Frog	2
	AMPH-005	None	0

5.7 Reptiles

5.7.1 Turtle Basking Surveys

Midland Painted Turtle was observed at two of the three stations in 2021: TURT-001 and TURT-003. Additionally, one Snapping Turtle was observed mud basking on June 15, 2020, at TURT-002; this species was not observed during any field surveys in 2021. Midland Painted Turtle and Snapping Turtle are ranked as S4 (Apparently Secure) in Ontario. Although Midland Painted Turtle is not listed under the ESA, it is

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ranked by COSEWIC and SARA as Special Concern. Snapping Turtle is ranked as Special Concern under the ESA, as well as COSEWIC and SARA.

Between 2020 and 2021, the highest number of Midland Painted Turtles counted at TURT-001 was six. The highest number of Midland Painted Turtles counted at TURT-003 was 12. Individuals observed were either basking on dead vegetation, shoreline edges, or shallow basking. See Table 12 for a summary of results in 2021.

According to *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF, January 2015) the presence of five or more Midland Painted Turtle observed during basking surveys at TURT-001 and TURT-003 is confirmed turtle wintering SWH. SWH is discussed further in Section 6.5 and Appendix D.

Table 12: Turtle Basking Results

Survey Date	Station ID	Species Observed	No. of Individuals
April 8, 2021	TURT-001	Midland Painted Turtle	4
	TURT-002	None	0
	TURT-003	Midland Painted Turtle	10
April 23, 2021	TURT-001	Midland Painted Turtle	6
	TURT-002	None	0
	TURT-003	Midland Painted Turtle	6
May 6, 2021	TURT-001	Midland Painted Turtle	5
	TURT-002	None	0
	TURT-003	Midland Painted Turtle	9
May 12, 2021	TURT-001	Midland Painted Turtle	5
	TURT-002	None	0
	TURT-003	Midland Painted Turtle	12

5.7.2 Turtle Nesting Surveys

No confirmed nests were found on the subject lands. Many potential nest scrapes were seen near the north and south pond, but none could be conclusively identified as evidence of nesting turtles.

As a control, the gravel shoulders along Sideroad 17 and Eighth Line were surveyed. One predated turtle nest was noted along the south side of Sideroad 17, on the bridge over the West Credit River (Erin Branch).

Based on the presence of overwintering turtles at all three turtle basking survey stations, it is assumed (but not confirmed) that turtle nesting habitat is present around the perimeter of the open water wetlands. Due to the disturbed nature of the site, nest predation and destruction rates of nests are likely to be high due to the presence of numerous predators that are active within the residential areas (i.e., Raccoon (*Procyon*

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Iotor), Striped Skunk (*Mephitis mephitis*), Red Fox (*Vulpes vulpes*) and Coyote (*Canis latrans*)).

5.8 Bats

5.8.1 Leaf-off and Leaf-on Surveys

Fifty-one (51) snags were identified in the treed communities located in the hedgerows and along the edges of the NHS (Figure 4). Of these, six are located outside the development limits and four fell during the winter of 2021-22, leaving 41 to be removed by the proposed development. Appendix H summarizes the characteristics of the candidate maternity roosting trees identified on the subject lands.

The snags present in the hedgerows are in areas that allow for direct sun exposure, giving them the ability to absorb sunlight; their relatively large DBH allows them to retain heat during cool nighttime temperatures.

Seventy-six (76) candidate maternity roosting trees were identified during leaf-on surveys on the subject lands (Appendix H). Among those identified, 41 were Sugar Maple. No oak trees, the preferred tree type of roosting Tri-colored Bat, were identified during the survey (MNRF, Guelph District, April 2017).

Dead leaf clusters were observed during the leaf-on survey; however, these features are variable and may or may not be present during any given year. Refer to Figure 4 for the locations of candidate maternity roosting habitat identified during the leaf-on surveys.

5.8.2 Exit Surveys

Acoustic surveys were conducted to assess the presence of SAR bats that may be utilizing the hedgerows on the subject lands. Observations taken during the time of the surveys are recorded in Table 13.

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Table 13: Bat Survey Observations

Date	Station	Visual Observations	Species Identified with the Echo Meter Touch 2 Pro
June 28, 2021	1	No bats were observed during the first half hour, four bats were observed during the second half hour and an additional six were observed during the final half hour.	<ul style="list-style-type: none"> • Little Brown Myotis • Big Brown Bat • Hoary Bat • Eastern Red Bat
June 28, 2021	2	No bats were observed during the first half hour, seven bats were observed during the second half hour and an additional six were observed during the final half hour. No more than 2 were viewed at the same time.	
June 28, 2021	3	No bats observed.	
June 28, 2021	4	Nine bats were observed during the final half hour; however, none were observed exiting the barn.	<ul style="list-style-type: none"> • Big Brown Bat
July 12, 2021	1	No bats were observed during the first half hour, nine bats were observed during the second half hour and an additional eight were observed during the final half hour. One bat was clearly seen emerging from the big barn at 9:25.	<ul style="list-style-type: none"> • Little Brown Myotis • Big Brown Bat • Hoary Bat • Silver-haired Bat • Eastern Red Bat
July 12, 2021	2	No bats were observed during the first half hour, 15 bats were observed during the second half hour and an additional bat was observed during the final half hour. Bats were clearly seen emerging from the small barn.	
July 12, 2021	3	Data not available.	-
July 12, 2021	4	Four bats were observed during the second half hour; however, none were observed exiting the barn.	<ul style="list-style-type: none"> • Hoary Bat • Big Brown Bat • Eastern Red Bat • Tri-colored Bat (see discussion below)

Recordings from the Echo Meter Touch 2 Pro Bat Call Detectors were verified using the more accurate Wildlife Acoustics Kaleidoscope Pro v. 4.3.2 software. Table 14 shows which bat species were detected by the Echo Meter heterodynes, how many events

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were recorded, and the level of confidence in the accuracy of the species identification, as verified by Kaleidoscope Pro software.

Table 14: Recorded Bat Calls

Station Information		Number of Recorded Events ¹							
Date	Station	Big Brown Bat	Eastern Red Bat	Hoary Bat	Silver-Haired Bat	Eastern Small-footed Myotis	Little Brown Myotis	Northern Myotis	Tri-colored Bat
June 28, 2021	1	54	1	2	0	0	7	0	0
June 28, 2021	4	6	0	0	0	0	0	0	0
July 12, 2021	2	45	0	2	1	0	8	0	0
July 12, 2021	4	2	2	14	0	0	0	0	1
Total Recorded Events		107	3	18	1	0	15	0	1
Total Verified Events		105	2	14	0	0	15	0	0
% of Verified Events		77%	1.5%	10%			11%		

¹Cells shaded green indicated a high probability that the species is present ($p < 0.05$).
Cells shaded orange indicated a moderated probability that the species is present ($p 0.05 < 0.1$).
Cells shaded red indicated a high probability of a false positive ($p > 0.1$).

Six species of bat were detected by the Echo Meter Touch 2 Pro heterodynes: Big Brown Bat, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Little Brown Myotis and Tri-colored Bat. Recordings were analyzed using Kaleidoscope Pro software. Big Brown Bat and Little Brown Myotis were detected on both surveys with high confidence and are therefore likely roosting within structures S4 and S5 (Figure 4). Due to the small number of calls and the low confidence value, neither Silver-haired Bat nor Tri-colored Bat are likely present. Bats were not observed roosting in the remaining five candidate structures.

5.8.3 Passive Acoustic Surveys

Bat calls were recorded using eight Wildlife Acoustics Song Meter SM4BAT FS and were verified using the more accurate Wildlife Acoustics Kaleidoscope Pro v. 4.3.2 software. Table 15 shows which bat species were detected by the heterodynes, how many events were recorded, and the level of confidence in the accuracy of the species identification, as verified by Kaleidoscope Pro software.

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Table 15: Recorded Bat Calls

Station	Big Brown Bat	Eastern Red Bat	Hoary Bat	Silver-haired Bat	Eastern Small-footed	Little Brown Myotis	Northern Myotis	Tri-colored Bat
A	1194	6	270	190	1	25		1
B	132	4	28	89		11		1
C	200	3	5	6	7	48	1	1
D	420	5	91	46	40	99	3	2
E	1250	20	76	100	12	101	5	2
F	78		7	4	2		3	
G	2295	1	17	233		4	1	
H	1		6	2	20	1		
Total	5570	39	500	670	82	289	13	7
Total Verified	5569	30	395	89	82	288	3	0
% of Verified	86%	0.46%	6%	1%	1.27%	4.46%	0.05%	
¹ Cells shaded green indicated a high probability that the species is present ($p < 0.05$). Cells shaded orange indicated a moderated probability that the species is present ($p < 0.1$). Cells shaded red indicated a high probability of a false positive ($p > 0.1$).								

Seven species of bats were verified on the subject lands. Most of the bat call events detected were Big Brown Bat (86%), which is not at risk. Three additional species, Hoary Bat (6%), Silver-haired Bat (1%) and Eastern Red Bat (0.46%) were verified at lower rates and are not at-risk.

Three of Ontario's four SAR bat species were verified on the subject lands: Little Brown Myotis (4.46%), Eastern Small-footed Myotis (1.27%) and Northern Myotis (0.05%). Seven call events were initially detected as Tri-colored Bat, however analysis with Kaleidoscope Pro v. 4.3.2 software determined there was a high probability of a false positive. As such, they are not considered present on the subject lands.

It is important to note that the number of calls identified through bioacoustics monitoring does not indicate a specific number of individuals; one individual could pass by one or more detectors several times in a night, resulting in a high number of calls.

SAR bats were detected at every Song Meter station on the subject lands. Eastern Small-footed Myotis and Little Brown Myotis calls were detected throughout the subject lands. The highest number of call events for Eastern Small-footed Myotis was recorded at Station D, which is located next to a large man-made rock pile. Northern Myotis was

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only verified at Station F, in the southeast portion of the subject lands, along the edge of the NHS. No single station detected all three SAR bats.

5.9 Aquatic Habitat

5.9.1 West Credit River

Two assessments were completed during the July 21, 2021 field investigation. One immediately upstream of Eighth Line and the other immediately downstream of Sideroad 17. These sites were referred to as W1 and W2, respectively (See Figure 5).

Generally, habitat conditions at the W1 survey location consists of a well-defined mainstem system, composed of good morphological and habitat complexity, and overall high fish habitat quality. The assessment area is dominated by run habitat types, with pool and riffles sub dominate features. It contains abundant cover throughout the reach in the form of undercut banks, overhanging vegetation, large woody debris (LWD) and pool habitat greater than 1 m (i.e., overwintering potential). Water quality parameters were generally good, with spot temperature readings documented as 20.9°C (see Table 16). Interestingly, almost a full degree of temperature variation was observed between the W1 and W2 sites, suggesting potential groundwater input between the reaches. Proximal to the existing bridge structure on Eighth Line, substrates were dominated by large and small gravel, while fine substates (i.e., sand and silt) were predominant throughout the upper assessment area. An active beaver impoundment was observed approximately 50 m upstream.

Two elliptical CSP culverts convey flow under Sideroad 17 into the W2 assessment area. The reach was noted to contain less complexity and sinuosity than the downstream W1 site and was dominated by flat habitat features. Although fish habitat was still considered good quality, utilization by fish and cover features were primarily limited to the littoral areas, where overhanging vegetation and woody debris was present. As such, the fish assemblage and concentrations are anticipated to be lower in the W2 assessment area than adjacent habitat features. It is surmised that the W2 assessment reach would primarily serve to connect preferred habitat, such as pools and runs upstream and downstream, where increased foraging opportunities and holding water is present, particularly for sportfish and salmonids.

Table 16: Water Quality Parameters

Parameter	W1	W2
Temperature	20.9°C	21.7°C
Dissolved Oxygen	10.97 mg/L	10.95 mg/L
pH	8.1	8.2
Specific Conductivity	538 uS/cm	539 uS/cm

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5.9.2 Residential Ponds

Three residential and/or agricultural ponds were investigated and assessed for potential fish habitat and connectivity to the downstream network (Figure 5). Pond 1 is located immediately north of the existing residence and is an isolated feature that is supported by groundwater discharge and some surface water input, with no inlet or outlet. It is an anthropogenically excavated pond, primarily created for aesthetics, that lacks naturalized banks and riparian cover, although some emergent vegetation is developing within the littoral areas due to lack of maintenance. Maximum depth was estimated to be 3.5 m, with a mixed bedform of clay, silt, and organic detritus. A resident population of Largemouth Bass was observed during the assessment and corroborated through communication with the landowner.

Pond 2, located at the southern extent of the subject lands, is an isolated feature with no outlet or connectivity to downstream habitat. This pond is surface water fed, with some groundwater support due to local groundwater ponding. A poorly defined drainage, identified as H6 conveys minor surface flow under favourable conditions, but was dry during all three HDF field investigations (see Section 5.10). The littoral and riparian area of the pond is well developed and naturalized, providing shade to the feature. Floating algae and abundant emergent vegetation are present throughout. Although fish sampling was not completed, it is anticipated that high tolerant cyprinid species occupy the pond, which is typical of historical farm ponds of this nature.

Pond 3 is a deep man-made test pit that was dry and unsuitable to support fish. No connectivity to downstream habitat is present or associated with the feature. This feature is not discussed further in this report.

5.10 Headwater Drainage Features

HDF's within the subject lands were mixed in structure and form and ranged from field drainage (H1) to a naturally defined channel (H2). In total, seven HDF features were investigated on the subject lands. Two ponds, originally referenced at potential HDF H4 and H6, lacked surface inlet and outlet connectivity following field investigations, and were removed from the HDF assessment, as per the protocol. Drainage features were segmented into sub-reaches when changes in hydrology, riparian vegetation, or site modifiers (e.g., tile drains) were observed. Sixteen (16) reaches were documented and categorized.

5.10.1 Reach Based Classification

Using hydrological characteristics, riparian vegetation, potential fish habitat and terrestrial linkage habitat, classification of each HDF feature was completed. Of the reaches within these networks, three were classified as 'Protection', one 'Conservation', and 12 as 'No Management Concern', based on the management decision matrix provided in Figure 2 of the HDF Guideline (TRCA & CVC, 2014). A summary of reached based classification is provided in Table 17 and Figure 5.

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Table 17: Headwater Drainage Feature Reach Classifications

Drainage	Reach	Hydrology	Modifier	Riparian Classification	Fish and Fish Habitat	Terrestrial Habitat	Management Recommendation
CR-H1	R1	Limited Hydrology	n/a	n/a	n/a	Limited Function	No Management Concern
	R2	Limited Hydrology	n/a	n/a	n/a	Limited Function	No Management Concern
CR-H2	R1	Important Hydrology	n/a	Important Function	Valued Function	Valued Function	Protection
	R2	Valued Hydrology	n/a	Important Function	Valued Function	Valued Function	Protection
	R3	Important Hydrology	n/a	Important Function	Valued Function	Valued Function	Protection
CR-H2b	R1	Limited Hydrology	Tile Drain	Limited Function	Contributing Function	Limited Function	No Management Concern
CR-H2c	R1	Contributing Hydrology	Agricultural Practices	Important Function	Contributing Function	Limited Function	Conservation
	R2	Limited Hydrology	Agricultural Practices	Contributing Function	Contributing Function	Limited Function	No Management Concern
	R3	Limited Hydrology	n/a	Contributing Function	Contributing Function	Limited Function	No Management Concern
	R4	Limited Hydrology	Suspected Tile Drain	Contributing Function	Contributing Function	Limited Function	No Management Concern
	R5	Limited Hydrology	Suspected Tile Drain	Contributing Function	Contributing Function	Limited Function	No Management Concern
CR-H2d	R1	Limited Hydrology	Agricultural Practices	Valued Function	Contributing Function	Limited Function	No Management Concern

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Drainage	Reach	Hydrology	Modifier	Riparian Classification	Fish and Fish Habitat	Terrestrial Habitat	Management Recommendation
	R2	Limited Hydrology	n/a	Limited Function	Contributing Function	Limited Function	No Management Concern
CR-H5	R1	Limited Hydrology	n/a	Valued Function	Contributing Function	Limited Function	No Management Concern
	R2	Limited Hydrology	n/a	Valued Function	Contributing Function	Limited Function	No Management Concern
CR-H6	R1	Limited Hydrology	n/a	Limited Function	Contributing Function	Limited Function	No Management Concern

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The H1 feature is a constrained field-side drainage associated with a hedgerow. It is comprised of an erosional scar and rill formation that conveys surface drainage along the field edge, under post-rain conditions. Flowing water was not observed during any of the field investigations. The lower reach of the feature is conveyed through a residential property and manicured lawn, which was outside the subject lands (no permission to access). However, observations from a distance suggest it lacks connectivity to downstream habitat.

The H2 drainage contains varying habitat types, channel formations and riparian communities throughout the assessment area. It also contains three sub-drainages, referred to as H2b, H2c, and H2d (Figure 5). The lower reach of H2 (i.e., H2-R1) is a naturally defined channel, which contained flowing water during the first and second assessment and standing water during the summer investigation. Upstream, R2 is marginally defined, likely due to the lack of confinement and gradient and supported by a mix of meadow and wetland habitat. Flow is conveyed under an access driveway, through a CSP culvert towards downstream habitat. Reach 3 is associated with an open water wetland, which is discussed in detail in Section 5.4 and Section 6.1. Fish were observed within the open water habitat, indicating seasonal connectivity between the wetland and downstream West Credit River mainstem.

The sub-drainages of the H2 feature (i.e., H2b, H2c and H2d) are anthropogenically impacted field drainages of varying forms that feed the receiving wetland and H2 system. H2b is a tile drain outlet associated with the northwestern most agricultural field. Flow was detected during the first field survey (heard audibly, but partially buried), but was otherwise dry during subsequent field visits. The H2c feature originates as a historical tile drain outlet, that drains the upper field on the subject lands. Given the gradients within reaches R5 and R4, some erosional definition is present within the feature, but lacked bed, banks, or substrate sorting. Downgradient, within the lower reaches, definition and erosional scouring is limited, or not present, due to a lack of gradient. Flows, when present, are conveyed along the field edge and into the receiving wetland. The furthest downgradient reach of H2c, R1, is a furrowed feature in the riparian meadow bordering the agricultural field. It has been historically altered to convey drainage from the field to the receiving wetland. Finally, the H2d drainage conveys flow into the lower north corner of a large agricultural field, with evidence of historical pooling and standing water in the area. At the time of the assessment, a drainage swale was cut into the receiving wetland to facilitate field drainage and minimize pooling, ultimately allowing for field cultivation.

H5 is a swale feature that lacked flowing water during any of the assessments. Vegetation type, particularly in the R2 reach, suggest some surface drainage or near surface soil saturation is present at times. Additionally, a culvert is present at the downstream termination of the feature, conveying flows into the Eighth Line ditch. It is

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anticipated that this feature only conveys flows occasionally flowing significant rain events, or during atypical freshet conditions.

The H6 has a semi-confined feature that's conveys flow through a dense thicket into a residential pond (i.e., Pond 2). Definition within the feature is limited, with only some small pockets of erosion where increased gradient or confinement is present.

Overall, and notwithstanding H2, the HDF's on-site provide indirect habitat to fish and the aquatic network and are highly impacted by agricultural practices. The H2 feature is a naturally defined channel in the lower reaches and associated with an open water wetland in the upper sections. Fish were observed within the feature during the assessment work, indicating it functions as direct fish habitat and therefore protected under the *Fisheries Act*. In addition, given spot temperature readings, proximity to the West Credit system, and its catchment area, the H2 drainage also provides valuable indirect function to the receiving feature by means of water balance, allochthonous input and thermal buffering. CR-H2C-R1 is classified as Conservation, although this is driven through the riparian habitat associated with the reach and not the hydrology of the feature. It is a furrowed feature that has been anthropogenically altered to facilitate the drainage of the field to the downgradient wetland. This reach featured standing water in April 2021, interstitial flow in May 2021 and it was dry in August 2021.

5.11 Incidental Wildlife Observations

Incidental wildlife observations recorded by Burnside during field investigations are listed in Table 18.

MNRFs provincial ranks (i.e., S1 to S5) are used to set protection priorities for rare species and natural communities. Except for Monarch (*Danaus plexippus*), the remaining species observed are not listed as provincially and / or federally significant and are listed as secure, or apparently secure in Southern Ontario (in other words, they are ranked as S4 or S5, which is defined by MNR as species that are common, widespread, and abundant in the province or uncommon but not rare).

Monarch is ranked as Special Concern under the ESA; therefore, this species does not have individual or habitat protection. According to COSSARO's Ontario Species at Risk Evaluation Report for Monarch, Eastern Subpopulation (September 2020), the area of overwintering habitat occupied by Monarchs in Mexico is very small and has continued to decline. This makes the subpopulation susceptible to disturbances and threats such as extreme weather, fire, disease, parasites, predation, and illegal logging. The eastern Monarch is also threatened within its breeding range (i.e., Ontario) by reduced availability of Milkweed host plants, due to increasing herbicide use and agricultural intensification. Monarch habitat is considered SWH and is discussed further in Section 6.5. Monarch habitat is present within the development limits of the subject lands and will be removed; therefore, mitigation measures are proposed to help offset

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any long-term negative impacts to the species or its habitat. Impact and mitigation measures to offset possible habitat removal are discussed in Section 10.0.

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Table 18: Summary of Incidental Wildlife Observations by Burnside Staff on the Subject Lands

Common Name	Scientific Name	Number Observed	S-Rank	Location / Comments
Coyote	<i>Canis latrans</i>	2	S5	Individuals.
Eastern Chipmunk	<i>Tamias striatus</i>	5+	S5	Observed throughout the subject lands.
Eastern Cottontail	<i>Sylvilagus floridanus</i>	2	S5	Observed throughout the subject lands.
Gray Squirrel	<i>Sciurus carolinensis</i>	3+	S5	Observed throughout the subject lands.
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	6	S5	Observed throughout the subject lands in wooded habitats.
Raccoon	<i>Procyon lotor</i>	1	S5	Inside barn (Structure 4).
White-tailed Deer	<i>Odocoileus virginianus</i>	2	S5	Individuals observed as well as signs throughout the site: scat, pathways, bedding.
Snapping Turtle	<i>Chelydra serpentina</i>	1	S4	Observed mud basking on June 15, 2020, at TURT-002.
Eastern Gartersnake	<i>Thamnophis sirtalis</i>	1	S5	-
American Toad	<i>Anaxyrus americanus</i>	1	S5	Observed in field on May 12, 2021.
Eastern Newt	<i>Notophthalmus viridescens</i>	5	S5	Observed in pond (AMPH-004) – adult aquatic phase.
Amphibian egg mass (species unknown)	-	1	-	Observed in pond (AMPH-001) on April 23, 2021.
American Tree Sparrow	<i>Spizelloides arborea</i>	1	S5	Observed on April 5, 2021 – assumed migrant.
Golden-crowned Kinglet	<i>Regulus satrapa</i>	2	S5	Observed on April 5, 2021 – assumed migrant.

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Common Name	Scientific Name	Number Observed	S-Rank	Location / Comments
Palm Warbler	<i>Setophaga palmarum</i>	1	S5B	Observed on May 6, 2021 – assumed migrant.
Tree Swallow	<i>Tachycineta bicolor</i>	1	S4, S5B	Observed on May 6, 2021 – assumed migrant.
Yellow-rumped Warbler	<i>Setophaga coronata</i>	1	S5B, S4N	Observed on May 6, 2021 – assumed migrant.
Merlin	<i>Falco columbarius</i>	1	S5	Observed on July 12, 2021.
Black Swallowtail	<i>Papilio polyxenes</i>	1	S5	Observed on June 10, 2021.
Easter Tiger Swallowtail	<i>Papilio glaucus</i>	2	S5	Observed on June 10, 2021.
Checkered Skipper	<i>Pyrgus communis</i>	1	S5	Observed on June 10, 2021.
Milbert's Tortoiseshell	<i>Aglais milberti</i>	1	S5	Observed on June 10, 2021.
Mourning Cloak	<i>Nymphalis antiopa</i>	1	S5	Observed on April 5, 2021.
Northern Crescent	<i>Phyciodes cocyta</i>	10+	S5	Observed on June 10, 2021, in various habitats of the subject lands.
Northern Pearly-eye	<i>Lethe anhedon</i>	1	S5	Observed on June 22, 2021.
Silvery Blue	<i>Glaucopsyche lygdamus</i>	5+	S5	Observed on June 10, 2021, in various habitats of the subject lands.
White Admiral	<i>Limenitis arthemis arthemis</i>	4	S5	Observed on June 10, 2021.
Monarch	<i>Danaus plexippus</i>	6+	S2N, S4B	Observed on multiple site visits, larvae on Milkweed and adult butterflies.
Widow Skimmer	<i>Libellula luctuosa</i>	5+	S5	Observed on June 22, 2021, in various habitats of the subject lands.

5.12 Anthropogenic Features

As stated in Section 4.9, searches for other anthropogenic features were conducted during field studies to determine evidence of wildlife use. While no wildlife use of anthropogenic features was confirmed, wildlife habitat is present on the subject lands that may provide potential reptile hibernaculum and refuge for other wildlife. The subject lands feature rural residential farm properties, with older barns and foundations and other structures. Eastern Milksnake (*Lampropeltis triangulum*) is the most likely species to be found in this type of habitat, particularly in rural southern Ontario. As per the background records review, there are records for this species in the vicinity of the subject lands, according to the ORAA (Refer to the SAR Screening Table in Appendix C). While Eastern Milksnake is no longer ranked as “at risk” under the provincial ESA, it is ranked as Special Concern under the federal SARA. Species, or habitat protection for Special Concern species, are not afforded protection under either legislation, but confirmed habitat is considered SWH.

Eastern Milksnake is a habitat generalist and is difficult to detect due to its nocturnal habits and preference for remaining underground, or under cover most of the time. On rural properties, it is most often found in or near farm outbuildings, barns, and sheds, and is attracted to places that offer shelter to the snakes and their food source (rodents). Suitable hibernacula on rural properties include rodent burrows, rock or soil crevices, old wells and root cellars, house foundations and crawl spaces, and crumbling old house or barn foundations.

As discussed in Section 2.4 of this report, the PPS requires that it must be demonstrated that there will be no negative impacts on natural features or their ecological functions, if development or site alteration is proposed. SWH is discussed further in Section 6.5 of this report. Given these candidate natural features are within the development limits of the subject lands and will be removed, mitigation measures are proposed to help offset any long-term negative impacts to the species or its habitat, impact, and mitigation measures to offset possible habitat removal are discussed in Section 10.0.

6.0 Identification of Provincially Significant Features

6.1 Provincially Significant Wetlands

Section 6.0 of the PPS (MMAH, 2020) defines significant wetlands as “*an area identified as provincially significant by the Ministry of Natural Resources using evaluation procedures established by the province, as amended from time to time.*”

The West Credit River PSW Complex consists of an amalgamation of several wetland features in the mid 1990’s. Three portions of the West Credit River PSW Complex are present on the subject lands: 1) A large area of White Cedar Hardwood Organic Mixed Swamp (SWMO1-1) internal to the woodlands of the NHS, at the southwest portion of

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the site; 2) A small area of Green Ash Mineral Deciduous Swamp (SWDM2-2) and Red Osier Dogwood Mineral Thicket Swamp (SWTM2-1), along the central eastern limit of the site; and 3) a pond and adjacent Mineral Deciduous Swamp (SWDM4), in the northeast portion of the site. Other unevaluated wetlands exist on the subject lands, which are discussed below.

The West Credit River PSW Complex was initially evaluated in 1994 and the file has been regularly added over time. Data for the wetland file is not compiled all in one place and therefore information provided by MNRF did not provide detailed information into the specific units present on the subject lands, but rather the PSW complex as a whole. A feature staking with MNRF was not possible due to the COVID-19 Pandemic restrictions. As such, wetland boundaries were staked by two OWES trained wetland evaluators (Lorraine Adderley, Burnside; Sarah Labrie, CVC) on July 5 and 19, 2021, to confirm PSW and other wetland limits.

Additional MNRF Unevaluated Wetlands, and previously undescribed wetlands also exist on the subject lands. Wetlands located off-site, and the PSW unit contained in the NHS woodland in the southwest were not site verified, staked, or surveyed. Following investigations, a recommendation is made as to whether to include each wetland unit in the PSW.

According to Burnside's ELC surveys completed in 2021, there are ten wetland ELC communities to be considered for the wetland complex located on the subject lands (Figure 7 and Table 19):

- Mineral Deciduous Swamp (SWDM4) (S1).
- Panicked Aster Mineral Meadow Marsh (MAMM2-2) (M1).
- Reed-canary Grass Graminoid Mineral Meadow Marsh Type (MAMM1-3) (M2).
- Aquatic (AQ) (M3).
- Willow Mineral Deciduous Swamp (SWDM4-1) (S2).
- Red-osier Dogwood Mineral Deciduous Thicket Swamp (SWTM2-1) (S3).
- Green Ash Mineral Deciduous Swamp (SWDM2-2) (S4).
- Pondweed Submerged Shallow Aquatic (SAS_1-1) (M4).
- Poplar Mineral Deciduous Swamp (SWDM4-5) (S5).
- White Cedar – Hardwood Organic Mixed Swamp (SWMO1-1) (S6).

The OWES for Southern Ontario describes wetland complexes as wetlands that are commonly related functionally. Not all wetlands that occur in proximity should be considered part of a complex; it depends on the combination of functional circumstances. The decision process for these units is outlined below in Table 20. Updated wetland boundaries were sent to MNRF following the feature staking (Darren Unger, Management Biologist, Guelph District). On May 18, 2022, Darren Unger (MNRF Management Biologist) confirmed that the updates to the PSW Complex wetland boundaries had been approved and would be updated in LIO. See Appendix B.

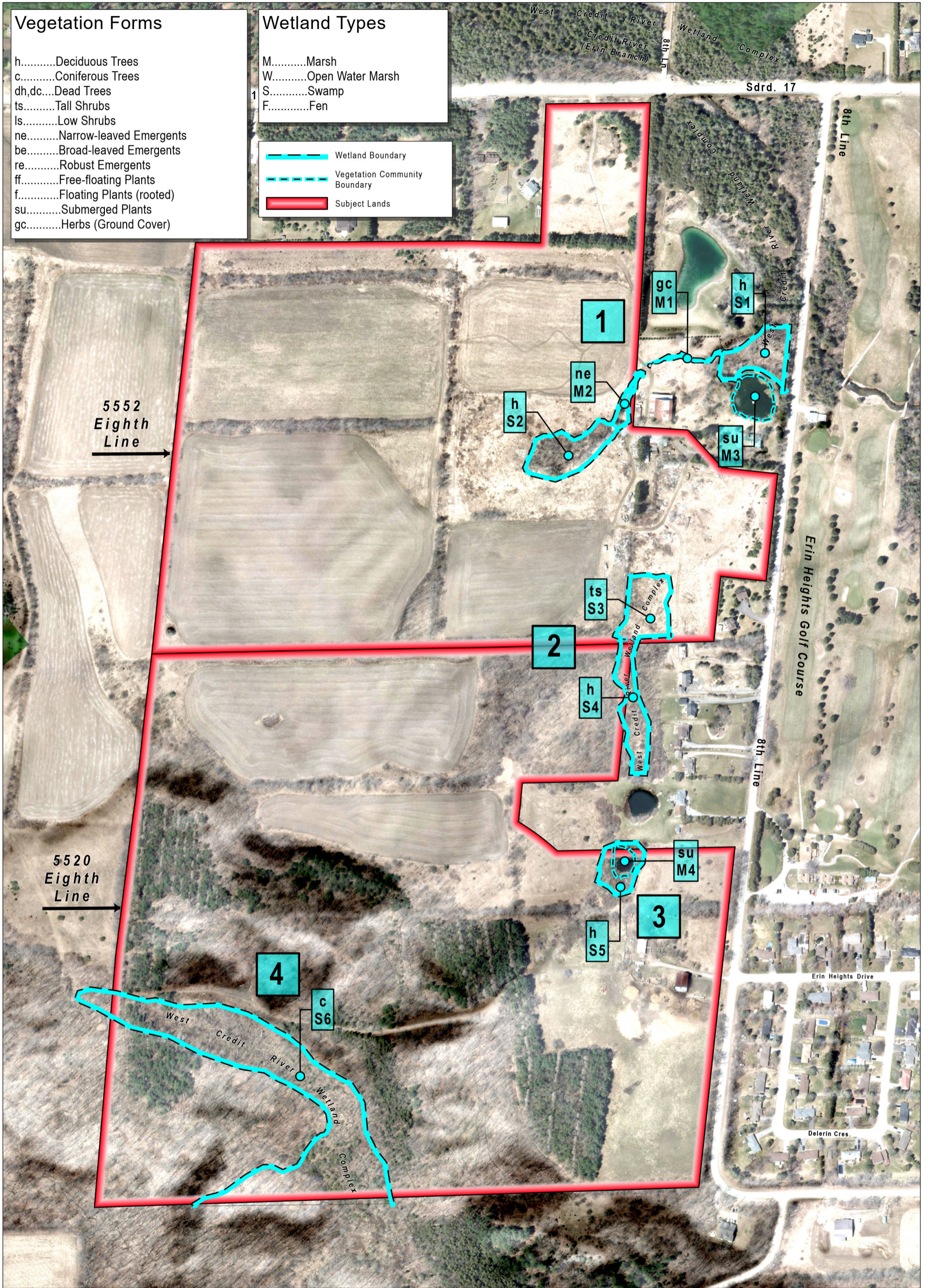
Vegetation Forms

- h.....Deciduous Trees
- c.....Coniferous Trees
- dh,dc....Dead Trees
- ts.....Tall Shrubs
- ls.....Low Shrubs
- ne.....Narrow-leaved Emergents
- be.....Broad-leaved Emergents
- re.....Robust Emergents
- ff.....Free-floating Plants
- f.....Floating Plants (rooted)
- su.....Submerged Plants
- gc.....Herbs (Ground Cover)

Wetland Types

- M.....Marsh
- W.....Open Water Marsh
- S.....Swamp
- F.....Fen

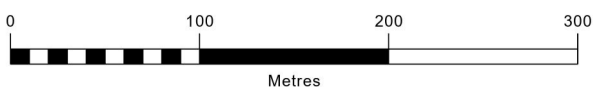
- Wetland Boundary
- Vegetation Community Boundary
- Subject Lands



Datum: North American 1983 CSRS
 Coord. System: NAD 1983 CSRS UTM Zone 17N
 Projection: Transverse Mercator
 Central Meridian: 81°0'0.00"W
 False Easting: 500,000m False Northing: 0m
 Page Orientation: -51° Scale Factor: 0.99960



Grid North



Client
**MATTAMY (ERIN) LIMITED
 AND 2779181 ONTARIO INC.**

Map Title

LANGEN PROPERTY EIS
OWES VEGETATION COMMUNITIES

Drawn	Checked	Date	Figure No. 7
PS	LA	2023/10/13	
Scale	Project No. 300052075		

H 1:4,000

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Table 19: Wetland Vegetation Communities for PSW Consideration

Wetland #	Map Code	Vegetation Forms	Dominant Species	Include in PSW?
1	hS1	h*, c, ts, re, ne, gc,	h, <i>Fraxinus pennsylvanica</i> , <i>Acer negundo</i> ; c, <i>Larix laricina</i> ; ts, <i>Cornus sericea</i> , <i>Salix discolor</i> ; re, <i>Scirpus atrovirens</i> , <i>Typha angustifolia</i> ; ne, <i>Carex</i> spp.; gc, <i>Equisetum arvense</i> , <i>Impatiens capensis</i> , <i>Circaea lutiana</i> .	Yes
	gcM1	ts, gc*, re, ne	ts, <i>Cornus sericea</i> ; gc, <i>Symphyotrichum lanceolatum</i> , <i>Impatiens capensis</i> , <i>Equisetum arvense</i> ; re, <i>Scirpus atrovirens</i> ; ne, <i>Phalaris arundinacea</i> , <i>Juncus effusus</i> .	Yes
	neM2	h, ts, gc, re ne*	h, <i>Acer negundo</i> , <i>Salix alba</i> ; ts, <i>Cornus sericea</i> ; gc, <i>Equisetum arvense</i> , <i>Eutrochium maculatum</i> , <i>Solidago canadensis</i> , <i>Symphyotrichum puniceum</i> ; re, <i>Scirpus atrovirens</i> , <i>Typha angustifolia</i> ; ne, <i>Phalaris arundinacea</i> .	Yes
	suM3	re, su*	re, <i>Typha angustifolia</i> ; su, <i>Potamogeton</i> spp.	Yes
	hS2	h*, ts, gc, re, ne	h, <i>Salix alba</i> , <i>Salix euxina</i> ; ts, <i>Acer negundo</i> , <i>Populus balsamifera</i> , <i>Populus tremuloides</i> , <i>Cornus sericea</i> , <i>Salix eriocephala</i> , <i>Salix bebbiana</i> ; gc, <i>Equisetum arvense</i> , <i>Impatiens capensis</i> , <i>Eutrochium maculatum</i> , <i>Solidago canadensis</i> , <i>Symphyotrichum puniceum</i> , <i>Symphyotrichum lanceolatum</i> ; re, <i>Scirpus atrovirens</i> , <i>Scirpus pendulus</i> , <i>Phragmites australis</i>	Yes

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Wetland #	Map Code	Vegetation Forms	Dominant Species	Include in PSW?
			subsp. <i>australis</i> ; ne, <i>Phalaris arundinacea</i> , <i>Carex flava</i> , <i>Juncus effusus</i> , <i>Juncus alpinoarticulatus</i> .	
2	tsS3	ts*, gc, re, ne	ts, <i>Cornus sericea</i> , <i>Salix alba</i> , <i>Salix petiolaris</i> ; gc, <i>Vicia cracca</i> , <i>Symphotrichum puniceum</i> , <i>Eutrochium maculatum</i> ; re, <i>Scirpus atrovirens</i> , <i>Scirpus pendulus</i> ; ne, <i>Agrostis gigantea</i> , <i>Festuca arundinacea</i> , <i>Carex hystercina</i> , <i>Carex aurea</i>	Yes
	hS4	h*, ts, ls, gc, re, ne	h, <i>Fraxinus pennsylvanica</i> , <i>Populus tremuloides</i> , <i>Ulmus americana</i> ; ts, <i>Cornus sericea</i> , <i>Cornus obliqua</i> , <i>Rhamnus cathartica</i> , <i>Rubus allegheniensis</i> ; ls, <i>Rubus pubescens</i> , <i>Parthenocissus vitacea</i> ; gc, <i>Solidago canadensis</i> , <i>Solidago rugosa</i> , <i>Geum aleppicum</i> , <i>Onoclea sensibilis</i> ; re, <i>Scirpus atrovirens</i> ; ne, <i>Carex gracillima</i> , <i>Carex echinata</i>	Yes
3	suM4	Su*	su, <i>Potamogeton</i> sp.	No
	hS5	h*, c, ts, gc, re	h, <i>Populus balsamifera</i> , <i>Fraxinus pennsylvanica</i> , <i>Salix alba</i> , <i>Acer saccharinum</i> ; c, <i>Larix laricina</i> ; ts, <i>Cornus sericea</i> , <i>Vitis riparia</i> ; gc, <i>Solidago canadensis</i> , <i>Equisetum arvense</i> , <i>Lycopus uniflorus</i> ; re, <i>Typha angustifolia</i>	No
4	cS6	h, c*	(Not field verified. PSW veg community map not available from MNRF)	Yes

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Wetland #	Map Code	Vegetation Forms	Dominant Species	Include in PSW?
			h, hardwood species unknown; c, <i>Thuja occidentalis</i>	

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Table 20: PSW Complex Decision Rationale

Map Code	Currently PSW?	Within Same Watershed as PSW?	Within 750 m of PSW?	Part of a Lacustrine Wetland?	Hydrologically or Hydrogeologically Connected to PSW?	Unit is >2 ha?	Include in PSW?
hS1	Yes	Yes	Yes	No	Yes	Yes, is a part of a larger 2.7 ha unit that continues off site.	Yes
gcM1	No	Yes	Yes	No	Yes	No. 0.05 ha.	Yes
neM2	No	Yes	Yes	No	Yes	No. 0.05 ha.	Yes
suM3	Yes	Yes	Yes	No	Yes	Yes, is a part of a larger 2.7 ha unit that continues off site.	Yes
hS2	No	Yes	Yes	No	Yes	No. 0.36 ha.	Yes
tsS3	Yes	Yes	Yes	No	Unknown	No. With hS4 unit is 0.91 ha.	Yes

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Map Code	Currently PSW?	Within Same Watershed as PSW?	Within 750 m of PSW?	Part of a Lacustrine Wetland?	Hydrologically or Hydrogeologically Connected to PSW?	Unit is >2 ha?	Include in PSW?
hS4	Yes	Yes	Yes	No	Unknown	No. With tS3 unit is 0.91 ha.	Yes
suM4	No	Yes	Yes	No	No	No. With hS5 unit is 0.28 ha.	No
hS5	No	Yes	Yes	No	No	No. With suM4 unit is 0.28 ha.	No
cS6	Yes	No (While in same overall watershed as the greater PSW, it is not in the same subwatershed that the rest of the site is).	Yes	No	Unknown	Yes	Yes

6.2 Significant Valleylands

The NHRM (MNR, 2010) provides criteria for identifying Significant Valleylands, including a variety of landform related functions and attributes as well as ecological features and functions. According to the NHRM a Significant Valleyland is defined as:

a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. Large, well-defined valleylands are often significant landscape features essential to the character of an area

Additionally, the PPS (2020) defines Significant Valleylands as:

ecologically important in terms of features, functions, representation, or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system

No Significant Valleylands are present on the subject lands. A high functioning Significant Valleyland system associated with the West Credit River (Erin Branch) is present northeast of the subject lands.

6.3 Significant Woodlands

Significant Woodlands are typically identified by the local municipality. According to the PPS (MMAH, 2020), significant woodland is defined as:

an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history

The PPS indicates that significant woodland criteria is to be identified using criteria established by MNRF; however, it is Burnside's understanding that these criteria have not yet been provided.

The County of Wellington online mapping identifies most of the central woodland and southern woodland associated with the NHS as "Significant Wooded Areas". These woodlands meet the criteria for significance based on the County's OP (2023), Section 5.4.4., where it states that in the Urban System:

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woodlands over 1 ha are considered to be significant by the County and are included in the Greenlands System. Woodlands of this size are important due to their economic, visual, and environmental contributions to the urban landscape. Detailed studies such as environmental impact assessments may be used to identify, delineate, and evaluate the significance of woodlands based on other criteria such as: proximity to watercourses, wetlands, or other woodlands; linkage functions; age of the stand or individual trees; presence of endangered or threatened species; or overall species composition. Significant woodlands will be protected from development or site alterations which would negatively impact the woodlands or their ecological functions. Smaller woodlands may also have local significance and, where practical, these smaller woodlands should be protected.

The central woodland is FODM7-2. The southern woodland is comprised of FODM6-5, FOCM6, FOCM6-1 ecosites, with a SWMO1-1 inclusion in the core of the woodland, which is part of the West Credit River PSW Complex. Both Significant Woodlands are protected as part of the NHS and receive a 10 m buffer.

Where impacts to Significant Woodlands are proposed (i.e., grading), mitigation measures have been presented in Section 10.0.

6.4 Significant Areas of Natural and Scientific Interest

According to the PPS (MMAH, 2020), ANSIs are defined as:

areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study, or education

According to the NHRM (MNR, 2010), provincially significant ANSIs include some of the most significant and best examples of these features in the province, and only include ANSIs identified as provincially significant.

No significant ANSIs are present on the subject lands, or adjacent lands.

6.5 Significant Wildlife Habitat

Determination of SWH is broadly categorized and described in the NHRM (MNR, 2010). Additionally, MNRF's SWHTG (MNR, 2000) and SWH Criteria Schedule for Ecoregion 6E (MNRF, 2015) are further supplemental documents intended to assist in identifying SWH. The four main categories of SWH are identified as:

1. Habitats of seasonal concentrations of animals.
2. Rare vegetation communities, or specialized habitat for wildlife.
3. Habitat of species of conservation concern.
4. Animal movement corridors.

Appendix D includes a screening of the various categories of SWH for the subject lands and adjacent lands, based on background records review, agency records and aerial photo interpretation as well as Burnside's field investigations for the subject lands, completed in 2020 and 2021.

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Table 21 summarizes Candidate and Confirmed SWH on the subject lands.

Table 21: Candidate and Confirmed SWH on the Subject Lands

Seasonal Concentration Areas of Animals
Candidate Raptor Wintering Area
Candidate Bat Maternity Colonies (Big Brown Bat)
Confirmed Turtle Wintering Area
Candidate Reptile Hibernaculum
Confirmed Deer Winter Congregation Areas (far northeast corner – mostly off-site)
Specialized Habitats for Wildlife Considered Significant Wildlife Habitat
Candidate Woodland Raptor Nesting Habitat
Candidate Turtle Nesting Areas
Confirmed Seeps and Springs (CVC data)
Confirmed Amphibian Breeding Habitat (Woodland)
Candidate Woodland Area-Sensitive Bird Breeding Habitat
Habitat for Species of Conservation Concern Considered Significant Wildlife Habitat
Confirmed Special Concern and Rare Wildlife Species: <ul style="list-style-type: none"> • Monarch (larvae and adult butterflies) • Eastern Wood-pewee • Wood Thrush • Barn Swallow • Snapping Turtle • Midland Painted Turtle
Animal Movement Corridors
Confirmed Amphibian Movement Corridors
Confirmed Deer Movement Corridors (far northeast corner – mostly off-site)

The majority of Candidate / Confirmed habitat on the subject lands is associated with the NHS (i.e., PSW, Significant Woodlands) and will not be directly impacted by the proposed development. Exceptions to this are:

- Candidate Bat Maternity Colonies (identified in the NHS and within the development limits),
- Candidate Reptile Hibernaculum, Special Concern and Rare Wildlife Species for Monarch and Barn Swallow; and
- Confirmed Amphibian Movement Corridors.

A dedicated wildlife tunnel that will cross under the proposed Street 'E' has been proposed as compensation for the removal of the Confirmed Amphibian Movement Corridor, south of SAS1-1 (Confirmed SWH for Amphibian Breeding Habitat (Woodland)

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and Turtle Wintering Area). This is discussed further in Section 8.0 and in DSEL's FSR (2023). SWH within the development limits will be removed; therefore, mitigation measures are proposed to help offset any long-term negative impacts to the species or its habitat. Impact and mitigation measures are discussed in Section 10.0.

6.6 Habitat of Endangered and Threatened Species

Burnside's background database review, consultation with agencies, and field investigations in 2020 and 2021 revealed the potential for species listed as Endangered or Threatened under the ESA on the subject lands and adjacent lands (Appendix C). Table 22 below, summarizes Confirmed and Candidate habitat for Endangered and Threatened species.

Table 22: Candidate and Confirmed Habitat for Endangered and Threatened Species on the Subject Lands

Habitat	Subject Lands
Confirmed Habitat Present	<ul style="list-style-type: none"> • Eastern Meadowlark • Little Brown Myotis • Northern Myotis • Eastern Small-footed Myotis • Butternut
Candidate Habitat Present	<ul style="list-style-type: none"> • Gypsy Cuckoo Bumble Bee

Where impacts to Candidate or Confirmed Habitat for Endangered and Threatened Species are proposed, mitigation measures have been presented in Section 10.0. Each of the Confirmed SAR species on the subject lands are described below, including implications under the ESA.

6.6.1 Eastern Meadowlark

Bobolink was not recorded on the subject lands. One Eastern Meadowlark was recorded on the second breeding bird survey on June 10, 2021. This individual was recorded singing from the field located immediately east of S7 (wooden barn and lean-to), at the southeast end of the subject lands. Tall grasses are present in this area, making it a potentially suitable breeding habitat for this species, but the parcel is small. The surrounding fields are heavily grazed and trampled by the horses and had also been recently disturbed by farming practices at the time of the sighting (i.e., overturned soil from tilling).

According to the Bobolink and Eastern Meadowlark in Ontario Recovery Strategy (McCracken et al., 2013), it is recommended that the level of evidence needed to establish breeding occupancy be "probable" or "confirmed" breeding, according to the Ontario Breeding Bird Atlas (Cadman et al., 2007), and has been confirmed to breed or

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probably has bred during the current or previous three years. The breeding evidence code for this individual recorded in 2021 was “possible” (singing male). Considering this individual was only recorded once on the subject lands during the active window with a “possible” breeding evidence code, it is not considered viable breeding habitat. There is a golf course immediately east of the site (sometimes used by grassland birds) and there are other rural properties with pasture fields located in the general vicinity. Given the date of the observation, it is possible that farms in the vicinity with pasture fields (hay) had recently been cut and that this was a transient male that had been displaced from his breeding site. This is a common occurrence in Southern Ontario, where many farmers cut hay at least three times during the growing season and inevitably overlap with this species peak breeding season². Additionally, a large tract of grassland habitat (i.e., not farmed) is present on neighbouring lands, at the southwest corner of the subject lands adjacent to the NHS, that would provide viable breeding habitat for grassland birds. Therefore, no further action is required under the ESA.

6.6.2 Butternut

Naturally occurring Butternut trees of any size and age are protected under the ESA due to widespread infection with Butternut Canker, a fungal disease that typically results in tree mortality. Hybrid trees that have a Butternut ancestor are not currently protected under the ESA. Sometimes visual characteristics can indicate whether a tree is a hybrid, but any Butternut like tree that is proposed for removal should be assessed by a Butternut Health Assessor. By law, what you can do with a Butternut tree depends on its health.

General habitat for Butternut includes suitable areas within a 50 m radius, centered on the trunk, or stem, of each Butternut tree in Ontario (regardless of its size). Butternut trees are divided into three categories:

Category 1 – In the advanced stages of disease because of butternut canker (“non retainable”) and its habitat is 25 m from the trunk, or stem, and includes the immediate habitat conditions surrounding the tree that support the growth and persistence of the tree over its lifetime.

Category 2 – The tree does not have butternut canker, or disease is not as advanced (“retainable”), and its habitat is 25 m to 50 m from the trunk or stem and includes the surrounding habitat conditions, supporting the core nut dispersal and seedling establishment areas up to 50 m from a parent tree.

² Early haying in Southern Ontario occurs from mid-May to about June 10th; middle haying from about June 10th to the first few days of July (weather dependent); late haying from early July onwards (Source: Farming with Grassland Birds: A Guide to Making Your Hay and Pasture Bird-Friendly, Jack Kyle and Ronald Reid, 2016)

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Category 3 – Could be useful in determining how to prevent or resist butternut canker (“archivable”). In 2016, AWS Environmental conducted ELC and vegetation surveys on the subject lands. During these surveys, three Butternut trees were identified within a hedgerow at the north end of the subject lands. A Butternut Health Assessment (BHA) was conducted on June 15, 2020, by Stewart Gibson, BHA #703. Two of the Butternut trees were determined to be Category 1 (non-retainable) and one was determined to be Category 2 (retainable). No hybrid trees were found.

A BHA report # 703-020 was prepared by Stewart Gibson, BHA #703, and submitted on January 27, 2022, to MECP via email. A copy of the BHA can be found in Appendix I. Following the mandatory 30-day waiting period, the Category 2 Butternut was registered under the former O. Reg. 242/08 for removal on March 11, 2022, via a Notice of Butternut Impact submitted through the ONe-Key provincial registry. Confirmation of Registration (ID # M102-8468359351) was received on March 11th, 2022. A copy of the Confirmation of Registration can be found in Appendix I. The Category 1 Butternut and their habitat are no longer protected as of February 27, 2022.

6.6.3 Bats

Since 2013, the four bat species listed above have been listed as Endangered under the ESA due to rapid declining population sizes, caused by White-nose Syndrome (WNS). Under the ESA, SAR bats and their general habitat are protected. This protection includes maternity roosting habitat used by SAR bat species to raise their young during spring and summer seasons.

In April and June 2021, Burnside ecologists completed leaf-off and leaf-on surveys in the forested communities to identify potential maternity roosting habitat for SAR bats. Based on those results, Burnside ecologists conducted acoustic monitoring surveys, in June 2021, to determine presence of SAR bats within the subject lands. Eastern Small-footed Myotis, Little Brown Myotis and Northern Myotis were detected at the acoustic monitoring stations. Only Little Brown Myotis was confirmed during the barn exit surveys.

Three of Ontario’s four SAR bat species were verified on the subject lands through acoustic monitoring: Little Brown Myotis (4.46% of all calls), Eastern Small-footed Myotis (1.27% of all calls) and Northern Myotis (0.05% of call calls). Seven call events were initially detected as Tri-colored Bat, however, analysis with Kaleidoscope Pro v. 4.3.2 software determined there was a high probability of a false positive. As such, they are not considered present on the subject lands.

Big Brown Bat, and Little Brown Myotis were detected during both exit surveys, with high confidence, and are therefore likely roosting within structures S4 and S5.

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High quality bat habitat is present in the NHS on the subject lands and adjacent lands. It is difficult to determine if SAR bat calls detected on the subject lands are from bats roosting in the NHS and foraging in fields close to the acoustic monitors, or from bats roosting in the identified snags on the subject lands. Since individual snags cannot be confirmed as roosting sites, all leaf-off candidate trees are considered confirmed habitat for Northern Myotis and Little Brown Myotis.

The summer activities of Eastern Small-footed Myotis are poorly understood, and as such, the impacts to this species are difficult to determine. Research suggests that they may roost in rocky substrate and sometimes old buildings. Exit surveys of the structures on the property did not detect Eastern Small-foot Myotis, so it is assumed they may be roosting at rocky sites, within or near, the subject lands. Most Eastern Small-footed Myotis activity was recorded at and between Stations D, E and H. One large rock pile, next to Station D, has been identified as a possible maternity roosting site. It is located along the edge of the NHS and will not be removed, or damaged, during construction. Additionally, the 10 m buffer around the NHS will protect it from indirect impacts and potential future impacts from residents of the new subdivision.

An old drainage feature, with exposed rocks and scrap lumber, was found in the Mineral Cultural Woodland (CUW1) ecosite near Station E. It is possible that Eastern Small-footed Myotis are roosting within these substrates. This ecosite will be removed during development and will require compensation. Station H was located 50 m within the southern NHS. No development or activities will occur here. As such, any maternity roosting site in this location will not be impacted.

An Information Gathering From (IGF) detailing the findings from bat surveys was submitted to MECP on March 4, 2022. A response was received March 21, 2022, requesting an Alternatives Avoidance Form (AAF). The AAF was submitted to MECP on April 14, 2022. On May 17, 2022, MECP requested an Application for an Overall Benefit Permit (OBP) under clause 17(2)(c) of the ESA form (C-PAF).

Burnside has worked extensively with MECP to develop the conditions of the OBP – mitigation, overall benefit action and monitoring.

Mitigation measures include:

- Clearing rock features between December 1 and March 14, outside the Eastern Small-footed Myotis active window.
- Building a man-made rock roost to replace removed rocky habitat.
- A planting of 50 native thorny shrubs to protect a retained rock roost from local residents.
- Clearing trees between October 1 and March 31, outside the Little Brown Myotis active window.
- Six rocket style bat boxes to replace snag trees to be removed.

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- Fencing around area of disturbance to prevent unintentional harm to retained roost trees in the NHS.
- Implementing International Dark-Sky Association guidelines for lighting on the subject lands.
- A training pamphlet will be given to staff working on site to inform them of SAR bats and what to do if they encounter them.

Overall benefit actions include:

- Woodland planting the size of 1,395 m² with native trees.
- Six cavities carved into standing trees on the subject lands.
- An additional man-made rock roost to be built in the NHS.
- Disseminate findings to the broader community of bat researchers in Ontario.

An extensive monitoring plan has been developed to ensure rock roosts are not overheating and are being used as habitat by SAR bats. Monitoring will continue for five years after the habitat features are installed, with annual updates to MECP. A copy of the permit will be circulated once it has been drafted and signed by the Minister.

7.0 Delineation of Environmental Constraints

Based on the background review, field investigations and agency consultation, there are several environmental constraints that must be taken into consideration for the proposed development. Figure 8 shows the environmental constraints and opportunities used to determine buffers and a suitable limit of development. These include:

- Staking of woodland limit.
- Staking of identified wetlands.

Per CVC's WPRP (2010), the following buffers have been applied to natural heritage features:

- 10 m from the drip line of Significant Woodlands.
- 10 m from the limit of other (unevaluated) wetlands.
- 30 m from the limit of PSWs.

As described in Section 6.1, updated PSW boundaries were applied to the West Credit River PSW Complex located on the subject lands. On May 18, 2022, Darren Unger (MNR Management Biologist) confirmed that the updates to the PSW Complex wetland boundaries had been approved and will be updated in LIO. See Appendix B.

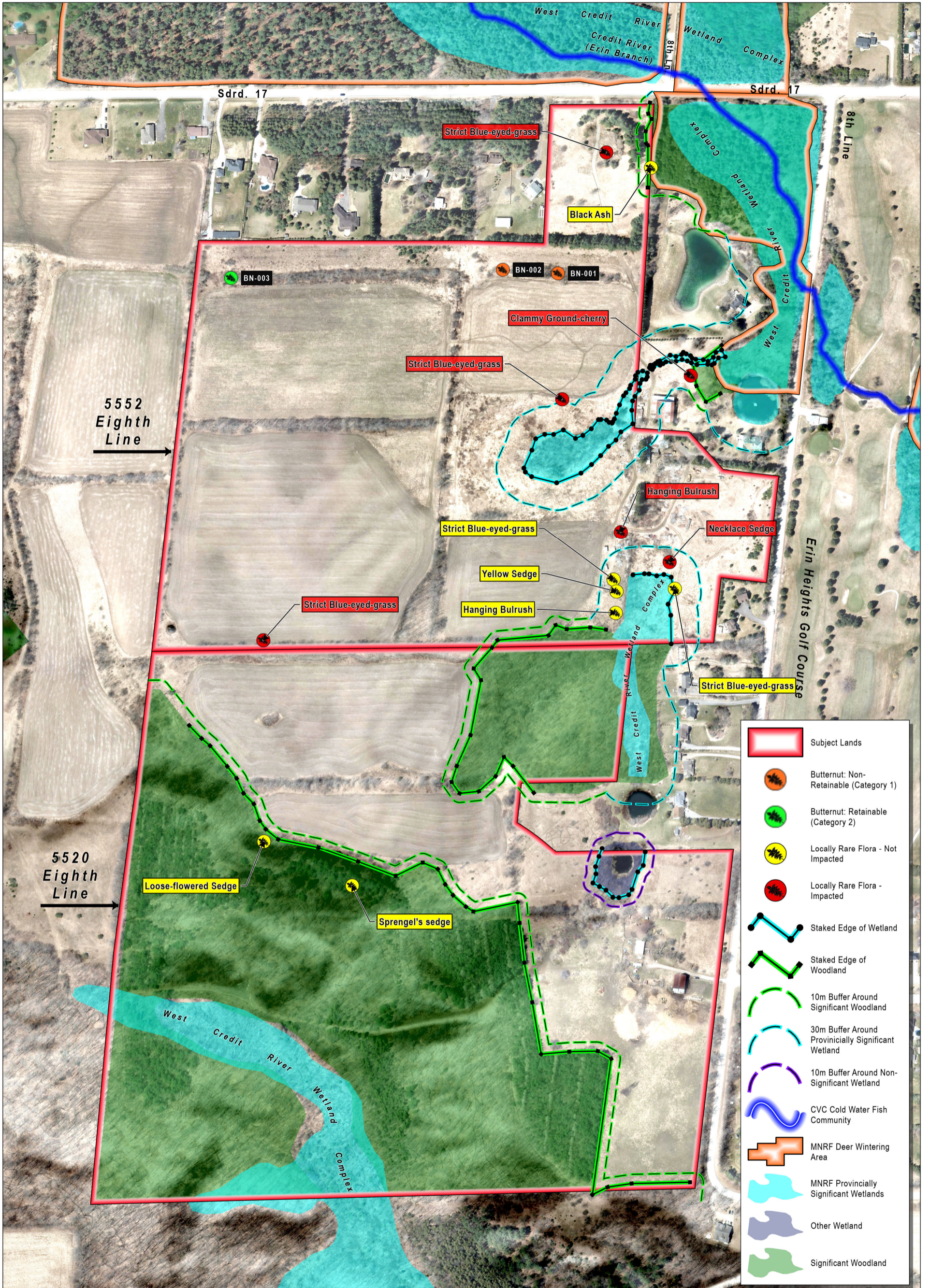
8.0 Natural Heritage System Linkages and Corridors
















CVC has published several documents that emphasize a NHS's approach to watershed planning, as it relates to the NHS and the maintenance of linkages and corridors for wildlife in the context of land development and infrastructure; these include:

- Watershed Planning & Regulation Policies (2010).
- Natural Heritage System Strategy (2015) and supporting documents.
- Fish and Wildlife Crossing Guidelines (2017).

Figure 9 depicts potential NHS linkages and corridors on the subject lands and adjacent lands. There are two main areas of wildlife linkage enhancement opportunities between NHS features on the subject lands. At the north end of the site, a linkage will be maintained between the northern PSW Complex and the central woodland / PSW features, through the proposed development plan, where the SWM pond and park are located. Currently, vegetation conditions in the location of the "linkage" between these two features is very degraded and contains old trailers and farm equipment / materials (barriers to safe wildlife passage).

The construction of the pond and park represents a significant "enhancement" to current conditions and will ensure that a vegetated linkage between the two features will be maintained (as opposed to residential lots, for example). Landscape plans will be provided during the detailed design stage that will enhance these features through native plantings and seed mixes and will outline the species, size, quantity, and arrangement. Both trees and shrubs will be planted to provide native plant cover at varying heights, which will provide cover for a variety of wildlife. Graded areas will be seeded with a native seed mix that contains grasses and wildflowers. Milkweed, the larval host plant for Monarch, should be included in all seed mixes where applicable to enhance Monarch breeding habitat on the subject lands. SWM ponds will be designed to meet the Municipal Design Criteria and MECP's criteria. Connectivity between the ponds and natural habitats can be enhanced by vegetation management and by following CVC's SWM Guideline (updated July 2022), SWM Planting Guidelines (2014) and Plant Selection Guideline (2018).



-  Subject Lands
-  Butternut: Non-Retainable (Category 1)
-  Butternut: Retainable (Category 2)
-  Locally Rare Flora - Not Impacted
-  Locally Rare Flora - Impacted
-  Staked Edge of Wetland
-  Staked Edge of Woodland
-  10m Buffer Around Significant Woodland
-  30m Buffer Around Provincially Significant Wetland
-  10m Buffer Around Non-Significant Wetland
-  CVC Cold Water Fish Community
-  MNRF Deer Wintering Area
-  MNRF Provincially Significant Wetlands
-  Other Wetland
-  Significant Woodland

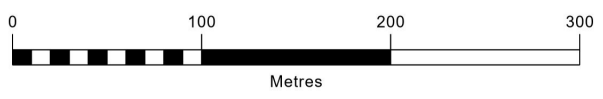
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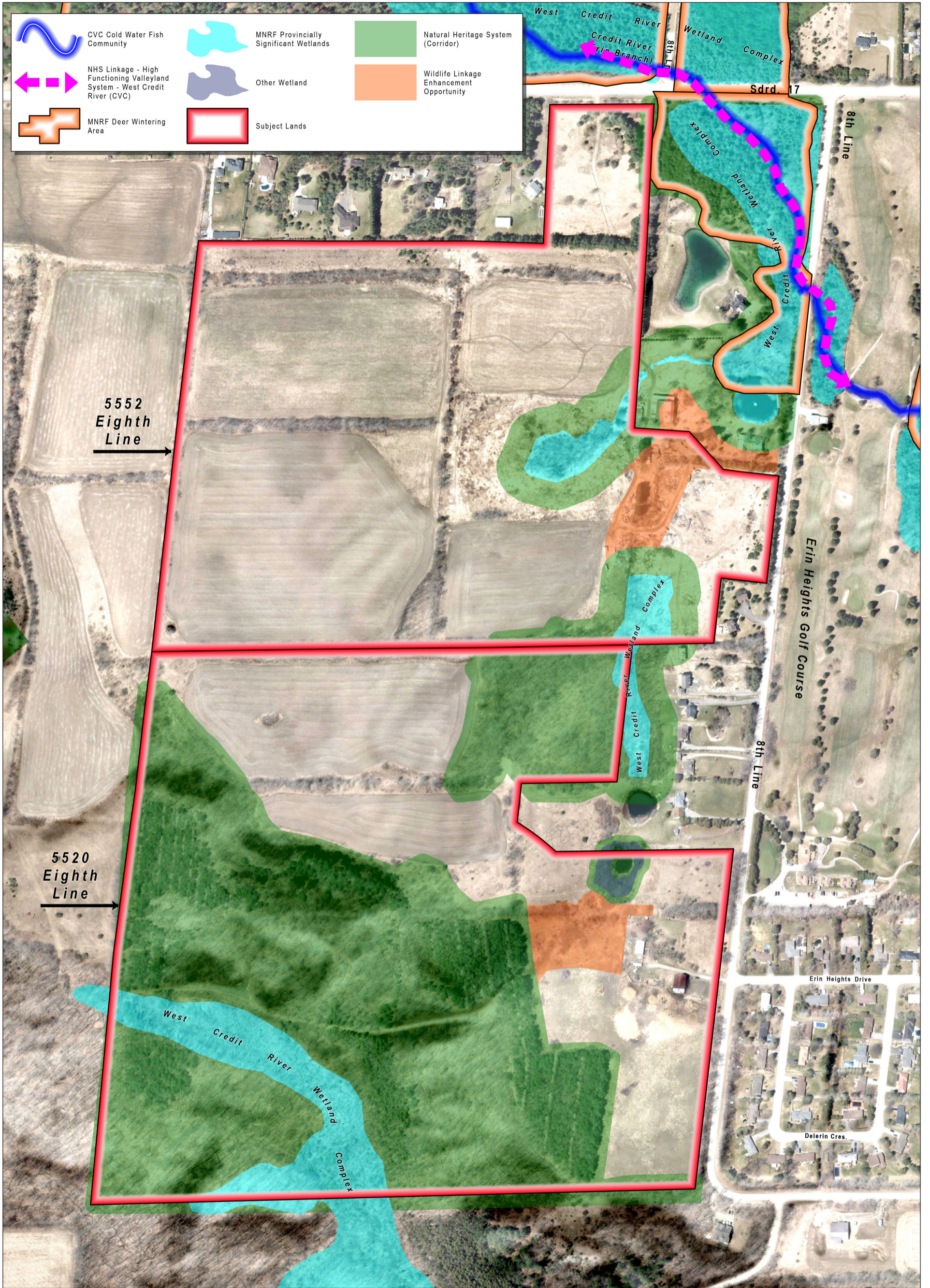


Map Title
LANGEN PROPERTY EIS
 ENVIRONMENTAL CONSTRAINTS

Client
MATTAMY (ERIN) LIMITED
AND 2779181 ONTARIO INC.

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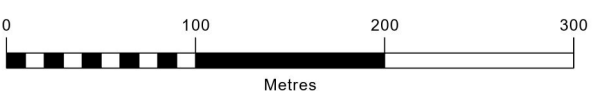


	CVC Cold Water Fish Community		MNRF Provincially Significant Wetlands		Natural Heritage System (Corridor)
	NHS Linkage - High Functioning Valleyland System - West Credit River (CVC)		Other Wetland		Wildlife Linkage Enhancement Opportunity
	MNRF Deer Wintering Area		Subject Lands		

Datum: North American 1983 CSRS
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Grid North



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Map Title
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**NHS CORRIDORS
 AND LINKAGES**

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During the TOR phase, CVC indicated areas of linkage between the southern and central woodlands/wetlands (NHS) that represent an enhancement opportunity: “the diversity and connectivity of natural heritage features on the subject lands should be maintained, restored, and enhanced. Opportunities to retain and enhance these linkages should be demonstrated.” As shown in Figure 9, the TAGM5 community provides natural cover and linkage between the wetland feature (SAS1-1) and the woodland in the NHS to the south and is considered SWH (Amphibian Movement Corridor). SAS1-1 is confirmed SWH for Amphibian Breeding Habitat (Woodland) and Turtle Wintering Area.

Two access roads are required for the residential community: one on the north side on Sideroad 17 and one on the east side, on Eighth Line. TAGM5 will be removed to accommodate the access road on Eighth Line. CVC’s Fish and Wildlife Crossing Guidelines (2017) and MNRF’s Best Management Practices for Reptile and Amphibian Crossings (2016) provide guidance on design specifications for target species. Based on the results of the field investigations, the target species at the site that are most likely to utilize the wildlife tunnel at this location are frogs / toads, salamanders, and turtles.

An openness ratio (OR) is the calculated sum of the cross-sectional area (opening) divided by the length of the culvert, or crossing (i.e., wildlife travel distance under or through the structure). According to the agency guidelines cited above, the recommended OR, and dimensions for targeted amphibian and reptile crossings, should be greater than or equal to 0.1 (but no less than 0.07). The CVC guideline states that the tunnel should be ideally less than 25 m. Additionally, while CVC provides recommended OR for wildlife tunnels, MNRF guideline states that the use of or as a sole measure to inform road mitigation design should be used with caution, especially for amphibians and reptiles.

Given the challenging existing grades in this location, DSEL and Burnside completed a detailed review of the design options for a wildlife tunnel in this location. It was determined that a slotted, at-grade wildlife tunnel, equipped with headwalls to direct migrating animals through the tunnel, is the best option in this location to provide the required connectivity for passage of amphibians and reptiles. Drawing 6 of the FSR (2023) illustrates the location of the wildlife passage on Street ‘E’, with a cross-section through the tunnel provided in Drawing 7.

With this design, keeping the length of the culvert as short as possible can be achieved (approximately 20 m long). The design iteration was based on the ACO slotted wildlife tunnel. The cross-section of the tunnel opening is approximately 0.3 m x 0.5 m, resulting in an OR <0.7. This design is also ideal for allowing more consistent ambient conditions inside the tunnel, including moisture, light, and temperature. Per the FSR (2023), the tunnel is proposed at grade, except through the north boulevard. A slotted, at-grade tunnel through the north boulevard is not possible as it would require reverse grading the boulevard and would result in sending uncontrolled drainage to the NHS. Details of the

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ACO tunnel design are found in Appendix K of the FSR and will be further refined at detailed design.

While several locations in this area were considered, the tunnel was ultimately shifted to its current location on Street 'E' to accommodate the slotted, shorter tunnel design, while maintaining a direct linkage to the NHS and minimizing the length of the retaining walls. The Open Space Block will contain the tunnel and will be 15 m wide and is considered adequate for amphibians using this corridor as a travel lane for food, nesting, or escape cover. This location is most suitable to minimize crossing length and retaining walls.

In addition to maintaining linkages on the subject lands, it should be noted that significant NHS linkages and corridors are present on adjacent lands that will be maintained. There is an NHS linkage associated with the High Functioning Valleyland System (West Credit River and PSW Complex); this location has also been identified by MNRF as a Deer Wintering Area (Figure 9).

9.0 Proposed Development

The proposed development plan is detailed in DSEL's FSR (2023). The following sections summarize the plan as it relates to impacts on the NHS.

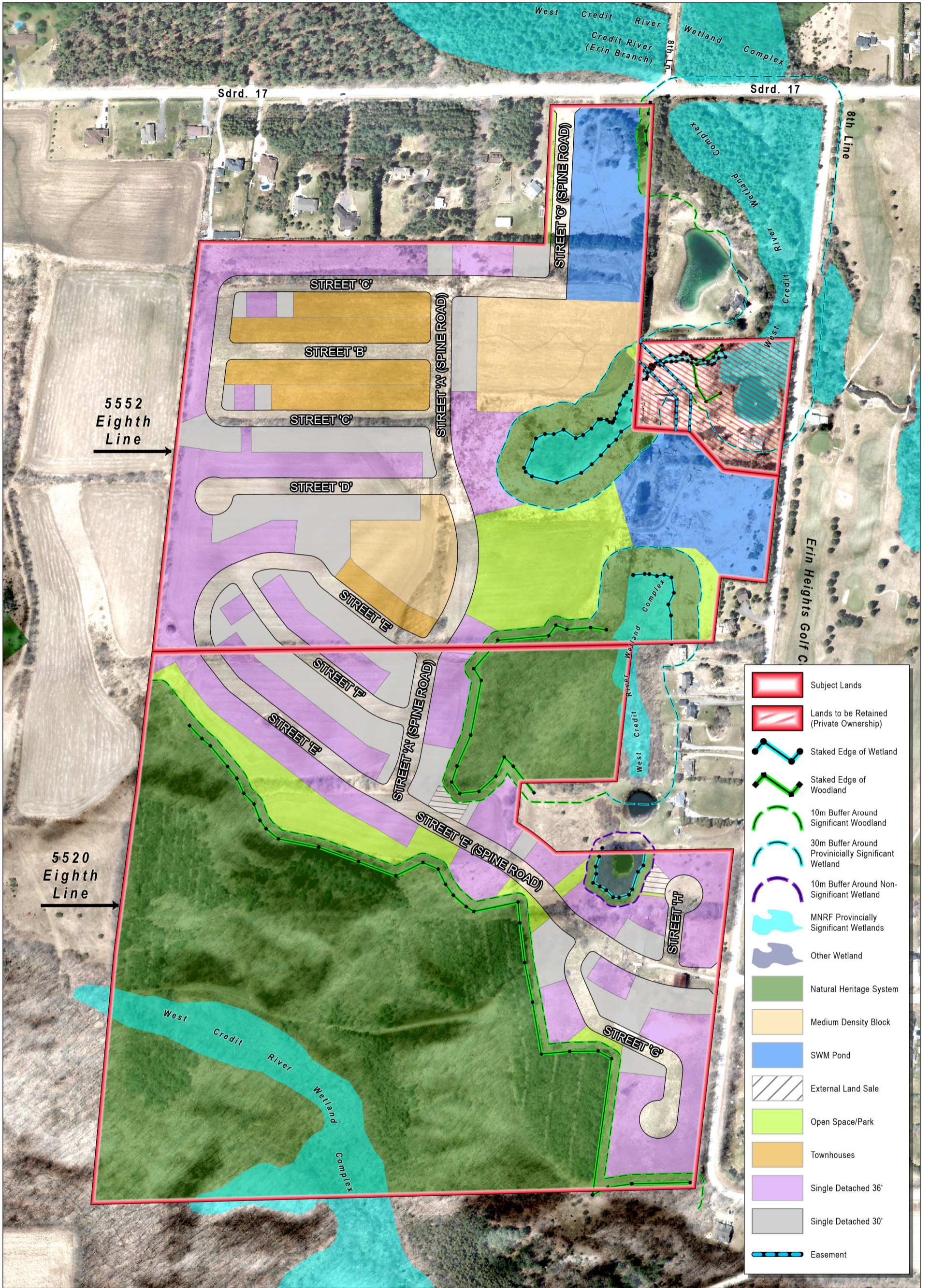
9.1 Concept Plan

Korsiak Urban Planning has developed a Preliminary Composite Lotted Plan (September 2023), and a Draft Plan of Subdivision for 5520 Eighth Line (September 27, 2023) and 5552 Eighth Line (September 29, 2023). The development on the subject lands is generally proposed outside the designated environmental features and buffers. These constraints are shown in Figure 8 and overlain on the proposed Draft Plan in Figure 10.

The development consists of the following land use types:

- Planned residential lots (single detached, townhouses and medium density blocks).
- Internal residential road network.
- Neighbourhood Park.
- Open Space Blocks.
- SWM Ponds (2).
- Natural Heritage System.

A portion of the original study area limits are now designated as "Lands to be Retained" and will continue to be used as a principal residence for the landowner on this parcel. The existing house and barns/sheds in this parcel will remain.



- Subject Lands
- Lands to be Retained (Private Ownership)
- Staked Edge of Wetland
- Staked Edge of Woodland
- 10m Buffer Around Significant Woodland
- 30m Buffer Around Provincially Significant Wetland
- 10m Buffer Around Non-Significant Wetland
- MNRF Provincially Significant Wetlands
- Other Wetland
- Natural Heritage System
- Medium Density Block
- SWM Pond
- External Land Sale
- Open Space/Park
- Townhouses
- Single Detached 36'
- Single Detached 30'
- Easement

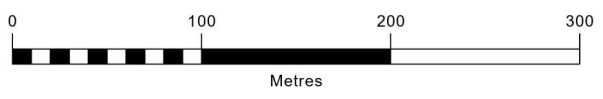
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Map Title
LANGEN PROPERTY EIS
PROPOSED DEVELOPMENT PLAN

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9.2 Preliminary Grading

A preliminary grading plan has been prepared for the subject lands. The site is generally constrained by the steep existing grades within the subject lands and the boundary elevations at the interface with the NHS, existing residential lots, agricultural lands to the west, Eighth Line and Sideroad 17. The conceptual grading plan is depicted in Drawing 6 of the FSR (2023).

Grading is limited within the natural heritage features and has been minimized to only what is required to facilitate the proposed development; however, there are specific locations where encroachments are proposed to meet the challenging existing grades. At the north end of the site, encroachments up to 15 m into the 30 m buffer of SWDM4-1 (PSW) are necessary along the western edge of the buffer. Encroachments, to a lesser extent, are also required along the northern edge of the SWDM4-1/MAMM1-3 (PSW) buffer. Encroachments up to 15 m into the 30 m buffer of SWTM2-1 (PSW) are necessary along the northern edge of the buffer.

There will be a 15 m wide sanitary easement crossing the NHS at the narrow union between MAMM1-3 and MAMM2-2 (PSW) ecosites. The sanitary sewer installation is proposed to be completed via open cut construction. The sanitary alignment will generally follow the existing laneway, through the NHS, to minimize impacts to the area as much as possible. During the detailed design stage, a native seed mix and rehabilitation plan will be prepared for the area impacted by the open cut. Hydrologic connectivity between the wetland units will be restored to existing conditions. See Section 0 for more details.

At the south end of the site, west of Street 'G' and 'E', challenging existing grades require minor encroachments into the woodland (NHS) buffer in five locations (see Drawing 6 of the FSR). Two of these localized areas will reach, but not encroach into the dripline. No encroachments past the dripline are currently proposed.

The maximum slope within the buffers will be 3:1 and only where necessary 2:1. It is important to note that while the grading is permanent, the impacts are temporary and will be an improvement from existing conditions where the land has been historically disturbed due to intensive farming practices and is significantly degraded. Therefore, no long-term net effects are anticipated; the restoration of the buffers in these locations represents a net benefit and will be enhanced with a native seed mix and conveyed into public use. The buffers will not to be incorporated into the back of residential lots, or ROWs and the functionality of the buffers will be maintained post-construction. In addition, the recommended measures (i.e., outlined in Table 25) during construction and post-construction will help to offset any negative impacts.

As described in Section 10.0, native species of plants, including those which support pollinator foraging, should be included when establishing planting plans for naturalized

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areas and erosion and sediment control planting. CVC's SWM Guideline (updated July 2022), SWM Planting Guidelines (2014) and Plant Selection Guideline (2018) will be used for reference when determining restoration plans.

9.3 Wastewater Servicing

The subject lands will be serviced by a network of local gravity sewers, designed in accordance with the Municipal Design Criteria. As shown in Figure 4 of the FSR (2023), sanitary drainage from the subject site will be conveyed via local gravity sewers to either "Trunk 1" or "Trunk 2". Trunk 1 generally collects sewage from the area north and west of the high point and conveys it north, and Trunk 2 generally collects sewage from the area south and east of the high point and conveys it southeast. To connect Trunk 1 to the proposed pumping station at Eighth Line or the Eighth Line trunk gravity sewer, crossing the NHS is required. A 15 m sanitary servicing easement is proposed for the NHS crossing. The proposed easement width is in excess of the minimum required easement width for sanitary sewers, per the Municipal Design Criteria, and accommodates the construction and maintenance of the sanitary sewer. The sanitary sewer installation is proposed to be completed via open cut construction. The sanitary alignment will generally follow the existing laneway through the NHS, to minimize the impact on the area. Following the NHS crossing, Trunk 1 is routed along the outer edge of the SWM Pond 2 block and conveys sanitary drainage towards Eighth Line. Trunk 1 and 2 will connect to a proposed gravity trunk sanitary sewer located on Eighth Line. The Eighth Line trunk sewer collects sanitary drainage from the subject site, as well as sanitary drainage from the neighboring Empire development and conveys the sanitary flows north. The trunk sewer on Eighth Line continues north toward Sideroad 17, via gravity before discharging to the Elora Cataract Trail trunk sewer.

Several alternatives were considered to connect the alignment to the pump station to avoid and minimize impacts to the NHS as much as possible. The option presented in the FSR (2023) represents the best location and method for the construction of this alignment. The alignment traverses through the narrowest part of the PSW Complex where there is a "break" between two ecosites (MAMM1-3 and MAMM2-2) – an existing laneway bisects through this location and portions of CUM1-1, presenting a location that is already very disturbed and avoids additional fragmentation of the adjacent wetland ecosites. Following a site inspection on August 24, 2022, the Town's peer reviewer confirmed there are no concerns with the proposed sanitary sewer alignment through the NHS and temporary wetland intrusion. Standard mitigation measures will apply storage of excess material, refueling, and equipment storage will be located a minimum of 30 m from the PSW. The storage area will be located outside the PSW buffer. A robust ESC and spills plan will be implemented for the open cut easement, maintenance hole construction and storage area to prevent sedimentation and contamination of the PSW at this location. The area will be restored, and a planting plan will include self-sustaining

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native vegetation that does not inhibit the function of the sanitary sewer. Rehabilitation plans will be provided during the detailed design stage.

See Section 10.0 for additional details.

9.4 Stormwater Management Plan

Stormwater treatment will be provided by the two end of pipe SWM wetland facilities (SWM Pond 1 and SWM Pond 2).

The pond block locations are proposed in the lowest areas of the site, near the receiving water body, the West Credit River. In addition to property limits, the pond block limits were established by defining existing constraints in the proposed locations. SWM Pond 1 is defined by a dripline buffer, to the east. SWM Pond 2 is defined by wetland buffers to the north and south, and a 100 m well head protection area (WHPA) radius to the east.

According to the FSR (2023), the SWM ponds have been designed in accordance with the requirements of the Municipal Design Criteria and MECP's Stormwater Management Planning and Design Manual (MOE, 2003), and include the following features:

- Sediment Forebay: to improve sediment removal prior to entering the pond.
- Permanent Pool: to buffer storm flows and trap pollutants.
- Extended Detention Storage: to provide water quality and erosion control.
- Quantity Control Storage: to attenuate post development flows to predevelopment.

The ponds have been sized to ensure post-development flows do not exceed pre-development conditions. 5 m wide access roads will be provided in the pond blocks to facilitate routine inspection and maintenance activities within the pond. The access road will double as a trail to provide pedestrian connection between adjacent streets and naturalized areas. The conceptual design of the SWM ponds and typical cross-sections are depicted in Figure 7 and Figure 8 of the FSR (2023).

It is recognized that the Upper Reaches of the Credit River are managed as cold water Brook Trout habitat. Therefore, thermal mitigation measures will be applied (where feasible) to limit potential thermal impacts to the West Credit River which has a cold water thermal regime (Credit River Fisheries Management Plan, CVC, 2002).

As summarized in Section 8.9 of the FSR (2023), the application of thermal mitigation measures will be further investigated at the detailed design stage and may include ponds discharging through a buried outlet pipe, vegetative shading of surface water with landscape material, increasing riparian vegetation via detailed landscape plans of the SWM blocks, and ensuring ponds outlet via a reverse graded pipe provided in a deep pool below the pond bottom.

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A SWM pond maintenance plan will be developed to ensure impacts to any wildlife that use the feature are avoided as outlined in MNR's Stormwater Management Pond Clean-out Best Management Practices (May 2016).

Details of the conceptual design are provided in the FSR (2023).

9.5 Feature-Based Water Balance

As a result of the proposed land use change (e.g., amount of impervious surface change, drainage area to wetlands, SWM ponds proposed directly adjacent to wetlands), CVC requested the completion of a feature-based water balance (FBWB) risk assessment for the wetlands on the subject lands as part of the TOR. The results informed design decisions in achieving a post-construction hydrological balance that matches pre-construction conditions, within key features. TRCA has authored several guidance documents pertaining to water balance and monitoring that were used during the assessment:

- TRCA Stormwater Management Criteria – Appendix D – Water Balance Guidelines for the Protection of Natural Features (2012).
- TRCA Wetland Water Balance Monitoring Protocol (2016).
- TRCA Wetland Water Balance Risk Evaluation (2017).

Field investigations completed by Burnside (hydrogeology and ecology) included provision for field studies that supported a FBWB. Determination of wetland sensitivity referenced TRCA's Wetland Water Balance Risk Evaluation (2017). To assess the sensitivity of a wetland to hydrological change five criteria were used: Vegetation Community, Fauna Species, Flora Species, SWH for Hydrologically Sensitive Species and Hydrological Classification.

The wetlands on the subject lands are divided into four main locations: 1) the north end of the site is comprised of a connected network of four main wetlands and an aquatic feature that form part of the PSW Complex (SWDM4-1, MAMM1-3, MAMM2-2, SWDM4, and AQ); 2) the central portion the site is comprised of SWTM2-1 and SWDM2-2 that also form part of the PSW Complex; 3) the southern portion of the site features a dug pond that is comprised of two wetland units that are not hydrologically connected to the PSW units and are considered 'other wetlands', SAS1-1 and SWDM4-5; and 4) large area of SWMO1-1 internal to the woodlands of the NHS, at the southwest portion of the site. Only the first three wetland locations, listed above, were considered for the FBWB as the fourth location in the southern NHS will not be affected by the proposed development.

According to TRCA's criteria used to evaluate the sensitivity of the wetland to hydrological change, the level of sensitivity for all three wetland locations was assessed as "high". The highest magnitude category with one or more criteria satisfied determines the potential magnitude of change; therefore, the overall risk assignment (magnitude of

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hydrological change and sensitivity of the wetlands) for each of the three wetland locations is shown in Table 23.

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Table 23: Wetland Risk Evaluation (Step 4) Results for the Subject Lands

Wetland Feature	Impervious Cover	Catchment Size	Water Taking or Discharge	Impact to Recharge Areas	Magnitude of Hydrological Change	Sensitivity of Wetland	Overall Risk Assessment
SWDM4-1	High	High	Low	High	High	High	High
MAMM1-3	High	High	Low	High	High		
MAMM2-2	High	High	Low	High	High		
SWDM4	High	High	Low	High	High		
AQ	Low	Low	Low	High	High		
SWTM2-1	Medium	Medium	Low	Low	Low	High	Low
SWDM2-2	Medium	Medium	Low	Low	Low		
SAS1-1	High	Low	Low	Low	Low	High	Low
SWDM4-5	High	Low	Low	Low	Low		

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According to the Evaluation, High Risk wetlands require a monitoring plan, continuous hydrological model, and a mitigation plan. The central wetland and south wetland communities have been evaluated as Low Risk; therefore, monitoring is not necessary, but a non-continuous model is required with output at monthly or higher resolution and a mitigation plan.

A detailed description of the assessment and water balance calculations are provided in Burnside's Hydrogeological Assessment – Langen Property (2023).

For High-Risk assignments, TRCA provides the following guidance (2017):

- Monitoring is required, as outlined in Wetland Water Balance Monitoring Protocol (2016).
- Additional emphasis is placed on characterization of groundwater interaction.
- Approved continuous hydrological model is required (e.g., EPA SWMM) for all applications.
- An integrated hydrological model may be required, where groundwater interaction is high.
- Model output at daily aggregated to weekly resolution.
- Design mitigation plan to maintain water balance to wetland as outlined in TRCA's SWM Criteria Document (2012).

A FBWB analysis was completed by GEO Morphix Limited to assess the surface water balance to the wetlands (data received October 2023). Figures 10 and 11 of the FSR (2023) depict the pre-development and post-development drainage areas to the wetlands, respectively. The results of the FBWB have been included in Appendix H of the FSR (2023) and are summarized below in Table 24. The post-development hydroperiod is sufficiently close to the pre-development hydroperiod to achieve protection of the on-site wetlands, as demonstrated below, with minimal changes to deficit/surplus in post-development conditions (+/- 5%).

Table 24: Feature-Based Water Balance Analysis by GEO Morphix

Wetland Feature(s)	% of Pre-Development Runoff in Post-Development Conditions	Deficit/Surplus in Post-Development Conditions
SWDM4-5 & SAS1-1 (Wetland A)	98%	-2%
SWTM2-1 & SWDM2-2 (Wetland B)	101%	+1%
SWDM4-1 (Wetland C)	97%	-3%
MAMM1-3 (Wetland D)	102%	+2%
MAMM2-2 (Wetland E – off-site)	108%	+8%

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Wetland Feature(s)	% of Pre-Development Runoff in Post-Development Conditions	Deficit/Surplus in Post-Development Conditions
SWDM4 (Wetland F – off-site)	108%	+8%
AQ – off-site	111%	+11%
AQ – off-site	92%	-8%

The results of the risk assessment were submitted to CVC on January 26, 2022. Elizabeth Paudel, Planner (Acting), provided initial feedback on the results on March 25, 2022 (via email). Ms. Paudel agreed with the assessment, noting that several wetland communities scored as both highly sensitive and high risk and requested that site design be considered, ensuring that appropriate buffers and water balance mitigations are proposed to bring these wetland communities to a low-risk category.

According to GEO Morphix's FBWB Assessment (October 2023), measures for minor and unavoidable impacts to achieve a low risk scenario for post-development water balances to the features include: maintaining natural heritage features (i.e., forests), the conversion of portions of the sites existing agricultural and pastoral lands to parks and green space and the routing of runoff from these areas to wetlands and ponds via overland flow and clean water collection systems; and the routing of rooftop drainage via backyard lawns to wetlands and ponds via overland flow and clean water collection systems. These mitigations are feasible given the site constraints.

Several low impact development strategies (LIDs) are recommended in the FSR (2023) to achieve pre to post development water balance for the subject lands (see Figure 9 of the FSR for the proposed locations of LIDs). The LIDs recommended for the development include:

- Disconnect roof leaders and discharge to pervious grade.
- Increase topsoil depth in the lots, boulevards, and park.
- Divert clean water to wetland features.
- Implement rear yard infiltration trenches and an infiltration gallery in the park.

10.0 Preliminary Impact Assessment, Avoidance and Mitigation Measures

The following preliminary evaluation of environmental impacts and recommended mitigation measures is based on an assessment of the potential effects that could occur to natural heritage features and functions over the short and long-term, following the implementation of the proposed Concept Plan (Table 25). This section also identifies planning, design and construction practices that will pinpoint avoidance, mitigation and / or restoration opportunities as well as net effects and monitoring measures, if applicable. Net effects are defined as negative environmental effects of a project and

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related activities that will remain after mitigation and impact management measures have been applied.

This impact assessment is provided based on field investigations and the proposed Concept Plan and will need to be refined during detailed design. Development constraints are depicted in Figure 8.

Table 25: Impact Assessment, Avoidance and Mitigation Measures

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
General Impacts				
Vegetation Communities	<p>Direct effects of construction activities will include clearing and loss/injury of both herbaceous and woody vegetation within the subject lands. Portions, or all of the vegetated ecosites listed under Net Effects, will be removed.</p> <p>Due to the steep topography on the subject lands, grading has been of particular importance when balancing the needs of the development and avoidance of encroachment into the NHS. Grading is limited within the natural heritage features and has been minimized to only what is required to facilitate the proposed development; however, there are specific locations where encroachments are proposed to meet the challenging existing grades.</p> <p>There will be grading encroachments into the buffer of the NHS woodland, at the south of the site. To the west of Street G there are five instances of encroachments, two of which the grading will reach to the dripline. No encroachments past the dripline are currently proposed.</p> <p>Other direct impacts can be expected during construction and may include soil compaction and changes in soil moisture.</p> <p>Indirect effects include the increase to edge habitats, which presents a number of potential effects, such as windthrow and sunscald, introduction of invasive plant and</p>	<p>General Mitigation</p> <p>Vegetation loss has been minimized to the extent possible. Encroachment into the buffer of the PSW Complex and Significant Woodland has been reduced to only what is required to facilitate the proposed development. Native species of plants, including those which support pollinator foraging, should be included when establishing planting plans for naturalized areas and erosion and sediment control planting. CVC's Ecosystem Offsetting Guidelines (2020), Plant Selection Guideline (2018), Healthy Soils Guideline for the NHS (2017) and Stormwater Management Pond Planting Guidelines (2014) should be used for reference when determining restoration plans.</p> <p>A 10 m buffer has been applied to woodlands and unevaluated wetlands to provide protection to core habitat. A 30 m buffer has been applied to the PSW Complex. These buffers provide additional protection to SWH located in the protected NHS features. They are to be established as a non-mowing area, with native self-sustaining vegetation. Grading encroachments into NHS buffers are to be enhanced with a native seed mix and conveyed into public use. These locations will be restored to existing or better conditions. They are not to be incorporated into the back of residential lots or ROWs. Per Town standards, lots adjacent to open space require fencing. Rear yards that abut the NHS will be fenced to limit encroachments.</p> <p>For the NHS crossing, the area will be restored, and a planting plan will include self-sustaining</p>	<p>Permanent effects to the following ELC communities:</p> <ul style="list-style-type: none"> • WOCM1-3 (Dry-Fresh White Pine Coniferous Woodland) • TAGM5 (Fencerow) • CUM1-1 (Dry-Moist Old Field Meadow Type) • CVR_4 (Rural Property) • IAGM1 (Agricultural Buildings) • MEGM3-5 (Smooth Broome Graminoid Meadow) • THDM2-1 (Sumac Deciduous Shrub Thicket) • SAGM2 (Orchard) • OAGM1 (Annual Row Crop) • OAGM4 (Open Pasture) • CUW1 (Mineral Cultural Woodland) • CUS1 (Mineral Cultural Savannah) • FOCM6 (Naturalized Coniferous Plantation) <p>None of these communities are locally or provincially rare. They represent communities often found on rural residential properties, where degradation of natural habitat has occurred due to intensive agricultural practices.</p> <p>While some rare plant specimens will be directly impacted by the development the populations of all rare plant species identified on the subject lands will be protected within the buffers of the NHS, ensuring their persistence on the landscape.</p> <p>Currently, the existing buffers to NHS features are either agricultural fields or</p>	<p>Fencing shall be inspected at intervals as recommended in the Erosion and Sediment Control Guide for Urban Construction (the ESC Guide) (TRCA, 2019) to ensure damage is repaired in a timely manner.</p> <p>Monitoring the success of plantings may be required.</p> <p>Tree protection fencing will be erected prior to grading activities. When root cutting and/or pruning occur during grading activities adjacent to the NHS, a qualified arborist is recommended on site to advise and supervise the works and to ensure mitigations are done correctly and without injury to the NHS.</p> <p>Weekly inspections of the protection fencing may be recommended while grading is occurring next to woodland features.</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
	<p>wildlife species which may outcompete or predate native species, change in soil moisture regime and water availability to plants and plant communities, increases in light penetration (pollution) and noise, soil compaction, equipment and pedestrian “traffic”, equipment laydown and spills.</p> <p>There are 3 locations where Strict Blue-eyed Grass will be impacted by the development and/or preliminary grading: 1 location for Necklace Sedge, and 1 location for Hanging Bulrush. Populations of each of these species are <u>also</u> contained within the NHS that will not be impacted. Strict Blue-eyed Grass is found in SWTM2-1, CUM1-1(a) and CUM1-1(b); Necklace Sedge is found in CUM1-1(a) and SWDM4-1; and Hanging Bulrush is found in SWDM4-1 and CUM1-1(a). Transplanting these 5 specimens is not necessary given the presence of these species in the protected NHS that will ensure populations will persist on the subject lands.</p> <p>Clammy Ground-cherry is found in CUM1-1(a) and may be impacted by the 15 m sanitary sewer easement where crossing the NHS is required on Mr. Langen’s property on adjacent lands. During detailed design, the final location of the NHS crossing will be assessed to confirm if impacts will occur to this species and whether transplanting is necessary in this location.</p> <p>See also Wetlands and Provincially Significant Wetlands below.</p>	<p>native vegetation that does not inhibit the function of the sanitary sewer. Rehabilitation plans will be provided during the detailed design stage.</p> <p>Detailed landscape plans will be provided during the detailed design stage. Some areas of the buffer zones may be considered for ecological enhancement plantings, where feasible.</p> <p>Common Buckthorn is present in some of the vegetation communities. To reduce its spread and minimize its impact, landscape plans should include verbiage to remove sapling sized Buckthorn shrubs (i.e., 1 to 9 cm dbh) capable of producing fruit that are found along woodland/wetland edges, where feasible. Opportunities may be present where ecological enhancement areas in the buffer zones are identified. These could be cut and/or sprayed with an appropriate contact kill herbicide.</p> <p>Construction Mitigation Where feasible, grading in the NHS is encouraged during the dormant season (i.e., November to February).</p> <p>To reduce the risk of disturbing breeding birds (and contravening the Migratory Birds Convention Act, 1994), timing constraints shall be applied to avoid vegetation clearing (including grubbing) during the core breeding bird period – broadly from April 1 to August 31 for most species (regardless of the calendar year) (see Avifauna for more details).</p> <p>For treed areas where all trees are to be retained, construction fencing should be installed and inspected prior to commencement of any land disturbance and construction</p>	<p>degraded communities featuring many invasive non-native species and even discarded farm equipment and debris. Grading is limited within the natural heritage features and has been minimized to only what is required to facilitate the proposed development; however, there are specific locations where encroachments are proposed to meet the challenging existing grades.</p> <p>Conditions will be enhanced using appropriate native seed mixes, with the goal of creating self-sustaining native vegetation. As such, while the grading is permanent, the impacts are temporary. All natural features that form the NHS will be protected and preserved. Buffers from these features in the NHS are designed to provide protection from site alteration and/or development.</p> <p>Vegetated protection zones do not currently exist and will therefore provide a net benefit to these features. The creation of the neighbourhood park (per the Proposed Development Plan) in place of current conditions (intensive agriculture), located between the north and central NHS features, will provide additional benefit for the protected NHS via landscape plantings (i.e., planting native trees/shrubs) and passive recreational use.</p>	

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>activities (including grading) to prevent pedestrian access, prevent the unnecessary encroachment/disturbance by humans and machinery into vegetation communities, and to prevent wildlife from entering the construction areas. Where possible, fencing should be installed 1 m from the the dripline of any trees to be preserved for the protection of tree roots.</p> <p>For treed areas where there is a mix of retainable and non-retainable trees, the required tree removals should be completed first and then the tree protection fence installed. Paige wire farm fencing should be employed with silt screen attached to the fence. The fencing should be erected at least 1 m beyond the dripline of retained trees wherever possible to better protect tree roots and low limbs from construction damage. See Tree Inventory and Preservation Plan (July 4, 2023) prepared by Jackson Arboriculture.</p>		
<p>Wetlands and Provincially Significant Wetlands (West Credit River PSW Complex)</p>	<p>The wetlands (PSW and Other) are all contained in the NHS and will not be removed. Per CVC's Watershed Planning and Regulation Policies (2010), the following buffers have been applied:</p> <ul style="list-style-type: none"> • 10 m from the limit of other wetlands. • 30 m from the limit of PSWs. <p>Encroachments up to 15 m into the 30 m buffer of SWDM4-1 PSW are necessary along the western edge of the buffer. Encroachments, to a lesser extent, are also required along the northern edge of SWDM4-1/MAMM1-3 PSW buffer.</p> <p>Encroachments up to 15 m into the 30 m buffer of SWTM2-1 PSW are necessary</p>	<p>General Mitigation Encroachment into the buffer of the PSW has been reduced to only what is required to facilitate the proposed development. Vegetated protection zones (buffers) around the PSW wetlands adjacent to the proposed grading area have been established to reduce impacts. Other wetland enhancement strategies (i.e., invasive species management, native species plantings, etc.) should be implemented.</p> <p>During the detailed design stage, a native seed mix and rehabilitation plan will be prepared for the area impacted by the open cut. Hydrologic connectivity between the wetland units will be restored to existing conditions.</p>	<p>See Vegetation Communities above.</p> <p>Net effects to wetlands from adjacent development will be reduced provided by the stormwater and LID measures described in the FSR; these measures are considered effective in maintaining the water balance.</p>	<p>An Environmental Monitoring Plan (EMP) will be required during construction to confirm that erosion and sediment control measures and spill prevention and response measures are installed and functioning, as designed. Remedial measures should be implemented as soon as possible if deficiencies, or unanticipated negative effects, are identified during monitoring.</p> <p>A Qualified Environmental Inspector should be on-site daily during any dewatering, within 120 m of natural features. The Inspector should ensure that the filter bag is working</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
	<p>along a portion of the northern edge of the buffer.</p> <p>There will be a 15 m wide sanitary serving easement crossing the NHS at the narrow union, between MAMM1-3 and MAMM2-2 PSW ecosites. The sanitary sewer installation is proposed to be completed via open cut construction. The sanitary alignment will generally follow the existing laneway, through the NHS, to minimize the impact to the area.</p> <p>Three main wetland communities are present on the subject lands that may be impacted by the change in water balance according to the Feature-Based Water Balance (FBWB) Risk Assessment:</p> <ul style="list-style-type: none"> • The north end of the site is comprised of a connected network of four main wetlands and an aquatic feature that form part of the PSW Complex (SWDM4-1, MAMM1-3, MAMM2-2, SWDM4) – High Overall Risk Assessment • The central portion the site is comprised of SWTM2-1 and SWDM2-2 that also form part of the PSW Complex – Low Overall Risk Assessment • The southern portion of the site features a dug pond that is comprised of two wetland units that are not hydrologically connected to the PSW units and are considered 'other wetlands', SAS1-1 and SWDM4-5. – Low Overall Risk Assessment 	<p>The road type and surfaces will be determined in consultation with the County, Town, and CVC. The Preliminary Grading Plan ensures that the development does not impact surface drainage patterns by continuing to provide surface water to wetlands.</p> <p>Stormwater management, including LID measures, will be used to maintain water balance to the wetlands. Per the FSR (2023), to promote additional infiltration and to reduce runoff volumes under post-development conditions, several LIDs are recommended and include:</p> <ul style="list-style-type: none"> • Disconnecting roof leaders and discharge to pervious grade. • Increase topsoil depth in the lots, boulevards, and park. • Divert clean water to wetland features. • Implement rear yard infiltration trenches and an infiltration gallery in the park. <p>Lighting should be directed away from the wetlands.</p> <p>Pedestrian access to the NHS should be limited to ensure that degradation and disturbance of sensitive habitats within this feature are minimized post-development. Rear yards that abut the NHS will be fenced to limit encroachments.</p> <p>The FBWB has determined that a continuous water balance model, monitoring and mitigation plan will be required for the High-Risk wetlands, per TRCA's Wetland Water Balance Risk Evaluation (2017), to ensure that water balance is maintained for natural features designated for protection. The central wetland and south wetland communities have been evaluated as "Low Risk"; therefore, monitoring is not</p>		<p>appropriately, and that no sediment is entering significant natural features or watercourse.</p> <p>Long-term monitoring of wetland vegetation communities, pre and post-construction is recommended for identifying changes in plant species composition, flow regime and soil moisture content. The plan will be provided with future submissions once detailed designs are finalized.</p>

	<p>Indirect impacts to wetland communities will occur because of construction activities and the proposed development. These may include:</p> <ul style="list-style-type: none"> • Erosion and sedimentation during and post construction could impact water quality and vegetation within the wetlands. • Sedimentation can bury organic soils and alter vegetation communities. • Accidental contaminant spills from construction equipment could impact water quality and vegetation with the wetlands. • Effects on hydrology due to changes to site grading and decreased permeability (roads, parking, buildings). • Effects on hydrology due to dewatering. • Alterations to surface and/or groundwater inputs to the wetlands due to changes in surface/groundwater drainage patterns (i.e., stormwater infiltration and runoff in the catchment area). • Increase in pedestrian use. • Habitat degradation and increased risk of exotic and invasive species colonizing in the wetlands from adjacent residential development. • Noise and human disturbance to wildlife. • Increased lighting from adjacent residential development. <p>Any infrastructure approved to achieve FBWB may have direct impacts on the wetlands (i.e., outfalls).</p> <p>The PSW Complex and other wetlands feature candidate and confirmed SWH and SAR and are discussed below.</p>	<p>necessary, but a non-continuous model is required with output at monthly or higher resolution and a mitigation plan.</p> <p>According to the FBWB analysis, the post-development hydroperiod is sufficiently close to the pre-development hydroperiod to achieve protection of the wetlands, with minimal changes to deficit/surplus in post-development conditions.</p> <p>Impacts from infrastructure approved to achieve FBWB will be assessed further during the detailed design stage when details are provided for the outfalls, etc.</p> <p>Construction Mitigation Construction within and adjacent to the wetlands should be avoided or minimized, where possible. If impacts (i.e., vegetation removal and changes to hydrology) are proposed, compensation and protective measures should be discussed with CVC.</p> <p>A Construction Emergency Response and Communications Plan shall be developed and followed throughout the construction phase (including spill response plans). The Contractor shall develop spill prevention and contingency plans during the construction phase.</p> <p>All requirements under the Ontario Water Resources Act, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers will be met, including the following mitigation measures and best practices:</p> <ul style="list-style-type: none"> • Any discharge from dewatering should outlet to a vegetated area at least 30 m from a significant natural feature, or watercourse, utilizing a sediment filter bag. 		
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Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<ul style="list-style-type: none"> • In the event of sediment discharge, all operations will stop immediately until the problem can be resolved. • If significant changes in water levels/seepage areas are noted, operations will cease until water levels recover. <p>Erosion and sediment control measures will be used during construction to avoid/minimize potential for off-site sedimentation into the wetlands. A robust ESC plan will be in place for the sanitary easement and open cut construction and the maintenance hole construction to prevent siltation of the PSW at this location, and to prevent sediment being carried downstream to the more sensitive PSW unit in the NHS to the east.</p> <p>As per standard mitigation measures – storage of excess material, refuelling and equipment storage should be located a minimum of 30 m from the PSW. The storage area should be located outside the PSW buffer.</p>		
Woodlands and Significant Woodlands	<p>Limited grading encroachments into the 10 m buffer of the southern Significant Woodland is proposed. Grading will not encroach beyond the dripline and has been minimized to the extent possible. These encroachments are detailed in the Vegetation Communities above and are necessary based on the steep topography in this location. Grading is limited to the FOCM6-1 (Naturalized Coniferous Plantation) community on the east side of the woodland, which is a naturalized plantation and has been historically disturbed.</p>	<p>General Mitigation A 10 m buffer has been applied to woodlands to provide protection to core habitat.</p> <p>See Vegetation Communities above for additional details.</p> <p>Construction Mitigation Tree protection barriers at the dripline will be sufficient for the conifer plantation (FOCM6-1). Locations of barriers to be identified in the Arborist Report.</p> <p>Trees should be felled so that they fall into the development footprint to avoid damage to retained trees, including both trunks and roots.</p>	<p>Grading encroachments are avoided outside the deciduous forest ecosite and are confined to the naturalized plantation. Encroachments in the NHS buffer will be enhanced using appropriate native seed mixes, with the goal to create self sustaining native vegetation. As such, their impacts are considered temporary. See also Vegetation Communities above for additional details.</p>	<p>An Arborist should inspect tree protecting barriers prior to vegetation removal.</p> <p>See also Vegetation Communities above for additional details.</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
	<p>Increased pressures from new residents can have indirect effects on woodlands and include:</p> <ul style="list-style-type: none"> • Potential changes in form and function of the woodland, due to edge effects associated with removal of surrounding vegetation (i.e., sun scald, windthrow, increased light penetration). • Human disturbance due to informal trail creation and litter in the NHS. • Habitat degradation and increased risk of exotic and invasive species colonizing from adjacent residential development due to increased human presence, including informal yard waste disposal. • Noise and human disturbance to wildlife. • Increased lighting from adjacent residential development. 	<p>See also Construction Mitigation measures outlined in the Vegetation Communities section, above.</p>		
<p>Wildlife and General Wildlife Habitat</p>	<p>Provincially common species considered ‘habitat generalists’ that are known to utilize a mosaic of agricultural, meadow, wetland and woodland habitats were noted incidentally during field investigations and include Coyote, White-tailed Deer, Raccoon, Eastern Cottontail and Eastern Chipmunk.</p> <p>Temporary displacement of, and disturbance to, wildlife and wildlife habitat during the construction phase (i.e., vegetation removals, noise, light trespass), including SAR. Development in these habitats may limit wildlife movement and reduce useable habitat. The development will permanently remove upland agricultural lands that some of</p>	<p>Construction fencing should be installed prior to commencement of construction activities to prevent wildlife from entering the construction areas.</p> <p>The excluded area shall be searched immediately following fencing installation for any wildlife (including SAR) that may have become trapped. Any wildlife shall be safely relocated, or permitted to escape, to a suitable habitat. All works shall stop immediately in the area and MECP contacted should a SAR be encountered within the construction, or operational area, to ensure compliance with the ESA.</p> <p>If an animal is encountered during construction and does not move from the construction zone, the Contract Administrator shall be notified. If</p>	<p>Permanent removal of the following ELC communities that are confirmed wildlife habitat:</p> <ul style="list-style-type: none"> • WOCM1-3 (Dry-Fresh White Pine Coniferous Woodland) • TAGM5 (Fencerow) • CUM1-1 (Dry-Moist Old Field Meadow Type) • CVR_4 (Rural Property) • IAGM1 (Agricultural Buildings) • MEGM3-5 (Smooth Broome Graminoid Meadow) • THDM2-1 (Sumac Deciduous Shrub Thicket) • SAGM2 (Orchard) • OAGM1 (Annual Row Crop) • OAGM4 (Open Pasture) • CUW1 (Mineral Cultural Woodland) • CUS1 (Mineral Cultural Savannah) 	<p>A Biologist may be required, on an as-needed basis, during construction works if wildlife is trapped within the construction zone and requires removal and relocation to land outside of the construction zone. They may also be required on-site, as needed, should a species that is protected under the ESA be identified within, or adjacent to the construction site. The Biologist may be required to confirm the presence and identification of a species prior to contacting MECP for further advice.</p> <p>Fencing should be monitored by a Qualified Environmental Inspector, at intervals, as recommended in the ESC Guide (TRCA, 2019), to ensure</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
	<p>these species are known to use as foraging and movement corridors.</p> <p>The majority of higher quality wildlife habitat on the subject lands is located within the NHS and will be protected. The EIS identified a Confirmed Amphibian Movement Corridor (SWH) that will be directly removed. This is discussed under SWH and Wildlife Linkages and Corridors below.</p> <p>Confirmed Monarch and Barn Swallow (SWH, Special Concern) and Candidate Reptile Hibernaculum (SWH) habitat will be directly removed. This is discussed under SWH below.</p> <p>Changes to surface water runoff and infiltration on the subject lands has the potential to alter hydrology in the wetlands. This could affect the functions of the wetlands, including the type of wildlife species and habitats they support. See Wetlands and Provincially Significant Wetlands above.</p> <p>The proposed development will increase road traffic, both on the subject lands and in the general area. This may increase wildlife road mortalities. See also Wildlife Linkages and Corridors below.</p>	<p>the construction activities are such that continuing construction in the area would result in harm to wildlife, construction activities in that location shall temporarily stop and MNRF or MECP shall be contacted for direction.</p> <p>Avoid vegetation clearing, or disturbance, during sensitive times of the year for local wildlife (i.e., when many animals bear their young, or migrate between wintering and summer habitats). Specific timing of works should be determined, in consultation with the appropriate Agency. Generally, the following avoidance windows apply if working within any of these habitats:</p> <ul style="list-style-type: none"> • Breeding birds and/or birds protected under the MBCA, 1994 (trees/shrubs/vegetation): April 1 to August 31. • SAR Bats (trees/structures): April 1 to September 30. • Overwintering reptiles (wetlands/subsurface features such as foundations, bedrock): October to April. • Breeding Amphibians (wetlands/open water features): April to June. <p>See Wildlife Linkages and Corridors below, for how to enhance existing features.</p>	<ul style="list-style-type: none"> • FOCM6 (Naturalized Coniferous Plantation) <p>Wildlife may be permanently displaced because of the proposed development; however, impacts to vegetation communities have been minimized and mitigated as described in the sections above. Features within the NHS will be protected.</p> <p>See also Vegetation Communities above and Avifauna and Area-Sensitive Species / Significant Wildlife Habitat / Habitat of Endangered and Threatened Species / Wildlife Linkages and Corridors for additional details.</p>	<p>there is no damage that may result in a decrease in function, or opportunities for injury or death to wildlife species.</p> <p>An Avian Biologist may be required on-site, as needed, should a nesting migratory bird (or SAR protected under ESA) be identified within, or adjacent to the construction site.</p> <p>The Avian Biologist may be required to confirm the presence and identification of an active nest, and/or breeding bird, prior to contacting MECP for further advice.</p>
<p>Avifauna and Area-Sensitive Species</p>	<p>Potential for disturbance, or destruction of migratory breeding birds and their habitat (prohibitions under the Migratory Birds Convention Act, 1994) during construction, including area-sensitive species.</p>	<p>General Mitigation</p> <p>To reduce the risk of contravening the Migratory Birds Convention Act, 1994, timing constraints shall be applied to avoid any limited vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period – broadly from April 1 to</p>	<p>Permanent removal of the following avifauna communities, including area-sensitive habitat for Savannah Sparrow:</p> <ul style="list-style-type: none"> • WOCM1-3 (Dry-Fresh White Pine Coniferous Woodland) • TAGM5 (Fencerow) 	<p>An Avian Biologist may be required on site, as needed, should a nesting migratory bird (or SAR protected under ESA) be identified within, or adjacent to the construction site.</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
	<p>SWH and SAR habitat are discussed separately, below.</p>	<p>August 31 for most species (regardless of the calendar year).</p> <p>Active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the ESA, cannot be destroyed at any time of the year. The destruction of inactive nests for some species may also be prohibited.</p> <p>Construction Mitigation If a nesting migratory bird (or SAR protected under ESA) is identified within, or adjacent to the construction Site (or during operations and maintenance activities), and the activities are such that continuing works in that area would result in a contravention of the Migratory Birds Convention Act, 1994 or ESA, all activities will stop and the Contract Administrator (with assistance from an Avian Biologist) shall discuss mitigation measures with the Town. Should SAR be identified, all activities will stop and MECP will be contacted immediately to ensure compliance with the ESA. The Contract Administrator shall instruct the Contractor on how to proceed based on the mitigation measures established through discussions with the Town, MECP and/or Environment Canada.</p>	<ul style="list-style-type: none"> • CUM1-1 (Dry-Moist Old Field Meadow Type) • CVR_4 (Rural Property) • IAGM1 (Agricultural Buildings) • MEGM3-5 (Smooth Broome Graminoid Meadow) • THDM2-1 (Sumac Deciduous Shrub Thicket) • SAGM2 (Orchard) • OAGM1 (Annual Row Crop) • OAGM4 (Open Pasture) • CUW1 (Mineral Cultural Woodland) • CUS1 (Mineral Cultural Savannah) • FOCM6 (Naturalized Coniferous Plantation) <p>Savannah Sparrow was recorded in the intensive agricultural fields, where patches of fallow grasses/forbs/legumes are present along the edges. While this species is considered 'area-sensitive', it is often found in smaller patches where larger, more suitable habitat is not as prevalent, particularly in Southern Ontario. Given the lack of high-quality habitat for this species on the subject lands, net effects to this species are considered low.</p> <p>These communities listed above are not ecologically diverse, are highly disturbed by current anthropogenic practices, small in nature and currently fragmented by agricultural fields.</p> <p>Impacts to vegetation communities have been minimized and mitigated as described in the sections above. Features within the NHS will be protected. See also Significant Wildlife Habitat below.</p>	<p>The Avian Biologist may be required to confirm the presence and identification of an active nest and/or breeding bird, prior to contacting MECP for further advice.</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
Herpetofauna	See Wildlife and General Wildlife Habitat and SWH.			
Significant Wildlife Habitat	<p>Direct impacts to habitats within the development limits: Candidate Reptile Hibernaculum, Confirmed Amphibian Movement Corridor, Confirmed habitat for Special Concern and Rare Wildlife Species: Monarch and Barn Swallow.</p> <p>Barn Swallow structure S7 will be removed which contained 1 nest.</p> <p>Indirect impacts to habitats contained within the NHS: Candidate Raptor Wintering Area, Candidate Bat Maternity Colonies, Confirmed Turtle Wintering Area, Confirmed Deer Winter Congregation Areas, Candidate Woodland Raptor Nesting Habitat, Candidate Turtle Nesting Areas, Confirmed Seeps and Springs (CVC data), Confirmed Amphibian Breeding Habitat (Woodland), Candidate Woodland Area-Sensitive Bird Breeding Habitat, Confirmed Special Concern and Rare Wildlife Species (Eastern Wood-pewee, Wood Thrush, Snapping Turtle, Midland Painted Turtle).</p> <p>See also Vegetation Communities, Wildlife and General Wildlife Habitat and Wetlands and Provincially Significant Wetlands.</p>	<p>General Mitigation See also Wildlife and General Wildlife Habitat.</p> <p>MNRF have published a Significant Wildlife Habitat Mitigation and Support Tool (2014). This document provides advice and recommendations for mitigating development effects in, and adjacent to SWH, and should be used as a guide.</p> <p>Opportunities should be explored to enhance wildlife habitat within the NHS, such as the creation of turtle nesting sites and reptile hibernaculum.</p> <p>Where possible, pedestrian access to the PSW, and other wetlands within the NHS, should be limited to ensure that degradation and disturbance of sensitive habitats within this feature are minimized as much as possible, post-development.</p> <p>Avoid vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (i.e., when many animals bear their young or migrate between wintering and summer habitats).</p> <p>For Candidate habitats within the development limits, targeted surveys may be required during detailed design, prior to project construction, to confirm presence.</p> <p>For Confirmed habitats within the development limits:</p>	<p>Permanent removal of the following habitats:</p> <ul style="list-style-type: none"> • Candidate Reptile Hibernaculum • Confirmed Amphibian Movement Corridor • Confirmed habitat for Special Concern and Rare Wildlife Species: Monarch and Barn Swallow. <p>Impacts to vegetation communities have been minimized and mitigated, as described in the sections above. Features within the NHS will be protected, where the majority of Candidate or Confirmed SWH occurs.</p> <p>The removal of these habitats can be replicated through the addition of native plantings and habitat enhancements in the NHS and elsewhere (i.e., reptile hibernacula, wildlife tunnel). The development represents an opportunity to provide additional benefits to wildlife through the creation of the neighbourhood park space (per the Proposed Development Plan) in place of current conditions (intensive agriculture), located between the north and central NHS features. This will provide additional benefits for the protected NHS, via landscape plantings (i.e., native trees/shrubs) and passive recreational use. Detailed landscape plans will be provided during the detailed design stage. Some areas of the buffer zones may be considered for ecological enhancement plantings, where feasible.</p>	See Wildlife and General Wildlife Habitat.

		<p>Seeps and Springs (CVC data):</p> <ul style="list-style-type: none"> • See Wetlands and Provincially Significant Wetlands and Headwater Drainage Features below. <p>Monarch:</p> <ul style="list-style-type: none"> • Milkweed should be included in all seed mixes, where applicable, to enhance Monarch breeding habitat on the subject lands. • Most of the land in the buffers are currently agricultural fields or degraded communities; these have not been included within the lot framework and will be established as non-mowing areas with native self-sustaining vegetation that will provide a net benefit to these features (and indirectly to Monarch). <p>Barn Swallow:</p> <ul style="list-style-type: none"> • Barn Swallow is protected under the MBCA, 1994. To avoid contravention of the MBCA, removal of S7 should occur outside the core breeding window (April 1 to August 31). • Structures S3 (3 nests) and S4 (10 nests) that were also confirmed Barn Swallow nesting habitat will remain on the “lands to be retained.” <p>Amphibian Movement Corridor:</p> <ul style="list-style-type: none"> • See Wildlife Linkages and Corridors. <p>Construction Mitigation Prior to construction works commencing, installation of construction fencing is recommended along the perimeter to prevent pedestrian access around the limit of construction, which includes all areas required for excavation and spoil stockpile, vehicle and worker access and material laydown. This prevents any wildlife from attempting to access the construction zone during construction works.</p>	<p>While the SWM ponds are not considered compensation for loss of habitat, they do provide the addition of quality ‘wetland’ habitat and vegetation communities that are currently not present on the subject lands and represent an improvement from current conditions and a more contiguous ‘naturalized’ corridor, between the central NHS features on the east side.</p>	
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Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>If designated areas are created during construction for the stockpiling of materials, especially fill, soil and gravel, the Contractor shall install temporary construction fencing around the perimeter of these areas to prevent any reptile species from entering the area and attempting to nest (i.e., reptiles are attracted to these materials for nesting).</p> <p>If temporary construction fencing is used at a location, it shall be installed to allow wildlife to leave the fenced area during vegetation clearing. Once the work area has been cleared, it can be securely fenced to prevent wildlife from returning.</p> <p>The excluded area should be searched immediately following fencing installation for any wildlife (including SAR) that may have become trapped. Any wildlife should be safely relocated, or permitted to escape, to a suitable habitat no more than 200 m away from the work zone. Wildlife shall be released no more than 200 m away from the work zone in a similar ecosystem type. All works should stop immediately and MECP contacted should a SAR be encountered within a construction, or operational area, to ensure compliance with the ESA.</p> <p>A SWM pond maintenance plan will be developed to ensure impacts to any wildlife that use the feature are avoided as outlined in MNR's Stormwater Management Pond Clean-out Best Management Practices (May 2016).</p>		

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
<p>Habitat of Endangered and Threatened Species</p>	<p>Sensitive or significant species or their habitat potentially affected (direct or indirect), including SAR Bats and Butternut.</p> <p>Structures located on the subject lands have been surveyed for Chimney Swift and SAR bats. At the time of the breeding bird and bat structure surveys, S3, S4 and S5 were in the development limits; these are now part of the “Lands to be Retained” and will continue to be used as a principal residence for the landowner on this parcel. Therefore, compensation will only be required for habitat to be removed at S7 (1 nest). No SAR Bats were detected at S7.</p> <p>Confirmed habitat for SAR Bats (Northern Myotis and Little Brown Myotis) has been identified in the hedgerows on the subject lands. The proposed development will impact all hedgerow habitat, resulting in the removal of 41 Candidate SAR bat maternity (BMH) roosting snags.</p> <p>Candidate habitat for Eastern Small-footed Myotis has been identified in the rock pile near the north edge of the FODM7-2 woodland and in the rocky drainage feature located in the center of the subject lands, in the CUW1 ecosite. The rocky drainage feature will be removed during the development.</p> <p>Indirect impacts to retained SAR bat habitat (woodland and rock piles) may be caused by increased pressures from residents.</p>	<p>For SAR where specific exemptions under the ESA Regulations are detailed (Butternut), all requirements under the ESA must be met.</p> <p>An Information Gathering Form was submitted to MECP on March 4, 2022. An Avoidance Alternative Form was submitted to MECP on April 14, 2022. On May 17, 2022, MECP requested an Application for an Overall Benefit Permit under clause 17(2)(c) of the ESA form (C-PAF).</p> <p>As part of the C-PAF, the following mitigation measures are recommended to avoid direct impacts to roosting individuals and maternity roosting colonies:</p> <ul style="list-style-type: none"> • Tree clearing will be completed between October 1 and March 31, which is outside the active period for Northern Myotis and Little Brown Myotis. • The exposed rock feature near Station E will be removed between December 1 and March 14, which is outside the active period for Eastern Small-footed Myotis. • Fifty (50) native thorny shrubs will be planted to protect a retained rock roost from local residents. • All efforts should be made to minimize the area of disturbance. • Trees should be felled so that they fall into the development footprint to avoid damage to retained trees, including both trunks and roots. • Implement International Dark-Sky Association guidelines for lighting on the subject lands. • A training pamphlet will be given to staff working on site to inform them of SAR bats and what to do if they encounter them. 	<p>In consultation with MECP, an Overall Benefit Permit for direct impacts to SAR bat habitat will be obtained; therefore, no net effects are anticipated. The higher quality woodland features will be protected in the NHS.</p>	<p>An extensive monitoring plan has been developed through the permit process with MECP to ensure these features are not overheating and are being used as habitat by SAR bats. Monitoring will continue for five years after the habitat features are installed, with annual updates to MECP.</p> <p>See also Wildlife and General Wildlife Habitat above.</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>Six Rocket Box style bat boxes, six cavities carved into standing trees, two rock roosts for Eastern Small-footed Myotis and a woodland planting of 1,395 m² will be installed on the subject lands.</p>		
<p>Wildlife Linkages and Corridors</p>	<p>Under current conditions, NHS features in the north, centre and south of the site are accessible to wildlife by traversing rural property, cultural meadow, thicket, hedgerows, and orchard ecosites.</p> <p>Residential homes with fences and the road network within the development will lead to a reduction in wildlife access across the subject lands.</p> <p>Increased wildlife road mortality incidents may arise from the network of roads.</p> <p>Between the south and central linkage area, vegetation outside the NHS and buffer will be cleared and Street E will divide the south NHS from the NHS to the north.</p>	<p>At the north end of the site, a linkage will be maintained between the northern PSW Complex and the central woodland/PSW features, through the proposed development plan, where the SWM pond and park are located. During detailed design, it is recommended that a park management plan be developed to identify no mowing areas, etc. that will enhance connectivity.</p> <p>Landscape plans will enhance NHS linkages through native plantings and seed mixes and will outline the species, size, quantity, and arrangement. Both trees and shrubs will be planted to provide native plant cover at varying heights, which will provide cover for a variety of wildlife. Graded areas will be seeded with a native seed mix that contains grasses and wildflowers. Milkweed should be included in all seed mixes, where applicable, to enhance Monarch breeding habitat on the subject lands. SWM ponds will be designed to meet Municipal Design Criteria and MECP's criteria. Connectivity between the ponds and natural habitats can be enhanced by vegetation management and by following CVC's Stormwater Management Pond Planting Guidelines (2014) and Plant Selection Guideline (2018).</p> <p>Between the south and central linkage area, the proposed wildlife tunnel will mitigate the vegetation clearing between the central and</p>	<p>The wildlife linkage between the north and central NHS will be enhanced by the park and SWM pond and will be an improvement from current conditions.</p> <p>While the SWM ponds are not considered compensation for loss of habitat, they do provide the addition of quality 'wetland' habitat and vegetation communities that are currently not present on the subject lands and represent an improvement from current conditions and a more contiguous 'naturalized' corridor between the central NHS features on the east side.</p> <p>No net effects are anticipated for the south to central linkage corridor with the placement of the wildlife tunnel and recommended wildlife crossing signs.</p>	<p>Monitoring the effectiveness of the wildlife tunnel is recommended post-construction (i.e., wildlife cams).</p> <p>The wildlife tunnel should be flushed in the spring annually to eliminate the salt which amphibians are highly sensitive to.</p> <p>Regular checks of the fencing and tunnel should be made to ensure that the system continues to function efficiently. At minimum this should include a visual inspection prior to spring migration periods. A maintenance plan should be developed to keep the system free of accumulations of vegetation and leaves.</p> <p>Responsibility for maintenance and flushing of the tunnel will be determined at a future date between the Client and Town.</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>south NHS features. The wildlife tunnel design is based on the principles provided in CVC's Fish and Wildlife Crossing Guidelines (2017) and MNRF's Best Management Practices for Reptile and Amphibian Crossings (2016). The crossing structure is proposed as a slotted, at-grade tunnel, equipped with headwalls to direct migrating animals through the tunnel and provide the required connectivity for passage of amphibians and reptiles.</p> <p>Directional exclusion fencing will be used to guide wildlife to the crossing following the principles in CVC's Fish and Wildlife Crossing Guidelines (2017).</p> <p>The proposed grading slope around the SAS_1-1 pond will help direct wildlife to the at-grade wildlife tunnel.</p> <p>Use of wildlife crossing signs on Street E, in the vicinity of SAS_1-1 pond will help alter drivers to increase caution and watch for amphibians and reptiles. Open spaces are proposed on either side of Street E.</p> <p>A SWM pond maintenance plan will be developed to ensure impacts to any wildlife that use the feature are avoided as outlined in MNRF's Stormwater Management Pond Clean-out Best Management Practices (May 2016).</p>		
Fish and Fish Habitat	Potential for indirect impacts to downstream fish habitat from water quality and quantity influences (i.e., sediment, pollutants, thermal loading, and changes to water balance).	<p>General Mitigation SMP and ESC Plans shall be developed, as noted above.</p> <p>Work will be avoided near watercourses and headwater drainage features during periods of excessive precipitation and / or excessive snow melt.</p>	<p>In-water works are not required for the proposed works and thus HADD of fish habitat and the death of fish will not occur.</p> <p>The implementation of the SMP and ESC plans will mitigate indirect impacts to downstream fish habitat from the water quality and quantity influences.</p>	A Qualified Environmental Inspector shall monitor construction activities to confirm the requirements outlined in the SMP and ESC plans are followed. ESC inspections are to be conducted at intervals as recommended in the ESC Guide (TRCA, 2019). Workers shall report any instances of spills or impacts to surface water features.

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>Compliance with the Ontario Water Resources Act, 1990 shall be maintained with respect to the quality of water discharging into natural receivers. Sediment and erosion control measures (such as silt fence barriers, etc.) shall be installed and maintained during the work phase and until the site has been stabilized. If control measures are not functioning properly, no further work shall occur until the problem is resolved. All temporary ESC measures shall be installed in accordance with recognized provincial standards. Extra silt fence and ESC control materials shall be stored on-site, should additional sediment mitigation be required.</p> <p>It is recognized that the Upper Reaches of the Credit River are managed as cold water Brook Trout habitat. Therefore, thermal mitigation measures will be applied to limit potential thermal impacts to the West Credit River which has a cold water thermal regime (Credit River Fisheries Management Plan, CVC, 2002).</p> <p>Construction Mitigation All disturbed areas of the work site should be stabilized within 30 days of inactivity, and re-vegetated as soon as conditions allow.</p> <p>All equipment and personal protective equipment must arrive on-site clean to prevent the potential transfer of invasive species (i.e., phragmites) to the local environment.</p> <p>Any stockpiled material shall be stored and stabilized away from the 30 m watercourse and down gradient of any LIDs. Sediment controls (i.e., silt fencing) shall be installed around all stockpiles. All materials and equipment used for the purpose of site preparation and road construction shall be operated and stored in a manner that prevents any deleterious</p>		

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>substance (e.g., petroleum products, silt, etc.) from entering the water. All equipment fueling and maintenance should be done outside of the regulated area to ensure that no deleterious substances enter the watercourse.</p> <p>No equipment refueling should occur within 30 m of a watercourse or NHS feature (e.g., woodland, wetland, valleyland), and all stationary equipment should be outfitted with drip pans (i.e., secondary containment) to prevent/contain oil spills.</p> <p>Spills should be immediately contained and cleaned up, in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit should always be on site during the work. Spills should be reported to the Ontario Spills Action Center at 1-800-268-6060.</p> <p>CVC shall be consulted during detailed design regarding potential works within, or near, flood regulated areas, as appropriate.</p>		
Headwater Drainage Features	Potential for loss of hydrologic contribution to watercourses, habitat loss for terrestrial and aquatic species, impacts to groundwater contributions, reduction in sediment control capacity, impacts to downstream water quality and increases in flooding.	<p>General Mitigation</p> <p>Potential HDFs were investigated within the subject lands with land use recommendations provided in the preceding sections, based on their function to the aquatic network, as outlined in Figure 2 of the HDF Guideline (TRCA &CVC, 2014).</p> <p>HDF's classified as no management concern (CR-H1, CR-H2B, CR-H2C (R5-R2), CR-H2D, H5 and H6) will be addressed through general minor and major stormwater management systems and do not require specific mitigation efforts.</p>	<p>Direct impacts to HDF's within the subject lands are anticipated to be minor, given low sensitivity features located within the developable limits.</p> <p>Net effects to the hydraulic function of HDF's, which includes maintaining surface flows to the downgradient PSW complex and West Credit River are expected to be minimal given the results of the FBWB.</p>	Monitoring will not be required as per the management recommendations.

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>The management recommendation for reach CR-H2C-R1 is Conservation. This reach is a small, furrowed feature that conveys drainage from the field to the downgradient wetland. The classification of this feature is based on the HDF decision matrix (CVC & TRCA, 2014), with the management recommendation of 'Conservation' triggered primarily due to the feature being located within a meadow community (i.e., not because of its aquatic sensitivity or hydraulic function). As such, we are of the opinion that continuing to feed the reach through the meadow is not ecologically warranted to maintain the function of the Wetland or the West Credit River, although backyards will drain toward this area. Given that CR-H2C-R1 does not provide fish habitat, and minimal or substantial flows as defined by the OSAP SR:M10 and M11 were not observed during any HDF assessment, we are of the opinion that the portion of the feature that will remain post-grading can be seeded with an approved CVC seed mixture to provide similar, or enhanced, ecological conditions. As noted in the FBWB, there will be surplus of runoff to the downgradient wetland (SWDM4) post-development.</p> <p>The management recommendation for Feature CR-H2 is Protection, and these features will not be altered in the proposed development.</p>		
Soils, Erosion and Sediment Control, and Surface Water	Potential for localized surface water or groundwater impacts as a result of spills, discharge or dumping of materials, fluids and other wastes during construction of proposed road extension and associated surface water facilities (e.g., swales).	<p>General Mitigation</p> <p>The Town is required to comply with the Ontario Water Resources Act, R.S.O. 1990, c. O.40, with respect to the quality of water discharging into natural receivers. The footprint of disturbed areas shall be minimized to the extent possible. For example, vegetated buffers shall be left in place adjacent to natural vegetation features</p>		<p>A Qualified Environmental Inspector shall regularly monitor construction activities to confirm the requirements outlined in the SMP and ESC are being followed.</p> <p>A Qualified Environmental Inspector shall inspect, suggest, and confirm</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>(forested areas), to the maximum extent possible.</p> <p>A Soil Management Plan (SMP) will be prepared by a Qualified Professional, as defined in O. Reg. 160/06 for managing soil materials on-site (includes excavation, location of stockpiles, reuse and off-site disposal).</p> <p>An Erosion and Sediment Control (ESC) Plan will be developed during detailed design, in consultation with CVC, and will conform to industry best management practices and recognized standard specifications, such as Ontario Provincial Standards Specification (OPSS).</p> <p>Construction Mitigation All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work should occur outside the work zone.</p> <p>ESC measures shall be installed and maintained during the construction phase and until all areas of the construction site have been stabilized. Double layered and stabilized ESC fencing will be required for protection of natural areas, such as adjacent to the PSW and Sanitary Serving Easement, which crosses the PSW. Single row, stabilized ESC fencing will be installed around the development limits where natural areas are absent. ESC measures shall be inspected at intervals as recommended in the ESC Guide (TRCA, 2019) to confirm they are functioning and maintained, as required. If ESC measures are not functioning properly, no further work in the</p>		<p>the repair of ESC measures as needed.</p> <p>Workers shall report any instances of spills to their supervisors.</p>

Environmental Component	Potential Environmental Effects	Avoidance, Mitigation and/or Restoration Measures	Net Effects	Recommended Monitoring Activities
		<p>affected areas will occur until the sediment and/or erosion problem is resolved.</p> <p>All disturbed areas of the construction site will be stabilized and re-vegetated within 30 days of inactivity.</p> <p>Any construction works within CVC regulated areas will require a permit under O. Reg. 160/06.</p> <p>Refueling and maintenance of construction equipment should occur within designated areas only. Any hazardous materials used for construction will be handled in accordance with appropriate regulations.</p> <p>A Construction Emergency Response and Communications Plan shall be developed and followed throughout the construction phase (including spill response plans). The Contractor shall develop spill prevention and contingency plans during the construction phase. Personnel shall be trained in how to apply the plans and the plans shall be reviewed to strengthen their effectiveness and allow for continuous improvement. Spills or depositions into watercourses shall be immediately contained and cleaned up, in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will always be on site during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.</p>		

11.0 Summary

The subject lands are proposed to be developed for residential and related purposes. Existing land use on the subject lands is comprised of intensive agriculture, with limited natural features in the development limits, and has been highly disturbed by anthropogenic and agricultural practices. Two rural residences are present on the northeast and southeast side. The existing house and barns / sheds that comprise the residence on the northeast side is part of the “Lands to be Retained” and will continue to be used as a principal residence for the landowner on this parcel. This parcel was part of the original study limits during field investigations but is no longer part of the proposed development lands as shown in Figure 10. The subject lands also contain NHS features including the West Credit River PSW Complex, two Significant Woodlands and a small Unevaluated Wetland in the central portion. The West Credit River (Erin Branch) flows northeast of 5552 Eighth Line, outside the limits of the subject lands.

The following summary highlights the natural heritage features present on the subject lands:

- Two residential ponds (aquatic features) are present: Pond 1 is supported by groundwater discharge and some surface water input. Pond 2 is surface water fed, with some groundwater support due to local groundwater ponding. The West Credit River Erin Branch is directly offsite along the northeast corner.
- Seven HDF features and 16 reaches were documented and categorized. Three were classified as ‘Protection’, one as ‘Conservation’ and 12 as ‘No Management Concern’.
- Seventeen (17) plant species were observed that are considered rare (R) or uncommon (U) to the Greater Toronto Area (GTA) (Varga et al., 2000).
- Seven “area-sensitive” bird species, as defined by MNRF, were observed exhibiting breeding evidence on the subject lands during breeding bird surveys. Except for Savannah Sparrow, these species were only recorded in the NHS outside the development limits and will not be directly impacted.
 - Five species, listed as provincially significant, were confirmed on the subject lands: Two Category 1 and one Category 2 Butternut (Endangered), three bat species (Endangered), and Eastern Meadowlark (Threatened). Category 1 Butternut and their habitat are no longer protected under the ESA, as of February 27, 2022. The Category 2 Butternut was registered for removal on March 11, 2022, and can be removed.
 - On May 17, 2022, MECP requested an Application for an Overall Benefit Permit under clause 17(2)(c) of the ESA form (C-PAF) for impacts to candidate SAR bat habitat within the development limits. A copy of the permit will be circulated once it has been drafted and signed by the Minister.
 - The most significant habitat for SAR bats is in the protected woodland features of the NHS and will not be removed.

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- Based on Burnside’s conclusions in Section 6.6.1 for Eastern Meadowlark, no further action is required under the ESA.
- Confirmed SWH Special Concern and rare wildlife species (Monarch, Eastern Wood-pewee, Wood Thrush, Barn Swallow, Snapping Turtle and Midland Painted Turtle) was recorded on the subject lands. For Monarch, native seed mixes will include Milkweed to provide habitat for the adult and larvae life stages. Eastern Wood-pewee and Wood Thrush were only recorded in the NHS outside the development limits; the species or its habitat will not be directly impacted. Barn Swallow habitat will be removed when S7 is demolished. This species is protected under the MBCA. Habitat removal should occur outside the core breeding window (April 1 to August 31). Structures S3 and S4 that were also confirmed Barn Swallow nesting habitat will remain on the “lands to be retained.”
- Confirmed SWH for overwintering turtles (Snapping Turtle and Midland Painted Turtle) was recorded at TURT-001 (AQ) and TURT-003 (SAS1-1). These features will be retained and will be protected within the NHS with appropriate buffers.
- Confirmed SWH amphibian breeding habitat was recorded at AMPH-004 (SAS1-1). Eastern Newts were also observed at this location. These features will be retained and will be protected within the NHS, with appropriate buffers.
- Confirmed SWH amphibian movement corridor is present between SAS1-1 and the woodland in the NHS to the south. A dedicated wildlife tunnel is proposed in this location under Street ‘E’.

The following summary highlights how this EIS conforms with the TOR established with CVC:

- The EIS demonstrates policy conformance (i.e., CVC, Town / County, and Greenbelt Plan policies) with respect to natural heritage features and buffers and ensures that landscape connectivity is maintained and enhanced through the establishment of a functional and connected NHS with natural buffers. All natural features that form the NHS will be protected and preserved. Buffers from these features in the NHS have been designed to provide protection from site alteration and / or development. Most of the land in the buffers are currently agricultural fields or degraded communities; these have not been included within the lot framework and will be established as non-mowing areas with native self-sustaining vegetation that will provide a net benefit to these features. These buffers will be conveyed into public use and will not be incorporated into the back of residential lots or ROWs. Per CVC’s WPRP (2010), the following buffers have been applied to natural heritage features:
 - 10 m from the drip line of Significant Woodlands.
 - 10 m from the limit of other (unevaluated) wetlands.
 - 30 m from the limit of PSWs.

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- While grading is permanent, temporary encroachments into NHS buffers are necessary in a few specific locations. Vegetation loss has been minimized to the extent possible. These locations will be restored to existing or better conditions. Encroachment into the buffer of the PSW Complex and Significant Woodland has been reduced to only what is required to facilitate the proposed development.
- The woodlands and wetlands, including the West Credit River PSW Complex was staked and surveyed on July 5 and 19, 2021. Updated wetland boundaries for the PSW were sent to MNR following the feature staking (Darren Unger, Management Biologist, Guelph District). On May 18, 2022, Darren Unger (MNR Management Biologist) confirmed that the updates to the PSW Complex wetland boundaries had been approved and would be updated in LIO.

A comprehensive Environmental Constraints map (Figure 8) has been developed and is used to establish an appropriate limit of development and lot framework that supports an NHS.

- The diversity and connectivity of the NHS has been maintained and enhanced. To the extent possible, the internal roads within the subdivision were planned such that they do not fragment the NHS. At the north end of the site, a wildlife linkage will be maintained between the northern PSW Complex and the central woodland / PSW features, through the proposed development plan, where the SWM pond and park are located. The construction of the pond and park represents a significant “enhancement” to current conditions and will ensure that a vegetated linkage between the two features will be maintained (as opposed to residential lots, for example). Landscape plans will be provided during the detailed design stage. At the south end, the southern and central woodlands represent a linkage enhancement opportunity. A dedicated wildlife tunnel that will cross under Street ‘E’ has been proposed as compensation for the removal of the Confirmed Amphibian Movement Corridor, south of SAS1-1 (Confirmed SWH for Amphibian Breeding Habitat (Woodland) and Turtle Wintering Area). The design followed recommendations made in CVC’s Fish and Wildlife Crossing Guidelines (2017) and has proposed an at-grade ACO slotted tunnel that ensures the culvert length is kept as short as possible and allows ambient conditions ideal for the target species (reptiles and amphibians). Exclusion fencing will be used to guide wildlife to the crossing following the principles in CVC’s Fish and Wildlife Crossing Guidelines (2017).
- A FBWB risk assessment for the wetlands on site has been completed (see also DSEL’s FSR (2023) and Burnside’s Hydrogeological Assessment (2023). According to TRCA’s criteria used to evaluate the sensitivity of the wetland to hydrological change, the level of sensitivity for all three wetland locations was assessed as “high”.
 - Field investigations completed by Burnside (hydrogeology and ecology) included provision for field studies that supported a FBWB. The water balance analysis demonstrates that hydrological regimes and hydroperiods will be maintained in the post-development scenario; the post-development hydroperiod is sufficiently

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close to the pre-development hydroperiod to achieve protection of the wetlands, with minimal changes to deficit / surplus in post-development conditions. The EIS has integrated the results of relevant required studies and assessed any required mitigation options.

- Measures for minor and unavoidable impacts to achieve a low risk scenario for post-development water balance to the wetland features are feasible given the site constraints.
- A water balance can be achieved by implementing SWM practices, including LID measures, to maintain water balance to the wetlands. Net effects to wetlands from adjacent development will be reduced provided by the stormwater and LID measures described in the FSR (2023) and outlined in the Stormwater Management Planning and Design Manual (MOE, 2003) and CVC / TRCA's LID Stormwater Management Planning and Design Guide (2010).

The preliminary evaluation of potential environmental impacts and recommended mitigation measures has been completed in consideration of the proposed development activities (see Section 10.0). Overall, the proposed Draft Plan is in general agreement with applicable natural heritage legislation and policies, with additional refinement of the design and supporting mitigation measures anticipated during the development of the detailed design and through consultation with regulatory agencies.

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12.0 References

- Ainsley Group. 2018. Town of Erin Urban Centre Wastewater Servicing Class Environmental Assessment. April 2018.
- Armstrong and Dodge. 2007. Paleozoic geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release- Data 219.
- Bird Studies Canada (BSC). March 2001. Ontario Breeding Bird Atlas Guide for Participants. 45 pp.
- Bird Studies Canada (BSC). 2009. Marsh Monitoring Program Participants Handbook for Surveying Amphibians. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. 13 pp.
- B.M. Ross. 2014. Town of Erin Servicing and Settlement Master Plan Final Report.
- Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp.
- Canadensys. Accessed in 2021. Database of Vascular Plants of Canada (VASCAN). <https://data.canadensys.net/vascan/search>.
- Chapman, L.J. and Putnam, D.F. 1984. Physiography of Southern Ontario. Map P.2715 (coloured). Scale 1: 600 000.
- Committee on the Status of Species at Risk in Ontario (COSSARO). 2020. Ontario Species at Risk Evaluation Report for Monarch (*Danus plexippus* _ Eastern Subpopulation.
- Conservation Authorities Act. 1990. Royal Statutes of Ontario. Chapter C. 27.
- County of Wellington. September 2023. Official Plan.
- Credit Valley Conservation (CVC). 1998. West Credit River Subwatershed Plan. Town of Wellington.
- CVC and Ministry of Natural Resources (MNR). 2002a. Credit River Fisheries Management Plan. Aurora.
- CVC. 2002b. Plants of the Credit River Watershed.
- CVC. 2010. Watershed Planning and Regulation Policies.
- CVC & TRCA. 2010. Low Impact Development Stormwater Management Planning and Design Guide.
- CVC. 2014. Stormwater Management Planting Guidelines.
- CVC. 2017. Fish and Wildlife Crossing Guidelines.

Environmental Impact Study
June 2022 (updated October 2023)

- CVC. 2017. Healthy Soils Guideline for the Natural Heritage System.
- CVC. 2018. Plant Selection Guideline.
- CVC. 2020. Ecosystem Offsetting Guidelines.
- CVC. 2022. Stormwater Management Guideline.
- David Schaeffer Engineering Ltd. (DSEL). October 2023. Functional Servicing and Stormwater Management Report.
- Department of Fisheries and Oceans Canada (DFO). 2017. Aquatic Species at Risk Maps. Accessed online at: <http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/onsw-soon-22-eng.htm>.
- Dillon Consulting (Dillon). 2019. Town of Erin Growth Management Strategy.
- Endangered Species Act (ESA). 2007. Statutes of Ontario, Chapter 6.
- Fisheries Act. 1985. Royal Statutes of Canada, Chapter F-14.
- Government of Ontario. 2017. Greenbelt Plan.
- Grand River Conservation Authority (GRCA). 2018. Mapping of a Natural Heritage System in the County of Wellington. Final Report.
- Humphrey, C. (2017). Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry. Peterborough, Ontario. vii + 76 pp.
- Kasier, J. 2001. The Vascular Plant Flora of the Region of Peel and the Credit River Watershed.
- Korsiak Urban Planning. 2023. Preliminary Composite Lotted Plan (September 2023), and Draft Plan of Subdivision for 5520 Eighth Line (September 27, 2023) and 5552 Eighth Line (September 29, 2023).
- Kyle, J. and Reid, R. 2016. Farming with Grassland Birds - a guide to making your hay and pasture bird friendly.
- Lausen, C., and R. M. R. Barclay. 2002. Roosting behaviour and roost selection of female big brown bats (*Eptesicus fuscus*) roosting in rock crevices in southeastern Alberta. Canadian Journal of Zoology 80(6): 1069-1076.
- Lee, H.T, W.D. Bakowsky, J.L. 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 Region, Science Development and Transfer Branch. Technical Manual ELC-005.
- Lee et al. 2008. Ecological Land Classification for Southern Ontario - unpublished version.

Environmental Impact Study
June 2022 (updated October 2023)

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 + 88 pp.

Migratory Birds Convention Act. 1994. Statutes of Canada, Chapter 22.

Ministry of Environment (MOE). 2003. Stormwater Management Planning and Design Manual.

Ministry of Municipal Affairs and Housing (MMAH). 2020. Provincial Policy Statement (PPS) under the Planning Act.

Ministry of Natural Resources (MNR). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.

Ministry of Natural Resources and Forestry (MNR) Guelph District. April 2017. Survey Protocol for Species at Risk Bats within Treed Habitats. Guelph.

MNR Aurora District. 2016. Stormwater Management Pond Clean-out Best Management Practices. 6 pp.

MNR Guelph District. October 2014. Use of Buildings and Isolated Trees by Species at Risk Bats: Survey Methodology. Guelph.

MNR Peterborough District. January 2015a. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. Peterborough.

MNR. 2015b. Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario.

MNR. 2016a. Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario. April 2016.

MNR Guelph District. 2016b. Blanding's Turtle Nest and Nesting Survey Guidelines.

MNR. 2022. Natural Heritage Information Centre (NHIC). Data pertaining to natural areas and provincially significant species obtained online at:
<http://www.gisoeapp.lrc.gov.on.ca/web/MNR/NHLUPS/NaturalHeritage/Viewer/Viewer.html>.

Ministry of Transportation. 2009. Environmental Guide for Fish and Fish Habitat. June 2009.

Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (SWHTG) & Appendices. 151 pp.

OMNR. August 2013. Survey Protocol for Eastern Meadowlark (*Sturnella magna*) in Ontario. Species at Risk Branch, Peterborough. ii + 20 pp.

Region of Peel. 2019. Greenbelt Plan (2017) Peel 2041 Discussion Paper. 70 pp.

Region of Peel. 2014. Credit River Watershed & Region of Peel Natural Areas Inventory.

Environmental Impact Study
June 2022 (updated October 2023)

- R.J. Burnside & Associates Ltd. 2023. Hydrogeological Assessment – Langen Property.
- Species at Risk Act (SARA). 2002. Statutes of Canada, Chapter 29.
- Stanfield, L. W. 2017. Ontario Stream Assessment Protocol (OSAP). Ontario Ministry of Natural Resources. Peterborough, Ontario v10.
- Thompson, T. 2013. Roost Ecology of Eastern Small-Footed Bats (*Myotis leibii*) In the Southern Appalachian Mountains. Master's Thesis at Indiana State University.
- Toronto and Region Conservation Authority (TRCA). 2012. Stormwater Management Criteria - Appendix D – Water Balance Guidelines for the Protection of Natural Features.
- TRCA and Credit Valley Conservation (CVC). January 2014. Evaluation, Classification and Management of Headwater Drainage Features Guideline.
- TRCA. 2016. Wetland Water Balance Monitoring Protocol. September 2016.
- TRCA. 2017. Wetland Water Balance Risk Evaluation. November 2017.
- TRCA. 2019. Erosion and Sediment Control Guide for Urban Construction
- Town of Erin. 2023. Official Plan.
- Varga, S., Leadbeater, D., Webber, J., Kaiser, J., Crins, B., Kamstra, J., Banville, D., Ashley, E., Miller, G., Kingsley, C., Jacobsen, C., Mewa, K., Tebby, L., Mosley, E., and E. Zajc. 2000. Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources Aurora District. 103 pp.
- Watson and Associates. 2019. Wastewater Servicing Financing Options Study - Town of Erin.



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Terms of Reference

Ariana Burgener

From: Hosale, Lisa <Lisa.Hosale@cvc.ca>
Sent: Wednesday, July 07, 2021 3:35 PM
To: Hannah Maciver; Labrie, Sarah
Cc: Land Development Team - Ecology; Angela Sciberras; Paul Evans; Meagan Ferris; John Tjeerdsma; Ryan Oosterhoff
Subject: RE: [External] RE: CVC review of EIS TOR for Mattamy, 8th Line Erin (PD 20/199)

Hi Hannah,
Thank you, it does clarify on that point.
See you onsite tomorrow.

Best wishes,
Lisa

Lisa Hosale, MA, MSc, AICP

Planner, Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 268 | 1-800-668-5557 | C: 437-881-1737
lisa.hosale@cvc.ca | cvc.ca

From: Hannah Maciver <Hannah.Maciver@rjburnside.com>
Sent: Wednesday, July 7, 2021 2:58 PM
To: Hosale, Lisa <Lisa.Hosale@cvc.ca>; Labrie, Sarah <Sarah.Labrie@cvc.ca>
Cc: Land Development Team - Ecology <LandDevelopmentTeam-Ecology@rjburnside.com>; Angela Sciberras <sciberras@mshplan.ca>; Paul Evans <Paul.Evans@erin.ca>; Meagan Ferris <meaganf@wellington.ca>; John Tjeerdsma <JTjeerdsma@dsel.ca>; Ryan Oosterhoff <Ryan.Oosterhoff@mattamycorp.com>
Subject: RE: [External] RE: CVC review of EIS TOR for Mattamy, 8th Line Erin (PD 20/199)

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Hi Lisa,

To address the raptor surveys:

The "report" in the comment-response table refers to the EIS report. Sorry, I thought that I covered this off in the comment-response attached to the updated TOR, so I did not edit the table in the TOR. The EIS report will certainly speak to breeding raptors on-site based on observations collected during the 3 standard breeding bird surveys and other earlier spring surveys (i.e., turtle nesting surveys, bat leaf-off and leaf-on surveys). During detailed design there may be additional need to conduct targeted early spring surveys for raptors depending on our findings in the EIS.

I hope that clarifies things!

Thanks
Hannah

From: Hosale, Lisa <Lisa.Hosale@cvc.ca>
Sent: Tuesday, July 06, 2021 5:16 PM
To: Hannah Maciver <Hannah.Maciver@rjburnside.com>; Labrie, Sarah <Sarah.Labrie@cvc.ca>
Cc: Land Development Team - Ecology <LandDevelopmentTeam-Ecology@rjburnside.com>; Angela Sciberras <sciberras@mshplan.ca>; Paul Evans <Paul.Evans@erin.ca>; Meagan Ferris <meaganf@wellington.ca>; John Tjeerdsma <JTjeerdsma@dsel.ca>; Ryan Oosterhoff <Ryan.Oosterhoff@mattamycorp.com>
Subject: RE: [External] RE: CVC review of EIS TOR for Mattamy, 8th Line Erin (PD 20/199)

Hi Hannah,

Good afternoon- thank you for sending the revised EIS TOR and Table dated June 24 (attached). Sarah has reviewed, and we can confirm that it satisfies the comments from our June 3 email (copied below) and meeting on June 9. We do have one remaining point of clarification that we hope will be minor for you to address:

One thing missing is the note about potential raptor surveys needing to be done during detailed design. This was acknowledged in the Table but no wording to this effect was included in the EIS TOR. The Table indicates that the "report" will include raptor surveys, but we are unsure if the report you are intending to include it in is the EIS or the EIS TOR? Please do let us know your intention in this regard and/or if you have any questions regarding what we are looking to clarify here.

And to follow up from our conversation onsite yesterday, we wanted to let you know that CVC uses two documents to determine plant regional and local rarity, which you should use for this site. Of the two documents, Kaiser is the preferred document as it is specific to CVC's watershed. The EIS TOR should be updated to include reference to these two documents as appropriate. Also, please see the attached materials (5 pdfs) related to these two documents.

- Kaiser 2001. The Vascular Plant Flora of the Region of Peel and the Credit River Watershed.
- Varga 2000. Distribution and Status of the Vascular Plants of the Greater Toronto Area.

We also wanted to thank you for working with us onsite yesterday, and we look forward to returning to finish the site visit/staking with you and your team on July 8.

Best wishes,
Lisa

Lisa Hosale, MA, MSc, AICP

Planner, Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 268 | 1-800-668-5557 | C: 437-881-1737
lisa.hosale@cvc.ca | cvc.ca

From: Hannah Maciver <Hannah.Maciver@rjburnside.com>
Sent: Thursday, June 24, 2021 2:54 PM
To: Hosale, Lisa <Lisa.Hosale@cvc.ca>; Labrie, Sarah <Sarah.Labrie@cvc.ca>
Cc: Land Development Team - Ecology <LandDevelopmentTeam-Ecology@rjburnside.com>; Angela Sciberras <sciberras@mshplan.ca>; Paul Evans <Paul.Evans@erin.ca>; Meagan Ferris <meaganf@wellington.ca>; John Tjeerdsma <JTjeerdsma@dsel.ca>; Ryan Oosterhoff <Ryan.Oosterhoff@mattamycorp.com>
Subject: [External] RE: CVC review of EIS TOR for Mattamy, 8th Line Erin (PD 20/199)

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Hi Lisa and Sarah,

Please find attached our comment response for the Terms of Reference per your comments below (and our phone call on June 9). Appended to the memo is the updated TOR.

Thank you,
Hannah

Hannah Maciver, B.E.S.
Project Coordinator/Ecologist

R.J. Burnside & Associates Limited | www.rjburnside.com
Office: +1 800-265-9662 Direct: +1 226-486-1555

From: Hosale, Lisa <Lisa.Hosale@cvc.ca>

Sent: Thursday, June 03, 2021 4:53 PM

To: Hannah Maciver <Hannah.Maciver@rjburnside.com>; Angela Sciberras <sciberras@mshplan.ca>; Paul Evans <Paul.Evans@erin.ca>; Meagan Ferris <meaganf@wellington.ca>; John Tjeerdsma <JTjeerdsma@dsel.ca>

Cc: Jennifer Szczerbak <Jennifer.Szczerbak@rjburnside.com>

Subject: CVC review of EIS TOR for Mattamy, 8th Line Erin (PD 20/199)

Hi Hannah,

Good afternoon- that you for your patience as we finished review of the EIS TOR for the Mattamy proposal on 8th Line, Erin (PD 20/199). We look forward to meeting with you tomorrow to discuss our comments (below) and other aspects of the project, as well planning our upcoming site visit/feature staking. I cc'd colleagues at the Town and County as they are retaining an ecological consultant to review the EIS TOR from their perspective as well. Please do take CVC's comments, below, in context of the forthcoming Town/County review, and we are happy to have any meetings as necessary to integrate in that regard.

As a note, we understand that the submitted EIS TOR is scoped to the subdivision site itself, and that separate ecological studies would be proposed and scoped for the offsite infrastructure/road works along 8th Line (i.e. bridge/ROW widening) and Dundas St West (i.e. sanitary extension) as those would likely proceed under a separate (EA) process. We can discuss that at the meeting tomorrow as well.

CVC Comments

1. The EIS and concept plan are to demonstrate policy conformance (in line with all CVC, Town/County, and Greenbelt Plan policies) with respect to natural heritage features and buffers and ensure that landscape connectivity is maintained and enhanced through the establishment of a functional and connected Natural Heritage System with natural buffers. Compatible land uses should be planned to suit the sensitivities of the adjacent natural heritage feature.

a. A comprehensive constraints and opportunities map should be developed and be used to establish an appropriate limit of development and lot framework that supports a Natural Heritage System. The upcoming site visit/feature staking with CVC should form the basis of the constraints and opportunities map.

b. The Natural Heritage System on the subject lands will need to be protected and enhanced through this proposal. The EIS and Concept plan are to demonstrate no net loss to the NHS and preferably a net ecological gain.

c. Based on the concept plan there are areas of linkage between the southern and central woodlands that represent a linkage enhancement opportunity and should be pursued. The diversity and connectivity of NHF on the subject lands should be maintained, restored, and enhanced. Opportunities to retain and enhance these linkages should be demonstrated.

d. Buffers are to be in line with all CVC, Town/County, and Greenbelt Plan policies and be appropriate in width and treatment to protect the NHF from the adjacent land use change. Buffers are not to be included within the lot framework are to be established as a now-mowing areas with native self-sustaining vegetation.

2. As per the EIS TOR, it is agreed that a site visit/feature staking should occur in consultation with CVC and relevant agencies. Features identified should appear on the constraints and opportunities mapping and be used to determine buffers and a suitable limit of development:
 - a. Staking of toe of slope and/or top of bank and associated valley vegetation.
 - b. Staking of woodland limit.
 - c. Staking of any identified wetlands.
3. Please note that as a result of the proposed land use change there will be a requirement to complete a feature-based water balance risk assessment for the wetlands on site; results from the risk assessment will help to inform design decisions in achieving a post-construction hydrological balance that matches pre-construction conditions within key features (including an analysis as to whether larger buffer widths are required). CVC previously advised that the wetland features are to be retained and that the concept plan is to demonstrate that the water balance is maintained for all wetland features (no impacts to surface or groundwater flows). The EIS is to integrate the results of any relevant required studies (e.g. Hydrogeology, Stormwater) and assess any required mitigation options (e.g. LID). The EIS TOR should include provision for field studies that would support a feature-based water balance (e.g. seasonal groundwater elevations). Based on our initial review we advise that a feature-based water balance will likely be triggered for the proposal; given the amount of impervious surface change, drainage area to the wetlands may be impacted (>10% change) and SWM ponds are proposed directly adjacent to wetlands, etc.
4. The following are comments related to Table 2: Fieldwork proposed.
 - a. With regards to ELC please ensure that all ELC data cards are submitted as an appendix; the cards should clearly show the main 4 species within each vegetation layer including invasive species cover and type.
 - i. A full 3 season botanical inventory should occur coincident with ELC.
 - b. Bat Maternity Roost Surveys are proposed during leaf on and off conditions following Guelph MNRF protocol. Please note that for Significant Wildlife Habitat maternity colonies (silver haired and big brown bat) the evaluation method is to follow *Bats and Bat habitats: Guidelines for Wind Power Projects*. The MNRF 2017 Guide indicated is specifically for Species at Risk little brown myotis, northern myotis and tri colored bat, not SWH species.
 - i. Note that if full retention of bat habitat (forests, swamps) is proposed within the lot framework then the need for surveys could be scoped.
 - c. It is noted that only grassland breeding bird surveys are proposed. Please confirm if forest bird surveys are proposed to investigate significant wildlife habitat (e.g. area sensitive breeding birds, raptor nesting).
 - i. If full retention of candidate SWH (i.e. woodlands) is proposed within the proposed lot framework then the surveys could be scoped, however if encroachment is proposed (e.g. grading into the buffer) then surveys to assess the function of the woodland should be planned to assess this possible scenario and recommend appropriate buffers and/or mitigations.
 - ii. Please include observation information for all species detected during surveys including location, abundance, breeding evidence.
 - d. Please confirm the appropriate methodology used for the Structure Surveys for Barn Swallow, Chimney Swift and Bats. The timing window given indicates the surveys will occur prior to mid May, however, this is not the core breeding window for these species and detection may be low. A more appropriate window would be June 1 – July 31.
 - e. Please confirm and provide details on the methodology/protocol used for Aquatic Habitat Assessment as none is provided in the TOR (e.g. Ontario Stream Assessment Protocol).

5. The Criteria for Determining Significance, Sensitivity and Rarity of Features Found On-Site section should be updated to include the following:
 - a. The EIS TOR does not speak to assessing wetland significance in accordance with provincial criteria. There are Provincially Significant Wetlands (PSW) within the subject lands as well as unevaluated wetlands. The wetlands on site should be assessed for complexing in with the greater PSW. Wetlands are to be assessed and delineated according to the provincial Ontario Wetland Evaluation System by a qualified professional.
 - b. The evaluation of sensitives should include reference to completing the TRCA Wetland Water Balance Risk Evaluation to determine the sensitivities of the wetland communities. Field studies must ensure that the data collected is sufficient to utilize the document (e.g. full botanical inventory of wetlands).
 - c. When assessing natural heritage features for significance ensure that the most recent version of the PPS and Official Plan(s) is referenced (i.e. County of Wellington Official Plan 2021).
6. The Analysis and Recommendations section should include a discussion and recommendations for a monitoring plan (e.g. plant establishment, water levels, water quality, species habitat usage).
7. Ensure that the assessment of impacts and mitigation sections include an assessment of any proposed stormwater outfalls/infrastructure. Stormwater outfalls should be planned to avoid impacts to natural heritage features.
8. Internal roads within the subdivision should be planned such that they do not fragment the Natural Heritage System. Opportunities to incorporate fish and wildlife crossing should be demonstrated for all new road crossings as appropriate following recommendations made in the CVC Fish and Wildlife Crossing Guideline.
9. If a trail is proposed, it should be contained to the natural heritage feature buffer(s) and not be planned within the feature itself. Where trails are planned, buffers should be widened to accommodate the trail as well as continuing to provide buffer function (e.g. 15m to woodlands instead of 10m). Any crossing of NHF's should be planned at the narrowest portions.
10. Given the potential for Species at Risk to inhabit the subject property it is strongly recommended that the Ministry of Environment Conservation and Parks (sarontario@ontario.ca) be consulted to discuss permitting and survey requirements.
11. The subject property contains watercourses which provide direct fish habitat. It is the responsibility of the proponent to ensure that works, undertakings or activities do not cause the death of fish or cause the harmful alteration, disruption or destruction of fish habitat under the Fisheries Act. Please review the complete list of measures to avoid harm at <http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html> and implement those that are applicable to the proposed work. If it is not possible to avoid or mitigate impacts, proponents can submit a request for review form to their region's Fish and Fish Habitat Protection Program office (contact info: fisheriesprotection@dfo-mpo.gc.ca or 1 855 852-8320). Please refer to the Fisheries and Oceans Canada (DFO) website for additional information.
12. Please note that CVC has mapping for confirmed Significant Wildlife Habitat on the property. Please submit a formal data request (planning@cvc.ca) to CVC to obtain the data.

Thank you for submitting the EIS TOE for our review, and we look forward to meeting with you tomorrow.
Best wishes,
Lisa

Lisa Hosale, MA, MSc, AICP
Planner, Planning and Development Services | Credit Valley Conservation

905-670-1615 ext 268 | 1-800-668-5557 | C: 437-881-1737

lisa.hosale@cvc.ca | cvc.ca

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June 24, 2021

Via: Email

Ms. Lisa Hosale
Planner, Planning and Development Services
Credit Valley Conservation
1255 Old Derry Road
Mississauga ON L5N 6R4

Dear Ms. Hosale:

**Re: Langen Property (Mattamy), Town of Erin
CVC Review of EIS Terms of Reference, 8th Line Erin (PD 20/199)
Comment Response
Project No.: 300052075.0001**

Thank you for your comments we received via email on June 3, 2021 regarding the draft Terms of Reference for the EIS (dated April 28, 2021). We appreciated the conference call to discuss your comments on June 9, 2021. Our responses to your comments are provided in the table below. The updated Terms of Reference is enclosed.

Item No.	CVC Comment	Burnside Response
1. a.	<p>The EIS and concept plan are to demonstrate policy conformance (in line with all CVC, Town/County, and Greenbelt Plan policies) with respect to natural heritage features and buffers and ensure that landscape connectivity is maintained and enhanced through the establishment of a functional and connected Natural Heritage System with natural buffers. Compatible land uses should be planned to suit the sensitivities of the adjacent natural heritage feature.</p> <p>A comprehensive constraints and opportunities map should be developed and be used to establish an appropriate limit of development and lot framework that supports a Natural Heritage System. The upcoming site visit/feature staking with CVC should form the basis of the constraints and opportunities map.</p>	Acknowledged.
b.	<p>The Natural Heritage System on the subject lands will need to be protected and enhanced through this proposal. The EIS and Concept plan are to demonstrate no net loss to the NHS and preferably a net ecological gain.</p>	Acknowledged.
c.	<p>Based on the concept plan there are areas of linkage between the southern and central woodlands that represent a linkage enhancement opportunity and should be pursued. The diversity and connectivity of NHF on the subject lands should be maintained, restored, and enhanced. Opportunities to retain and enhance these linkages should be demonstrated.</p>	Acknowledged. During our fieldwork we will be looking at opportunities where linkages can be retained and / or enhanced where feasible and warranted.
d.	<p>Buffers are to be in line with all CVC, Town/County, and Greenbelt Plan policies and be appropriate in width and treatment to protect the NHF from the adjacent land use change. Buffers are not to be included within the lot framework are to be established as a now-mowing areas with native self-sustaining vegetation.</p>	Acknowledged.
2.	<p>As per the EIS TOR, it is agreed that a site visit/feature staking should occur in consultation with CVC and relevant agencies. Features identified should appear on the constraints and opportunities mapping and be used to determine buffers and a suitable limit of development:</p> <ul style="list-style-type: none"> • Staking of toe of slope and / or top of bank and associated valley vegetation; • Staking of woodland limit; and • Staking of any identified wetlands. 	Acknowledged. Feature staking has been scheduled with CVC for July 5 and July 8, 2021.
3.	<p>Please note that as a result of the proposed land use change there will be a requirement to complete a feature-based water balance risk assessment for the wetlands on site; results from the risk assessment will help to inform design decisions in achieving a post-construction hydrological balance that matches pre-construction conditions within key features (including an analysis as to whether larger buffer widths are required). CVC previously advised that the wetland features are to be retained and that the concept plan is to demonstrate that the water balance is maintained for all wetland features (no impacts to surface or groundwater flows). The EIS is to integrate the results of any relevant required studies (e.g. Hydrogeology, Stormwater) and assess any required mitigation options (e.g. LID). The EIS TOR should include provision for field studies that would support a feature-based water balance (e.g. seasonal groundwater elevations). Based on our initial review we advise that a feature-based water balance will likely be triggered for the proposal; given the amount of impervious surface change, drainage area to the wetlands may be impacted (>10% change) and SWM ponds are proposed directly adjacent to wetlands, etc.</p>	Acknowledged.

Item No.	CVC Comment	Burnside Response
4. a. i.	<p>The following are comments related to Table 2: Fieldwork proposed.</p> <p>With regards to ELC please ensure that all ELC data cards are submitted as an appendix; the cards should clearly show the main four species within each vegetation layer including invasive species cover and type.</p> <p>A full 3 season botanical inventory should occur coincident with ELC.</p>	<p>As discussed, only one visit for ELC confirmation and botanical survey was scoped. Spring inventories capture spring woodland ephemerals and would not provide additional info on the non-woodland communities where impacts are proposed. We have existing botanical surveys from 2016 (previous work that was undertaken on the site) but we do not have actual dates; however, we can infer that the botanical surveys were undertaken in from spring/early summer, and in late summer based on the species list - spring ephemerals (spring), sedges (June), grasses (late June/July), asters (August-October), goldenrods (August-October) and rare plant species were listed. Site confirmation of the 2016 ELC was completed by RJB in June 2020. It is suggested that the remaining ELC/botanical survey (including an inventory of wetland plants for the feature-based water risk assessment) will be completed in late June/early July to capture the time period when habitat indicator plants (i.e. wetland plants, ferns, grasses, and sedges) will be most established and possessing key morphological features (e.g. flowers, soria, perigynia, seeds, full leaf out).</p> <p>We have reviewed the TRCA Wetland Water Balance Risk Evaluation (2017) and it does not require a 3-season inventory for wetland plants as part of the risk assessment. However, botanical surveys of the wetland units will be collected for the risk assessment.</p> <p>If impacts are proposed for SWM outlets, grading, etc. further studies are recommended during detailed design and would be included in the report.</p>
b. i.	<p>Bat Maternity Roost Surveys are proposed during leaf on and off conditions following Guelph MNRF protocol. Please note that for Significant Wildlife Habitat maternity colonies (silver haired and big brown bat) the evaluation method is to follow <i>Bats and Bat habitats: Guidelines for Wind Power Projects</i>. The MNRF 2017 Guide indicated is specifically for Species at Risk little brown myotis, northern myotis and tri colored bat, not SWH species.</p> <p>Note that if full retention of bat habitat (forests, swamps) is proposed within the lot framework then the need for surveys could be scoped.</p>	<p>As discussed, currently the forested ecosites in the study area will be retained as they are all protected under the NHS or Environmental Protection/Core Greenlands designations; only hedgerows will be removed. However, intrusions into the NHS may be required for SWM outfalls, grading, etc. and additional surveys for these areas would be necessary during the detailed design stage once impacts are better understood. Hand-held acoustic monitoring and stationary monitoring in June will be located at key stations (based on the results of the leaf-on and leaf-off surveys) that include the perimeter of the wooded NHS in the southern half of study area; from our stationary acoustic monitoring results we will be able to infer likelihood of presence / absence of Silver-haired and Big Brown Bat, if they are detected.</p> <p>Given that actual bat maternity roosting sites are notoriously difficult to confirm, our analysis of Significant Wildlife Habitat will also ensure that at minimum any forested ecosites are designated as "Candidate [or Confirmed if these species are detected] Significant Wildlife Habitat" for Bat Maternity Colonies to acknowledge these features as potential habitat for Silver-haired Bat and Big Brown Bat.</p>

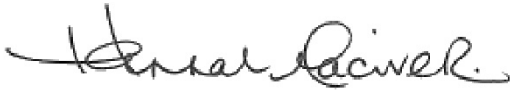
Item No.	CVC Comment	Burnside Response
c.	It is noted that only grassland breeding bird surveys are proposed. Please confirm if forest bird surveys are proposed to investigate significant wildlife habitat (e.g. area sensitive breeding birds, raptor nesting).	<p>The TOR states that “Breeding Bird <u>and</u> Grassland SAR Bird Surveys (Bobolink and Eastern Meadowlark)” will be completed, which would include any other breeding birds observed (i.e., raptors, forest birds). The TOR also states that “Breeding bird surveys would incorporate observations of all SAR birds (i.e., Eastern Meadowlark, Bobolink, Barn Swallow, Chimney Swift).” Standard breeding bird surveys will be completed on the same dates as the targeted grassland surveys; this will ensure that all features will be surveyed for breeding birds. The species list will include a column that identifies “area-sensitive” breeding birds.</p> <p>Habitat for raptors may be present in the study area, in forested ecosites or mature hedgerows. Breeding raptor surveys are typically completed in early spring (end of April to early May). While these surveys were not included in the TOR, if raptors are nesting in the study area they should at least be detected during the standard breeding bird surveys since most species (including fledged young) would still be on territory during the survey window. The location of any stick nests will also be noted. Of the species listed from the OBBA records, the following comments apply:</p> <ul style="list-style-type: none"> • Cooper’s Hawk and Sharp-shinned Hawk young usually fledge in July. • Broad-winged Hawk initiates nesting relatively later than other raptors. • While Red-tailed Hawk nest earlier in the season, they are very conspicuous near the nest site and when the young have fledged. The young remain near the nest site for nearly a month after fledging. Earlier surveys for turtle basking surveys will also assist in detecting any presence of breeding raptors in the study area. <p>The report will acknowledge that future early spring raptor surveys may be required during detailed design, if intrusions into candidate breeding habitat are proposed, to ensure that any confirmed raptor nesting habitat is protected.</p>
i.	If full retention of candidate SWH (i.e. woodlands) is proposed within the proposed lot framework then the surveys could be scoped, however if encroachment is proposed (e.g. grading into the buffer) then surveys to assess the function of the woodland should be planned to assess this possible scenario and recommend appropriate buffers and/or mitigations.	Acknowledged.
ii.	Please include observation information for all species detected during surveys including location, abundance, breeding evidence.	Acknowledged. The TOR states: “Identification and characterization of wildlife habitats and incidental wildlife observations” during all surveys.
d.	Please confirm the appropriate methodology used for the Structure Surveys for Barn Swallow, Chimney Swift and Bats. The timing window given indicates the surveys will occur prior to mid-May, however, this is not the core breeding window for these species and detection may be low. A more appropriate window would be June 1 – July 31.	The structure surveys are intended as an initial reconnaissance to quantify number of structures and to identify 1) potential habitat for Barn Swallow nesting and Chimney Swift habitat (assessing for capped/sealed chimneys); 2) potential habitat for bats (i.e., exit points). The TOR states, “Findings are to determine what (if any) further studies are required during the breeding season.” The structure surveys are meant to inform what types of surveys are needed in the appropriate windows for those species (i.e., final Barn Swallow nest count during the nesting season, Chimney Swift roosting surveys, bat exit surveys, etc.).

Item No.	CVC Comment	Burnside Response
e.	Please confirm and provide details on the methodology/protocol used for Aquatic Habitat Assessment as none is provided in the TOR (e.g. Ontario Stream Assessment Protocol).	Our approach to aquatic habitat assessments for land development projects usually pull from a variety of protocols; OSAP as a standalone protocol typically, doesn't provide sufficient detail to support the requisite provincial and federal permitting requirements. In addition, the Credit River (Erin Branch) does not flow within the subject lands, and would require land access from adjacent landowners. As such, Burnside will complete an aquatic habitat assessment using Burnside's Standard Operating Procedures (SOP's), based on the Ministry of Transportation Environmental Guide for Fish and Fish Habitat (2009) (The Guide), immediately upstream and downstream of Sideline 27, in the vicinity of the proposed stormwater outfall location. Supplemental assessment details, such as channel morphology measurements, transects, substrates composition, channel geomorphic units, and documentation of limiting or critical habitat features may also be recorded, pending site conditions during the assessment. Given the extensive sampling within the watercourse, and an established fish community assemblage, fish sampling is not proposed during the assessment.
5. a.	The Criteria for Determining Significance, Sensitivity and Rarity of Features Found On-Site section should be updated to include the following: The EIS TOR does not speak to assessing wetland significance in accordance with provincial criteria. There are Provincially Significant Wetlands (PSW) within the subject lands as well as unevaluated wetlands. The wetlands on site should be assessed for complexing in with the greater PSW. Wetlands are to be assessed and delineated according to the provincial Ontario Wetland Evaluation System by a qualified professional.	Our approach would be to classify all communities using ELC; however, our botanist is also certified in the OWES system and can translate ELC to OWES codes for the figures. Any unevaluated wetlands within 750 m of the existing PSW will be assessed under the OWES system protocols for their potential to be complexed into the existing PSW (based on the OWES system that states "any wetland within the same watershed and 750 m of a PSW may be added to the PSW complex by amending the wetland file"). We have notified MNRF (Darren Unger, Management Biologist, Guelph District) of the feature staking scheduled for July 5 and 8, 2021. Updated wetland boundaries (if appropriate) will be sent to MNRF following the feature staking.
b.	The evaluation of sensitivities should include reference to completing the TRCA Wetland Water Balance Risk Evaluation to determine the sensitivities of the wetland communities. Field studies must ensure that the data collected is sufficient to utilize the document (e.g. full botanical inventory of wetlands).	Acknowledged; we have updated the TOR with this additional wording.
c.	When assessing natural heritage features for significance ensure that the most recent version of the PPS and Official Plan(s) is referenced (i.e. County of Wellington Official Plan 2021).	Acknowledged.
6.	The Analysis and Recommendations section should include a discussion and recommendations for a monitoring plan (e.g. plant establishment, water levels, water quality, species habitat usage).	Acknowledged. We have updated the TOR with this additional wording.
7.	Ensure that the assessment of impacts and mitigation sections include an assessment of any proposed stormwater outfalls/infrastructure. Stormwater outfalls should be planned to avoid impacts to natural heritage features.	Acknowledged.
8.	Internal roads within the subdivision should be planned such that they do not fragment the Natural Heritage System. Opportunities to incorporate fish and wildlife crossing should be demonstrated for all new road crossings as appropriate following recommendations made in the CVC Fish and Wildlife Crossing Guideline.	Acknowledged.

Item No.	CVC Comment	Burnside Response
9.	If a trail is proposed, it should be contained to the natural heritage feature buffer(s) and not be planned within the feature itself. Where trails are planned, buffers should be widened to accommodate the trail as well as continuing to provide buffer function (e.g. 15m to woodlands instead of 10m). Any crossing of NHF's should be planned at the narrowest portions.	Acknowledged.
10.	Given the potential for Species at Risk to inhabit the subject property it is strongly recommended that the Ministry of Environment Conservation and Parks (sarontario@ontario.ca) be consulted to discuss permitting and survey requirements.	Initial consultation has been completed (Lisa McShane, Management Biologist, SAR Branch); further consultation will occur if any SAR are confirmed, or Notice of Activity under the Regulations, whichever applies.
11.	The subject property contains watercourses which provide direct fish habitat. It is the responsibility of the proponent to ensure that works, undertakings or activities do not cause the death of fish or cause the harmful alteration, disruption or destruction of fish habitat under the Fisheries Act. Please review the complete list of measures to avoid harm at http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html and implement those that are applicable to the proposed work. If it is not possible to avoid or mitigate impacts, proponents can submit a request for review form to their region's Fish and Fish Habitat Protection Program office (contact info: fisheriesprotection@dfo-mpo.gc.ca or 1 855 852-8320). Please refer to the Fisheries and Oceans Canada (DFO) website for additional information.	Acknowledged.
12.	Please note that CVC has mapping for confirmed Significant Wildlife Habitat on the property. Please submit a formal data request (planning@cvc.ca) to CVC to obtain the data.	Yes, we will need to obtain this information from CVC. We have sent a request, per your instructions.

Yours truly,

R.J. Burnside & Associates Limited



Hannah Maciver
Project Coordinator / Ecologist
HM:sp

Enclosure(s) EIS Terms of References dated April 28, 2021 (updated June 24, 2021)

cc: Ryan Oosterhoff, Mattamy (enc.) (Via: Email)
 John Tjeerdsma, DSEL (enc.) (Via: Email)
 Meagan Ferris, County of Wellington (enc.) (Via: Email)
 Angela Sciberras, Macaulay Shiomi Howson Ltd. (Town of Erin) (enc.) (Via: Email)

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April 28, 2021 (updated June 24, 2021)

Via: Email

Ms. Lisa Hosale
Planner
Credit Valley Conservation
1255 Old Derry Road
Mississauga ON L5N 6R4

Dear Ms. Hosale:

**Re: Environmental Impact Study Terms of Reference
Langen Property (Mattamy), Town of Erin, Ontario
Project No.: 300052075.0001**

1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by Mattamy (Erin) Limited (Client) to conduct an Environmental Impact Study (EIS) for a future development located at the southwest corner of Sideroad 17 and Eighth Line (herein referred to as the 'subject lands'), shown on Figure 1. The EIS will accompany the development application. The subject lands are in the Town of Erin (Town), County of Wellington and in the jurisdiction of Credit Valley Conservation (CVC). This letter provides the proposed Terms of Reference (TOR) for the EIS in support of a Draft Plan of Subdivision Application. At this time, we are seeking your input and would appreciate any comments on our approach, as well as any additional information you may have that is relevant to our study (i.e., we will also be circulating the Town and County for their review and approval).

The preliminary Draft Plan proposed is for the development of residential lands with an internal road network, stormwater features and open space features resulting from retained natural features and their buffers. CVC will be requested to attend a site visit with Burnside ecologists to determine the limits of the woodland and wetlands on-site. The development team will determine appropriately sized buffers based on natural feature characteristics and ecological functions, as well as applicable policies.

The subject lands are currently comprised of active crop agriculture and rural residential lands. Also found on, or adjacent to the subject lands, are natural and naturalized features that are comprised of coniferous and deciduous hedgerows, coniferous forest, mixed forest, deciduous forest, coniferous plantation, swamp, open water, marsh and meadow vegetation communities. A branch of the West Credit River flows through the rural residential property to the north and east of the subject lands. A portion of the West Credit River Provincially Significant Wetland Complex is also present on the subject lands. Many of these natural features are contained with the Natural Heritage System (NHS) designation.

The TOR are organized as follows:

- Part I: Summary of Background Secondary Source Information.
- Part II: Proposed EIS Methodology, including:
 - Fieldwork methodology.
 - Criteria for evaluating the significance, sensitivity, and rarity of features on, and in the vicinity of the subject lands.
 - Analysis and recommendations.
 - Reporting.
- Part III: Information Requests.

2.0 Environmental Field Study Framework

Part I: Background Secondary Source Information

Burnside has reviewed the following existing data sources prior to the start of the 2021 field investigations:

- Recent digital aerial photography;
- Ontario Base Mapping;
- Ministry of Natural Resources and Forestry (MNR) Make a Map: Natural heritage Areas to identify natural heritage features and Natural Heritage Information Centre (NHIC) data of rare wildlife species on, and in the vicinity of, the subject lands;
- MNR Land Information Ontario (LIO) database;
- MNR Aquatic Resource Area (ARA) summary data;
- Ontario Hydrology Network (OHN) mapping;
- CVC regulated areas and features mapping;
- West Credit River Subwatershed Study Characterization Report (January 1998);
- Credit River Watershed and Region of Peel Natural Areas Inventory (2011-2020);
- The Ontario Breeding Bird Atlas (OBBA) for records of breeding birds in the area;
- The Ontario Reptile and Amphibian Atlas (ORAA) for records of reptiles and amphibians in the area;
- iNaturalist records;
- eBird records;
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk (SAR) mapping;
- MNR Aquatic Resource Area (ARA) data;
- Town of Erin Official Plan (2004; with Modifications and Applications to May 2012);
- Town of Erin Growth Management Strategy (Dillon Consulting, October 2019); and
- County of Wellington Official Plan (2021).

Based on this review, the following applicable environmental policies and legislative framework is summarized in Table 1.

Table 1: Applicable Environmental Policies and Legislative Framework

Policy or Guidance Document	Land Use Designations and / or Applicable Policies
Fisheries Act, 1985	Construction activities that have the potential to impact fish, or fish habitat, must be built and operated in compliance with the federal Fisheries Act.
Fisheries and Oceans Canada (DFO)	If the “death of a fish by means other than fishing”, or the “harmful alteration, disruption or destruction of fish habitat” is likely to occur as a result of the project, the proponent responsible for the activities is required to obtain an Authorization from DFO as per Paragraphs 34.4(2) and 35(2)(b) of the Fisheries Act.
Migratory Birds Convention Act, 1994	The legislation protects certain species and the “incidental take” of migratory birds; the disturbance, destruction or taking of the nest of a migratory bird is prohibited.
Species at Risk Act, 2002	The Act provides protection for federally listed Species at Risk (SAR) and their habitat. SARA prohibitions may pertain to private lands for certain aquatic species, birds and other species if provincial/territorial legislation or voluntary measures do not adequately protect the species and its habitat.
Endangered Species Act, 2007	<p>The Act provides protection for SAR and their habitat. The ESA is now administered by the Ministry of the Environment, Conservation and Parks (MECP) and provides policies for the protection of Extirpated, Endangered and Threatened species, as well as species of Special Concern.</p> <p>Background records indicate the potential for SAR, on or adjacent to the subject lands, including but not limited to: Butternut, Monarch, Barn Swallow, Bank Swallow, Eastern Wood-pewee, Bobolink, Eastern Meadowlark, Chimney Swift, Wood Thrush, Monarch, Snapping Turtle, Western Chorus Frog, and SAR Bats (Little Brown Myotis, Northern Myotis, and Tri-colored Bat).</p>
Provincial Policy Statement (PPS) (2020) under the Planning Act (1990)	All planning decisions are required to be consistent with the applicable provisions of the PPS.

Policy or Guidance Document	Land Use Designations and / or Applicable Policies
Greenbelt Plan (2017)	<p>Applicable policies:</p> <ul style="list-style-type: none"> • Protected Countryside; • Settlement Areas; and • Natural Heritage System.
A Place to Grow: Growth Plan for the Greater Golden Horseshoe (GGH) (2020)	<p>Building upon the policy foundation in the PPS, the Plan provides growth management policy direction for the GGH, which includes Wellington County. It provides additional and more specific land use planning policies for this geographic area.</p>
County of Wellington Official Plan (January 8, 2021 Consolidation)	<p>Applicable policies:</p> <ul style="list-style-type: none"> • Town of Erin Settlement Area; • Erin Urban Centre; • Secondary Agricultural; • Greenbelt Protected Countryside; • Greenlands System: <ul style="list-style-type: none"> – Greenlands (Significant Woodlands). – Core Greenlands (PSW).
County of Wellington's Conservation and Sustainable Use of Woodlands By-law 5115-09	<p>Applies to tree removal on private lands. A County permit is required before the cutting or destruction of trees in a forested area greater than 1 ha (woodlands).</p>
Town of Erin Official Plan (2004; with Modifications and Applications to May 2012)	<p>Applicable Policies:</p> <ul style="list-style-type: none"> • Residential; • Environmental Protection (EP) 1 and 2; and • Greenlands and Core Greenlands.
Town of Erin Growth Management Strategy (Dillon Consulting, October 2019)	<p>Subject lands fall under Potential Development Area C (priority area to direct growth subject to future wastewater servicing). Figures 9 and 10 identify natural heritage features and constraints as well as slope risks associated with valleylands.</p>
CVC Regulated Areas (Ontario Regulation 160/06) under Section 28 of the Conservation Authorities Act	<p>Lands regulated by CVC on the subject lands include:</p> <ul style="list-style-type: none"> • Wetlands (unevaluated); • West Credit River Provincially Significant Wetland (PSW) Complex; • Watercourses; • Floodplains / Hazard lands; and • Headwater Drainage Features.

Policy or Guidance Document	Land Use Designations and / or Applicable Policies
CVC Watershed Planning and Regulation Policies (WPRP) (2010)	Provides CVC’s updated watershed planning and regulation policies. These policies provide the parameters against which CVC administers Ontario Regulation 160/06.

Part II: Proposed EIS Methodology

We understand that an EIS is required to support the approval and implementation of a Draft Plan of Subdivision. Prior to finalizing, environmental constraints must be delineated. Detailed field studies will be required to complete the EIS. As well, on-site limits of NHS features, such as woodlands and wetlands, will be delineated for future feature staking with the agencies.

Features identified will appear on the constraints and opportunities mapping and be used to determine buffers and a suitable limit of development:

- Staking of toe of slope and / or top of bank and associated valley vegetation;
- Staking of woodland limit; and
- Staking of any identified wetlands.

Field investigations, in combination with background information obtained from the natural heritage databases and consultation with Agencies (i.e., MNRF, MECP, CVC), will be used to undertake a screening for potential SAR habitat as well as Significant Wildlife Habitat (SWH).

Fieldwork Methodology

Burnside’s proposed methodology is summarized in Table 2 below. **It should be noted that to avoid missing any key timing windows for surveys in 2021, some of the fieldwork has already commenced.**

Table 2: Fieldwork Proposed in 2021

Survey Type	Fieldwork Requirements	Location	Survey Timing Window
Headwater Drainage Feature Assessments	<ul style="list-style-type: none"> • Field investigations following CVC and TRCA Headwater Drainage Feature Guidelines (Finalized January 2014). 	Subject lands.	Up to three site visits, between late March and August 2021.
Amphibian Breeding Call Surveys	<ul style="list-style-type: none"> • Three surveys, following Marsh Monitoring Program Participant’s Handbook for Surveying Amphibians (Bird Studies Canada), for wetland/watercourse features potentially impacted by the proposed development. 	All ponds and wetlands present on the subject lands.	Three surveys from April to June 2021, as detailed in the Marsh Monitoring protocol.

Survey Type	Fieldwork Requirements	Location	Survey Timing Window
<p>Turtle Overwintering / Basking Surveys</p>	<p>Surveys to be completed, generally following the MNRF Survey Protocol for Blanding's Turtle in Ontario (2015) for visual encounter surveys.</p> <p>Five surveys completed after ice cover has melted on warm, sunny days, spread over a minimum of three weeks.</p> <p>Supplemental observations during all other site visits.</p>	<p>All ponds and wetlands present on the subject lands.</p>	<p>After ice cover has melted and no later than June 15.</p>
<p>Species at Risk Structure Surveys (Reconnaissance)</p>	<p>Initial inspection of exterior and interior of structures to assess habitat suitability for Barn Swallow, Chimney Swift and SAR bats.</p> <p>Findings will determine what (if any) further studies are required during the breeding season.</p>	<p>All farm / industrial-related structures, and any chimneys located on the subject lands.</p>	<p>Early spring (prior to mid-May).</p>
<p>Butternut Survey</p>	<p>Survey for the location of Butternut trees throughout subject lands.</p> <p>Once all Butternut are located, a Butternut Health Assessment, reporting and permitting may be necessary.</p>	<p>Subject lands and 50 m into the NHS lands.</p>	<p>Leaf-on period, as defined in MNRF guidelines (May 15 to August 31, 2021).</p> <p>(To be completed at the same time as the ELC/Botanical survey).</p>

Survey Type	Fieldwork Requirements	Location	Survey Timing Window
Candidate Maternity Roost Surveys (Species at Risk and SWH bats)	Leaf-off and Leaf-on surveys for candidate maternity roosting habitat, following the Guelph MNRFP protocol (April 2017), in treed ecosites potentially impacted by the development. Candidate SWH for bats will also be identified.	Treed ecosites and areas where trees greater than 25 cm DBH are present.	During leaf-off period (before May 15) and leaf-on period, (before October 15).
Turtle Nesting Surveys	Surveys to be completed, generally following the MNRFP Survey Protocol for Blanding’s Turtle in Ontario (2015) for nesting surveys. Six evening and/or daytime surveys within all areas suitable for nesting (i.e., friable soils dominated by sand and gravel and exposed to sun and warmth).	Upland areas adjacent to wetland ecosites on the subject lands.	To commence when the first sign of Midland Painted Turtle or Snapping Turtle nesting in the area has begun and continue for three weeks.
Standard Breeding Bird Surveys and Grassland SAR Bird Surveys (Bobolink and Eastern Meadowlark)	Assume three surveys to be completed to capture all breeding birds (forest, wetland grassland, etc.); surveys for grassland SAR birds will follow the MNRFP Survey Protocol for Eastern Meadowlark (2013). Breeding bird surveys will incorporate observations of all SAR birds (i.e., Eastern Meadowlark, Bobolink, Barn Swallow, Chimney Swift).	Subject lands.	Between May 21, 2021, and July 3, 2021. Surveys should be conducted between dawn and 10:00 a.m.
ELC and identification of rare species	Site confirm ELC. Following ELC for southern Ontario (Lee et al., 1998). Compilation of a plant inventory list. All ELC data cards will be submitted as an appendix; the cards will clearly show the main four species within each vegetation layer including invasive species cover and type.	Subject lands and 50 m into adjacent lands.	June to September 2021. (To be completed at the same time as the Butternut survey).

Survey Type	Fieldwork Requirements	Location	Survey Timing Window
Species at Risk Bat Acoustic Monitoring	<p>MNRF Guelph District (April 2017). The fieldwork requirements will be determined by the results of the Leaf-off and Leaf-on surveys.</p> <p>Candidate SWH for Silver-haired Bat and Big Brown Bat will also be identified based on results of acoustic surveys.</p>	<p>The location of acoustic monitoring will be determined by the results of the Leaf-off and Leaf-on surveys and significant woodland features present on the subject lands that may be Candidate SWH for bats.</p>	<p>June 2021.</p>
Aquatic Habitat Assessment	<p>One aquatic habitat assessment of the tributary and ponds. Assessment will use Burnside's Standard Operating Procedures (SOP's), based on the Ministry of Transportation Environmental Guide for Fish and Fish Habitat (2009) (The Guide).</p>	<p>Subject lands.</p>	<p>May to August 2021.</p>
Identification and characterization of wildlife habitats and incidental wildlife observations.	<p>Recording features present that may be considered wildlife habitat such as:</p> <ul style="list-style-type: none"> • Dens; • Reptile hibernacula; • Structures; • Uncapped chimneys; and • Foundations. <p>Observations will be recorded during all site visits.</p>	<p>Subject lands and adjacent natural heritage features, where accessible.</p>	<p>All field surveys 2021.</p>

Criteria for Determining the Significance, Sensitivity and Rarity of Features Found On-site.

In accordance with the Natural Heritage Reference Manual (NHRM) (MNR, 2010), habitats of endangered and threatened species are identified and evaluated based on provincial criteria. Burnside will consult with MECP to ensure that the appropriate criteria are utilized, including species-specific habitat regulations and guidance material.

By contrast, the identification and evaluation of Significant Woodlands and Significant Wildlife Habitats are undertaken at the local and/or regional planning level, using landscape level data and criteria from the NHRM as well as supporting policy documents, such as Official Plans and CVC's Watershed Planning and Regulation Policies. Preliminary ELC communities have been identified by Burnside (2020) and will be site-confirmed in 2021.

Significant Wildlife Habitat (SWH) will be evaluated based on the criteria for Ecoregion 6-E (MNR, 2015). Species rarity will be based on:

- Species' status under the Endangered Species Act, 2007 and Species at Risk Act, 2002.
- Species' S-rank as provided on the NHIC database.
- Rarity for Wellington and Dufferin Counties as listed in The Distribution and Status of the Vascular Plants of Central Region (Riley et al., 1989).
- Dougan & Associates 2009. Significant Plant List for Wellington County. City of Guelph Natural Heritage Study, Appendix A.
- Frank, R and A. Anderson. 2009. The Flora of Wellington County. Wellington County Historical Society.
- Rarity for the Credit River Watershed as listed in CVC. 2002. Plants of the Credit River Watershed.

Wetland significance will be assessed in accordance with provincial criteria. There are PSW within the subject lands as well as unevaluated wetlands. The unevaluated wetlands on site will be assessed for complexing in with the greater PSW. Wetland communities will be classified using ELC. Lorraine Adderley, who is trained in both the ELC and the Ontario Wetland Evaluation System (OWES) systems, will provide OWES vegetation codes for the figures. Any unevaluated wetlands within 750 m of the existing PSW will be assessed under the OWES system protocols for their potential to be complexed into the existing PSW (based on the OWES system that states "any wetland within the same watershed and 750 m of a PSW may be added to the PSW complex by amending the wetland file).

Our EIS will make a recommendation for each wetland unit, as to whether it should be added to the PSW complex according to OWES guidelines. This will be forwarded to the local MNR district office for their review. A Wetland Water Balance Risk Evaluation per TRCA's guidelines (2017) will be required to determine the sensitivities of the wetland communities. Field studies will ensure that the data collected is sufficient to utilize the document (i.e., full botanical inventory of wetlands, fauna records).

Analysis and Recommendations

The EIS will provide an analysis of potential impacts, recommend mitigation measures to minimize impacts and demonstrate conformity with all applicable natural heritage policies.

Specifically, the EIS will include the following:

- A demonstration that the development meets the requirements of the Town and County Official Plans, and the PPS, as well as any other relevant policies and regulations.
- Identification of the significance of natural features at a Provincial and Regional level, with reference to standard information sources from the Province and CVC.
- Identification of the significance of natural features according to the Official Plans.
- Identification of the environmental features potentially impacted by development.

- A general description of the proposed development.
- A demonstration of how and where the proposed development can proceed without negative impact on the NHS and features and their ecological functions, and identification of mitigation and enhancement measures, where necessary.
- Quantification of impacts to any features within the natural heritage system that may result from the proposed development.
- Identification of mitigation and enhancement measures, where necessary. This will include an assessment of any proposed stormwater outfalls/infrastructure.
- Opportunities to incorporate fish and wildlife crossing will be demonstrated for all new road crossings following recommendations made in the CVC Fish and Wildlife Crossing Guidelines (2017).
- Recommendations for an environmental monitoring plan (e.g., plant establishment, water levels, water quality, species habitat usage).

Reporting

All findings will be summarized in a report, complete with figures. The locations of all provincially significant species, and / or habitat encountered, will be recorded using GPS and included on the figures (excepting those classified by MNRF/MECP as Restricted Species). Locally rare species will also be recorded in the ELC unit in which they are found.

Part III: Information Requests

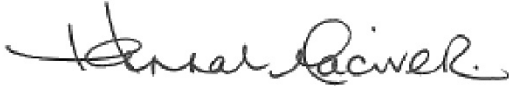
As part of the background review, Burnside will be submitting information requests to provincial agencies, including MECP and MNRF. We request the following information from CVC to assist in our study, if available:

- A copy of any locally rare species lists, or comment on which locally rare species list is preferred, to assist with the assessment of species significance and rarity.
- Any additional records of natural features, flora, or fauna in the area. Digital mapping would be preferred.
- Fish sampling locations (e.g., fish dot mapping) along with sample dates and species occurrence records for water bodies that are located within the study area.
- Confirmed and/or potential spawning / rearing / foraging habitat locations.
- Flow and temperature data.
- Thermal regime classifications.
- CVC Regulation mapping, including a breakdown of the features contributing to the Regulation Limit (i.e., floodplain, steep slopes, etc.). Digital mapping would be preferred.

This updated Terms of Reference reflects comments received from CVC on June 3, 2021. If you have any questions or comments regarding these Terms of Reference, please feel free to contact me at 519-820-2562 (hannah.maciver@rjburnside.com).

Yours truly,

R.J. Burnside & Associates Limited



Hannah Maciver, B.E.S.
Project Coordinator / Ecologist
HM:sp

Enclosure(s) Figure 1 – Study Area

cc: Ryan Oosterhoff, Director, Land Development, Mattamy (Erin) Limited (enc.) (Via: Email)
 John Tjeerdsma, DSEL (enc.) (Via: Email)
 Meagan Ferris, County of Wellington (enc.) (Via: Email)
 Angela Sciberras, Macaulay Shiomi Howson Ltd. (Town of Erin) (enc.) (Via: Email)

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052075 Langen EIS (Mattamy) TOR_210624
24/06/2021 11:26 AM



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

Agency Correspondence

Ariana Burgener

From: Species at Risk (MECP) <SAROntario@ontario.ca>
Sent: Friday, May 07, 2021 1:38 PM
To: Hannah Maciver
Subject: RE: 052075 Mattamy Langen EIS, Town of Erin - SAR Information Request

Hi Hannah,

In addition to the species you list below I would add Butternut, Barn swallow and Bobolink. Additional special concern species would be Eastern wood-pewee, wood thrush, short-eared owl, Canada warbler and monarch. There are many areas where the Government of Ontario does not currently have information. On-site assessments can better verify site conditions, identify and confirm presence of species at risk and/or their habitats. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

Please note it remains the clients responsibility to:

- Carry out preliminary screening for their project,
- Obtain the best available information for all applicable information sources,
- Conduct necessary field studies or inventories to identify and confirm the presence of absence of species at risk or their habitat,
- Consider any potential impacts to species at risk that a proposed activity might cause, and
- Comply with the Endangered Species Act (ESA).

Kind Regards,
Lisa

Lisa McShane

Management Biologist | Permissions and Compliance Section, Species at Risk Branch | Land and Water Division | Ministry of the Environment, Conservation and Parks | lisa.mcshane@ontario.ca | (226) 668-0527

From: Hannah Maciver <Hannah.Maciver@rjburnside.com>
Sent: Friday, April 16, 2021 1:48 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: 052075 Mattamy Langen EIS, Town of Erin - SAR Information Request

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good afternoon,

I am writing to request Species at Risk Information for our Mattamy Langen Property EIS. The site is currently planned for a future residential development located at the southwest corner of Sideroad 17 and Eighth Line shown on Figure 1, attached. The EIS will accompany the development application. The subject lands are in the Town of Erin, County of Wellington and in the jurisdiction of Credit Valley Conservation (CVC).

In addition to data from CVC and MNRF, we are requesting the following information from MECP:

- Locations, observation dates and any other relevant information about terrestrial and aquatic SAR that is not included in the list below – if possible, please provide the UTM's/accuracy codes.
- Locally rare species lists or species records known from the study area and adjacent lands.

Our search of the NHIC database on April 8, 2021 resulted in 5 records for NHIC Square 17NJ7346 (subject lands) and adjacent squares within 1 km.

- Eastern Meadowlark
- Snapping Turtle
- Midland Painted Turtle
- Gypsy Cuckoo Bumble-bee
- Yellow-banded Bumble-bee

If you are able to respond by April 30, 2021 it would be greatly appreciated. Please do not hesitate to contact me at 519-820-2562 or via email if you have any questions or concerns.

Sincerely,
Hannah Maciver

 **BURNSIDE**
Hannah Maciver, B.E.S.
Project
Coordinator/Ecologist

R.J. Burnside & Associates Limited
1465 Pickering Parkway, Suite 200, Pickering, Ontario L1V
7G7
Office: +1 800-265-9662 Direct Line: +1 226-486-1555
www.rjburnside.com



COVID 19: We remain open for business

The health and safety of our employees and clients is of paramount importance. Most of our staff are working remotely and continue to serve clients using our well established collaborative technology platforms. For our full COVID 19 response please [click here](#).

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Thank you.



April 19, 2021

Via: Email

Management Biologist
MNRF Guelph District Office
1 Stone Rd W
Guelph ON N1G 4Y2

To Whom it Concerns:

**Re: Environmental Impact Study - Background Data Request
Langen Property (Mattamy), Town of Erin, Ontario
Project No.: 300052075.0001**

R.J. Burnside & Associates Limited (Burnside) has been retained by Mattamy (Erin) Limited (Client) to conduct an Environmental Impact Study (EIS) for a future development located at the southwest corner of Sideroad 17 and Eighth Line (herein referred to as the 'subject lands'), shown on Figure 1, attached. The EIS will accompany the development application. The subject lands are in the Town of Erin (Town), County of Wellington and in the jurisdiction of Credit Valley Conservation (CVC).

The preliminary Draft Plan proposed is for the development of residential lands with an internal road network, stormwater features and open space features resulting from retained natural features and their buffers. The subject lands are currently comprised of active crop agriculture and rural residential lands. Also found on, or adjacent to the subject lands, are natural and naturalized features that are comprised of coniferous and deciduous hedgerows, coniferous forest, mixed forest, deciduous forest, coniferous plantation, swamp, open water, marsh and meadow vegetation communities. A branch of the West Credit River flows through the rural residential property, to the north and east of the subject site. A portion of the West Credit River Provincially Significant Wetland Complex is present on the subject lands. Many of these natural features are contained with the Natural Heritage System (NHS) designation.

As part of the EIS, current environmental background information (both aquatic and terrestrial) is required for the study area and adjacent lands. At this time, we are requesting any applicable/available data (preferably in GIS shapefiles) as listed below. We have also contacted Credit Valley Conservation (CVC) and Ministry of the Environment, Conservation and Parks (MECP) for Species at Risk data. Information we are seeking from MNRF includes:

Terrestrial

- Significant wildlife habitat (e.g., nesting/breeding/hibernation).
- Sensitive avian nesting sites (heronries, stick nest locations).

- Provincially Significant Wetland Evaluation for the following wetland: West Credit River PSW Complex.
- Digital boundary information for updated designated natural features that may not yet be available from LIO or that have been recently staked (e.g., Areas of Natural and Scientific Interest (ANSI), Environmentally Significant Areas (ESA), evaluated or unevaluated wetlands, etc.).

Aquatics

- Any aquatics/fisheries information that may not be available from CVC, if applicable.

Where possible, digital format of the requested information is preferred (i.e., GIS shapefiles). We would appreciate your response by April 30, 2021, if possible. Please do not hesitate to contact the undersigned should you have any questions or concerns.

Yours truly,

R.J. Burnside & Associates Limited



Hannah Maciver, B.E.S.
Project Coordinator / Ecologist

Enclosure(s) Figure 1 – Study Area

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Ariana Burgener

From: Ungar, Darren (MNRF) <Darren.Ungar@ontario.ca>
Sent: Tuesday, June 15, 2021 11:05 AM
To: Hannah Maciver
Subject: RE: 052075 Langen (Mattamy) EIS - Information Request

Good morning Hannah,

It looks like MNRF has only the outer boundaries mapped in our GIS and I do not have access to the hardcopies at this time. Thank you for letting me know about the field visit, unfortunately, I will not be able to attend.

Sorry for the inconvenience

Darren Ungar
Management Biologist
Ministry of Natural Resources & Forestry
Guelph District
226-962-6870

From: Hannah Maciver <Hannah.Maciver@rjburnside.com>
Sent: June 15, 2021 10:33 AM
To: Ungar, Darren (MNRF) <Darren.Ungar@ontario.ca>
Subject: RE: 052075 Langen (Mattamy) EIS - Information Request

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Thank you, Darren. I appreciate it. Is there a map of the wetland units by chance?

I also want to inform you that a portion of the West Credit River PSW will be staked along with any other unevaluated wetland features (including woodlands and top-of-bank) located on the property on the following dates: **July 5th and 8th** (second date only required if necessary). We acknowledge that you are unable to attend feature stakings due to COVID restrictions; therefore, we will send you an updated map of the complex with any additional wetlands to be included (i.e., within 750 m) using the OWES system for mapping. Staff from CVC will be in attendance.

Thanks
Hannah

Hannah Maciver, B.E.S.
Project Coordinator/Ecologist

R.J. Burnside & Associates Limited | www.rjburnside.com
Office: +1 800-265-9662 Direct: +1 226-486-1555

From: Ungar, Darren (MNRF) <Darren.Ungar@ontario.ca>
Sent: Tuesday, June 15, 2021 10:27 AM
To: Hannah Maciver <Hannah.Maciver@rjburnside.com>
Subject: RE: 052075 Langen (Mattamy) EIS - Information Request

Good morning Hannah,

Please see the attached West Credit River Wetland Complex.

Additional species:

1. Snapping Turtle
2. Fisher
3. Credit River- Blacknose dace, Bluntnose minnow, Brook trout, Common shiner, Largemouth bass, Longnose dace, White sucker, Mottled sculpin, Creek chub, Brook stickleback
4. See wetland evaluation

Thank you

Darren Ungar
Management Biologist
Ministry of Natural Resources & Forestry
Guelph District
226-962-6870

From: Hannah Maciver <Hannah.Maciver@rjburnside.com>
Sent: June 9, 2021 2:29 PM
To: ESA Guelph (MNRF) <ESAGUELPH@ontario.ca>
Subject: RE: 052075 Langen (Mattamy) EIS - Information Request

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Good afternoon,

I am following up on this request. Specifically, we are looking to obtain a copy of the West Credit River PSW Evaluation. The letter attached also provides additional data request information, pending availability.

Thank you,
Hannah

Hannah Maciver, B.E.S.
Project Coordinator/Ecologist

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From: Hannah Maciver
Sent: Monday, April 19, 2021 12:25 PM
To: esa.guelph@ontario.ca
Cc: Jennifer Szczerbak <Jennifer.Szczerbak@rjburnside.com>
Subject: 052075 Langen (Mattamy) EIS - Information Request

Hello,

Please find attached an information request for the Langen (Mattamy) property in the Town of Erin, Ontario.

Thank you,
Hannah Maciver

RE: 052075 Langen Erin Property - PSW File Request

Lorraine Adderley <Lorraine.Adderley@rjburnside.com>

Tue 9/14/2021 9:23 AM

To: darren.ungar@ontario.ca <darren.ungar@ontario.ca>

Cc: Hannah Maciver <Hannah.Maciver@rjburnside.com>; Ariana Burgener <Ariana.Burgener@rjburnside.com>

Hi Darren,

Thank you so much for sending along this helpful information regarding the West Credit River PSW.

In undertaking our EIS, we have been asked by CVC to make recommendations as to whether the wetlands in our ELC/botanical inventory are recommended for inclusion to the PSW and to formally stake and survey their boundaries and provide you and CVC with a wetland map with all wetlands described with OWES codes. While we have not produced the OWES style figure at this point, I've included a copy of our most recent ELC and constraints map for your reference.

As you can see in the attached figure, the presently unevaluated wetlands in the northern central portion of the site (SWDM4-1) are connected to the PSW hydrologically via a narrow riparian wetland along a headwater drainage feature that flows intermittently to drain the landscape. I will be recommending as part of our EIS that this should be included in the PSW complex.

I would also like to discuss with you the boundary of the SWTM2-1 in the central-eastern portion of the site. The boundary of the wetland as staked and surveyed by myself and Sarah LaBrie at CVC, both OWES trained evaluators, differs considerably from the boundary staked last in 2016. Typically, I would request your presence on-site to verify the staked boundary to update the PSW boundary, but I understand that NDMNRF is not able to undertake field visits at this time due to COVID restrictions. Would NDMNRF consider amending the wetland boundary to that staked and surveyed here, while maintaining the PSW for the rest of that unit of the PSW? Please note that we did not stake and survey the SWDM2-2 swamp through the wooded area and would not seek to change this boundary at this time due to a lack of data certainty.

I will also, not be recommending the SAS1-1 and SWDM4-3 pond at the south end of the site for inclusion in the PSW as it appears to be a dug farm pond with no hydrological connection to the other PSW units.

I would appreciate your feedback and some direction as to how I can contribute to updating the wetland evaluation file. As I said, in my experience the MNRF biologist has always taken on this role.

Kind regards,

Lorraine Adderley

Lorraine Adderley, MSc, CERP
Project Coordinator/Terrestrial Ecologist

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From: Ungar, Darren (MNRF) <Darren.Ungar@ontario.ca>**Sent:** Tuesday, August 31, 2021 2:53 PM**To:** Hannah Maciver <Hannah.Maciver@rjburnside.com>**Cc:** Lorraine Adderley <Lorraine.Adderley@rjburnside.com>; Ariana Burgener <Ariana.Burgener@rjburnside.com>**Subject:** RE: 052075 Langen Erin Property - PSW File Request

Good afternoon Hannah,

To follow up on our telephone conversation from a couple of weeks ago, the West Credit River PSW was an amalgamation of several wetland features in the mid 1990's and the outer boundaries were developed for the entire wetland complex with the idea that the internal boundaries would eventually be incorporated as new information became available. Although a full assessment of the wetland features was not carried out during the 1994 evaluation (detailed community descriptions) the necessary information sufficient to determine the status of Provincially Significant was gathered.

Please see the text below highlighted in red for additional information on the Langen Erin property.

Thank you

Darren Ungar - Management Biologist
Guelph District
Ministry of Northern Development, Mines, Natural Resources & Forestry
©226-962-6870
Darren.ungar@ontario.ca

From: Hannah Maciver <Hannah.Maciver@rjburnside.com>
Sent: July 29, 2021 10:05 AM
To: Ungar, Darren (MNRF) <Darren.Ungar@ontario.ca>
Cc: Lorraine Adderley <Lorraine.Adderley@rjburnside.com>; Ariana Burgener <Ariana.Burgener@rjburnside.com>
Subject: 052075 Langen Erin Property - PSW File Request

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Hi Darren,

Thank you so much for picking up this file when you were at the office, we really appreciate it! This may take some time on your part to go through the file. If you prefer, Lorraine would be happy to meet you at the Guelph MNRF office or at our Guelph office to review the file and photo copy/scan the parts of the file that we need (that's what she usually does with MNRF Aurora/Steve Varga). I will forward an example of the data we've received for another project if that helps (Heart Lake PSW Complex).

Otherwise, here is a summary:

1. Current Wetland Vegetation Community Map
 - The West Credit River PSW was an amalgamation of several wetland features in the mid 1990's and the general boundary was developed for the entire wetland complex.
2. Catchment Basin Map (if available).
 - Please see the attached shapefile. I was able to recreate the catchment basin using the [Ontario Flow Assessment Tool \(gov.on.ca\)](http://gov.on.ca).
3. Site specific vegetation community maps for the subject lands.
 - N/a
4. Any MNRF correspondence with the subject lands property owners (i.e., Mr. Gary Langen, etc)
 - See attached "Azimuth Environmental Report"
5. Any records of evaluation activities (i.e., boundary stakings, reevaluation of units) on the subject lands. We know that CVC was out with MNRF in 2012 to re-stake some swamp units for severances. We would really appreciate this info.
 - See attached "Wetland Map Gary Langen Farm 2016"

- o Please note the attached "West Credit River" shapefile has the most current boundaries as of this email.

6. Any site specific flora/fauna lists for the wetland units or vegetation communities found on the subject lands.

- General species list
 - o Red Osier Dogwood, Aspen sp., Bittersweet Nightshade, Balsam Poplar, Pussy Willow, Salix sp., Green Ash, White Ash, Sensitive Fern, Carex spp., Joe Pye Weed Sp., Jewelweed sp., Buttercup sp., Moss spp., Wild Raspberry, Horsetail sp., Solomans's seal, Violet spp.,
 - o American Robin, Black-capped chickadee, Northern flicker, American Woodcock, Blue jay, White-throated sparrow, American goldfinch, Field sparrow, American tree swallow, Red-winged blackbird
 - o Eastern cottontail, White-tailed deer

Any questions, feel free to reach out to Lorraine Adderly (cc:d above).

Thanks
Hannah

From: Cisco Unity Connection Messaging System <unityconnection@unity.rjburnside.com>
Sent: Tuesday, July 27, 2021 3:17 PM
To: hmaciver@unity.rjburnside.com
Subject: Message from DARREN UNGAR (2269626870)



Hannah Maciver, B.E.S.
 Project
 Coordinator/Ecologist

R.J. Burnside & Associates Limited
 1465 Pickering Parkway, Suite 200, Pickering, Ontario
 L1V 7G7
Office: +1 800-265-9662 **Direct Line:** +1 226-486-1555
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Thank you.

Hannah Maciver

From: Ungar, Darren (NDMNR) <Darren.Ungar@ontario.ca>
Sent: Wednesday, May 18, 2022 12:02 PM
To: Hannah Maciver
Cc: Ungar, Darren (NDMNR)
Subject: Approved - West Credit River PSW (Langen Property)

Follow Up Flag: Follow up
Flag Status: Flagged

Good afternoon Hannah,

The update to the West Credit River (Langen Property) has been approved and will be updated in Land Information Ontario (LIO) in the near future. As part of the update to LIO, the Ministry is required contact the landowner to inform them of the update to their property. Please send me the landowners contact information at your earliest convenience. Once I have this information, I will pass along a note to the various agencies outlining the decision.

Thank you

Darren Ungar - Management Biologist
Aylmer/Guelph District
Ministry of Northern Development, Mines, Natural Resources & Forestry
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Darren.ungar@ontario.ca

Hannah Maciver

From: Lorraine Adderley
Sent: Monday, January 24, 2022 11:10 AM
To: Ungar, Darren (MNRF); esa.guelph@ontario.ca
Cc: Hannah Maciver
Subject: ATTN: DARREN UNGAR - OWES Data - Langen Erin Property
Attachments: 052075 OWES Data.rar; 052075 F-00 OWES 004k ANSI B (1).pdf; Table 18 - PSW decision matrix.docx

Hi Darren,

The shapefiles for the attached corresponding pdf. As requested. Please read this map in conjunction with the PSW inclusion/exclusion decision matrix and the vegetation unit information tables forwarded previously (see below).

If you require anything else, please let me know.

Kind regards,

Lorraine Adderley

Lorraine Adderley, MSc, CERP
Project Coordinator/Terrestrial Ecologist

R.J. Burnside & Associates Limited | www.rjburnside.com
Office: +1 800-265-9662 Direct: +1 705-797-4354

Hi Darren,

Sorry there were IT issues in getting all this info to you.

Attached please find the figure for the Nov 18 email (below). I've also attached our wetland map which looks at the wetlands in OWES vegetation communities and wetland units for your review and a summary of those units is below (an excerpt from our DRAFT EIS). The attached word document is the draft decision matrix for inclusion/exclusion from the PSW for each of the units.

Please let me know if you need additional information, the figures in CAD or GIS formats, or anything else for your review.

Kind regards,

Lorraine Adderley

According to Burnside's ELC surveys completed in 2021, there are 10 wetland ELC communities to be considered for the wetland complex located on the subject property:

- Mineral Deciduous Swamp (SWDM4) (S1);
- Panicked Aster Mineral Meadow Marsh (MAMM2-2) (M1);

- Reed-canary Grass Graminoid Mineral Meadow Marsh Type (MAMM1-3) (M2);
- Aquatic (AQ) (M3);
- Willow Mineral Deciduous Swamp (SWDM4-1) (S2);
- Red-osier Dogwood Mineral Deciduous Thicket Swamp (SWTM2-1) (S3);
- Green Ash Mineral Deciduous Swamp (SWDM2-2) (S4);
- Pondweed Submerged Shallow Aquatic (SAS_1-1) (M4);
- Poplar Mineral Deciduous Swamp (SWDM4-5) (S5); and
- White Cedar – Hardwood Organic Mixed Swamp (SWMO1-1) (S6).

Wetland #	Map Code	Vegetation Forms	Dominant Species	Include in PSW?
1	hS1	h*, c, ts, re, ne, gc,	h, <i>Fraxinus pennsylvanica</i> , <i>Acer negundo</i> ; c, <i>Larix laricina</i> ; ts, <i>Cornus sericea</i> , <i>Salix discolor</i> ; re, <i>Scirpus atrovirens</i> , <i>Typha angustifolia</i> ; ne, <i>Carex</i> spp.; gc, <i>Equisetum arvense</i> , <i>Impatiens capensis</i> , <i>Circaea lutiana</i> .	Yes
	gcM1	ts, gc*, re, ne	ts, <i>Cornus sericea</i> ; gc, <i>Symphyotrichum lanceolatum</i> , <i>Impatiens capensis</i> , <i>Equisetum arvense</i> ; re, <i>Scirpus atrovirens</i> ; ne, <i>Phalaris arundinacea</i> , <i>Juncus effusus</i> .	Yes
	neM2	h, ts, gc, re ne*	h, <i>Acer negundo</i> , <i>Salix alba</i> ; ts, <i>Cornus sericea</i> ; gc, <i>Equisetum arvense</i> , <i>Eutrochium maculatum</i> , <i>Solidago canadensis</i> , <i>Symphyotrichum puniceum</i> ; re, <i>Scirpus atrovirens</i> , <i>Typha angustifolia</i> ; ne, <i>Phalaris arundinacea</i> .	Yes
	suM3	re, su*	re, <i>Typha angustifolia</i> ; su, <i>Potamogeton</i> spp.	Yes
	hS2	h*, ts, gc, re, ne	h, <i>Salix alba</i> , <i>Salix euxina</i> ; ts, <i>Acer negundo</i> , <i>Populus balsamifera</i> , <i>Populus tremuloides</i> , <i>Cornus sericea</i> , <i>Salix eriocephala</i> , <i>Salix bebbiana</i> ; gc, <i>Equisetum arvense</i> , <i>Impatiens capensis</i> , <i>Eutrochium maculatum</i> , <i>Solidago canadensis</i> , <i>Symphyotrichum puniceum</i> , <i>Symphyotrichum lanceolatum</i> ; re, <i>Scirpus atrovirens</i> , <i>Scirpus pendulus</i> , <i>Phragmites australis</i> subsp. <i>australis</i> ; ne, <i>Phalaris arundinacea</i> , <i>Carex flava</i> , <i>Juncus effusus</i> , <i>Juncus alpinoarticulatus</i> .	Yes
2	tsS3	ts*, gc, re, ne	ts, <i>Cornus sericea</i> , <i>Salix alba</i> , <i>Salix petiolaris</i> ; gc, <i>Vicia cracca</i> , <i>Symphyotrichum puniceum</i> , <i>Eutrochium maculatum</i> ; re, <i>Scirpus atrovirens</i> , <i>Scirpus pendulus</i> ; ne, <i>Agrostis gigantea</i> , <i>Festuca arundinacea</i> , <i>Carex hystercina</i> , <i>Carex aurea</i>	Yes

Wetland #	Map Code	Vegetation Forms	Dominant Species	Include in PSW?
	hS4	h*, ts, ls, gc, re, ne	h, <i>Fraxinus pennsylvanica</i> , <i>Populus tremuloides</i> , <i>Ulmus americana</i> ; ts, <i>Cornus sericea</i> , <i>Cornus obliqua</i> , <i>Rhamnus cathartica</i> , <i>Rubus allegheniensis</i> ; ls, <i>Rubus pubescens</i> , <i>Parthenocissus vitacea</i> ; gc, <i>Solidago canadensis</i> , <i>Solidago rugosa</i> , <i>Geum aleppicum</i> , <i>Onoclea sensibilis</i> ; re, <i>Scirpus atrovirens</i> ; ne, <i>Carex gracillima</i> , <i>Carex echinata</i>	Yes
3	suM4	Su*	su, <i>Potamogeton</i> sp.	No
	hS5	h*, c, ts, gc, re	h, <i>Populus balsamifera</i> , <i>Fraxinus pennsylvanica</i> , <i>Salix alba</i> , <i>Acer saccharinum</i> ; c, <i>Larix laricina</i> ; ts, <i>Cornus sericea</i> , <i>Vitis riparia</i> ; gc, <i>Solidago canadensis</i> , <i>Equisetum arvense</i> , <i>Lycopus uniflorus</i> ; re, <i>Typha angustifolia</i>	No
4	cS6	h, c*	(not field verified. PSW veg community map not available from MNRF) h, hardwood species unknown; c, <i>Thuja occidentalis</i>	Yes



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Appendix C

Species at Risk Screening Table

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Background Review of Potential Species at Risk and Species of Conservation Concern in the Study Area

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description ⁵	Habitat Present on the Subject Property and/or Adjacent Lands (Within 120 m)
Birds								
Bank Swallow (Source: OBBA)	<i>Riparia riparia</i>	S4B	THR	THR	THR	1	Prefers open habitats including, farmland, lake/river shorelines, grasslands, and wetlands. Nests in exposed earthen banks along shorelines and in artificial sites such as gravel pits. ⁶	No suitable breeding habitat present on the subject property. No potential breeding habitat on adjacent lands. No obvious features such as exposed earthen banks or shorelines.
Barn Swallow (Source: OBBA, MECP, Burnside)	<i>Hirundo rustica</i>	S4B	SC	SC	THR	1	Prefers farmland, lake/river shorelines, wooded clearings, urban populated areas, rocky cliffs, and wetlands. Nests inside or on exterior of buildings; under bridges and in road culverts; on rock faces, and in caves, etc. ⁷	Confirmed breeding habitat on the subject property in three structures: S3 – 12 nests S4 – 3 nests S7 – 2 individuals observed entering/existing barn on east side facing Eighth Line indicating potential nest; full access to interior of barn was not possible for safety reasons; no nests confirmed. High potential breeding habitat on adjacent lands given the presence of rural properties that feature barns, structures, etc.
Bobolink (Source: OBBA, MECP)	<i>Dolichonyx oryzivorus</i>	S4B	THR	SC	THR	1	Generally prefers open grasslands and hay fields for nesting, typically featuring relatively tall vegetation. Sometimes uses large fields of winter wheat and rye in southwestern Ontario. Sensitive to vegetation structure and composition. Positively associated with high grass-to-forb ratios; moderate litter depth; tolerate wetter portions of fields compared to Eastern Meadowlark (EAME) and more likely to nest closer to field centres rather than field margins. Lower tolerance to presence of patches of bare ground. Appear to prefer larger fields than EAME. ⁸	No suitable breeding habitat present on the subject property. High potential on adjacent lands, especially the grassland habitat neighbouring the SW corner of the subject property.
Canada Warbler (Source: OBBA, MECP)	<i>Cardellina canadensis</i>	S5B	SC	SC	THR	1	Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to	Low potential breeding habitat on the subject property in the SWMO1-1 ecosite (White Cedar – Hardwood Organic Mixed Swamp) located entirely in the NHS. None

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description ⁵	Habitat Present on the Subject Property and/or Adjacent Lands (Within 120 m)
							conceal the nest. ⁶	recorded during breeding bird surveys. High potential on adjacent lands within the West Credit River PSW Complex where wet coniferous, deciduous, and mixed forest types are present.
Chimney Swift (Source: OBBA)	<i>Chaetura pelagica</i>	S3B	THR	THR	THR	1	Historically nested in large hollow trees, other tree cavities and cracks in cliffs. Currently, most are found in developed areas in large, uncapped chimneys. Proximity to lakes is also a preferred habitat feature as they will forage for flying insects close to water. ⁶	No suitable breeding habitat present on the subject property. The chimneys on the properties were lined and/or sealed. Additionally, none were recorded foraging overhead during breeding bird surveys. Low potential breeding habitat on adjacent lands given the presence of residential structures with chimneys; however, none were recorded foraging overhead during breeding bird surveys that would indicate potential nesting sites nearby.
Eastern Meadowlark (Source: NHIC, OBBA, Burnside)	<i>Sturnella magna</i>	S4B, S4N	THR	THR	THR	1	Generally prefers grassy pastures, meadows and hay fields. Prefers moderately tall grass with abundant litter cover, a high proportion of grass cover, moderate forb density, low proportions of shrub and woody vegetation cover, and low percent of bare ground. Prefers to nest in drier sites and frequently nests around field margins. ⁸	Confirmed on the subject property during the 3rd breeding bird survey only. One singing male recorded on the eastern portion of the subject property in the small field comprised of meadow/pasture (approx. 0.25 ha) adjacent to the barn and house. High potential on adjacent lands, especially the grassland habitat neighbouring the SW corner of the subject property and the Erin Heights Golf Course located east of the subject property.
Eastern Wood-pewee (Source: OBBA, MECP, Burnside)	<i>Contopus virens</i>	S4B	SC	SC	SC	1	Prefers open space near the nest in the form of forest edges, clearings, roadways, and water. Does not require large areas of woods but occurs less frequently in woodlots surrounded by development than in those without. ⁶	Confirmed nesting habitat on the subject property in the FODM6-5 ecosite (Fresh-Moist Sugar Maple – Hardwood Deciduous Forest) located entirely in the NHS. Four singing males recorded. High potential on adjacent lands given the presence of forested habitats.
Short-eared Owl (Source: OBBA, MECP)	<i>Asio flammeus</i>	S4?B, S2S3N	THR	THR	SC	1	This species is principally nomadic and are generally uncommon in Ontario with a sparse distribution throughout the province. The Short-eared Owl prefers open habitats including tundra, grasslands, wetlands, and agricultural lands. The nest is built on the ground, usually adjacent to a clump of tall vegetation that	Marginally suitable habitat present on the subject property and adjacent lands (open areas, wetlands); however, breeding habitat for this species is very unlikely. None were observed during any of the field investigations in 2020 and 2021 (including surveys that were conducted in low light

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description ⁵	Habitat Present on the Subject Property and/or Adjacent Lands (Within 120 m)
							provides some shelter and concealment. ⁶ The NHIC (2021) states: "Uncommon to rare and declining breeding species; small numbers breed scattered throughout most of the province but most individuals in Ontario are in the Hudson Bay Lowlands. Exact population difficult to ascertain due to strong year-to-year fluctuations in location due to changing prey availability. Uncommon migrant throughout the province and uncommon but very local at a small number of wintering sites in southern Ontario."	conditions in the evening/early morning). There are few records that exist for the general area from eBird and OBBA. In eBird, the records in the vicinity of the subject lands in the last 10 years are greater than 15 km from the subject property and are non-breeding records.
Wood Thrush (Source: OBBA, MECP, Burnside)	<i>Hylocichla mustelina</i>	S4B	SC	THR	THR	1	Inhabits and breeds in woodlands ranging from small (3 ha) and isolated to large and contiguous. The presence of tall trees and a thick understorey are usually prerequisites for site occupancy. ⁶	Confirmed breeding habitat on the subject property in the FODM6-5 ecosite (Fresh-Moist Sugar Maple – Hardwood Deciduous Forest) located entirely in the NHS. Two singing males recorded. High potential breeding habitat on adjacent lands given the presence of forested habitats.
Insects								
Monarch (Source: Burnside)	<i>Danaus plexippus</i>	S2N, S4B	SC	END	SC	1	Throughout their life cycle, Monarchs use three different types of habitats. Only the caterpillars (larvae) feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in Oyamel Fir forests found in central Mexico. The largest threat to Ontario Monarchs is habitat loss and fragmentation at overwintering sites in central Mexico where forests are being logged and converted into agricultural fields and pastures. Widespread pesticide and herbicide use throughout the Monarch's range may also limit recovery. ⁹	Confirmed on the subject property throughout the site where milkweed (host plant) and meadow habitat are present. Both larvae and adult butterflies recorded. High potential on adjacent lands given the presence of meadow habitats.
Gypsy Cuckoo Bumble Bee (Source: NHIC)	<i>Bombus bohemicus</i>	S1S2	END	END	END	1	In Ontario, the Gypsy Cuckoo Bumble Bee was historically found throughout most of the province; however, in recent years it has been known only to occur in Pinery Provincial Park. Gypsy Cuckoo Bumble Bees are a parasitic species which follows the life cycle pattern and	Low to Moderate potential on the subject property and adjacent lands. Due to its severe decline, this species is unlikely to occur; however, based on the presence of suitable habitat for Yellow-banded Bumble Bee (open habitats, farmland) and records for this species in the vicinity it cannot be

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description ⁵	Habitat Present on the Subject Property and/or Adjacent Lands (Within 120 m)
							therefore, in part, the habitat of its hosts which are other bumble bees (e.g., the Rusty-patched and Yellow-banded Bumble Bees). The decline of the host species on which it depends is considered the main threat to the Gypsy Cuckoo Bumble Bee. ⁹	ruled out.
Yellow-banded Bumble Bee (Source: NHIC)	<i>Bombus terricola</i>	S3S5	SC	SC	SC	1	<p>This species is a forage and habitat generalist, able to use a variety of nectaring plants and environmental conditions. It can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands and urban areas.</p> <p>Nest sites are often underground in abandoned rodent burrows or decomposing logs.</p> <p>In southern Ontario, it is still observed but is less common than it was historically after steep declines. Causes of decline of this once common species are only partially understood. Suspected threats include a combination of factors such as the introduction of pathogens from managed bee colonies, pesticide use, climate change, and habitat loss.⁹</p>	Low to Moderate potential on the subject lands and adjacent lands. Due to its severe decline, this species is unlikely to occur; however, based on the presence of suitable habitat (open habitats, farmland) and records for this species in the vicinity it cannot be ruled out.
Mammals								
Little Brown Myotis (Source: MECP, Burnside)	<i>Myotis lucifugus</i>	S3	END	END	END	1	<p>Overwintering habitat: Caves and mines that remain above 0 degrees Celsius.</p> <p>Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).¹¹</p>	<p>Confirmed presence on the subject property during passive acoustic surveys.</p> <p>High potential roosting habitat on adjacent lands based on confirmation of presence on the subject property.</p>
Northern Myotis (Source: MECP, Burnside)	<i>Myotis septentrionalis</i>	S3	END	END	END	1	<p>Overwintering habitat: Caves and mines that remain above 0 degrees Celsius.</p> <p>Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)¹¹</p>	<p>Confirmed presence on the subject property during passive acoustic surveys.</p> <p>High potential roosting habitat on adjacent lands based on confirmation of presence on the subject property.</p>
Tri-colored Bat (Source: MECP)	<i>Perimyotis subflavus</i>	S3?	END	END	END	1	<p>Overwintering habitat: Deepest parts of caves and mines where temperature is the least variable.</p> <p>Maternal Roosts: Less is known about roosts of Tri-colored Bats. Most roost sites found within</p>	<p>Habitat for this species not considered present on the subject lands based on results from acoustic surveys.</p> <p>Moderate roosting habitat potential on adjacent lands based on presence of</p>

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description ⁵	Habitat Present on the Subject Property and/or Adjacent Lands (Within 120 m)
							forested habitats. May roost in clumps of dead foliage and lichens. May prefer oak trees. In more anthropogenically modified landscapes, maternity roosts may be barns or similar human-made structures. ¹¹	forested/wetland communities and rural structures such as barns.
Eastern Small-footed Myotis (Source: MECP, Burnside)	<i>Myotis leibii</i>	S2S3	END	-	-	-	Overwintering habitat: Cool caves and abandoned mines with low humidity and temperatures and relatively stable microclimates. Cave hibernacula known to be used by Eastern Small-footed Myotis in Ontario are found primarily in limestone, but also in sandstone. Maternal Roosts: In Ontario, summer habitats, including sites of maternity colonies, are very poorly understood. Some reports include anthropogenic buildings (shed/barn, old structures), rocky habitats. However, the extent of the use of summer rock roosts in Ontario has not been determined. ¹²	Confirmed presence on the subject property during passive acoustic surveys. The highest number of call events for Eastern Small-footed Myotis was recorded at Station D, which is located next to a large man-made rock pile, but this species was recorded through the site. High potential roosting habitat on adjacent lands based on confirmation of presence on the subject property.
Plants								
Butternut (Source: MECP, Burnside)	<i>Juglans cinerea</i>	S2?	END	END	END	1	Butternut grows best in rich, moist and well-drained soils or limestone gravel sites. They are less commonly found in dry, rocky and sterile soils. They generally grow alone or in small groups in deciduous forests that are commonly comprised of Basswood, Black Cherry, Beed, Black Walnut, Elm, Hemlock, Hickory, Oak, Red Maple, Sugar Maple, Poplar, White Ash and Yellow Birch. In Ontario, they can be found throughout southern Ontario, south of the Canadian Shield. ⁹	Confirmed on the subject property. Three (3) specimens: two Category 1, one Category 2. High potential on adjacent lands based on confirmation of presence on the subject property.
Herptiles								
Midland Painted Turtle (Source: NHIC, Burnside)	<i>Chrysemys picta marginata</i>	S4	-	SC	SC	1	Generally prefers waterbodies such as ponds, marshes, lakes and slow-moving creeks that have a soft bottom and provide abundant basking sites and aquatic vegetation. ¹⁰	Confirmed overwintering habitat on the subject property at TURT-001 and TURT-003. The highest number recorded at TURT-001 was 6. The highest number recorded at TURT-003 was 12. Nesting habitat is assumed present; however, no nesting sites were confirmed during targeted nesting surveys. High potential overwintering and nesting habitat on adjacent lands given the

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK ¹	Provincial SARO Status ²	COSEWIC ³	Federal SARA Status ³	Federal SARA Schedule ⁴	Habitat Description ⁵	Habitat Present on the Subject Property and/or Adjacent Lands (Within 120 m)
								presence of the West Credit River PSW Complex and suitable roadside gravel shoulders (Eighth Line, 17 Sideroad).
Eastern Milksnake (Source: ORAA)	<i>Lampropeltis triangulum</i>	S4	-	SC	SC	1	Habitat generalist. Found in wide variety of habitats, from open woodlands, bogs, swamps, woodland edges, marshes, lakeshores, old fields, pastures, farmyards, parks, gardens. Often in or near farm outbuildings, barns, and sheds, and are attracted to piles of rocks, logs, firewood, or building materials, or any place that offers shelter to snakes and their prey (rodents). ¹⁰	High potential on the subject property and adjacent lands given the variety of suitable overwintering habitat present and availability of shelter materials (barns, outbuildings, foundations, farm debris, wood piles, wetlands, etc.). None were recorded during any of the field investigations; however, this species can be easily overlooked due to its nocturnal and cryptic nature.
Snapping Turtle (Source: NHIC, ORAA, iNaturalist, Burnside)	<i>Chelydra serpentina</i>	S4	SC	SC	SC	1	Generally inhabits shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. ⁹	Confirmed on the subject property at TURT-002. One individual was recorded on June 15, 2020 (mud basking). Nesting habitat is assumed present; however, no nesting sites were confirmed during targeted nesting surveys. Confirmed on adjacent lands via iNaturalist records (specimen). High potential overwintering and nesting habitat on adjacent lands given the presence of the West Credit River PSW Complex and suitable roadside gravel shoulders (Eighth Line, 17 Sideroad).
Western Chorus Frog (Source: ORAA)	<i>Pseudacris maculata</i>	S4	-	THR (Great Lakes - St Lawrence population in Canada)	THR (Great Lakes - St Lawrence population in Canada)	1	The Western Chorus Frog is primarily a lowland terrestrial species. In marshes or wooded wetland areas, it is found on the ground or in low shrubs and grass. Like all other frogs, the Western Chorus Frog requires both terrestrial and aquatic habitats in close proximity. For breeding and tadpole development, it requires seasonally dry temporary ponds devoid of predators, particularly fish. It is very rarely found in permanent ponds. In southern Ontario, its range is bounded by the United States border in the south, Georgian Bay in the northwest, and south of Algonquin Park and up the Ottawa River valley to the vicinity of Eganville in the east. ⁷	Not present on the subject property. None recorded during amphibian breeding call surveys conducted in 2020 and 2021. Moderate potential on adjacent lands based on the presence of the West Credit River PSW Complex.

** Sources: Natural Heritage Information Centre (NHIC) database of records searched on April 8, 2021 (9 - 1x1 km² Squares: 17NJ7346, NJ247, NJ7347, NJ7447, NJ7246, NJ7245, NJ7345, NJ7445 and NJ7446); Ontario Breeding Bird Atlas (2001-2005) searched on April 8, 2021 (10x10 km² Square 17NJ74); Ontario Reptile and Amphibian Atlas (ORAA) searched on April 8, 2021 (10x10 km² Square 17NJ74); MECP correspondence on May 7, 2021 (MECP Guelph District, Lisa McShane, Management Biologist); R.J. Burnside & Associates (Burnside) observations during ecological field surveys in 2020 and 2021.

¹S-Ranks (provincial)

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: <http://explorer.natureserve.org/nsranks.htm>)

SX — Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20–40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

S1 — Critically Imperiled - Critically imperiled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.

S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.

S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 — Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 — Secure - Common, widespread, and abundant in the province.

SNR — Unranked - Province conservation status not yet assessed.

SU — Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA — Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S# — Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

S#? – Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers

B – Breeding Conservation status refers to the breeding population of the species in the nation or state/province.

N – Nonbreeding Conservation status refers to the non-breeding population of the species in the province.

M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

²SARO *Endangered Species Act, 2007*

(provincial status from <http://www.ontario.ca/environment-and-energy/how-species-risk-are-listed#section-3>)

The provincial review process is implemented by the MNRF's Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.

Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.

Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.

Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.

Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.

Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

³SARA (*Federal Species at Risk Act*) Status and Schedule (includes COSEWIC Status)

The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Extinct - A wildlife species that no longer exists.

Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.

Endangered (END) - A wildlife species facing imminent extirpation or extinction.

Threatened (THR) - A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Data Deficient (DD) - A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

⁴SARA Schedule

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.

Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: species listed in Schedule 3 are species that had been designated as special concern and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

⁵Sources:

⁶Cadman, M.D., et al. (eds). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp

⁷Species at Risk Public Registry <https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10>

⁸McCracken, J.D. et al. 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 and Forestry, Peterborough, Ontario, viii + 88 pp.

⁹MECP SARO List Species Descriptions (<https://www.ontario.ca/page/species-risk-ontario>)

¹⁰Ontario Nature Reptile and Amphibian Atlas (<https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/species/>)

¹¹Environment 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 + 110 pp.

¹²Humphrey, C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 76 pp.



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Appendix D

Significant Wildlife Habitat Screening Table

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Appendix D: Significant Wildlife Habitat Screening in the Study Area – Ecoregion 6E Criteria (2015)

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
Table 1.1: Seasonal Concentration Areas of Animals					
Waterfowl Stopover & Staging Areas (Terrestrial) Rationale: Habitat important to migrating waterfowl.	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these ecosites.	Fields with sheet water during Spring (mid-March to May). <ul style="list-style-type: none"> Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. 	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects." <ul style="list-style-type: none"> Any mixed species aggregations of 100 or more individuals required. The flooded field ecosite habitat plus a 100-300 m radius area, dependent on local site conditions and adjacent land use is the SWH. Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). SWHMiST Index #7 provides development effects and mitigation measures. 	No potential on the subject property. The criteria for Significant Wildlife Habitat is not present. No large aggregations of waterfowl were observed during any of the field investigations that occurred in early spring. Candidate habitat on adjacent lands but not within 120 m. The West Credit River PSW Complex Evaluation identified waterfowl staging areas as "known to occur" in this complex (MNRF, 1993).
Waterfowl Stopover & Staging Areas (Aquatic) Rationale:	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	<ul style="list-style-type: none"> Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and SWM ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). 	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup	Studies carried out & verified presence of: <ul style="list-style-type: none"> Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days. Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. The combined area of the Ecological Land Classification (ELC) ecosites and a 100 m radius area is the SWH. 	No potential on the subject property. The criteria for Significant Wildlife Habitat is not present. No large aggregations of waterfowl were observed during any of the field investigations that occurred in early spring.

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.			Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	<ul style="list-style-type: none"> Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are SWH. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). SWHMIST Index #7 provides development effects and mitigation measures. 	Candidate habitat on adjacent lands but not within 120 m. The West Credit River PSW Complex Evaluation identified waterfowl staging areas as "known to occur" in this complex (MNRF, 1993).
Shorebird Migratory Stopover Area <u>Rationale:</u> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	<ul style="list-style-type: none"> Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. 	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	Studies confirming: <ul style="list-style-type: none"> Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). Whimbrel stop briefly (<24 hrs.) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100 m radius area. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". SWHMIST Index #8 provides development effects and mitigation measures. 	No potential on the subject property. The criteria for Significant Wildlife Habitat is not present. None of these species were observed utilizing the ecosites listed during field investigations on the subject property. Candidate habitat on adjacent lands but not within 120 m. The West Credit River PSW Complex Evaluation identified shorebird stopover areas as "significant in Site District" in this complex (MNRF, 1993).
Raptor Wintering Area <u>Rationale:</u> Sites used by multiple species, a high number of individuals	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; <u>Forest:</u> FOD,	<ul style="list-style-type: none"> The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites (hawk/owl) need to be > 20 ha, 	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl <u>Special Concern:</u> Short-eared Owl	Studies confirm the use of these habitats by: <ul style="list-style-type: none"> One or more Short-eared Owls or; One or more Bald Eagle or; At least 10 individuals and two of the listed hawk/owl species. 	Moderate potential within the southern portion of the NHS on the subject property for Red-tailed Hawk, Northern Harrier and/or American Kestrel. Red-tailed Hawk was the only species of this list recorded during breeding bird surveys.

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and used annually are most significant.	<p>FOM, FOC.</p> <p><u>Upland:</u> CUM; CUT; CUS; CUW.</p> <p><u>Bald Eagle:</u> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).</p>	<p>with a combination of forest and upland.</p> <ul style="list-style-type: none"> Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting. 	Bald Eagle	<ul style="list-style-type: none"> To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects." SWHMIST Index #10 and #11 provides development effects and mitigation measures. 	<p>While the forested ecosites within the NHS are present, the subject property does not provide sufficient sized idle/fallow or lightly grazed fields/meadows – however, these are present on neighbouring lands at the SW corner of the subject property adjacent to the NHS.</p> <p>The subject property lacks large rivers and lakes with open water for Bald Eagle.</p> <p>High potential on adjacent lands based on the mosaic of upland and forested ecosites associated with the West Credit River PSW Complex.</p>
<p>Bat Hibernacula</p> <p><u>Rationale:</u> Bat hibernacula are rare habitats in all Ontario landscapes.</p>	<p>Bat Hibernacula may be found in these ecosites:</p> <p>CCR1 CCR2 CCA1 CCA2</p> <p>(Note: buildings are not considered to be SWH)</p>	<ul style="list-style-type: none"> Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered as SWH. The locations of bat hibernacula are relatively poorly known. 	Big Brown Bat Tri-coloured Bat	<ul style="list-style-type: none"> All sites with confirmed hibernating bats are SWH. The habitat area includes a 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms. Studies are to be conducted during the peak swarming period (August to September). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects". SWHMIST Index #1 provides development effects and mitigation measures. 	<p>No potential on the subject property or adjacent lands.</p> <p>The criteria for Significant Wildlife Habitat is not present on the subject property or adjacent lands (i.e., caves, abandoned mine shafts, karsts, etc. are absent).</p>
<p>Bat Maternity Colonies</p> <p><u>Rationale:</u> Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.</p>	<p>Maternity colonies considered SWH are found in forested ecosites.</p> <p>All ELC ecosites in ELC Community Series:</p> <p>FOD FOM</p>	<ul style="list-style-type: none"> Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario. 	Big Brown Bat Silver-haired Bat	<ul style="list-style-type: none"> Maternity Colonies with confirmed use by: <ul style="list-style-type: none"> >10 Big Brown Bats >5 Adult Female Silver-haired Bats The area of the habitat includes the entire woodland, or a forest stand ELC ecosite or an ecoelement containing the maternity colonies. 	Big Brown Bat is confirmed present on the subject property but Silver-haired Bat is considered absent. It is assumed that bat maternity colony SWH is present within the NHS (FOD, FOC and SWM ecosites) although this cannot

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	SWD SWM	<ul style="list-style-type: none"> • Maternity colonies located in Mature deciduous or mixed forest stands with >10 ha large diameter (>25 cm dbh) wildlife trees. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred. 		<ul style="list-style-type: none"> • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #12 provides development effects and mitigation measures. 	<p>be confirmed. Big Brown Bat appeared to be most abundant at Station 1 and 2 located at the farm structures at the north end of the subject property (barn, storage shed, etc.) during acoustic surveys. Passive acoustic equipment was placed within the NHS (Station H) and along the edge of the NHS (Station F and G) for more than 10 days of suitable weather. Big Brown Bat was detected at Station F and G but not Station H within the NHS.</p> <p>High potential on adjacent lands based on the presence of forest and wetland ecosites mainly associated with the West Credit River PSW Complex.</p>
<p>Turtle Wintering Areas</p> <p>Rationale: Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.</p>	<p>Snapping and Midland Painted Turtles.</p> <p>ELC Community Classes:</p> <p>SW, MA, OA and SA</p> <p>ELC Community Series:</p> <p>FEO and BOO</p> <p>For Northern Map Turtle: Open water areas such as deeper rivers or streams and lakes with current can also be</p>	<ul style="list-style-type: none"> • For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. 	<p>Midland Painted Turtle</p> <p>Special Concern: Northern Map Turtle Snapping Turtle</p>	<ul style="list-style-type: none"> • Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (September–October) or spring (March–May). • Congregation of turtles is more common where wintering areas are limited and therefore significant. 	<p>Confirmed overwintering habitat on the subject property at TURT-001 and TURT-003. The highest number recorded at TURT-001 was 6. The highest number recorded at TURT-003 was 12.</p> <p>Despite the later date, one record for Snapping Turtle on June 15, 2020 at TURT-002 may indicate overwintering areas are present on the subject property for this species as well. SW and MA ecosites, as well as ponds deep enough to overwinter in are present on the subject property.</p>

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	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
	used as over-wintering habitat.			<ul style="list-style-type: none"> • SWHMiST Index #28 provides development effects and mitigation measures for turtle wintering habitat. 	Candidate overwintering habitat assumed present on adjacent lands (West Credit River PSW Complex).
Reptile Hibernaculum <u>Rationale:</u> Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and ecosites: FOC1 and FOC3.	<ul style="list-style-type: none"> • For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock groundcover. • Five-lined Skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures. 	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern:</u> Milksnake Eastern Ribbonsnake <u>Lizard: Special Concern:</u> (Southern Shield population): Five-lined Skink	Studies confirming: <ul style="list-style-type: none"> • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (e.g., foundation or rocky slope) on sunny warm days in Spring (April/May) and Fall (September/October). • Note: If there are Special Concern Species present, then site is SWH. • Note: Sites for hibernation possess specific habitat parameters (e.g., temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e., strong hibernation site fidelity). Other critical life processes (e.g., mating) often take place near hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH. • SWHMiST Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for Skink is significant. • SWHMiST Index #37 provides development effects and mitigation measures for five-lined Skink wintering habitat. 	High potential on the subject property and adjacent lands given the variety of suitable overwintering habitat present and availability of shelter materials (barns, outbuildings, foundations, farm debris, wood piles, wetlands, etc.).
Colonially - Nesting Bird Breeding Habitat (Bank & Cliff) <u>Rationale:</u> Historical use and number of nests in a	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites:	<ul style="list-style-type: none"> • Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed 	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Studies confirming: <ul style="list-style-type: none"> • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. 	No potential on the subject property. The criteria for Significant Wildlife Habitat is not present. Neither species recorded during breeding bird surveys or any other field surveys completed on the property.

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	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation.		<ul style="list-style-type: none"> • A colony identified as SWH will include a 50 m radius habitat area from the peripheral nests. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #4 provides development effects and mitigation measures. 	Low potential breeding habitat on adjacent lands. No obvious features such as exposed earthen banks or shorelines, but NAI#6498 records presence of Northern Rough-winged Swallow in the area.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	<ul style="list-style-type: none"> • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. 	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	Studies confirming: <ul style="list-style-type: none"> • Presence of 5 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300 m radius or extent of the Forest ecosite containing the colony or any island <15.0 ha with a colony is the SWH. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. • SWHMiST Index #5 provides development effects and mitigation measures. 	No potential on the subject property. One (1) Green Heron was recorded during the breeding window but no breeding evidence observed (foraging at northern-most pond (AMPH-001 / TURT-001)). Low potential breeding habitat on adjacent lands for Great Blue Heron, Black-crowned Night-heron or Great Egret. No heronries are known from the vicinity of the subject property. High potential breeding habitat for Green Heron on adjacent lands within the West Credit River PSW Complex.
Colonially - Nesting Bird Breeding Habitat (Ground) Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird). MAM1 – 6 MAS1 – 3 CUM	<ul style="list-style-type: none"> • Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands. 	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Studies confirming: <ul style="list-style-type: none"> • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150 m radius area of habitat, or the extent of the ELC ecosites containing the colony or 	No potential on the subject property or adjacent lands. The criteria for Significant Wildlife Habitat is not present (i.e., no gull or tern colonies are known from the area). Breeding records for Brewer's Blackbird in Ecoregion 6E are only known from the Bruce Peninsula.

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	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
	CUT CUS			any island <3.0 ha with a colony is the SWH. <ul style="list-style-type: none"> Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". SWHMiST Index #6 provides development effects and mitigation measures. 	
Migratory Butterfly Stopover Areas Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Combination of ELC Community Series; need to have present one Community Series from each land class. <u>Field:</u> CUM CUT CUS <u>Forest:</u> FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	<ul style="list-style-type: none"> A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Erie or Ontario. The habitat is typically a combination of field and forest and provides the butterflies with a location to rest prior to their long migration south. The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes. 	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Studies confirm: <ul style="list-style-type: none"> The presence of Monarch Use Days (MUD) during fall migration (August/October). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. SWHMiST Index #16 provides development effects and mitigation measures. 	No potential on the subject property or adjacent lands. The criteria for Significant Wildlife Habitat is not present. The subject property is more than 5 km from Lake Erie or Lake Ontario.
Landbird Migratory Stopover Areas Rationale: Sites with a high diversity of species as well as high numbers are most significant.	All ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	<ul style="list-style-type: none"> Woodlots >10 ha in size and within 5 km of Lake Ontario. If woodlands are rare in an area of shoreline, woodland fragments 2-5 ha can be considered for this habitat. If multiple woodlands are located along the shoreline those Woodlands <2 km from Lake Ontario are more significant. 	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: <i>Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)</i>	Studies confirm: <ul style="list-style-type: none"> Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. Studies should be completed during spring (April/May) and fall (August/October) migration using standardized assessment techniques. Evaluation methods to follow 	No potential on the subject property or adjacent lands. The criteria for Significant Wildlife Habitat is not present. The subject property is more than 5 km from Lake Erie or Lake Ontario.

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	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
		<ul style="list-style-type: none"> Sites have a variety of habitats; forest, grassland and wetland complexes. The largest sites are more significant. Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5 km of Lake Ontario are Candidate SWH. 		<p>"Bird and Bird Habitats: Guidelines for Wind Power Projects".</p> <ul style="list-style-type: none"> SWHMIST Index #9 provides development effects and mitigation measures. 	
<p>Deer Yarding Areas</p> <p>Rationale: Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.</p>	<p>Note: MNRF to determine this habitat.</p> <p>ELC Community Series providing a thermal cover component for a deer yard would include:</p> <p>FOM FOC SWM SWC</p> <p>Or these ELC ecosites:</p> <p>CUP2 CUP3 FOD3 CUT</p>	<ul style="list-style-type: none"> Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, 	White-tailed Deer	<p>No Studies Required:</p> <ul style="list-style-type: none"> Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40 cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. Deer Yards are mapped by MNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by MNRF will be available at local MNRF offices or via Land Information Ontario (LIO). Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area, then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. SWHMIST Index #2 provides development effects and mitigation measures. 	See Deer Winter Congregation Areas below.

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	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
		<p>hemlock, cedar, spruce) with a canopy cover of more than 60%.</p> <ul style="list-style-type: none"> • MNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual". • Woodlots with high densities of deer due to artificial feeding are not significant. 			
<p>Deer Winter Congregation Areas</p> <p><u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.</p>	<p>All Forested ecosites with these ELC Community Series:</p> <p>FOC FOM FOD SWC SWM SWD</p> <p>Conifer plantations much smaller than 50 ha may also be used.</p>	<ul style="list-style-type: none"> • Woodlots will typically be >100 ha in size. Woodlots <100 ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. • Woodlots with high densities of deer due to artificial feeding are not significant. 	White-tailed Deer	<p>Studies confirm:</p> <ul style="list-style-type: none"> • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. • Studies should be completed during winter (January/February) when >20 cm of snow is on the ground using aerial survey techniques, ground or road surveys, or a pellet count deer density survey. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area, then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMIST Index #2 provides development effects and mitigation measures. 	<p>Confirmed deer wintering area (Stratum II) via Land Information Ontario (LIO) at the northeastern portion of subject property associated with the West Credit River PSW Complex. It is part of a larger area that extends north and east of the subject property.</p> <p>Confirmed on adjacent lands. This large wintering area extends north and east of the subject property.</p>
Table 1.2.1: Rare Vegetation Communities					
<p>Cliffs and Talus Slopes</p> <p><u>Rationale:</u></p>	<p>Any ELC ecosite within Community Series:</p> <p>TAO CLO</p>	<ul style="list-style-type: none"> • A Cliff is vertical to near vertical bedrock >3 m in height. • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. 		<ul style="list-style-type: none"> • Most cliff and talus slopes occur along the Niagara Escarpment. • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes. 	No potential on the subject property or adjacent lands.

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
Cliffs and Talus Slopes are extremely rare habitats in Ontario.	TAS CLS TAT CLT			<ul style="list-style-type: none"> • SWHMiST Index #21 provides development effects and mitigation measures. 	The habitat criteria for Significant Wildlife Habitat is not present.
Sand Barren 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 \leq 60%.	<ul style="list-style-type: none"> • Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. 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%. 		<ul style="list-style-type: none"> • A sand barren area $>$0.5 ha in size. • Confirm any ELC Vegetation Type for Sand Barrens. • Site must not be dominated by exotic or introduced species ($<$50% vegetative cover is exotic sp.). • SWHMiST Index #20 provides development effects and mitigation measures. 	No potential on the subject property or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
Alvar Rationale: Alvars are extremely rare habitats in Ecoregion 6E.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: <i>Carex crawei</i> <i>Panicum philadelphicum</i> <i>Eleocharis compressa</i> <i>Scutellaria parvula</i> <i>Trichostema brachiatum</i> These indicator species are very specific to Alvars within Ecoregion 6E.	<ul style="list-style-type: none"> • 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 plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. • Alvar is particularly rare in Ecoregion 6E where the only known sites are found in the western islands of Lake Erie. 		Field studies that identify: <ul style="list-style-type: none"> • An Alvar site $>$ 0.5 ha in size. • Four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species ($<$50% vegetative cover is exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. • SWHMiST Index #17 provides development effects and mitigation measures. 	No potential on the subject property or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
Old Growth Forest Rationale: Due to historic logging practices and land clearance for agriculture, old growth forest is rare in the Ecoregion 6E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	<ul style="list-style-type: none"> 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. 		Field Studies will determine: <ul style="list-style-type: none"> If dominant trees species are >140 years old, then the area containing these trees is SWH. The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present). The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. Determine ELC vegetation types for the forest area containing the old growth characteristics. SWHMIST Index #23 provides development effects and mitigation measures. 	<p>No potential on the subject property. The habitat criteria for Significant Wildlife Habitat is not present.</p> <p>Low potential on adjacent lands. Access to adjacent lands was not granted; therefore, the criteria cannot be confirmed.</p>
Savannah Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	<ul style="list-style-type: none"> A Savannah is a tallgrass prairie habitat that has tree cover between 25–60%. 		Field studies confirm: <ul style="list-style-type: none"> 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. One or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used. Area of the ELC ecosite is the SWH. Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). SWHMIST Index #18 provides development effects and mitigation measures. 	<p>No potential on the subject property or adjacent lands.</p> <p>The habitat criteria for Significant Wildlife Habitat is not present.</p>
Tallgrass Prairie Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	<ul style="list-style-type: none"> No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway Right of Ways (ROW) are not considered to be SWH. A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. 		Field studies confirm: <ul style="list-style-type: none"> One or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used. Area of the ELC ecosite is the SWH. 	<p>No potential on the subject property or adjacent lands.</p> <p>The habitat criteria for Significant Wildlife Habitat is not present.</p>

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
				<ul style="list-style-type: none"> Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). SWHMiST Index #19 provides development effects and mitigation measures. 	
Other Rare Vegetation Communities Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	<ul style="list-style-type: none"> Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH. 	<ul style="list-style-type: none"> Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps. 		<ul style="list-style-type: none"> ELC ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M. The MNRF/Natural Heritage Information Centre (NHIC) will have up to date listing for rare vegetation communities. <p>Field studies should confirm:</p> <ul style="list-style-type: none"> If an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG. Area of the ELC Vegetation Type polygon is the SWH. SWHMiST Index #37 provides development effects and mitigation measures. 	Regionally rare communities have been confirmed on adjacent lands (beyond 120 m) associated with the West Credit River PSW Complex (NAI #6497 and NAI #6498).
Table 1.2.2: Specialized Habitats for Wildlife considered Significant Wildlife Habitat					
Waterfowl Nesting Area Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	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	<ul style="list-style-type: none"> A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120 m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. 	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	Studies confirmed: <ul style="list-style-type: none"> 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". 	No potential on the subject property. Of the wildlife species listed, only Wood Duck was recorded during the breeding window (4 individuals). Low potential on adjacent lands. Waterfowl nesting not identified as significant in the West Credit River PSW Complex Evaluation.

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
	Note: includes adjacency to Provincially Significant Wetlands (PSW).	<ul style="list-style-type: none"> Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites. 		<ul style="list-style-type: none"> 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 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. SWHMiST Index #25 provides development effects and mitigation measures. 	
Bald Eagle & Osprey Nesting, Foraging & Perching Habitat <u>Rationale:</u> Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	ELC Forest Community Series: FOD FOM FOC SWD SWM and SWC (directly adjacent to riparian areas – rivers, lakes, ponds and wetlands).	<ul style="list-style-type: none"> 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). 	Osprey Special Concern Bald Eagle	Studies confirm the use of these nests by: <ul style="list-style-type: none"> One or more active Osprey or Bald Eagle nests in an area. 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 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800 m is dependent on-site lines from the nest to the development and inclusion of perching and foraging habitat. 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. 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". SWHMiST Index #26 provides development effects and mitigation measures. 	No potential on the subject property or adjacent lands. Bald Eagle or Osprey were not recorded during breeding bird surveys or any other field investigations. The habitat criteria for Significant Wildlife Habitat is not present. There are no breeding records for either species in OBBA Square 17NJ74 (2001-2005); additionally, supplemental data from LIO does not have any nesting records for Osprey or Bald Eagle in the Erin area. There are non-breeding eBird records for both species in the general area but not within 120 m.
Woodland Raptor Nesting Habitat	May be found in all forested ELC ecosites.	<ul style="list-style-type: none"> All natural or conifer plantation woodland/forest stands >30 ha with >10ha of interior habitat. 	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk	Studies confirm:	Not confirmed on the subject property but assumed present (Candidate) in the NHS given

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	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
<p>Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.</p>	<p>May also be found in: SWC SWM SWD and CUP3</p>	<p>Interior habitat determined with a 200 m buffer.</p> <ul style="list-style-type: none"> 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 Coopers 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. 	<p>Red-shouldered Hawk Barred Owl Broad-winged Hawk</p>	<ul style="list-style-type: none"> Presence of 1 or more active nests from species list is considered significant. Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha area of habitat is the SWH (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest). Barred Owl – A 200 m radius around the nest is the SWH. Broad-winged Hawk and Coopers Hawk– A 100 m radius around the nest is the SWH. Sharp-Shinned Hawk – A 50 m radius around the nest is the SWH. 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 Index #27 provides development effects and mitigation measures. 	<p>the size of the forest/wetland ecosites extending beyond the subject property. Field surveys completed in early spring did not reveal raptor nesting evidence; one stick nest was observed on the edge of the NHS in the southern portion of the subject property but no raptors were observed near the site (however, there was confirmed breeding evidence for American Crow in the same woodlot). One Red-tailed Hawk was observed once incidentally during field surveys but no breeding evidence was recorded. No raptors from the species list were observed during the 3 breeding bird surveys.</p> <p>Confirmed habitat on adjacent lands. According to the NAI#6498 (north of 17 Sideroad), the area supports habitat for Northern Goshawk and Broad-winged Hawk.</p>
<p>Turtle Nesting Areas</p> <p>Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.</p>	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC ecosites:</p> <p>MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1</p>	<ul style="list-style-type: none"> 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. 	<p>Midland Painted Turtle</p> <p><u>Special Concern Species:</u> Northern Map Turtle Snapping Turtle</p>	<p>Studies confirm:</p> <ul style="list-style-type: none"> Presence of 5 or more nesting Midland Painted Turtles. One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH. Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100 m area of habitat. 	<p>Candidate habitat is present on the subject property and adjacent lands. Targeted nesting surveys were completed on the subject property, however no nests were confirmed. Many potential nest scrapes were observed near TURT-001 and TURT-003. Given the presence of Midland Painted Turtle and Snapping Turtle in the wetlands present on the subject property, turtle nesting areas are assumed present adjacent to these ecosites.</p>

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
		<ul style="list-style-type: none"> Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. 		<ul style="list-style-type: none"> 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 Index #28 provides development effects and mitigation measures for turtle nesting habitat. 	
Seeps and Springs Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	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.	<ul style="list-style-type: none"> Any forested area (with <25% meadow/field/ pasture) within the headwaters of a stream or river system. Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. 	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Field Studies confirm: <ul style="list-style-type: none"> Presence of a site with 2 or more seeps/springs should be considered SWH. The area of a ELC forest ecosite or an ecoelement within 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. SWHMiST Index #30 provides development effects and mitigation measures. 	Confirmed. CVC staff have mapped points for seeps and springs that have been observed incidentally. Confirmed on adjacent lands. According to the NAI#6497 (east of Eighth Line) and NAI#6498 (north of 17 Sideroad) seeps and springs are present.
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.	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.	<ul style="list-style-type: none"> Presence of a wetland, pond or woodland pool (including vernal pools) >500 m² (about 25 m diameter) within or adjacent (within 120 m) to a woodland (no minimum size). 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. 	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	Studies confirm: <ul style="list-style-type: none"> 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) or 2 or more of the listed frog species with Call Level Codes of 3. A combination of observational study and call count surveys 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 wetland area plus a 230 m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. SWHMiST Index #14 provides development effects and mitigation measures. 	Confirmed habitat on the subject property at AMPH-004 based on the presence of at least 5 Eastern Newts and a full chorus of Spring Peepers. Wood Frog was also recorded (but less than 20 individuals); American Toad (Call Level Code 3) and Green Frog was recorded but are not indicator species. Amphibian egg masses were also observed (not identified to species). Candidate habitat is present on adjacent lands based on the presence of ponds and the West Credit River PSW Complex.

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
<p>Amphibian Breeding Habitat (Wetlands)</p> <p>Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.</p>	<p>ELC Community Classes:</p> <p>SW MA FE BO OA and SA.</p> <p>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.</p>	<ul style="list-style-type: none"> Wetlands >500 m² (about 25 m diameter), 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. 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. 	<p>Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog</p>	<p>Studies confirm:</p> <ul style="list-style-type: none"> Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) 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 will be required during the spring (March-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 Index #15 provides development effects and mitigation measures. 	<p>No potential on the subject property.</p> <p>The criteria for Significant Wildlife Habitat is not present. AMPH-002 is the only wetland on the subject property that is >120m from woodland ecosites; however does not meet the size criteria and the presence of breeding population of 2 or more of the listed frog/toad species was not recorded.</p> <p>Candidate habitat is present on adjacent lands based on the presence of ponds and the West Credit River PSW Complex.</p>
<p>Woodland Area-Sensitive Bird Breeding Habitat</p> <p>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.</p>	<p>All ecosites associated with these ELC Community Series:</p> <p>FOC FOM FOD SWC SWM SWD</p>	<ul style="list-style-type: none"> Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30 ha. Interior forest habitat is at least 200 m from forest edge habitat. 	<p>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</p> <p>Special Concern: Cerulean Warbler Canada Warbler</p>	<p>Studies confirm:</p> <ul style="list-style-type: none"> 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". SWHMIST Index #34 provides development effects and mitigation measures. 	<p>Yellow-bellied Sapsucker, Veery, Scarlet Tanager and Ovenbird were recorded during breeding bird surveys (2016 and/or 2021) but not all within the same ecosites. However, given that the large NHS woodland/wetland in the southern portion of the subject property extends well beyond the limits of the study site (and is >30 ha), this area is considered Candidate SWH. It is likely that additional species from the list are also present.</p> <p>Confirmed habitat on adjacent lands. According to the NAI#6498 (north of 17 Sideroad), woodland area-</p>

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
					sensitive bird breeding habitat is present.
Table 1.3: Habitat for Species of Conservation Concern considered Significant Wildlife Habitat					
Marsh Breeding Bird Habitat Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites	<ul style="list-style-type: none"> Nesting occurs in wetlands. All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. 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. 	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	Studies confirm: <ul style="list-style-type: none"> Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes breeding by any combination of 5 or more of the listed species. Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. 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". SWHMIST Index #35 provides development effects and mitigation measures. 	No potential on the subject property. None of these species were recorded during the 3 breeding bird surveys or any other surveys with the exception of one (1) Green Heron that was recorded during the breeding window but no breeding evidence observed (foraging at northern-most pond (AMPH-001 / TURT-001)). Low potential on adjacent lands for any of the listed species with the exception of Green Heron. High potential breeding habitat for Green Heron on adjacent lands within the West Credit River PSW Complex.
Open Country Bird Breeding Habitat Rationale: This wildlife habitat is declining throughout Ontario and North America. Species	CUM1 CUM2	<ul style="list-style-type: none"> Large grassland areas (includes natural and cultural fields and meadows) >30 ha. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or 	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern Short-eared Owl	Field Studies confirm: <ul style="list-style-type: none"> Presence of nesting or breeding of 2 or more of the listed species. A field with 1 or more breeding Short-eared Owls is to be considered SWH. The area of SWH is the contiguous ELC ecosite field areas. 	No potential on the subject property. Vesper Sparrow was recorded along the hedgerows on the west side of the property but the fields on the subject property are active row crops. Similarly, Savannah Sparrow was recorded in an

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.		<p>intensive hay or livestock pasturing in the last 5 years).</p> <ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> 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". SWHMIST Index #32 provides development effects and mitigation measures. 	<p>active row crop of soy mixed with remnants of canola where meadow edges were also present. Large grassland areas are absent from the subject property.</p> <p>High potential on adjacent lands. A large tract of grassland habitat is present on neighbouring lands at the SW corner of the subject property adjacent to the NHS.</p>
<p>Shrub/Early Successional Bird Breeding Habitat</p> <p><u>Rationale:</u> 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.</p>	<p>CUT1 CUT2 CUS1 CUS2 CUW1 CUW2</p> <p>Patches of shrub ecosites can be complexed into a larger habitat for some bird species.</p>	<ul style="list-style-type: none"> Large field areas succeeding to shrub and thicket habitats >10 ha 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). Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. 	<p>Indicator Spp: Brown Thrasher Clay-coloured Sparrow</p> <p>Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher</p> <p>Special Concern: Yellow-breasted Chat Golden-winged Warbler</p>	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as SWH. 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". SWHMIST cxlix Index #33 provides development effects and mitigation measures. 	<p>No potential on the subject property. The Criteria for Significant Wildlife Habitat is not present. One of the indicator species (Brown Thrasher) and four of the common species (Field Sparrow, Black-billed Cuckoo, Eastern Towhee and Willow Flycatcher) were recorded during breeding bird surveys; however, they were not in the same ecosite but scattered throughout the subject property in various small ecosites 1 ha or less in size.</p> <p>High potential on adjacent lands. A large tract of grassland habitat is present on neighbouring lands at the SW corner of the subject property adjacent to the NHS (approximately 7.5 ha in size). Some of these species were recorded incidentally on adjacent lands during breeding bird surveys.</p>

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
Terrestrial Crayfish Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	<ul style="list-style-type: none"> Wet meadow and edges of shallow marshes (no minimum size) 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. 	Chimney or Digger Crayfish (<i>Fallicambarus fodiens</i>) Devil Crayfish or Meadow Crayfish (<i>Cambarus Diogenes</i>)	Studies Confirm: <ul style="list-style-type: none"> Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. 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 in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. SWHMIST Index #36 provides development effects and mitigation measures. 	No potential on the subject property. None observed during any of the field surveys. Moderate potential on adjacent lands associated with the West Credit River PSW Complex.
Special Concern and Rare Wildlife Species Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All plant and animal Element Occurrences (EO) within a 1 or 10 km 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.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the NHIC.	Studies Confirm: <ul style="list-style-type: none"> 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 be easily mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat. SWHMIST Index #37 provides development effects and mitigation measures. 	Confirmed on the subject property. <ul style="list-style-type: none"> Monarch (larvae and adult butterflies) Barn Swallow Eastern Wood-pewee Wood Thrush Snapping Turtle Midland Painted Turtle. Confirmed on adjacent lands (records from OBBA, ORAA, iNaturalist, NHIC and NAI).
Table 1.4.1: Animal Movement Corridors					
Amphibian Movement Corridors Rationale: Movement corridors for amphibians	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the	<ul style="list-style-type: none"> Movement corridors between breeding habitat and summer habitat. Movement corridors must be determined when Amphibian breeding habitat is confirmed 	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog	<ul style="list-style-type: none"> 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. 	Confirmed on the subject property at the southern pond (AMPH-004).

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	significant breeding habitat for these species in Table 1.1.	as SWH from Table 1.2.2 (Amphibian Breeding Habitat–Wetland) of this Schedule.	Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	<ul style="list-style-type: none"> Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. Corridors should have at least 15 m of vegetation on both sides of waterway or be up to 200 m wide of woodland habitat and with gaps <20 m. Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. SWHMiST Index #40 provides development effects and mitigation measures. 	Confirmed on adjacent lands according to NAI#6497 and #6498.
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.	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. <ul style="list-style-type: none"> A deer wintering habitat identified by the MNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion. Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). 	White-tailed Deer	<ul style="list-style-type: none"> 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 habitat should be unbroken by roads and residential areas. Corridors should be at least 200 m wide with gaps <20 m and if following riparian area with at least 15 m of vegetation on both sides of waterway. Shorter corridors are more significant than longer corridors, SWHMiST Index #39 provides development effects and mitigation measures. 	Confirmed on subject property and adjacent lands (see Table 1.1 above). Deer wintering area (Stratum II) identified via LIO; therefore, deer movement corridors are present at the northeast corner of the subject property and mostly located off-site on adjacent lands.
Table 1.5.1: Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 6E					
6E-14 Mast Producing Areas Rationale: The Bruce Peninsula has an isolated and distinct population of	All Forested habitat represented by ELC Community Series: FOM FOD	<ul style="list-style-type: none"> Woodland ecosites >30 ha with mast-producing tree species, either soft (cherry) or hard (oak and beech). Black bears require forested habitat that provides cover, winter hibernation sites, and mast-producing tree species. 	Black Bear	All woodlands >30 ha with a 50% composition of these ELC Vegetation Types are considered significant: FOM1-1 FOM2-1 FOM3-1 FOD1-1	No potential on the subject property or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. Black Bear are

Significant Wildlife Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		Candidate or Confirmed SWH Habitat on the Subject Property and/or Adjacent Lands (Within 120 m)
	Ecological Land Classification Ecosite Codes	Habitat Criteria	Wildlife Species	Defining Criteria	
black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bear.		<ul style="list-style-type: none"> Forested habitats need to be large enough to provide cover and protection for black bears. 		FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5 SWHMiST Index #3 provides development effects and mitigation measures.	not typically found in this part of Ecoregion 6E.
6E- 17 Lek Rationale: Sharp-tailed grouse only occur on Manitoulin Island in Ecoregion 6E, Leks are an important habitat to maintain their population.	CUM CUS CUT	<ul style="list-style-type: none"> The Lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography. Leks are typically a grassy field/meadow >15 ha with adjacent shrublands and >30 ha with adjacent deciduous woodland. Conifer trees within 500 m are not tolerated. Grasslands (field/meadow) are to be >15 ha when adjacent to shrubland and >30 ha when adjacent to deciduous woodland. Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying). Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting. 	Sharp-tailed Grouse	<ul style="list-style-type: none"> Studies confirming Lek habitat are to be completed from late March to June. Any site confirmed with sharp-tailed grouse courtship activities is considered significant. The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the Lek habitat. SWHMiST cxlix Index #32 provides development effects and mitigation measures. 	No potential on the subject property or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. Sharp-tailed Grouse only occur on Manitoulin Island in Ecoregion 6E.



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Appendix E

Soil Auger Data Sheets

Date July 21 2021 Surveyor(s) Ariana + Meredith
 Time _____ Waypoint(s) EPA ELC Point (creation) "Soil auger #2"
 Photo(s) _____ Zone _____ Easting _____ Northing _____

depth (cm)		horizon / layer		matrix colour			% coarse fragments (vol)				Sampling Method	
up	down	horizon (e.g. Ah, B1)	texture (e.g. SiCL)	hue	value	chroma	gravel	cobble	stone	boulder	<input type="checkbox"/> pit	<input checked="" type="checkbox"/> auger
0	29		Silt Loam				30					
29	60		Loam									
60	97		Silty Clay									
		effective texture										
		mottle colour										
		gley colour										

Organic Material Depths (cm)	Organic Material Classification	Depths to / of	Slope
L	humus form	depth sampled <u>97</u>	PSD 1
F	type of organic material <input type="checkbox"/> shallow folic <input type="checkbox"/> deep folic (> 40 cm) <input type="checkbox"/> peaty phase (20 - 40 cm) <input type="checkbox"/> wet organic - fibric <input type="checkbox"/> wet organic - mesic + humic	mottles <u>31</u>	PSD 2
H		gley	
Of		bedrock	Mode of Deposition
Om		carbonates	Landform
Oh		water table	Topographic Feature
total organics	Notes	seepage	
			position on slope
			slope class
			slope aspect
			slope percent
			slope type
			slope shape

Site Coverages (%)

bedrock (rockiness)
coarse frag. (stoniness)
mineral substrate
organic material
woody debris
moss
vegetation
vernal pooling



- Chemistry
- calcareous
 - non-calcareous
 - saline
- Energy
- active
 - not active

- Site
- open water
 - shallow water
 - parent mineral
 - mineral soil
 - coarse fragments
 - bedrock
 - organic

- Material Family
- bedrock
 - coarse fragments
 - sandy
 - coarse loamy
 - silty
 - fine loamy
 - clayey
 - organic - folic (dry)
 - organic - peat (wet)

- Substrate Depth
- rock (< 5 cm)
 - very shallow (5 - 15 cm)
 - shallow (15 - 30 cm)
 - moderate (30 - 60 cm)
 - moderately deep (60 - 120 cm)
 - deep (> 120 cm)

Derived Variables

drainage
moisture regime
substrate class
⑧ Substrate Type

- ⑧ ↓ Hydric Substrates
- hydric (MR 6, 7, 8)
 - near hydric (MR 5)
 - not hydric (MR<5)

⑤ ↓ ⑥ ↑ →

Management / Disturbance	intensity	extent	score



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Appendix F

Breeding Bird Summary Table

300052075 Langen Property EIS
Breeding Bird Survey Summary Table - 2021
Surveys Conducted By: Hannah Maciver

Common Name	Scientific Name	Provincial SRANK ¹	Provincial SARO (Endangered Species Act, 2007) ²	Federal COSEWIC ³	Federal SARA (Species at Risk Act) ³	Federal SARA Schedule ⁴	Provincial MNR Area Sensitive Species ⁵	Highest Number Recorded (All Habitat Units Combined)	Highest Recorded Breeding Evidence ⁶	Comments
Alder Flycatcher	<i>Empidonax alnorum</i>	S5B						3	T	
American Crow	<i>Corvus brachyrhynchos</i>	S5						21	FY	
American Goldfinch	<i>Spinus tristis</i>	S5						32	P	
American Redstart	<i>Setophaga ruticilla</i>	S5B					Yes	5	T	
American Robin	<i>Turdus migratorius</i>	S5						23	NY	
American Woodcock	<i>Scolopax minor</i>	S4B						2	D	Displaying on May 17, 2021 (observed during amphibian breeding call surveys).
Baltimore Oriole	<i>Icterus galbula</i>	S4B						8	A	
Barn Swallow	<i>Hirundo rustica</i>	S4B	SC	SC	THR	1		21	NE	Confirmed nesting in: S3 – 3 nests S4 – 10 nests S7 – 1 nest (based on observations of pair entering/exiting the structure).
Belted Kingfisher	<i>Megaceryle alcyon</i>	S5B,S4N						1	S	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	S4S5B						4	P	
Black-capped Chickadee	<i>Poecile atricapillus</i>	S5						10	FY	
Blue Jay	<i>Cyanocitta cristata</i>	S5						18	FY	
Brown Thrasher	<i>Toxostoma rufum</i>	S4B						3	S	
Brown-headed Cowbird	<i>Molothrus ater</i>	S5						2	S	
Canada Goose	<i>Branta canadensis</i>	S5						15	X	Flyover
Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5						13	P	
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	S5B						3	T	
Chipping Sparrow	<i>Spizella passerina</i>	S5B,S3N						11	FY	
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	S4S5B						8	AE	Nesting in mixed colony with Barn Swallow in S4

Common Name	Scientific Name	Provincial SRANK ¹	Provincial SARO (Endangered Species Act, 2007) ²	Federal COSEWIC ³	Federal SARA (Species at Risk Act) ³	Federal SARA Schedule ⁴	Provincial MNRF Area Sensitive Species ⁵	Highest Number Recorded (All Habitat Units Combined)	Highest Recorded Breeding Evidence ⁶	Comments
										(10 nests counted, some built on top of Barn Swallow nests)
Common Grackle	<i>Quiscalus quiscula</i>	S5						16	CF	
Common Raven	<i>Corvus corax</i>	S5						4	D	Observed with nest building material and copulating on April 8, 2021.
Common Yellowthroat	<i>Geothlypis trichas</i>	S5B						7	T	
Downy Woodpecker	<i>Picoides pubescens</i>	S5						3	S	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S4B						3	T	
Eastern Meadowlark	<i>Sturnella magna</i>	S4B,S3N	THR	THR	THR	1		1	S	
Eastern Phoebe	<i>Sayornis phoebe</i>	S5B						2	H	
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	S4B,S3N						2	S	
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	SC	SC	SC	1		4	T	
European Starling	<i>Sturnus vulgaris</i>	SNA						40	CF	
Field Sparrow	<i>Spizella pusilla</i>	S4B,S3N						3	T	
Gray Catbird	<i>Dumetella carolinensis</i>	S5B,S3N						3	P	
Great Blue Heron	<i>Ardea herodias</i>	S4						6	X	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	S5B						5	P	
Green Heron	<i>Butorides virescens</i>	S4B						1	X	
Hairy Woodpecker	<i>Picoides villosus</i>	S5					Yes	3	H	
House Wren	<i>Troglodytes aedon</i>	S5B						9	T	
Indigo Bunting	<i>Passerina cyanea</i>	S5B						11	A	
Killdeer	<i>Charadrius vociferus</i>	S4B						3	A	
Merlin	<i>Falco columbarius</i>	S5						1	X	Eastern Kingbird observed attacking; incidental.
Mourning Dove	<i>Zenaida macroura</i>	S5						8	S	
Mourning Warbler	<i>Geothlypis philadelphia</i>	S5B						1	S	
Northern Cardinal	<i>Cardinalis cardinalis</i>	S5						9	A	
Northern Flicker	<i>Colaptes auratus</i>	S5						6	S	
Ovenbird	<i>Seiurus aurocapilla</i>	S5B						4	T	
Pileated Woodpecker	<i>Dryocopus pileatus</i>	S5					Yes	2	P	Observed on April 8, 2021.
Pine Warbler	<i>Setophaga pinus</i>	S5B,S3N						2	T	

Common Name	Scientific Name	Provincial SRANK ¹	Provincial SARO (Endangered Species Act, 2007) ²	Federal COSEWIC ³	Federal SARA (Species at Risk Act) ³	Federal SARA Schedule ⁴	Provincial MNRF Area Sensitive Species ⁵	Highest Number Recorded (All Habitat Units Combined)	Highest Recorded Breeding Evidence ⁶	Comments
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	S5						2	P	
Red-eyed Vireo	<i>Vireo olivaceus</i>	S5B						9	P	
Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5						1	X	Observed on April 5, 2021 at north end of subject property. Flyover.
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S5						17	CF	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	S5B						4	CF	
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	S5B						1	H	
Ruffed Grouse	<i>Bonasa umbellus</i>	S5						1	D	Heard drumming on April 8, 2021 FODM8-1 ecosite at northeast side of subject property.
Savannah Sparrow	<i>Passerculus sandwichensis</i>	S5B,S3N					Yes	6	T	
Scarlet Tanager	<i>Piranga olivacea</i>	S5B					Yes	1	S	
Song Sparrow	<i>Melospiza melodia</i>	S5						27	AE	
Spotted Sandpiper	<i>Actitis macularius</i>	S5B						1	S	
Tree Swallow	<i>Tachycineta bicolor</i>	S4S5B						6	H	
Turkey Vulture	<i>Cathartes aura</i>	S5B,S3N						6	X	
Vesper Sparrow	<i>Pooecetes gramineus</i>	S4B						2	T	
Warbling Vireo	<i>Vireo gilvus</i>	S5B						3	T	
White-breasted Nuthatch	<i>Sitta carolinensis</i>	S5					Yes	3	S	
Wild Turkey	<i>Meleagris gallopavo</i>	S5						8	FY	
Willow Flycatcher	<i>Empidonax traillii</i>	S4B						2	T	
Wood Duck	<i>Aix sponsa</i>	S5B, S3N						4	H	Observed on May 6, 2021 in CVR_4 ecosite west of main house.
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	SC	THR	THR	1		2	T	
Yellow Warbler	<i>Setophaga petechia</i>	S5B						4	T	
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	S5B,S3N					Yes	2	CF	
TOTAL	68 species									

¹S-Ranks (provincial)

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: <http://explorer.natureserve.org/nsranks.htm>)

SX — Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20–40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

S1 — Critically Imperiled - Critically imperiled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.

S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.

S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 — Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 — Secure - Common, widespread, and abundant in the province.

SNR — Unranked - Province conservation status not yet assessed.

SU — Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA — Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S# — Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

S#? — Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers

B – Breeding Conservation status refers to the breeding population of the species in the nation or state/province.

N – Nonbreeding Conservation status refers to the non-breeding population of the species in the province.

M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

²SARO Endangered Species Act, 2007

(provincial status from <http://www.ontario.ca/environment-and-energy/how-species-risk-are-listed#section-3>)
 The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.

Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.

Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.

Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.

Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.

Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

³SARA (Federal Species at Risk Act) Status and Schedule (includes COSEWIC Status)

The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Extinct - A wildlife species that no longer exists.

Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.

Endangered (END) - A wildlife species facing imminent extirpation or extinction.

Threatened (THR) - A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Data Deficient (DD) - A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

⁴SARA Schedule

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.

Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

⁵Source: Ontario Ministry of Natural Resources. 2000. *Significant Wildlife Habitat Technical Guide & Appendices*.

⁶Ontario Breeding Bird Atlas - Breeding Evidence Codes

Observed	
X	Species observed in its breeding season (no breeding evidence).

Possible	
H	Species observed in its breeding season in suitable nesting habitat.
S	Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

Probable	
P	Pair observed in suitable nesting habitat in nesting season.
T	Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D	Courtship or display, including interaction between a male and a female or two males, including courtship feeding or 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 hole.

Confirmed	
DD	Distraction display or injury feigning.
NU	Used nest or egg shells found (occupied or laid within the period of the survey).

FY	Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE	Adult leaving or entering nest sites in circumstances indicating occupied nest.

FS	Adult carrying fecal sac.
CF	Adult carrying food for young.
NE	Nest containing eggs.
NY	Nest with young seen or heard.



BURNSIDE

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Appendix G

Plant List and ELC Data Sheets

Botanical Inventory Plant List

Scientific Name	Common Name	ESA	COSEWIC	SARA	G-Rank	S-Rank	Native/ Introduced	OWES Wetland Plant List	CVC CVC/Peel Status (2002)	CVC Local and Regional Rank (Kaiser 2001)	Greater Toronto Area (Varga et al. 2000)	Cultural Meadows and Hedgerows (RJB Survey)	Uncultivated Fields and Fencerows (previous EIS)	Wetland (RJB Survey)	Wetlands (previous EIS)	Woodland (RJB Survey)	Upland Woodland (previous EIS)
<i>Abies balsamea</i>	Balsam Fir				G5	S5	N	S	X		X					X	
<i>Acer ginnala</i>	Amur Maple				GNR	SNA	I						X				
<i>Acer negundo</i>	Manitoba Maple				G5	S5	N	S	X		X	X	X	X	X	X	X
<i>Acer platanoides</i>	Norway Maple				GNR	SNA	I		X		X	X					
<i>Acer rubrum</i>	Red Maple				G5	S5	N	S	X		X	X					
<i>Acer saccharinum</i>	Silver Maple				G5	S5	N	I	X		X			X			
<i>Acer saccharum</i>	Sugar Maple				G5	S5	N		X		X	X	X			X	X
<i>Achillea millefolium</i>	Common Yarrow				G5	SNA	I		X		X	X				X	X
<i>Actaea racemosa</i>	Black Snakeroot				G3G4	S2	N										
<i>Actaea rubra</i>	Red Baneberry				G5	S5	N		X		X					X	X
<i>Agrimonia gryposepala</i>	Hooked Agrimony				G5	S5	N		X		X						X
<i>Agrostis gigantea</i>	Redtop				G4G5	SNA	I		X		X		X	X			
<i>Alliaria petiolata</i>	Garlic Mustard				GNR	SNA	I		X		X					X	X
<i>Ambrosia artemisiifolia</i>	Common Ragweed				G5	S5	N		X		X		X				
<i>Amelanchier sp.</i>	Serviceberry Species											X					
<i>Anemone cylindrica</i>	Long-headed Anemone				G5	S4	N		rare	rare	R					X	
<i>Apocynum androsaemifolium</i>	Spreading Dogbane				G5	S5	N		X		X		X				
<i>Apocynum cannabinum var. cannabinum</i>	Hemp Dogbane				G5T5	S5	N		X		X	X					
<i>Arctium minus</i>	Common Burdock				GNR	SNA	I		X		X	X					X
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit				G5	S5	N	S	X		X					X	
<i>Asarum canadense</i>	Canada Wild-ginger				G5	S5	N		X		X						X
<i>Asclepias syriaca</i>	Common Milkweed				G5	S5	N		X		X	X	X	X			X
<i>Athyrium filix-femina</i>	Common Lady Fern				G5	S5	N	S									X
<i>Barbarea vulgaris</i>	Bitter Wintercress				GNR	SNA	I		X		X			X			
<i>Betula pendula</i>	Weeping Birch				GNR	SNA	I	S	X		X					X	
<i>Bidens cernua</i>	Nodding Beggarticks				G5	S5	N	I	X		X				X		
<i>Brassica nigra</i>	Black Mustard				GNR	SNA	I		X		X		X				
<i>Bromus inermis</i>	Smooth Brome				G5T5	SNA	I		X		X	X	X				
<i>Calamagrostis canadensis var. canadensis</i>	Bluejoint Reedgrass				G5T5	S5	N		X		X			X	X		

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<i>Capsella bursa-pastoris</i>	Common Shepherd's Purse				GNR	SNA	I		X		X			X			
<i>Carex albursina</i>	White Bear Sedge				G5	S5	N		rare		X						X
<i>Carex aurea</i>	Golden Sedge				G5	S5	N	S	X		X	X					
<i>Carex bebbii</i>	Bebb's Sedge				G5	S5	N	I	X		X		X				
<i>Carex blanda</i>	Woodland Sedge				G5	S5	N		X		X					X	
<i>Carex crinita</i>	Fringed Sedge				G5	S5	N	I	X		X			X			
<i>Carex cristatella</i>	Crested Sedge				G5	S5	N	I	X		X			X			
<i>Carex deweyana</i>	Dewey's Sedge				G5	S5	N		X		X					X	X
<i>Carex echinata</i>	Star Sedge				G5	S5	N	I	rare	rare	R			X			
<i>Carex echinodes</i>	Quill Sedge				G5TNR	S4	N							X			
<i>Carex flava</i>	Yellow Sedge				G5	S5	N	I	rare		R	X		X	X		
<i>Carex gracillima</i>	Graceful Sedge				G5	S5	N	S	X		X					X	X
<i>Carex granularis</i>	Limestone Meadow Sedge				G5	S5	N	S	X		X		X	X	X	X	
<i>Carex hystericina</i>	Porcupine Sedge				G5	S5	N	I	X		X		X	X	X		
<i>Carex interior</i>	Inland Sedge				G5	S5	N	I	X		X				X		
<i>Carex lacustris</i>	Lake Sedge				G5	S5	N	I	X		X				X		
<i>Carex lasiocarpa</i>	Woolly-fruit Sedge				G5	S5	N	I	rare	rare	R			X	X		
<i>Carex laxiflora</i>	Loose-flowered Sedge				G5	S5	N		rare		X						X
<i>Carex lupulina</i>	Hop Sedge				G5	S5	N	I	X					X			
<i>Carex pallescens</i>	Pale Sedge				G5	S4	N	S	rare	rare	R		X				
<i>Carex pedunculata</i>	Long-stalked Sedge				G5	S5	N		X		X					X	
<i>Carex pennsylvanica</i>	Pennsylvania Sedge				G5	S5	N		X		X						X
<i>Carex projecta</i>	Necklace Sedge				G5	S5	N	I	rare		X		X	X	X		
<i>Carex pseudocyperus</i>	Cyperus-like Sedge				G5	S5	N	I	X		X				X		
<i>Carex retrorsa</i>	Retrorse Sedge				G5	S5	N	I	X		X				X		
<i>Carex rosea</i>	Rosy Sedge				G5	S5	N		X		X					X	
<i>Carex scoparia</i>	Pointed Broom Sedge				G5	S5	N	S	rare	rare	R				X		
<i>Carex sp.</i>	Sedge Species											X		X		X	
<i>Carex sparganioides</i>	Burreed Sedge				G5	S4S5	N		X		X						X
<i>Carex spicata</i>	Spiked Sedge				GNR	SNA	I		X		X						X
<i>Carex sprengei</i>	Sprengel's Sedge				G5	S5	N		rare	rare	R					X	
<i>Carex stipata</i>	Awl-fruited Sedge				G5	S5	N	I	X		X		X	X	X		

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<i>Carex stricta</i>	Tussock Sedge				G5	S5	N	I	X		X				X		
<i>Carex vulpinoidea</i>	Fox Sedge				G5	S5	N	I	X		X		X	X	X		
<i>Caulophyllum thalictroides</i>	Blue Cohosh				G5	S5	N		X		X					X	X
<i>Cerastium arvense ssp. arvense</i>	Field Chickweed				G5T5	SNA	I		X		X	X					
<i>Cerastium fontanum</i>	Common Mouse-ear Chickweed				GNR	SNA	I		X		X		X				
<i>Chelidonium majus</i>	Greater Celandine				GNR	SNA	I		X		X	X					
<i>Chenopodium album</i>	Common Lamb's-quarters				G5	SNA	I		X		X	X					
<i>Cichorium intybus</i>	Wild Chicory				GNR	SNA	I		X		X	X	X				
<i>Circaea canadensis</i>	Broad-leaved Enchanter's Nightshade				G5	S5	N		X		X	X		X	X	X	X
<i>Cirsium arvense</i>	Canada Thistle				G5	SNA	I		X		X		X	X		X	
<i>Cirsium vulgare</i>	Bull Thistle				GNR	SNA	I		X		X	X	X				
<i>Clematis virginiana</i>	Virginia Clematis				G5	S5	N	S	X		X			X	X		X
<i>Clinopodium vulgare</i>	Wild Basil				G5	S5	N		X		X	X				X	
<i>Convallaria majalis</i>	European Lily-of-the-valley				G5	SNA	I		X		X		X				X
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood				G5	S5	N		X		X	X				X	X
<i>Cornus obliqua</i>	Silky Dogwood				G5	S5	N	I	rare		R			X	X		
<i>Cornus sericea</i>	Red-osier Dogwood				G5	S5	N		X		X	X	X	X	X	X	X
<i>Crataegus punctata</i>	Dotted Hawthorn				G5	S5	N		X		X					X	
<i>Crataegus sp.</i>	Hawthorn Species											X					
<i>Cynoglossum officinale</i>	Common Hound's-tongue				GNR	SNA	I		X		X						X
<i>Dactylis glomerata</i>	Orchard Grass				GNR	SNA	I		X		X	X	X		X	X	X
<i>Daucus carota</i>	Wild Carrot				GNR	SNA	I		X		X	X	X				
<i>Dipsacus fullonum</i>	Common Teasel				GNR	SNA	I		X		X		X		X		
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern				G5	S5	N	S	X		X			X	X	X	X
<i>Echinocystis lobata</i>	Wild Cucumber				G5	S5	N	S	X		X			X	X		X
<i>Echium vulgare</i>	Common Viper's Bugloss				GNR	SNA	I		X		X	X					
<i>Eleocharis erythropoda</i>	Red-stemmed Spikerush				G5	S5	N	I	X		X			X			
<i>Eleocharis palustris</i>	Common Spikerush				G5	S5	N	I	rare		X				X		
<i>Elymus hystrix</i>	Bottlebrush Grass				G5	S5	N		X		X					X	
<i>Epilobium hirsutum</i>	Hairy Willowherb				GNR	SNA	I	I	X		X		X				
<i>Epilobium parviflorum</i>	Small-flowered Hairy Willowherb				GNR	SNA	I	S	X		X				X		
<i>Epipactis helleborine</i>	Broad-leaved Helleborine				GNR	SNA	I		X		X					X	X

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<i>Equisetum arvense</i>	Field Horsetail				G5	S5	N	S	X		X	X	X	X	X	X	X
<i>Equisetum fluviatile</i>	Water Horsetail				G5	S5	N	I	rare		X				X		
<i>Erigeron annuus</i>	Annual Fleabane				G5	S5	N		X		X					X	
<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				G5	S5	N	S	X		X	X			X		
<i>Erigeron strigosus</i>	Rough Fleabane				G5	S5	N		X		X		X				X
<i>Erythronium americanum</i>	Yellow Trout-lily				G5	S5	N		X		X						X
<i>Eupatorium perfoliatum</i>	Common Boneset				G5	S5	N	I	X		X				X		
<i>Euphorbia cyparissias</i>	Cypress Spurge				G5	SNA	I		X		X						
<i>Euphorbia epithymoides</i>	Cushion Spurge				GNR	SNA	I		X		X	X					
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod				G5	S5	N		X		X		X		X		
<i>Eutrochium maculatum var. maculatum</i>	Spotted Joe Pye Weed				G5T5	S5	N	I	X		X	X		X	X		
<i>Fagus grandifolia</i>	American Beech				G5	S4	N		X		X						X
<i>Festuca trachyphylla</i>	Hard Fescue				GNR	SNA	I		X		X		X				
<i>Fragaria virginiana ssp. virginiana</i>	Wild Strawberry				G5T5	S5	N		X		X	X	X	X	X		X
<i>Fraxinus americana</i>	White Ash				G5	S4	N		X		X	X			X	X	X
<i>Fraxinus nigra</i>	Black Ash		END	END	G5	S4	N	I	X		X	X		X	X		
<i>Fraxinus pennsylvanica</i>	Red Ash				G5	S4	N	S	X		X	X	X	X		X	X
<i>Galeopsis tetrahit</i>	Common Hemp-nettle				GNR	SNA	I		X		X		X				X
<i>Galium aparine</i>	Common Bedstraw				G5	S5	N		rare		X				X		
<i>Galium asprellum</i>	Rough Bedstraw				G5	S5	N	I	X		X	X		X			
<i>Galium mollugo</i>	Smooth Bedstraw				GNR	SNA	I		X		X		X				
<i>Galium palustre</i>	Common Marsh Bedstraw				G5	S5	N	I	X		X		X		X		
<i>Galium trifidum ssp. trifidum</i>	Three-petalled Bedstraw				G5T5	S5	N		rare		X			X	X		
<i>Geranium robertianum</i>	Herb-Robert				G5	S5	N		X		X	X		X		X	X
<i>Geum aleppicum</i>	Yellow Avens				G5	S5	N	S	X		X	X	X	X	X	X	
<i>Geum canadense</i>	Canada Avens				G5	S5	N	S	X		X			X		X	X
<i>Geum rivale</i>	Water Avens				G5	S5	N	I	rare	rare	R				X		
<i>Glechoma hederacea</i>	Ground-ivy				GNR	SNA	I		X		X						X
<i>Gleditsia triacanthos</i>	Honey Locust				G5	S2?	N		X		X	X					
<i>Glyceria striata</i>	Fowl Mannagrass				G5	S5	N	I	X		X			X	X	X	X

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<i>Hesperis matronalis</i>	Dame's Rocket				G4G5	SNA	I		X		X		X				X
<i>Hordeum jubatum</i>	Foxtail Barley				G5	S5?	N	S	X								
<i>Hydrophyllum virginianum</i> var. <i>virginianum</i>	Virginia Waterleaf				G5T5	S5	N		X		X					X	
<i>Hypericum perforatum</i>	Common St. John's-wort				GNR	SNA	I		X		X	X	X	X			X
<i>Impatiens capensis</i>	Spotted Jewelweed				G5	S5	N	I	X		X	X		X	X		X
<i>Impatiens pallida</i>	Pale Jewelweed				G5	S4	N	S	rare		R3						X
<i>Inula helenium</i>	Elecampane				GNR	SNA	I	S	X		X	X		X			
<i>Juglans cinerea</i>	Butternut	END	END	END	G3	S2?	N		X		X	X	X				
<i>Juglans nigra</i>	Black Walnut				G5	S4?	N		X		R		X				X
<i>Juncus alpinoarticulatus</i>	Alpine Rush				G5	S5	N	I	rare	rare	R7				X		
<i>Juncus dudleyi</i>	Dudley's Rush				G5	S5	N	S	X		X		X	X	X		
<i>Juncus effusus</i> ssp. <i>solutus</i>	Soft Rush				G5T5	S5?	N		X		X		X	X	X		
<i>Juncus tenuis</i>	Path Rush				GNR	S5	N		X		X		X			X	
<i>Juniperus virginiana</i>	Eastern Red Cedar				G5	S5	N		rare		R4		X			X	
<i>Lactuca serriola</i>	Prickly Lettuce				GNR	SNA	I		X		X		X				
<i>Larix laricina</i>	Tamarack				G5	S5	N	I	X		X			X		X	X
<i>Leersia oryzoides</i>	Rice Cutgrass				G5	S5	N	I	X		X				X		
<i>Leonurus cardiaca</i> ssp. <i>cardiaca</i>	Common Motherwort				GNRTNR	SNA	I		X		X	X					X
<i>Leucanthemum vulgare</i>	Oxeye Daisy				GNR	SNA	I		X		X	X	X				
<i>Linaria vulgaris</i>	Butter-and-eggs				GNR	SNA	I		X		X	X	X				
<i>Lobelia siphilitica</i>	Great Blue Lobelia				G5	S5	N	I	X		XU		X				
<i>Lolium arundinaceum</i>	Tall Ryegrass				GNR	SNA	I		X		X	X					
<i>Lolium perenne</i>	Perennial Ryegrass				GNR	SNA	I		X		X		X				
<i>Lolium pratense</i>	Meadow Ryegrass				G5	SNA	I		X		X		X				
<i>Lonicera morrowii</i>	Morrow's Honeysuckle				GNR	SNA	I		X		X						X
<i>Lonicera tatarica</i>	Tatarian Honeysuckle				GNR	SNA	I		X		X					X	X
<i>Lonicera x bella</i>	(<i>Lonicera morrowii</i> X <i>Lonicera tatarica</i>)				GNA	SNA	N		X		X					X	
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil				GNR	SNA	I		X		X	X	X		X		
<i>Lycopus americanus</i>	American Water-horehound				G5	S5	N	I	X		X			X			
<i>Lycopus uniflorus</i>	Northern Water-horehound				G5	S5	N	I	X		X			X	X		
<i>Lythrum salicaria</i>	Purple Loosestrife				G5	SNA	I	I	X		X			X	X		

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<i>Maianthemum canadense</i>	Wild Lily-of-the-valley				G5	S5	N		X		X					X	
<i>Maianthemum racemosum</i>	Large False Solomon's Seal				G5T5	S5	N		X		X					X	
<i>Malus pumila</i>	Common Apple				G5	SNA	I		X		X	X	X			X	X
<i>Malus sp.</i>	Apple Species											X					
<i>Malva moschata</i>	Musk Mallow				GNR	SNA	I		X		X	X					
<i>Matteuccia struthiopteris</i>	Ostrich Fern				G5	S5	N	S	X		X			X	X		
<i>Medicago lupulina</i>	Black Medick				GNR	SNA	I		X		X	X	X				
<i>Medicago sativa</i>	Alfalfa				GNR	SNA	I		X				X				
<i>Melilotus albus</i>	White Sweet-clover				G5	SNA	I		X		X	X	X				
<i>Mentha canadensis</i>	Canada Mint				G5	S5	N		X					X	X		
<i>Muhlenbergia sp.</i>	Satin Grass Species															X	
<i>Myosotis scorpioides</i>	True Forget-me-not				G5	SNA	I	I	X		X			X		X	
<i>Nasturtium officinale</i>	Watercress				GNR	SNA	I								X		
<i>Nepeta cataria</i>	Catnip				GNR	SNA	I		X		X	X					X
<i>Oenothera biennis</i>	Common Evening-primrose				G5	S5	N		X		U	X	X				
<i>Onoclea sensibilis</i>	Sensitive Fern				G5	S5	N	I	X		X			X	X	X	X
<i>Ostrya virginiana</i>	Eastern Hop-hornbeam				G5	S5	N		X		X	X				X	X
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel				G5	SNA	I		X		X	X				X	X
<i>Panicum capillare</i>	Common Panicgrass				G5	S5	N		X		X		X				
<i>Parthenocissus quinquefolia</i>	Virginia Creeper				G5	S4?	N		X		R	X			X	X	X
<i>Parthenocissus vitacea</i>	Thicket Creeper				G5	S5	N		X		X	X		X		X	
<i>Phalaris arundinacea</i>	Reed Canarygrass				G5	S5	N	S	X		X	X	X	X	X		
<i>Phleum pratense</i>	Common Timothy				GNR	SNA	I		X		X	X	X	X			X
<i>Phragmites australis ssp. australis</i>	European Reed				G5T5	SNA	I	S	X		X	X		X	X		
<i>Physalis heterophylla</i>	Clammy Ground-cherry				G5	S4	N		rare	rare	R7		X				
<i>Picea abies</i>	Norway Spruce				G5	SNA	I		X		X	X					
<i>Picea glauca</i>	White Spruce				G5	S5	N	S	X		X	X	X			X	
<i>Picea pungens</i>	Blue Spruce				G5	SNA	I					X					
<i>Picris hieracioides</i>	Hawkweed Oxtongue				G5	SNA	I				XSR		X				X
<i>Pilosella officinarum</i>	Mouse-ear Hawkweed				GNR	SNA	I		X		X		X				

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<i>Pilosella piloselloides ssp. piloselloides</i>	Tall Hawkweed				GNRTNR	SNA	I		X		X		X				
<i>Pinus strobus</i>	Eastern White Pine				G5	S5	N	S	X		X	X	X	X		X	X
<i>Pinus sylvestris</i>	Scots Pine				GNR	SNA	I		X		X	X	X			X	
<i>Plantago lanceolata</i>	English Plantain				G5	SNA	I		X		X	X	X				
<i>Plantago major</i>	Common Plantain				G5	SNA	I		X		X		X		X	X	
<i>Plantago rugelii</i>	Rugel's Plantain				G5	S5	N		X		X		X		X		
<i>Poa compressa</i>	Canada Bluegrass				GNR	SNA	I		X		X			X	X		X
<i>Poa palustris</i>	Fowl Bluegrass				G5	S5	N	I	X		X				X		
<i>Poa pratensis</i>	Kentucky Bluegrass				G5	S5	N		X		X	X	X	X		X	
<i>Poa trivialis</i>	Rough Bluegrass				GNR	SNA	I		X		X						X
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal				G5	S5	N		X		X						X
<i>Populus balsamifera</i>	Balsam Poplar				G5	S5	N	S	X		X	X	X	X	X	X	X
<i>Populus deltoides</i>	Eastern Cottonwood				G5	S5	N	S	X				X				
<i>Populus tremuloides</i>	Trembling Aspen				G5	S5	N	S	X		X	X		X	X	X	X
<i>Potamogeton natans</i>	Floating-leaved Pondweed				G5	S5	N	I	X		XU				X		
<i>Potamogeton sp.</i>	Pondweed Species													X			
<i>Potentilla argentea</i>	Silvery Cinquefoil				GNR	SNA	I		X		X	X					
<i>Potentilla recta</i>	Sulphur Cinquefoil				GNR	SNA	I		X		X	X	X				
<i>Prunella vulgaris ssp. vulgaris</i>	Common Self-heal				G5TU	SNA	I		X		X	X	X		X		X
<i>Prunus avium</i>	Sweet Cherry				GNR	SNA	I		X		X					X	
<i>Prunus serotina</i>	Black Cherry				G5	S5	N		X		X	X		X		X	X
<i>Prunus virginiana</i>	Chokecherry				G5	S5	N		X		X	X				X	X
<i>Pyrola asarifolia</i>	Pink Pyrola				G5	S5	N	S	X		XU						X
<i>Pyrus communis</i>	Common Pear				G5	SNA	I		X		X		X				
<i>Ranunculus acris</i>	Common Buttercup				G5	SNA	I	S	X		X	X	X	X	X		X
<i>Ranunculus caricetorum</i>	Northern Swamp Buttercup				G5T5	S5	N				X	X					
<i>Ranunculus sceleratus</i>	Cursed Buttercup				G5	S5	N	I	X				X				
<i>Rhamnus cathartica</i>	European Buckthorn				GNR	SNA	I	S	X		X	X	X	X	X	X	X
<i>Rhus typhina</i>	Staghorn Sumac				G5	S5	N		X		X	X	X				X
<i>Ribes americanum</i>	American Black Currant				G5	S5	N	S	X		X	X		X	X		X
<i>Ribes cynosbati</i>	Eastern Prickly Gooseberry				G5	S5	N		X		X					X	X

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<i>Ribes triste</i>	Swamp Red Currant				G5	S5	N	I	X		XU						X
<i>Ribes sp.</i>	Currant													X			
<i>Robinia pseudoacacia</i>	Black Locust				G5	SNA	I		X		X		X				X
<i>Rorippa palustris</i>	Marsh Yellowcress				G5	S5	N	I	X						X		
<i>Rosa multiflora</i>	Multiflora Rose				GNR	SNA	I		X		X	X			X		X
<i>Rosa sp.</i>	Rose Species											X					
<i>Rubus allegheniensis</i>	Allegheny Blackberry				G5	S5	N		X		X			X			
<i>Rubus idaeus ssp. strigosus</i>	North American Red Raspberry				G5T5	S5	N		X		X	X				X	X
<i>Rubus occidentalis</i>	Black Raspberry				G5	S5	N		X		X						X
<i>Rubus pubescens</i>	Dwarf Raspberry				G5	S5	N		X		X			X			
<i>Rubus setosus</i>	Bristly Blackberry				G5	S4	N	S						X			
<i>Rudbeckia hirta</i>	Black-eyed Susan				G5	S5	N		X		X	X	X				
<i>Rumex crispus</i>	Curled Dock				GNR	SNA	I	S	X		X	X	X	X			
<i>Rumex obtusifolius</i>	Bitter Dock				GNR	SNA	I	S	X		X		X				
<i>Sagittaria latifolia</i>	Broad-leaved Arrowhead				G5	S5	N	I	X		X			X	X		
<i>Salix alba</i>	White Willow				G5	SNA	I	S	X		X	X		X			
<i>Salix bebbiana</i>	Bebb's Willow				G5	S5	N	I	X			X		X	X		
<i>Salix discolor</i>	Pussy Willow				G5	S5	N	I	X		X	X		X	X	X	
<i>Salix eriocephala</i>	Cottony Willow				G5	S5	N	S	X		X			X			
<i>Salix euxina</i>	Crack Willow				GNR	SNA	I		rare				X	X	X		
<i>Salix lucida</i>	Shining Willow				G5T5	S5	N	I	rare		XU			X	X		
<i>Salix petiolaris</i>	Meadow Willow				G5	S5	N	I	X		X	X			X	X	
<i>Salix purpurea</i>	Purple Willow				G5	SNA	I	S	X		X				X		
<i>Salix sp.</i>	Willow Species											X		X			
<i>Sambucus canadensis</i>	Common Elderberry				G5T5	S5	N	S	X			X		X	X		
<i>Sambucus racemosa</i>	Red Elderberry				G5	S5	N		X		X			X			X
<i>Sanguinaria canadensis</i>	Bloodroot				G5	S5	N		X		X					X	X
<i>Schoenoplectus tabernaemontani</i>	Soft-stemmed Bulrush				G5	S5	N	I	X		X		X	X	X		
<i>Scirpus atrovirens</i>	Dark-green Bulrush				G5	S5	N	S	X		X		X	X	X		
<i>Scirpus pendulus</i>	Hanging Bulrush				G5	S5	N	I	rare		R7	X		X	X		
<i>Scutellaria galericulata</i>	Marsh Skullcap				G5	S5	N	I	X		X				X		

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<i>Securigera varia</i>	Purple Crown-vetch				GNR	SNA	I		X		X	X	X				
<i>Silene latifolia</i>	White Champion				GNR	SNA	I		X		X		X				
<i>Silene vulgaris</i>	Bladder Champion				GNR	SNA	I		X		X	X	X			X	
<i>Sisyrinchium montanum</i>	Strict Blue-eyed-grass				G5	S5	N	S	rare		XU	X	X	X	X		
<i>Solanum dulcamara</i>	Bittersweet Nightshade				GNR	SNA	I	S	X		X			X	X	X	X
<i>Solidago altissima</i>	Tall Goldenrod				G5	S5	N		X		X		X		X		X
<i>Solidago canadensis</i>	Canada Goldenrod				G5	S5	N		X		X	X	X	X	X	X	X
<i>Solidago flexicaulis</i>	Zigzag Goldenrod				G5	S5	N		X		X						X
<i>Solidago gigantea</i>	Giant Goldenrod				G5	S5	N	S	X		X			X	X		X
<i>Solidago nemoralis</i>	Grey-stemmed Goldenrod				G5	S5	N		X				X				
<i>Solidago rugosa ssp. rugosa</i>	Northern Rough-stemmed Goldenrod				G5T5	S5	N	S	X		X		X	X		X	
<i>Solidago sp.</i>	Goldenrod Species											X		X		X	
<i>Sonchus arvensis</i>	Field Sow-thistle				GNR	SNA	I		X		X	X					
<i>Sorbus aucuparia</i>	European Mountain-ash				G5	SNA	I		X		X	X				X	X
<i>Stachys palustris</i>	Marsh Hedge-nettle				G5	SNA	I	I	rare		R3				X		
<i>Symphotrichum ericoides</i>	White Heath Aster				G5	S5	N		X				X				
<i>Symphotrichum lanceolatum</i>	Panicled Aster				G5	S5	N		X		X	X	X	X	X	X	
<i>Symphotrichum lateriflorum</i>	Calico Aster				G5	S5	N	S	X						X	X	X
<i>Symphotrichum novae-angliae</i>	New England Aster				G5	S5	N		X		X	X	X				
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster				G5	S5	N	I	X				X	X	X		
<i>Symphytum officinale</i>	Common Comfrey				GNR	SNA	I		X			X		X	X		
<i>Taraxacum officinale</i>	Common Dandelion				G5	SNA	I		X		X	X	X	X		X	X
<i>Thalictrum dioicum</i>	Early Meadow-rue				G5	S5	N		X		X					X	
<i>Thlaspi arvense</i>	Field Pennycress				GNR	SNA	I		X		XSR		X				
<i>Thuja occidentalis</i>	Eastern White Cedar				G5	S5	N	S	X		X	X	X	X	X	X	
<i>Tilia americana</i>	Basswood				G5	S5	N		X		X	X	X			X	X
<i>Tilia cordata</i>	Little-leaved Linden				GNR	SNA	I					X					
<i>Trifolium hybridum</i>	Alsike Clover				GNR	SNA	I		X		X		X				
<i>Trifolium pratense</i>	Red Clover				GNR	SNA	I		X		X	X	X				
<i>Trifolium repens</i>	White Clover				GNR	SNA	I		X		X	X					
<i>Trillium erectum</i>	Red Trillium				G5	S5	N		X		X					X	
<i>Trillium grandiflorum</i>	White Trillium				G5	S5	N		X		X					X	

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<i>Tussilago farfara</i>	Coltsfoot				GNR	SNA	I	S	X		X			X	X		X
<i>Typha angustifolia</i>	Narrow-leaved Cattail				G5	SNA	I	I	X		X			X	X		
<i>Typha latifolia</i>	Broad-leaved Cattail				G5	S5	N	I	X		X				X		
<i>Ulmus americana</i>	White Elm				G4	S5	N	S	X		X	X		X			X
<i>Urtica dioica</i>	Stinging Nettle				G5	SNA	I		X		X		X				
<i>Valeriana officinalis</i>	Common Valerian				GNR	SNA	I		X			X	X				
<i>Verbascum thapsus</i>	Common Mullein				GNR	SNA	I		X		X	X	X				
<i>Verbena hastata</i>	Blue Vervain				G5	S5	N	I	X		X						X
<i>Veronica officinalis</i>	Common Speedwell				G5	SNA	I		X		X	X				X	X
<i>Viburnum lentago</i>	Nannyberry				G5	S5	N	S	X		X	X	X				X
<i>Viburnum opulus var. opulus</i>	Cranberry Viburnum				G5TNR	SNA	I		X		X	X	X	X			X
<i>Vicia cracca</i>	Tufted Vetch				GNR	SNA	I		X		X	X	X	X	X		
<i>Vicia tetrasperma</i>	Four-seed Vetch				GNR	SNA	I		X		X						X
<i>Viola canadensis</i>	Canada Violet				G5	S5	N		X		XU						X
<i>Viola pubescens</i>	Yellow Violet				G5	S5	N		X		X					X	X
<i>Vitis riparia</i>	Riverbank Grape				G5	S5	N		X		X	X	X	X	X	X	X

CVC. 2002. Plants of the Credit River Watershed.

Kasier, J. 2001. The Vascular Plant Flora of the Region of Peel and the Credit River Watershed.

Varga, S., Leadbeater, D., Webber, J., Kaiser, J., Crins, B., Kamstra, J., Banville, D., Ashley, E., Miller, G., Kingsley, C., Jacobsen, C., Mewa, K., Tebby, L., Mosley, E., and E. Zajc. 2000. Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources Aurora District. 103 pp.

ESA Status

Species at Risk in Ontario list: The list of species that are classified as species at risk under the Endangered Species Act (2007).

EXT: Extinct – A species that no longer exists anywhere.

EXP: Extirpated – A species that no longer exists in the wild in Ontario but still occurs elsewhere.

END: Endangered – A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA).

THR: Threatened – A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SC: Special Concern (formerly Vulnerable) – A species with characteristics that make it sensitive to human activities or natural events.

NAR: Not at Risk – A species that has been evaluated and found to be not at risk.

DD: Data Deficient (formerly Indeterminate) – A species for which there is insufficient information for a provincial status recommendation.

COSEWIC Status

Committee on the Status of Endangered Wildlife in Canada status: Species has been assessed by COSEWIC as having status, but status is not necessarily adopted on the official Schedule 1 to SARA.

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species no longer existing in the wild in Canada, but occurring elsewhere.
END:	Endangered – A species facing imminent extirpation or extinction.
THR:	Threatened – A species likely to become endangered if limiting factors are not reversed.
SC:	Special Concern (formerly vulnerable) – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR:	Not At Risk – A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD:	Data Deficient (formerly Indeterminate) – Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

SARA Schedule 1 Status

Species at Risk Act Schedule 1 Status: Schedule 1 is the official list of species that are classified as extirpated, endangered, threatened, and of special concern. The Act establishes Schedule 1, as the official list of species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented.

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species that no longer exists in the wild in Canada but exists elsewhere in the wild.
END:	Endangered – A species that is facing imminent extirpation or extinction.
THR:	Threatened – A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC:	Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Global Rank

GX	Presumed Extinct (species)/Eliminated (ecological communities and systems) — Species not located despite intensive searches and virtually no likelihood of rediscovery. Ecological community or system eliminated throughout its range, with no restoration potential.
GH	Possibly Extinct (species)/ Eliminated (ecological communities and systems) — Known from only historical occurrences but still some hope of rediscovery. There is evidence that the species may be extinct or the ecosystem may be eliminated throughout its range, but not enough to state this with certainty.
G1	Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2	Imperiled—At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.
G3	Vulnerable—At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
G4	Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	Secure—Common; widespread and abundant.

Variant Ranks

G#G#:	Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
GU:	Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.
GNR:	Unranked – Global rank not yet assessed
GNA:	Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Rank Qualifiers

?:	Inexact Numeric Rank – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.
Q:	Questionable taxonomy that may reduce conservation priority – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.
C:	Captive or Cultivated Only – Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The “C” modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to “Extinct” in the Wild (EW) in IUCN’s Red List terminology (IUCN 2001).

Subnational Rank

S-Rank: Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks but consider only those factors within the political boundaries of Ontario.

S1:	Critically Imperiled – Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2:	Imperiled – Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

- S3: Vulnerable – Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4: Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5: Secure – Common, widespread, and abundant in the nation or state/province.
- S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SX: Presumed Extirpated – Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
- SH: Possibly Extirpated (Historical) – Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
- SE: Species is considered exotic in Ontario
- SNR: Unranked – Nation of state/province conservation status not yet assessed.
- SU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- SNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Native?:

- N: Native to Ontario. Species does not have exotic status under NHIC database.
- I: Introduced to Ontario. Species has exotic status rank under NHIC database.

OWES Wetland Plant List

- S: Wetland Species
- I: Wetland Indicator

ELC Community Summary Sheet	Polygon # 1
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Project #: 52075 Project Name: Langen EIS Surveyor(s): JTA AJB Date: June 24, 21

Community Series: <u>Cum</u>		Ecosite: <u>Cum1</u>	Vegetation Type: <u>Cum1-1</u>
System: Terrestrial Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: Open Shrub Tree	History: Natural Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water <u>meadow</u>	

Stand Description		
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: Rare / Occasional / Abundant / Dominant		
Deadfall Logs: Rare / Occasional / Abundant / Dominant		
Health L / M / H	Sensitivity L / M / H	Botanical Quality L / M / H
Slope: None / Gentle / Moderate / Steep		
<u>Simple</u> / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	<u>12</u>	<u>1</u>	<u>ACERPLA = ACERRUB = PINUSYL = THICOR</u>
2 Subcanopy	<u>3</u>	<u>1</u>	<u>MALUPVM = PINUSYL = RHAMCAT</u>
3 Understorey	<u>4.5</u>	<u>1</u>	<u>PICEGLA = THUJOC = CORNSTO = VETIRIP</u>
4 Groundlayer	<u>6.7</u>	<u>4</u>	<u>DACTGLO = POAPRA = PLANLAN = SOLI-SP</u>

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, exotic species, trails, dumping, noise, predation <u>Cultural meadow</u> <u>almonds</u>
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:

Depth Sampled	<u>59</u>	
Depth to Mottles	<u>18</u>	
Depth to Gley	<u>∞</u>	<u>302</u>
Depth to Bedrock	<u>∞</u>	
Carbonates	<u>-</u>	<u>Lvs dk brown</u>
Depth to Gr. Water	<u>∞</u>	
Depth of Organics	<u>0.3cm</u>	<u>rfSL med brown</u>
Effective Texture		
Position on Slope		<u>f s</u>
Moisture Regime		<u>2020 Stone</u>

		Community Name	Code	% of Community
Inclusion	<input checked="" type="checkbox"/>	<u>mamm1-1</u>		<u>20</u>
Inclusion	<input type="checkbox"/>			
Inclusion	<input type="checkbox"/>			

ELC Community Summary Sheet

Polygon # 2

Project #: 52075 Project Name: Langen EIS Surveyor(s): LJA AJB Date: JUN 24, 21

Community Series: <u>FOD</u>		Ecosite: <u>FODM11</u>	Vegetation Type: —
System: Terrestrial Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: Open Shrub Tree	History: Natural Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water	

Stand Description		
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: Rare / Occasional / Abundant / Dominant		
Deadfall Logs: Rare / Occasional / Abundant / Dominant		
Health L / M / H	Sensitivity L / M / H	Botanical Quality L / M / H
Slope: None / Gentle / Moderate / Steep		
Simple / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	12	4	ACERSAS = FRAXAME = PICEGLA
2 Subcanopy	3	4	THUTOCC >>> FRAXNIG
3 Understorey	4.5	3	ACERSAS = RHAMCAT = THUTOCC = FRAXAME
4 Groundlayer	6.7	2	PARTVIT = TARAOFF > SOLI-SP

Height Codes – (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes – (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH
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Evidence of Disturbance: Tree cutting, exotic species, trails, dumping, noise, predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:

Depth Sampled		
Depth to Mottles		
Depth to Gley		
Depth to Bedrock		
Carbonates		
Depth to Gr. Water		
Depth of Organics		
Effective Texture		
Position on Slope		
Moisture Regime		

		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

Project #: 52075 Project Name: Langen EIS Surveyor(s): LJA AIB Date: June 24

Community Series: <u>WOCM</u>		Ecosite: <u>WOCM1</u>	Vegetation Type: <u>WOCM1-3</u>
System: <u>Terrestrial</u> Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope <u>Tableland</u> Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / <u>Coniferous</u> / Mixed	
Cover: Open Shrub <u>Treed</u>	History: <u>Natural</u> Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland <u>Forest</u> / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water	

Stand Description		
Community Age: Pioneer / Young <u>Mid-Aged</u> / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: Rare / <u>Occasional</u> / Abundant / Dominant		
Deadfall Logs: Rare / <u>Occasional</u> / Abundant / Dominant		
Health <u>L</u> M / H	Sensitivity <u>L</u> M / H	Botanical Quality <u>L</u> M / H
Slope: <u>None</u> / Gentle / Moderate / Steep		
<u>Simple</u> / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	<u>1.2</u>		<u>PINUSSTR</u>
2 Subcanopy	<u>3</u>		<u>JUNIVIR = FRAXAME = THUJOC = SORBACO</u>
3 Understorey	<u>4.5</u>		<u>RHAMCAT = VITIRIP = PRUNVIR</u>
4 Groundlayer	<u>6.7</u>		<u>DACTGLO = SOLI-SP > POA-PRA > SOLI RUG</u>

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	R	A	A	—
	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, <u>exotic species</u> trails, <u>dumping</u> , <u>noise</u> predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:

Depth Sampled	
Depth to Mottles	
Depth to Gley	
Depth to Bedrock	
Carbonates	
Depth to Gr. Water	
Depth of Organics	
Effective Texture	
Position on Slope	
Moisture Regime	

		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

ELC Community Summary Sheet	Polygon # 5
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Project #: 52075 Project Name: Lengen EIS Surveyor(s): LJA/TJB Date: Jun 24, 21

Community Series: MAM		Ecosite: MAMM2	Vegetation Type: MAMM2-2
System: Terrestrial <u>Wetland</u> Aquatic	Topographic Feature: Lacustrine / <u>Riverine</u> / Bottomland / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / <u>Submerged</u> / Floating-leaved / Graminoid / <u>Forb</u> / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: <u>Open</u> Shrub Treed	History: <u>Natural</u> Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / Cultural / Swamp / Bog / <u>Marsh</u> / Open Water / Shallow Water	

Stand Description		
Community Age: Pioneer / <u>Young</u> / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: <u>Rare</u> / Occasional / Abundant / Dominant		
Deadfall Logs: <u>Rare</u> / Occasional / Abundant / Dominant		
Health L / <u>M</u> / H	Sensitivity L / <u>M</u> / H	Botanical Quality L / <u>M</u> / H
Slope: None / <u>Gentle</u> / Moderate / Steep		
Simple / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	=	0	
2 Subcanopy	3	0	
3 Understorey	1.5	1	CORNSTO
4 Groundlayer	0.7	4	ASTELAN > EQUIARV = IMPHCAP / JUNCEFF

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)				
N/A	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, exotic species, trails, <u>dumping</u> , noise, predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments: rock piles

Depth Sampled	35	fscl refused due to stoniness
Depth to Mottles	0	
Depth to Gley	∞	
Depth to Bedrock	∞	
Carbonates	-	
Depth to Gr. Water	∞	
Depth of Organics	1	
Effective Texture		
Position on Slope		
Moisture Regime		

		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

Project #: S2075 Project Name: Langen ES Surveyor(s): LJA AJG Date: June 24

Community Series: <u>FOD</u>		Ecosite: <u>FODM8</u>	Vegetation Type: <u>FODM8-1</u>
System: <u>Terrestrial</u> Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope <u>Tableland</u> Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: Open Shrub <u>Treed</u>	History: <u>Natural</u> Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / <u>Forest</u> / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water	

Stand Description		
Community Age: Pioneer / Young / <u>Mid-Aged</u> / Mature / Old Growth	Basal Area (m ² /ha):	
Standing Snags: <u>Rare</u> / Occasional / Abundant / Dominant		
Deadfall Logs: <u>Rare</u> / Occasional / Abundant / Dominant		
Health L / <u>M</u> / H	Sensitivity L / <u>M</u> / H	Botanical Quality L / <u>M</u> / H
Slope: <u>None</u> / Gentle / Moderate / Steep <u>Simple</u> / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy			<u>POPULAL = POPOTRE = ACER NEG</u>
2 Subcanopy			<u>THUTSCE = CORNALT < PRUNVIR</u>
3 Understorey			<u>RUBUIDS > PRUNVIR > CORNALT</u>
4 Groundlayer			<u>IMPACAP = SOLI. SP > CIRCLUT = GERAROB</u>

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	<u>A</u>	<u>D</u>	<u>A</u>	<u>B</u>
	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH

Evidence of Disturbance: <u>Tree cutting</u> , <u>exotic species</u> , <u>trails</u> , dumping, noise, predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:

Depth Sampled	
Depth to Mottles	
Depth to Gley	
Depth to Bedrock	
Carbonates	
Depth to Gr. Water	
Depth of Organics	
Effective Texture	
Position on Slope	
Moisture Regime	

		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

ELC Community Summary Sheet	Polygon # 7
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Project #: 52075 Project Name: Langen EIS Surveyor(s): LJA AJB Date: June 24, 21

Community Series: SWD		Ecosite: SWDM4	Vegetation Type: —
System: Terrestrial Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / <u>Bottomland</u> / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte <u>Deciduous</u> / Coniferous / Mixed	
Cover: Open Shrub <u>Treed</u>	History: <u>Natural</u> Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / <u>Swamp</u> / Bog / Marsh / Open Water / Shallow Water	

Stand Description		
Community Age: Pioneer / Young / <u>Mid-Aged</u> / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: Rare / Occasional / Abundant / Dominant		
Deadfall Logs: Rare / Occasional / <u>Abundant</u> / Dominant		
Health L / M / <u>H</u>	Sensitivity L / M / <u>H</u>	Botanical Quality L / M / <u>H</u>
Slope: None / <u>Gentle</u> / Moderate / Steep		
Simple / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	12	4	FRAXPENE ACERNEG > POPULTR = POPULBAL
2 Subcanopy	3	2	CLEMVIR > THUJOC > LARILAR = FRAXNIG
3 Understorey	4.5	6	CLEMVIR > THUJOC = CORNST > SAMBRAC
4 Groundlayer	4.7	4	EQUIARV = INTACAD = CIRCLUT > ZBEUMALE

Height Codes – (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes – (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, exotic species, trails, dumping, <u>noise</u> , predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:

Depth Sampled	
Depth to Mottles	
Depth to Gley	
Depth to Bedrock	
Carbonates	mineral (organics >40cm only near road)
Depth to Gr. Water	
Depth of Organics	
Effective Texture	
Position on Slope	
Moisture Regime	

		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

Project #: 652075 Project Name: Lungen EIS Surveyor(s): LJA AJB Date: June 29 2021

Community Series: SWD		Ecosite: SWDM	Vegetation Type: SWDM4-1
System: Terrestrial <u>Wetland</u> Aquatic	Topographic Feature: Lacustrine / Riverine / <u>Bottomland</u> / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / <u>Mixed</u>	
Cover: Open Shrub <u>Treed</u>	History: <u>Natural</u> Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / Cultural / <u>Swamp</u> / Bog / Marsh / Open Water / Shallow Water	

Stand Description	
Community Age: Pioneer / Young / Mid-Aged / <u>Mature</u> / Old Growth	Basal Area (m2/ha):
Standing Snags: Rare / <u>Occasional</u> / Abundant / Dominant	
Deadfall Logs: Rare / <u>Occasional</u> / Abundant / Dominant	
Health L / <u>M</u> / H	Sensitivity L / M / <u>H</u>
Botanical Quality L / M / <u>H</u>	
Slope: None / <u>Gentle</u> / Moderate / Steep	
Simple / <u>Complex</u>	

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	1.2	3	SALIBAB > SALIFRA
2 Subcanopy	3	2	ACERNEG = POPURAL = POPUTRE
3 Understorey	4.5	2	CFEMVIR = CORNSTO = SALIDEG = SALIBAC
4 Groundlayer	6.7	3	EQUIARV = IMPACAP > SOLICAN = JUNC EFF

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	R	O	A	R
	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, <u>exotic species</u> , trails, <u>dumping</u> , noise, predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:

Depth Sampled	
Depth to Mottles	
Depth to Gley	
Depth to Bedrock	
Carbonates	
Depth to Gr. Water	
Depth of Organics	
Effective Texture	
Position on Slope	
Moisture Regime	

		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

ELC Community Summary Sheet Polygon # 11

Project #: 52075 Project Name: Langen EIS Surveyor(s): LJA ATB Date: June 29, 21

Community Series: <u>MAM</u>		Ecosite: <u>MAMMI</u>	Vegetation Type: <u>MAMMI-1</u>
System: Terrestrial <u>Wetland</u> Aquatic	Topographic Feature: <u>Riverine</u> / Bottomland / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: <u>Graminoid</u> / Submerged / Floating-leaved / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: <u>Open</u> Shrub Treed	History: <u>Natural</u> Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / <u>Crevice-Cave</u> / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / Cultural / Swamp / <u>Bog / Marsh</u> / Open Water / Shallow Water	

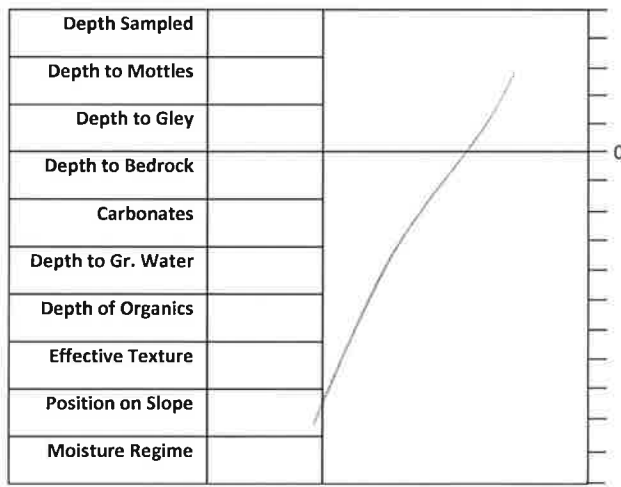
Stand Description	
Community Age: <u>Young</u> / Pioneer / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):
Standing Snags: <u>Occasional</u> / Rare / Abundant / Dominant	
Deadfall Logs: <u>Occasional</u> / Rare / Abundant / Dominant	
Health: <u>L</u> / M / H	Sensitivity: <u>L</u> / M / H
Botanical Quality: <u>L</u> / M / H	
Slope: <u>Gentle</u> / None / Moderate / Steep Simple / Complex	

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	—	—	
2 Subcanopy	<u>3</u>	<u>1</u>	<u>ACERNEG = SALICER</u>
3 Understorey	<u>4.5</u>	<u>1</u>	<u>SALICER = CORNSTO</u>
4 Groundlayer	<u>0.7</u>	<u>4</u>	<u>PRAIRI = ASTFLAN = SCIRATV = CARESTI</u>

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH
<u>N/A</u>				

Evidence of Disturbance: Tree cutting, <u>exotic species</u> , <u>trails</u> , <u>dumping</u> , noise, predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:



		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

ELC Community Summary Sheet	Polygon # 12
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Project #: 52045 Project Name: Langen EIS Surveyor(s): LJA/BJB Date: June 29, 21

Community Series: <u>Cum</u>		Ecosite: <u>Cum1</u>	Vegetation Type: <u>Cum1-1</u>
System: <u>Terrestrial</u> Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / <u>Tableland</u> Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: <u>Plankton / Submerged</u> / Floating-leaved / <u>Graminoid / Forb</u> / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: <u>Open</u> Shrub Treed	History: Natural <u>Cultural</u>	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / <u>Alvar</u> / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / <u>Cultural / Swamp</u> / Bog / Marsh / Open Water / Shallow Water	

Stand Description		
Community Age: <u>Pioneer</u> / Young / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: <u>Rare</u> / Occasional / Abundant / Dominant		
Deadfall Logs: <u>Rare</u> / Occasional / Abundant / Dominant		
Health <u>L</u> / M / H	Sensitivity <u>L</u> / M / H	Botanical Quality <u>L</u> / M / H
Slope: <u>None</u> / Gentle / Moderate / Steep		
<u>Simple / Complex</u> inc. MAMMI-12		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy			
2 Subcanopy	<u>3</u>	<u>1</u>	<u>SALIPEB = SALIPET = SALIALB</u>
3 Understorey	<u>4.5</u>	<u>4</u>	<u>PHALARU = SOLICAN = FESTARU = MELIALB</u>
4 Groundlayer	<u>0.7</u>	<u>4</u>	<u>SECUVAR = TRIEPR = LEUCVUL = LOTUCOR</u>

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH
<u>N/A</u>				

Evidence of Disturbance: Tree cutting, <u>exotic species</u> , <u>trails</u> , <u>dumping</u> , noise, predation <u>tractor ruts</u>
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments: <u>me 5 - moist meadow.</u>

Depth Sampled	
Depth to Mottles	
Depth to Gley	
Depth to Bedrock	
Carbonates	
Depth to Gr. Water	
Depth of Organics	
Effective Texture	
Position on Slope	
Moisture Regime	

See separate sheet

		Community Name	Code	% of Community
Inclusion	<input checked="" type="checkbox"/> Complex	<u>MAMMI-12</u>		
Inclusion	<input type="checkbox"/> Complex			
Inclusion	<input type="checkbox"/> Complex			

ELC Community Summary Sheet	Polygon # 13
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Project #: 052075 Project Name: langunais Surveyor(s): LJA-ATB Date: June 29, 21

Community Series: SWT		Ecosite: SWTM2	Vegetation Type: SWTM2-1
System: Terrestrial <u>Wetland</u> Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / <u>Tableland</u> Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / <u>Deciduous</u> / Coniferous / Mixed	
Cover: Open <u>Shrub</u> Treed	History: <u>Natural</u> <u>Cultural</u>	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / <u>Rock Barren</u> / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / Cultural / <u>Swamp</u> / Bog / Marsh / Open Water / Shallow Water	

Stand Description	
Community Age: <u>Pioneer</u> / Young / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):
Standing Snags: Rare / Occasional / Abundant / Dominant	
Deadfall Logs: Rare / Occasional / Abundant / Dominant	
Health L / <u>M</u> / H	Sensitivity L / M / <u>H</u>
Botanical Quality L / <u>M</u> / H	
Slope: None / <u>Gentle</u> / Moderate / Steep	
Simple / Complex	

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	—	—	
2 Subcanopy	3	1	SALIALB
3 Understorey	4.5	4	CORNSTO >>> SALIPET = SALIALB
4 Groundlayer	6.7	2	VICICRA > AGROGIG = ASTEPUN = FESTARU

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, <u>exotic species</u> , trails, <u>dumping</u> , noise, predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments:

Depth Sampled	
Depth to Mottles	
Depth to Gley	
Depth to Bedrock	
Carbonates	
Depth to Gr. Water	
Depth of Organics	
Effective Texture	
Position on Slope	
Moisture Regime	

mineral

		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

Project #: 052095 Project Name: Langens IS Surveyor(s): LJA AJB Date: June 29, 21

Community Series: FOC		Ecosite: FOCmb	Vegetation Type: —
System: Terrestrial Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / <u>Tableland</u> Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / <u>Beach</u> / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / <u>Graminoid</u> / Forb / Lichen / Bryophyte / Deciduous / <u>Coniferous</u> / Mixed	
Cover: Open Shrub <u>Tree</u>	History: Natural <u>Cultural</u>	Community Class: Beach-Bar / Sand Dune / Bluff / <u>Cliff</u> / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / <u>Forest</u> / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water	

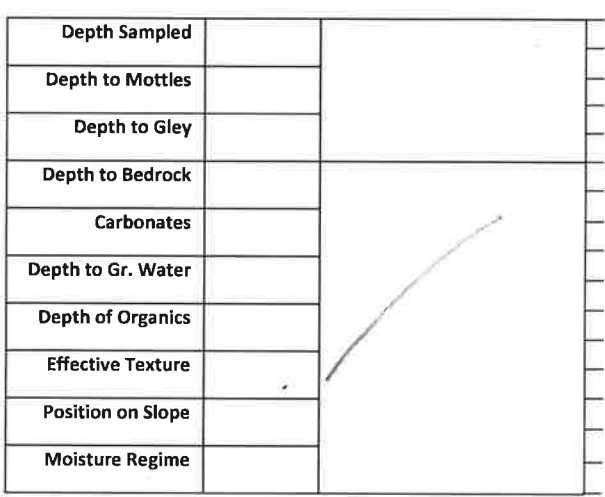
Stand Description		
Community Age: Pioneer / <u>Young</u> / <u>Mid-Aged</u> / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: Rare / <u>Occasional</u> / Abundant / Dominant		
Deadfall Logs: Rare / <u>Occasional</u> / Abundant / Dominant		
Health: <u>L</u> / M / H	Sensitivity: <u>L</u> / M / H	Botanical Quality: <u>L</u> / M / H
Slope: None / <u>Gentle</u> / Moderate / Steep Simple / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	1.2	4	PICEGLA = PINUSSTR = PINUSYL > POPUTRE
2 Subcanopy	3	3	RHAMCAF1 > VITRIP
3 Understorey	5.6	2	VITRIP
4 Groundlayer	6.7	5	same as adjacent cumi-1

Height Codes – (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes – (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, exotic species, trails, dumping, noise, predation Naturalized conifer plantation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments: mostly on adj. lands



Inclusion		Complex	Community Name	Code	% of Community

ELC Community Summary Sheet	Polygon # 17
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Project #: 052075 Project Name: LangenEIS Surveyor(s): WJAATB Date: June 29, 21

Community Series: SWT?		Ecosite:	Vegetation Type:
System: Terrestrial Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: Open Shrub Treed	History: Natural Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water	

Stand Description		
Community Age: Pioneer / <u>Young</u> / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):	
Standing Snags: Rare / Occasional / Abundant / Dominant		
Deadfall Logs: Rare / Occasional / Abundant / Dominant		
Health L / M / H	Sensitivity L / M / H	Botanical Quality L / M / H
Slope: None / Gentle / Moderate / <u>Steep</u> Simple / Complex		

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy			ULMUS AME = ACER NEG
2 Subcanopy			CORNUS STO = SALIPET = SALIDIS
3 Understorey			" "
4 Groundlayer			?

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH
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Evidence of Disturbance: Tree cutting, exotic species, trails, dumping, noise, predation dug pit
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests
Comments: Small deep dug pit.

Depth Sampled	
Depth to Mottles	
Depth to Gley	
Depth to Bedrock	
Carbonates	
Depth to Gr. Water	
Depth of Organics	
Effective Texture	
Position on Slope	
Moisture Regime	

			Community Name	Code	% of Community
Inclusion		Complex			
Inclusion		Complex			
Inclusion		Complex			

Too small to be a mappable unit.
 Not an ELC community.

Project #: 052095 Project Name: Langen EIS Surveyor(s): LJAATB Date: June 29, 21

Community Series: FOD		Ecosite: FODM6-5	Vegetation Type: FODM6-5
System: Terrestrial Wetland Aquatic	Topographic Feature: Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Dominant Plant Form: Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed	
Cover: Open Shrub Tree	History: Natural Cultural	Community Class: Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie - Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water	

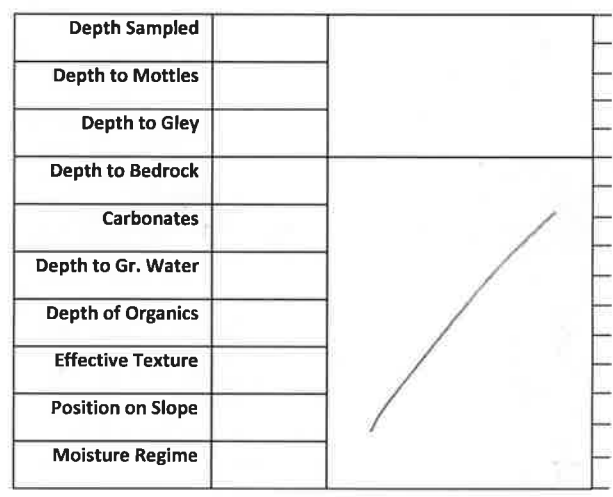
Stand Description	
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth	Basal Area (m2/ha):
Standing Snags: Rare / Occasional / Abundant / Dominant	
Deadfall Logs: Rare / Occasional / Abundant / Dominant	
Health: L / M / H	Sensitivity: L / M / H
Botanical Quality: L / M / H	
Slope: None / Gentle / Moderate / Steep	
Simple / Complex	

Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1 Canopy	1.2	4	ACERSAS = PRAXAMEZTILAMEZPINUSSTR
2 Subcanopy	3	2	OSTRUVIR > ACERSAS = VITIRIP = PARTQU
3 Understorey	4.5	3	CORNALTE PRUNVIR = RHAMCAT = VITIRIP
4 Groundlayer	0.7	4	ACERSAS = GERAROB > CAREROS = HYDRVIA

Height Codes - (1) >20m, (2) 10-20m, (3) 2-10m, (4) 1-2m, (5) 0.5-1m, (6) 0.2-0.5m, (7) <0.2m
 Cover Codes - (0) None, (1) 1-10%, (2) 10-25%, (3) 25-60%, (4) >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	< 10cm DBH	10 - 24cm DBH	25 - 50cm DBH	> 50cm DBH

Evidence of Disturbance: Tree cutting, exotic species, trails, dumping, noise, predation
Wildlife / Habitat Observations: Birds, mammals, calls, observed, dens, nests Blue jay Am. Crow
Comments:



		Community Name	Code	% of Community
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

UNIT NO: 23

Date: Project name & number:
Observers: Weather/limitations:

HEDGEROW - FIELD DATA SHEET

TAGMS

*Abundance Code: S=Scarce, O=Occasional, F=Frequent, A=Abundant, D=Dominant

Table with columns for SPECIES, LAYER / ABUNDANCE (1-4), and SPECIES Beefy HR, LAYER / ABUNDANCE (1-4). Includes handwritten species names like ACERASAS, PRUNUS, FRAXANE, MALVUM, RUTACEAE, CORNUS.

Table with columns: HEIGHT / AGE (1= Pioneer, 2= Young, 3= Mid-Aged, 4= Mature, 5= Old Growth), TREE HEALTH / CONDITION (Excellent, Good, Fair, Poor, Very Poor, Dead), TREE STRUCTURE (multi-stemmed, leaning, broken, deadfall, standing snags). Includes handwritten notes for ACERASAS and FRAXANE.

Table with columns: HEDGEROW SIZE (circle), SIZE CLASS ANALYSIS* (< 10 cm DBH, 10 - 24 cm DBH, 25 to 50 cm DBH, > 50 cm DBH).

Table with columns: COMMUNITY DIVERSITY, COMMUNITY STRUCTURE, CONTINUITY, LINKAGE, DISTURBANCE. Includes abundance code legend: *Abundance Code: S=Scarce, O=Occasional, F=Frequent, A=Abundant, D=Dominant.

COMMENTS (including wildlife observations - vernal pools, hibernacula, snags, fallen logs, tracks, den/nest, scat, carcass, vocalization, feeding, etc.)

UNIT NO: 25

Date: Project name & number:
Observers: Weather/limitations:

HEDGEROW - FIELD DATA SHEET

TRG105

*Abundance Code: S=Scarce, O=Occasional, F=Frequent, A=Abundant, D=Dominant

Table with columns for SPECIES and LAYER / ABUNDANCE (1-4) for both sides of the hedgerow.

Table with columns: HEIGHT / AGE (1-5), TREE HEALTH / CONDITION (Excellent to Dead), TREE STRUCTURE (multi-stemmed, leaning, broken, deadfall, standing snags)

Table with columns: HEDGEROW SIZE (circle) [Narrow, Moderate, Broad width], SIZE CLASS ANALYSIS* [DBH ranges]

*Abundance Code: S=Scarce, O=Occasional, F=Frequent, A=Abundant, D=Dominant

Table with columns: COMMUNITY DIVERSITY, COMMUNITY STRUCTURE, CONTINUITY, LINKAGE, DISTURBANCE

COMMENTS (including wildlife observations - vernal pools, hibernacula, snags, fallen logs, tracks, den/nest, scat, carcass, vocalization, feeding, etc.)



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix H

Bat Survey Data

300052075 –Langen Property EIS Leaf-off Candidate Maternity Roost Trees

Feature ID	Tree Height (m)	No. of Cavities	DBH (cm)	No. of Snags Within 10m	Peeling Bark %	No. of Habitat Characteristics	Avg Cavity Height (m)	Tree Species	Canopy Cover %	Decay Class	Significant Features
SNAG-001	10	0	36	0	30	0	0	Butternut	45	2	
SNAG-002	10	1	34	0	0	2	7	Basswood	20	1	
SNAG-003	6	0	40	1	25	4	4	Black Cherry	25	4	Multiple small cracks, peeling bark
SNAG-004	0	0	25	1	0	0	0	American Beech	60	4	Fell in winter 2021-22
SNAG-005	5	4	32	1	15	4	3	Eastern Cottonwood	15	4	Fell in winter 2021-22
SNAG-006	15	3	38	1	0	3	10	Eastern Cottonwood	10	1	
SNAG-007	8	3	36	0	5	5	6	Butternut	5	2	Fungal growth
SNAG-008	6	4	30	1	5	6	0	Manitoba Maple	0	3	Cracks, cavities, woodpecker activity
SNAG-009	7	1	40	1	50	3	0	Black Cherry	0	2	Cracks, broken limb
SNAG-010	12	7	88	0	0	10	8	Sugar Maple	0	2	Large cavities, hollow trunk
SNAG-011	12	4	52	0	40	8	8	Black Cherry	30	2	cracks and crevices, peeling bark, woodpeckers
SNAG-012	14	4	90	0	0	6	7	Green Ash	40	2	deep knot holes, woodpecker activity
SNAG-013	20	15	101	0	0	20	15	Green Ash	30	2	Large cavities, cracked branches, woodpecker activity,
SNAG-014	20	10	46	0	0	15	16	Basswood	60	1	Located in NHS
SNAG-015	12	5	81	0	0	5	8	Green Ash	40	2	Located in NHS
SNAG-016	10	10	62	0	0	10	10	Manitoba Maple	5	2	Located outside development footprint
SNAG-017	20	5	89	0	0	7	0	Red Maple	25	2	Located outside development footprint
SNAG-018	5	3	42	0	0	3	5	Manitoba Maple	0	3	Located outside development footprint
SNAG-019	14	6	60	0	0	6	10	Red Maple	30	2	Know holes, woodpecker activity
SNAG-020	8	2	52	0	5	3	6	Not Recorded	20	5	Cracks and crevices
SNAG-021	6	4	31	1	0	5	6	Not Recorded	90	6	Cracks & crevices dead no limbs
SNAG-022	12	2	60	1	5	5	0	Sugar Maple	70	2	Peeling bark cavities mushroom growth
SNAG-023	12	2	59	0	0	6	12	Not Recorded	30	5	Holes, crevices
SNAG-024	12	1	60	0	10	4	3	Green Ash	60	3	Peeling bark dead limbs
SNAG-025	12	0	49	1	5	3	0	Green Ash	55	3	Peeling bark, crack
SNAG-026	11	3	35	1	5	3	8	Green Ash	40	3	Multiple limbs
SNAG-027	10	1	35	0	10	2	7	Green Ash	50	3	1 cavity, 1 crack, peeling bark

SNAG-028	13	0	29	0	5	3	0	Green Ash	30	1	Peeling bark, crevices, broken & dead limbs
SNAG-029	12	3	35	0	0	3	8	Green Ash	70	2	
SNAG-030	17	2	111	1	5	0		Sugar Maple	0	1	Knot hole, 2 cracked limbs, woodpecker holes on dead broken limb
SNAG-031	15	3	83	1	5	5	10	Green Ash	30	2	Partially hollow
SNAG-032	16	2	78	0	5	4	13	Sugar Maple	40	1	Fell in winter 2021-22
SNAG-033	12	3	58	0	5	3	9	Black Cherry	45	1	Knot hole, cracked limbs, exfoliating bark
SNAG-034	17	2	32	1	0	0	12	Black Cherry	40	1	Holes, cracked branches, dead branch, trunk splits into 3
SNAG-035	17	5	107	1	0	0	10	Sugar Maple	35	1	Large cavities
SNAG-036	6	5	50	0	30	10	5	Not Recorded	0	6	Cracks, crevices, woodpecker activity, peeling bark, grape vine
SNAG-037	13	5	31	2	5	6	9	Sugar Maple	55	1	Broken limb, cavities
SNAG-037	10	0	36	2	5	5	5	Sugar Maple	55	2	Broken limbs, cavities,
SNAG-037	10	0	36	2	5	5	5	Sugar Maple	55	2	Broken limbs, cavities,
SNAG-038	16	4	42	1	0	4	10	Green Ash	70	2	Cavities and woodpecker activity
SNAG-039	16	6	61	1	0	6	13	Basswood	70	1	Knot holes
SNAG-040	9	0	43	1	0	4	8	Not Recorded	0	6	Dead, cracks, holes
SNAG-041	16	2	50	2	5	4	9	Black Cherry	70	1	Holes, cracks
SNAG-042	15	2	54	1	0	0	0	Green Ash	80	1	Furrows with cavities
SNAG-043	15	0	150	0	5	6	0	Green Ash	40	2	Located in NHS
SNAG-044	13	0	64	0	20	3	0	Green Ash	0	4	Loose bark only
SNAG-045	17	5	105	0	5	7	14	Sugar Maple	40	1	Peeling bark, broken limbs, cavities
SNAG-046	12	3	47	1	0	5	9	Black Cherry	80	2	Cracked limbs and cavities
SNAG-047	15	3	52	1	0	3	12	Sugar Maple	70	1	
SNAG-048	15	4	46	1	5	5	6	Sugar Maple	25	1	Holes, peeling bark
SNAG-049	10	5	40	1	5	7	8	Sugar Maple	10	2	Fell in winter 2021-22
SNAG-050	17	10	30	0	5	11	11	Basswood	60	1	Cavities, 5 trunks plus broken off one
SNAG-051	5	1	42	0	5	2	3	Manitoba Maple	60	2	Deep medium cavity, 1 small crack

300052075 – Langen Property EIS

Leaf-on Candidate Maternity Roost Trees

Feature ID	Tree Species	Decay Class	DBH (cm)	Canopy Cover %	No. of Dead or Dying Leaf Clusters	Tree Height (m)
TCB-001	Sugar Maple	1	26	45	0	12
TCB-002	Sugar Maple	1	42	30	5	15
TCB-003	Sugar Maple	1	39	50	2	14
TCB-004	Sugar Maple	1	29	0	3	12
TCB-005	Sugar Maple	1	29	203	2	13
TCB-006	Sugar Maple	1	34	30	0	13
TCB-007	Sugar Maple	1	45	50	5	12
TCB-008	Sugar Maple	1	27	50	0	10
TCB-009	Sugar Maple	1	52	10	4	15
TCB-010	Sugar Maple	1	55	25	2	16
TCB-011	Sugar Maple	1	93	30	0	18
TCB-012	Sugar Maple	1	43	60	0	14
TCB-013	Sugar Maple	1	69	40	0	15
TCB-014	Sugar Maple	1	67	20	0	20
TCB-015	Sugar Maple	1	41	40	0	15
TCB-016	Sugar Maple	2	32	0	1	12
TCB-017	Sugar Maple	1	20	25	0	12
TCB-018	Sugar Maple	1	25	40	3	8
TCB-019	Sugar Maple	1	81	25	5	20
TCB-020	Sugar Maple	1	72	20	2	18
TCB-021	Sugar Maple	2	34	35	0	15
TCB-022	Sugar Maple	2	60	0	1	18
TCB-023	Sugar Maple	2	36	60	1	18
TCB-024	Sugar Maple	1	40	60	0	18
TCB-025	Sugar Maple	1	67	60	0	20
TCB-026	Sugar Maple	1	44	50	4	20
TCB-027/28	Sugar Maple	1	58	50	3	18
TCB-029	Sugar Maple	1	67	40	0	17

Feature ID	Tree Species	Decay Class	DBH (cm)	Canopy Cover %	No. of Dead or Dying Leaf Clusters	Tree Height (m)
TCB-030	Sugar Maple	1	79	15	2	16
TCB-031	Sugar Maple	1	79	30	0	15
TCB-032	Sugar Maple	2	28	25	2	10
TCB-033	Sugar Maple	1	38	15	1	9
TCB-034	Sugar Maple	1	32	0	2	8
TCB-035	Sugar Maple	1	89	10	2	12
TCB-036	Sugar Maple	2	73	5	1	14
TCB-037-40	Sugar Maple	1	29	15	0	8
TCB-041	Sugar Maple	1	67	5	0	15
TCB-042	Sugar Maple	2	33	25	3	15
TCB-043	Sugar Maple	2	52	30	5	15
TCB-044	Sugar Maple	2	62	25	5	16
TCB-045/46	Sugar Maple	1	63	40	2	15
TCB-047	Sugar Maple	1	124	25	4	18
TCB-049	Sugar Maple	1	40	0	2	15
TCB-050	Sugar Maple	1	47	10	5	12
TCB-051/52	Sugar Maple	1	35	30	5	15
TCB-053	Sugar Maple	1	39	40	0	14
TCB-054	Sugar Maple	1	45	10	2	16
TCB-055-57	Sugar Maple	1	51	50	1	16
TCB-058	Sugar Maple	1	32	45	2	18
TCB-059	Sugar Maple	1	47	60	1	20
TCB-060	Sugar Maple	1	56	50	1	18
TCB-061	Sugar Maple	1	38	0	2	16
TCB-062	Sugar Maple	2	38	80	0	8
TCB-063	Sugar Maple	1	40	25	1	12
TCB-064	Sugar Maple	1	45	40	0	12
TCB-065	Sugar Maple	1	105	10	5	20
TCB-066	Sugar Maple	1	78	25	1	18
TCB-067	Sugar Maple	1	27	30	2	9
TCB-068	Sugar Maple	1	66	0	0	14
TCB-069	Sugar Maple	1	50	0	1	17

Feature ID	Tree Species	Decay Class	DBH (cm)	Canopy Cover %	No. of Dead or Dying Leaf Clusters	Tree Height (m)
TCB-070	Sugar Maple	1	31	70	1	10
TCB-071	Sugar Maple	1	55	45	2	15
TCB-072	Sugar Maple	1	103	15	0	20
TCB-073	Sugar Maple	1	89	50	2	15
TCB-074	Sugar Maple	1	75	30	2	20
TCB-075	Sugar Maple	1	60	35	4	20
TCB-076	Sugar Maple	1	51	60	0	18



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix I

Butternut Health Assessment and Registration Confirmation



August 27, 2021

Via Email: ryan.oosterhoff@mattamycorp.com

Ryan Oosterhoff
Director, Land Development
Mattamy Homes Canada,
GTA Low Rise Division
433 Steeles Ave. E., Milton, ON L9T 8Z4

Dear Mr. Oosterhoff:

**Re: Butternut Health Assessment – Mattamy Erin Development, Pt. Lot 17, Con. 8 Erin
Project No.: 300052075**

Enclosed, please find the Butternut Health Assessment (BHA) that R.J. Burnside & Associates Limited completed for three Butternut trees identified within the proposed Mattamy Erin Development, Pt. Lot 17, Con. 8 in the Town of Erin. The BHA was conducted on June 15, 2020 by Stewart Gibson, BHA #703. Two of the Butternut trees are assessed as Category 1 (non-retainable) and one is assessed as Category 2 (retainable).

As you are aware, Stewart has recently left Burnside and moved out of the province. Stewart prepared the enclosed BHA Report, before his departure. With your permission (and with Stewart's), I will be submitting the report to the Ministry of Environment Conservation and Parks (MECP) on your behalf. During the 30 days following submission, no Butternut trees (of any category) are permitted to be killed, harmed, or removed, and MECP may contact you for an opportunity to examine the trees or audit the BHA Report.

After the 30 days, You may remove or harm Category 1 trees and register the removal or harm to the Category 2 tree with the MECP registry.

Yours truly,

R.J. Burnside & Associates Limited

Lorraine Adderley, M.Sc., CERP
Project Coordinator – Terrestrial Ecologist
BHA #428
LJA:xx

Enclosures:

1. Information from the Ministry of Natural Resources and Forestry about Butternut and the *Endangered Species Act, 2007*
2. Butternut Health Assessor's Report
3. Electronic and printed copies of the Excel Data Spreadsheet (BHA Tree Analysis)
4. Data Form 1 and Form 2
5. Photos

Other than by the addressee, copying or distribution of this document, in whole or in part, is not permitted without the express written consent of R.J. Burnside & Associates Limited.

1 - Cover Letter.docx
27/08/2021 4:00 PM

Ministry of Natural
Resources and Forestry

Species At Risk
P.O. Box 7000, 300 Water Street
Peterborough ON K9J 8M5

Ministère des Richesses
naturelles et des Forêts

Espèces en péril
C.P. 7000, 300, rue Water
Peterborough ON K9J 8M5



The enclosed Butternut Health Assessor's Report documents the results of the Butternut health assessment that was conducted by the designated Butternut Health Assessor (BHA) identified in the top section of the report. If there are other Butternut trees (of any size or age) at the site that may be affected by the activity and they are not identified in the enclosed BHA Report, they too must be assessed by a designated BHA.

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the *Endangered Species Act, 2007* (ESA) from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: <http://www.ontario.ca/environment-and-energy/butternut-trees-your-property>.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local Ministry of Natural Resources and Forestry (MNRF) District Manager. Note that MNRF cannot accept photocopies or scanned electronic copies of the data forms.

Note regarding changes:

If the enclosed BHA Report does not identify which Butternut tree(s) are proposed to be killed, harmed, or taken in Table 1 (i.e., if "unknown" is indicated in the second last column of Table 1), or, if the information in the last two columns of Table 1 has changed since the date this BHA Report was produced, **do not make any edits to the BHA Report**. Instead, please attach a cover letter that identifies which Butternut tree(s) are proposed to be killed, harmed, or taken (by referencing the tree identification numbers) when you submit the enclosed BHA Report to the local MNRF District Manager.

The BHA Report must be submitted at least 30 days prior to registering an eligible activity to kill, harm, or remove a Butternut tree. During this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MNRF may contact you for an opportunity to examine the trees. If MNRF chooses to examine the trees, a representative of MNRF will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the “Notice of Butternut Impact” form on the [MNRF Registry](#) **after the 30 day period has elapsed.**

If you are **not** eligible to follow the rules in regulation under section 23.7, please contact the local MNRF district office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MNRF offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this information and a copy of the BHA Report (including copies of all data forms) for your records, along with any other documentation you may receive from MNRF should an examination of the trees occur. If you have any questions, please contact your local MNRF district office.

Links:

Endangered Species Act, 2007:

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):

http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

MNRF Office Locations:

<https://www.ontario.ca/government/ministry-natural-resources-and-forestry-regional-and-district-offices>

Butternut Health Assessor's Report Number: 703-020

Stewart Gibson – BHA# 703
 207 Ferguson Street
 Guelph Ontario
 N1E2Z1
 226-971-2481
 Stewart.gibson@rjburnside.com

Ryan Oosterhoff
 GTA Low Rise Division
 Mattamy Homes
 433 Steeles Ave. E., Milton, ON L9T 8Z4
 Ryan.oosterhoff@mattamycorp.com

Site location: 8th Line and Sideroad 17, Erin, Ontario.

Date(s) of Butternut health assessment: June 15, 2020
 Date BHA Report prepared: May 4, 2021

Map datum used: NAD83 WGS84

Total number of trees assessed in this BHA Report: 3

The assessed trees were numbered on site using Orange Flagging Tape with numbering on the flagging tape. The numbers at the site correspond to the tree numbers referenced in this report.

This BHA Report includes the following tables:

- Table 1: Butternut Trees Assessed
- Table 2: Trees Determined by BHA to be Butternut Hybrids
- Table 3: Summary of Assessment Results

Note to BHAs: add/remove table rows as necessary

Table 1: Butternut Trees Assessed

Tree #	UTM coordinates	Category ¹ (1, 2, or 3 ²)	dbh ³ (cm)	Cultivated? (Y/N)	Proposed to be: (enter one: unknown ⁴ , killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
1	43.769768N 080.092422W	1	36	N	Killed	To accommodate proposed residential construction

¹ The extent to which the tree is affected by Butternut Canker is presented in the Excel document titled, "BHA Tree Analysis" that accompanies this BHA Report.

² Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08.

³ dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)

⁴ In this column, "unknown" indicates that at the time of assessment, there are no proposals to kill, harm or take this tree that are known to the BHA.

Tree #	UTM coordinates	Category ¹ (1, 2, or 3 ²)	dbh ³ (cm)	Cultivated? (Y/N)	Proposed to be: (enter one: unknown ⁴ , killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
						activities.
2	43.769370N 080.092934W	1	65	N	Killed	To accommodate proposed residential construction activities.
3	43.767245N 080.095183W	2	1	N	Killed	To accommodate proposed residential construction activities.

Table 2: Trees Determined by BHA to be Butternut Hybrids

Tree #	UTM coordinates	Method used (genetic testing or field identification):

Table 3: Summary of Assessment Results

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
Category 1	2	<ul style="list-style-type: none"> A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered “non-retainable”. During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees. Category 1 trees may be killed, harmed or taken after the 30 day period that follows submission of this BHA Report to the MNRF District Manager, unless the results of an MNRF examination indicate that the assessment has not been conducted in accordance with the document entitled “Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the <i>Endangered Species Act, 2007</i>”.
Category 2	1	<ul style="list-style-type: none"> A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered “retainable”.

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		<ul style="list-style-type: none"> • During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees. • Activities that may kill, harm or take up to a maximum of ten (10) Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. • Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regis/english/elaws_regs_080242_e.htm • Activities that may kill, harm or take more than ten (10) Category 2 trees are not eligible to follow the rules in section 23.7 of Ontario Regulation 242/08. Contact the local MNRF district office for information on how to seek an ESA authorization (e.g., a permit) or consider an alternative that would be eligible for the regulation.
Category 3	0	<ul style="list-style-type: none"> • A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable". • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • Contact the local MNRF district office for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees.
Cultivated	0	<ul style="list-style-type: none"> • An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08. • Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MNRF district office. • The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	<ul style="list-style-type: none"> • Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

This concludes the summary of the BHA Report. A complete BHA Report must also include:

1. All original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), and
2. Electronic and printed copies of the Excel data analysis spreadsheet.

BHA Tree Analysis (version: December 2013)

This table is to be completed by a designated Butternut Health Assessor (BHA).

BHA Report #	703-020	Assessment Date(s)	15-Jun-20				Total # Butternut Trees in BHA Report	3												
BHA ID #	703	BHA Name	Stewart Gibson																	
Landowner / Client Name			Mattamy Homes																	
Property Location		43.769768 N / 080.092422 W																		
input field data										automatic calculations from field data						Categories:				
Tree #	Live Crown %	Tree dbh (cm)	# bole cankers				# root flare (RF) cankers		<40 m from cankered tree? (Y or N)	Circ. (cm) = Pi x dbh	total bole canker width (sooty x 2.5 + open x 5)	total RF canker width (sooty x 2.5 + open x 5)	bole canker % of circ.	RF canker % of circ.	total bole & root canker % of 2xCirc	LC% >= 50 & BC% = 0	LC% >70 & BRC% <20	LC% >70 & BC% <20	Preliminary tree call	FINAL TREE CALL a Cat 2, dbh>20cm <40m from a Cat 1
			sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)		RF S	RF O												
			S <2 m	S >2 m	O <2 m	O >2 m														
1	0	36	5	0	1	7	7	3	Y	113	52.5	32.5	46.4	28.8	37.6	1	1	1	1	1
2	50	65	5	1	5	6	3	2	Y	204.1	70.0	17.5	34.3	8.6	21.4	1	1	1	1	1
3	100	1	0	0	0	0	0	0	Y	3.14	0.0	0.0	0.0	0.0	0.0	2	2	2	2	2

Surveyor ID or BHA # **703**

(PLEASE USE BLOCK LETTERS)

Date (dd/mm/yyyy) **15-06-2020**

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact
 First **STEWART** Last **GIBSON**
 Email **STEWART.GIBSON@RJBURNSIDE.COM**
 Telephone **(226) 971-2481** Telephone Other () x

Property Owner
 (check if same as surveyor)
 First **RYAN** Last **OOSTERHOFF**
 or Company **MATTAMY HOMES**
 Email **RYAN.OOSTERHOFF@MATTAMYCORP.COM**
 Telephone **(905) 203-3967** Telephone Other **(289) 981-9056**x

Property Owner's Mailing address
 Address **433 STEELES AVE. E.** Postal Code **L9T 8Z4** Prov. **ON**
 City **MILTON**

Tree Location (if different from mailing address)
 Address/(911#) **5552 8TH LINE**
 Township **ERIN** Lot **17** Con **08**
 City **ERIN**

Directions
From main St, turn left on Shamrock Rd / Sld 17, follow to lane way for #9495. Take lane to HR.

Yes No Can Share Location Information with other Butternut Recovery Organizations?
 Yes No Site visits OK? (prior arrangements will always be made for a site vist)

Butternut Trees Tally by Diameter Class

> (Greater than)
 < (Less than)

(Do a dot tally in blank space; write total# in box for each)

Tree Condition	< 3 cm	3-15 cm	16-30cm	>30 cm
Vigorous: > 50% Live Crown Minor or no cankers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor Vigor: <50% Live Crown or >50% Live Crown + heavily cankered stem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall Property Description (area(s) containing Butternut)

Rolling Upland Bottomland
 Valley Slope Variable
 Tableland Unknown

Vegetation Community/ies

Open Fencerow
 Shrubland Roadside
 DeciduousForest Quarry
 ConiferForest UrbanYard
 MixedForest UrbanPark

Other

Historically, do some trees produce seeds? Y N Unknown

Estimated area containing butternut for properties > 1 acre (0.4 hectares): Acres Hectares

Blank area for notes or sketches.

Soil Drainage

Well Drained
 Moderately Drained
 Poorly Drained
 Unknown

Soil Depth

> 1metre
 30 - 99cm
 < 30cm
 Variable
 Unknown

Soil Texture

Clay Sand
 Clay Loam Variable
 Loam Unknown
 Loamy Sand

Please enter matching numerical page link code on forms 1 and 2

Page Link

(Contact information follows all applicable privacy policies and guidelines)

Please return forms to:
 Forest Gene Conservation Association
 Suite 233, 286 Charlotte St.
 Peterborough, ON, K9J 2V4
 www.fgca.net

49731



Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE BLOCK LETTERS)

Fill when Form 1 indicates canker is well established. The information on Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

Shaded fields are mandatory for Butternut Health Assessments

Site Code(A,B,...Z, AA...)

Surveyor ID or BHA # **703**

Date (dd/mm/yyyy)

15 - 06 - 2020

Surveyor Last Name **GIBSON**

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # **1** Zone **1** Easting **1** Northing **1**

Crown Class **00** Live Crown % **2** Main Stem Length(m) **2** Below crown **2** Seed Signs **2**

Twig Dieback Branch Dieback Defoliation Discolouration #Stems **1** DBH(cm) **36**

Butternut Origin Natural Planted Unknown Male Flowers Female Flowers Seed Set None

Assess below live crown

#Epic-Live #Epic-Dead Bark Type # Callused Wounds **1**

#Open #Sooty Root **3** **7** =<2m **1** **5** >2m **7** **0**

Metres from badly cankered tree < 40 > 40 None Found

Competing Species

Tree # **2** Zone **1** Easting **1** Northing **1**

Crown Class **50** Live Crown % **3** Main Stem Length(m) **3** Below crown **3** Seed Signs **3**

Twig Dieback Branch Dieback Defoliation Discolouration #Stems **1** DBH(cm) **65**

Butternut Origin Natural Planted Unknown Male Flowers Female Flowers Seed Set None

Assess below live crown

#Epic-Live #Epic-Dead Bark Type # Callused Wounds **2**

#Open #Sooty Root **2** **3** =<2m **1** **4** >2m **6** **5**

Metres from badly cankered tree < 40 > 40 None Found

Competing Species

- Lots of broken branches, sig. decay in trunk

Tree # **3** Zone **1** Easting **1** Northing **1**

Crown Class **100** Live Crown % **1** Main Stem Length(m) **1** Below crown **1** Seed Signs **1**

Twig Dieback Branch Dieback Defoliation Discolouration #Stems **1** DBH(cm) **1**

Butternut Origin Natural Planted Unknown Male Flowers Female Flowers Seed Set None

Assess below live crown

#Epic-Live #Epic-Dead Bark Type # Callused Wounds **00**

#Open #Sooty Root **00** **00** =<2m **00** **00** >2m **00** **00**

Metres from badly cankered tree < 40 > 40 None Found

Competing Species

Young tree.

Tree # **1** Zone **1** Easting **1** Northing **1**

Crown Class Live Crown % Main Stem Length(m) Below crown Seed Signs

Twig Dieback Branch Dieback Defoliation Discolouration #Stems DBH(cm)

Butternut Origin Natural Planted Unknown Male Flowers Female Flowers Seed Set None

Assess below live crown

#Epic-Live #Epic-Dead Bark Type # Callused Wounds

#Open #Sooty Root =<2m >2m

Metres from badly cankered tree < 40 > 40 None Found

Competing Species

Tree # **1** Zone **1** Easting **1** Northing **1**

Crown Class Live Crown % Main Stem Length(m) Below crown Seed Signs

Twig Dieback Branch Dieback Defoliation Discolouration #Stems DBH(cm)

Butternut Origin Natural Planted Unknown Male Flowers Female Flowers Seed Set None

Assess below live crown

#Epic-Live #Epic-Dead Bark Type # Callused Wounds

#Open #Sooty Root =<2m >2m

Metres from badly cankered tree < 40 > 40 None Found

Competing Species

Please enter matching page link code on forms 1 and 2

Page Link

(Contact information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731



Photos



BN 1



BN 1



BN 1



BN 2



BN 2



BN 2



BN 3



BN 3



BN 3

CONFIRMATION OF REGISTRATION

Form Name: Butternut (O. Reg. 830/21 Part V)
Date Registration Filed: 03/11/2022
Confirmation ID: M-102-8468359351
Version Number: 001
Update Date:

Dear Sir/Madam,

For your reference, your Notice Form contained the following as your contact information:

Mattamy (Erin) Limited

433 Steeles BAY E
MILTON, ON L9T8Z4

If you need to update your contact information, please sign in to your ONE-key account and update the information in "My Profile."

You have submitted a Notice Form to the Ministry of the Environment, Conservation and Parks under the following subsection of the specified regulation under the *Endangered Species Act, 2007*:

Butternut (O. Reg. 830/21 Part V)

For activities located at:

5552 8th LINE, ERIN, ON

Note: If the site for this registration has multiple locations, only the location identified as the primary location will be displayed here.

The species to be impacted by the registered activity are listed in Appendix A (see last page of this document). Please retain this Confirmation of Registration for your records.

It is your responsibility to:

- Ensure that your activity does not contravene the Endangered Species Act, 2007 (ESA).
- Determine whether your activity will impact a species that is listed as endangered, threatened or extirpated on the Species at Risk in Ontario (SARO) List (Ontario Regulation 230/8) and monitor the SARO List for changes that may be relevant to your activity, such as newly listed species.
- Ensure your activity satisfies the eligibility requirements for the conditional exemption for which you have registered.
- Fulfil all conditions of the conditional exemption for which you have registered.
- Monitor the applicable regulation for changes that may be relevant to your activity.

For more information:

Ontario Regulation 230/08 (SARO List): www.ontario.ca/laws/regulation/080230

Ontario Regulation 242/08 (General Regulation): www.ontario.ca/laws/regulation/080242

Ontario Regulation (Exemptions - Barn Swallow, Bobolink, Eastern Meadowlark and Butternut):

<https://www.ontario.ca/laws>

Information about ESA authorizations and regulatory requirements is available on our website at:
www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization

Additional requirements:

- You are required to show this Confirmation of Registration upon request of the Ministry.
- When documents are requested by the Ministry of the Environment, Conservation and Parks, they are due within 14 days of the request.

Technical questions about the online registry system should be directed to:

Registry and Approval Services Centre

Toll Free: 1-855-613-4256

Email: mnr.rasc@ontario.ca

Questions about this Confirmation of Registration or the conditional exemptions in regulations under the Endangered Species Act, 2007 should be directed to:

Species at Risk Branch

Ministry of the Environment, Conservation and Parks

Email: SARregistry@ontario.ca

Learn about Ontario's species at risk at www.ontario.ca/page/species-risk-ontario

Appendix A:

Species impacted by the registered activity:

