Final

9354 Wellington Road 22
Hillsburgh Subdivision

Environmental Impact Study

Prepared for:

Thomasfield Homes Limited
295 Southgate Drive
Guelph, ON, N1G 3M5

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

9354 Wellington Road 22 Hillsburgh Subdivision

Environmental Impact Study

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EXECUTIVE SUMMARY

Natural Resource Solutions Inc. (NRSI) was retained by Thomasfield Homes Limited in August 2021 to complete an Environmental Impact Study (EIS) for the proposed development of a residential subdivision located at Part Lot 23, Concession 7, Wellington Road 22 in the settlement of Hillsburgh, Wellington County, Ontario (Map 1).

This report summarizes background information on natural heritage features, as well as the methods and results of a comprehensive field program including vegetation community delineation and mapping, multi-season vascular flora inventories, aquatic habitat characterization, tree inventory, and targeted surveys for birds and mammals within and adjacent to the subject property.

The detailed characterization of existing natural features was used to inform an analysis of the significance of natural features within the study area with consideration for applicable municipal and provincial policies and legislation. Based on this analysis, the following significant natural features have been confirmed within the study area and require consideration:

Aquatic Habitat Features

- West Credit River, Erin Branch

Wetland Features

- West Credit River Provincially Significant Wetland Complex

Significant Wildlife Habitat

- Habitat for Species of Conservation Concern (Eastern Wood-Pewee)
- Bat Maternity Colonies

Habitat for Threatened and Endangered Species

- Butternut
- Little Brown Myotis
- Northern Myotis

Other Significant Natural Features/Area Designations

- Significant Woodlands
- Regionally Significant Valleylands
- Regionally Significant Greenlands and Core Greenlands
- Fish and Fish Habitat
- Linkages

To protect the form and function of these natural features, appropriate setbacks and buffers were recommended to inform the development proposal. These recommendations were incorporated where possible and with consideration for other physical and planning constraints to design a development plan for the property that respects the natural environment.

Based on the characterization of existing natural features and the proposed development details, an assessment of potential adverse impacts to natural features associated with the proposed development was also completed and is summarized in this report. Where potential impacts were identified, mitigation measures have been recommended to avoid or minimize impacts. It is generally anticipated that minor and temporary impacts to natural features, wildlife

and wildlife habitats can be mitigated through carefully planned construction timing windows and best management construction practices. Monitoring recommendations are also provided for pre-, during and post-construction to monitor the effectiveness of mitigation measures and allow for adaptive management, as necessary.

In addition to the mitigation measures, opportunities for restoration and enhancement of existing natural features are presented and recommended in this report to ensure the maintenance and protection of the form and function of these natural features following the construction of the proposed development. The development of a Restoration and Enhancement Plan is recommended to include the naturalization of the proposed stormwater management facility, tree compensation, Species at Risk habitat compensation and the enhancement of woodland edge buffers, through a further recommended Woodland Edge and Buffer Management Plan.

No significant negative residual impacts are anticipated to arise from the proposed residential subdivision development if the recommendations to protect, enhance and restore natural features and wildlife habitats within the subject property are implemented.

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Thomasfield Homes Limited in August 2021 to complete an Environmental Impact Study (EIS) for the proposed development of a residential subdivision located at Part Lot 23, Concession 7, Wellington Road 22 in the settlement of Hillsburgh, Wellington County, Ontario (Map 1).

The subject property is currently characterized by an active row crop agricultural field and falls within the Hillsburgh Urban Area. The property is designated as Residential, and a small portion as Core Greenlands (Town of Erin 2023). Surrounding land use is primarily residential, agricultural and natural environment. Agricultural lands occur to the west of the subject property, and rural residential properties are present to the south. Lands to the north of the subject property include woodland, pine plantations and open, meadow vegetation communities, as well as the West Credit River. To the east of the subject property, a natural area comprising woodland and wetland features, including a portion of the West Credit River Provincially Significant Wetland (PSW) Complex and the West Credit River, is present. The West Credit River and PSW are identified as Core Greenlands by the Town of Erin (2023). The PSW is further identified as Core Greenlands by Wellington County (2022). The woodland feature associated with the PSW to the east of the subject property is also identified as Greenlands and is considered a Significant Woodland by the County (Wellington County 2022). Due to the presence of wetlands and a watercourse feature on adjacent lands, a portion of the subject property is regulated by the Credit Valley Conservation Authority (CVC) under Ontario Regulation 160/06.

Planning and engineering design for the proposed development has been provided by GSP Group and GM BluePlan Engineering Ltd. Input related to stormwater management for the purposes of infiltration system design and water balance calculations have also been provided by GM BluePlan Engineering Ltd. These designs and calculations have been incorporated into this report.

This report contains the detailed findings of the Scoped EIS. Existing natural features are characterized based on the results of a background review and original field surveys. The detailed characterization was used to inform an analysis of the significance and sensitivity, the identification of any natural feature constraints in association with land use policy designations,

the assessment of potential impacts associated with the proposed development and the identification of appropriate mitigation measures.

2.0 Project Scoping

2.1 Study Area

For the purposes of this report, the term “subject property” refers to the lands owned by the proponent, including the area where the development is proposed to occur. The term “study area” refers to the subject property plus the surrounding area for which additional information was collected and reviewed, as could be gathered without direct access to these areas. The limits of the study area were defined based on available background information and the province’s natural heritage policies pertaining to lands adjacent to natural heritage features. All lands within 1 to 10 km of the property boundary where legacy data has been collected by agencies and wildlife atlases were included in the study area. All natural heritage features within 250 m of the subject property boundary were also included in the study area in order to address Section 2.1.8 of the Provincial Policy Statement (PPS), which states that development and site alteration is not permitted on adjacent lands to natural heritage features 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 feature or its ecological functions (MMAH 2020).

2.2 Background Information

2.2.1 Collection and Review of Background Information

Existing natural heritage information was collected and reviewed to identify key natural heritage features, habitats and species that are reported from, or have the potential to occur within the study area. The following background information sources were reviewed to provide an accurate understanding of the physical and biological attributes within the study area:

- Natural Heritage Information Centre (NHIC) (MNRF 2023b);
- Ontario Ministry of Environment, Conservation and Parks (MECP);
- Ministry of Natural Resources and Forestry (MNRF);
- Credit Valley Conservation (CVC);
- Town of Erin Official Plan (2023);
- Wellington County Official Plan (2022);
- Ontario Breeding Bird Atlas (BSC et al. 2009);
- eBird (eBird 2023);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (Macnaughton et al. 2023);

- Ontario Odonate Atlas (OOAD 2023); and
- iNaturalist (iNaturalist 2023).

Species lists were compiled to provide information on species reported from within the study area based on data available from the wildlife atlases listed above. These atlases provide data based on 10x10 km survey squares. Information on species from the survey squares that overlap with the study area was compiled. These initial species lists were used to guide the scope and type of wildlife field surveys required.

Background information received from the NHIC, MNRF, and MECP on September 14 of 2021, December 9 of 2022, and January 17 of 2023, respectively, have been included in this report.

2.2.2 Significant Species Screening

Based on the compiled species lists for the study area, a screening exercise was completed to assess the potential for reported Species at Risk (SAR) and Species of Conservation Concern (SCC) to occur in the study area. This involved cross-referencing the preferred habitat for reported SAR and SCC (MNRF 2000, Oldham and Brinker 2009, Eakins 2023, Reznicek et al. 2011) against habitats known to occur in the study area. This exercise was completed to ensure that the potential presence of all SAR and SCC within the study area was adequately assessed in this study.

Species at Risk are those listed on the SAR in Ontario List (SARO) (MECP 2023a). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed by COSSARO as Endangered or Threatened are protected by the *Endangered Species Act*, 2007 (ESA), which includes protection of their habitat, and are referred to as regulated SAR. Species listed as Special Concern are included in the definition of SCC, which comprises the following:

- Species designated provincially as Special Concern;
- Species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the NHIC; and
- Species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC), but not provincially by COSSARO. If these species are listed under the Species at Risk Act (SARA) under Schedule 1 they are protected by the federal Act but not provincially by the ESA.

Full SAR and SCC screening results are provided in Appendix I and Appendix II.

2.2.3 Significant Wildlife Habitat Screening

A screening exercise was completed to assess the presence of Significant Wildlife Habitat (SWH) within the study area. SWH is protected under the Ontario Provincial Policy Statement (PPS) (MMAH 2020) and is described in the MNRF Significant Wildlife Habitat Technical Guide (SWHTG) (MNRF 2000) as being comprised of four major categories of habitat:

- Seasonal concentration areas;
- Rare vegetation communities and specialized wildlife habitat;
- Habitats of species of conservation concern; and
- Animal movement corridors.

Specific criteria defining wildlife habitat significance for Ecoregion 6E are described in the SWHTG Addendum (MNRF 2015). Individual SWH types within these four broad categories were assessed as either not present, candidate, or confirmed for the study area based on a comparison of significance criteria against information obtained from relevant background documents.

Full SWH screening results are provided in Appendix III.

2.3 Terms of Reference and Agency Input

Based on the initial findings of the Background Information review, a Terms of Reference (TOR) for the EIS was prepared by NRSI and submitted to the Town of Erin, Wellington County, and the CVC on November 14, 2022. The Town of Erin and CVC reviewed the TOR and provided comments on January 23, 2023, and March 10, 2023, respectively. The TOR was revised to address these comments and is included in Appendix IV.

2.4 Relevant Policies, Legislation and Planning Studies

Natural features identified during background review and field investigations were evaluated against relevant policies, legislation and planning studies (Table 1) to help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected.

Table 1. Relevant Policies, Legislation and Planning Studies.

Policy/Legislation/Planning Study	Description	Project Relevance

• Provincial Policy Statement, 2020 (PPS)	• Issued under the authority of Section 3 of the Planning Act and came into effect on May 1, 2020, replacing the 2014 PPS (MMAH 2014).
	• Section 2.1 of the PPS – Natural Heritage establishes a clear direction for the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'.
	• The Natural Heritage Reference Manual (MNR 2010) and the Significant Wildlife Habitat Technical Guide (MNRF 2000) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• Several natural features were identified within the subject property or on adjacent lands as having potential implications under the PPS:
		  • Provincially Significant Wetlands (PSW);
		  • Valleylands;
		  • Fish Habitat;
		  • Woodland;
		  • Significant Wildlife Habitat (SWH); and
		  • Habitat of Endangered and Threatened Species.
		• Development and site alteration shall not be permitted in SWH unless it has been demonstrated that there will be no negative impacts on natural features or their ecological functions (Section 2.1.5)
		• Development and site alteration shall not be permitted in the habitat of endangered and threatened species except in accordance with provincial and federal requirements (Sections 2.1.7).
		• Development and site alteration shall not be permitted 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 on their ecological functions.

Policy/Legislation/Planning Study	Description	Project Relevance
• *Endangered Species Act*, 2007 (ESA)	• The original ESA, written in 1971, underwent a year-long review that resulted in several changes that came into force in 2007. • The ESA prohibits killing, harming, harassing or capturing Species at Risk (SAR) and protects their habitats from damage and destruction.	• Based on the background information review, candidate suitable habitat for several SAR is present within the subject property. • Field surveys identified the presence of Butternut (*Juglans cinerea*) on the subject property.
• *Fish and Wildlife Conservation Act,* 1997	• Provincial legislation containing provisions for the protection of certain bird species not protected by the Migratory Birds Convention Act, as well as fur-bearing mammals.	• If any active dens of fur-bearing mammals are discovered, these cannot be destroyed without a permit from the MNRF. • The timing of construction activities, especially vegetation clearing and site grading, must have consideration for bird nesting and den sites for fur-bearing mammals.
• *Migratory Birds Convention Act*, 1994 (MBCA)	• The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. • The schedule of on-site work must consider the MBCA windows, with the breeding bird season typically occurring between May 1 and July 31; however, this is a guideline since the MBCA applies to nesting bird species. • “Incidental take” is considered illegal, with the exception of a permit obtained from the Canadian Wildlife Service (CWS).	• The timing of construction activities, especially vegetation clearing and site grading, must have consideration for the MBCA.
• *Fisheries Act*, 1985	• Proposed amendments to the *Fisheries Act* were introduced in 2018 to restore lost protections and incorporate modern safeguards. On August 28, 2019, the new "modernized" *Fisheries Act* came into force, which includes new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. • The modernized Act provides protection for all fish and fish habitat and prohibits the harmful	• Fish habitat is present in the West Credit River (Erin Branch), located to the northeast of the subject property.

Policy/Legislation/Planning Study	Description	Project Relevance
	alteration, disruption or destruction of fish habitat. • The Department of Fisheries and Oceans Canada's (DFO) Fish and Fish Habitat Protection Program ensures compliance with relevant provisions under both the Fisheries Act and the Species at Risk Act. The program reviews proposed works, undertakings and activities that may impact fish and fish habitat. • Works that are proposed in and around certain types of waterbodies may not require DFO review. Likewise, if proponents can follow all specified measures to protect fish and fish habitat outlined by DFO, review may not be necessary.	
• Growth Plan for the Greater Golden Horseshoe (Government of Ontario 2020)	• The Growth Plan, in conjunction with other provincial land use plans, builds on the Provincial Policy Statement to establish a land use planning framework for the Greater Golden Horseshoe. • The Growth Plan identifies a Natural Heritage System (NHS) for the greater Golden Horseshoe to be integrated into long-term regional planning approaches for the protection of these features and their ecological functions. • Updated NHS mapping for the Greater Golden Horseshoe was released in February 2018.	• Section 4.2.2 (1) of the plan states that *the NHS for the Growth Plan excludes lands within settlement area boundaries that were approved and in effect as of July 1, 2017*. The Town of Hillsburgh settlement boundary was approved and in effect as of April 5, 2012 (Town of Erin Official Plan 2023). The subject property falls within the settlement area of the Town of Hillsburgh. • Section 4.2.2 (6) of the plan identifies the municipality as responsible for the protection of natural heritage features and areas in a manner consistent with the PPS within settlement areas. It further identifies that the municipality may continue to protect any other natural heritage system or identify new systems in a manner that is consistent with the PPS in settlement areas.
• Credit Valley Conservation Authority O. Reg. 160/06	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990. • Through this regulation, the CVC has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near	• A portion of the proposed development footprint is regulated by the CVC, through proximity to the PSW adjacent to the subject property. • Permission from the CVC is required to develop within the regulated area.

Policy/Legislation/Planning Study	Description	Project Relevance
	rivers, streams, floodplains, wetlands, and slopes). • CVC regulations prohibit the development of land within 120 metres of all provincially significant wetlands and areas within 30 metres of all other wetlands unless it has been demonstrated that there will be no negative impacts on the wetland feature or its ecological function.	

• Wellington County Official Plan (2022)	• The Wellington County Official Plan (2022) outlines current policies for the protection of natural features within the County.
	• Development and site alteration will not be allowed in significant habitat of endangered or threatened species except in accordance with provincial and federal requirements.
	• Development or site alteration adjacent to significant habitat of endangered or threatened species shall require an Environmental Impact Assessment that demonstrates there will be no negative impact on the significant habitat of endangered or threatened species or its ecological function.
		• Several natural features were identified within the subject property or on adjacent lands as having potential implications under the plan:
		  • Core Greenlands (i.e., Habitat of Endangered or Threatened species) are identified as present within the subject property
		  • Core Greenlands (i.e., PSW, fish habitat) and Greenlands (i.e., valleylands, woodlands) are identified as adjacent to the subject property
		• Development and site alteration may be permitted in habitat of endangered and threatened species in accordance with provincial and federal requirements (Section 5.4.2).
		• Development or site alteration will only be permitted on lands contiguous to Core Greenlands and Greenlands where the proposed activity will not result in adverse environmental impacts on features and ecological functions of the features (Section 5.6.2).

• Town of Erin Official Plan (2023)	• The Town of Erin Official Plan (2023) outlines current intentions on how future growth and development will be managed.
	• Development on lands adjacent to provincially significant wetlands are only permitted subject to the preparation of an Environmental Impact Assessment (3.1.2)
		• Several natural features were identified within the subject property or on adjacent lands as having potential implications under the plan:
		  • Core Greenlands (i.e., Habitat of Endangered or Threatened species) are identified as present within the subject property
		  • Core Greenlands (i.e., PSW, fish habitat) and Greenlands (i.e., valleylands, woodlands) are identified as adjacent to the subject property

Policy/Legislation/Planning Study	Description	Project Relevance
	• Development and site alteration will not be allowed in significant portions of the habitat of endangered or threatened species (3.1.5)	• Development and site alteration will not be allowed in significant portions of the habitat of endangered or threatened species (Section 3.1.5). • Sections 4.3.3b and 4.3.4 identify that new development is only permitted if "*there are not significant negative impacts on the Greenlands.*"

3.0 Field Methods

Field surveys were undertaken within the study area to characterize natural features and identify significant and sensitive natural heritage features and species that have the potential to be adversely affected by the proposed development. A total of 11 field visits were completed between October 2021 and July 2023. A variety of field surveys were undertaken and are described in detail below and summarized in Table 2. Surveys were conducted in accordance with provincial and local guidance documents.

Table 2. Field Survey Summary

Survey Type	Protocol	Date(s)
Vegetation		
Vegetation Community Delineation and Fall Vascular Flora Inventory	Lee et al. 1998;	October 15, 2021
Vascular Flora Inventories (Spring, Summer and Fall)	Systematic search by ELC polygon	October 15, 2021
		May 23, 2023
		July 6, 2023
Butternut Health Assessment	MECP 2014	October 15, 2021
Tree Inventory	Systematic area search	November 29, 2021
		December 13, 2021
Delineation of Top of Slope and associated Vegetation Limit (CVC Ecologists), and Woodland Dripline (NRSI Biologists)	N/A	January 11, 2023
Mammals		
Bat Habitat Assessment	MECP 2022a, MECP 2022b	November 29, 2021
		December 13, 2021
Birds		
Breeding Bird Surveys	OBBA 2001	May 26, 2023
		June 13, 2023
		July 4, 2023
Significant Wildlife and Species at Risk Habitat		
Significant Wildlife Habitat and Species at Risk Habitat Assessments	N/A	All Site Visits
Aquatic Habitat		
Aquatic Habitat Assessment	N/A	January 18, 2023
Unconstrained Headwater Drainage Feature Assessment	Gorenc and Stanfield 2017	April 4, 2023

3.1 Terrestrial Field Surveys

3.1.1 Vegetation Surveys

Vegetation Community Delineation

Vegetation community delineation was completed within the subject property using aerial photography and thorough investigations in the field. The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee et al. 1998). Details of vegetation communities were recorded including species composition, dominance and uncommon species or features.

Vegetation communities identified and delineated beyond the limits of the subject property were determined based on: 1) field surveys completed by NRSI biologists on adjacent lands where permission to access private property was obtained, 2) data collected from the subject property boundary and aerial imagery review, and 3) available open source data (CVC 2022).

Vascular Flora Inventory

All observed species of vascular flora within the subject property were recorded during spring, summer and fall vascular flora inventories, conducted in conjunction with vegetation community delineations.

Natural Feature Boundary Assessment

The stable top-of-bank and associated vegetation limit were delineated by CVC Ecologists, Annie Li, Elizabeth Paudel and Sarah Labrie, on January 11, 2023. The driplines associated with the Mineral Cultural Woodland Ecosite (CUW1) and Dry-Fresh Sugar Maple-Black Cherry Deciduous Forest Type (FOD5-7) vegetation communities were delineated by NRSI Biologists on January 11, 2023.

The vegetation limit and driplines were surveyed using an SXBlue II GNSS GPS unit which is capable of mapping grade accuracy $\leq$0.5m. The stable top-of-bank was surveyed by Van Harten Surveying Inc.

Tree Inventory

A comprehensive inventory of trees with the potential to be impacted by the proposed development was completed by Certified Arborists and Registered Professional Foresters within the subject property. Individual trees ≥10 cm in Diameter at Breast Height (DBH) were assessed by a Certified Arborist and surveyed using a SXBlue II GNSS GPS unit.

The following information was recorded for each tree:

- Species;
- DBH;
- Crown radius (metres);
- General health (excellent, good, fair, poor, very poor, dead);
- Potential for structural failure (improbable, possible, probable, imminent);
- Potential cavities that could be used by SAR bats;
- Tree location (on-site, boundary, off-site); and
- General comments (i.e., disease, aesthetic quality, development constraints, sensitivity to development).

The overall health and potential for structural failure of each tree was assessed using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. None of the trees examined on the property were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

Butternut Health Assessments

Butternut (*Juglans cinerea)* trees were identified within the subject property during the tree inventory and vascular plant surveys conducted by NRSI staff within the subject property. An off-season Butternut Health Assessment (BHA) was conducted on each tree by a Certified Butternut Health Assessor on October 15, 2021, as per the Butternut Assessment Guidelines (MECP 2014). Samples were also collected and submitted for genetic analysis.

3.1.2 Mammal Surveys

Bat Habitat Assessment

A bat habitat assessment was conducted during the leaf-off period in conjunction with the Tree Inventory to identify trees that have the potential to provide suitable roosting habitat for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) (MECP 2022a, MECP 2022b). All standing live or dead trees with cracks, crevices, hollows, cavities, and/or exfoliating bark, and with the potential to be impacted

by the proposed development, were documented. Tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree. All trees with suitable dead or dying leaf clusters with the potential to be impacted by the proposed development were also documented as they have the potential to provide suitable roosting habitat for Tri-colored Bat. All identified candidate roost trees were surveyed with a Trimble SXBlue II GNSS GPS unit.

3.1.3 Bird Surveys

Breeding Bird Surveys

Three early morning breeding bird surveys were conducted within the subject property. Survey methods primarily followed the Ontario Breeding Bird Atlas protocol (OBBA 2021a, OBBA 2021b). The breeding bird surveys consisted of a combination of 10-minute point counts and area searches. They occurred in the early morning, beginning no earlier than 30 minutes prior to sunrise and extending to four hours after sunrise. All birds observed, as well as the highest level of breeding evidence exhibited for each species, were recorded by an NRSI avian biologist.

3.1.4 Additional Wildlife

All observations of birds, mammals, herpetofauna and insects were documented on all field visits. This included actual direct observations of individuals, as well as signs of wildlife presence (i.e., tracks, scats, dens, nests etc.).

3.1.5 Significant Wildlife Habitat Assessment and Species at Risk Habitat

Significant Wildlife Habitat (SWH) types and SAR habitats identified as potentially occurring within the study area (i.e., Candidate) during the background review were further assessed for their presence in the field during all surveys.

3.1.6 Aquatic Surveys

Aquatic Habitat Assessment

An assessment was completed at the crossing of the West Credit River by Wellington County Road 22 (Map 2) to characterize aquatic habitats. The following information was recorded to inform the assessment:

- Flow conditions and physical watercourse characteristics including approximate depth, width, bank full width, bank height, etc.;
- In-situ water quality measurements (i.e., water temperature, pH, conductivity, and dissolved oxygen);
- Substrate type and general composition;
- General bank stability;
- Riparian and aquatic vegetation;
- In-stream cover type and quality; and
- Suitable habitat for critical life stages of fish (spawning, nursery, foraging, etc.).

The area was also assessed for potential groundwater seepages and any additional ephemeral, intermittent, or permanent watercourse features. The watercourse was evaluated for its potential to provide fish habitat and to inform its ecological function within the study area.

Headwater Drainage Feature Assessment

Potential Headwater Drainage Features (HDFs) were initially identified through a review of aerial imagery, previous site visits, and available mapping. This preliminary analysis indicated that a single HDF was potentially present within the northern portion of the subject property. NRSI biologists trained in the application of the *Ontario Stream Assessment Protocol (V10.S4.M11) Unconstrained Headwater Sampling* (Gorenc and Stanfield 2017) completed a site visit on April 4, 2023, to assess the potential HDF during early spring high water table conditions.

The *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA and CVC 2014) document (herein referred to as the Headwater Guidelines) defines HDFs as follows:

> "*non-permanently flowing drainage features that may not have defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales and connected headwater wetlands, but do not include rills or furrows*."

During the on-site review of the potential HDF, NRSI biologists determined that the feature in question is a small rill within an agricultural field that forms during the spring as a result of local topography and ephemeral surface flows within the bare soils of the field. The rill does not connect to any features downstream, does not provide any important hydrological or ecological

functions, and does not meet the definition of an HDF as per the Headwater Guidelines. As a result, additional field investigations were not necessary and the rill is not discussed further in this report.

4.0 Existing Conditions

4.1 Soil, Terrain and Drainage

Located in Ecoregion 6E, the study area overlaps the boundary between two physiographic regions described as the Hillsburgh Sandhills (northern 80% of the subject property) and the Guelph Drumlin Field (southern 20% of the subject property) (Chapman and Putnam 2007). Bedrock is characterized as the Guelph and Amabel Formations, which are both comprised primarily of sandstone, shale, dolostone and siltstone (OGS 2011). The predominant surface soil type within the subject property is categorized as Hillsburgh Fine Sandy Loam, which has fine-to-medium sand and good drainage (Hoffman et al. 1963). Surficial soils consist of stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain and ice-contact stratified deposits of sand and gravel, minor silt, clay and till in the northeastern portion of the subject property (OGS 2010).

Subsurface investigations (i.e., boreholes) were initially completed in 2015 by V.A. Wood (Guelph) Inc. and supplemented by additional surveys (i.e., monitoring wells) by GM BluePlan Engineering Ltd. in 2016. Six boreholes were advanced to depths ranging from 4.9 m to 6.6 m below ground surface (bgs) in March 2015, with drilling operations encountering generally stiff or compact soils to approximately 2.5 m to 3 m bgs and hard or very dense soils beyond; all six boreholes were observed to be dry following the completion of drilling (V.A. Wood 2015). The overall stratigraphic sequence of soils is described by V.A. Wood (Guelph) Inc. as topsoil (typically 0.3 m thick) overlying silt (sandy to clayey, typically 4.5 – 6 m thick) and clayey silt till. In September 2016, six new boreholes (each installed with a monitoring well) were advanced by GM BluePlan Engineering Ltd. to depths of 8.03 – 14.30 m bgs. Five sequential soil strata are described by GM BluePlan Engineering Ltd. as follows (GM BluePlan 2024a):

- Topsoil, between 0.3 m and 0.8 m thick, generally of sandy silt texture except for clayey silt in lower-lying areas in the northeastern and central portions of the subject property;
- Silt, approximately 2.5 m to 6 m thick, with varied portions of sand and gravel but similar soft consistency and low plasticity across the subject property;
- Upper Till (Sandy Silt to Clayey Silt), approximately 4.5 m to ≥12.5 m thick, exhibiting a stiff to hard consistency and containing a greater proportion of fines (silt and clay) than the Silt stratum above;

- Gravel and Sand to Sand and Silt Aquifer, ranging in texture from very coarse gravel and sand in the northwest and southeast of the property to fine sandy silt in the centre of the property; and
- Lower Till (Clayey Silt), with a predominantly clayey silt texture, a very hard consistency, and a moisture content well below the plastic limit despite the stratum being located below the water table.

Following the subsurface investigations and groundwater monitoring, GM BluePlan determined that a local groundwater divide is present within the subject property. The groundwater divide bisects the property in a north-south direction near the centre of the subject property. Groundwater west of the divide generally flows in a southwesterly direction, while groundwater east of the divide tends to flow east towards the Credit River (Erin Branch) (GM BluePlan 2024a).

Free groundwater was encountered in the Gravel and Sand to Sand and Silt Aquifer or Lower Till (Clayey Silt) strata during drilling on September 26, 2016 (GM BluePlan 2024a). and Groundwater levels fluctuate seasonally, with the difference between the maximum (i.e., seasonal high) and minimum (i.e., seasonal low) measured levels being between 1.24 m (in MW-01) and 4.91 m (in MW-02) (GM BluePlan 2024a). The groundwater table is closest to the surface in the southwest corner of the site where the seasonally high groundwater level is within approximately 2m of the surface. Seasonal highs were observed in late winter and early spring (generally March/April), descending to seasonal lows in the summer and fall.

Given the high content of dense, fine-textured soils within the subhect property, s significant separation between the surface and groundwater table is inferred (GM BluePlan 2024a). The subject property is located within the Credit Valley Source Protection Area and overlaps with a Significant Groundwater Recharge Area (SGRA) with an unevaluated vulnerability score of 'N/A' (MECP 2023b).

The topography of the subject property is undulating, with a minor local ridge in the north-central portion of the site gradually decreasing in elevation towards Wellington Road 22. Northeast (and outside) of the subject property boundary, lands slope steeply downwards from the tablelands to the West Credit River (Erin Branch) valley, with average slopes of up to 13% and an elevation change of approximately 20 m (GM BluePlan 2024a).

Existing drainage patterns within the subject property are divided among the east, west, and south directions. Surface water currently sheet flows overland within three pre-development subcatchments described by GM BluePlan Engineering Ltd. (2024b):

- Catchment 101 is 6.86 ha and conveys surface flows east towards the West Credit River PSW and watercourse (Erin Branch);
- Catchment 102 is 5.81 ha and conveys surface flows west towards the adjacent agricultural field; and
- Catchment 103 is 1.47 ha and conveys surface flows south towards an existing roadside ditch along Wellington Road 22, which ultimately discharges to the West Credit River PSW and watercourse (Erin Branch).

Under existing conditions, pre-development Catchment 101 and 103 (8.33 ha in total) contribute water to the West Credit River PSW and watercourse (Erin Branch), as detailed on Figure No. 3 of the Function Servicing Report (FSR) (GM BluePlan 2024b).

4.2 Vegetation

4.2.1 Vegetation Community Delineation

A summary of major ELC communities identified within the subject property is provided in Table 3 and shown on Map 2.

Table 3. Ecological Land Classification Community Descriptions.

ELC Code	Community Type	Community Description
OAGM1	Open Agriculture – Annual Row Crops	Active open agricultural land of annual row crops that comprises most of the subject property. Canopy: None Sub-canopy: None Understory: None Groundcover: None
FOD5-7	Dry – Fresh Sugar Maple – Black Cherry Deciduous Forest Type	This mature forest community is dominated by Sugar Maple (*Acer saccharum*) and is regenerating following a history of anthropogenic disturbance. Where it is located to the east of the subject property, it contains a valley with steep slopes leading to a waterbody that feeds the West Credit River. Canopy: Sugar Maple, Black Cherry (*Prunus serotina*), American Basswood (*Tilia americana*), Eastern Cottonwood (*Populus deltoides*), Trembling Aspen (*Populus tremuloides*) Groundcover: Sugar Maple, Trout Lily (*Erythronium americanum*), Broad-leaved Enchanter's Nightshade

ELC Code	Community Type	Community Description
		(*Circaea canadensis*), Downy Yellow Violet (*Viola pubescens*)
CUM-1	Mineral Cultural Meadow Ecosite	This low-diversity cultural meadow at the northern corner of the subject property receives periodic mowing. The community is dominated by a mix of native and non-native early-successional species. There are occasional stands of Scot's Pine throughout the community, which appear to have been seeded in from adjacent plantations. Canopy: Scot's Pine (*Pinus sylvestris*) Sub-canopy: Black Walnut (*Juglans nigra*), Scot's Pine Understory: Common Buckthorn (*Rhamnus cathartica*) Groundcover: Smooth Brome (*Bromus inermis*), Kentucky Bluegrass (*Poa pratensis*), Canada Goldenrod (*Solidago canadensis*).
H1 and H2	Hedgerow	The H1 community is a Black Cherry-dominated hedgerow located along the southwestern boundary of the subject property. This community also contains 13 Butternut (*Juglans cinerea*). The H2 community is a mature Sugar Maple-dominated hedgerow located along the northwestern boundary of the subject property. It also contains sparse Black Cherry. The ground cover layer in both hedgerow communities exhibits low species diversity and contains a mix of disturbance-tolerant native species and aggressive non-native species. Canopy: Sugar Maple Sub-canopy: Sugar Maple, Black Cherry Understory: Sugar Maple, Black Cherry, Riverbank Grape (*Vitis riparia*), White Ash (*Fraxinus americana*), Alternate-leaved Dogwood (*Cornus alternifolia*) Groundcover: Virginia Water-leaf (*Hydrophyllum virginianum*), Sugar Maple, Riverbank Grape, Garlic Mustard (*Alliaria petiolate*), Spinulose Wood Fern (*Dryopteris carthusiana*).
H3	Hedgerow	This mid-age, mowed, equidistant sugar maple hedgerow is located along the roadside in the southeast portion of the subject property. The ground cover layer of this community exhibits low diversity and is dominated by aggressive non-native species. Canopy: Sugar Maple Groundcover: Smooth Brome, Kentucky Bluegrass, Quackgrass (*Elymus repens*)
CUT1	Mineral Cultural Thicket Ecosite	This mid-aged valley slope cultural thicket community is dominated by Common Apple (*Malus pumila*) and includes occasional Ash, Manitoba Maple (*Acer negundo*), Black Cherry, and sparse American Elm (*Ulmus americana*). Almost all mid-age or mature Ash trees are dead or declining due to Emerald Ash Borer.

ELC Code	Community Type	Community Description
		The ground layer of this community exhibits low diversity and is dominated by a mix of native and non-native disturbance-tolerant species. Canopy: Manitoba Maple, Black Cherry Sub-canopy: Common Buckthorn Understory: Common Apple, Common Buckthorn, Manitoba Maple Ground Cover: Garlic Mustard, Catling's Avens (*Geum x catlingii*), Riverbank Grape
CUW1	Mineral Cultural Woodland Ecosite	This mid-aged valley slope deciduous cultural woodland contains a sparse and broken canopy with dead American Elm and Ash. The subcanopy and understorey of the community is dense with non-native shrubs, and the ground layer contains a mix of native and non-native species tolerant of disturbance. Canopy: Manitoba Maple, Black Cherry, American Elm Sub-canopy: Common Buckthorn, Black Cherry, American Elm Understory: Common Buckthorn, Riverbank Grape, Wild Black Current (*Ribes americanum*), Choke Cherry (*Prunus virginiana*), Alternate-leaved Dogwood, Woodbine (*Parthenocissus vitacea*) Ground Cover: Woodbine, Herb-Robert (*Geranium robertianum*), Garlic Mustard, Wood Avens (*Geum urbanum*)

4.2.2 Vascular Flora Inventory

Detailed vegetation inventories resulted in the identification of 109 vegetation species within the subject property by NRSI biologists. A complete list of all observed species and species reported from the study area is provided in Appendix V.

Based on available background information, one vegetation SAR is reported from the study area. Appendix I and Appendix II provide a summary of significant species reported from the study area, including their current status ranks and preferred habitats. NRSI biologists observed one plant SAR, Butternut (*Juglans cinerea*), within the subject property during vascular flora inventories. No other federally, provincially or regionally significant species were observed within the subject property.

A total of 16 Butternut were documented in the Dry – Fresh Sugar Maple – Black Cherry Deciduous Forest Type (FOD5-7), Hedgerow 1 (H1), and Hedgerow 2 (H2) vegetation communities within or immediately adjacent to the subject property (Map 3). The results of a Butternut Health Assessment identified the health of each individual as a Category 2 tree (i.e.,

trees that do not have a Butternut Canker or are not in advanced stages of the disease caused by the fungus known as Butternut Canker). Genetic analysis of samples collected during the assessment confirmed that each of the individuals are pure Butternut, and not hybrids between Butternut (*Juglans cinerea*) and Japanese Walnut (*Juglans ailantifolia*) (Precision Biomonitoring Inc. 2021). Details of each observed individual are provided in the Tree Preservation Plan (TPP) (Appendix VI).

4.2.3 Tree Inventory

In total, 385 trees were inventoried, comprising of 16 species. Of the trees inventoried and assessed, 338 are native species and 47 are non-native. A complete list of trees inventoried and the location of each inventoried tree is provided in the TPP (Appendix VI).

NRSI biologists observed one plant SAR, Butternut (*Juglans cinerea*). No other federally, provincially or regionally significant species were observed within the subject property.

4.3 Wildlife

4.3.1 Birds

A total of 108 bird species have been reported from the study area based on background information (BSC et al. 2009, MNRF 2023b, eBird 2023). Avian biologists observed 30 of these species, and an additional five species, within the subject property during breeding bird surveys. A complete list of all observed species and species reported from the study area is provided in Appendix VII.

Based on available background information, five bird SCC and three bird SAR are reported from the study area (BSC et al. 2009, MNRF 2023b, eBird 2023). Appendices I and II provide a summary of significant species reported from the study area, including their current status ranks and preferred habitats. NRSI observed one SCC bird species within the subject property during breeding bird surveys.

Eastern Wood-Pewee (*Contopus virens*) is listed as Special Concern both provincially and federally (MNRF 2023a, Government of Canada 2023). This species uses open, deciduous, mixed or coniferous forest that is predominated by oak with little understory, forest clearings, edges, farm woodlots and parks (MNRF 2000). This species was observed exhibiting probable breeding evidence at monitoring stations BMB-003 and BMB-004 within the FOD5-7 and CUW1 vegetation communities present along the eastern subject property boundary (Map 2).

4.3.2 Herpetofauna

A total of 11 herpetofauna species, including one SCC, Common Snapping Turtle (*Chelydra serpentina serpentina*), have been reported from the study area (Ontario Nature 2019, MNRF 2023a, MNRF 2023b). None of these species, including no federally, provincially or regionally significant herpetofauna species, were observed incidentally by NRSI biologists within the subject property. A complete list of all species reported from the study area is provided in Appendix VIII. Appendix II provides a summary of SCC, including Common Snapping Turtle, reported from the study area.

4.3.3 Mammals

According to the Mammal Atlas of Ontario and NHIC database (Dobbyn 1994, MNRF 2023b), 46 mammal species have been reported from the study area. A total of four mammal species were recorded by NRSI biologists through direct observation or observation of physical evidence (e.g., tracks) within the subject property. A complete list of all observed species and species reported from the study area is provided in Appendix IX.

Based on available background information, five mammal SAR and one mammal SCC are reported from the study area (Dobbyn 1994, Government of Canada 2023, MECP 2023a, MNRF 2023b). Appendix I and Appendix II provide a summary of significant species reported from the study area, including their current status ranks and preferred habitats. NRSI biologists did not observe any federally, provincially or regionally significant mammal species within the subject property.

Bat Habitat Assessment

Six candidate bat roost trees for Little Brown Myotis and Northern Myotis were documented within hedgerow features in the subject property (Map 3, Table 4). No dead or dying leaf clusters with suitable roosting habitat for Tri-colored Bat were observed.

Table 4. Summary of Observed Candidate Bat Roost Trees

Tree ID	Species		Location (UTM Coordinates; Zone 17T)		DBH[1] (cm)	Height Class[2]	Decay Class[2]	Microhabitat Details
	Common Name	Scientific Name	Easting	Northing				
RST-099	Black Cherry	*Prunus serotina*	569199	4847673	38.5, 29.7, 29.7	2	2	Cavity
RST-122	American Basswood	*Tilia americana*	569068	4847794	23.1, 14.1, 23.0, 10.4	2	3	Cavity
RST-128	Sugar Maple	*Acer saccharum*	569059	4847803	76.2	3	2	Cavity
RST-211	Sugar Maple	*Acer saccharum*	569029	4847851	39.0, 42.1	2	2	Cavity
RST-213	Sugar Maple	*Acer saccharum*	569036	4847857	96.7	2	2	Cavity
RST-243	Black Cherry	*Prunus serotina*	569051	4847812	57.3, 46.6	3	2	Cavity, Crack/Crevice

[1]Diameter-at-Breast Height
[2]Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = Suppressed (well below canopy)
[3]Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact; 4 = Recently dead, bark peeling, only branches intact; 5 = Older dead tree, 90% of bark lost, few branch stubs, broken top; 6 = Very old dead tree, advanced decay, no branches, parts of stem have rotted away

4.3.4 Insects

According to the Ontario Butterfly Atlas and NHIC database (Macnaughton et al. 2023, MNRF 2023b), 30 butterfly species, including one butterfly SCC, Monarch (*Danaus plexippus*), are reported from the study area (Macnaughton et al. 2023, MNRF 2023a). No butterfly species, including federally, provincially or regionally significant species, were observed by NRSI biologists within the subject property. A complete list of all observed species and species reported from the study area is provided in Appendix X.

No odonate species are reported from the study area based on available background information (OOAD 2023, MNRF 2023b). No odonate species, including federally, provincially or regionally significant species, were observed within the subject property.

4.4 Aquatic Habitat

4.4.1 West Credit River

The West Credit River (Erin Branch) flows southeast as a small, permanent coldwater feature northeast of the subject property and provides direct fish habitat for a diverse fish community, including the sensitive species, Brook Trout (*Salvelinus fontinalis fontinalis*). Upstream and downstream of the Wellington Road 22 crossing, the river flows through a predominantly naturalized landscape.

The West Credit flows through a concrete box culvert under Wellington Road 22. The upstream end of the culvert ties into the streambed, while the downstream end is elevated slightly above the streambed. At the downstream end, this elevation difference creates a minor drop into a plunge pool (approximately 0.6 m deep) (Appendix XI, Photo 1). Water velocities are elevated at the culvert inlet due to the presence of boulders, which constrict the flow into the culvert. Velocities remain relatively high through the culvert and at the outlet. These water velocities, in addition to the minor elevation drop at the outlet, may act to inhibit upstream fish movement through the culvert.

Upstream of the Wellington Road 22 crossing of the watercourse, the channel is meandering. Downstream of the crossing, the channel is relatively straight with a moderate gradient. At the time of the assessment, the wetted width of the watercourse ranged from 2 to 5 m with riffle, run, and pool sequencing. Hydraulic head measurements ranged from 7 to 70 mm. Substrates within the assessed reach were dominated by sand and cobble with gravel and silt in small proportions. Watercress (*Nasturtium officinale*) was noted to be present in low abundance, and is an indicator of groundwater input. Direct fish habitat is present throughout the full extent of the assessed reach. In-stream fish habitat and cover is provided by cobble substrates, riffle and pool areas, backwater areas, undercut banks, woody debris, and in-stream emergent aquatic vegetation (Watercress) in relatively low abundance at some locations along the banks (Appendix XI, Photo 2). Water depths throughout the assessed reach ranged from approximately 0.1 to 0.6 m, with the greatest depth observed within a plunge pool located immediately downstream of the road crossing. In situ water quality measurements were taken upstream of the road crossing at 9:45 hrs on January 18, 2023: the air temperature was 2.5°C, the water temperature ranged from 2.6 and 2.8°C, pH was 8.43, total dissolved solids were 510 ppm, and conductivity was 880 us/cm.

The banks are moderate to steeply sloped from the river's edge. Banks were noted to be moderately stable, with some areas of minor bank erosion along the southwest bank near the downstream extent of the assessed reach. The adjacent lands are steeply sloped with established vegetation extending greater than 30 m from the banks on each side upstream of the road crossing. Downstream of the road crossing, the extent of established vegetation is reduced and only extends from 0 to 10 m from the banks on each side of the watercourse (Appendix XI, Photo 3). The vegetation community consists of terrestrial vegetation characterized by Dry-Fresh Sugar Maple Basswood Deciduous Forest Type (FOD5-6) and White Cedar – Conifer Organic Coniferous Swamp Type (SWC3-2) vegetation communities to the north of the road crossing, and a Cultural Meadow (CUM1-1) to the south of the road crossing of the watercourse. The canopy of the adjacent forest, swamp and riparian zone provides very good to fair shade quality to the river, which helps to reduce solar radiation. Land use adjacent to the river consists of natural environment (i.e., forest and swamp), rural residential and agriculture.

An additional permanent tributary is present and flows to the West Credit upstream of the road crossing along the east bank. Wetted width was recorded to be 0.63 m, and water depths were up to 12 cm. Although limited, fish habitat is present within the tributary. Areas of iron staining were observed along the northeast bank of the West Credit downstream of the road crossing, which suggests groundwater influence.

Online ponds are present both upstream and downstream of the assessed reach. These ponds are connected to the West Credit and provide fish habitat; however, it is unclear whether barriers to fish movement persist where the river connects to the ponds.

5.0 Natural Environment Significance

This section analyzes the significance of natural features to determine areas that need to be protected and areas that present opportunities for development. Natural features that are sensitive to disturbance are identified based on the rarity or significance of the feature or the functions/processes and/or policies inhibiting development within them. These areas are discussed in the context of natural heritage policies governing their protection.

This analysis is intended to guide the recommendation of buffers and location of the proposed development envelope to avoid or minimize impacts to significant natural features and their ecological functions. Identified natural features to be avoided during development are shown on Maps 3, 5 and 6.

5.1 Wetlands

Wetlands are important for many reasons including collecting and storing surface water and groundwater and providing habitat for plants, wildlife, and fish. Wetlands operate on a water budget, where the hydrologic character of the wetland is determined by the combination of water inflow/outflow, topography, and groundwater conditions (Mitsch and Gosselink 1993). Wetlands receive water through precipitation, surface inflow, and groundwater inflow, and lose water through evapotranspiration, surface and groundwater outflow. In Wellington County, wetlands are typically identified as PSW (evaluated and identified to be of provincial significance) or locally significant (evaluated and identified to be of non-provincial significance or unevaluated). Provincially Significant Wetlands are designated as Core Greenland features by the Town of Erin and Wellington County (Town of Erin 2023, Wellington County 2022).

All wetlands and their associated areas of interference (120 m) are regulated by CVC under Ontario Regulation 160/06 (2022). Any development or interference within a wetland or development within an area of interference requires a permit from CVC.

The PPS (MMAH 2020) states that development and site alteration shall not be permitted on adjacent lands to significant wetlands (PSW) 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 on their ecological functions. In accordance with the PPS, development or site alteration is prohibited on lands within 120 m of Core Greenlands in the Town of Erin and Wellington County unless it has been demonstrated that there will be no

negative impacts on the feature and its ecological functions (Town of Erin 2023, Wellington County 2022).

No wetland features are present within the subject property (Map 1). Portions of the West Credit River PSW Complex are located to the north, east and south of the subject property, the majority of which are greater than 120 m from the subject property limits. Along the northeastern subject property boundary, a portion of the PSW Complex is present within 65 m of the subject property limits. The subject property is separated from this wetland feature by a steep slope and wooded area.

The West Credit River PSW Complex is associated with the Erin Branch of the Credit River, a watercourse which originates west of the community of Hillsburgh and generally flows southeast towards the town of Erin (Map 1). The wetland evaluation record for the West Credit River PSW indicates that swamp vegetation communities comprise the majority (approximately 85%) of the complex, with marsh communities characterizing the remaining portions (15%). Hydrological systems within the complex are dominated by riverine (70%) and palustrine (30%) processes (MNRF 1995).

On the lands immediately adjacent to the northeast boundary of the subject property, the West Credit River PSW is characterized by a combination of meadow marsh, shallow aquatic, and mixed or coniferous swamp communities (Map 2). These communities are located down a steep, wooded slope in the West Credit River corridor valleylands, approximately 65 to 100 m from the subject property boundary. Southeast of Wellington Road 22, the Credit River flows through coniferous, mixed, and deciduous swamp communities before reaching a large (>6 ha) open aquatic feature approximately 400 m from the subject property (Map 2). Under existing conditions, approximately 60% (8.33 ha) of the subject property overlaps with the overall surface water catchment for the West Credit River PSW (GM BluePlan 2024b, MNRF 2023c).

5.2 Woodlands

The Natural Heritage Reference Manual (MNR 2010) provides guidance for assessing the ecological function of woodlands. It outlines criteria for determining the significance of woodlands within Ontario, considering four broad categories: woodland size, ecological function, uncommon characteristics, and economic and social values. Woodlands identified as ‘significant’ according to the criteria outlined in the Natural Heritage Reference Manual are considered within the PPS (MMAH 2020). The PPS states that development and site alteration

shall not be permitted in significant woodlands and development and site alteration shall not be permitted on adjacent lands to significant woodlands 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 Natural Heritage Reference Manual and the policies of the PPS can also be used by municipalities to further refine local policies, objectives, and evaluation criteria for woodlands.

In the Urban System of Hillsburgh, within which the subject property is located, woodlands over one hectare in size are considered to be significant by Wellington County and are included in the County's Greenland System (Wellington County 2022). The woodland communities along the northeastern boundary of the subject property are considered significant by Wellington County and the Town of Erin (Town of Erin 2023, Wellington County 2022) (Map 3).

The Dry – Fresh Sugar Maple – Black Cherry Deciduous Forest Type (FOD5-7) vegetation community to the north of the subject property is contiguous with a White Pine Coniferous Plantation Type (CUP3-2) vegetation community that is located off-property. A detailed study is planned to be conducted to evaluate the significance of this feature as part of the implementation of the existing Draft Plan of Subdivision for the adjacent property (Carson Reid Homes Ltd., pers. comm., 2023). The portion of the feature that extends to within the subject property should be protected until otherwise confirmed as significant.

Within Wellington County and the Town of Erin, development or site alteration is not permitted within or on adjacent lands to significant woodland features unless it has been demonstrated that there will be no negative impacts on the feature or its ecological functions. Tree removals shall be subject to the Wellington County *Forest Conservation By-law*.

5.3 Valleylands

Valleylands consist of 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 (MNR 2010, Wellington County 2022, Town of Erin 2023). As the natural drainage systems for watersheds, valleys can provide several important ecological functions including short-term storage of storm and melt waters, transport of nutrients and sediments, fish and wildlife habitat, natural linkages between habitat features and migration corridors for plants and animals (MNR 2010). Criteria outlined in MNR (2010) for determining the significance of valleys within Ontario consider three broad categories: landform-related functions and attributes, ecological features and restored

ecological functions. Valleys identified as 'significant' according to the criteria outlined in the Natural Heritage Reference Manual are considered within the PPS (MMAH 2020). The PPS states that development and site alteration shall not be permitted within or on lands contiguous to significant valleylands 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 Natural Heritage Reference Manual and the policies of the PPS can also be used by municipalities to further refine local policies, objectives, and evaluation criteria for valleylands.

Well-defined valleylands can be delineated by the stable top-of-bank, and less well-defined valleylands can be delineated using a combination of proxy boundaries such as riparian zones, flood hazard limits, the meander belt of the watercourse or the highest general level of seasonal inundation (MNR 2010, Wellington County 2018).

Valleylands associated with the West Credit River are present to the east of the subject property. This feature is a well-defined valleyland in the vicinity of the subject property, and therefore, the limit of this feature can be delineated by the stable top-of-bank (Map 5).

Within Wellington County and the Town of Erin, valleylands are included in the Greenlands system and are protected from development or site alterations which would negatively impact the feature or its ecological functions. Development, redevelopment or site alteration may only be permitted on lands adjacent to Greenlands where it is demonstrated that the proposed works would not result in adverse environmental impacts on the natural heritage feature or the ecological functions of the feature (Wellington County 2022, Town of Erin 2023). Lands within river valleys are further regulated by the CVC. Development or site alteration within a river valley requires a permit from the CVC in accordance with the applicable regulations approved under the Conservation Authorities Act.

5.4 Significant Wildlife Habitat

Based on background information review, desktop analyses, and field studies, one SWH type was confirmed for the subject property, one was maintained as candidate SWH, and all other candidate SWH types were ruled out as occurring in the subject property (Appendix III). Confirmed and candidate habitats are discussed in detail in the following sections. Confirmed SWH types are shown on Map 3. Development or site alteration within SWH is not permitted

under the PPS unless it has been demonstrated that there will be no negative impacts on the habitat or its ecological functions (MMAH 2020).

5.4.1 Confirmed Significant Wildlife Habitat

Habitat for Species of Conservation Concern

Special Concern and Rare Wildlife Species

These species are quite rare or have experienced significant population declines in Ontario. To inventory a site for the identified special concern or rare species, studies need 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 and is delineated through field studies. The habitat needs to be easily mapped and cover an important life stage component for a species such as specific nesting habitat or foraging habitat.

Based on the results of wildlife field surveys, one SCC, Eastern Wood-Pewee, was confirmed using habitats within the study area for an important life stage component (i.e., breeding). The CUW1 and FOD5-7 vegetation communities are confirmed Special Concern and Rare Wildlife SWH for Eastern Wood-pewee (Map 3).

5.4.2 Candidate Significant Wildlife Habitat

Seasonal Concentration

Bat Maternity Colonies

Known locations of bat maternity colonies are extremely rare in forested vegetation communities across Ontario. This SWH type is confirmed based on the presence of either a Big Brown Bat or Silver-haired Bat maternity colony. Traditionally, Big Brown Bats formed maternity colonies beneath loose bark and in small cavities of various tree species. Common maternity roosts today for this species are found in buildings, barns and bridges, however, these anthropogenic structures are not considered to be SWH. Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Mature forests with at least 21 snags per hectare are preferred by Silver-haired Bats (MNRF 2000).

Forest communities within the study area may provide suitable maternity roosting habitat for either Big Brown Bat or Silver-haired Bat. Two candidate roost trees, of suitable size (i.e., > 25 cm DBH), that may be used for maternity colony roosting by either species were documented within the FOD5-7 vegetation community along the northwestern property boundary (Map 3). As the majority of this vegetation community is off-property, a full inventory of candidate roost

trees within this vegetation community to evaluate its potential as Bat Maternity Colonies SWH was not possible as part of this study. It is therefore recommended to maintain all forest communities adjacent to the subject property as Candidate SWH for Bat Maternity Colonies until additional studies confirm otherwise.

5.5 Habitat of Threatened and Endangered Species

5.5.1 Confirmed Habitats

Butternut

Butternut is listed as Endangered both provincially and federally (MNRF 2023a, Government of Canada 2023). Butternut is a member of the walnut family and is native to, and widespread in eastern Canada. The species is listed as Endangered because it is rapidly declining due to a fungus called Butternut Canker (*Sirococcus clavigignenti-juglandacearum*). This species receives general habitat protection under the ESA. General habitat is an area on which a species depends, directly or indirectly, to carry out its life processes (MECP 2023c). With regards to Butternut, all suitable areas within 50 m of an individual Butternut tree are protected under the Act. This includes the area within 25 m of the individual within which the individual would require for root protection at its greatest size, and the area within 50 m of an individual within which the individual could seed additional individuals to maintain the population (i.e., seed dispersal area).

If a proposed development or site alteration may result in harming or killing a Butternut, the proposed works will require a permit or authorization under the ESA to proceed. Note, that harming or killing an individual applies to not only direct impacts to the tree but also impacts to the habitat, including within 50 m of an individual.

Some proposed activities that will result in impacts to Butternut may be eligible for conditional exemptions to permitting under Ontario Regulation 242/08 or Ontario Regulation 830/21 that would otherwise be required under Section 17(2)(c) of the ESA. These exemptions apply to those activities that propose to kill (i.e., remove) or harm trees that are in advanced stages of disease (Category 1), for up to a maximum of 15 Category 2 and up to a maximum of 5 Category 3 trees as identified during a Butternut Health Assessment.

A total of 16 Category 2, pure Butternut were documented in the Dry – Fresh Sugar Maple – Black Cherry Deciduous Forest Type (FOD5-7), Hedgerow 1 (H1), and Hedgerow 2 (H2) vegetation communities within or immediately adjacent to the subject property (Map 3).

5.5.2 Candidate Habitats

Little Brown Myotis

Little Brown Myotis (*Myotis lucifugus*) is listed as Endangered both provincially and federally, and receives general habitat protection under the ESA (Government of Canada 2023, MECP 2023a). This species was not observed within the subject property, but no targeted bat surveys were completed. Candidate habitat for the species, specifically candidate roost trees, were documented within the FOD5-7 vegetation community along the northwestern property boundary, and within the hedgerow feature along the western property boundary (Map 3). Suitable flyways may also be present along the edges of all treed vegetation communities within the subject property. Foraging habitat may be present within treed vegetation communities in the subject property, however, given the current land use (i.e., active row-crop agricultural field) of the lands adjacent to treed vegetation communities within the subject property, suitable foraging habitat beyond the limit of the treed communities is unlikely to be present.

Northern Myotis

Northern Myotis (*Myotis septentrionalis*) is listed as Endangered both provincially and federally (Government of Canada 2023, MECP 2023a). This species received general habitat protection under the ESA. Northern Myotis was not observed within the subject property, but no targeted bat surveys were completed. Candidate roosting habitat for this species was documented within the FOD5-7 vegetation community along the northwestern property boundary, and within the hedgerow feature along the western property boundary (Map 3). Foraging habitat may be present within treed vegetation communities, and flyways may be present along the edges of all treed vegetation communities within the subject property. However, this species is known to prefer interior, mature forest habitats and is, therefore, unlikely to use roosting and foraging habitats that are available within the subject property (Humphrey and Fotherby 2019).

5.6 Fish and Fish Habitat

One watercourse exists within the study area; the West Credit River (Erin Branch), which is a permanent coldwater feature. The West Credit River (Erin Branch) provides year-round habitat for a variety of fish species, including Brook Trout, which exhibit a coldwater thermal preference. The channel provides riffle, run, and pool habitats and a variety of cover features (e.g., riffles and pools, cobble/boulder substrates, and woody debris) that provide suitable nursery and foraging opportunities for the local fish community. Suitable Brook Trout spawning habitat appears limited within the study area but may still exist. This watercourse is influenced by

groundwater inputs, as evidenced by areas of Watercress and iron staining within the main channel and the inflowing tributary. Brook Trout rely heavily on areas of groundwater upwelling for spawning and incubation and, more generally, during the summer months since groundwater helps to maintain coldwater temperatures within the preferred range for the species. As such, groundwater inputs to the watercourse features must be maintained.

5.7 Linkages

Maintaining connectivity among natural features across the landscape is important to allow for the dispersal of otherwise isolated populations, as well as to allow for the movement of species which require access to multiple habitat types to carry out their life processes. Ecological linkage systems are linear features that can provide connectivity between core areas and other large areas of habitat (MNR 2010). Linkages can function at a range of scales and vary from providing a simple connection between habitat patches to offering a whole suite of ecological functions in order to sustain a wide range of organisms throughout their life cycle.

Watercourses, such as the West Credit River, and their associated riparian habitats can provide a corridor and/or linkage for plant and animal movement between natural features, contributing to the overall ecological integrity, connectivity and long-term sustainability of the natural heritage system. Under the PPS and the Wellington County Official Plan, the location of these corridors and the maintenance of the connectivity among natural heritage features across the landscape must be considered in the development review process of any proposed development or site alteration (MMAH 2020, Wellington County 2022). Similarly, under the Town of Erin's Official Plan (2023), development, redevelopment or site alteration will avoid Natural Heritage Corridors, where feasible. Where it is not feasible to avoid these areas, development, redevelopment or site alteration within Natural Heritage Corridors will be designed to maintain, enhance and restore the ecological functions of Natural Heritage Corridors. Maintaining any potential plant and animal movement corridors and/or linkages associated with the West Credit River (Erin Branch) should be considered during detailed design of the proposed undertaking.

6.0 Natural Environment Protection

Based on the results of the analysis of significance and sensitivity of natural features presented in Sections 5.0, several natural features were identified as sensitive to disturbance within and adjacent to the subject property. Table 5 provides a summary of these natural features and the natural heritage policies that govern their protection.

Table 5. Summary of Natural Feature Constraints

Natural Feature Constraint	Regulatory and Permitting Considerations	Project Considerations
Wetlands	• Provincial Policy Statement (MMAH 2020) • CVC Ont. Reg. 160/06 • Wellington County Official Plan (2022) • Town of Erin Official Plan (2023)	• The West Credit River Provincially Significant Wetland (PSW) Complex is adjacent to the subject property (Map 1). • All wetlands and associated areas of interference are regulated by the CVC. Any development or interference within wetlands or development in areas of interference requires permission from the CVC. • Development and site alteration within 120 m of a PSW is prohibited unless permitted by the CVC. • A setback of 30 m is recommended from PSW features.
Woodlands	• Provincial Policy Statement (MMAH 2020) • Wellington County Official Plan (2022) • Town of Erin Official Plan (2023)	• Significant Woodland is present within and adjacent to the subject property (Map 3). • The PPS states that development and site alteration shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on natural features or their ecological functions. • In the Urban System, woodlands over 1 ha in size are considered to be significant by the County and the Town of Erin and are designated as Greenlands. • Detailed studies may be used to identify, delineate and evaluate the significance of woodlands based on other criteria including, proximity to watercourses, wetlands, or other woodlands, linkage functions, age of the stand or individual trees, presence of Species at Risk (SAR), overall species composition, etc. • The removal, destruction or injuring of woodlands and/or trees is regulated by the Wellington County *Forest Conservation By-law.* • A setback of 10 m is recommended from Significant Woodlands.

Natural Feature Constraint	Regulatory and Permitting Considerations	Project Considerations
Valleylands	• Provincial Policy Statement (MMAH 2020) • CVC Ont. Reg. 160/06 • Wellington County Official Plan (2022) • Town of Erin Official Plan (2023)	• Valleyland is adjacent to the subject property. • Development or site alteration is not permitted within Valleylands. • Development or site alteration on lands adjacent to Valleylands is not permitted unless it is demonstrated that there will be no negative impacts on the natural feature or its ecological functions.

Significant Wildlife Habitat	• Provincial Policy Statement (MMAH 2020)
	• Wellington County Official Plan (2022)
	• Town of Erin Official Plan (2023)
		• The following SWH type has been confirmed within the subject property:
		  • Special Concern and Rare Wildlife Species.
		• The following SWH type has been identified as Candidate within the subject property:
		  • Bat Maternity Colonies.
		• The PPS states that development and site alteration shall not be permitted in SWH unless it has been demonstrated that there will be no negative impacts on the SWH type or its ecological functions.
		• Development and site alteration shall not be permitted on adjacent lands to SWH 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 SWH type or on its ecological functions.

Habitat for Threatened and Endangered Species	• *Endangered Species Act*, 2007
	• Provincial Policy Statement (MMAH 2020)
	• Wellington County Official Plan (2022)
	• Town of Erin Official Plan (2023)
		• General habitat for Butternut has been confirmed within the subject property.
		• Candidate habitat for the following SAR was identified within the subject property:
		  • Little Brown Myotis; and
		  • Northern Myotis.
		• Section 9 of the ESA prohibits activities which result in direct impacts to SAR such as killing, harming, harassing, etc.
		• Section 10 of the ESA prohibits damage or destruction of habitat for SAR.
		• Consultation with the Ministry of the Environment, Conservation and Parks (MECP) is recommended to confirm whether or not the policies under Ontario Regulation 242/08 and 830/21 of the ESA that exempt the need for a permit for proposed adverse impacts to Butternut and their habitat applies to the subject property and proposed development. Specific mitigation plans and/or permitting under the ESA may be required.

Natural Feature Constraint	Regulatory and Permitting Considerations	Project Considerations
		• Potential adverse impacts as a result of the proposed development to any treed vegetation communities, including hedgerow features, will need to address potential impacts to bat SAR and habitats. It is recommended to avoid impairing or eliminating the function of the habitat as well as timing any required tree removals to outside of the bat active season (April 1 – September 30 in Southern Ontario) to avoid contravention of the ESA. Specific mitigation plans and/or permitting under the ESA may be required.
Watercourses and Floodplains	• CVC Ont. Reg. 160/06	• One watercourse, the West Credit River (Erin Branch) and its associated floodplain, are present in the study area. • Development and site alteration within watercourses and their associated floodplain areas are prohibited unless permitted by the CVC (refer to the regulations for specifics).
Fish Habitat	• Provincial Policy Statement (MMAH 2020) • Federal *Fisheries Act*, 1985 • Wellington County Official Plan (2022) • Town of Erin Official Plan (2023)	• The West Credit River (Erin Branch) present within the study area provides fish habitat. • Development and site alteration within watercourses and their associated fish habitat is prohibited unless permitted by the CVC and DFO. • Strict timing windows are required to be adhered to for any in-water works. Based on the fish species present and the 2013 in-water work timing window guidelines, Fish Habitat associated with the West Credit River (Erin Branch) should be managed under the Brook Trout timing window (all work restricted between October 1 and May 31). • Limiting works in and around the high-water mark will limit the potential need for a Fisheries Act Authorization.
Linkages	• Provincial Policy Statement (MMAH 2020) • Wellington County Official Plan (2022) • Town of Erin Official Plan (2023)	• The location of linkages and the maintenance of the connectivity among natural heritage features across the landscape must be considered in the development review process of any proposed development or site alteration (MMAH 2020, Welling County 2022). • All watercourses are considered environmental corridors or linkages by the County and Town and must be protected and maintained. • Where feasible, incorporating linkages into the design of new developments or site alterations is encouraged to protect existing corridors. • The West Credit River (Erin Branch) riparian corridor provides wildlife with a movement corridor and maintenance of this linkage should be considered during detailed design.

The protection of the natural features outlined in Table 5 is typically achieved as part of a proposed development through the application of appropriate distance setbacks, design and buffering to protect them from impacts during development and to provide long-term protection to their form and function. Properly functioning buffers protect natural features against sedimentation and erosion, provide attenuation of precipitation and run-off, protect against human disturbances, serve as habitat transition zones, and contribute to the protection of the natural feature through, for example, maintaining microclimate conditions and limiting the spread of invasive species to within the sensitive natural feature.

A buffer is required to be applied to the PSW, woodlands and valleylands that are present within and adjacent to the subject property in order to protect these features and their ecological functions. In determining an appropriate buffer width to be applied to each of these natural features, the area and nature of the feature being protected was considered as well as the nature of the anticipated adjacent land use, the functions that the buffer is expected to perform, and the local biophysical context (e.g., slopes, soils, surface drainage, groundwater conditions and flows).

Based on the direction of surface water drainage and topography of the subject property, a buffer to the PSW, woodlands, and valleylands that occur along the northeastern and northwestern subject property boundaries is therefore expected to provide protection against sedimentation and erosion and provide attenuation of precipitation, run-off and nutrients. The buffer will further provide a hazard mitigation zone for large branch or tree fall and protection against human disturbances, including noise, light, and encroachment, as a result of the proposed residential development.

The area beyond the dripline of the woodland features and vegetation limit of the valleyland where a buffer would be recommended to be applied is currently characterized by an active row-crop agricultural field. At certain times of year between when crops are harvested and before the next crop is established, row-crop agricultural fields provide little attenuation of precipitation and run-off and afford little function as a buffer. Furthermore, the low diversity of plant species typical of a row-crop offers little in terms of wildlife habitat and does not support a high diversity of wildlife species. A standard 10 m buffer is generally recommended to be applied to woodland driplines and vegetation limits to provide protection to the natural features and functions as well as to provide a buffer to proposed developments from potential future hazard trees. Along the northeastern property boundary, a buffer smoothing exercise was

therefore completed to create more linear rear lot lines, while still ensuring suitable protection for the retained natural features. The majority of the smoothing along this boundary is minor (e.g., less than 2.0 m encroachment) with one pinch point where the buffer is reduced by 8.5 m. However, in this location, the edge of the existing agricultural field extends 2.8 m to within the dripline. The reduction in buffer by 8.5 m would therefore still correspond with the protection and restoration of the area within 4.3 m of the edge of the existing agricultural field, and would not result in any direct impacts to adjacent trees. Based on the results of the smoothing exercise, a buffer width range of 1.5 to 12.9 m will be applied to the Significant Woodland and valleyland features along the northeastern subject property boundary.

Similarly, along the northwestern property boundary, a standard 10 m buffer from the woodland feature was deemed unnecessary to protect this feature and its ecological functions due to the current conditions (i.e., active row-crop agricultural field) of the area that would buffer the woodland feature. A minimum buffer of 1 m is recommended to be applied to the dripline of this woodland feature. Given the edge of the existing agricultural field extends up to 7.8 m to within the dripline along this property boundary (Map 4), the application of a 1 m buffer is considered sufficient to protect the feature and its functions.

A minimum setback of 30 m from the PSW boundary is recommended to be applied to protect the form and function of the PSW feature. This minimum buffer recommendation will be met as the PSW boundary is a minimum of approximately 65 m beyond the northeastern subject property boundary.

The above-recommended setbacks will also provide sufficient protection to the form and function of confirmed SWH and candidate bat SAR habitat within the subject property, and the ecological linkage associated with the West Credit River riparian corridor. Recommended buffers to be applied to any retained Butternut trees are provided under Section 7.3.3 in relation to ESA policies and regulations.

7.0 Impact Analysis

7.1 Proposed Undertaking

The boundaries of natural features that were identified as requiring protection from potential adverse impacts as a result of the proposed development, and associated recommended setbacks were provided to the project team to guide the development proposal. This information was combined with other physical and planning constraints to design a suitable development plan for the property which respects the natural environment. The details of the undertaking are shown on Map 5, Proposed Draft Plan of Subdivision, prepared by GSP Group Inc. Further details of the proposed development, including stormwater management, grading, and servicing, were prepared by other project team members under separate covers (V.A. Wood 2015, GM BluePlan 2024a, GM BluePlan 2024b).

The 14.14 ha residential subdivision is proposed to consist of 142 single-detached lots, two on-street townhome blocks (24 units), a multiple residential block (± 48 units), an open space block, and a park block (Map 5). An internal roadway network, stormwater management (SWM) facility and a sanitary sewage pumping station is also proposed as part of the development. The site will be accessed via a road connection to Wellington Road 22 to the south of the subject property. A secondary connection will be provided in the future to the north of the site in conjunction with the development of the lands to the north.

The proposed development will be serviced by extending a watermain along Wellington Road 22 from Trafalgar Road to the site limits. A local watermain will then be extended from the Wellington Road 22 watermain through the site via the internal road network. The proposed sanitary sewage pumping station will pump sanitary flows from the site via a forcemain proposed by the Town of Erin along Wellington Road 22 to the Town's proposed gravity sanitary sewer to be located at the Elora Cataract Trailway crossing and Wellington Road 22 intersection.

7.1.1 Stormwater Management Approach Overview

The following sections summarize the proposed approach to stormwater management (SWM) for the Hillsburgh Subdivision, developed by GM BluePlan Engineering Ltd.; for full details, the reader is referred to the FSR (GM BluePlan 2024b).

A 'treatment train' approach will be used to remove sediments and any absorbed contaminants before stormwater is discharged to the receiving outlets. The overall SWM strategy (described in more detail below) includes the use of lot-level rear yard infiltration galleries, a SWM facility, a

superpipe system, and overland sheet flow. Post-development drainage for the site is modelled by GM BluePlan Engineering Ltd. as five catchments, shown on Figure 4 of the FSR:

- Catchment 200 (10.86 ha, 60% impervious) represents the majority of the subdivision, and runoff generated from this catchment enters the proposed SWM facility;
- Catchment 201 (1.43 ha, 50% impervious) represents the proposed SWM facility;
- Catchment 202 (1.26 ha, 55% impervious) represents rear yard areas for lots in the northeast corner of the subdivision, and runoff generated from this catchment sheet flows towards the off-site woodland in the northeast;
- Catchment 203 (0.29 ha, 7% impervious) represents a portion of the proposed park block, and runoff from this catchment sheet flows towards the agricultural field to the west; and
- Catchment 204 (0.30 ha, 60% impervious) represents the Street A roadway connection to Wellington Road 22 and the proposed sanitary sewage pumping station block, and runoff from this catchment will be collected in a superpipe system.

The final receiver for drainage from post-development catchments 200, 201, 202, and 204 will be the West Credit River (Erin Branch) and associated West Credit River PSW Complex downstream of Wellington Road 22. The FSR (GM BluePlan 2024b) describes that runoff from post-development catchments 200 and 201 will be managed with a wetland-type SWM facility proposed within the southeastern portion of the subject property, designed with a forebay and a minimum 0.3 m-deep permanent pool to provide water quality controls. To maintain existing drainage patterns for the site, the SWM facility will have two outlet structures:

- Outlet Structure No. 1 will discharge to the existing Wellington Road 22 roadside ditch through a reverse-draw outlet that draws cooler water from deeper parts of the permanent pool as a thermal mitigation management practice; and
- Outlet Structure No. 2 will discharge to a 15 m-long, 2 m-wide, and 1 m-deep linear energy dissipation and dispersion trench (weir) that will convey flows to the existing woodlot east of the site.

Due to the grade differential at the eastern property boundary, the elevation of the weir (Outlet Structure No. 2) is governed by existing property line elevations and will therefore need to be

higher than Outlet Structure No. 1. As a result, smaller storm events (up to and including the 5-year design storm) will be directed to Outlet Structure No. 1 only, while larger storm events will be discharged through both outlet structures. Flow rates and volumes to the existing woodlot east of the site have therefore been mitigated to resemble pre-development drainage patterns during higher storm events (50-year, 100-year, and Regional storm events). In lower storm events, pre-development drainage patterns cannot be replicated due to the above-noted elevation differential at the eastern property line. However, runoff from catchment 202 (encompassing the rear yard areas of lots 1-23) will still contribute drainage to the eastern woodlot during minor (<5-year design storm) events via overland sheet flow.

Drainage from catchment 204 cannot be directed to the SWM facility; instead, runoff from this catchment will be attenuated by a proposed superpipe system prior to discharging to the Wellington Road 22 roadside ditch. The superpipe system will be located within the Street A municipal right-of-way and will consist of a 50 m-long pipe at a 0.2% slope.

Lastly, to achieve infiltration targets for the site, lot-level controls are proposed that include the use of rear yard infiltration galleries on each residential lot, designed to infiltrate clean runoff from building rooftops for storm events of up to 25 mm.

7.2 Approach to Impact Analysis

Potential impacts arising from the proposed undertaking are determined by comparing the details of the proposed undertaking with the characteristics of the existing natural features and their ecological functions. Where the development proposal overlaps with the natural features, or indirectly affects their functions, negative impacts may arise. In the context of natural heritage features and areas, the PPS defines a negative impact as the:

> "*degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple, or successive development or site alteration activities*" (MMAH 2020).

Ecological functions are defined as:

> *"the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. They may include biological, physical and socio-economic interactions*" (MMAH 2020).

Both site-level and landscape-level assessments are important for determining potential impacts (MNRF 2010). The impacts over time are also required to be considered, in order to determine if there are possible future or cumulative impacts created by the development, or if there will be residual impacts after mitigation measures are implemented (MNRF 2010). Mitigation measures to prevent or reduce undesirable impacts are acceptable, so long as they are consistent with the PPS; in this context, it is important to consider the overall significance of the feature, and the severity and longevity of the impact (MNRF 2010). When assessing whether natural feature removal is appropriate, the following should be considered:

> "*the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of Natural Heritage Systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features*" (MMAH 2020).

The following is a description of the types of potential negative impacts which will be discussed:

- Direct impacts to the natural features within the subject property associated with disruption or displacement caused by the actual proposed 'footprint' of the development, including impacts caused by site grading and the installation of site servicing features.
- Indirect impacts associated with changes in site conditions such as drainage, water balance and water quantity/quality, and effects of construction on adjacent natural features.
- Induced impacts associated with impacts after the development is constructed such as disturbance or degradation of adjacent natural features and species habitats, and subsequent demand on available resources created by increased habitation/use of the area and vicinity.

7.3 Direct Impacts

The approach to identifying and delineating the natural features and associated buffers was aimed at avoiding direct impacts from development on important natural features. The delineation of the natural features, including woodland and valleyland features, informed the basis for the development layout to ensure direct impacts to these natural features are avoided where at all possible. The following sections provide a summary of where it wasn't possible to avoid direct impacts, including recommended mitigation measures to minimize or avoid such impacts.

7.3.1 Vegetation Removal and Site Grading

All existing vegetation and trees will be removed from within the proposed construction footprint (Map 5). The proposed construction footprint will require removal of approximately 542 m of hedgerow features (H1 and H3). The construction footprint also overlaps with approximately 127 m^2 of the H2 hedgerow feature, 443 m^2 of the Mineral Cultural Thicket (CUT1) vegetation community, and 58 m^2 of the Dry – Fresh Sugar Maple – Black Cherry Deciduous Forest Type (FOD5-7) community. A minor encroachment (approximately 10 m^2) to within the Mineral Cultural Woodland (CUW1) community will also occur.

All hedgerow features within the subject property are highly disturbed with low species diversity present in the ground cover layers. The ground cover layer of the H1 and H2 communities contain a mix of disturbance-tolerant native species and aggressive non-native species, and the H3 ground cover layer is dominated by non-native, invasive species. The federally and provincially significant species, Butternut, is present in the H1 community. No federally, provincially, or regionally significant vegetation species were observed in the H2 and H3 communities. A portion of the H1 community that contains five Butternut trees, will be retained and incorporated into the proposed Open Space/Park Block (Map 5). An area of the H1 community will also be retained at its northern extent in order to retain one additional Butternut. All of the H3 community as well as the entire extent of the H2 community where it extends to within the subject property will be removed to accommodate the proposed development.

No federally, provincially, or regionally significant vegetation species were observed within the CUT1 vegetation community. This mid-aged community is dominated by Common Apple (*Malus pumila*) with a ground cover layer that is dominated by a mix of native and non-native disturbance-tolerant species. The majority of the area of overlap of the construction footprint with this community does not extend beyond the edge of the existing active agricultural field and will, therefore, not result in the removal of any vegetation (Map 5). The exception to this is at the southeastern corner of the subject property where the pumping station footprint, proposed as part of the SWM facility, will encroach to within the community. The proposed encroachment is restricted to the edge of the community and will, therefore, not result in fragmentation of the community.

The CUW1 vegetation community contains a sparse and broken canopy with dead American Elm (*Ulmus americana*) and White Ash (*Fraxinus americana*) with a highly disturbed subcanopy, understorey and ground cover layer consisting of a mix of native and non-native species tolerant

of disturbance. No federally, provincially, or regionally significant vegetation species were observed within the Cultural Thicket vegetation community. Although the proposed construction footprint encroaches to within the dripline of this community, it does not extend beyond the edge of the active agricultural field (Map 5). No direct impacts to the CUW1 vegetation community as a result of vegetation removal are therefore anticipated to occur.

The FOD5-7 vegetation community proposed to be impacted is located along the northwestern property boundary (Map 5). This community is a mature forest community dominated by Sugar Maple (*Acer saccharum*) and is regenerating following a history of anthropogenic disturbance. The federally and provincially significant species, Butternut, is present in this vegetation community. The proposed encroachment to within this community is associated with the proposed temporary road turnaround and future road connection to the property to the north. It will be restricted to the edge of the community and will not result in the fragmentation of the community. Beyond the construction footprint, where lot lines are proposed to encroach to within this community, no vegetation removal, including site grading, is required to accommodate the residential development. The majority of FOD5-7 community along the northwestern property boundary that extends to within the subject property will therefore be retained and is recommended to be protected as part of the proposed development.

A Woodland Edge and Buffer Management Plan is recommended to be developed during detailed design of the proposed undertaking to further mitigate potential impacts associated with vegetation removal. The goal of the Plan should be to protect, restore and enhance woodland edges and buffers within the subject property. The Plan is recommended to highlight the protection, restoration and enhancement of the area of the FOD5-7 community within which the proposed lot lines overlap with this community. Through the development and implementation of the Plan, potential adverse impacts as a result of vegetation removal are anticipated to be appropriately mitigated. Details of the recommended Plan are further described in Section 8.6.3.

7.3.2 Significant Wildlife Habitat

Candidate Significant Wildlife Habitat

Bat Maternity Colonies

Bat Maternity Colonies SWH has the potential to occur in the FOD5-7 vegetation communities within and adjacent to the subject property. Site alterations which result in the loss of vegetation can reduce the ecological function of bat maternity colonies through reduced prey availability,

decreased foraging efficiency, and increased vulnerability to predators (MNRF 2014). It is possible that the loss of a maternity colony site can have significant impacts on local bat populations.

Where complete avoidance of impacts to this SWH type is not possible, and the extent of the SWH is large, minimizing the amount of habitat affected may be a satisfactory mitigation option (MNRF 2014). The extent of the FOD5-7 vegetation communities within the subject property that have been identified as Candidate Bat Maternity Colony SWH are small and contiguous with a tract of forested habitat to the north and east of the subject property. The extent of candidate roosting habitat within the vicinity of the proposed development is therefore large. The extent of vegetation removal, and associated candidate SWH removal, as required for the proposed development has been minimized through the design of the development layout. Direct impacts to the candidate SWH will be limited to the northeastern corner of the FOD5-7 vegetation community, along the northwestern property boundary, where vegetation is proposed to be removed for the construction of a temporary vehicle turnaround, and pending the development plans for the private property to the north, a future road connection. The proposed removal of a portion of the candidate SWH is restricted to the edge of the habitat and will therefore not result in the fragmentation of the habitat. Where the lot lines along the northwestern property boundary are proposed to encroach upon the candidate SWH, no vegetation removal in the SWH will occur as the limit of the proposed construction footprint will remain within the limit of the existing active agricultural field. Potential direct impacts to Candidate Bat Maternity Colony SWH as a result of the proposed development have therefore been minimized to the extent possible. Given the current size of the tract of forested habitat beyond the subject property boundary, it is not anticipated that the proposed development will adversely impact this SWH type. The edge of this candidate SWH type is further recommended to be restored and enhanced through the development of a Woodland Edge and Buffer Management Plan (Section 8.6.3), including within the area where the proposed lot lines encroach to within the FOD5-7 community.

To ensure direct impacts to individuals that may be using the habitat are avoided, vegetation removals must occur outside of the bat active period (April 1 – September 30). If vegetation removal is required during the active season, it is recommended to complete further studies to assess the presence of this SWH type during the peak bat maternity period in June/early July.

7.3.3 Habitat of Threatened and Endangered Species

Confirmed Habitats

Butternut

The footprint associated with the residential development overlaps with the confirmed habitat of 16 pure, Category 2 Butternut within the subject property. As mentioned above, some proposed activities that will result in impacts to Butternut and its habitat may be eligible for conditional exemptions to permitting under Ontario Regulation 242/08 or Ontario Regulation 830/21 that would otherwise be required under Section 17(2)(c) of the ESA. These exemptions apply to those activities that propose to kill (i.e., remove) or harm trees that are in advanced stages of disease (Category 1), or up to a maximum of 15 Category 2 and up to a maximum of 5 Category 3 trees as identified during a Butternut Health Assessment. Of the 16 Butternuts identified within the subject property, eight are proposed to be retained, and eight are proposed for removal (i.e., to be killed).

To mitigate impacts to retained Butternuts, a condition of the exemption to permitting (Section 30, O. Reg. 830/21) requires that no permanent structure be constructed or installed within 25 m of a Butternut tree to be retained. Permanent structures, including infiltration galleries and buildings, are proposed within 25 m of the Butternut trees, 003-BN, 004-BN, 005-BN, 012-BN and 016-BN to be retained (Map 6b). To address this condition, one of the following three options may be considered:

1. Register as if the tree is being killed, regardless of whether it is or not;
2. Consult with MECP to request special permission to remain compliant with the exemptions by providing an explanation as to why the structures need to be constructed in this location, and how impacts to the tree will be minimized. If permission is granted, register as if the tree is being harmed; or
3. Obtain a permit under the ESA.

It should be noted that compensation requirements are greater for trees that are registered as being killed versus being harmed.

The Root Harm Prevention Zone (RHPZ) of each retained tree must also be protected for all retained Butternut to comply with the conditions of the exemptions. The size of the RHPZ is specific to each individual Butternut and is determined based on the DBH of the tree. To protect the RHPZ, the following actions shall not take place within the RHPZ (Section 31(1) of O. Reg. 830/21):

- Transport or operation of heavy equipment;
- Placement of temporary facilities or temporary roads for the purpose of construction;
- Excavation of soil or other substrates;
- Storage of materials such as excavated soil, debris or construction materials;
- Production of ruts or compacted soil; and
- Removal of vegetation in a manner that destabilizes soil.

In addition, to prevent disturbance, compaction and erosion of soil in the RHPZ and harm to the roots of a Butternut tree, the actions outlined above are also not permitted within a five-metre buffer area surrounding the perimeter of the RHPZ.

The use of heavy equipment and the excavation of soil for the construction of permanent infrastructure is proposed within the RHPZ of the Butternuts, 003-BN and 004-BN (Map 6b). The use of heavy equipment, excavation of soil for the construction of permanent infrastructure, and vegetation removal are proposed within the RHPZ buffer of the tree, 005-BN (Map 6b). Minor soil disturbance (i.e., grading) is also proposed to occur within the RHPZ buffer of the Butternuts, 012-BN, 014-BN, 015-BN and 016-BN (Map 6c).

Due to the potential for the proposed development to not be in compliance with the conditions of the exemptions to permitting, as outlined above, potential impacts to Butternut are recommended to be addressed in consultation with MECP. To inform the consultation process, MECP requires detailed mapping of proposed temporary and permanent impacts to Butternuts and their habitats as a result of the proposed development. Preliminary mapping of proposed impacts is provided on Maps 6a, b and c. Temporary adverse impacts to Butternut were identified where minor soil disturbance (e.g., grading) is proposed within the Open/Park Space block as the conversion of row-crop agricultural field to a park space is not considered a permanent impact to the habitat, and may actually support the growth of Butternut roots to within the park space. Permanent adverse impacts to Butternut were identified where proposed infrastructure associated with the construction of infiltration galleries and houses will occur, as well as where vegetation removal is proposed to accommodate the development. No impacts to Butternut habitats between 25 and 50 m from a tree were identified where this area overlaps with the active row-crop agricultural field as it currently does not function as habitat (i.e., seed dispersal area) for the species. In addition, within the RHPZ and RHPZ buffer for each tree where it overlaps with the active agricultural field, it is assumed that the roots of the Butternut

trees have been damaged or removed as a result of land use (i.e., tilling). Therefore, any proposed temporary or permanent adverse impacts to the RHPZ or RHPZ buffer that is currently within an active row-crop agricultural field are expected to result in little to no harm to the roots of retained Butternut. Based on the results of the preliminary mapping exercise, the proposed development is anticipated to harm three of the eight Butternuts proposed to be retained. Proposed temporary and/or permanent impacts to the habitat of the remaining five Butternut to be retained are minimal and therefore, assumed to not result in harm to the individuals. Pending MECP review and approval, including permission to construct permanent infrastructure within 25 m of three Butternut trees, it is possible that the proposed development may be eligible for an exemption to permitting under the ESA for Butternut.

Candidate Habitats

Little Brown Myotis and Northern Myotis

The proposed development will result in the removal of four candidate bat roost trees that occur within the H1 hedgerow feature, as well as 58 m^2 of the FOD5-7 vegetation community, identified as candidate roosting and foraging habitat, that is present along the northwestern property boundary. The two candidate bat roost trees identified within this FOD5-7 community are proposed to be retained.

The development will also result in the removal of 10 m^2 of the CUW1 community, identified as candidate roosting and foraging habitat for the species. No candidate roost trees will be removed from within the CUW1 community.

Where vegetation removal is proposed to occur along the edge of the FOD5-7 and CUW1 communities, as well as the CUT1 community, new treed edges will be created and therefore, may result in adverse impacts to candidate flyways within the subject property due to changes in the structure of the edge (e.g., removal of shrub layer). The potential adverse impacts to forest and woodland edge structure are restricted to a relatively small length of woodland edge (Map 5), and are anticipated to be temporary. The new edges will be retained as part of the proposed development and it is expected that shrub and herbaceous layers, and the overall structure of the new edges, will eventually re-establish. The recommendation to develop and implement a Woodland Edge and Buffer Management Plan will ensure the re-establishment of the structure of the edge with native, non-invasive, species, and therefore, will also ensure potential adverse impacts to candidate bat flyways are mitigated. The Plan is also recommended to include the restoration and enhancement of the buffers that will be applied to

forest and woodland driplines, which will ultimately provide a benefit to the species through the creation of suitable foraging habitat. Details of the Plan are further described in Section 7.6.3.

Given the proposed habitat removals will not result in fragmentation of the habitat and consists of the removal of a proportionally small area of habitat, including a small number of potential bat roost trees, it is not anticipated that the proposed development will result in impairing or eliminating the function of candidate bat habitats within the subject property, or the contravention of the ESA under subsection 10(1). To ensure that the proposed development does not result in the contravention of the ESA under subsection 9(1), all tree removals must occur outside of the bat active season (April 1 – September 30), between October 1 and March 31. If tree removals are required to occur within the bat active season, additional studies (e.g., bat passive acoustic monitoring) will be required, and pending the results of the additional studies, permitting under the ESA may be required to ensure the proposed development is in compliance with the ESA.

7.3.4 Other Wildlife

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation clearing should therefore occur outside the bird nesting season of April 1 – August 31 so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*, 1994.

7.4 Indirect Impacts

Construction of the proposed development has the potential to cause indirect impacts to adjacent natural features and functions if not mitigated appropriately. Recommended mitigation measures are provided for each potential impact below.

7.4.1 Adjacent Natural Features

Vegetation clearing and other construction activities have the potential to inadvertently destroy, damage and degrade existing vegetation along the development limits unless the development limit boundaries are clearly marked. For example, construction activities can cause scarring and decreased health of adjacent trees whose branches or root systems have been damaged by machinery or affected by construction-related dust and sedimentation. Damage to trees and

other vegetation can also be caused by the compaction of soils within tree rooting zones along any new woodland edges to be created at the development limits.

Direct damage and indirect disturbances can cause stresses on the natural features that weaken their ecological integrity. In these states, natural features are more prone to establishment and proliferation of invasive, non-native species such as Common Buckthorn (*Rhamnus cathartica*). Proliferation of invasive, non-native species within natural communities decreases their ecological value such as by suppressing native species, diminishing biodiversity and reducing habitat suitability.

To limit ecological impacts during construction, clearly defined construction limits should be established to avoid unnecessary vegetation removal. Tree protection fencing should be installed following the requirements outlined in the TPP (Appendix VI). Where trees are located along the natural feature edges to be retained, protective tree fencing should be installed at least 1 m from the dripline where possible to adequately protect the root zone from soil compaction and other disturbances. All tree protection fencing must be installed prior to site alteration and construction activities, and inspected by a Certified Arborist or Registered Professional Forester. Where tree protection fencing is not required along construction area limits, other forms of boundary demarcation should be used, which may include silt fencing for erosion and sediment control purposes or brightly-coloured snow fencing.

Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located entirely outside the retained natural features and their buffers, and preferably located away from buffers so as to limit the potential to indirectly impact the adjacent natural features.

7.4.2 Wildlife

Potential indirect impacts to wildlife may arise from noise and dust associated with construction activities and unnatural lighting resulting from the development.

Indirect impacts potentially resulting from noise and vibrations during the construction phase of the proposed development are expected to be temporary, minimal and localized. Any noise impacts can be mitigated by restricting the daily timing of construction activities to day-light hours. This recommended timing restriction includes the use of generators or pumps insofar as possible to minimize potential indirect impacts.

During construction activities, such as vegetation clearing and grubbing, dust can potentially lead to changes in vegetation due to increased heat absorption and decreased transpiration. High levels of dust may also fall into aquatic or wetland systems, causing adverse effects to plants and/or wildlife that are not adapted to high levels of sedimentation. In order to suppress the spreading of dust, areas of bare soil should be moistened with water during construction activities to ensure that the amount of dust within the subject property is reduced. Topsoil stockpile locations should be in areas of lesser wind exposure and away from natural features and their buffers.

Light pollution can also have an impact on wildlife predator-prey relationships in natural areas. For example, it can result in reduced foraging times for some species (e.g., salamanders) and can compromise cover or the ability for an individual to remain hidden from predators. General wildlife indirect impacts associated with light pollution can be mitigated by restricting the daily timing of construction activities to day-light hours. Any artificial lighting used for construction purposes should be turned off or directed away from adjacent natural features following the completion of daily construction activities. Post-construction, permanent outdoor lighting for residential structures should be selected to minimize light pollution. This can be achieved through the following:

- Eliminate the use of decorative lighting;
- Use covered bulbs that light facing downward. Ensure the cone of light does not extend beyond the development footprint to adjacent natural areas;
- Use “warm” or filtered LEDs (CCT < 3,000 K; S/P ratio < 1.2) to minimize blue emission;
- Use motion sensors and timers to minimize unnecessary lighting; and
- Use International Dark-Sky Association (IDA) approved fixtures.

Assuming the above recommended mitigation measures are implemented, significant adverse effects on wildlife from noise, dust and light pollution are not expected to occur. It is expected that displaced wildlife species will return to the vicinity of the subject property following construction.

7.4.3 Surface and Groundwater Flows

To address potential adverse impacts to the existing water balance of the West Credit River PSW Complex, a Wetland Water Balance Risk Evaluation (TRCA 2017) was completed for the proposed development. The Risk Evaluation uses information about the proposed development, proposed changes to the hydrology of the wetland, and natural heritage information to assign a level of risk for 1) the potential magnitude of hydrological change, and 2) the sensitivity of the wetland to hydrological change. The assigned level of risk for these two factors are then evaluated together using a decision tree to assign an overall risk to the wetland from the proposed development and guide monitoring requirements and mitigation measures. The following sections detail the approach to, and results of, the Risk Evaluation for the proposed Hillsburgh residential subdivision. A discussion of potential impacts to the wetland's form and function based on the feature based water balance prepared by GEI is provided in the section following the risk evaluation

Wetland Water Balance Risk Evaluation

Using the approach outlined by the TRCA (2017) for evaluating risk to the water balance of wetlands, the following four steps were considered:

Step 1. Determine which retained wetland(s) may be impacted by the proposal.

Step 2. Determine the magnitude of potential hydrological change.

Step 3. Determine the sensitivity of the wetland and its associated flora and fauna to hydrological change.

Step 4. Integrate information from step 1, 2, and 3 to assign a level of risk to the proposal.

Step 1. Determine which retained wetland(s) may be impacted by the proposal.

The West Credit River PSW is located entirely outside of the subject property. As a result, this analysis is based on information that could be collected without direct access to the wetlands (e.g., roadside assessments, available vegetation community data from CVC, wildlife data from atlases and research-grade observations on iNaturalist and eBird).

For the purposes of this assessment, it has been assumed that any hydrological changes from the proposed development will largely influence wetland communities located downslope and downstream of the subject property. The dominant hydrological process for the PSW are riverine (70%) and to a lesser extent, palustrine (MNRF 1995). Reviewing topographic mapping

for the Study Area (0.5m contours, MNR 2024), indicates that the vegetation communities near the subject property are likely dominated by riverine process. As such, only portions of the PSW that potentially receive surface water runoff from the subject property are considered in this assessment. Map 2 illustrates the vegetation communities included in the receiving wetlands, discussed further below. All the potentially impacted wetlands are located within the same catchment area; however, since runoff from the subject property is directed to the east and to the south (south of Wellington Road 22), the wetland catchment has been divided to discuss each receiving wetland area separately, as follows:

- **Wetland 1:** North of Wellington Road 22 – includes wetlands located east of the subject property, and on the west side of the West Credit Erin Branch watercourse, including:
  - MAM2-E – Bulrush Graminoid Mineral Meadow Marsh
  - SAF1-1 – Water Lily – Bullhead Lily Floating-leaved Shallow Aquatic Ecosite
  - SWC4-A - Tamarack – Balsam Fir - Spruce Organic Coniferous Swamp
  - SWM4-1 - White Cedar - Hardwood Organic Mixed Swamp
- **Wetland 2:** South of Wellington Road 22 – includes wetlands located southeast of the subject property, and adjacent the West Credit Erin Branch watercourse, including:
  - SWC3-2 - White Cedar Conifer Organic Coniferous Swamp
  - SWD7-1 - White Birch - Poplar Organic Deciduous Swamp
  - SWM1-1 - White Cedar Mineral Mixed Swamp Ecosite
  - MAM3 - Organic Meadow Marsh Ecosite

The two receiving wetlands are shown on Map 2 and Map 4. For Wetland 1, the topographic contours (shown on Map 2) were used to determine where surface water runoff from lands adjacent to the wetland is likely to be directed. Vegetation communities near the north east side of the subject property were excluded from the assessment as the contours suggest that runoff to the SWD4, SWT3 and MAM3 communities is from the lands to the north, and not the subject property. Contours at the northeast corner of the subject property suggest runoff flows southeast towards the MAM2 and SAF1 communities. For Wetland 2, an adjustment to the receiving wetland area previously reported on (NRSI 2023) was made, reducing the area to the vegetation communities on the east side of the watercourse near the ditch outlet. As discussed in the Hydrogeological Report, the shallow groundwater flow from the subject property is

towards the southeast (Figure 7, GM BluePlan 2024a), and groundwater discharges to the watercourse. As such, vegetation communities on the west side of the watercourse are not included in the receiving wetlands.

Given that the wetlands are located within areas where site access was not available, the area measurements used in this assessment are based on ELC polygon boundaries available from open-source data (CVC 2022). The Ontario Watershed Information Tool (OWIT, MNRF 2023c), was used to identify the catchment areas for each wetland. The catchment for Wetland 1 is contained within the catchment of Wetland 2 (see Map 4).

Table 6 summarizes wetland data and development details required to assess the magnitude of the proposed hydrological changes to the adjacent and downstream wetlands.

Table 6. Wetland Data and Magnitude of Potential Hydrological Change

Data	Definition and Required Information	Wetlands Impacted	
		Wetland 1	Wetland 2
Wetland feature limits (area)	The size and shape of the wetland feature(s) in question. Under normal circumstances this should be based on staked and surveyed feature limits. **Note: Given the lack of site access all measurements are based on ELC boundaries available through open-source data (CVC 2022).**	2.9ha	5.5ha
Extent and size of pre-development catchment (C)	Surface water catchment of the wetland, delineated using appropriate methods.	1,700ha	1,741ha
Total development area of catchment (*Cdev*)	Area of the wetland's catchment lying outside of any identified natural system (e.g. natural heritage areas, natural hazard zones, and their associated buffers), but inclusive of any existing developed areas within the catchment.	235.3ha	257.3ha
Area of the wetland catchment owned by the proponent	The development area of the wetland catchment (*Cdev*) that is owned by the proponent[1].	6.86ha	8.33ha
Percent of impervious cover planned within the proponent's holdings (*IC*)	The anticipated proportion of impervious cover within the area of the wetland catchment owned by the proponent, as determined from average values for a given land cover type, or from knowledge of proponent's preliminary design.	55.0%	59.0%

Data	Definition and Required Information	Wetlands Impacted	
		Wetland 1	Wetland 2
Proposed extent and size of post-development catchment	The anticipated size of the feature's catchment resulting from grade changes and/or implementation of the stormwater management plan, based on the best available information.	1.26ha Post-development Catchment 202*	12.59ha Post-development Catchment 200, 201, and 204*
Anticipated magnitude and duration of water taking	The approximate magnitude and duration of any water taking anticipated from groundwater or surface water bodies directly connected to the wetland, and associated discharge of this water. This is determined using the best data available about site conditions and the proposed development form at the time the *Risk Evaluation* is applied.	Under typical groundwater levels, dewatering is expected to be required for the construction of the sanitary pumping station only, and is anticipated to be <7,000L/day. During high groundwater conditions, dewatering may occur for the construction of the sanitary pumping station, the SWM pond, and site servicing, up to a maximum of 261,000L/day. Dewatering will be temporary, and the effects are expected to be contained within 13m to 106m of the excavation areas (GM BluePlan 2024a). The adjacent and downstream wetlands are located well beyond the anticipated zone of influence. A monitoring and mitigation plan for dewatering discharge is provided in the Hydrogeology Study (GM BluePlan 2024a). A detailed plan will be prepared for the EASR registration and will include the plan details provided in the Hydrogeology Study.	
Location and extent of any locally significant recharge areas	Locally significant recharge areas are defined in this document as areas within the wetland's catchment covered by highly porous sedimentary deposits or otherwise having high hydraulic conductivity. These may be identified through preliminary geotechnical site investigations, visual means, monitoring data, or numerical model outputs.	The subject property is within a Significant Groundwater Recharge Area. The mapped area is vast, and the Subject Property will alter <10% of the overall Significant Groundwater Recharge Area.	

* See Figure 3 and 4 of the FSR (GM BluePlan 2024b)

Step 2. Determine the magnitude of potential hydrological change.

Impervious Cover

Increases in impervious cover within the catchment of a wetland have the potential to increase runoff to receiving features if adequate mitigation measures are not used. Similarly, baseflow and/or interflow volumes currently feeding a receiving feature may change if infiltration and

groundwater recharge are decreased as a result of a proposed development. Research into the relationship between impervious cover (IC) within a wetland's catchment and its ecological integrity suggests that there are two thresholds governing wetland response (TRCA 2017):

1) Between 3.5% and 10% IC, plant density and the diversity of amphibians and macro-invertebrates begin to significantly decline (Taylor 1993; Taylor et al. 1995; Hicks and Larson 1997; Reinelt and Taylor 2001).
2) Between 20 and 25% IC, beyond which only certain hardy and/or exotic plant and amphibian species can persist within a wetland (Boward et al. 1999; Reinelt and Taylor 2001; Chin 1996).

Consistent with the guidance used to evaluate risks to wetlands (TRCA 2017), a threshold value of 10% and 25% IC has been applied because there is relative certainty that exceeding these thresholds will lead to ecological degradation in the absence of a well-designed mitigation strategy. To determine potential impacts from the post-development increase in imperviousness within the subject property, an Impervious Cover Score (*S*) is used. The Impervious Cover Score recognizes both the impact of any single development, in addition to the estimated cumulative impacts of all future developments within the wetland catchment. This landscape-scale approach ensures that the receiving wetland hydrology is adequately protected as development within the catchment area proceeds.

The equation used to calculate impervious cover score is as follows:

$$S=\frac{IC \cdot Cdev}{C}$$

Where *S* is the impervious cover score, IC is the proportion of impervious cover (as a percentage between 0 and 100) proposed within the area of wetland catchment that is within the subject property, Cdev is the total development area of the catchment (in ha), and C is the size of the wetland's catchment (in ha). In all cases, the pre-development catchment is used.

For this analysis, C_{dev} was calculated as the total area within the Hillsburgh Urban Area that falls within the receiving wetland catchment but outside of areas designated as 'Environmental Protection' on Schedule C of the Wellington County Official Plan (2022). Remaining lands within the receiving wetland catchment area are designated as Protected Countryside under the provincial Green Belt Plan (MMAH 2017), and so it is assumed at this time that future

development will not occur in these areas. The extent of C_{dev} for the Wetland 1 and 2 catchment areas is shown on Map 4, and is calculated as 235.3ha and 257.3ha respectively.

The results of the impervious cover score calculation for the receiving wetlands are presented in Table 7.

Table 7. Impervious Cover Scores

Wetland No. (Pre-dev Catchment)	Equation	Impervious Cover Score (*S*)
Wetland 1 (101)	55 x 235.3 / 1,700	7.6
Wetland 2 (103)	590 x 257.3 / 1,741	8.7

Catchment Size

The pre-development catchment sizes were used to define changes to wetland catchment size (Table 8). The same magnitude thresholds used for impervious cover (10% and 25 %) were used as thresholds to define catchment size alteration (TRCA 2017). Given the size of the wetland catchments and the area of the catchments on the subject property, the changes to the catchments are relatively minor. Map 4 illustrates the surface water catchment area as determined using the Ontario Watershed Information Tool. Site specific pre-development catchment areas within the subject property are illustrated on Figure 3 of the FSR (GM BluePlan 2024b)

Table 8. Summary of Catchment Size Changes

Wetland No.	Pre-Development Catchment Size (ha)	Post-Development Catchment Size (ha)	Overall Change (ha)	Overall Change (%)
Wetland 1 (101)	1,700	1,694.4	-5.6	-0.3%
Wetland 2 (103)	1,741	1752.1	11.1	-0.6%

Water Taking

Temporary drawdown of the shallow groundwater table will occur during construction of the site servicing and stormwater management pond. The zone of influence for dewatering will extend between 13m and 38m from the excavation areas (depending on local hydraulic conductivity) (GM BluePlan 2023). The wetlands north and south of Wellington Rd 22 are located well beyond the zone of influence and are not expected to be impacted by dewatering activities.

Recharge Areas

The subject property is located within a Significant Groundwater Recharge Area. The mapped area (MECP 2024) is vast, covering most of the lands within and near the Hillsburgh Urban Area (and well beyond). Local recharge potential and infiltration capacity of the subject property is discussed in the Hydrogeological Study (GM Blue Plan 2024a) and the Functional Servicing Report (GM BluePlan 2024b).

Criteria used to evaluate the probability and magnitude of hydrological change

Table 9 summarizes the magnitude score of the proposed hydrological change to each wetland catchment area. Wetland 1 and 2 will experience a low magnitude of hydrological change in the proposed post-development scenario.

Table 9 Criteria used to evaluate the probability and magnitude of hydrological change

Criteria	High Magnitude	Medium Magnitude	Low Magnitude
Impervious cover Score (*S*) within catchment	>25%	10-25%	<10% Wetland 1 (7.6%) Wetland 2 (8.7%)
Increase or decrease in catchment size	>25%	10-25%	<10% Wetland 1 (0.3% decrease)[1] Wetland 2 (0.6% increase)[1])
Water taking or discharge	Dewatering exceeding MOECC EASR limits (> 400,000 L/day) for > 6 months anticipated	Dewatering within MOECC EASR limits (50,000 - 400,000 L/day) for > 6 months anticipated OR Dewatering exceeding MOECC EASR limits (>400,000 L/day) for < 6 months anticipated	Dewatering within MOECC EASR limits (50,000 - 400,000 L/day) for < 6 months anticipated Groundwater dewatering will occur during construction only. A maximum 261,000L/day may occur with typical volumes expected to be <7,000 L/day. Under typical groundwater level conditions, dewatering is anticipated to occur only for the construction of the sanitary pumping station.[2] The zones of influence for the proposed dewatering will range from 13m to 106m depending on the location, hydraulic conductivity, and type of construction activity.[2] The wetlands north and south of Wellington Rd 22 are located well beyond the zones of influence

Criteria	High Magnitude	Medium Magnitude	Low Magnitude
			and are not expected to be impacted. Discharge from dewatering will be subject to ESC measures and will exit to a discharge area within Block 149, with the outlet draining south toward the roadside ditch along County Road 22. The location and details of the dewatering discharge area are provided in the erosion and sediment control plan, provided under separate cover. The overland flow path is to be located such that flow is across a fully vegetated area, where possible.[2]
Impact to recharge areas	Impact (e.g. replacement with impervious cover) to >25% of locally significant recharge areas	Impact (e.g. replacement with impervious cover) to 10-25% of locally significant recharge areas	Impact (e.g. replacement with impervious cover) to <10% of locally significant recharge areas The subject property is within a Significant Groundwater Recharge Area. The mapped area[3] is vast, and the subject property will alter <10% of the overall Significant Groundwater Recharge Area.

[1]As determined using the pre- and post-development catchment areas illustrated in Figures 3 and 4 in the FSR (GM BluePlan 2024b)
[2]GM BluePlan 2024a
[3]MECP 2024

Step 3. Determine the sensitivity of the wetland and its associated flora and fauna to hydrological change.

To assess the sensitivity of a wetland to hydrological change five criteria are used (TRCA 2017):

i) Vegetation community
ii) Fauna species
iii) Flora species
iv) Significant wildlife habitat for hydrologically sensitive species
v) Hydrological classification

Wetland 1 and 2, east and south of the subject, have been evaluated using these criteria (Table 10). Data used for this evaluation included:

- data available through the background review,
- multi-season wildlife and vegetation surveys described in Table 2, as could be collected without direct site access,
- wetland community data and descriptions as summarized in Table 3, and
- the SWH analysis as discussed in Section 5.4.

The results of the ecological sensitivity analysis are presented in Table 11.

Table 10. Wetland Plant and Wildlife Species Sensitivity Scores

Species Name	Common Name	Sensitivity Score	Sensitive Period	Wetland 1	Wetland 2
Birds					
Lophodytes cucullatus	Hooded Merganser	High	mid Mar-late Oct	X	X
Rallus limicola	Virginia Rail	Medium	early Apr-mid Sep	X	X
Parkesia noveboracensis	Northern Waterthrush	Medium	start May-mid Aug	X	X
Anas crecca	Green-winged Teal	Medium	mid Apr-early Sep	X	X
Mareca strepera	Gadwall	Medium	end Mar-mid Oct	X	X
Cistothorus palustris	Marsh Wren	Medium	late Apr-mid Sep	X	X
Aix sponsa	Wood Duck	Medium	early Mar-end Oct	X	X
Ardea herodias	Great Blue Heron	Low	start Apr-early Oct	X	X
Butorides virescens	Green Heron	Low	early Apr-end Sep	X	X
Empidonax alnorum	Alder Flycatcher	Low	late May-late Aug	X	X
Branta canadensis	Canada Goose	Low	early Mar-early Oct	X	X
Geothlypis trichas	Common Yellowthroat	Low	start May-late Aug	X	X
Anas platyrhynchos	Mallard	Low	mid Mar-end Oct	X	X
Melospiza georgiana	Swamp Sparrow	Low	early Apr-end Aug	X	X
Gallinago delicata	Wilson's Snipe	Low	start Apr-early Sep	X	X
Herpetofauna					
Dryophytes versicolor	Gray Treefrog	High	late Apr-early Oct	X	X

Species Name	Common Name	Sensitivity Score	Sensitive Period	Wetland 1	Wetland 2
Lithobates sylvaticus	Wood Frog	High	late Mar-end Aug	X	X
Pseudacris crucifer	(Northern) Spring Peeper	High	start Apr-end Sep	X	X
Lithobates pipiens	Northern Leopard Frog	High	late Sep-mid Aug	X	X
Chelydra serpentina	Common Snapping Turtle[1]	High	all year	X	X
hrysemys picta marginata	Midland Painted Turtle	High	all year	X	X
Lithobates clamitans	Green Frog	Medium	all year	X	X
Lithobates catesbeianus	American Toad	Medium	late Apr-mid Sep	X	X
Mammals					
Ondatra zibethicus	Muskrat	High	all year	X	X
Neogale vison	(American) Mink	Low	all year	X	X
Castor canadensis	Beaver	Low	all year	X	X
Condylura cristata	Star-nosed Mole	Low	all year	X	X
Plants					
Larix laricina	Tamarack	Medium		X	X
Abies balsamea	Balsam Fir	Medium		X	X
Thuja occidentalis	Eastern White Cedar	Medium		X	X

[1]Species of Conservation Concern (designated as Special Concern under the provincial *Endangered Species Act*, 2007)

Table 11. Criteria used to Evaluate the Sensitivity of the Receiving Wetland to Hydrological Change (TRCA 2017)

Criteria	High sensitivity	Medium sensitivity	Low sensitivity	Wetland 1	Wetland 2
Vegetation community type (ELC)	Presence of a high sensitivity vegetation community	Presence of a medium sensitivity vegetation community	No high or medium sensitivity criteria satisfied	High[1] SWC4 and SWM4	High[1,2] MAM3 and SWC3-2
High sensitivity fauna species	Presence of a high sensitivity species	Presence of a medium sensitivity species	No high or medium sensitivity criteria satisfied	High[3]	High[3]
High sensitivity flora species	Presence of multiple high sensitivity species	Presence of multiple medium sensitivity species OR Presence of one high sensitivity species	No high or medium sensitivity criteria satisfied	Medium	Medium[4]
Significant Wildlife Habitat	Presence of Significant Wildlife Habitat, as defined by OMNRF (2014), for high sensitivity species	N/A	No high criteria satisfied	High[4] Candidate SWH for: • Turtle Wintering Area • Amphibian Breeding Habitat (Woodland) • Terrestrial Crayfish • Habitats of Special Concern and Rare Wildlife Species (Snapping Turtle)	High[4] Candidate SWH for: • Turtle Wintering Area • Amphibian Breeding Habitat (Woodland) • Terrestrial Crayfish • Habitats of Special Concern and Rare Wildlife Species (Snapping Turtle)

Criteria	High sensitivity	Medium sensitivity	Low sensitivity	Wetland 1	Wetland 2
Hydrological classification considering ecology	Isolated/palustrine AND Presence of medium or high sensitivity vegetation communities OR Presence of medium or high sensitivity flora or fauna species	Isolated/palustrine AND No medium or high sensitivity vegetation communities AND no medium or high sensitivity flora or fauna species present	Riverine/lacustrine	High[4] Potential presence of medium/high sensitivity flora and fauna	High[4] Potential presence of medium/high sensitivity flora and fauna
			Overall Sensitivity of Wetland	**High**	**High**

[1]Most ELC codes for Wetlands 1 and 2 are derived from open source data and do not have subcodes. A conservative approach was taken and the highest sensitivity status for the ELC code group was used.
[2]Very small portion of SWC3-2 is adjacent to the Credit; however the proportion of this feature that could potentially be impacted by increased flow is minimal and is therefore not included in the sensitivity rank.
[3]Potential for highly sensitive species to be present based on assessment of available habitat without direct
[4]Presence of species/habitats is based on assessments completed without direct site access

Step 4. Integrate information from step 1, 2, and 3 to assign a level of risk to the proposal.

The risk of the proposed development to the hydrological and ecological integrity of the wetlands using the criteria evaluated in Steps 1, 2 and 3 above (Table 11) has been determined to be Low for both Wetland 1 and Wetland 2. Development proposal with low risk levels occur when it is unlikely that the proposed activity will have a substantial impact on wetland hydrology. Mitigation measures are required to compensate for any changes to monthly water balance results (e.g. low impact development features) (TRCA 2017).

Table 12. Overall Wetland Risk Level

Wetland No.	Catchment Areas	Magnitude of Hydrological Change	Sensitivity of Wetlands to Change	Overall Risk Level
Wetland 1	101 (202)*	Low	High	Low
Wetland 2	103 (200, 201, 204)*	Low	High	Low

*GM BluePlan 2024b

Water Balance Impacts Discussion

The FSR (GM BluePlan 2024b) provides monthly pre- and post-development recharge (i.e., infiltration) volumes on a site wide basis, while monthly runoff volumes (in cubic meters) anted for the adjacent natural area to the east (containing Wetland 1) and the wetland south of Wellington Road 22 (Wetland 2). Monthly recharge and runoff volumes relevant to the impact analysis presented here were extracted from the FSR and are presented in Table 13 and 14 respectively. The adjacent natural area to the east is referred to as “the woodlot” in the FSR (GM BluePlan 2024b).

Under existing conditions, the annual estimated recharge volume on the site (from pre-development subcatchments 101 and 103) is 26,448m^3. Under post-development conditions, and with the implementation of the proposed lot-level infiltration galleries, natural and enhanced annual recharge volumes on the site (from post-development subcatchments 200, 201, 202, 203 and 204) are estimated to be 26,603m^3, which is an increase of 156m^3 (0.6%).

In the pre-development condition, the annual estimated runoff volume contributing to Wetland 1 is 1,2831m^3, and to Wetland 2 is 2,750m3 (GM BluePlan 2024b). Under post-development conditions the annual estimated runoff (i.e., after accounting for enhanced infiltration through low impact development mitigation measures) to Wetland 1 is 3,788m^3, which is a decrease of 9,043m^3. Post-development estimated annual runoff to Wetland 2 is 50,124m^3, which is an

increase of 47,375m^3 (GM BluePlan 2024b). While the changes to runoff may initially appear significant it is emphasized here that after the Hillsburgh Subdivision is constructed, the subject property will represent just 13.55ha of the overall Wetland 1 catchment (1,700ha), and 13.85ha of the overall Wetland 2 catchment (1,746ha), which is 0.80% for each catchment area.

The outcome of the Wetland Water Balance Risk Evaluation (as per TRCA 2017, presented above) indicates that the receiving wetlands are considered highly sensitive to hydrological change based on the vegetation communities, vascular flora, and wildlife that are potentially present (Table 10**Error! Reference source not found.** and 11). However, the overall level of risk to the wetland from the proposed development is considered low due to the minimal overall magnitude of hydrological change (Table 9 and 12). This, in combination with the water balance analysis presented below, drives the conclusion that the mitigation measures integrated into the SWM approach are adequate, and that no impacts to the receiving wetland's hydrological or ecological functions and processes are expected to occur.

The following sections present a detailed interpretation of water balance information from an ecological perspective. Note, all volumes and water balance data referred to below are extracted from the FSR (GM BluePlan 2024b).

Groundwater Recharge

The groundwater recharge component of the water balance was assessed at a site-wide basis. Data presented in Table 13 was extracted from the FSR (GM BluePlan 2024b).

Soils within the development area have a relatively low hydraulic conductivity and the Hydrogeology Study (GM BluePlan 2024a) indicates that a significant separate between the surface and groundwater table exists within the subject property. A slight increase in site-wide recharge is proposed for the post-development condition (156m^3 annually). Infiltration galleries proposed throughout the site aim to distribute recharge evenly over the entire site; therefore, approximating the pre-development recharge conditions (GM BluePlan 2024a).

A recharge deficit is anticipated to occur from November to June, ranging from 6.5% (June) to 31.5% (May) below the pre-development recharge volumes. July through October is expected to see a surplus of groundwater recharge, ranging from 44.8% (July) to 363.7% in October, during the post-development condition. The proposed recharge condition will be more consistent throughout the year, particularly from April through December, whereas, in the pre-

development condition, most of the annual recharge occurred towards the beginning of the growing season.

Recharge occurring on site contributes to shallow groundwater movement, and does not intercept deeper groundwater aquifers. As noted in the Hydrogeology Study groundwater levels in the deeper aquifer remain relatively consistent throughout the year. The receiving wetlands to the east and south of the subject property, and the West Credit River (Erin Branch) intersect the deeper aquifer and receive groundwater discharge inputs from this system. The relative contribution of infiltration from the subject property to the shallow groundwater table and to the receiving wetlands and watercourse is small in comparison to the contribution from other lands and the deeper aquifer within the large catchment area. The annual change represents a 0.6% increase of groundwater recharge from the subject property occurring within the shallow groundwater layer (see Table 13). .

Table 13. Summary of Pre- and Post-development Monthly Site-wide Recharge (GM BluePlan 2024b)

	Site-wide Recharge			
Month	Pre-development[1] (m3)	Post-development[2] (m3)	Total Difference (m3)	Total Difference (%)
January	672	570	-102	-15.2%
February	336	285	-51	-15.2%
March	168	143	-25	-15.2%
April	3,218	2,206	-1,012	-31.4%
May	9,029	6,183	-2,846	-31.5%
June	4,515	4,223	-291	-6.5%
July	2,257	3,268	1,011	44.8%
August	1,129	2,604	1,475	130.7%
September	564	2,112	1,548	274.3%
October	315	1,463	1,147	363.7%
November	2,829	2,363	-467	-16.5%
December	1,415	1,184	-231	-16.3%
Annual Total	**26,448**	**26,603**	**156**	**0.6%**

[1]The monthly post-development recharge volumes are generated by Catchments 200, 201, 202, 203 and 204 in the FSR (GM BluePlan 2024b).
[2]The monthly pre-development recharge volumes are generated by Catchments 101, 102, and 103 in the FSR (GM BluePlan 2024b).

Groundwater processes will control the timing and duration of the high and low groundwater table periods and the distribution and volumes of groundwater discharge. It is anticipated that periods of inundation and periods of dry conditions within the receiving vegetation communities and watercourse will be maintained post-development, and will not be impacted by the

proposed development. The proposed SWM approach achieves site-wide annual infiltration targets and is expected to sustain the existing groundwater flow directions (GM BluePlan 2024a, b).

Surface Water Runoff

As described above, surface runoff from the proposed development is conveyed offsite via four different routes:

- Via rear yard overland flow from lots in the northeast corner of the proposed development (catchment 202) into the adjacent woodland and downslope to Wetland 1;
- From the SWM pond (catchment 201; Outlet Structure No. 2), through a spreader swale along the edge of the eastern woodlot, and overland to Wetland 1;
- From the SWM pond (catchment 202), into a roadside ditch along Wellington Rd. 22, that drains into the West Credit River (Erin Branch) southeast of the subject property, and flows through Wetland 2; and
- Via a superpipe system (catchment 204) discharging into a roadside ditch along Wellington Rd. 22, that drains into the West Credit River (Erin Branch) southeast of the subject property, and flows through Wetland 2.

Note, all volumes, water balance, and storm event data referred to below are extracted from GM BluePlan (2024b).

Wetland 1

Upstream of Wellington Road 22, the West Credit River (Erin Branch) is located >100 m from the property line where overland flow from post-development catchment 202, and the SWM facility weir (catchment 201; Outlet Structure No. 2), will enter the adjacent forest and woodland communities and into the marsh, swamp, and shallow aquatic communities on the west side of the watercourse (Map 2; Figure 4, GM BluePlan 2024b).

As shown on Map 2, steep slopes are present in the natural area immediately east of the subject property. The West Credit River (Erin Branch) south of the SAF1-1 community appears to be highly confined in a steep sided valley. The SWC4-A and SWM4-1 communities are partially or wholly located along the valley wall. The valley floor is wider to the north, where the MAM2-E and SAF1-1 communities are located.

Based on the contours (Map 2), overland flow from the post-development catchment 202 is expected to reach a portion of the MAM2-E community and the SAF1-1 community; however, this likely only occurs during larger rain events as runoff volumes occurring during smaller, more frequent events, are likely to be intercepted by the forest and cultural woodlot communities located upslope. Through aerial photo interpretation (Google Earth images, 2004 to 2024), and review of CVC's ELC mapping (2022), the marsh and shallow aquatic community are closely connected, with the shape and size of each community fluctuating over time. It is reasonable to assume that an outlet structure is present at the downstream end of the SAF1-1 community, due to the consistent inundation that occurs upstream. As such, runoff volumes from the subject lands to the MAM2-E and SAF1-1 communities are expected to provide a small proportion of the overall water (surface and groundwater) received by these wetland communities.

Due to grading constraints the outlet that will direct water through the spreader swale and into the eastern woodlot will only flow during storm events greater than the 10-year storm (see Table 14). All of the water from the 25mm, 2-year, and 5-year storm captured and discharged from the SWM pond will be directed downstream to the roadside ditch and towards Wetland 2. Water will also be directed to the roadside ditch along Wellington Rd. 22 during the 25mm, 2-year, and 5-year events.

The surface water runoff portion of the water balance does not highlight the flow splitting that will occur during the 10-year and greater storm events. As such, the runoff deficit to the woodlot (and Wetland 1) appears more substantial than what will actually occur. Table 14 shows that a minimum of 30% of the total flow from the SWM pond will be directed towards Wetland 1, up to a maximum of 90% during the Regional Storm. The SWC4-A and SWM4-1 communities are located downslope of the cultural and forest communities. During the existing condition, the portion of overland flow received by the wetland communities during the 25mm, 2-year, and 5-year storm events is likely minimal and may even be negligible. Overland flow is likely captured by vegetation occurring upstream, taken up by roots, stored in micro-topographical features, and infiltrated into the soil (contributing to soil moisture content).

Table 14. Total Flow to the Roadside Ditch (Wetland 2) and the Woodlot (Wetland 1)

Storm Event[1]	Total Flow from SWM Pond (m^3/s)[1]	Total to Wellington Rd 22 Ditch (m^3/s) (Wetland 2)[1]	Total to Eastern Woodlot (m3/s) (Wetland 1)[1]	% of Total Flow to Wellington Rd 22 Ditch (m3/s) (Wetland 2)[2]	% of Total Flow to Eastern Woodlot (m3/s) (Wetland 1)[2]
2-year	0.086	0.086	0	100.00%	0.00%
5-year	0.117	0.117	0	100.00%	0.00%
10-year	0.186	0.132	0.055	70.97%	29.57%
25-year	0.547	0.14	0.407	25.59%	74.41%
50-year	0.917	0.145	0.771	15.81%	84.08%
100-year	1.321	0.15	1.171	11.36%	88.64%
Regional	1.669	0.154	1.515	9.23%	90.77%

[1]Table 6 in the FSR (GM BluePlan 2024b)
[2]Caclulated by NRSI staff using data from the FSR (GM BluePlan 2024b)

Groundwater table elevations, contours, and cross-sections (C-C'; Figure 9C) presented in the Hydrogeological Study (GM BluePlan 2024a) indicate that the groundwater table is at a higher elevation within the subject property than along the West Credit River (Erin Branch). Cross-section C-C' is located through the SWM4-1 and SWC4-A vegetation communities. Based on the data and figures in the Hydrogeological Study, it is reasonable to assume that the SWM4-1 and SWC4-A are fed through groundwater discharge, and rely on riverine process and groundwater discharge, rather than overland flow from the subject property. Similarly, the hydrology of the wetland communities upstream (MAM2-E and SAF1-1) is likely controlled by water inputs from upstream, riverine processes, and groundwater discharge.

The effort undertaken by GM BluePlan Engineering Ltd. during the development of the SWM approach to maintain existing drainage patterns and input locations using a second SWM facility outlet is anticipated to adequately mitigate any minor differences between pre- and post-development runoff volumes. As such, the reduction in runoff volumes identified in the water balance results (GM Blueplan 2024b) is not anticipated to impact the hydrological or ecological form and function of Wetland 1. No impacts resulting from changes to hydrological conditions from the proposed development are anticipated to occur within the vegetation communities between the subject property and the West Credit River (Erin Branch) upstream of Wellington Road 22.

Wetland 2

Based on the water balance data provided in the FSR, the majority of surplus runoff volumes from the Hillsburgh Subdivision will be directed to the Wellington Rd. 22 ditch and into the West Credit River (Erin Branch), via the SWM facility Outlet No. 1 (GM BluePlan 2024b). As stated in the Wetland Water Balance Risk Evaluation in Section 7.4.3, the hydrology of the wetland is dominated by riverine processes (70%) and palustrine process (30%). The available topographical contours south of Wellington Road 22 (MNR 2024), show a steep valley wall on the west side of the watercourse and a flatter, floodplain on the east side. Interpreting the information provided in the Hydrogeological Study (GM BluePlan 2024a), the wetland evaluation (MNRF 1995), and the local topography, it is expected that the hydrology of the SWC3-2 and SWM1-1 vegetation communities is dominated by groundwater discharge, and riverine process, including flood conditions within the floodplain. The proposed increase in runoff volume to the West Credit River (Erin Branch) will contribute to the hydrology of the SWC3-2 and SWM1-1 (and downstream wetland communities including SWD7-1 and MAM3 located near the open aquatic area) via flooding during high flow events.

During the winter period (November to March), GM BluePlan's modelling estimates surplus runoff volumes between 281m^3 (March) and 12,972m^3 (May) (Table 1**Error! Reference source not found.**5). Increased runoff during the winter will not lead to substantial erosion or other related impacts due to the ground being saturated or frozen and generally protected by dormant vegetation thatch cover and plant roots. Runoff will be released from the SWM facility and superpipe system at rates that generally match pre-development conditions (GM BluePlan 2024b), thus addressing any erosion or flooding concerns.

The largest increase in runoff is estimated to occur between July and October, which generally corresponds to the growing season, and when vegetation is well established. During these months, surplus volumes range between 2,195m^3 (a total of 2,237m^3 in October) and 5,405m^3 (a total of 5,707m^3 in July) (Table 15). Applying the assumption that runoff occurs over multiple rain events (i.e., 1 event every 2 to 3 days, or 12 events per month during the growing season), this translates to 475.6m^3 per event during the month of July. In addition, the water balance results do not account for flow splitting that will occur at storm events greater than the 10-year event. Table 14 identifies the percentage of total flow that will be directed to Wetland 1 and Wetland 2 during the modeled storm events. The volumes of runoff provided in the water balance will be lower in the post-development condition due to flow splitting at the SWM pond

outlet. The proposed increased runoff volumes throughout the growing season are not anticipated to result in impacts to the hydrology or ecology of the receiving wetland.

There are two main considerations relating to the form of the receiving wetland that combine to build a tolerance to increased runoff volumes: dominant hydrological processes, and the size of the wetland and its catchment area. Riverine and palustrine processes dominate the hydrology of the West Credit River PSW Complex (MNRF 1995); therefore, excess water entering the receiving wetland at Wellington Road 22 will be carried downstream by the West Credit River (Erin Branch) to the large Open Aquatic (OA) feature located immediately upstream of a privately-owned dam. Due to the presence of this dam, it is anticipated that wetland communities adjacent to the Open Aquatic feature regularly experience fluctuations in water levels to a greater extent than in unmanaged natural river systems. In addition, a variety of factors occurring upstream and outside the subject property have a greater potential to influence water levels within the receiving wetland than the comparatively minor proposed increased runoff from the site. Wetland 2 (5.5ha) is contained within a large wetland (approximately 16 ha), and equates to approximately 35% of the total wetland area, which further improves tolerance to increased runoff. No impacts resulting from changes to hydrological conditions are anticipated to occur within the vegetation communities downstream of Wellington Road 22.

Table 15. Summary of Pre- and Post-development Monthly Runoff Contributing to the Receiving Wetlands (GM BluePlan 2024b)

	Runoff to Woodlot (Wetland 1)				Runoff to County Rd 22 / Wetland (Wetland 2			
Month	Pre-development[1] (m^3)	Post-development[2] (m^3)	Total Difference (m^3)	Total Difference (%)	Pre-development[1] (m^3)	Post-development[2] (m^3)	Total Difference (m^3)	Total Difference (%)
January	306	87	-219	-71%	90	1,122	1,032	1149%
February	153	44	-109	-71%	45	561	516	1149%
March	77	22	-55	-71%	22	281	258	1149%
April	1,466	375	-1,090	-74%	430	4,645	4,214	980%
May	4,112	1,048	-3,064	-75%	1,207	12,972	11,766	975%
June	2,056	620	-1,436	-70%	603	8,105	7,502	1243%
July	1,028	408	-620	-60%	302	5,707	5,405	1792%
August	514	286	-228	-44%	151	4,241	4,091	2712%
September	257	209	-48	-19%	75	3,249	3,173	4207%
October	144	142	-1	-1%	42	2,237	2,195	5206%
November	1,289	364	-924	-72%	378	4,671	4,292	1135%
December	644	182	-463	-72%	189	2,334	2,144	1134%
Annual Total	**12,046**	**3,788**	**-8,258**	**-68.55%**	**3,535**	**50,124**	**46,589**	**1,317.90%**

[1]The monthly pre-development runoff volumes are generated by Catchments 101 (to woodlot) and 103 (to County Rd 22 and downstream wetland).
[2]The monthly post-development runoff volumes are generated by Catchments 200, 201, 202, and 204,

Potential Impacts to West Credit River (Erin Branch)

The Erin Branch of the West Credit River acts as the receiver for a large proportion of the surface and groundwater flow that originates across the subject property. Potential indirect impacts to the river may result from changes to surface flows, and particularly in cases where surface flows to receiving watercourses increase substantially. These increases over pre-development flow rates may cause erosion and sedimentation along their path from subject property to the receiving watercourse. Surface flow rates are presented and discussed in the FSR (GM BluePlan 2024b) and have been discussed further within the water balance analysis of this report. A direct flow path between the SWM facility and the West Credit River will be along the roadside ditch parallel to Wellington Road 22, which will be maintained post-construction. When comparing modelled pre-construction and post-construction flow rates along Wellington Road 22, the rates are, slightly lower than the pre-construction rates for all design storms with the exception of Regional storm events. Post-construction flow rates for Regional storm events are similar to but slightly higher than pre-construction rates (GM BluePlan 2024b). Therefore, it is not expected that there will be any indirect impacts related to erosion or sedimentation to the East Branch. Further to this, thermal mitigation management practices have been implemented into the design of the proposed SWM facility. The design will help to mitigate potential thermal impacts to the East Branch that could be caused by the SWM facility. This includes the incorporation of a deep pool, and a reverse draw from the deep pool, which will draw and release the coolest water from the facility.

7.4.4 Water Quality

Water quality within the study area has the potential to be affected by the proposed residential development. However, based on the FSR and Hydrogeological Study reports prepared by GM BluePlan Engineering Ltd., no adverse impacts to water quality are expected as a result of the proposed development; for full details, the reader is referred to the FSR and Hydrogeological Study (GM BluePlan 2024a, b). The following sections summarize potential impacts and mitigation measures for both surface and groundwater quality.

Groundwater

Appendix F of the Hydrogeological Study (GM BluePlan 2024a) presents the results of pre-development groundwater quality testing from 5 wells installed within the study area. Under existing conditions, the groundwater generally has moderate mineralization, demonstrated by

elevated levels of hardness, manganese, magnesium, and calcium, however, these results are typical of the geological environment of the study area (GM BluePlan 2024a).

The proposed development is proposed to utilize potable water from the municipal system of Hillsburgh and will be connected to the municipal sanitary sewer system. Potential changes to groundwater quality as a result of the proposed development will be mitigated by the proposed SWM facility which has been designed to function as a wetland. The SWM facility will consist of a large permanent pool with a storage volume 1,641 m^3 and a sediment forebay with an additional 585 m^3 (GM Blueplan 2024b), and will have the capacity to effectively remove pollutants through sedimentation. However, potential impacts to the groundwater quality prior to the operation of the SWM facility may result from the excavation of the SWM pond itself as there is the potential for the excavation to enter the sand and gravel/sand-silt aquifer that lies beneath the upper till (GM BluePlan 2024a). This creates the potential for the SWM pond to become a pathway for contaminants to enter into the aquifer. To mitigate the potential for the SWM pond to influence the water quality in the underlying aquifer, GM BluePlan Engineering Ltd. (2024a) has recommended that a liner be designed and installed to prevent the development of transport pathways most likely to occur at the deepest parts of the SWM pond (i.e., the outlet "deep pool" basin and forebay). Additionally, construction dewatering may be required to complete servicing activities, the discharge of which may result in impacts to water quality. Though the dewatering activity itself is not expected to affect water quality, activities such as fueling of equipment or storage of chemicals should be prohibited within 30 m of the SWM pond or open excavations (GM BluePlan 2024a). Following these mitigation measures, no adverse impacts to the quality of groundwater are expected to occur from the proposed development.

Surface Water

As mentioned in Section 8.4.3, the Erin Branch of the West Credit River and PSW act as the final receivers for a large proportion of the surface flow that originates across the subject property. Water quality of the West Credit River and PSW is therefore subject to potential adverse impacts to the quality of surface run-off as a result of the proposed development.

During the construction process, there is a potential for contaminants and sediments from fueling of equipment, storage of chemicals, excavations, grading, and machinery operations to be carried through surface flows into the watercourse and wetland. To mitigate for the overland transport of contaminants and sediment, an Erosion and Sediment Control (ESC) Plan has been developed by GM Blue Plan (2024b) and will be implemented (refer to section 8.4.5).

Additionally, GM Blue Plan (2024b) has designed the stormwater management approach of the proposed development to treat and remove any accumulated sediments or contaminants and provide thermal mitigation to stormwater from within the subject property before discharging any run-off. The design includes management and treatment of stormwater within individual lots, during overland transport, and at end-of-pipe discharge to aid in infiltration and the removal of sediments. Further details of the design and management practices can be found in the FSR (GM BluePlan 2024b). Assuming these measures are implemented, no adverse impacts to the quality of surface water are expected to occur as a result of the proposed development.

7.4.5 Sedimentation and Erosion

During construction, areas of bare soil will be exposed which have the potential to erode during rainfall events and impact adjacent natural features. The removal of vegetation in combination with the presence of exposed soils during construction activities may also increase the potential for stormwater flow to down-slope areas if not appropriately mitigated. Increased stormwater surface flow and erosion processes may cause the deposition of sediments onto down-slope vegetation and receiving water bodies, ultimately causing vegetation die-back or impaired health.

Soil compaction also has potential to occur as a result of heavy machinery in the area of development. Soil compaction can greatly reduce the permeability of soils and affect their ability to retain water during rain/snow melt events. This can result in an increase in surface water run-off and ultimately increase the erosion potential and the amount of sediment being transported into adjacent natural features.

In order to protect on-site and off-site natural features from potential impacts due to sediment, an ESC plan has been developed GM Blue Plan (2024b) and will be implemented prior to any construction activities on the site.

The primary principles associated with sedimentation and erosion protection measures are to: (1) minimize the duration of soil exposure, (2) retain existing vegetation, where feasible, (3) encourage re-vegetation, (4) divert run-off away from exposed soils, (5) keep runoff velocities low, and (6) trap sediment as close to the source as possible.

The following general recommendations should be implemented to mitigate erosion and sedimentation impacts:

- Installation of silt fencing along the construction limits in all locations where run-off will discharge to adjacent lands or on-site natural features and buffers.
- ESC measures must be regularly inspected and repaired or replaced in a timely manner. Accumulated sediment must be removed immediately.
- Placement of topsoil and seeding of all graded areas not subject to active construction within 30 days. A native seed mix, appropriate to the site conditions, should be applied in areas adjacent to existing natural features.

It is also recommended that topsoil piles be located away from adjacent natural features and that silt fencing be installed around piles to prevent off-site migration of water-borne sediments.

The impact resulting from soil compaction can be mitigated by minimizing the use of construction vehicles and equipment within buffers except where required, and by locating material stockpile and equipment storage locations away from natural features.

7.5 Induced Impacts

Induced impacts are described as those that are not directly related to the construction or operation of the facilities in question, but rather arise from the use of natural areas as a result of development or site alteration. The simplest example is an increase in the use of natural areas adjacent to a residential development by residents. It is well known that natural areas and wildlife are affected by the presence of people and how they use and access areas. Effects can include vegetation trampling, plant removal, dumping of refuse, creation of unauthorized trails, tree damage, introduction of non-native, invasive plant species and wildlife predation and harassment by domestic pets.

Establishment of the proposed residential subdivision will introduce increased potential for human disturbances within the surrounding natural features, including the adjacent Significant Woodland. In the absence of any mitigative measures, the increase in local residents may result in increased human access to, and activity within adjacent natural features, with associated potential for habitat degradation. Habitat degradation may subsequently facilitate the further establishment of non-native, invasive species such as Common Buckthorn and reduce the diversity of regenerating vegetative growth. Increased human population in the immediate vicinity will also increase the potential for domestic animals (e.g., Domestic Cat (*Felis*

catus)) and other development-tolerant predatory mammals (e.g., Raccoon (*Procyon lotor*)) to access surrounding natural areas. Easier access provided to these animal groups may impact nesting success and direct mortality among certain small-size wildlife, such as passerine birds. Measures are therefore required to mitigate these potential induced impacts on the adjacent natural features and to ensure the existing ecological integrity and regionally significant characteristics of the features are maintained.

The development has been planned with buffers between the development and adjacent natural areas. The buffers will function as a physical separation between the occupants and adjacent natural areas. To further inhibit human access into buffers, natural features and adjacent existing residential areas, it is recommended to consider, where feasible, the installation of permanent fencing along the limits of the proposed development. However, this is not recommended along the limit of the proposed development where proposed lot lines encroach to within natural features and wildlife habitats along the northwestern property boundary as this would result in adverse impacts to the features. In this area, dense plantings of native trees and shrubs can be used to discourage human intrusion into sensitive areas. These measures (i.e., fencing and dense plantings) will also prevent informal trail construction by residents within buffers and adjacent natural features and allow for natural regeneration or targeted restoration of the natural features, as recommended under Section 8.6. To appease new residents, recreational pedestrian trails may be considered to be incorporated into the design of the proposed Open/Park Space and SWM blocks to further divert pedestrians away from adjacent natural features and buffers.

Education with respect to the values and implications of the neighbouring natural areas is also a tool that can be used to reduce human-induced impacts. An educational brochure should be distributed to homeowners within the new development to inform them of the ecological sensitivity of the adjacent natural features, examples of various activities that can cause stresses on ecological systems, and tips on how they can enjoy and live next to the adjacent features without negatively impacting them. It is also recommended that an educational/interpretative sign be installed along any planned pedestrian trails within the SWM block describing the adjacent natural features (e.g., Significant Woodland, PSW, Species at Risk habitat, Significant Wildlife Habitat, etc.) to increase public awareness and appreciation for these significant features.

7.6 Restoration and Enhancement

In addition to the mitigation measures outlined in Section 6.0, restoration and enhancement within natural feature buffers are recommended to further improve habitat functions. The following recommendations are provided to restore and enhance natural features and habitat functions on the subject property or off-site. Further details are recommended to be provided in a Restoration and Enhancement Plan to be prepared during the detailed design stage of the development application. It is recommended that the Restoration and Enhancement Plan be developed in consultation with review agency staff and be required as a Condition of Approval.

7.6.1 Tree Compensation

Required compensation for the removal of trees within the subject property is outlined in the TPP (Appendix VI). The number and species of trees to be planted, along with recommendations for species composition are outlined in the TPP (Appendix VI).

The development of a Woodland Edge and Buffer Management Plan has been recommended to protect, restore and enhance the woodland edges and buffers within the subject property (Section 7.6.3). It is recommended to consider incorporating replacement plantings into the design of this Plan in order to meet tree compensation requirements. The addition of trees to the edge of retained treed vegetation communities (e.g., FOD5-7, CUW1) will increase the area of interior habitat within these communities and reduce the impacts of edge effects associated with development such as light-wash, noise and proliferation of invasive species.

Required replacement plantings could also be incorporated into the landscape design of the proposed SWM facility, where appropriate, to support the recommended naturalization of the facility, as discussed further in Section 7.6.4 below.

7.6.2 Species at Risk Habitat Compensation

Compensation requirements for the proposed removal and harm to trees of the Endangered species, Butternut, will be determined in consultation with MECP during detailed design of the proposed development. If the proposed development is determined to be eligible for a conditional exemption under the ESA, compensation will involve either planting and tending of Butternuts or payment into the SAR Conservation Fund. If a permit is required under the ESA for the proposed development to proceed, compensation may also involve planting and tending of Butternuts and/or payment in the SAR Conservation Fund, as well as additional activities that will ensure an overall benefit to the species is achieved as a result of the implementation of the compensation measures.

7.6.3 Woodland Edge and Buffer Management Plan

A Woodland Edge and Buffer Management Plan is recommended to be developed during detailed design of the proposed undertaking with the goal to protect, restore and enhance woodland edges and buffers within the subject property. The Plan is recommended to highlight the protection, restoration and enhancement of the area of the FOD5-7 vegetation community where the proposed lot lines overlap with this community. This area, although included within proposed lots, should be protected as part of the proposed development to ensure no negative impacts on the feature or its ecological functions occur as a result of the development.

The Plan should focus on establishing early successional communities, including meadow, thicket and forest communities, along woodland edges and within buffers to compensate for the proposed encroachment of lot lines to within forest communities as well as vegetation removal associated with the loss of hedgerow features and encroachment to within thicket, woodland and forest vegetation communities as a result of the proposed development (Map 5). The Woodland Edge component of the Management Plan should address the management and enhancement of existing woodland edges, including invasive species and hazard tree management as well as the removal of any unwanted debris, trash, etc. Where the edge of the currently active agricultural field extends to within woodland driplines, the Edge Management Plan should also focus on the re-vegetation of these areas. The Woodland Buffer component of the Management Plan should focus on re-vegetation of the buffer areas, as well as any other site-specific matters associated with transforming the existing agricultural lands to naturalized areas (e.g., lack of topsoil and minor grading requirements). The Woodland Edge and Buffer Management Plan is therefore recommended to include, at a minimum, the following components:

- Existing species composition and structure of woodland edges;
- Hazard tree identification and management;
- Invasive species management;
- Planting zones (e.g., trees, shrubs and herbaceous); and
- Other considerations (e.g., lighting, maintenance).

7.6.4 Stormwater Management Facility Enhancement

Naturalization of the SWM facility is recommended through appropriate landscaping with suitable native vegetation species to support the proposed design of the facility to function as a wetland (GM BluePlan 2024b), including meeting water quality, water quantity, infiltration and

other requirements. A combination of shallow marsh, meadow marsh and upland meadow vegetation communities are recommended to be considered, where appropriate. Scattered shrubs and trees could also be incorporated into the design, where appropriate, beyond the banks of the SWM pond. As recommended by GM BluePlan Engineering Ltd. (2024b), the landscape design should consider the use of native, non-invasive species that will eventually support shading of the SWM pond, banks and outlet structure to mitigate potential adverse thermal impacts to the West Credit River and associated direct fish habitat as a result of the proposed development. The naturalization of the facility will further enhance and support the form and functions of the buffer that will be applied to the adjacent woodland feature, including increased protection to adjacent natural features from sedimentation and erosion. It will also aid in infiltration to decrease run-off and protect against human disturbances, such as establishment and spread of invasive species, within existing adjacent natural features. Further details are recommended to be developed and provided in a Restoration and Enhancement Plan during the detailed design stage of the development application.

7.7 Monitoring

Pre-, during-, and post-construction monitoring is required as a means to ensure that adjacent natural features are not impacted throughout all stages of property development. Exact details of the monitoring program should be determined at the detailed design stage of the development application. Recommendations for monitoring to be included in the monitoring program are described throughout the following sections.

7.7.1 Pre-Construction

On-site inspections by an environmental inspector, Certified Arborist or Registered Professional Forester of the following to ensure proper installation of:

- Sediment and erosion control measures; and
- Tree protection measures, such as fences installed along dripline setbacks and trees to be retained.

7.7.2 Construction-Stage Monitoring

Construction monitoring is the responsibility of the proponent and is tied to the specific undertaking. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits. Often, an environmental inspector is required to carry out construction monitoring during grading, servicing and building construction. Additional construction monitoring may be required based on consultation with MECP with regard to SAR.

In addition to an environmental inspector, the following are recommended during construction:

- Pruning of any limbs or roots disrupted during construction (of trees to be retained) by a Certified Arborist;
- Maintenance of vegetated setbacks from wetlands and woodlands;
- Fueling of machinery to be completed at designated locations away from the retained natural features;
- Storage of machinery and material, fill, etc., to be completed in designated areas away from the retained natural features; and
- Equipment movement through natural areas and associated buffers is controlled.

7.7.3 Post-Construction

In order to detect any potential negative impacts to terrestrial and aquatic natural features and species, it is critical to conduct post-construction monitoring, as well as ensure there are strategic procedures developed to react immediately to any negative effects resulting from the development.

At a minimum, the following post-construction monitoring measures should be completed:

- Inspections of tree compensation plantings to ensure proper establishment and succession toward the intended vegetation community composition as outlined in the TPP (Appendix VI);
- Inspections of restoration plantings within the SWM facility to ensure proper establishment and succession toward the intended vegetation community composition; and
- Inspections of woodland edge and buffer restoration and enhancement plantings to ensure proper establishment and succession toward the intended vegetation community composition.

The details of this monitoring plan will be refined during the detailed design stage of the development application process in consultation with agency staff, and should be outlined in the recommended Restoration and Enhancement Plan.

7.8 Impact Assessment Summary

A summary of potential impacts associated with the proposed development, with associated recommended mitigations and significance of impacts once mitigated, are presented in Table 16.

Table 16. Summary of Potential Development Impacts and Mitigation

Potential Adverse Impacts		Recommended Mitigation Measures	Resulting Impact Significance[1]
Type	**Proposed Potential Impacts**		
Design and Construction Phase			
Vegetation and habitat removal	• The proposed conceptual development will result in the removal of confirmed Species at Risk (SAR) habitat for Butternut, Candidate SAR habitat for Little Brown and Northern Myotis, and a portion of Candidate Bat Maternity Colonies SWH. • The proposed conceptual development occurs outside of the adjacent Significant Woodland, Valleyland, Provincially Significant Wetland (PSW), Fish Habitat, Confirmed Significant Wildlife Habitat (SWH) for Special Concern and Rare Species and recommended buffers.	• Limit unnecessary vegetation removal and degradation by clearly demarcating the boundaries of construction zones. • The future site development should be planned to maximize the physical separation between the development and the adjacent natural features. • A Woodland Edge and Buffer Management Plan is recommended to be developed during detailed design of the proposed undertaking with the goal to protect, restore and enhance retained woodland edges and buffers within the subject property. • Proposed harm and killing of Butternut will be addressed either through the registration of the proposed activity under a conditional exemption of the *Endangered Species Act*, 2007 (ESA) or through obtaining a permit under ESA, to be determined in consultation with MECP. • Proposed removal of a portion of the Candidate Bat Maternity Colonies SWH is restricted to the edge of the habitat, and will not result in the removal of any candidate bat roost trees that may provide maternity colony roost habitat. • Vegetation removal must occur outside of the bat active period (April 1 – September 30) to avoid direct adverse impacts to bats, both SAR and non-SAR bats, and contravention of the ESA.	• Not Significant
Bird nesting disruption and avoidance, and active nest destruction	• The proposed conceptual development will result in the removal of treed hedgerow features, and an area of forested and thicket vegetation communities.	• Time vegetation removal activities to occur outside the typical bird breeding season (April 1 – August 31). • Construction activities should be restricted to daylight hours only and the use of artificial lighting should be avoided. • Clearly delineate the limit of all buffer areas to avoid unnecessary encroachment into the buffer area and natural features.	• Not Significant
Impacts to West Credit River (Erin Branch)	• The proposed conceptual development is well removed from the Credit River, but the River will be one of the final receivers of surface water runoff originating from the subject property. Flows from the SWM facility will be split during storm events greater than the 10-year storm. This flow splitting and the controls on Outlet Structure No. 1 will prevent excess volume from being discharged downstream to the West Credit River (Erin Branch). The controls on Outlet Structure No. 1 will also reduce discharge velocities to pre-development conditions to address potential erosion concerns. • The development has the potential to impact water quality, including the thermal regime, of the West Credit River; however, no negative impacts to water quantity are anticipated.	• Mitigation measures are outlined in the Functional Servicing Report for the Hillsburgh Subdivision (GM BluePlan 2024b). • Naturalization of the proposed Stormwater Management (SWM) facility is recommended through appropriate landscaping with suitable native vegetation species to support the proposed design of the facility to function as a wetland (GM BluePlan 2024b), including meeting water quality, water quantity, infiltration, thermal regime and other requirements. • The proposed conceptual development is not anticipated to cause any negative impact to the watercourse or the direct fish habitat it provides.	• Not Significant
Impacts to West Credit River PSW Complex	• The PSW will be one of the final receivers of surface and groundwater drainage originating from the subject property. • Potential impacts to the hydrological balance of the PSW are not anticipated to occur as a result of the proposed changes in surface run-off, baseflow, shallow groundwater flow, and/or interflow volumes. • The proposed development is within a vast Significant Groundwater Recharge Area and represents a very small proportion. Given the local separation between the surface and the groundwater table, no impacts are anticipated to the Significant Groundwater Recharge Area. • Natural and enhanced annual recharge volumes on-site are estimated to increase by 0.6% as a result of the proposed development (GM BluePlan 2024b).	• The results of the Wetland Water Balance Risk Evaluation identified the overall level of risk to the PSW from the proposed development as low due to the minimal overall magnitude of hydrological change. • The post-development recharge volumes provide consistent recharge opportunities throughout the year, and will contribute to the shallow groundwater system. No negative impacts to the groundwater table or to groundwater contributions to the wetlands are anticipated as a result of the proposed development • Post-development runoff volumes will increase; however, the majority of runoff volume will be attenuated by the SWM facility. Runoff directed to the woodlot and Wetland 1 will flow overland through the woodland and downslope towards the West Credit River (Erin Branch) Runoff is expected to be intercepted by the woodland vegetation, and the wetland communities along the valley wall, with the remainder entering the watercourse and flowing downstream. Runoff to Wetland 2 will be directed to the Wellington Road 22 ditch and into the West Credit River (Erin Branch), and will be attenuated by the SWM Facility. • Mitigation measures integrated into the SWM approach (GM BluePlan 2024b) are considered adequate, and therefore, no impacts to the receiving PSW's hydrological or ecological functions and processes are expected to occur as a result of the proposed development.	• Not Significant

Potential Adverse Impacts		Recommended Mitigation Measures	Resulting Impact Significance[1]
Type	**Proposed Potential Impacts**		
Damage or other disturbance to adjacent natural features	• The conceptual development is proposed to occur adjacent to natural features that are designated as Significant Woodland, Valleyland and PSW, as well as other naturalized vegetation communities, all of which are proposed to be retained.	• Clearly demarcate the limits of construction with silt fencing around the perimeter of the construction zone. • Garbage, leaf litter, and other debris should not be deposited within the adjacent woodland, valleyland, wetland or buffer areas. • A Woodland Edge and Buffer Management Plan is recommended to be developed during detailed design of the proposed undertaking with the goal to protect, restore and enhance retained woodland edges and buffers within the subject property.	• Not Significant
Wildlife avoidance of the area, and other impacts associated with construction	• The conceptual development is proposed to occur adjacent to Confirmed Significant Wildlife Habitat (SWH) for Special Concern and Rare Species, Candidate SAR habitat for Little Brown and Northern Myotis, and Candidate Bat Maternity Colonies SWH.	• Construction activities should be restricted to daylight hours only and the use of artificial lighting should be avoided. • These construction-related impacts are expected to be temporary, minimal, and localized.	• Not Significant
Erosion and sedimentation	• Exposure of areas of bare soil as a result of vegetation removal and other construction activities have the potential to erode during rainfall events, and increase the potential for stormwater flow to down-slope areas (e.g., adjacent Significant Woodland), resulting in adverse impacts to adjacent natural features. • Soil compaction also has potential to occur as a result of heavy machinery in the area of development.	• A Sediment and Erosion Control Plan has been developed by GM BluePlan Engineering Ltd. (2023b) and will be implemented prior to the initiation of construction activities. • Install silt fencing along the boundaries of the construction zone, inspect on a regular basis, remove accumulated sediment as needed and immediately replace any damaged fencing.	• Not Significant
Post-Construction Use			
Disturbances to adjacent and retained natural features on property	• Increase in the use of adjacent natural areas by new residents, and the associated potential for vegetation trampling, plant removal, dumping of refuse, creation of unauthorized trails, tree damage, introduction of non-native, invasive plant species and wildlife predation and harassment by domestic pets within the adjacent retained natural features.	• No vegetation clearing should occur within the adjacent forest or wetland communities, or elsewhere within the subject property, with the exception of non-native species removal. • Garbage, leaf litter, and other debris should not be deposited within the adjacent forest or wetland, buffers, or within other existing subject property natural features, including restored and enhanced areas. • The use of lawn or garden chemicals should be reduced or eliminated. • Any landscape plantings should use native species to avoid the proliferation of non-native species within adjacent natural features. • Household pet cats should not be permitted by the owners to roam within the adjacent natural features. • A Woodland Edge and Buffer Management Plan is recommended to be developed during detailed design of the proposed undertaking with the goal to protect, restore and enhance retained woodland edges and buffers within the subject property. • All recommended buffers to adjacent natural features should be maintained in a natural state. • Where appropriate, consider the use of dense plantings of native trees and shrubs or fencing to discourage human intrusion into sensitive areas. • Incorporate recreational pedestrian trails into the design of the proposed Open/Park Space and SWM facility to divert pedestrians away from adjacent natural features and buffers. • Distribution of educational brochure to homeowners and installation educational/interpretative signs in appropriate locations to increase public awareness and appreciation for retained, restored and enhanced natural features.	• Not Significant

[1]Assumes all recommended mitigation measures are implemented

8.0 Summary

Natural Resource Solutions Inc. was retained by Thomasfield Homes Limited in August 2021 to complete an Environmental Impact Study (EIS) for the proposed development of a residential subdivision located at Part Lot 23, Concession 7, Wellington Road 22 in the settlement of Hillsburgh, Wellington County, Ontario. This EIS characterized the natural heritage features within the subject property through a comprehensive background information review and field survey program. Field survey data was assessed against applicable municipal and provincial policy and guidance documents for the determination of significant features and functions. Several significant natural features, species and habitats were identified within the scope of this study including Significant Woodland, Provincially Significant Wetland, habitats for Species at Risk, Significant Wildlife Habitat, and fish habitat.

Recommendations have been provided to minimize impacts and mitigate potential negative effects caused by the development. These include recommendations to mitigate direct, indirect and induced impacts that may arise through construction and post-construction human use of the proposed development. Buffers and associated buffer management measures have been recommended to protect and enhance the adjacent natural features and their ecological functions. Other restoration measures have been recommended to improve the quality and ecological value of the retained features.

Monitoring measures have been provided as required by the EIS findings. These include a comprehensive plan to monitor the integrity of protected and created features and significant habitat functions through the pre-construction, construction and post-construction phases. Corrective mitigation strategies will be determined and employed, in consultation with regulatory agencies, if required.

No significant negative residual impacts are anticipated to arise from the proposed residential subdivision development if the recommendations to protect, enhance and restore natural features and wildlife habitats within the subject property are implemented.

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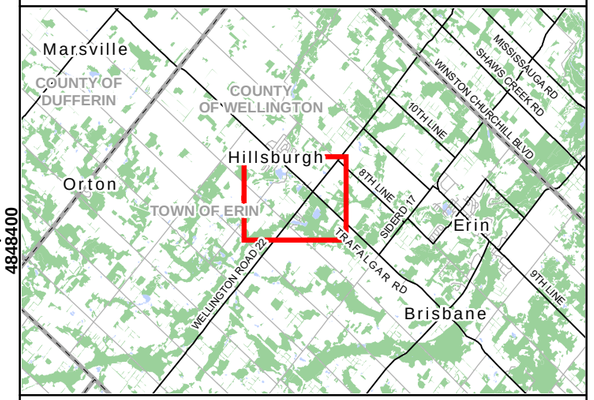
Maps

Map 1

Wellington Rd Hillsburgh EIS

Study Area



Legend

- Subject Property
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland
- Wooded Area
- Significant Woodland (Wellington County 2022)

Wildlife Activity Area

- White-tailed Deer Wintering Area (Stratum 2)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681
Date: November 7, 2023

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

N

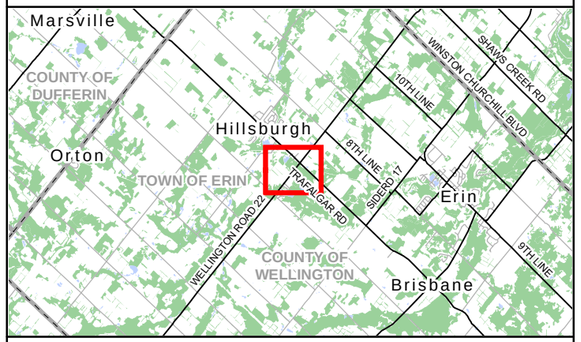
0 100 200 300 400 500 600 700 Metres

Path: X:\2681_Wellington_Rd_Hillsburgh_EIS\NRSI_2681_Map1_StudyArea_11K_2023_11_07_KEF.mxd

Map 2

Wellington Rd Hillsburgh EIS

Vegetation Communities and Monitoring Stations



Legend

- Subject Property
- Aquatic Habitat Point (AHP)
- Bird Breeding Monitoring (BMB)
- Credit Valley Conservation Vegetation Limit (CVC 2023)
- Woodland/Forest Dripline (NRSI 2023)
- Existing Contours (0.5m) (MNR 2024)
- Permanent Watercourse
- Intermittent Watercourse

Receiving Wetlands

- Wetland 1
- Wetland 2
- Ecological Land Classification (ELC) (CVC 2022)
- Ecological Land Classification (ELC) (NRSI 2023)

(Ag) Agriculture
(CUM1) Mineral Cultural Meadow Ecosite
(CUM1-1) Dry - Moist Old Field Meadow Type
(CUP3) Coniferous Plantations
(CUP3-1) Red Pine Coniferous Plantation Type
(CUP3-2) White Pine Coniferous Plantation Type
(CUP3-3) Scotch Pine Coniferous Plantation Type
(CUP3-4) Jack Pine Coniferous Plantation Type
(CUT1) Mineral Cultural Thicket Ecosite
(CUW1) Mineral Cultural Woodland Ecosite
(FOC4) Fresh - Moist White Cedar Coniferous Forest Ecosite
(FOD5-6) Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type
(FOD5-7) Dry - Fresh Sugar Maple - Black Cherry Deciduous Forest Type
(H) Hedgerow
(MAM2-E) Bulrush Graminoid Mineral Meadow Marsh
(MAM3) Organic Meadow Marsh Ecosite
(OA) Open Water
(SAF1-1) Water Lily - Bullhead Lily Floating-leaved Shallow Aquatic Type
(SAS1-3) Stonewort Submerged Shallow Aquatic Type
(SWC1-2) White Cedar - Conifer Mineral Coniferous Swamp Type
(SWC3-2) White Cedar - Conifer Organic Coniferous Swamp Type
(SWC4-A) Tamarack - Balsam Fir - Spruce Organic Coniferous Swamp
(SWD) Deciduous Swamp
(SWD4) Mineral Deciduous Swamp Ecosite
(SWD4-3) White Birch - Poplar Mineral Deciduous Swamp Type
(SWD7-1) White Birch - Poplar Organic Deciduous Swamp Type
(SWM1-1) White Cedar Mineral Mixed Swamp Ecosite
(SWM2-1) Red Maple - Conifer Mineral Mixed Swamp Type
(SWM4-1) White Cedar-Hardwood Organic Mixed Swamp Type
(SWT2-2) Willow Mineral Thicket Swamp Type
(SWT3-5) Red-osier Organic Thicket Swamp Type

***NOTE**: Vegetation communities identified and delineated beyond the limits of the subject property were determined based on 1) field surveys completed by NRSI biologists on adjacent lands where permission to access private property was obtained, 2) data collected from the subject property boundary and aerial imagery review, and 3) available open source data (CVC 2022)*

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681
Date: September 25, 2024

NAD83 - UTM Zone 17
Size: 11x17"
1:6,000

0 100 200 300 400 Metres

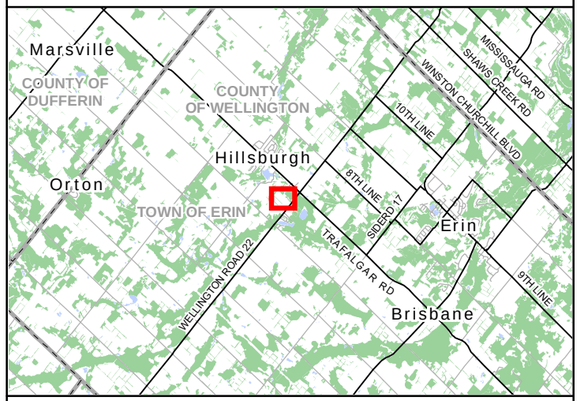
N

Path: X:\2681_Wellington_Rd_Hillsburgh_EIS\NRSI_2681_Map2_ELC_MonitoringStations_6K_2024_09_25_LRC.mxd

Map 3

Wellington Rd Hillsburgh EIS

Significant Natural Features and Wildlife Habitat



Legend

- Subject Property
- Provincially Significant Wetland (PSW)
- Significant Woodland (Wellington County 2022)

Confirmed Species at Risk

- Butternut *(Juglans cinerea)*

Candidate Species at Risk

- Candidate Bat Species at Risk Roost

Confirmed Significant Wildlife Habitat

- Special Concern and Rare Wildlife Species (Eastern Wood-Pewee *(Contopus virens)*

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681
Date: November 7, 2023

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

0 40 80 120 160 Metres

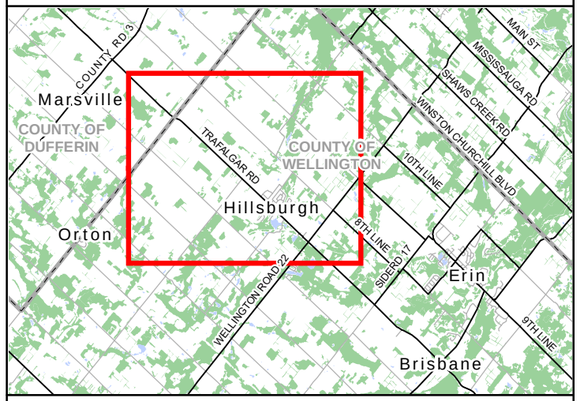
N

Path: X:\2681_Wellington_Rd_Hillsburgh_EIS\NRSI_2681_Map3_SigNatFeatures_WildlifeHabitat_3K_2023_11_07_KEF.mxd

Map 4

Wellington Rd. Hillsburgh EIS

Receiving Wetlands Catchment Areas



564000 565000 566000 567000 568000 569000 570000 571000

4853000 4852000 4851000 4850000 4849000 4848000

DUFFERIN COUNTY ROAD 24

TRAFALGAR RD

WELLINGTON ROAD 22

8TH LINE

Wetland 1

Wetland 2

Legend

- Subject Property
- Hillsburgh Urban Area
- Primary Road
- Secondary Road
- Protected Countryside
- Environmental Protection (as per Wellington County Official Plan Schedule C)
- Total Potentially Developable Area of Catchment (Cdev)
- Wetland Catchment
- Additional Wetland Catchment

Receiving Wetlands

- Wetland 1
- Wetland 2

Wetland catchment areas were derived using the Ontario Watershed Information Tool (MECP 2024)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681
Date: September 11, 2024

NAD83 - UTM Zone 17
Size: 11x17"
1:25,000

0 400 800 1,200 1,600 Metres

N

Path: X:\2681_Wellington_Rd_Hillsburgh_EIS\NRSI_2681_Map4_WetlandWaterBalanceRiskAnalysis_25K_2024_09_10_KB.mxd

Map 5

Wellington Rd Hillsburgh EIS

Proposed Development

Legend

- Subject Property
- Proposed Development Footprint
- Proposed Construction Footprint
- Proposed Site Plan
- Proposed Building Footprint
- Proposed Fence
- Proposed Servicing
- Proposed Grading
- Proposed Erosion and Sediment Control (ESC) Fence
- Proposed Sediment Control Mat
- Proposed Infiltration Gallery
- Top of Bank (CVC 2023)
- Top of Bank Buffer (10m) (JLP 2024)
- Woodland/Forest Dripline (NRSI 2023)
- Normalized Woodland Buffer
- Woodland Buffer (1m)
- Credit Valley Conservation Vegetation Limit (CVC 2023)
- Credit Valley Conservation Vegetation Limit Buffer (10m)
- Edge of Active Agriculture Field (NRSI 2023)
- Receiving Wetland
- Ecological Land Classification (ELC) (CVC 2022)
- Ecological Land Classification (ELC) (NRSI 2023)
- (Ag) Agriculture
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP3) Coniferous Plantations
- (CUP3-1) Red Pine Coniferous Plantation Type
- (CUP3-2) White Pine Coniferous Plantation Type
- (CUP3-3) Scotch Pine Coniferous Plantation Type
- (CUP3-4) Jack Pine Coniferous Plantation Type
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD5-6) Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type
- (FOD5-7) Dry - Fresh Sugar Maple - Black Cherry Deciduous Forest Type
- (H) Hedgerow
- (MAM2) Mineral Meadow Marsh Ecosite
- (MAM3) Organic Meadow Marsh Ecosite
- (SAF1) Floating-leaved Shallow Aquatic Ecosite
- (SWC3-2) White Cedar - Conifer Organic Coniferous Swamp Type
- (SWC4) Tamarack - Black Spruce Organic Coniferous Swamp Ecosite
- (SWD) Deciduous Swamp
- (SWM) Mixed Swamp
- (SWM1-1) White Cedar Mineral Mixed Swamp Ecosite
- (SWM4) White Cedar Organic Mixed Swamp Ecosite

***NOTE**: Vegetation communities identified and delineated beyond the limits of the subject property were determined based on 1) field surveys completed by NRSI biologists on adjacent lands where permission to access private property was obtained, 2) data collected from the subject property boundary and aerial imagery review, and 3) available open source data (CVC 2022)*

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681 Date: November 11, 2024	NAD83 - UTM Zone 17 Size: 24x36" **1:1,250**	N

0 10 20 30 40 50 60 70 80 Meters

Inset

0 10 20 30 40 50 60 Meters
1:450


Map 6a
Wellington Rd Hillsburgh EIS
Proposed Development
and Butternut Impacts
Marsville
Hillsburgh
Orton
Belfountain
Erin
Brisbane
COUNTY RD 3
WELLINGTON ROAD 26
WELLINGTON ROAD 22
TRAFALGAR RD
10TH LINE
8TH LINE
MAIN ST
WINSTON CHURCHILL BLVD
MCLAREN RD
9TH LINE
Legend
Subject Property
Proposed Development Footprint
Proposed Construction Footprint
Proposed Site Plan
Proposed Building Footprint
Proposed Fence
Proposed Servicing
Proposed Grading
Proposed Erosion and Sediment Control (ESC) Fence
Proposed Sediment Control Mat
Proposed Infiltration Gallery
Top of Bank (CVC 2023)
Top of Bank Buffer (10m) (JLP 2024)
Woodland/Forest Dripline (NRSI 2023)
Normalized Woodland Buffer
Woodland Buffer (1m)
Credit Valley Conservation Vegetation Limit (CVC 2023)
Credit Valley Conservation Vegetation Limit Buffer (10m)
Edge of Active Agriculture Field (NRSI 2023)
Butternut (Juglans cinerea) to be Retained
Butternut (Juglans cinerea) to be Removed
Butternut Habitat (25m)
Butternut Habitat (50m)
Butternut Root Harm Prevention Zone
Butternut Root Harm Prevention Zone Buffer (5m)
Proposed Permanent Impact to Butternut Habitat
Proposed Temporary Impact to Butternut Habitat
Ecological Land Classification (ELC) (CVC 2022)
Ecological Land Classification (ELC) (NRSI 2023)
(Ag) Agriculture
(CUM1-1) Dry - Moist Old Field Meadow Type
(CUP3-2) White Pine Coniferous Plantation Type
(CUT1) Mineral Cultural Thicket Ecosite
(CUW1) Mineral Cultural Woodland Ecosite
(FOD5-6) Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type
(FOD5-7) Dry - Fresh Sugar Maple - Black Cherry Deciduous Forest Type
(H) Hedgerow
(MAM2) Mineral Meadow Marsh Ecosite
(SAF1) Floating-leaved Shallow Aquatic Ecosite
(SWC3-2) White Cedar - Conifer Organic Coniferous Swamp Type
(SWC4) Tamarack - Black Spruce Organic Coniferous Swamp Ecosite
(SWM4) White Cedar Organic Mixed Swamp Ecosite
NOTE: Vegetation communities identified and delineated beyond the limits of the subject property were determined based on 1) field surveys completed by NRSI biologists on adjacent lands where permission to access private property was obtained, 2) data collected from the subject property boundary and aerial imagery review, and 3) available open source data (CVC 2022)
Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNR© Copyright: King's Printer Ontario.
Imagery: ESRI (2021/2018).
Project: 2681
Date: November 11, 2024
NAD83 - UTM Zone 17
Size: 24x36"
1:800
0 10 20 30 40 50 Meters
N
CUP3-2
FOD5-7
CUW1
CUP3-2
SWM4
FOD5-6
CUW1
CUP3-2
CUT1
Ag (Annual Row Crop)
H1
Residential
H3
WELLINGTON ROAD 22

Map 6b

Wellington Rd Hillsburgh EIS

Proposed Development and Butternut Impacts

Legend

- Subject Property
- Proposed Development Footprint
- Proposed Construction Footprint
- Proposed Site Plan
- Proposed Building Footprint
- Proposed Servicing
- Proposed Grading
- Proposed Erosion and Sediment Control (ESC) Fence
- Proposed Infiltration Gallery
- Woodland/Forest Dripline (NRSI 2023)
- Woodland Buffer (1m)
- Edge of Active Agriculture Field (NRSI 2023)
- Butternut (*Juglans cinerea*) to be Retained
- Butternut Habitat (25m)
- Butternut Habitat (50m)
- Butternut Root Harm Prevention Zone
- Butternut Root Harm Prevention Zone Buffer (5m)
- Proposed Permanent Impact to Butternut Habitat
- Ecological Land Classification (ELC) (NRSI 2023)
  - (Ag) Agriculture
  - (CUM1-1) Dry - Moist Old Field Meadow Type
  - (CUP3-2) White Pine Coniferous Plantation Type
  - (FOD5-7) Dry - Fresh Sugar Maple - Black Cherry Deciduous Forest Type
  - (H) Hedgerow

***NOTE**: Vegetation communities identified and delineated beyond the limits of the subject property were determined based on 1) field surveys completed by NRSI biologists on adjacent lands where permission to access private property was obtained, 2) data collected from the subject property boundary and aerial imagery review, and 3) available open source data (CVC 2022)*

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681 Date: November 11, 2024	NAD83 - UTM Zone 17 Size: 24x36" 1:300	N

0 4 8 12 16 20 Meters

Butternut ID 003-BN

0 4 8 12 16 20 Meters 1:600

Butternut ID 004-BN

0 4 8 12 16 20 Meters 1:600

Butternut ID 005-BN

0 4 8 12 16 20 Meters 1:600

Map 6c

Wellington Rd Hillsburgh EIS

Proposed Development and Butternut Impacts

Legend

- Subject Property
- Proposed Development Footprint
- Proposed Construction Footprint
- Proposed Site Plan
- Proposed Building Footprint
- Proposed Servicing
- Proposed Grading
- Proposed Erosion and Sediment Control (ESC) Fence
- Proposed Infiltration Gallery
- Butternut (*Juglans cinerea*) to be Retained
- Butternut Habitat (25m)
- Butternut Habitat (50m)
- Butternut Root Harm Prevention Zone
- Butternut Root Harm Prevention Zone Buffer (5m)
- Proposed Permanent Impact to Butternut Habitat
- Proposed Temporary Impact to Butternut Habitat
- Ecological Land Classification (ELC) (NRSI 2023)
  - (Ag) Agriculture
  - (H) Hedgerow

***NOTE**: Vegetation communities identified and delineated beyond the limits of the subject property were determined based on 1) field surveys completed by NRSI biologists on adjacent lands where permission to access private property was obtained, 2) data collected from the subject property boundary and aerial imagery review, and 3) available open source data (CVC 2022)*

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681 Date: November 11, 2024	NAD83 - UTM Zone 17 Size: 24x36" **1:300**	N

0 4 8 12 16 20 Meters

Butternut ID 012-BN

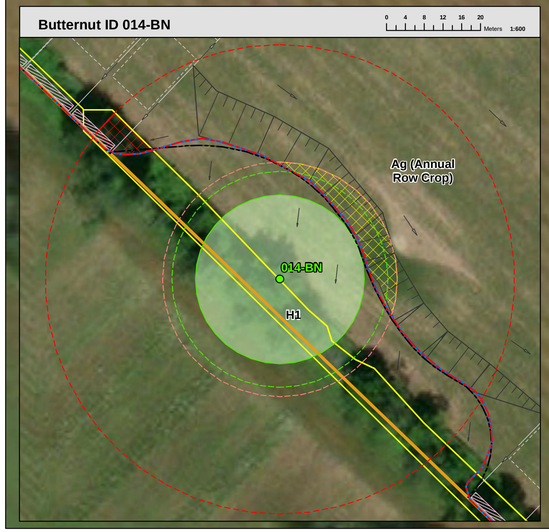
0 4 8 12 16 20 Meters 1:600

Butternut ID 013-BN

0 4 8 12 16 20 Meters 1:600

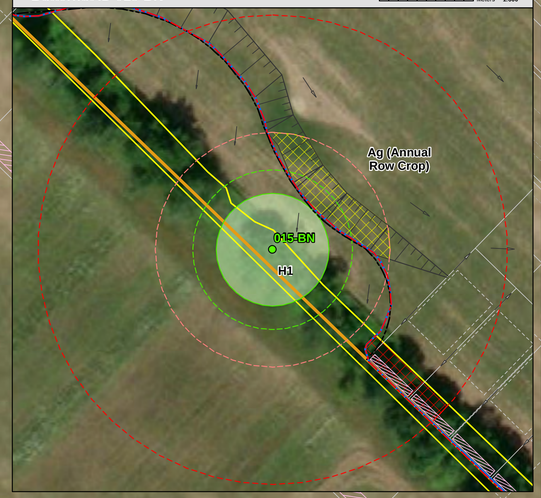
Butternut ID 014-BN

0 4 8 12 16 20 Meters 1:600



Butternut ID 015-BN

0 4 8 12 16 20 Meters 1:600



Butternut ID 016-BN

0 4 8 12 16 20 Meters 1:600

Appendix I
Species at Risk Screening Table

Scientific Name	Common Name	S-RANK[1]	SARO[2]	COSEWIC[3]	SARA[3]	SARA Schedule[3]	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Suitable Habitats within Study Area	Rationale	Observed within Subject Property
Birds												
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	Recovery Strategy for the Bank Swallow in Ontario (Falconer et al. 2016)	Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Usually on banks of river and lakes, but also found in sand and gravel pits.	No	Possible	No banks or cliffs are present within the subject property. Suitable nesting habitat may be present within the study area.	
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	Recovery Strategy for the Bobolink and Eastern Meadowlark in Ontario (McCracken et al. 2013)	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occasionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario.	No	Possible	Suitable grasslands are not present within the subject property, which is in agricultural production. Suitable grassland may be present within the study area.	
Sturnella magna	Eastern Meadowlark	S4B	THR	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.	No	Possible	Suitable grasslands are not present within the subject property, which is in agricultural production. Suitable grassland may be present within the study area.	
Mammals												
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	S1	END	E	E	Schedule 1	Dobbyn 1994	In Ontario, badgers are found in a variety of habitats, such as tallgrass prairie, sand barrens and farmland. These habitats provide badgers with small prey, including groundhogs, rabbits and small rodents. Soil is a major factor influencing their distribution and areas of sandy or loamy soils are preferred by the species in Ontario. They do not typically inhabit cultivated fields.	No	Possible	No suitable habitat present on subject property and no signs of presence detected (e.g., tracks). Soil substrate is too high in silt-clay. Suitable habitat may be present within the study area.	
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				Dobbyn 1994	Hibernates in cool caves and abandoned mines; roosts in rocky habitats including talus slopes and open rock barrens. May also roost in man-made structures, however, very rarely; foraging habitat poorly understood in Ontario. Within the United States of America, it feeds primarily in forests, but also over waterbodies, within riparian forests, and occasionally open fields.	No	Possible	No suitable roosting habitat is present within the subject property. Suitable structures may be present within the study area, although they are rarely used by this species.	
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	Dobbyn 1994	Hibernates in cool, humid caves and abandoned mines; uses caves, quarries, tunnels, hollow trees or tree cavities, or buildings for roosting and maternity colonies; forages over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Yes	Possible	Suitable roosting habitat in isolated snags and trees with roost features (e.g., exfoliating bark, cracks, crevices, etc.) is present within the subject property. Suitable roosting habitat is likely present within the woodland to the northeast of the study area. Anthropogenic structures are also present in the study area that may be used by the species for roosting.	
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	Dobbyn 1994	Hibernates in cool, humid caves and abandoned mines; uses hollow trees or tree cavities, loose bark, or buildings for roosting and maternity colonies; forages within treed habitats over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Yes	Possible	Suitable roosting habitat in isolated snags and trees with roost features (e.g., exfoliating bark, cracks, crevices, etc.) is present within the subject property. Suitable roosting habitat is likely present within the woodland to the northeast of the study area. Anthropogenic structures are also present in the study area that may be used by the species for roosting.	
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1	Dobbyn 1994	Hibernates in cool, humid caves and abandoned mines; maternity colony and roosting habitat poorly understood in Ontario. Elsewhere within its range, this species has been documented to use dead/dying leaf clusters, arboreal lichens and epiphytes, or buildings for roosting and maternity colonies; forages over still water, rivers, wetlands, in forest gaps, edges, or along trails.	Yes	Possible	Suitable roosting habitat in isolated trees that have the potential to provide roost features (i.e., dead/dying leaf clusters in maple species) is present within the subject property. Suitable roosting habitat may also be present within the woodland to the northeast of the study area.	

Scientific Name	Common Name	S-RANK[1]	SARO[2]	COSEWIC[3]	SARA[3]	SARA Schedule[3]	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Suitable Habitats within Study Area	Rationale	Observed within Subject Property
Plants												
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	MNRF 2023b	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.	Yes	Possible	Suitable habitat is present within the subject property (limited to roadside and hedgerows) and study area. 16, pure Category 2, trees have been confirmed as present in the subject property.	*Yes*

Appendix II
Species of Conservation Concern Screening Table

Scientific Name	Common Name	S-RANK[1]	SARO[2]	COSEWIC[3]	SARA[3]	SARA Schedule[3]	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Suitable Habitats within Study Area	Rationale	Observed within Subject Property
Birds												
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	MNRF 2022b, BSC et al. 2006	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	No	Yes	No structures are present within the subject property. Suitable nesting habitat within structures is present within the study area.	
Cardellina canadensis	Canada Warbler	S4B	SC	SC	T	Schedule 1	BSC et al. 2006	An interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30 ha.	No	Yes	No forest is present within the subject property. Suitable forest may be present to the northeast of the subject property within the study area.	
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	MNRF 2022b, BSC et al. 2006	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks	No	Yes	No forest is present within the subject property. Suitable forest is present to the northeast of the subject property within the study area.	Yes
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	BSC et al. 2006	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland > 10 ha	No	Possible	Suitable grasslands are not present within the subject property, which is in agricultural production. Suitable grassland may be present within the study area.	
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	BSC et al. 2006	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	No	Yes	No forest is present within the subject property. Suitable forest is present to the northeast of the subject property within the study area.	
Herpetofauna												
Chelydra serpentina serpentina	Common Snapping Turtle	S4	SC	SC	SC	Schedule 1	MNRF 2022b, Ontario Nature 2019	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	No	Yes	No watercourses or wetlands are present within the subject property. Suitable wetland habitat is present to the northeast of the subject property within the study area.	
Mammals												
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	Dobbyn 1994	In Ontario, the Woodland Vole lives in mature deciduous forest in the Carolinian region where there is a deep litter layer that allows it to burrow.	No	Possible	No forest is present within the subject property, but suitable forest habitats may be present within the study area.	
Insects												
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	Macnaughton et al. 2021	Open areas with milkweed species (*Asclepias spp.*).	Possible	Possible	The presence of Milkweed spp. is minimal, but suitable habitat is present within the subject property (limited to roadside and hedgerows) and study area.	

Appendix III
Significant Wildlife Habitat Screening Tables

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	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). • 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[cxlviii]. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	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"[ccxi] • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • 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[cxlix] Index #7 provides development effects and mitigation measures.	No evidence of spring flooding in agricultural fields is evident based on a review of aerial imagery. **Subject Property: Not SWH** **Study Area: Not SWH**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
Rationale: 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.	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 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	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water 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). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[l] or more of listed species for 7 days[l], results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • 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[cxlix] Index #7 provides development effects and mitigation measures.	None of the listed communities are present within the subject property. Suitable habitat may be present in ponds to the north, east and south of the subject property, within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shorebird Migratory Stopover Area					
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	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 Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	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. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • 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 (<24hrs) 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 100m radius area[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #8 provides development effects and mitigation measures.	None of the listed communities are present within the subject property. Suitable shoreline habitat is not present in ponds to the north, east and south of the subject property, within the study area. **Subject Property: Not SWH** **Study Area: Not SWH**
Wildlife Habitat: Raptor Wintering Area					
Rational: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha[cxlviii, cxlix] with a combination of forest and upland.[xvi, xvii, xviii, xix, xx, xxi] Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] 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 Information Sources • OMNRF Ecologist or Biologist • Field Naturalist Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] 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"[ccxi] • SWHMiST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	The subject property is characterized as an active, row-crop agricultural field, but forest (FOD) and upland (CUT, CUW) vegetation communities are present to the north and northeast of the subject property and extend slightly into the subject property. The size of the vegetation communities that extend to within the subject property do not meet the size criteria, however, suitable wintering habitat may be present beyond the limits of the subject property, and specifically, to the northeast of the subject property. **Subject Property: Not SWH** **Study Area: Candidate SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Hibernacula					
Rationale Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• 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. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum[cxlviii, ccvii] for most. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv] • SWHMiST[cxlix] Index #1 provides development effects and mitigation measures.	None of the listed communities are present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**
Wildlife Habitat: Bat Maternity Colonies					

Rationale:
Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.
	Big Brown Bat
	Silver-haired Bat
		Maternity colonies considered SWH are found in forested Ecosites.
		
		All ELC Ecosites in ELC Community Series:
		FOD
		FOM
		SWD
		SWM
			Maternity colonies can be found in tree cavities, vegetation and often in buildings[xxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH).
			• Maternity roosts are not found in caves and mines in Ontario[xxii]
			• Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]
			• Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]
			• 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[ccx]
			
			Information Sources
			• OMNRF for possible locations and contact for local experts
			• University Biology Departments with bat experts.
				• Maternity Colonies with confirmed use by:
				  • >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.
				• Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects[ccv]
				• SWHMiS T[cxlix] Index #12 provides development effects and mitigation measures.
					Two candidate bat roost trees of suitable size (> 25 cm DBH) were identified within the FOD5-7 vegetation community along the north boundary of the subject property. A FOD5-7 vegetation community is also present at the northeastern corner of the subject property, and extends off-property. Suitable habitat may also be present within the study area, adjacent to the subject property.
					
					Subject Property: Candidate SWH
					Study Area: Candidate SWH

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to 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[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• 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 (Sept. – Oct.) or spring (Mar. – May)[cvii] • Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	None of the listed communities are present within the subject property. Suitable habitat is present within the study area to the northeast of the subject property. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: Reptile Hibernaculum					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of 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 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the 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[xliv, l, li, liii, cxii]. • 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 ground cover. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • 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 (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • 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 in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[l] • SWHMiST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Suitable habitat is not present in the subject property as a result of the current use of the land for agricultural row crops. Suitable habitat may be present within natural features adjacent to the subject property, within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					
Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• 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 soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas [ccv] • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii] • 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"[ccxi] • SWHMiST[cxlix] Index #4 provides development effects and mitigation measures	Suitable habitat is not present within the subject property due to a lack of vertical cliffs, hills, or embankments. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: 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.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• 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 15m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5[l] or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH [cc, ccvii] • 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[cxlix] Index #5 provides development effects and mitigation measures.	None of the listed communities are present within the subject property. Suitable habitat may be present within the study area to the northeast of the subject property. **Subject Property: Not SWH** **Study Area: Candidate SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					
Rationale: Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	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 CUT CUS	• 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 or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • 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[i]. • 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 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii] • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #6 provides development effects and mitigation measures.	No suitable habitat is present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: Field: CUM CUS CUT Forest: FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	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 Ontario[cxlix]. • 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[xxxii, xxxiii, xxxiv, xxxv, xxxvi.] • 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 cxlviii, cxlix. • 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[xxxvii, xxxviii, xxxix, xl, xli.] Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. 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[xxxvii], significant variation can occur between years and multiple years of sampling should occur [xl, xlii]. • 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[cxlix] Index #16 provides development effects and mitigation measures.	Study area is greater than 5km from Lake Ontario. **Subject Property: Not SWH** **Study Area: Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Landbird Migratory Stopover Areas					
Rationale: Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha[i] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant[cxlix] • Sites have a variety of habitats; forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot 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 (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #9 provides development effects and mitigation measures.	Study area is greater than 5km from Lake Ontario. **Subject Property: Not SWH** **Study Area: Not SWH**
Wildlife Habitat: Deer Yarding Areas					
Rationale: Winter habitat for deer is considered to be the main 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.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• 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 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm 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, hemlock, cedar, spruce) with a canopy cover of more than 60%[cxciv]. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"[cxcv] • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH[lvi, lvii, lviii, lix, lx, i]. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF 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[cxcv]. • 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[cxlix] Index #2 provides development effects and mitigation measures.	No Deer Yarding Areas have not been identified within the subject property or study area by the MNRF. **Subject Property: Not SWH** **Study Area: Not SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas					
Rationale: 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[cxlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • 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 MNR[i]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv] , ground or road surveys, or a pellet count deer density survey[ccxxv]. • If a SWH is determined for Deer Wintering Area of 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[cxlix] Index #2 provides development effects and mitigation measures.	The MNRF has identified White-tailed Deer Wintering Area (Stratum 2) within the study area to the south of the subject property. **Subject Property: Not SWH** **Study Area: Confirmed SWH**

Significant Wildlife Habitat Assessment Tables

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

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMiST[cxlix] Index #21 provides development effects and mitigation measures.	None of the listed communities are present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[i]. • SWHMiST[cxlix] Index #20 provides development effects and mitigation measures.	None of the listed communities are present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**

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

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Alvar					
Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleochairs compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5 ha in size[lxxv]. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species[lxxv, cxlix] at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMiST[cxlix] Index #17 provides development effects and mitigation measures.	None of the listed communities are present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii] • The stand will have experienced no recognizable forestry activities[cxlviii] • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand[lxxviii] • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	Old growth forest is not present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**

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

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Savannah					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST[cxlix] Index #18 provides development effects and mitigation measures.	None of the listed communities are present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST[cxlix] Index #19 provides development effects and mitigation measures.	None of the listed communities are present within the subject property or study area. **Subject Property: Not SWH** **Study Area: Not SWH**

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

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii] The OMNR/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	No rare vegetation communities are present within the subject property, but may be present in the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST[cxlix] Index #25 provides development effects and mitigation measures.	The subject property is currently in active agricultural production and therefore does not provide suitable habitat. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: 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.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top of a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi], ccvii. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant[ccvii] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	FOD vegetation communities (e.g., FOD5-7) are present along the subject property boundary and are associated with the West Credit River valleylands and Provincially Significant Wetland complex. However, no potential Osprey or Bald Eagle nests were observed within the subject property during field investigations. Suitable habitat is present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[bxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Forested vegetation communities are present along the subject property boundary that may provide interior habitat off-property. No potential woodland raptor nests were observed on the subject property during field investigations. Suitable habitat is present within the study area, adjacent to the subject property. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[i] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	The subject property consists of an active agricultural field which may provide marginal nesting habitat and is approximately 65 m from a wetland community. However, it is not recommended to identify active agricultural fields as significant turtle nesting habitat as they are known to act as a population sink due to hatchling mortality during crop harvesting and potentially other agricultural practices (e.g., chemical treatments). Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	No headwater areas, including seeps or springs, are present within the subject property. Seeps and springs may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[cbxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	No wetlands, ponds, or woodland pools are present within the subject property. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)[lxxi, lxxiii], or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys[cviii] will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #15 provides development effects and mitigation measures.	None of the listed communities are present within the subject property. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clviii, clix • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	No interior forests are present within the subject property. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[l]. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[l]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #35 provides development effects and mitigation measures	None of the listed communities are present within the subject property. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[l]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #32 provides development effects and mitigation measures.	No large grasslands >30 ha are present within the subject property as it is in active agricultural row-crop production. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha[clxiv] 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)[i]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[i]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #33 provides development effects and mitigation measures.	Suitable shrub and thicket habitat >10 ha in size is not present within the subject property. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.[ccii]	Chimney or Digger Crayfish: (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish: (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci] • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult[cci] • SWHMiST[cxlix] Index #36 provides development effects and mitigation measures.	None of the listed communities are present within the subject property. Suitable habitat may be present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	One Special Concern and Provincially Rare species, Eastern Wood Pewee (*Contopus virens*), has been documented during field investigations completed within the subject property. Refer to Species of Conservation Concern Screening for details (Appendix II). Candidate habitat for one Special Concern and Provincially Rare species, Monarch (*Danaus plexippus*), has also been documented within the subject property. NHIC's species conservation status ranks estimate the risk of a species going extinct or being extirpated. NHIC has assigned Monarch an S-RANK of "S2N, S4B" which indicates that the breeding population is apparently secure and the non-breeding population (i.e., migrating population) is imperiled. Because the breeding population is apparently secure, critical habitats for Monarch are currently only protected under the SWH type, Migratory Butterfly Stopover Areas, which is not present within the subject property. **Subject Property: Confirmed SWH** **Study Area: Confirmed SWH**

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. Information Sources • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat – Wetland SWH is candidate for the study area, but is not present in the subject property. Due to the potential presence of Amphibian Breeding Habitat - Wetland SWH in the study area, there is therefore potential for movement corridors in the subject property, however, it is considered unlikely as the subject property is currently characterized as an active, row-crop agricultural field. **Subject Property: Not SWH** **Study Area: Candidate SWH**
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule[i]. • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix] . Shorter corridors are more significant than longer corridors[cxlix] • SWHMiST[cxlix] Index #39 provides development effects and mitigation measures.	The MNRF has identified White-tailed Deer Wintering Area (Stratum 2) within the study area to the south of the subject property. Movement corridors are likely present within the study area. **Subject Property: Not SWH** **Study Area: Candidate SWH**

Significant Wildlife Habitat Assessment Tables

Table 6. Exceptions for Ecodistricts within Ecoregion 6E.

	Wildlife Habitat and Species	Candidate SWH			Confirmed SWH	Study Area
		Ecosites	Habitat Description	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
EcoDistrict: 6E-14						
Rationale: The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracks with mast producing tree species is important for bears. [clxxxvi, ccxvii]	**Mast Producing Areas** Black Bear	All Forested habitat represented by ELC Community Series: FOM FOD	• Black bears require forested habitat that provides cover, winter hibernation sites, and mast producing tree species. [clxxxv, clxxxvii, clxxxviii, clxxxix, cxc, cxci, cxcii, cxciii, ccxvii] • Forested habitats need to be large enough to provide cover and protection for black bears [ccxvii].	Woodland ecosites >30ha with mast-producing tree species, either soft (cherry) or hard (oak and beech), Information Sources Important forest habitat for black bears may be identified by OMNRF.	• All woodlands > 30 ha with a 50% composition of these ELC Vegetation Types are considered significant: FOM1-1 FOM2-1 FOM3-1 FOD1-1 FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5 • SWHMiST [cxlix] Index #3 provides development effects and mitigation measures.	Study area is not located on the Bruce Peninsula. **Subject Property: Not SWH** **Study Area: Not SWH**
EcoDistrict: 6E-17						
Rationale: Sharp-tailed grouse only occur on Manitoulin Island in Ecoregion 6E, Leks are an important habitat to maintain their population	**Lek** Sharp-tailed Grouse	CUM CUS CUT	• The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topographyccxix. • Leks are typically a grassy field/meadow >15h with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated. ccxix	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland[ccxix]. • 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[ccxix] Information Sources • OMNRF district office • Bird watching clubs • Local landowners • Ontario Breeding Bird Atlas	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	Study area is not located on Manitoulin Island. **Subject Property: Not SWH** **Study Area: Not SWH**

Appendix IV
Terms of Reference

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

March 31, 2023 Project No. 2681

Tom McLaughlin
Thomasfield Homes
295 Southgate Drive
Guelph ON
N1G 3M5

Dear Tom McLaughlin,

RE: 9354 Wellington Road 22, Hillsburgh, Town of Erin, Thomasfield Homes Subdivision Scoped Environmental Impact Study Draft Terms of Reference

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide this draft Terms of Reference (TOR) to conduct a Scoped Environmental Impact Study (EIS) for the proposed development of a residential subdivision located at Part Lot 23, Concession 7, Wellington Road 22 in the settlement of Hillsburgh, Wellington County, Ontario (Map 1).

The subject property is currently characterized by an active agricultural field and the surrounding land use is primarily agricultural and natural environment. The subject property is within the Hillsburgh Urban Area and is designated as Residential, and a small portion as Core Greenlands (Town of Erin 2012). The West Credit River, West Credit River Provincially Significant Wetland (PSW) Complex and a woodland feature are located immediately to the northeast of the subject property. These natural features are identified as Core Greenlands by the Town of Erin (2012). The PSW is further identified as Core Greenlands by Wellington County (2021). Due to the size of the woodland feature (>1ha), it is also further identified as Greenlands and a Significant Woodland by the County (Wellington County 2021).

Due to the presence of wetlands and a watercourse to the northeast, a portion of the subject property is regulated by the Credit Valley Conservation Authority (CVC) under Ontario Regulation 160/06. In accordance with the CVC regulation governing development within or adjacent to regulated features, as well as municipal and county policy, a Scoped EIS is required to demonstrate that the proposed development will not negatively impact existing natural features or their ecological functions.

Please do not hesitate to contact me if you have any questions or comments regarding the content of the following proposed TOR.

Sincerely,
Natural Resource Solutions Inc.

Heather Fotherby, M.Sc., P.Biol.
Terrestrial and Wetland Biologist

Part Lot 23, Concession 7, Hillsburgh Scoped Environmental Impact Study
Draft Terms of Reference
November 7, 2022

Introduction

A residential subdivision is proposed to be constructed at Part Lot 23, Concession 7, Wellington Road 22 in the Village of Hillsburgh, Wellington County, Ontario (Map 1). The subject property is characterized by an active agricultural field and the surrounding land use is primarily agricultural and natural environment. The subject property is within the Hillsburgh Urban Area and is designated as Residential, and a small portion as Core Greenlands (Town of Erin 2012). The West Credit River, West Credit River Provincially Significant Wetland (PSW) Complex and a woodland feature are located immediately to the northeast of the subject property. These natural features are identified as Core Greenlands by the Town of Erin (2012). The PSW is further identified as Core Greenlands by Wellington County (2021). Due to the size of the woodland feature (>1ha), it is also further identified as Greenlands and a Significant Woodland by the County (Wellington County 2021).

Due to the presence of wetlands and a watercourse to the northeast, a portion of the subject property is regulated by the Credit Valley Conservation Authority (CVC) under Ontario Regulation 160/06. In accordance with the CVC regulation governing development within or adjacent to regulated features, as well as municipal and county policy, a Scoped Environmental Impact Study (EIS) is required to demonstrate that the proposed development will not negatively impact existing natural features or their ecological functions.

The following identifies the scope of work required to complete the EIS for the proposed development. The identified scope of work is being submitted as a draft TOR to the CVC, Wellington County and Town of Erin for review and approval. The review will ensure that a suitable level of field effort is being executed to appropriately identify existing habitat and species within and adjacent to the subject property.

Project Approach

The completion of a Scoped EIS will consist of the following components:

1. Background information review;
2. Field surveys to characterize existing natural heritage features and functions within the subject property; and
3. Reporting, which will include the following:
    a. Identification of opportunities and constraints in relation to existing natural heritage features; and
    b. Impact analysis, including the identification of potential impacts from the proposed development and recommendation of mitigative measures.

Study Area

For the purposes of this TOR, the term “subject property” refers to the lands within which the development is proposed to occur. The term “study area” refers to the subject property plus the surrounding area for which additional information has been collected and reviewed, as could be gathered without direct access to these areas. The limits of the study area were defined based on available background information and the province’s natural heritage policies pertaining to lands adjacent to natural heritage features. All lands within 1 to 10km of the property boundary

where legacy data has been collected by agencies and wildlife atlases were included in the study area. All natural heritage features within 250m of the subject property boundary were also included in the study area in order to address Section 2.1.8 of the Provincial Policy Statement (PPS) which states that development and site alteration are not permitted on adjacent lands to natural heritage features 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 feature or its ecological functions (OMMAH 2020).

Background Information Collection and Review

All available existing background natural environment information for the subject property and adjacent lands has been collected and reviewed. This information has been compiled and assessed for data gaps and was gathered from the following sources:

- Natural Heritage Information Centre (NHIC) (MNRF 2022b);
- Ontario Ministry of Environment, Conservation and Parks (MECP);
- Ministry of Natural Resources and Forestry (MNRF);
- Credit Valley Conservation (CVC);
- CVC Regulation Mapping (2021);
- Town of Erin Official Plan (2021);
- Wellington County Official Plan (2022);
- Ontario Breeding Bird Atlas (BSC et al. 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (Macnaughton et al. 2022); and
- Ontario Odonate Atlas (OOAD 2021).

A preliminary Species at Risk (SAR) and Species of Conservation Concern (SCC) screening exercise has also been completed to inform this TOR and is provided in Appendix I. This involved cross-referencing the preferred habitats for reported SAR and SCC against habitats known to occur in the study area based on aerial imagery interpretation and field investigations.

A preliminary screening exercise has also been completed to assess the potential presence for Significant Wildlife Habitats (SWH) within the study area and is provided in Appendix II. This screening exercise was based on aerial imagery interpretation and field investigations, and used discrete significance criteria established by the MNDMNRF (MNRF 2015).

NRSI has submitted background information requests to the MNDMNRF and the MECP. New information provided in responses will be addressed in the EIS report or through other agency requirements.

Field Investigations

The following field studies are proposed to characterize and delineate the existing natural features and wildlife habitats within and adjacent to the subject property to inform the EIS. The following studies were scoped based on the proposed concept plan for the residential subdivision. The proposed development footprint will not encroach to within any adjacent significant natural features, including the Significant Woodland feature along the northeast subject property boundary. Currently, residential lots and a Stormwater Management (SWM) pond are proposed along the northeast subject property boundary. A 10 m buffer is proposed to be applied to the Significant Woodland feature and maintained in a natural state behind all proposed residential lots. The buffer is currently an active agricultural field and is anticipated to

require restoration in order to function as a buffer. Restoration activities may involve ground disturbance (i.e., grading) during the construction phase of the proposed development. The proposed SWM pond and associated grading, berms, energy dissipation structures, etc., will be constructed up to the property line, but outside of the Significant Woodland feature.

Field Studies Completed in 2021:

- Vegetation community classification and delineation in accordance with the Ecological Land Classification (ELC) for Southern Ontario Protocol 2nd Edition (Lee et al. 1998) (Map 2).
- Fall vegetation inventory of vascular flora species within each vegetation community.
- Inventory of all trees ≥10cm Diameter at Breast Height (DBH) on the subject property and adjacent areas with the potential to be impacted by the proposed development. Inventoried trees were assessed by a Certified Arborist or Registered Professional Forester (RPF).
- Bat habitat assessment of all trees ≥10cm DBH with the potential to be impacted by the proposed development. The habitat assessment occurred in December 2021, during the leaf-off season, following provincial protocols (MNRF 2017).
- Candidate SWH and habitat for SAR that was identified during the desktop screening exercise was further examined in the field.
- Incidental observations of all wildlife species were recorded, including direct and indirect observations such as tracks, scat, vocalizations, etc.

Field Studies to be completed in 2023:

- Woodland dripline delineation and review with agency staff.
- Spring and summer inventory of vascular flora species within each vegetation community.
- Three early morning breeding bird surveys according to the Ontario Breeding Bird Atlas methodology to understand bird breeding habitat use of the subject property
- Headwater Drainage Feature (HDF) Assessment following the current Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation evaluation, classification and management of HDF guidelines.
- Aquatic habitat characterization of the West Credit River to document flow regime, adjacent land uses, basic channel morphology, substrates, in-water habitat and cover, riparian and shoreline habitat and cover, aquatic vegetation, important habitat features and *in-situ* water quality (temperature, pH and dissolved oxygen) 25 meters upstream and 40 meters downstream of the proposed stormwater management outlet location to the river. The West Credit River will be assessed in terms of potential to provide fish habitat and the quality of available habitat.

Reporting

An EIS report will be prepared to summarize the findings of the background information review and field surveys described above. This report will provide a characterization of the natural features within and adjacent to the subject property and identify natural environment constraints, such as significant habitat features and habitats for significant species. The report will include detailed mapping of natural heritage features and recommended buffers, as appropriate. Any other aspects of natural feature significance or sensitivity identified through the field surveys will be incorporated.

The details of the proposed undertaking will be reviewed and compared to the existing conditions documented within and adjacent to the subject property. To assess the sensitivity of

and potential impacts to the PSW adjacent to the subject property, the details of the proposed undertaking will be incorporated into a Wetland Water Balance Risk Evaluation following current TRCA guidelines. The impact assessment will identify areas where the proposed undertaking conflicts with significant natural features and habitats such that negative impacts may occur. Recommendations will be provided to avoid, or otherwise minimize or mitigate anticipated impacts.

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MAPS

Maps have been removed from the TOR as they have been updated and are provided in the EIS as Map 1 and 2

Appendix I

Appendix I has been removed from the TOR as it has been updated and is provided in the EIS as Appendix I and II

Appendix II

Appendix II has been removed from the TOR as it has been updated and is provided in the EIS as Appendix III

Appendix V
Vegetation Species Reported from the Study Area

Plant Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NHIC Data*	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	MNRF 2023b	NRSI Results from 2021 to 2023
Pteridophytes	**Ferns & Allies**							
Dryopteridaceae	**Wood Fern Family**							
Dryopteris carthusiana	Spinulose Wood Fern	S5						X
Matteuccia struthiopteris	Ostrich Fern	S5						X
Equisetaceae	**Horsetail Family**							
Equisetum arvense	Field Horsetail	S5						X
Gymnosperms	**Conifers**							
Pinaceae	**Pine Family**							
Larix decidua	European Larch	SE2						X
Larix laricina	Tamarack	S5						X
Picea glauca	White Spruce	S5						X
Pinus strobus	Eastern White Pine	S5						X
Pinus sylvestris	Scots Pine	SE5						X
Dicotyledons	**Dicots**							
Aceraceae	**Maple Family**							
Acer negundo	Manitoba Maple	S5						X
Acer platanoides	Norway Maple	SE5						X
Acer saccharinum	Silver Maple	S5						X
Acer saccharum	Sugar Maple	S5						X
Apiaceae	**Carrot or Parsley Family**							
Daucus carota	Wild Carrot	SE5						X
Asclepiadaceae	**Milkweed Family**							
Asclepias syriaca	Common Milkweed	S5						X

Plant Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NHIC Data*	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	MNRF 2023b	NRSI Results from 2021 to 2023
Asteraceae	**Composite or Aster Family**							
Arctium minus	Common Burdock	SE5						X
Erigeron annuus	Annual Fleabane	S5						X
Erigeron canadensis	Canada Horseweed	S5						X
Erigeron philadelphicus	Philadelphia Fleabane	S5						X
Erigeron strigosus	Rough Fleabane	S5						X
Eutrochium maculatum	Spotted Joe Pye Weed	S5						X
Hieracium scabrum	Rough Hawkweed	S4						X
Leucanthemum vulgare	Oxeye Daisy	SE5						X
Picris hieracioides	Hawkweed Oxtongue	SE5						X
Pilosella caespitosa	Meadow Hawkweed	SE5						X
Solidago sp.	Goldenrod sp.							X
Solidago canadensis	Canada Goldenrod	S5						X
Sonchus arvensis	Field Sow-thistle	SE5						X
Symphyotrichum lanceolatum	Panicled Aster	S5						X
Symphyotrichum novae-angliae	New England Aster	S5						X
Taraxacum officinale	Common Dandelion	SE5						X
Tragopogon dubius	Yellow Goat's-beard	SE5						X
Berberidaceae	**Barberry Family**							
Caulophyllum giganteum	Giant Blue Cohosh	S5						X
Boraginaceae	**Borage Family**							
Myosotis arvensis	Rough Forget-me-not	SE4						X
Brassicaceae	**Mustard Family**							
Alliaria petiolata	Garlic Mustard	SE5						X
Barbarea vulgaris	Bitter Wintercress	SE5						X
Caprifoliaceae	**Honeysuckle Family**							
Lonicera periclymenum	European Honeysuckle	SEH						X
Lonicera tatarica	Tatarian Honeysuckle	SE5						X
Sambucus canadensis	Common Elderberry	S5						X
Sambucus racemosa	Red Elderberry	S5						X
Viburnum opulus	Cranberry Viburnum	S5						X
Caryophyllaceae	**Pink Family**							
Cerastium fontanum	Common Mouse-ear Chickweed	SE5						X
Silene vulgaris	Bladder Campion	SE5						X

Plant Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NHIC Data*	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	MNRF 2023b	NRSI Results from 2021 to 2023
Celastraceae	**Staff-tree Family**							
Euonymus europaeus	European Euonymus	SE2						X
Clusiaceae	**St. John's-wort Family**							
Hypericum perforatum	Common St. John's-wort	SE5						X
Cornaceae	**Dogwood Family**							
Cornus alternifolia	Alternate-leaved Dogwood	S5						X
Cornus racemosa	Gray Dogwood	S5						X
Cornus sericea	Red-osier Dogwood	S5						X
Elaeagnaceae	**Oleaster Family**							
Elaeagnus umbellata	Autumn Olive	SE3						X
Fabaceae	**Pea Family**							
Lotus corniculatus	Garden Bird's-foot Trefoil	SE5						X
Medicago lupulina	Black Medic	SE5						X
Trifolium pratense	Red Clover	SE5						X
Vicia cracca	Tufted Vetch	SE5						X
Geraniaceae	**Geranium Family**							
Geranium robertianum	Herb-Robert	S5						X
Grossulariaceae	**Currant Family**							
Ribes americanum	Wild Black Currant	S5						X
Ribes rubrum	Northern Red Currant	SE5						X
Hydrophyllaceae	**Water-leaf Family**							
Hydrophyllum virginianum	Virginia Waterleaf	S5						X

Plant Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NHIC Data*	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	MNRF 2023b	NRSI Results from 2021 to 2023
Juglandaceae	**Walnut Family**							
Juglans cinerea	Butternut	S2?	END	E	E	Schedule 1	X	X
Juglans nigra	Black Walnut	S4?						X
Lamiaceae	**Mint Family**							
Clinopodium vulgare	Field Basil	S5						X
Galeopsis tetrahit	Common Hemp-nettle	SE						X
Glechoma hederacea	Ground Ivy	SE5						X
Leonurus cardiaca	Common Motherwort	SE5						X
Nepeta cataria	Catnip	SE5						X
Moraceae	**Mulberry Family**							
Morus alba	White Mulberry	SE5						X
Oleaceae	**Olive Family**							
Fraxinus americana	White Ash	S4						X
Syringa vulgaris	Common Lilac	SE5						X
Onagraceae	**Evening-primrose Family**							
Circaea canadensis	Broad-leaved Enchanter's Nightshade	S5						X
Oxalidaceae	**Wood Sorrel Family**							
Oxalis stricta	Upright Yellow Wood-sorrel	SE5						X
Papaveraceae	**Poppy Family**							
Chelidonium majus	Greater Celandine	SE5						X
Polygonaceae	**Smartweed Family**							
Rumex crispus	Curly Dock	SE5						X
Ranunculaceae	**Buttercup Family**							
Actaea rubra	Red Baneberry	S5						X
Anemonastrum canadense	Canada Anemone	S5						X
Ranunculus acris	Tall Buttercup	SE5						X
Rhamnaceae	**Buckthorn Family**							
Rhamnus cathartica	Common Buckthorn	SE5						X

Plant Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NHIC Data*	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	MNRF 2023b	NRSI Results from 2021 to 2023
Rosaceae	**Rose Family**							
Agrimonia striata	Woodland Agrimony	S4						X
Crataegus sp.	Hawthorn sp.							X
Crataegus punctata	Dotted Hawthorn	S5						X
Filipendula ulmaria	Queen-of-the-meadow	SE1						X
Fragaria virginiana	Wild Strawberry	S5						X
Geum canadense	White Avens	S5						X
Geum urbanum	Wood Avens	SE3						X
Geum x catlingii	*(Geum canadense X Geum urbanum)*	SNA						X
Malus pumila	Common Apple	SE4						X
Prunus avium	Sweet Cherry	SE4						X
Prunus serotina	Black Cherry	S5						X
Prunus virginiana	Choke Cherry	S5						X
Rubus allegheniensis	Allegheny Blackberry	S5						X
Rubus idaeus	Common Red Raspberry	S5						X
Rubus occidentalis	Black Raspberry	S5						X
Sorbus americana	American Mountain-ash	S5						X
Rubiaceae	**Madder Family**							
Galium mollugo	Smooth Bedstraw	SE5						X
Scrophulariaceae	**Figwort Family**							
Linaria vulgaris	Butter-and-eggs	SE5						X
Verbascum thapsus	Common Mullein	SE5						X
Veronica officinalis	Common Speedwell	SE5						X
Solanaceae	**Nightshade Family**							
Solanum dulcamara	Bittersweet Nightshade	SE5						X
Tiliaceae	**Linden Family**							
Tilia americana	American Basswood	S5						X
Ulmaceae	**Elm Family**							
Ulmus americana	American Elm	S5						X
Violaceae	**Violet Family**							
Viola arvensis	European Field Pansy	SE4						X
Viola pubescens var. pubescens	Downy Yellow Violet	S5						X
Vitaceae	**Grape Family**							
Parthenocissus vitacea	Thicket Creeper	S5						X
Vitis riparia	Riverbank Grape	S5						X

Plant Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	NHIC Data*	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	MNRF 2023b	NRSI Results from 2021 to 2023
Monocotyledons	**Monocots**							
Liliaceae	**Lily Family**							
Erythronium americanum	Yellow Trout-lily	S5						X
Maianthemum racemosum	Large False Solomon's Seal	S5						X
Trillium erectum	Red Trillium	S5						X
Poaceae	**Grass Family**							
Bromus inermis	Smooth Brome	SE5						X
Dactylis glomerata	Orchard Grass	SE5						X
Elymus repens	Creeping Wildrye	SE5						X
Phleum pratense	Common Timothy	SE5						X
Poa pratensis	Kentucky Bluegrass	S5						X
Total							**1**	**109**

*NHIC Atlas Squares: 17NJ6848, 17NJ6948, 17NJ6847, 17NJ6947

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Appendix VI
Tree Preservation Plan

9354 Wellington Road 22 Residential Subdivision Hillsburgh Ontario

Tree Preservation Plan

Prepared for:

Thomasfield Homes Ltd.
295 Southgate Drive
Guelph, ON N1H 6N2

Project No. 2681 | November 2023

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

9354 Wellington Road 22
Residential Subdivision
Hillsburgh Ontario

Tree Preservation Plan

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Report submitted on November 15, 2023

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Registered Professional Forester (#2588)

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Thomasfield Homes in August 2021 to complete an Environmental Impact Study (EIS) and corresponding Tree Preservation Plan (TPP) for the proposed development of a residential subdivision ("proposed development") located at Part Lot 23, Concession 7, Wellington Road 22 in the settlement of Hillsburgh, Wellington County, Ontario ("subject property") (Map 1).

The subject property primarily consists of an active agricultural field surrounded by hedgerows and wooded areas. The subject property falls within the Hillsburgh Urban Area and is designated as Residential, with a small portion identified as Core Greenlands (Town of Erin 2021). The subject property is generally bounded by Wellington County Road 22 and rural residential homes to the south, agricultural lands to the west, and the West Credit River, West Credit River Provincially Significant Wetland (PSW) Complex and woodland features located immediately to the north and east. These natural features are identified as Core Greenlands by the Town of Erin (2021). The surrounding PSW is further identified as Core Greenlands by Wellington County (2022). Due to the size of the adjacent woodland feature (>1ha) to the east, it is also identified as Greenlands and is considered Significant Woodland by the County (Wellington County 2022). A detailed study is planned to be conducted to evaluate the significance of the woodland feature to the north of the subject property as part of the implementation of the existing Draft Plan of Subdivision for the adjacent property (Carson Reid Homes Ltd., pers. comm., 2023). The portion of the feature that extends within the subject property should be protected until otherwise confirmed as significant (NRSI 2023).

The Township of Erin Engineering Design Standards Manual (2022) (referred to herein as Design Standards) states that a TPP is required for individual private and public trees that are affected by a development application. As per Section 12 of the Design Standards, this report provides the findings of the tree inventory, analysis of the proposed plans against existing health and structural integrity of trees, protection measures for trees to be retained, and recommended mitigation measures. The tree data and mapping has been compared to the site plan provided by GSP Group and GM BluePlan Engineering Ltd (2023) (Map 2). These maps show the tree inventory data against the site plan and limits of grading to determine whether existing trees may be impacted by the proposed development. Avoidance, mitigation, and protection measures for trees were examined to determine which trees would be impacted, and which could be retained.

2.0 Tree Inventory Methods

A comprehensive inventory and assessment of all trees with the potential to be impacted by the proposed development was completed between November 29th and December 13th 2021 by NRSI staff. Trees ≥10cm in Diameter at Breast Height (DBH) were assessed by a Certified Arborist or Registered Professional Forester. The location of trees inventoried was surveyed by staff using an SXBlue II GNSS GPS unit, capable of sub-meter accuracy. A complete list of the trees that were assessed and their overall health and potential for structural failure is included in Appendix I.

The following information was recorded for each tree:

- Tree location;
- Species (common and scientific name);
- DBH (cm);
- Crown radius (m);
- General health (excellent, good, fair, poor, very poor, dead);
- Potential for structural failure (improbable, possible, probable, imminent);
- Potential roost features that could be used by Species at Risk (SAR) bats for roosting; and
- General comments (i.e., disease, aesthetic quality, development constraints, sensitivity to development, etc.).

The overall health of each tree and potential for structural failure was assessed based on the criteria outlined in Appendix II. In carrying out these assessments, NRSI has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out these assessments. The assessments have been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. None of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken. The conditions for this assessment, including restrictions, professional responsibility, and third-party liability can be found in Appendix III.

2.1 Butternut Health Assessments

Butternut (*Juglans cinerea)* trees were identified within the subject property during the tree inventory and vascular plant surveys conducted by NRSI staff as part of the EIS (NRSI 2023). An off-season Butternut Health Assessment (BHA) was conducted on each tree by a Certified Butternut Health Assessor on October 15, 2021 as per the Butternut Assessment Guidelines (MECP 2014). Samples were also collected and submitted for genetic analysis.

2.2 Bat Habitat Assessments

Three bat species known from the area are listed as Endangered provincially and are afforded general habitat protection under the *Endangered Species Act*, 2007 (ESA). These three bat species are therefore considered Species at Risk (SAR), and include Little Brown Myotis (*Myotis lucifigus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*).

Little Brown Myotis and Northern Myotis are known to roost in tree cavities, crevices, hollows, under exfoliating tree bark, etc., as well as within buildings (Humphrey and Fotherby 2019). Tri-colored Bat roosting habitat is more poorly understood than habitat for Little Brown Myotis and Northern Myotis. Elsewhere in its range (i.e., outside of Ontario), Tri-colored Bat has been documented to use dead leaf clusters, dense clusters of live foliage, arboreal lichens or epiphytes and buildings (Humphrey and Fotherby 2019). As part of the tree inventory, NRSI staff trained and experienced in the current provincial bat habitat assessment protocols (MECP 2022a, MECP 2022b), visually scanned all trees for the presence of roost features (i.e., cavities, exfoliating bark, etc.) that may provide bat roosting habitat, including for maternity colonies.

Information considered (and recorded, where applicable) for candidate roost trees included tree species, location, DBH, canopy cover, height class, decay class according to Watt and Caceres (1999), and the number, approximate height and type of potentially suitable roost features. Other criteria were also considered, including the use of roost features by other wildlife, the potential for roost features to be used by predators, supporting/surrounding habitat, and other characteristics which may contribute to the habitat requirements of these species, such as temperature regulation.

3.0 Summary of Tree Inventory Findings

In total, 385 trees were inventoried, comprising of 16 species. Of the inventoried trees, 338 (88%) are native and 47 (12%) are non-native. A complete list of inventoried trees is provided in Appendix I and the location of inventoried trees within the subject property are shown on Map 2.

Appendix IV provides a list of tree species inventoried within the subject property, whether they are native or non-native and their overall health. A summary of the overall health of trees inventoried within the subject property, along with their potential for structural failure can also be found in Appendix IV. The majority of the trees inventoried are in good to fair health with an improbable potential for structural failure.

3.1 Butternut Health Assessment Findings

Butternut is listed as Endangered both provincially and federally (MNRF 2023a, Government of Canada 2023). As previously stated, BHA's were completed outside the recommended survey period, however characteristics of each tree that were able to be observed during this time, and results of the genetic testing, indicate that each tree is considered a Category 2 pure Butternut. Category 2 Butternuts are trees that are either not, or are minimally, affected by the fungus known as Butternut Canker (*Sirococcus clavigignenti-juglandacearum*). These trees are protected under the ESA as they could support the protection or recovery of Butternuts within the area. The findings of the BHA's are discussed further in the EIS (NRSI 2023).

3.2 Bat Habitat Assessment Findings

The bat habitat assessment completed during the tree inventory resulted in the identification of six candidate bat roost trees for Little Brown Myotis and Northern Myotis within hedgerow and woodland features in the subject property. No suitable roosting habitat for Tri-colored Bat was observed. The observed candidate roosting habitat is characterized and discussed further in the subject property EIS (NRSI 2023).

4.0 Tree Removal and Retention Analysis

Tree removal and retention was based on the following considerations:

1. Trees identified as having a probable or imminent potential for structural failure or poor or very poor health: The removal of these trees may be recommended for safety, especially if they are located within striking distance of a potential target.

2. Trees that require removal based on the extent of the proposed site plan and grading limits: The location of inventoried trees was compared to development components identified in the site plan, as shown on Map 2. Should these plans change, a revised retention and removal analysis may be required.

In total, 385 trees were inventoried within and adjacent to the subject property. Of the 385 trees inventoried, 175 are proposed to be removed. Table 1 provides a break-down of the retention/removal analysis and Appendix I includes a list of trees inventoried, their overall health and potential for structural failure, recommended action (retain, remove, etc.) and rationale for removal. Retention and removals are shown on Map 2. The following categories were included in the analysis:

- Retain;
- Retain / Confirm in Field – extent of site clean-up/removal activities and final grading associated with the proposed development to be confirmed in the field just prior to site preparation to confirm retention opportunity. Extent of grading/disturbance may be impacted by equipment utilized; and
- Remove.

Table 1. Retention and Removal Analysis

Proposed Action	**Total**
Remove	175
Total Trees to be Removed	**175**
Retain	206
Retain / Confirm in Field	4
Total Trees to be Retained	**210**
Overall Total	**385**

Of the 175 trees proposed for removal, 133 trees are considered boundary or off-property trees, in addition to three of the four trees marked for “Retain-Confirm in Field”. Removal of any boundary or off-property trees will require the permission of all owners involved. If the main

stem of any tree is located on multiple properties, all owners of those properties must be consulted before any tree removal occurs. NRSI is not aware of receipt of approval for these removals at this time, and our recommendation for removal should not be inferred to reflect any approval from any parties.

Of the 16 Butternuts assessed within or adjacent to the subject property, eight have been proposed for removal in order to accommodate the proposed development. The remaining eight Butternuts will be retained; however, development has been proposed within the area defined as general habitat for the species (i.e., within 50 m of a Butternut), and which is afforded protection under the ESA. A detailed discussion regarding the anticipated impacts is provided in the EIS (NRSI 2023).

5.0 Compensation and Restoration Plan

The proposed development plan will result in the removal of canopy cover (175 trees). In order to mitigate the loss of the canopy, the Town of Erin's Design Standards (2022) Section 12.6 states that the standard compensation rate for trees removed are to be calculated using the chart below:

Table 2. Tree Compensation Ratio

Remove Tree DBH	Compensation Ratio
100mm-150mm	1 to 1
151mm-350mm	2 to 1
351mm-500mm	3 to 1
>501mm	4 to 1

As per the Design Standards (2022), a tree health coefficient (Table 3) was applied to each tree proposed for removal to calculate total compensation. The coefficient is multiple to the replacement rate for each tree proposed for removal to determine a compensation rate relative to a healthy tree. A breakdown of compensation rates for each tree proposed for removal can be found in Appendix I.

Table 3. Tree Health Coefficient

Health of Tree	Health Coefficient
Dead	0
Hazard or Infected	0.25
Poor	0.5
Fair	0.75
Good	1

Based on the required tree removals and tree replacement ratios identified above, a total of 273 trees are required in compensation for the removal of 175 trees on the subject property. As discussed within Section 8.6.3. of the subject property EIS (NRSI 2023), the development of a Woodland Edge and Buffer Management Plan has been recommended to protect, restore and enhance the woodland edges and buffers within the subject property. It is recommended that the replacement plantings be incorporated into this plan in order to meet the tree compensation requirement. The Design Standards (2022) states that if full compensation cannot be provided, a cash-in-lieu agreement may be arranged for the rate of $500 per replacement tree not planted on the subject property.

Replacement plantings will be native to the County of Wellington and will not include any species that are listed as introduced, invasive or provincially or federally at-risk species. The use of hardy species will ensure successful early establishment and minimize the potential for invasive species proliferation. The following will be considered during development of the compensation planting design:

- Use of hardy, native tree species known to occur in the County of Wellington that are known to thrive in more urban conditions (i.e., compacted soil, drought, high salt tolerance);
- Include a diversity of trees from several genus to increase disease and pest tolerance and discourage monocultures (no more than 30% from a single genus, 10% from a single species);
- Include a watering and monitoring plan for 2 years following planting;
- Plantings will include Black Cherry (*Prunus serotina),* Shagbark Hickory (*Carya ovata),* as well as Oak (*Quercus)* and Maple *(Acer)* species, to provide future roosting habitat for bats;
- Avoidance of Ash (*Fraxinus*) species due to high risk of Emerald Ash Borer (*Agrilus planipennis*);
- Plantings to be installed during appropriate planting season (early spring or fall);
- Plantings to be replaced if they die within the 2-year monitoring period;
- Spacing of plant material should be appropriate for the selected planting stock;
- Special attention should be paid to location and height of trees in proximity to any utilities, including proximity of tree root zones to subsurface utilities; and
- Appropriate soil volumes should be accounted for, and load-bearing soil cells, or suitable alternatives, should be considered for increased survivorship and tree health.

5.1 Butternut Compensation

Compensation requirements for anticipated adverse impacts to the Endangered species, Butternut, is addressed in relation to ESA policies and legislation in the EIS (NRSI 2023).

6.0 Tree Protection Measures and Recommended Mitigation

During the construction process, efforts will be made to protect the health and root systems of trees that have been assessed for retention in this plan. The Client, or their designate (e.g., construction inspector or site manager), must ensure that all employees and contractors are informed of the meaning and importance of tree protection measures and the ways in which trees to be retained are identified.

6.1 Prior to Construction

Tree Protection Fencing (TPF) should be installed where trees are adjacent to the limit of disturbance/grading. A combination of Erosion and Sediment Control (ESC) fence and TPF may be used where appropriate.

The combined TPF/ESC fencing will be installed and maintained by the developer or its designate. Prior to any construction activities (rough grading, vegetation and tree removal), the TPF should be installed at least 1m beyond the dripline of trees to be retained and adjacent woodland features, where possible, in order to protect the root systems. A corresponding fencing diagram can be found on Map 2. Prior to works commencing on-site, fence installation and location shall be inspected by a Certified Arborist or Registered Professional Forester. The ESC/TPF is to take the form of 2240mm iron T-bar stakes supporting 1200mm paige-wire fencing and geotextile woven fabric. Signage indicating the purpose of protection fencing will be attached to the TPF every 100-150m.

In some instances, the combined protection fencing location is proposed to go through the canopy of a small number of trees marked for retention. This has been done with the intention of retaining as many trees as possible. It is expected that the retained trees that do not have complete protection from the proposed construction are expected to tolerate

6.1.1 Significant Woodlands

The County of Wellington Official Plan (2022) states that all Significant Woodlands should be provided a protection zone of at least 10m buffering them from any proposed development. However, the edges of the woodlands that abut the subject property have a history of disturbance based on agricultural use (i.e., tilling) and roots within these areas will have been damaged or removed previously as a result. Based on this history of disturbance, a reduced buffer has been proposed, which varies from 1.5m to 12.9m off the significant woodland dripline (NRSI 2023). The alignment of the combined TPF and ESC fencing must show consideration

for the recommended significant woodland buffer and be installed as per the TPF and ESC alignment identified on Map 2.

6.1.2 Migratory Birds Convention Act

The removal of trees has the potential to disrupt nesting birds. The *Migratory Birds Convention Act* (MBCA) directs that all tree removals occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS) (Government of Canada 1994) This period extends from April 1 – August 31. All developers/consultants/contractors, etc., are legally obligated to carry out due diligence to protect migratory birds from harm during all construction projects.

6.1.3 Species at Risk Bat Habitat

The destruction of Species at Risk (SAR) bats and their habitat is prohibited under the ESA. Since tree removal has the potential to directly impact candidate bat roosting habitat, it is recommended that this activity occur outside of the active roosting season (April 1 – September 30), to avoid direct impacts to individuals of the species and associated contravention of the Act. Further details regarding the presence of SAR bats and associated habitats can be found in NRSI's EIS (NRSI 2023).

6.2 During Construction

The TPF is to be maintained by the Client or its agents during the entire construction period to ensure that trees being retained (including their root systems) are protected. Minor construction damage (e.g., damage to limbs or roots) to trees to be retained must be pruned using proper arboricultural techniques. Root pruning, if necessary, should be performed by a Certified Arborist using an appropriate implement to make proper pruning cuts and encourage callous root growth. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, the Client should be consulted to determine a plan of action, such as treatment or compensation.

Areas protected by TPF shall remain undisturbed and shall not be used for temporary storage, placement or excavation of fill or top soil, the storage of construction materials or equipment, or the storage of debris. Recognizing the root system of a tree often extends well beyond its dripline (i.e., outside the protected area), construction contaminants such as fuels, oils, etc. should be kept clear of areas protected by the TPF.

6.3 Post-Construction

It is recommended that the TPF be removed upon completion of construction activities and adjacent areas are stabilized with a suitable vegetative cover to the satisfaction of the Environmental Inspector or qualified biologist. A Certified Arborist/Registered Professional Forester and/or qualified other should inspect all retained trees and their rooting area, and if deemed necessary, recommend remediation work. A post-construction remediation plan may be required if damage to retained trees is noted. Following remediation activities, if needed, a final assessment should be completed to ensure all protocols were met, ensuring final project approval.

7.0 Summary

NRSI was retained by Thomasfield Homes to complete a Tree Preservation Plan (TPP) for the property located at Part Lot 23, Concession 7, Wellington Road 22, in the settlement of Hillsburgh, Wellington County, Ontario.

NRSI Certified Arborists and Registered Professional Foresters conducted a comprehensive inventory and assessment of isolated trees within the subject property between November 29th and December 13th, 2021. A total of 385 trees belonging to 16 common native and non-native species were inventoried and assessed for removal within the subject property. Of the 385 trees inventoried, 175 are prescribed for removal.

It is recommended that all proposed tree removals occur in consideration of general timing windows for migratory birds and SAR bats. Prior to any construction activities, a combined ESC fence and TPF is to be installed at least 1m beyond the dripline of the adjacent woodland, Significant Woodland, and any other trees to be retained, where possible, in order to protect the root systems (Map 2). All fencing installation and tree removals should be done under the supervision of a Certified Arborist/Forester or similarly qualified professional.

Based on the required tree removals and tree replacement ratios identified above, a total of 273 trees are required in compensation for the removal of 175 trees on the subject property. It is recommended that the replacement plantings be incorporated into the proposed Woodland Edge and Buffer Management Plan in order to meet the tree compensation requirement. If full compensation cannot be provided, a cash-in-lieu agreement may be arranged for the rate of $500 per replacement tree not planted on the subject property.

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Appendix I
Tree Inventory Data

Wellington Rd, Hillsburgh Tree Preservation Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	DBH Sum	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Tree Health Coefficient	Compensation Ratio	Compensation Total	Comments
001	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	37.3	37.3	3	Improbable	Fair	Off Property	Remove	0.75	3	2.25	Forked stem above DBH; included bark with minor decay; callous growth at former branch union.
002	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	34.1	34.1	3	Improbable	Good	On Property	Remove	1.00	2	2	Strong straight form; codominant stems; balanced canopy overall.
003	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	22.3	22.3	2	Improbable	Fair	On Property	Remove	0.75	2	1.5	Open growth characteristics; vigorous.
004	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	45.8	45.8	5	Possible	Fair	On Property	Remove	0.75	3	2.25	Straight form; large scaffold branch dieback; cracks in bark.
005	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	42.2	42.2	4	Improbable	Fair	On Property	Remove	0.75	3	2.25	Former pruning cuts; minor dieback of lower branches; sap rot fungus on twigs.
006	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	50	50	3	Improbable	Good	On Property	Remove	1.00	3	3	Strong straight form; balanced crown.
007	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	47.9	47.9	3	Improbable	Fair	On Property	Remove	0.75	3	2.25	Former pruning cuts; gypsy moth egg masses; minor dieback of twigs; callous wound at base.
008	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	44.7	44.7	4	Probable	Poor	On Property	Remove	0.50	3	1.5	Conks growing out of main stem; cavity in main stem, bark exfoliating; branch dieback.
009	Silver Maple	*Acer saccharinum*	Native	1	85.2	85.2	5.5	Improbable	Fair	On Property	Remove	0.75	4	3	Evidence of previous branch failure; minor dieback; slight lean to road; epicormic growth.
010	Silver Maple	*Acer saccharinum*	Native	1	101.1	101.1	9	Possible	Fair	On Property	Remove	0.75	4	3	Branch dieback; gypsy moth egg sacs.
011	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.8	18.8	1.5	Improbable	Good	On Property	Remove	1.00	2	2	Minor epicormic growth.
012	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	43.9	43.9	4	Improbable	Fair	On Property	Remove	0.75	3	2.25	Callous wounds at former branch union; minor dieback of lower branches.
013	Silver Maple	*Acer saccharinum*	Native	1	80.7	80.7	8	Improbable	Poor	On Property	Remove	0.50	4	2	Epicormic growth; minor dieback; evidence of previous branch failure; included bark with minor decay.
014	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.0	12	2	Improbable	Fair	On Property	Remove	0.75	1	0.75	Some epicormic growth; gypsy moth egg masses.
015	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	59.0	59	5	Improbable	Good	On Property	Remove	1.00	4	4	Lower branches pruned appropriately; straight form; balanced canopy overall healthy crown.
016	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	39.7	39.7	3.5	Improbable	Fair	On Property	Remove	0.75	3	2.25	Forked crown; previous pruning cuts healed; included bark in upper crotch.
017	Silver Maple	*Acer saccharinum*	Native	1	65.0	65	5	Improbable	Poor	Boundary	Remove	0.50	4	2	Multiple failed branches; branch dieback throughout.
018	Silver Maple	*Acer saccharinum*	Native	1	84.3	84.3	8	Possible	Fair	On Property	Remove	0.75	4	3	Branch dieback; history of branch failures; gypsy moth egg sacs; exfoliating bark.
019	Manitoba Maple	*Acer negundo*	Native	1	32	32	4	Possible	Poor	On Property	Remove	0.50	2	1	Multiple failed branches; significant dieback; epicormic growth; moderate lean.
020	Manitoba Maple	*Acer negundo*	Native	1	15.1	15.1	1.5	Probable	Poor	Boundary	Remove	0.50	2	1	Major lean curved stem; branch rub.
021	Black Walnut	*Juglans nigra*	Native	1	39.2	39.2	6	Improbable	Fair	Boundary	Remove	0.75	3	2.25	Forked crown; moderate branch dieback.
022	Black Walnut	*Juglans nigra*	Native	1	51.9	51.9	7	Possible	Poor	Boundary	Remove	0.50	4	2	History of branch failures; major gypsy moth egg sacs on scaffold branches.
023	Black Walnut	*Juglans nigra*	Native	1	53.5	53.5	4.5	Improbable	Fair	Boundary	Remove	0.75	4	3	Small canker with minor decay in bole; vigorous growth.
024	Black Walnut	*Juglans nigra*	Native	1	48.5	48.5	5	Possible	Poor	Boundary	Remove	0.50	3	1.5	Dead/broken top; large scaffold branch failure; some epicormic growth.
025	Black Walnut	*Juglans nigra*	Native	1	49.7	49.7	8	Possible	Fair	Boundary	Remove	0.75	3	2.25	Branch dieback; asymmetrical crown; gypsy moth egg sacs.
026	Manitoba Maple	*Acer negundo*	Native	1	11.4	11.4	5	Possible	Very Poor	Boundary	Remove	0.25	1	0.25	Dead/broken top on one stem; considerable decay throughout.
027	Black Walnut	*Juglans nigra*	Native	1	11.2	11.2	3	Possible	Fair	Boundary	Remove	0.75	1	0.75	Curved stem; minor branch dieback.
028	Manitoba Maple	*Acer negundo*	Native	1	16.5	16.5	3	Improbable	Fair	On Property	Remove	0.75	2	1.5	Considerable epicormic growth; moderate branch dieback.
029	Manitoba Maple	*Acer negundo*	Native	3	19.7+16.7+14.2,	50.6	5	Possible	Fair	On Property	Remove	0.75	4	3	Extensive epicormic growth; history of branch failure; branch dieback; scaly bark.
030	Manitoba Maple	*Acer negundo*	Native	3	12.3+18.4+20.4	51.1	3	Possible	Poor	Boundary	Remove	0.50	4	2	Significant epicormic growth; secondary stem growing off failed horizontal stem; grapevine in crown.
031	Manitoba Maple	*Acer negundo*	Native	1	17.3	17.3	6	Possible	Fair	On Property	Remove	0.75	2	1.5	Branch dieback; asymmetrical crown; epicormic growth.
032	Manitoba Maple	*Acer negundo*	Native	1	25.8	25.8	4	Possible	Poor	Boundary	Remove	0.50	2	1	Significant epicormic growth; branch dieback; decay in stem.
033	Hawthorn species	*Crataegus sp.*	**	6	28+25+30+27	110	6	Probable	Poor	Boundary	Remove	0.50	4	2	History of branch failures; root rot.
034	Black Cherry	*Prunus serotina*	Native	3	31.5+19.0+18.0	68.5	6	Probable	Poor	Boundary	Remove	0.50	4	2	History of branch failures; many gypsy moth egg sacs on branches.
035	Manitoba Maple	*Acer negundo*	Native	3	47.1+50.4+54.7	152.2	5	Possible	Poor	Off Property	Remove	0.50	4	2	Multistem with previous trunk failure; previous branch failure; decay and branch dieback throughout.
036	Black Cherry	*Prunus serotina*	Native	1	40.6	40.6	7	Probable	Poor	Boundary	Remove	0.50	3	1.5	History of branch failure; asymmetrical crown leaning over fence west; gypsy moth egg sacs; rotted dead branch.
037	Black Cherry	*Prunus serotina*	Native	3	27.4+27.6+29.6	84.6	4	Possible	Poor	Boundary	Remove	0.50	4	2	Multiple failed branches; branch dieback throughout; decay on branching.
038	Black Walnut	*Juglans nigra*	Native	1	11	11	3.5	Improbable	Fair	On Property	Remove	0.75	1	0.75	Branch failure; root flare bulge/gall.
039	American Mountain-Ash	*Sorbus americana*	Native	3	55.0+24.2+25.0	104.2	6	Improbable	Fair	Boundary	Remove	0.75	4	3	Sapsucker wound; stems fused at base; minor dieback.
040	Black Cherry	*Prunus serotina*	Native	1	48	48	8	Possible	Fair	Boundary	Remove	0.75	3	2.25	History of branch failure; exfoliating bark; gypsy moth egg sacs

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041	Manitoba Maple	*Acer negundo*	Native	3	16.1+11.3	27.4	3	Possible	Fair	On Property	Remove	0.75	2	1.5	Codominant stems with included bark.
042	Black Cherry	*Prunus serotina*	Native	3	27.6+20.5+23+23.1	94.2	5	Possible	Fair	Boundary	Remove	0.75	4	3	Evidence of previous branch failure; epicormic growth; vines overtaking crown.
043	Manitoba Maple	*Acer negundo*	Native	1	20.2+16.5	36.7	3	Probable	Poor	On Property	Remove	0.50	3	1.5	History of branch failures; epicormic growth.
044	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16.6	16.6	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Black bark; minor dieback.
045	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.8	17.8	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Black bark; minor dieback.
046	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.8	14.8	2	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Black bark; minor dieback.
047	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.5	11.5	1.5	Improbable	Good	Boundary	Remove	1.00	1	1	Good straight form; balanced canopy overall healthy
048	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	21.4	21.4	2	Improbable	Poor	Boundary	Remove	0.50	2	1	Open wound in upper crown; black bark; minor dieback.
049	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	13.4+12.8	26.2	3	Possible	Fair	Boundary	Remove	0.75	2	1.5	Codominant stems with included bark; black bark.
050	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.5	15.5	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback; black bark.
051	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	26.7	26.7	7	Possible	Fair	Boundary	Remove	0.75	2	1.5	Branch dieback; asymmetrical crown toward east.
052	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11	11	1	Possible	Fair	Boundary	Remove	0.75	1	0.75	Branch dieback; straight form.
053	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	14.4+12.3	26.7	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback; black bark.
054	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	21.5	21.5	2	Improbable	Poor	Boundary	Remove	0.50	2	1	Black bark; twig and branch dieback.
055	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.4	12.4	4	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Branch rub from adjacent trees.
056	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	29.3	29.3	5	Possible	Fair	Boundary	Remove	0.75	2	1.5	Compartmentalized branch wound, good form.
057	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.6	11.6	3	Possible	Fair	Boundary	Remove	0.75	1	0.75	Branch dieback.
058	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.1	19.1	3	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Previous pruning cuts; black bark; minor dieback.
059	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.9	18.9	2.5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback.
060	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.3	18.3	2.5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback.
061	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	27.8	27.8	2.5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback.
063	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.1	19.1	5	Possible	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown toward east; branch dieback.
064	Black Cherry	*Prunus serotina*	Native	2	41.1+30.2	71.3	4	Improbable	Poor	Boundary	Remove	0.50	4	2	Previously failed branches and stem; decay at branch unions.
065	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.2	18.2	4	Possible	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown to west; branch rub.
066	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.5	12.5	2	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Minor dieback.
067	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.5	19.5	4	Possible	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown to west; minor branch dieback.
068	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.2	15.2	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback; asymmetrical crown.
069	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	26.8	26.8	3	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback; branch failure; asymmetrical crown.
070	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.6	12.6	1	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Minor dieback; asymmetrical crown.
071	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.6	15.6	4	Possible	Fair	Boundary	Remove	0.75	2	1.5	Branch rub; black bark; branch dieback.
72	Black Cherry	*Prunus serotina*	Native	1	24	24	4	Probable	Poor	Boundary	Remove	0.50	2	1	Rotting stem; asymmetrical crown toward west.
073	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	62.0	62	5	Improbable	Fair	On Property	Remove	0.75	4	3	Evidence of previous branch failure; fused stem with minor decay; minor dieback.
74	Black Cherry	*Prunus serotina*	Native	2	47.2+39	86.2	6	Possible	Poor	Boundary	Remove	0.50	4	2	Evidence of multiple previous branch failures; large wound along stem; minor decay in upper crotch.
075	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.3	12.3	1	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Minor dieback.
076	Manitoba Maple	*Acer negundo*	Native	1	12.5	12.5	2	Probable	Poor	Boundary	Remove	0.50	1	0.5	2nd stem dead; branch failures evident.
077	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	20.7	20.7	1.5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback; asymmetrical crown due to neighboring trees.
078	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	31.9	31.9	3	Possible	Fair	Off Property	Remove	0.75	2	1.5	Minor branch dieback
079	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.2	14.2	1.5	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Minor dieback; asymmetrical crown due to neighboring trees.
080	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	34.4+20.2	54.6	4	Possible	Fair	Boundary	Remove	0.75	4	3	History of branch failures, minor dieback.

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081	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	14.9+11.0	25.9	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback; asymmetrical crown due to neighboring trees.
082	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.5	10.5	3.5	Possible	Fair	Boundary	Remove	0.75	1	0.75	Branch dieback; asymmetrical crown; branch rub
083	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.0	14	4	Possible	Fair	Boundary	Remove	0.75	1	0.75	Asymmetrical crown toward east; dead branch leaning on tree
084	Black Cherry	*Prunus serotina*	Native	2	40.4+40.0	80.4	6	Improbable	Poor	Boundary	Remove	0.50	4	2	Evidence of previous branch failures and pruning cuts; decay in branch unions; fused with neighboring tree.
085	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	31.6	31.6	5	Possible	Fair	Boundary	Remove	0.75	2	1.5	Branch dieback; dead branch leaning on stem
086	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	24.3	24.3	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Old pruning cuts; fused with neighboring tree; minor dieback.
087	Black Cherry	*Prunus serotina*	Native	2	33.9+43.8	77.7	5	Possible	Poor	Boundary	Remove	0.50	4	2	Multiple failed branches; dieback throughout; vines overtaking crown.
088	Black Cherry	*Prunus serotina*	Native	2	35.5+31.7	67.2	6	Possible	Poor	Boundary	Remove	0.50	4	2	Decay at base; multiple failed branches; dieback throughout; vines overtaking crown.
089	Black Walnut	*Juglans nigra*	Native	1	13.1	13.1	2	Improbable	Fair	Off Property	Remove	0.75	1	0.75	Asymmetrical crown due to neighboring trees; suppressed.
090	Manitoba Maple	*Acer negundo*	Native	1	37.8	37.8	5	Possible	Poor	Off Property	Retain	0.50			Epicormic growth throughout; multiple failed branches; hollow at base; dieback throughout.
091	Black Cherry	*Prunus serotina*	Native	4	34.1+27.2+41.5+42	144.8	6	Probable	Poor	Boundary	Retain	0.50			2 stems dead/declinng; history of branch failure; watersprouts.
092	Sweet Cherry	*Prunus avium*	Non-Native	2	16.2+17.1	33.3	3	Possible	Poor	Boundary	Retain	0.50			Multiple failed branches; leaning; small cavity in stem.
093	Black Cherry	*Prunus serotina*	Native	1	62.5	62.5	6.5	Possible	Poor	On Property	Retain	0.50			Multiple failed branches; leaning; decay throughout crown; shadow cavity with decay at base.
094	Black Cherry	*Prunus serotina*	Native	1	23.4	23.4	2	Improbable	Fair	Off Property	Retain	0.75			Epicormic growth; minor dieback.
095	Black Cherry	*Prunus serotina*	Native	1	56.1	56.1	6	Possible	Poor	Boundary	Retain	0.50			Multiple failed branches; dieback throughout; egg masses; vines in crown.
096	Black Cherry	*Prunus serotina*	Native	3	28.1+48.2+45.6	121.9	4	Possible	Poor	Boundary	Retain	0.50			Multiple failed branches; dieback throughout crown; egg masses; vines in crown.
097	Black Cherry	*Prunus serotina*	Native	1	42.2	42.2	5	Probable	Very Poor	Boundary	Retain	0.25			Trunk flare; soft rot; history of branch failure; extensive gypsy moth egg sacs.
098	Black Cherry	*Prunus serotina*	Native	1	24.4	24.4	3	Probable	Very Poor	Boundary	Retain	0.25			History of branch failures; gypsy moth egg sacs extensive.
099	Black Cherry	*Prunus serotina*	Native	3	38.5+29.7+29.7	97.9	3	Probable	Poor	Boundary	Retain	0.50			History of branch failure; grapevines; tree cavity.
100	Black Cherry	*Prunus serotina*	Native	4	40+30+34.5+35	139.5	5	Probable	Poor	Boundary	Retain	0.50			History of branch failure; branch dieback.
101	Manitoba Maple	*Acer negundo*	Native	1	22.2	22.2	2	Improbable	Fair	On Property	Remove	0.75	2	1.5	Epicormic growth; vines overtaking crown; moderate branch dieback.
102	Black Walnut	*Juglans nigra*	Native	2	21.8+10.1	31.9	3	Possible	Fair	On Property	Remove	0.75	2	1.5	Codominant stems with included bark; branch dieback.
103	Black Walnut	*Juglans nigra*	Native	1	12.9	12.9	3.5	Improbable	Fair	On Property	Remove	0.75	1	0.75	Asymmetrical crown due to neighboring trees; minor dieback.
104	Black Cherry	*Prunus serotina*	Native	1	20.2	20.2	2.5	Probable	Very Poor	Boundary	Remove	0.25	2	0.5	Branch dieback; extensive gypsy moth egg sacs.
105	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.5	11.5	2	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Minor branch dieback; asymmetrical crown due to neighboring trees.
106	Black Cherry	*Prunus serotina*	Native	1	23.4	23.4	2.5	Improbable	Poor	Boundary	Remove	0.50	2	1	Moderate branch dieback; heavy lean and asymmetrical crown due to neighboring trees.
107	Black Cherry	*Prunus serotina*	Native	1	13.8	13.8	1.5	Possible	Poor	Boundary	Remove	0.50	1	0.5	Multiple failed branches; decay in branches; dieback throughout.
108	White Ash	*Fraxinus americana*	Native	1	29.7	29.7	5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Leaning; asymmetrical crown due to neighboring trees; minor dieback.
109	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	4	39.1+32.7+23.3+23.2	118.3	6	Possible	Poor	Boundary	Remove	0.50	4	2	History of branch dieback; gypsy moth egg sacs; trunk split at stems with decay.
110	American Basswood	*Tilia americana*	Native	4+	40.0+44.5+41.0+38.2	163.7	6	Improbable	Fair	Boundary	Remove	0.75	4	3	Multistem; dieback throughout crown; multiple failed branches; upper stems fused in some areas; cavity in multiple stems; pruning cuts.
111	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.8	11.8	4	Possible	Fair	Off Property	Remove	0.75	1	0.75	Good straight form; balanced canopy overall; minor branch dieback.
112	Black Cherry	*Prunus serotina*	Native	1	36.6	36.6	5	Possible	Poor	Boundary	Remove	0.50	3	1.5	History of branch failures; gypsy moth egg sacs; codominant stems with included bark.
113	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.4	15.4	3	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown due to neighboring tree; minor branch dieback.
114	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.9	11.9	1.5	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Asymmetrical crown due to neighboring tree; minor branch dieback.
115	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	25.7	25.7	4	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown due to neighboring trees and leaning north; minor branch dieback.
116	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16.4	16.4	2	Possible	Fair	Boundary	Remove	0.75	2	1.5	Good form; branch dieback.
117	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.7	10.7	1.5	Probable	Very Poor	Boundary	Remove	0.25	1	0.25	Tree leaning heavily; exfoliating bark.
118	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	24	24	6	Possible	Fair	Boundary	Retain	0.75			Lower pruning cuts; tree fused to black cherry at base.
119	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.9	14.9	2	Improbable	Good	Boundary	Remove	1.00	1	1	Good straight form; balanced canopy overall healthy

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120	Black Cherry	*Prunus serotina*	Native	1	40.1	40.1	5	Possible	Very Poor	Boundary	Remove	0.25	3	0.75	Dead and broken top; major dieback; epicormic growth; decay in branch unions.
121	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.4	11.4	2	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Asymmetrical crown due to neighboring trees; minor dieback.
122	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	21.4	21.4	3.5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown due to neighboring trees; minor dieback.
123	American Basswood	*Tilia americana*	Native	4	23.1+14.1+23.0+10.4	70.6	3.5	Possible	Poor	Boundary	Remove	0.50	4	2	Secondary growth multistem; minor dieback; fused with neighboring stems.
124	Black Cherry	*Prunus serotina*	Native	1	29.5	29.5	3.5	Possible	Poor	Boundary	Remove	0.50	2	1	Multiple failed branches; dieback throughout; asymmetrical crown due neighboring trees.
125	American Basswood	*Tilia americana*	Native	9	25.3+25.3+30+22	102.6	6	Possible	Fair	Boundary	Remove	0.75	4	3	Many codominant stems; branch dieback.
126	American Basswood	*Tilia americana*	Native	1	26.1	26.1	5	Possible	Fair	Boundary	Remove	0.75	2	1.5	Gypsy moth egg sacs; cutved stem; branch dieback.
127	American Basswood	*Tilia americana*	Native	1	31.7	31.7	4	Improbable	Fair	Off Property	Remove	0.75	2	1.5	Main stem pruned; new leader; minor branch dieback; small wound at base.
128	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	76.2	76.2	7	Probable	Poor	Boundary	Remove	0.50	4	2	Large open cavities in stem; exfoliating bark; history of branch failure
129	White Elm	*Ulmus americana*	Native	2	31.4+18.0	49.4	6	Possible	Fair	Boundary	Retain	0.75			Leaning sw; moderate branch dieback; fused stems; previous pruning cuts.
130	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	20.9	20.9	2.5	Improbable	Good	Boundary	Retain- Confirm	1.00			Good straight form; balanced canopy.
131	Black Cherry	*Prunus serotina*	Native	5	24.1+38.8+45,	107.9	4	Probable	Poor	On Property	Remove	0.50	4	2	History of branch failures; grapevines weighing them down.
132	Black Cherry	*Prunus serotina*	Native	3	54.5+33.7+27.9	116.1	6	Probable	Poor	On Property	Remove	0.50	4	2	History of branch failures failure; extensive gypsy moth egg sacs on branches; one dead stem.
133	White Elm	*Ulmus americana*	Native	2	15.2+16.5	31.7	2	Improbable	Poor	Off Property	Remove	0.50	2	1	Multiple failed branches; large dead branch in crown; dieback throughout.
134	White Elm	*Ulmus americana*	Native	1	71.2	71.2	7	Possible	Poor	Off Property	Remove	0.50	4	2	Multiple failed branches; dead/broken top; vines in crown; shadow cavity.
135	White Elm	*Ulmus americana*	Native	1	23.3	23.3	3.5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Multiple pruning cuts; failed scaffold branch; minor dieback.
136	Black Cherry	*Prunus serotina*	Native	1	50	50	6	Probable	Poor	On Property	Remove	0.50	3	1.5	History of branch failures; extensive gypsy moth egg sacs.
137	White Ash	*Fraxinus americana*	Native	1	11.3	11.3	2	Possible	Fair	On Property	Remove	0.75	1	0.75	Curved stem; branch dieback.
138	American Mountain-Ash	*Sorbus americana*	Native	2	18.4+10.6	29	3.5	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor dieback; vines in crown.
139	Manitoba Maple	*Acer negundo*	Native	1	45.6	45.6	5	Possible	Very Poor	Boundary	Remove	0.25	3	0.75	Exfoliated bark; heavy lean; multiple failed branches; decay throughout.
140	Manitoba Maple	*Acer negundo*	Native	1	65.6	65.6	8	Possible	Poor	Boundary	Remove	0.50	4	2	Forked crown; multiple failed branches; branch dieback throughout.
141	White Ash	*Fraxinus americana*	Native	1	25.0	25	4	Improbable	Fair	Off Property	Remove	0.75	2	1.5	Small callous wound; minor dieback.
142	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	13.9	13.9	2	Probable	Very Poor	Boundary	Remove	0.25	1	0.25	Exfoliating bark; branch dieback; grapevines.
144	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.1	17.1	2	Improbable	Very Poor	Boundary	Remove	0.25	2	0.5	Large wound at base; significant branch dieback; poor form.
145	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.5	19.5	2	Improbable	Poor	Boundary	Remove	0.50	2	1	Dead/broken top; dieback throughout; asymmetrical crown due to neighboring tree.
146	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.4	14.4	3	Improbable	Poor	Boundary	Remove	0.50	1	0.5	Minor dieback; asymmetrical crown due to neighboring trees.
147	Black Cherry	*Prunus serotina*	Native	1	29.1	29.1	4	Possible	Poor	Boundary	Remove	0.50	2	1	Dead/broken top; previous branch failure; fungus throughout crown.
148	Black Cherry	*Prunus serotina*	Native	1	16.5	16.5	2	Probable	Very Poor	Boundary	Remove	0.25	2	0.5	Mostly dead snag with fruiting bodies; one viable branch.
149	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.3	18.3	5	Possible	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown; minor branch dieback.
150	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	23.3	23.3	3.5	Possible	Fair	Boundary	Remove	0.75	2	1.5	Good straight form; balanced canopy overall.
201	Silver Maple	*Acer saccharinum*	Native	1	72.3	72.3	6	Possible	Fair	Off Property	Retain	0.75			Multi leader; larger burl on smaller leader; epicormic growth ; evidence of branch failure; large branch off largest leader has signs of dead core.
202	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	56.5	56.5	6.5	Improbable	Poor	Off Property	Retain	0.50			Codominant; split seam with decay and included bark; seeping from seam; black bark; open growth characteristics.
203	Silver Maple	*Acer saccharinum*	Native	1	59.8	59.8	6	Possible	Fair	Off Property	Retain	0.75			Evidence of branch failure; large healed wound on trunk; poor branch attatchment; large branch broken and dead.
204	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	56.8	56.8	5.5	Improbable	Fair	Off Property	Retain	0.75			Moderate branch dieback; minor included bark; wide crown.
205	Silver Maple	*Acer saccharinum*	Native	1	62.6	62.6	8	Possible	Fair	Off Property	Retain	0.75			Double leader; epicormic growth; evidence of branch failure; large dead branches.
206	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	41.8	41.8	5	Improbable	Fair	Off Property	Retain	0.75			Minor branch dieback; minor wound on root flare; included bark.
207	Black Cherry	*Prunus serotina*	Native	1	33.2	33.2	4	Probable	Poor	On Property	Retain	0.50			Asymmetrical crown ; double leader, one rotted/dead; multiple dead branches; epicormic growth; large rotted wound up main stem.

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208	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	64.9	64.9	5.5	Possible	Poor	Off Property	Retain	0.50			Cavity with decay at base; dieback throughout crown; forked crown above DBH; previously pruned.
209	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.2	11.2	2	Improbable	Good	On Property	Retain	1.00			Suppressed; asymmetrical crown.
210	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.2	10.2	1	Probable	Very Poor	On Property	Remove	0.25	1	0.25	Dead/broken top; live epicormic growth and scaffold branch.
211	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	39.0+42.1	81.1	4	Possible	Poor	Off Property	Retain	0.50			Branch dieback throughout; multiple cavities in stem; evidence of branch failures.
212	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	29.1+26.1	55.2	5	Probable	Poor	Boundary	Retain	0.50			Both stems have double leader; numerous large dead branches; epicormic growth evidence of large branch failure.
213	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	96.7	96.7	4	Improbable	Fair	Boundary	Retain	0.75			Branch dieback throughout; large open cavity; evidence of branch failures; split seam.
214	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	19.2+19.6	38.8	3	Possible	Poor	Boundary	Retain	0.50			Fence grown into stem; dieback throughout.
216	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	20.9	20.9	6	Improbable	Fair	Boundary	Retain	0.75			Asymmetrical crown toward field; vines up trunk and thru canopy; epicormic growth; signs of branch failure.
217	Black Cherry	*Prunus serotina*	Native	1	41.5	41.5	6	Improbable	Fair	Boundary	Retain	0.75			Vines up trunk; some branch failure; curved trunk.
218	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.8	12.8	1	Improbable	Fair	Boundary	Retain	0.75			Suppressed by adjacent trees.
219	Black Cherry	*Prunus serotina*	Native	1	12.8	12.8	5	Possible	Very Poor	Boundary	Retain	0.25			Multiple dead scaffold branches; evidence of branch failures; cavity with decay at base; forked above DBH; dieback throughout.
220	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	33.2	33.2	5	Improbable	Fair	Boundary	Retain	0.75			Poor canopy structure, many twisted branched; epicormic growth.
221	White Ash	*Fraxinus americana*	Native	1	12.8	12.8	2	Probable	Very Poor	On Property	Retain	0.25			EAB exit holes; branch dieback throughout; peeling bark; vines in crown.
222	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	26.0	26	3.5	Improbable	Fair	Boundary	Retain	0.75			Small callous wounds at base; asymmetrical crown toward north; minor branch dieback.
223	Black Cherry	*Prunus serotina*	Native	2	37.6+38.0	75.6	7	Possible	Poor	Boundary	Retain	0.50			Multiple failed branches; dieback throughout; large dead scaffold branches with decay; fungus on branches.
224	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.2	11.2	2.5	Improbable	Fair	On Property	Retain	0.75			Minor branch dieback; asymmetrical crown toward north; multiple callous wounds.
225	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.7	18.7	4	Improbable	Fair	On Property	Retain	0.75			Asymmetrical crown toward north; minor branch dieback; pruning cuts.
226	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.3	19.3	4	Improbable	Fair	On Property	Retain	0.75			Minor branch dieback; asymmetrical crown toward field edge.
227	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.9	19.9	2.5	Improbable	Fair	Boundary	Retain	0.75			Minor branch dieback.
228	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.3	15.3	3.5	Improbable	Poor	Boundary	Retain	0.50			Asymmetrical crown due to adjacent trees; minor branch dieback; large crook in stem.
229	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	33.9	33.9	7	Possible	Fair	Boundary	Retain	0.75			Minor branch dieback.
230	Black Cherry	*Prunus serotina*	Native	3	40.7+31+30.3	102	6	Probable	Poor	Boundary	Retain	0.50			One stem dead; exfoliating bark; history of branch failure.
231	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16	16.4	3	Improbable	Good	Boundary	Retain	1.00			Good straight form; balanced canopy overall healthy.
232	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	27.2	27.2	5	Possible	Fair	Boundary	Retain	0.75			Minor branch dieback; good straight form; balanced canopy overall.
233	Sycamore Maple	*Acer pseudo-platanus*	Non-Native	1	13.7	13.7	4	Possible	Good	Boundary	Retain	1.00			Good straight form; overall healthy balanced canopy.
234	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	23.1	23.1	4	Improbable	Poor	Boundary	Remove	0.50	2	1	Small canker; broken top; minor branch dieback.
235	White Ash	*Fraxinus americana*	Native	1	17.5	17.5	3	Possible	Poor	On Property	Remove	0.50	2	1	Epicormic growth; history of branch failure.
236	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.4	18.4	3	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown due to neighboring trees; minor branch dieback.
237	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	21.4	21.4	3	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Multiple previous pruning cuts; minor branch dieback.
238	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.4	19.4	3	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Asymmetrical crown due to neighboring trees; minor branch dieback; pruning cuts.
239	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	4	36+26.8+29.5+14	106.3	6.5	Improbable	Fair	Boundary	Remove	0.75	4	3	Minor branch dieback; narrow crown.
240	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	62.1	62.1	8	Possible	Fair	Boundary	Remove	0.75	4	3	Evidence of previous branch failure; branch dieback; small cavity below DBH; good vigor.
241	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.5	19.5	2	Improbable	Fair	Boundary	Remove	0.75	2	1.5	Minor branch dieback; suppressed by neighboring trees; small wound with callous growth.
242	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.5	18.5	5	Improbable	Good	Boundary	Remove	1.00	2	2	Good straight form; balanced canopy overall healthy.
243	Black Cherry	*Prunus serotina*	Native	2	57.3+46.6	103.9	8	Probable	Poor	Boundary	Remove	0.50	4	2	One stem broken off and dead/discoloured bark; gypsy moth egg sacs; stained bark; history of branch failures.
244	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12.9	12.9	2	Improbable	Fair	Boundary	Remove	0.75	1	0.75	Asymmetrical crown due to neighboring trees; pruning cuts; minor branch dieback.

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245	American Basswood	*Tilia americana*	Native	4	21.0+23.2+21.5+25.8	91.5	5.5	Improbable	Fair	Boundary	Remove	0.75	4	3	Small canker in two stems; 1 broken top; epicormic growth; previous branch failure.
246	American Basswood	*Tilia americana*	Native	4	31.3+22.5+19.8+26.3	99.9	6.5	Possible	Fair	Boundary	Remove	0.75	4	3	Multiple failed branches; minor cavity in one stem; epicormic growth; dieback throughout.
247	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.7	19.7	5	Possible	Fair	Boundary	Remove	0.75	2	1.5	Good straight form; balanced canopy overall healthy; minor branch dieback.
248	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	13.3	13.3	4	Improbable	Good	On Property	Remove	1.00	1	1	Good straight form; balanced canopy overall healthy.
249	American Basswood	*Tilia americana*	Native	4	50.4+48+33.7+32.0	164.1	6	Possible	Fair	Boundary	Remove	0.75	4	3	Multiple failed branches; minor cavity in one stem; epicormic growth.
250	American Basswood	*Tilia americana*	Native	2	41.0+36.7	77.7	6	Possible	Poor	Off Property	Remove	0.50	4	2	Asymmetrical crown due to neighboring trees; failed branches; branch dieback.
251	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	21.6	21.6	4.5	Improbable	Good	On Property	Retain	1.00			Twisted trunk.
253	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	35.3	35.3	4.5	Improbable	Fair	Boundary	Retain	0.75			Previously pruned; dieback throughout; decay in cavity at base.
254	Black Cherry	*Prunus serotina*	Native	1	36.8	36.8	3	Possible	Very Poor	Boundary	Retain	0.25			Formerly codominant but one leader has since broken; dieback throughout; dead and broken top.
255	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.4	14.4	5	Improbable	Good	Boundary	Retain	1.00			Slight twist at top; good overall.
256	Black Cherry	*Prunus serotina*	Native	1	56.3	56.3	5	Possible	Very Poor	Boundary	Retain	0.25			Previously pruned; heavily leaning; epicormic branching; previously failed scaffold branches.
257	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	28	27.9	5	Improbable	Fair	Boundary	Retain	0.75			Growing into other tree; poor canopy structure; epicormic growth; twisted branches.
259	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	20.7+17.2	37.9	4	Possible	Fair	Boundary	Retain	0.75			Multi leader; numerous broken and dead branches; epicormic growth; poor canopy structure.
260	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	22.1	22.1	3	Improbable	Fair	Boundary	Retain	0.75			Minor branch dieback; suppressed.
261	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	18.3	18.3	4	Possible	Fair	Boundary	Retain	0.75			Large branch failure; epicormic growth.
262	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	4	17.0+14.7+19.6+10.9	62.2	3.5	Improbable	Fair	Off Property	Retain	0.75			Fused stems at base; dieback throughout.
263	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.5	15.5	1.5	Possible	Very Poor	Off Property	Retain	0.25			Fungal fruiting bodies; considerable dieback; decay throughout.
264	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.5	14.5	3.5	Possible	Very Poor	Off Property	Retain	0.25			Numerous dead branches; trunk and branches twisted and contorted.
265	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	35.3	35.3	3	Improbable	Poor	Off Property	Retain	0.50			Asymmetrical crown due adjacent trees; dieback throughout; decay at base.
266	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	65.5	65.5	5	Possible	Poor	Off Property	Retain	0.50			Large open cavity at base; asymmetrical crown due adjacent trees; dieback throughout.
267	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	42.3	42.3	6	Possible	Fair	Off Property	Retain	0.75			Poor branch attatchment; signs of branch failure; numerous dead branches.
268	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	42.1	42.1	6	Improbable	Fair	Boundary	Retain	0.75			Previously pruned; asymmetrical crown due adjacent trees; minor branch dieback.
269	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	3	14.9+29.2+40.6	84.7	6	Possible	Fair	Boundary	Retain	0.75			Numerous dead branches; epicormic growth; branches twisted; branch failure; large knot in middle of one stem.
270	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	42.9	42.9	3	Possible	Fair	Boundary	Retain	0.75			Previously pruned; multiple dead scaffold branches.
271	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17	17.2	5	Improbable	Good	Boundary	Retain	1.00			Asymmetrical crown; knot at base; some epicormic growth.
272	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	3	45.5+50.4+16.1	112	5	Possible	Poor	Boundary	Retain	0.50			Large open cavities in main stem; dieback throughout; previously failed branches.
273	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	4	11.5+42.4+17.4+36.4	107.7	5	Improbable	Fair	Boundary	Retain	0.75			Some branch failure; epicormic growth ; scaffold branch from smallest stem, broken top.
274	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	3	28.8, 14.1, 12.8	55.7	5	Improbable	Fair	Boundary	Retain	0.75			Epicormic growth; asymmetrical crown toward field; branch failure.
275	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	20.5	20.5	4	Improbable	Good	Off Property	Retain	1.00			Epicormic growth; some branch failure.
276	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	3	14.5+22.9+24.0	61.4	5	Possible	Fair	Boundary	Retain	0.75			One stem dead; large knots in smallest stem, growing around fence; epicormic growth; branch failure.
277	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	30.4+41.5	71.9	6	Possible	Fair	Boundary	Retain	0.75			Numerous dead or failed branches; epicormic growth; poor crown structure.
278	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	22.8+47.3	70.1	6	Possible	Fair	Off Property	Retain	0.75			Evidence of large branch failure; poor attatchment; numerous dead branches.
279	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14	14	3	Improbable	Fair	Off Property	Retain	0.75			Knots on trunk; basal shoots; epicormic growth.
280	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10.4	10.4	2.5	Improbable	Fair	Off Property	Retain	0.75			Twisted branches and trunk; few small dead branches.
281	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	22.3	22.3	6.5	Improbable	Fair	Off Property	Retain	0.75			Asymmetrical crown toward field; failed branches from neighbouring trees hung in crown.
283	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	46.8	46.8	5	Improbable	Poor	Off Property	Retain	0.50			Large open cavities at base; dieback throughout.

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284	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16.3	16.3	4	Improbable	Fair	Off Property	Retain	0.75			Numerous dead branches; epicormic growth.
285	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	69.3	69.3	8	Possible	Fair	Boundary	Retain	0.75			Multiple dead scaffold branches; dieback throughout.
286	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	59.4	59.4	6.5	Improbable	Poor	Off Property	Retain	0.50			Large cavity at base, 1.6m tall, completely rotted heartwood; numerous dead branches; epicormic growth.
287	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	49.5	49.5	5	Improbable	Fair	Boundary	Retain	0.75			Evidence of branch failures; minor branch dieback; decay in former branch union.
288	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16.5	16.5	4	Probable	Poor	Boundary	Retain	0.50			Large open wound knot at BH, completely rotted through; epicormic growth; twisted branches; large trunk wounds.
289	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	94.5	94.5	9	Possible	Fair	Boundary	Retain	0.75			Multiple dead scaffold branches; seam in stem; previously pruned; dieback throughout.
290	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	33.5	33.5	5	Improbable	Fair	Boundary	Retain	0.75			Twisted branches; growinb within the fence; epicormic growth.
291	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	73.4	73.4	9	Possible	Fair	On Property	Retain	0.75			Multiple dead scaffold branches; previously pruned; dieback throughout; large seam starting from crotch in crown where canopy forks..
292	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	56.4	56.4	8	Improbable	Poor	Boundary	Retain	0.50			Chain grown into stem at 3m; multiple dead scaffold branches; previously pruned; dieback throughout; epicormic growth.
293	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	41.3	41.3	3	Improbable	Very Poor	Boundary	Retain	0.25			Multiple cavities throughout stem; dieback throughout; suppressed and asymmetrical crown due adjacent trees.
294	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	12	12	2	Improbable	Fair	Boundary	Retain	0.75			Poor canopy structure; twisted branches; multiple dead branches.
295	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.1	15.1	1	Improbable	Fair	On Property	Retain- Confirm	0.75			Suppressed and asymmetrical crown due adjacent trees; minor branch dieback.
296	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16.2	16.2	1	Improbable	Fair	Boundary	Retain	0.75			Suppressed and asymmetrical crown due adjacent trees; minor branch dieback.
297	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	27	27	4.5	Improbable	Fair	Off Property	Retain	0.75			Epicormic growth; large rotted wound just above BH; poor canopy structure.
298	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	14.3+31.1	45.4	1	Improbable	Poor	Boundary	Retain	0.50			Scaffold branch fused into adjacent trees; asymmetrical crown due; minor branch dieback.
299	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16	16	5	Improbable	Fair	Boundary	Retain	0.75			Poor branch attatchment; epicormic growth.
300	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	3	21.8+25.3+13.7	60.8	2.5	Improbable	Fair	Boundary	Retain	0.75			Dieback throughout; evidence of branch failures; black bark.
301	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.5	19.5	4.5	Improbable	Fair	On Property	Retain	0.75			Poor branch attatchment; branch failure; epicormic growth; few dead branches.
302	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.2	19.2	2.5	Improbable	Fair	Boundary	Retain	0.75			Asymmetrical crown due adjacent trees; minor branch dieback.
303	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	29.5+19.2	48.7	4	Improbable	Fair	Boundary	Retain	0.75			Fused stems; dieback throughout.
304	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	30.8	30.8	5	Improbable	Good	Boundary	Retain	1.00			Poor branch attatchment.
305	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	94.0	94	9	Improbable	Poor	Off Property	Retain- Confirm	0.50			Large cavity at 1.5m; dead scaffold branches; dieback throughout.
306	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	23	23	5	Improbable	Good	Boundary	Remove	1.00	2	2	Epicormic growth; double leader; few broken branches.
307	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	68.2	68.2	6	Improbable	Fair	On Property	Remove	0.75	4	3	Previously pruned; included bark; minor branch dieback throughout.
308	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.9	14.9	2	Improbable	Good	Boundary	Remove	1.00	1	1	Epicormic growth; vines within canopy.
309	Black Cherry	*Prunus serotina*	Native	2	46.2+44.5	90.7	5	Improbable	Poor	Boundary	Remove	0.50	4	2	Poor form; multiple dead scaffold branches; dieback throughout.
310	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	39.7	39.7	4	Improbable	Fair	Boundary	Remove	0.75	3	2.25	Multiple dead branches; epicormic growth; poor crown structure; large branches broken and dead.
311	Common Apple	*Malus pumila*	Non-Native	4	44.2+22.1+36.4+44	146.7	4	Improbable	Poor	Boundary	Retain- Confirm	0.50			Fused stems; dieback throughout; decay in crotch; epicormic growth throughout.
312	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	13.7	13.7	2.5	Improbable	Good	Boundary	Retain	1.00			Multi leader; some epicormic growth.
313	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	14.6	14.6	1.5	Improbable	Fair	Boundary	Retain	0.75			Previously pruned; minor branch dieback.
314	Black Cherry	*Prunus serotina*	Native	1	50.1	50.1	6	Possible	Poor	Boundary	Retain	0.50			Multiple previously pruned branches; twig and branch dieback throughout; evidence of branch failures.
315	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	54.3	54.3	10	Possible	Fair	Boundary	Retain	0.75			Multi leader; poor branch attatchment; numerous dead branches; epicormic growth.
316	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	65	65	7	Improbable	Fair	Boundary	Retain	0.75			Dieback throughout; previously pruned branches toward field; forked crown.
317	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	51.6+26	77.6	6	Possible	Fair	Boundary	Retain	0.75			Multiple dead branches; poor canopy structure; scaffold branches.

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318	Black Cherry	*Prunus serotina*	Native	1	47.3	47.3	4	Possible	Very Poor	Boundary	Retain	0.25			Previous stem pruned; fruiting bodies on stem; considerable dieback; multiple previously pruned branches.
319	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	11.4	11.4	2	Improbable	Fair	Boundary	Retain	0.75			Numerous dead branches; epicormic growth; vines up trunk and into canopy; numerous dead branches.
320	White Ash	*Fraxinus americana*	Native	1	15.5	15.5	3	Improbable	Poor	On Property	Retain	0.50			Evidence of EAB; peeling bark showing dead sapwood and EAB all up trunk; double leader.
321	White Elm	*Ulmus americana*	Native	1	13.9	13.9	2	Improbable	Fair	Boundary	Retain	0.75			Slightly suppressed; minor branch dieback.
322	Black Cherry	*Prunus serotina*	Native	2	47.5+70.1	117.6	6	Probable	Very Poor	On Property	Retain	0.25			Previously pruned; multiple dead scaffold branches; decay throughout; cavity with decay in stem.
323	Black Cherry	*Prunus serotina*	Native	1	43.6	43.6	6.5	Possible	Fair	Boundary	Retain	0.75			Large branch failure; numerous dead branches; damage at base.
324	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.4	19.4	4	Improbable	Fair	On Property	Retain	0.75			Considerable epicormic growth; slight lean.
325	Black Cherry	*Prunus serotina*	Native	1	39.6	39.6	6	Possible	Poor	On Property	Retain	0.50			Previously pruned; multiple dead scaffold branches; epicormic growth.
326	Manitoba Maple	*Acer negundo*	Native	1	11.2	11.2	2	Improbable	Fair	Boundary	Retain	0.75			Minor branch dieback.
327	Manitoba Maple	*Acer negundo*	Native	3	10.8+13.1+12	35.9	4.5	Improbable	Fair	On Property	Retain	0.75			Epicormic growth; poor canopy structure; slight lean.
328	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	20.1	20.1	4	Improbable	Fair	On Property	Retain	0.75			Minor branch dieback; small seam with callous tissue.
329	White Elm	*Ulmus americana*	Native	2	36.4+27.5	63.9	5	Improbable	Fair	On Property	Retain	0.75			Minor branch dieback; fused stems at base.
330	Manitoba Maple	*Acer negundo*	Native	7	11.5+10.5+12+10.2+11.8+10.3+12.2	78.5	4	Improbable	Fair	On Property	Retain	0.75			Epicormic growth; basal shoots.
331	Manitoba Maple	*Acer negundo*	Native	1	10.9	10.9	5	Improbable	Fair	On Property	Retain	0.75			Minor branch dieback.
332	Manitoba Maple	*Acer negundo*	Native	2	12.9+10.4	23.3	3	Improbable	Fair	On Property	Retain	0.75			Minor branch dieback.
334	Manitoba Maple	*Acer negundo*	Native	2	11.4+9.9	21.3	4	Improbable	Fair	On Property	Retain	0.75			Slight lean toward field; epicormic growth; numerous dead branches.
335	Manitoba Maple	*Acer negundo*	Native	3	10.5+15.4+10	35.9	3	Improbable	Fair	On Property	Retain	0.75			Suppressed; minor branch dieback.
336	Common Apple	*Malus pumila*	Non-Native	2	35.7+36.2	71.9	6	Possible	Very Poor	On Property	Retain	0.25			Epicormic growth; dieback throughout; previously failed scaffold branches.
337	Common Apple	*Malus pumila*	Non-Native	1	41.5	41.5	7	Improbable	Fair	Boundary	Retain	0.75			Evidence of large branch failure; some dead branches; epicormic growth; twisted trunk
338	Common Apple	*Malus pumila*	Non-Native	2	36.3+29.7	66	6	Possible	Fair	Off Property	Retain	0.75			Second stem mostly dead; epicormic growth; evidence of large branch failure.
333	Manitoba Maple	*Acer negundo*	Native	1	10.5	10.5	2	Improbable	Fair	Boundary	Retain	0.75			Suppressed; minor branch dieback.
339	Manitoba Maple	*Acer negundo*	Native	1	14.4	14.4	3	Improbable	Fair	Boundary	Retain	0.75			Branch dieback throughout.
340	Common Apple	*Malus pumila*	Non-Native	2	26.9+24.2	51.1	5	Improbable	Fair	Boundary	Retain	0.75			Epicormic growth; twisted stems; few dead branches.
341	Common Apple	*Malus pumila*	Non-Native	2	31+45.4	76.4	5	Improbable	Fair	Boundary	Retain	0.75			Evidence of large branch failure, recent; numerous dead branches.
342	Common Apple	*Malus pumila*	Non-Native	5	31.5+24.2+14+29.5+27.3	126.5	5	Improbable	Fair	Boundary	Retain	0.75			Epicormic growth throughout; dieback throughout.
343	Common Apple	*Malus pumila*	Non-Native	1	22.6	22.6	4	Possible	Poor	Boundary	Retain	0.50			Epicormic growth throughout; dieback throughout; previously pruned.
344	Common Apple	*Malus pumila*	Non-Native	1	35.4	35.4	5	Possible	Poor	On Property	Retain	0.50			Epicormic growth throughout; dieback throughout; previously pruned.
345	Common Apple	*Malus pumila*	Non-Native	1	15.1	15.1	5	Possible	Poor	Boundary	Retain	0.50			Epicormic growth throughout; dieback throughout; previously pruned.
346	Common Apple	*Malus pumila*	Non-Native	2	17.6+17.4	35	5	Possible	Poor	Boundary	Retain	0.50			Evidence of previous branch failure; picormic growth throughout; dieback throughout; previously pruned.
347	Common Apple	*Malus pumila*	Non-Native	2	19.9+22.6	42.5	5	Possible	Poor	Boundary	Retain	0.50			Mechanical wound; previously pruned; dieback throughout.
348	Common Apple	*Malus pumila*	Non-Native	4	21+16.4+19+16.9	73.3	5	Possible	Poor	Boundary	Retain	0.50			Branch dieback throughout.
349	Common Apple	*Malus pumila*	Non-Native	1	15.4	15.4	3	Improbable	Fair	Boundary	Retain	0.75			Minor dieback throughout.
350	Common Apple	*Malus pumila*	Non-Native	1	22.3	22.3	4	Improbable	Fair	Boundary	Retain	0.75			Previously pruned; minor dieback throughout.
351	Common Apple	*Malus pumila*	Non-Native	2	15.7+11	26.7	4	Improbable	Very Poor	Off Property	Retain	0.25			Epicormic growth; large wound at base; minor dieback throughout.
352	Common Apple	*Malus pumila*	Non-Native	1	15.5	15.5	2	Improbable	Poor	Boundary	Retain	0.50			Epicormic growth; branch dieback throughout.
353	Common Apple	*Malus pumila*	Non-Native	1	22.5	22.5	3	Improbable	Poor	Boundary	Retain	0.50			Epicormic growth; branch dieback throughout.
354	Common Apple	*Malus pumila*	Non-Native	3	34.0+19.6+24.1	77.7	3	Possible	Poor	Off Property	Retain	0.50			Large previously failed dead branches; epicormic growth; branch dieback throughout.
355	Common Apple	*Malus pumila*	Non-Native	1	19.3	19.3	3	Improbable	Fair	Off Property	Retain	0.75			Minor epicormic growth; branch dieback throughout.
356	Common Apple	*Malus pumila*	Non-Native	1	15.5	15.5	3	Improbable	Poor	Boundary	Retain	0.50			Large previously pruned branches.
357	Common Apple	*Malus pumila*	Non-Native	4	21.0+14.2+20.5+15.2	70.9	5	Improbable	Poor	Boundary	Retain	0.50			Dieback throughout; previously pruned.
358	Common Apple	*Malus pumila*	Non-Native	1	31.0	31	4	Improbable	Fair	Boundary	Retain	0.75			Previously pruned; dieback throughout.
359	Common Apple	*Malus pumila*	Non-Native	2	31.7+15.1	46.8	4	Improbable	Poor	Boundary	Retain	0.50			Epicormic growth; large branch failure; dieback throughout.
360	Common Apple	*Malus pumila*	Non-Native	1	15.5	15.5	3	Improbable	Fair	Off Property	Retain	0.75			Epicormic growth.
361	Common Apple	*Malus pumila*	Non-Native	2	19.9+16.1	36	3	Improbable	Poor	Off Property	Retain	0.50			Epicormic growth; minor dieback.
362	Common Apple	*Malus pumila*	Non-Native	2	18.0+11.9	29.9	3	Improbable	Poor	Off Property	Retain	0.50			Epicormic growth; branch dieback; large branch failure.
363	White Ash	*Fraxinus americana*	Native	3	16.6+18.5+35.5	70.6	5	Possible	Very Poor	Off Property	Retain	0.25			Large branch failure; epicormic growth; EAB.

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364	White Ash	*Fraxinus americana*	Native	2	13.1+13.0	26.1	2	Possible	Very Poor	Boundary	Retain	0.25			EAB; branch dieback; epicormic growth.
365	White Ash	*Fraxinus americana*	Native	3	21.5+18+37.0	76.5	2	Possible	Very Poor	Boundary	Retain	0.25			EAB; branch dieback; epicormic growth; peeling bark.
366	Common Apple	*Malus pumila*	Non-Native	1	21	21	3	Possible	Poor	Boundary	Retain	0.50			Heavily leaning; epicormic growth; previously pruned.
367	European Larch	*Larix decidua*	Non-Native	1	26.5	26.5	3	Improbable	Fair	Boundary	Retain	0.75			Small wound at base.
368	European Larch	*Larix decidua*	Non-Native	1	13.8	13.8	2	Improbable	Fair	Boundary	Retain	0.75			Slightly asymmetrical crown.
369	Common Apple	*Malus pumila*	Non-Native	2	19.5+18	37.5	2	Improbable	Poor	Boundary	Retain	0.50			Epicormic growth; branch dieback throughout.
370	White Ash	*Fraxinus americana*	Native	1	42.9	42.9	5	Possible	Poor	Boundary	Retain	0.50			Epicormic growth; EAB exit holes; branch dieback.
371	White Ash	*Fraxinus americana*	Native	3	18.5+13.1+17.3	48.9	5	Possible	Poor	On Property	Remove	0.50	3	1.5	Epicormic growth; EAB exit holes; branch dieback.
372	White Ash	*Fraxinus americana*	Native	1	11.5	11.5	3	Possible	Poor	Boundary	Retain	0.50			Epicormic growth; EAB exit holes; branch dieback.
373	Common Apple	*Malus pumila*	Non-Native	2	17+23	40	3	Possible	Fair	Boundary	Retain	0.75			Epicormic growth; branch dieback throughout.
374	Common Apple	*Malus pumila*	Non-Native	3	17.1+16+15.5	48.6	3	Improbable	Fair	Boundary	Retain	0.75			Previously pruned; epicormic growth; branch dieback throughout.
375	White Ash	*Fraxinus americana*	Native	3	37.5+34+21.2	92.7	4	Possible	Very Poor	Boundary	Retain	0.25			Eab exit holes; epicormic growth; branch dieback throughout.
376	Common Apple	*Malus pumila*	Non-Native	2	19.2+12.1	31.3	4	Improbable	Poor	Boundary	Retain	0.50			Epicormic growth; heavy lean; branch dieback.
377	Common Apple	*Malus pumila*	Non-Native	2	20.7+27	47.7	4	Possible	Very Poor	Boundary	Retain	0.25			Dead and decating branches; epicormic growth; heavy lean; branch dieback.
378	Common Apple	*Malus pumila*	Non-Native	1	23.0	23	4	Possible	Very Poor	Boundary	Retain	0.25			Previously pruned; dead and decating branches; epicormic growth; heavy lean; branch dieback.
379	White Ash	*Fraxinus americana*	Native	1	35.1	35.1	4	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; epicormic growth; branch dieback.
380	Common Apple	*Malus pumila*	Non-Native	3	18+20+16	54	3	Possible	Very Poor	Boundary	Retain	0.25			Epicormic growth; multiple dead branches; branch dieback.
381	White Ash	*Fraxinus americana*	Native	1	36	36	3	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; epicormic growth; multiple dead branches; previously pruned branches; branch dieback.
382	White Ash	*Fraxinus americana*	Native	1	36.9	36.9	5	Possible	Very Poor	Off Property	Retain	0.25			EAB exit holes on stem; epicormic growth; multiple dead branches; previously pruned branches; branch dieback.
383	White Ash	*Fraxinus americana*	Native	1	12.1	12.1	2	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; epicormic growth; multiple dead branches; branch dieback.
384	White Ash	*Fraxinus americana*	Native	1	19.4	19.4	4	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; epicormic growth; multiple dead branches; branch dieback.
385	Common Apple	*Malus pumila*	Non-Native	1	31.1+20.1	51.2	3.5	Possible	Poor	Off Property	Retain	0.50			Considerable epicormic growth; multiple dead branches; branch dieback.
386	White Ash	*Fraxinus americana*	Native	1	48.5	48.5	3.5	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; multiple dead branches; branch dieback.
387	White Ash	*Fraxinus americana*	Native	1	16.5	16.5	2	Possible	Fair	Boundary	Retain	0.75			Fused codominant; minor dieback.
388	Eastern White Pine	*Pinus strobus*	Native	1	27.7	27.7	5	Improbable	Good	Off Property	Retain	1.00			Wide vigorous crown; open growth characteristics.
389	White Ash	*Fraxinus americana*	Native	2	21.5+21.3	42.8	4	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; branch dieback; bark peeling.
390	White Ash	*Fraxinus americana*	Native	3	33+20.7+17.5	71.2	5	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; branch dieback; bark peeling.
391	Common Apple	*Malus pumila*	Non-Native	1	26.0	26	4	Possible	Fair	Boundary	Retain	0.75			Branch dieback; epicormic growth.
392	White Ash	*Fraxinus americana*	Native	1	13.5	13.5	2	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; branch dieback; epicormic growth.
393	Common Apple	*Malus pumila*	Non-Native	1	35.5	35.5	5	Possible	Poor	Boundary	Retain	0.50			Previously pruned branches; epicormic growth; multiple failed branches; small crack in stem.
394	Common Apple	*Malus pumila*	Non-Native	3	20.1+17.5+19.8	57.4	3.5	Possible	Poor	Boundary	Retain	0.50			Multiple dead branches; epicormic growth; small wound at base.
395	Common Apple	*Malus pumila*	Non-Native	1	25.5	25.5	3	Improbable	Fair	Off Property	Retain	0.75			Epicormic growth; stems fused at base.
396	Common Apple	*Malus pumila*	Non-Native	3	19.7+15.5	35.2	4	Possible	Poor	Boundary	Retain	0.50			Considerable epicormic growth; multiple dead branches; branch dieback throughout.
397	White Ash	*Fraxinus americana*	Native	1	62.3	62.3	5	Possible	Very Poor	On Property	Remove	0.25	4	1	EAB exit holes on stem; epicormic growth; bark peeling off; branch dieback throughout; previously pruned branches.
398	Black Cherry	*Prunus serotina*	Native	1	51.3	51.3	6	Improbable	Poor	Boundary	Retain	0.50			Previously pruned branches; branch dieback throughout; multiple failed branches.
399	American Mountain-Ash	*Sorbus americana*	Native	2	11.5+12.5	24	3	Improbable	Fair	Boundary	Retain	0.75			Minor branch dieback; poor form.
400	Common Apple	*Malus pumila*	Non-Native	2	35.9+18.8	54.7	3	Possible	Poor	Boundary	Retain	0.50			Previously pruned branches; minor dieback; branch dieback throughout.
401	Black Cherry	*Prunus serotina*	Native	1	30.1	30.1	5	Possible	Fair	On Property	Retain	0.75			Previously pruned branches; seam in stem; minor dieback; branch dieback throughout.
402	Black Cherry	*Prunus serotina*	Native	1	28.4	28.4	5	Improbable	Fair	On Property	Retain	0.75			Previously pruned branches; minor dieback; branch dieback throughout.
403	Black Cherry	*Prunus serotina*	Native	1	15.5	15.5	1.5	Improbable	Fair	Boundary	Retain	0.75			Heavy lean; branch dieback.
404	Common Apple	*Malus pumila*	Non-Native	3	15.4+16.5+27	58.9	3	Improbable	Fair	Boundary	Retain	0.75			Epicormic growth; branch dieback.
405	White Ash	*Fraxinus americana*	Native	1	31.5	31.5	5	Possible	Very Poor	Boundary	Retain	0.25			Epicormic growth; EAB exit holes on stem; branch dieback; peeling bark.
406	White Elm	*Ulmus americana*	Native	1	42.2	42.2	7	Improbable	Fair	Boundary	Retain	0.75			Minor branch dieback.
407	White Ash	*Fraxinus americana*	Native	1	24.5	24.5	5	Possible	Poor	Boundary	Retain	0.50			EAB exit holes on stem; branch dieback.
408	Black Cherry	*Prunus serotina*	Native	1	31.6	31.6	6	Improbable	Poor	Boundary	Retain	0.50			Previously pruned branches; epicormic growth; branch dieback.
409	Black Cherry	*Prunus serotina*	Native	1	43.3	43.3	6	Improbable	Fair	Boundary	Retain	0.75			Forked crown above DBH; branch dieback.
410	Black Cherry	*Prunus serotina*	Native	1	15.4	15.4	3	Improbable	Fair	On Property	Retain	0.75			Minor branch dieback.

Wellington Rd, Hillsburgh Tree Preservation Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native/ Non-native	Stem Count	DBH (cm)	DBH Sum	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Tree Health Coefficient	Compensation Ratio	Compensation Total	Comments
411	Black Cherry	*Prunus serotina*	Native	3	26.5+14+15	55.5	4	Improbable	Poor	Boundary	Retain	0.50			Minor branch dieback; cavity at base; epicormic growth.
412	Black Cherry	*Prunus serotina*	Native	1	25.1	25.1	3	Improbable	Poor	On Property	Retain	0.50			Previously pruned branches; branch dieback throughout; decay visible in branches.
413	Black Cherry	*Prunus serotina*	Native	1	21.5	21.5	3	Improbable	Poor	Boundary	Retain	0.50			Forked crown; multiple dead branches; epicormic growth.
414	Black Cherry	*Prunus serotina*	Native	3	22.5+36+40	98.5	5	Improbable	Poor	On Property	Retain	0.50			Previously pruned branches; epicormic growth; branch dieback throughout.
415	White Ash	*Fraxinus americana*	Native	1	15.5	15.5	2.5	Possible	Very Poor	Boundary	Retain	0.25			EAB exit holes on stem; branch dieback throughout.
416	White Ash	*Fraxinus americana*	Native	1	10.5	10.5	1	Improbable	Fair	On Property	Retain	0.75			EAB exit holes on stem; branch dieback throughout.
417	Black Cherry	*Prunus serotina*	Native	1	36+31.5	67.5	5	Possible	Poor	Boundary	Remove	0.50	4	2	Previously failed branches; epicormic growth; branch dieback throughout.
418	White Ash	*Fraxinus americana*	Native	1	21.5	21.5	5	Possible	Poor	Boundary	Remove	0.50	2	1	EAB exit holes on stem; epicormic growth; minor dieback.
419	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	10	10	2	Improbable	Poor	Boundary	Remove	0.50	1	0.5	Minor dieback.
420	White Ash	*Fraxinus americana*	Native	2	19.8+16.1	35.9	4	Possible	Very Poor	On Property	Remove	0.25	3	0.75	Minor dieback; EAB exit holes on stem; bark exfoliating.
421	White Ash	*Fraxinus americana*	Native	1	23.1	23.1	4	Possible	Very Poor	Boundary	Remove	0.25	2	0.5	Minor dieback; broken top; EAB exit holes on stem; bark exfoliating.
422	Manitoba Maple	*Acer negundo*	Native	1	11.3	11.3	2	Improbable	Fair	On Property	Remove	0.75	1	0.75	Minor dieback; small wound at base.
423	Manitoba Maple	*Acer negundo*	Native	2	28.0+25.1	53.1	4	Improbable	Fair	Boundary	Remove	0.75	4	3	Minor dieback; cavity at base; heavy lean; poor form.
001-BN	Butternut	*Juglans cinerea*	Native	1	28.2	28.2	4	Possible	Poor	Off Property	Remove	0.50	2	1	Large cavity at base; branch dieback throughout; decay in branch unions.
002-BN	Butternut	*Juglans cinerea*	Native	1	2	2	0.25	Improbable	Fair	On Property	Remove	0.75	1	0.75	Sooty cavity on root flare
003-BN	Butternut	*Juglans cinerea*	Native	1	107.3	107.3	11	Improbable	Fair	Boundary	Retain	0.75			Large scaffold branch; few dead branches; epicormic growth; evidence of branch failure.
004-BN	Butternut	*Juglans cinerea*	Native	1	31.1	31.1	3	Possible	Poor	Boundary	Retain	0.50			Sooty cavity; minor branch dieback.
005-BN	Butternut	*Juglans cinerea*	Native	1	12.2	12.2	3	Improbable	Poor	On Property	Retain	0.50			Sooty cavity; asymmetrical crown due to neighboring trees.
006-BN	Butternut	*Juglans cinerea*	Native	1	47.9	47.9	7	Probable	Poor	Boundary	Remove	0.50	3	1.5	History of branch failure; cankers; branch rub.
007-BN	Butternut	*Juglans cinerea*	Native	5	29.7+32.6+28.1+ 14.5+31.5	136.4	6.5	Possible	Poor	On Property	Remove	0.50	4	2	History of branch failures; sooty cankers throughout.
008-BN	Butternut	*Juglans cinerea*	Native	2	49.1+26.6	75.7	7	Probable	Poor	On Property	Remove	0.50	4	2	Branch dieback; frost crack; cankers; dead tree leaning on it.
009-BN	Butternut	*Juglans cinerea*	Native	1	25.2	25.2	2	Probable	Very Poor	Boundary	Remove	0.25	2	0.5	Canker throughout with gypy moths dead inside; grapevines; woodpecker holes; history of branch failure.
010-BN	Butternut	*Juglans cinerea*	Native	3	11.9+26.6+13.6	52.1	4.5	Possible	Poor	Boundary	Remove	0.50	4	2	Sooty cavity; branch dieback.
011-BN	Butternut	*Juglans cinerea*	Native	1	14.3	14.3	2	Probable	Very Poor	Boundary	Remove	0.25	1	0.25	Sooty canker; asymmetrical crown; branch dieback.
012-BN	Butternut	*Juglans cinerea*	Native	1	30.1	30.1	4	Improbable	Fair	Boundary	Retain	0.75			Sooty canker; dieback.
013-BN	Butternut	*Juglans cinerea*	Native	3	28.8+19.6+22.0	70.4	4	Possible	Poor	On Property	Retain	0.50			Sooty canker; dieback.
014-BN	Butternut	*Juglans cinerea*	Native	3	28.7+30.6+13.3	72.6	6.5	Possible	Fair	On Property	Retain	0.75			History of branch failure; canker in root flare area where stems branch off.
015-BN	Butternut	*Juglans cinerea*	Native	3	29.5+29.6+29.7	88.8	6	Probable	Poor	On Property	Retain	0.50			History of branch failures; cankers throughout.
016-BN	Butternut	*Juglans cinerea*	Native	1	25.9	25.9	4	Probable	Poor	On Property	Retain	0.50			Cankers; history of branch failure; frost crack; good straight form; balanced crown.
097b	Black Cherry	*Prunus serotina*	Native	1	47.9	47.9	5	Probable	Very Poor	Boundary	Retain	0.25			History of branch failures; extensive gypsy moth egg sacs.
A	Manitoba Maple	*Acer negundo*	Native	1	45	45	4	Possible	Fair	Boundary	Remove	0.75	3	2.25	Epicormic growth; moderate branch dieback.

Appendix II
Tree Health & Risk Assessment Criteria

Tree Health Assessment Criteria

Assessment Criteria	Definition[1]
Excellent	Represents a tree in near perfect form, health, and vigour. This tree would exhibit no deadwood, no decline, and no visible defects.
Good	Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigour and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare.
Fair	Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigour and structure of the tree.
Poor	Represents a tree that exhibits a poor vigour, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown unbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future.
Very Poor	Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in an advanced state of decline and would be identified as very poor. These trees may have a probable or imminent potential for structural failure and may be identified for removal.
Dead	Represents a tree that exhibits no sign of new growth, including buds, foliage, or shoot growth. These trees may have a probable or imminent potential for structural failure and may be identified for removal.

[1]Dunster 2009

Potential for Structural Failure Assessment Criteria

Assessment Criteria*	Definition[2]
Improbable	The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.
Possible	Failure could occur, but it is unlikely during normal weather conditions within the specified time frame.
Probable	Failure may be expected under normal weather conditions within the specified time frame.
Imminent	Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for a risk assessor to encounter, and it may require immediate action to protect people from harm.
*A specified time frame of 2 years will be used when assessing potential for structural failure.	

[2]Dunster et al. 2013

Appendix III
Conditions of Tree Inventory Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations by Natural Resource Solutions Inc. (NRSI) as they existed at the time of the site inspection(s) of the Client's Property as described in this report (the "Subject Lands") and the trees situated thereon, and upon information provided by the Client to NRSI. The opinions in this assessment are given based on observations made and using generally accepted professional judgment, however, because trees are living organisms and subject to change, damage and disease, the results, observations, recommendations, and analysis as set out in this assessment are valid only at the date any such observations and analysis took place. No guarantee, warranty, representation or opinion is offered or made by NRSI as to the length of the validity of the results, observations, recommendations and analysis contained within this assessment. As a result, the Client shall not rely upon this assessment, save and except for representing the circumstances and observations at the date of site inspection(s), and the analysis and recommendations made in relation to the proposed undertaking. It is recommended that the inventoried trees discussed in this assessment should be re-assessed periodically, where required.

Further Services

Neither NRSI, nor any assessor employed or retained by NRSI (the "Assessor") for the purpose of preparing or assisting in the preparation of this assessment shall be required to provide any further consultation or services to the Client including, without limitation, acting as an expert witness or witness in any court in any jurisdiction unless the Client has first made specific arrangements with respect to such further services, including providing payment of the Assessor's regular hourly billing fees.

NRSI accepts no responsibility for the implementation of all or any part of this report, unless specifically requested to examine the implementation of such activities recommended herein. Any request for the inspection or supervision of all or part of the implementation shall be made in writing and the details agreed to in writing by both parties.

Assumptions

The Client is hereby notified that where any of the information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, NRSI will in no way be responsible for the veracity or accuracy of any such information. Further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property is in full compliance with all applicable federal, provincial, municipal and local statutes, regulations, by-laws, guidelines and other related laws. NRSI explicitly denies any legal liability for any and all issues with respect to non-compliance with any of the above-referenced statutes, regulations, by-laws, guidelines and laws as it may pertain to or affect the Property.

Restriction of Assessment

The assessment carried out was restricted to the areas as described in this report. NRSI is not legally liable for any other trees except those expressly discussed herein. The conclusions of this assessment do not apply to any areas, trees, or any other property not covered or referenced in this assessment.

Professional Responsibility

In carrying out this assessment, NRSI and any Assessor appointed for and on behalf of NRSI to perform and carry out the assessment has exercised a reasonable standard of care, skill and diligence. The assessment has been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discolored foliage (during the leaf-on period), the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. Except where specifically noted in the assessment, none of the trees examined on the property were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

No guarantees are offered, or implied, that trees recommended for retention, or all parts of them, will remain standing. It is professionally impossible to predict with absolute certainty the behaviour of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most

trees have the potential to fall, lean, or otherwise pose a danger to property and persons in the event of extreme weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by NRSI or its directors, officers, employers, contractors, agents or Assessors for:

a) any legal description provided with respect to the Property;
b) issues of title and/or ownership with respect to the Property;
c) the accuracy of the Property line locations or boundaries with respect to the Property; and
d) the accuracy of any other information provided to NRSI by the Client or third parties;
e) any consequential loss, injury or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings and business interruption; and
f) the unauthorized distribution of the assessment.

Third Party Liability

This assessment was prepared by NRSI for the Client. The data collected reflect NRSI's best assessment of the inventoried trees situated on the Property with the information available at the time of observation. Data analysis and the assessment of potential impacts to inventoried trees is specific to the proposed undertaking as described in this report. NRSI accepts no responsibility for any damages or loss suffered by any third party or by the Client as a result of decisions made or actions based upon the use of this assessment for purposes unrelated to the proposed undertaking.

General

Any plans and/or illustrations in this assessment are included only to help the Client visualize the issues in this assessment and shall not be relied upon for any other purpose.

This report shall be considered as a whole, no sections are severable, and the assessment shall be considered incomplete if any pages are missing.

Appendix IV
Tree Inventory Summary Tables

Summary of Inventoried Trees

Common Name	Scientific Name	Good	Fair	Poor	Very Poor	Total
American Basswood	*Tilia americana*		7	2		9
American Mountain-Ash	*Sorbus americana*		3			3
Black Cherry	*Prunus serotina*		10	37	11	58
Black Walnut	*Juglans nigra*		8	2		10
Butternut	*Juglans cinerea*		4	10	2	16
Eastern White Pine	*Pinus strobus*	1				1
Hawthorn sp.	*Crataegus* sp.			1		1
Manitoba Maple	*Acer negundo*		17	9	2	28
Silver Maple	*Acer saccharinum*		6	2		8
Sugar Maple	*Acer saccharum ssp. saccharum*	19	116	24	7	166
White Ash	*Fraxinus americana*		5	7	19	31
White Elm	*Ulmus americana*		5	2		7
Total		**20**	**181**	**96**	**41**	**338**
Common Apple	*Malus pumila*		15	23	5	43
European Larch	*Larix decidua*		2			2
Sweet Cherry	*Prunus avium*			1		1
Sycamore Maple	*Acer pseudo-platanus*	1				1
Total		**1**	**17**	**24**	**5**	**47**
Overall Total		**21**	**198**	**120**	**46**	**385**

Overall Condition of Trees Inventoried

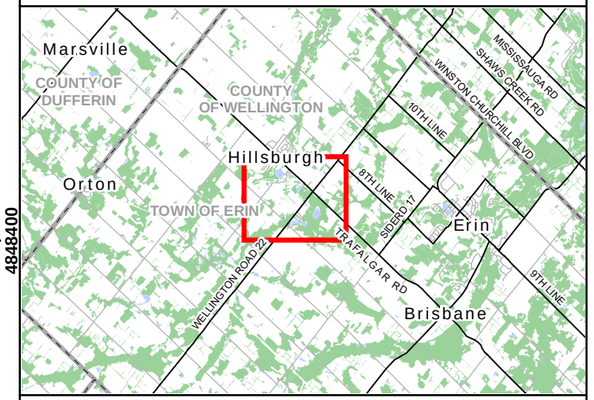
Potential for Structural Failure Rating	Overall Condition						Total
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Improbable	0	20	134	39	3	0	196
Possible	0	1	64	57	31	0	153
Probable	0	0	0	24	12	0	36
Imminent	0	0	0	0	0	0	0
Total	**0**	**21**	**198**	**120**	**46**	**0**	**385**

Maps

Map 1

Wellington Rd Hillsburgh EIS

Study Area



Legend

- Subject Property
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland
- Wooded Area
- Significant Woodland (Wellington County 2022)

Wildlife Activity Area

- White-tailed Deer Wintering Area (Stratum 2)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681
Date: November 7, 2023

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

N

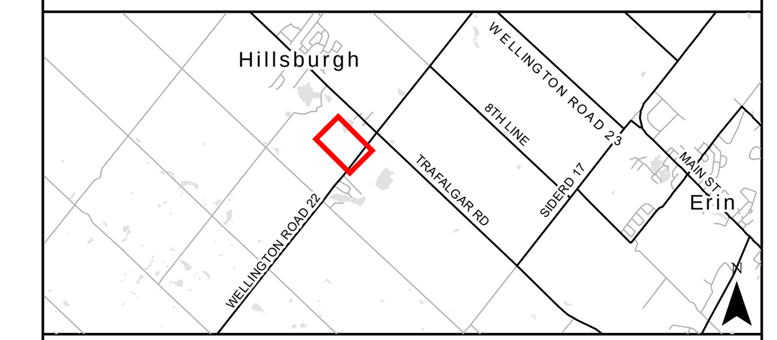
0 100 200 300 400 500 600 700 Metres

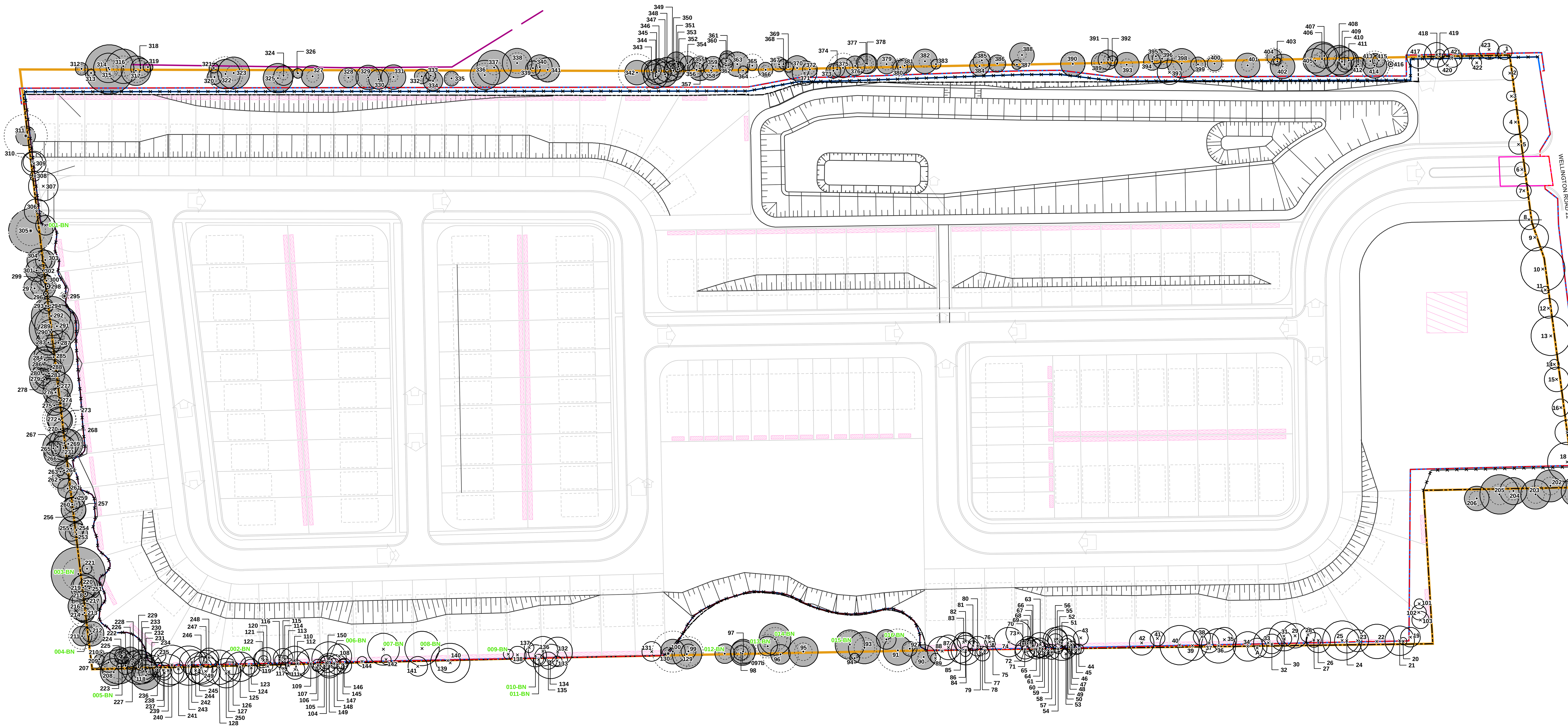
Path: X:\2681_Wellington_Rd_Hillsburgh_EIS\NRSI_2681_Map1_StudyArea_11K_2023_11_07_KEF.mxd

Map 2

9354 Wellington Road 22 Residential Subdivision

Tree Inventory and Preservation Plan





Legend

- Tree to be Retained (Crown to Scale)
- Tree to be Retained- Confirm in Field (Crown to Scale)
- Tree to be Removed (Crown to Scale)
- Minimum Tree Protection Zone (TPZ)
- Subject Property
- Proposed Development Footprint
- Proposed Construction Footprint
- Proposed Site Plan
- Proposed Building Footprint
- Proposed Grading
- Proposed Erosion and Sediment Control (ESC) Fence
- Proposed Sediment Control Mat
- Proposed Infiltration Gallery
- Top of Bank (CVC 2023)
- Tree Protection Fence (TPF)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2681
Date: November 15, 2023

NAD83 - UTM Zone 17
Size: 24x36"
1:850

0 10 20 30 40 50 Meters

Appendix VII
Bird Species Reported from the Study Area

Bird Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	MNRF 2023b	NRSI Results from 2023
Anatidae	**Ducks, Geese & Swans**								
Aix sponsa	Wood Duck	S5B,S3N					CO		**PR**
Anas crecca	Green-winged Teal	S4B,S4N,S5M					PR		
Anas platyrhynchos	Mallard	S5					CO		
Branta canadensis	Canada Goose	S5					CO		**OB**
Cygnus buccinator	Trumpeter Swan	S4	NAR	NAR	NS	No schedule	PR		
Cygnus columbianus	Tundra Swan	S2B,S4N,S3M							**OB**
Phasianidae	**Partridges, Grouse & Turkeys**								
Bonasa umbellus	Ruffed Grouse	S5					CO		
Meleagris gallopavo	Wild Turkey	S5					CO		**PO**
Columbidae	**Pigeons & Doves**								
Columba livia	Rock Pigeon	SNA					PR		
Zenaida macroura	Mourning Dove	S5					CO		
Cuculiformes	**Cuckoos & Anis**								
Coccyzus americanus	Yellow-billed Cuckoo	S4B					PO		
Coccyzus erythropthalmus	Black-billed Cuckoo	S4S5B					PO		
Coccyzus sp.	Black/Yellow-billed Cuckoo	NP					PO		
Trochilidae	**Hummingbirds**								
Archilochus colubris	Ruby-throated Hummingbird	S5B					CO		
Rallidae	**Rails, Gallinules & Coots**								
Rallus limicola	Virginia Rail	S4S5B					PR		
Charadriidae	**Plovers & Lapwings**								
Charadrius vociferus	Killdeer	S4B					CO		
Scolopacidae	**Sandpipers & Allies**								
Actitis macularia	Spotted Sandpiper	S5B					PR		
Gallinago delicata	Wilson's Snipe	S5B					PR		
Scolopax minor	American Woodcock	S4B					PR		
Laridae	**Gulls, Terns & Skimmers**								
Larus delawarensis	Ring-billed Gull	S5							**OB**
Ardeidae	**Herons & Bitterns**								
Ardea herodias	Great Blue Heron	S4					PO		
Butorides virescens	Green Heron	S4B					CO		
Cathartidae	**Vultures**								
Cathartes aura	Turkey Vulture	S5B,S3N					PO		**OB**

Bird Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	MNRF 2023b	NRSI Results from 2023
Accipitridae	**Hawks, Kites, Eagles & Allies**								
Accipiter gentilis	Northern Goshawk	S4	NAR	NAR	NS	No schedule	CO		
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	PR		
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	CO		
Buteo platypterus	Broad-winged Hawk	S5B					PO		
Circus hudsonius	Northern Harrier	S5B,S4N	NAR	NAR	NS	No schedule	PR		
Strigidae	**Typical Owls**								
Asio otus	Long-eared Owl	S4					PR		
Bubo virginianus	Great Horned Owl	S4					PR		
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	PR		
Alcedinidae	**Kingfishers**								
Megaceryle alcyon	Belted Kingfisher	S5B,S4N					CO		
Picidae	**Woodpeckers**								
Colaptes auratus	Northern Flicker	S5					CO		**PO**
Dryobates pubescens	Downy Woodpecker	S5					CO		
Dryobates villosus	Hairy Woodpecker	S5					CO		**PO**
Dryocopus pileatus	Pileated Woodpecker	S5					CO		**OB**
Melanerpes carolinus	Red-bellied Woodpecker	S5							**PO**
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B,S3N					CO		
Falconidae	**Caracaras & Falcons**								
Falco sparverius	American Kestrel	S4					CO		
Tyrannidae	**Tyrant Flycatchers**								
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	PR	X	**PO**
Empidonax alnorum	Alder Flycatcher	S5B					CO		
Empidonax minimus	Least Flycatcher	S5B					PO		
Empidonax traillii	Willow Flycatcher	S4B					PR		
Myiarchus crinitus	Great Crested Flycatcher	S5B					PR		**PR**
Sayornis phoebe	Eastern Phoebe	S5B					CO		
Tyrannus tyrannus	Eastern Kingbird	S4B					CO		
Vireonidae	**Vireos**								
Vireo gilvus	Warbling Vireo	S5B					PR		
Vireo olivaceus	Red-eyed Vireo	S5B					CO		**PR**
Corvidae	**Crows & Jays**								
Corvus brachyrhynchos	American Crow	S5					CO		**PR**
Corvus corax	Common Raven	S5					CO		**OB**
Cyanocitta cristata	Blue Jay	S5					PR		**PR**
Alaudidae	**Larks**								
Eremophila alpestris	Horned Lark	S4					CO		

Bird Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	MNRF 2023b	NRSI Results from 2023
Hirundinidae	**Swallows**								
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	CO	X	
Petrochelidon pyrrhonota	Cliff Swallow	S4S5B					CO		
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	CO		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					PR		
Tachycineta bicolor	Tree Swallow	S4S5B					CO		
Paridae	**Chickadees & Titmice**								
Poecile atricapillus	Black-capped Chickadee	S5					CO		**PR**
Poecile hudsonicus	Boreal Chickadee	S4							**PO**
Sittidae	**Nuthatches**								
Sitta canadensis	Red-breasted Nuthatch	S5					CO		**PO**
Sitta carolinensis	White-breasted Nuthatch	S5					PR		
Certhiidae	**Creepers**								
Certhia americana	Brown Creeper	S5					CO		
Troglodytidae	**Wrens**								
Cistothorus palustris	Marsh Wren	S4B,S3N					PO		
Cistothorus stellaris	Sedge Wren	S4B	NAR	NAR	NS	No schedule	PO		
Troglodytes aedon	House Wren	S5B					CO		**PO**
Troglodytes hiemalis	Winter Wren	S5B,S4N					CO		
Regulidae	**Kinglets**								
Corthylio calendula	Ruby-crowned Kinglet	S5B,S3N							**OB**
Regulus satrapa	Golden-crowned Kinglet	S5					CO		
Turdidae	**Thrushes**								
Catharus fuscescens	Veery	S5B					PR		
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	PR		
Sialia sialis	Eastern Bluebird	S5B,S4N	NAR	NAR	NS	No schedule	CO		
Turdus migratorius	American Robin	S5					CO		**PR**
Mimidae	**Mockingbirds, Thrashers & Allies**								
Dumetella carolinensis	Gray Catbird	S5B,S3N					CO		**PO**
Toxostoma rufum	Brown Thrasher	S4B					CO		
Sturnidae	**Starlings**								
Sturnus vulgaris	European Starling	SNA					CO		
Bombycillidae	**Waxwings**								
Bombycilla cedrorum	Cedar Waxwing	S5					CO		**PO**
Passeridae	**Old World Sparrows**								
Passer domesticus	House Sparrow	SNA					CO		

Bird Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	MNRF 2023b	NRSI Results from 2023
Fringillidae	**Finches & Allies**								
Haemorhous mexicanus	House Finch	SNA					CO		
Haemorhous purpureus	Purple Finch	S5					PR		
Spinus tristis	American Goldfinch	S5					PR		**PR**
Emberizidae	**New World Sparrows & Allies**								
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	CO		
Melospiza georgiana	Swamp Sparrow	S5B,S4N					CO		
Melospiza melodia	Song Sparrow	S5					CO		**PR**
Passerculus sandwichensis	Savannah Sparrow	S5B,S3N					CO		**OB**
Pipilo erythrophthalmus	Eastern Towhee	S4B,S3N					CO		
Pooecetes gramineus	Vesper Sparrow	S4B					PR		
Spizella passerina	Chipping Sparrow	S5B,S3N					CO		
Spizella pusilla	Field Sparrow	S4B,S3N					PR		**PR**
Zonotrichia albicollis	White-throated Sparrow	S5					CO		
Icteridae	**Troupials & Allies**								
Agelaius phoeniceus	Red-winged Blackbird	S5					CO		**PR**
Dolichonyx oryzivorus	Bobolink	S4B	THR	SC	T	Schedule 1	CO	X	
Icterus galbula	Baltimore Oriole	S4B					CO		**OB**
Molothrus ater	Brown-headed Cowbird	S5					CO		
Quiscalus quiscula	Common Grackle	S5					CO		
Sturnella magna	Eastern Meadowlark	S4B,S3N	THR	T	T	Schedule 1	CO	X	
Parulidae	**Wood Warblers**								
Cardellina canadensis	Canada Warbler	S5B	SC	SC	T	Schedule 1	PR		
Geothlypis philadelphia	Mourning Warbler	S5B					CO		
Geothlypis trichas	Common Yellowthroat	S5B,S3N					CO		
Leiothlypis ruficapilla	Nashville Warbler	S5B					PO		
Mniotilta varia	Black-and-white Warbler	S5B					PR		
Parkesia noveboracensis	Northern Waterthrush	S5B					CO		
Seiurus aurocapilla	Ovenbird	S5B					CO		
Setophaga coronata	Yellow-rumped Warbler	S5B,S4N					CO		**PO**
Setophaga magnolia	Magnolia Warbler	S5B					PO		
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					CO		
Setophaga petechia	Yellow Warbler	S5B					CO		**OB**
Setophaga pinus	Pine Warbler	S5B,S3N					PR		**PR**
Setophaga ruticilla	American Redstart	S5B					PR		
Setophaga virens	Black-throated Green Warbler	S5B					CO		

Bird Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	MNRF 2023b	NRSI Results from 2023
Cardinalidae	**Cardinals, Grosbeaks & Allies**								
Cardinalis cardinalis	Northern Cardinal	S5					PR		
Passerina cyanea	Indigo Bunting	S5B					CO		**PR**
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B					CO		**PO**
Piranga olivacea	Scarlet Tanager	S5B					PR		
Total							**108**	**4**	**35**

*OBBA Atlas Square: 17NJ64

**NHIC Atlas Squares: 17NJ6848, 17NJ6948, 17NJ6847, 17NJ6947

References

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Appendix VIII
Herpetofauna Species Reported from the Study Area

Reptile and Amphibian Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	ORAA*	NHIC Data**
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Ontario Nature 2019	MNRF 2023b
Turtles								
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	X	X
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1	X	X
Trachemys scripta	Pond Slider	SNA					X	
Snakes								
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1	X	
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					X	
Frogs and Toads								
Anaxyrus americanus	American Toad	S5					X	
Dryophytes versicolor	Gray Treefrog	S5					X	
Pseudacris crucifer	Spring Peeper	S5					X	
Lithobates clamitans	Green Frog	S5					X	
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	X	
Lithobates sylvaticus	Wood Frog	S5					X	
Total							**11**	**2**

*ORAA Atlas Square: 17NJ64

**NHIC Atlas Squares: 17NJ6848, 17NJ6948, 17NJ6847, 17NJ6947

References

Ministry of Natural Resources and Forestry (MNRF). 2023a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2023-05-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Appendix IX
Mammal Species Reported from the Study Area

Mammal Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Dobbyn 1994	MNRF 2023b	NRSI Results from 2021 to 2023
Didelphimorphia	**Opossums**								
Didelphis virginiana	Virginia Opossum	S4					X		
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**								
Blarina brevicauda	Northern Short-tailed Shrew	S5					X		
Condylura cristata	Star-nosed Mole	S5					X		
Parascalops breweri	Hairy-tailed Mole	S4					X		
Sorex cinereus	Masked Shrew	S5					X		
Sorex fumeus	Smoky Shrew	S5					X		
Sorex palustris	Water Shrew	S5					X		
Chiroptera	**Bats**								
Eptesicus fuscus	Big Brown Bat	S4					X		
Lasionycteris noctivagans	Silver-haired Bat	S4		E	NS	No schedule	X		
Lasiurus borealis	Eastern Red Bat	S4		E	NS	No schedule	X		
Lasiurus cinereus	Hoary Bat	S4		E	NS	No schedule	X		
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				X		
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	X		
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	X		
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1	X		
Lagomorpha	**Rabbits and Hares**								
Lepus americanus	Snowshoe Hare	S5					X		
Lepus europaeus	European Hare	SNA					X		
Sylvilagus floridanus	Eastern Cottontail	S5					X		
Rodentia	**Rodents**								
Castor canadensis	Beaver	S5					X		
Erethizon dorsatum	Porcupine	S5					X		
Glaucomys sabrinus	Northern Flying Squirrel	S5					X		
Marmota monax	Woodchuck	S5					X		
Microtus pennsylvanicus	Meadow Vole	S5					X		
Microtus pinetorum	Woodland Vole	S3?	SC	SC	SC	Schedule 1	X		
Mus musculus	House Mouse	SNA					X		
Napaeozapus insignis	Woodland Jumping Mouse	S5					X		
Ondatra zibethicus	Muskrat	S5					X		
Peromyscus leucopus	White-footed Mouse	S5					X		
Peromyscus maniculatus	Deer Mouse	S5					X		
Rattus norvegicus	Norway Rat	SNA					X		
Sciurus carolinensis	Eastern Gray Squirrel	S5					X		X
Synaptomys cooperi	Southern Bog Lemming	S4					X		
Tamias striatus	Eastern Chipmunk	S5					X		X
Tamiasciurus hudsonicus	Red Squirrel	S5					X		X
Zapus hudsonius	Meadow Jumping Mouse	S5					X		
Canidae	**Canines**								
Canis latrans	Coyote	S5					X		
Vulpes vulpes	Red Fox	S5					X		

Mammal Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Dobbyn 1994	MNRF 2023b	NRSI Results from 2021 to 2023
Felidae	**Felines**								
Lynx rufus	Bobcat	S4					X		
Mephitidae	**Skunks and Stink Badgers**								
Mephitis mephitis	Striped Skunk	S5					X		
Mustelidae	**Weasels and Allies**								
Mustela richardsonii	American Ermine	S5					X		
Neogale frenata	Long-tailed Weasel	S4					X		
Neogale vison	American Mink	S4					X		
Taxidea taxus jacksoni	American Badger (Southwestern Ontario	S1	END	E	E	Schedule 1	X		
Procyonidae	**Raccoons and Allies**								
Procyon lotor	Northern Raccoon	S5					X		
Ursidae	**Bears**								
Ursus americanus	American Black Bear	S5	NAR	NAR	NS	No schedule	X		
Artiodactyla	**Deer and Bison**								
Odocoileus virginianus	White-tailed Deer	S5					X		X
Total							**46**	**0**	**4**

*Mammal Atlas Square Number: NU
**NHIC Atlas Squares: 17NJ6848, 17NJ6948, 17NJ6847, 17NJ6947

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Appendix X
Butterfly Species Reported from the Study Area

Butterfly Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Macnaughton et al. 2023	MNRF 2023b
Hesperiidae	**Skippers**							
Carterocephalus palaemon	Arctic Skipper	S5					X	
Papilionidae	**Swallowtails**							
Battus philenor	Pipevine Swallowtail	SNA					X	
Papilio glaucus	Eastern Tiger Swallowtail	S5					X	
Papilio polyxenes	Black Swallowtail	S5					X	
Pieridae	**Whites and Sulphurs**							
Colias philodice	Clouded Sulphur	S5					X	
Pieris oleracea	Mustard White	S4					X	
Pieris rapae	Cabbage White	SNA					X	
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**							
Celastrina sp.	Azure species	SNA					X	
Satyrium liparops	Striped Hairstreak	S5					X	
Satyrium titus	Coral Hairstreak	S5					X	
Nymphalidae	**Brush-footed Butterflies**							
Boloria bellona	Meadow Fritillary	S5					X	
Boloria selene	Silver-bordered Fritillary	S5					X	
Cercyonis pegala	Common Wood-Nymph	S5					X	
Coenonympha california	Common Ringlet	S5					X	
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	X	
Lethe anthedon	Northern Pearly-Eye	S5					X	
Lethe eurydice	Eyed Brown	S5					X	
Limenitis archippus	Viceroy	S5					X	
Limenitis arthemis arthemis	White Admiral	S5					X	
Limenitis arthemis astyanax	Red-spotted Purple	S5					X	
Nymphalis antiopa	Mourning Cloak	S5					X	
Nymphalis l-album	Compton Tortoiseshell	S5					X	
Phyciodes cocyta	Northern Crescent	S5					X	
Polygonia comma	Eastern Comma	S5					X	
Polygonia interrogationis	Question Mark	S5					X	
Speyeria aphrodite	Aphrodite Fritillary	S5					X	
Speyeria cybele	Great Spangled Fritillary	S5					X	
Vanessa atalanta	Red Admiral	S5B					X	
Vanessa cardui	Painted Lady	S5B					X	
Vanessa virginiensis	American Lady	S5					X	

Butterfly Species Reported from the Study Area - Wellington Rd Hillsburgh EIS (Project #2681)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	Macnaughton et al. 2023	MNRF 2023b
Total							**30**	**0**

*TEA Atlas Square: Square #
**NHIC Atlas Square: Square #

References

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Appendix XI
Aquatic Habitat Assessment Photograph Log

Photo 1. Facing WNW, downstream of Wellington 22. Elevation change creating a minor drop into a plunge pool at downstream extent of culvert.

Survey Date: January 18, 2023.

Photo 2. Facing SE, upstream of Wellington 22. Patches of aquatic vegetation and some woody debris are visible.

Survey Date: January 18, 2023.

Photo 3. Facing ESE, downstream of Wellington 22. Reduced extent of natural vegetation along the banks.

Survey Date: January 18, 2023.

Photo 4. Facing SE, downstream of Wellington 22. Reduced extent of natural vegetation along the banks.

Survey Date: January 18, 2023.