Mayberry Hill Subdivision Phase 3B

Scoped Environmental Impact Study

Prepared for:

Thomasfield Homes
295 Southgate Drive
Guelph, ON
N1G 3M5

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Mayberry Hill Subdivision Phase 3B

Scoped Environmental Impact Study

Project Team

Tara Brenton	Project Advisor, Senior Terrestrial & Wetland Biologist / Certified Arborist
Patrick Deacon	Project Manager, Terrestrial and Wetland Biologist
Lillian Knopf	Terrestrial and Wetland Biologist
Joseph Lance	Terrestrial and Wetland Biologist, Certified Arborist
Amy Reinert	Terrestrial and Wetland Biologist
Brett Woodman	Terrestrial and Wetland Biologist, Certified Arborist
Kaitlin Filippov	GIS Specialist

Report submitted on March 31, 2020

Patrick Deacon
Terrestrial and Wetland Biologist, Project Manager

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Thomasfield Homes in February 2019 to complete a Scoped Environmental Impact Study (EIS) for the Mayberry Hill Phase 3B subdivision development in the Town of Grand Valley, Ontario.

This report characterizes the natural heritage features within and adjacent to the subject property and assesses potential impacts arising from the proposed residential development. Additionally, this report addresses potential impacts within the subject property relating to the construction of a collector road as shown in the Town of Grand Valley Transportation Master Plan (2017a). Mitigation measures to reduce impacts associated with the development are summarized, as well as recommendations for naturalization plantings and monitoring.

Due to the presence of a wetland in the southern portion of the subject property, lands within the development area are regulated by the Grand River Conservation Authority (GRCA) and identified in the Official Plan Schedule A1 as Environmental Conservation (Town of Grand Valley 2017b).

Technical studies, relevant to other aspects of the development, such as planning, stormwater management, hydrogeology and engineering were prepared by the consulting team and have been used to help assess potential impacts to the natural features. This report should be read in conjunction with the studies outlined below. The consulting team is comprised of:

- GM BluePlan (Hydrogeology Study);
- GM BluePlan (Servicing and Stormwater Management Report);
- Astrid J. Clos Planning Consultants (Planning);
- NRSI (Natural Heritage)

1.1 Proposed Undertaking

The proposed development will include site grading and the build-out of approximately 153 residential subdivision lots. The development will also include servicing and the construction of a stormwater management feature (2 ponds) and a collector road that will encroach into the wetland at the southern extent of the property. The grading plan prepared by GM BluePlan is appended to this report (see Maps).

2.0 Project Scoping

2.1 Study Area

The study area includes the subject property where the development is proposed, and the lands within approximately 120m of the property to ensure contiguous and adjacent natural heritage features were considered.

The development is located at Part Lot 30, Concession 2 in the Township of East Luther Grand Valley (Map 1). The subject property is approximately 13 hectares in area and is located west of Taylor Drive, with existing residential development to the north and east, agricultural lands to the west, and cultural meadow and swamp thicket to the south. The decommissioned Toronto, Grey & Bruce Railway corridor borders the southern property boundary and has been repurposed as the Upper Grand Trailway recreational trail.

2.2 Terms of Reference and Agency Input

An extensive review of background information and screening exercise was conducted by NRSI to determine if habitat for Species at Risk (SAR), Species of Conservation Concern (SCC), or Significant Wildlife Habitat (SWH) may occur in the study area. The results of this review were used to inform the Terms of Reference (TOR) for the Scoped EIS which was circulated to the Town of Grand Valley (Town), Grand River Conservation Authority (GRCA), and Ministry of Natural Resources and Forestry (MNRF), Guelph District on April 16, 2019 for review and comment. The GRCA acknowledged receipt of the TOR on May 3, 2019 with no additional comments. No comments were received from the other agencies. The TOR, and the results of the screening exercises are provided in Appendix I.

In correspondence between the GRCA and Astrid J. Clos Planning Consultants regarding the draft plan of subdivision (L. Warner, pers. comm. 2019a) and collector road alignment (L. Warner pers. comm. 2019b), the GRCA has generally been supportive of the proposed development. During the wetland boundary review, the GRCA identified that stormwater management will need to provide enhanced quality control and that the hydrological and ecological functions of the retained wetland will need to be restored and enhanced (R. Messier, pers. comm. 2019).

There has been ongoing discussion between the project team, Town staff and IPS Consulting Inc. regarding the alignment of the collector road as it relates to the neighbouring Corseed

subdivision development to the southeast (C. Sellers pers. comm. 2019). The Transportation Master Plan (Town of Grand Valley 2017a) identifies the development of this road which adhere to setbacks from existing properties. The alignment as indicated in this report has been developed to accommodate both subdivisions and involved discussion between the environmental consultant for the Corseed site (Azimuth Environmental Consulting Inc.) and the GRCA.

2.3 Relevant Policies, Legislation and Planning Studies

Table 1 summarizes the legislation, policies and planning studies that are relevant to the proposed development in relation to the protection of natural heritage features within the Township of Grand Valley and Dufferin County. The specific implications of these policies to the study area are discussed in further detail in this report.

Table 1. Relevant Policies, Legislation and Planning Studies

Policy/Legislation	Description	Project Relevance
GRCA Ontario Regulation 150/06 (GRCA 2015)	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990. • Through this Regulation, the GRCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes), and in areas where development could interfere with the hydrologic function of a wetland, including areas up to 120m of all Provincially Significant Wetlands (PSWs). • Section 3.25.8 of the Town Zoning by-law states "*All buildings and structures shall be located a minimum of 30 metres from the edge of a local, or unevaluated wetland*." • In addition, Section 6.2.14 of the GRCA Wetland Policy (GRCA 2003) states "*The GRCA will encourage member municipalities and the private sector to avoid wetlands in designing and building transportation and utilities infrastructure*." • However, Section 8.4.6 of *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 150/06) (GRCA 2015) states "*Public Infrastructure including but not limited to roads, sanitary sewers, utilities, water supply wells, well houses, and pipelines, within a wetland larger than specified in Sections 8.4.4-8.4.5 may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, provided that it can be demonstrated that:* *a) an Environmental Assessment or other comprehensive plan supported by the GRCA, demonstrates that all alternatives to avoid wetland loss or interference have been considered and that the proposed alignment minimizes wetland loss or interference to the greatest extent possible, and* *b) where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized and it can be demonstrated that best management practices including site and infrastructure design and appropriate remedial measures will adequately restore and enhance features and functions*."	• Lands regulated by the GRCA (unevaluated wetland) are present within the subject property. • No PSWs are present within the study area. • As per the Transportation Master Plan (Town of Grand Valley 2017a), a collector road is proposed through the eastern portion of a wetland within the subject property. • The western Stormwater Management (SWM) pond will outlet to the wetland. • In accordance with the outlined policies, the proposed road development must demonstrate minimized interference and loss of wetland habitat and maintain site hydrology through grading and SWM design. • The buffer provided for the retained wetland provides an opportunity for naturalization plantings to mitigate development impacts.

Policy/Legislation	Description	Project Relevance
Provincial Policy Statement (PPS) (MMAH 2014)	• Issued under the authority of Section 3 of the Planning Act and came into effect on April 30, 2014, replacing the 2005 PPS (MMAH 2005). • Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. • Section 3.1.7 states that development and site alteration may occur within hazard lands where the effects can be mitigated and no adverse environmental impacts will occur. • The Natural Heritage Reference Manual (MNRF 2010) and the Significant Wildlife Habitat Technical Guide (MNRF 2000, MNRF 2012) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	• Based on a preliminary analysis and field surveys, natural features were identified within the study area which have implications under the PPS (wetland) • No SAR or SWH, Significant Woodland, fish habitat, or other constraints were identified.
Endangered Species Act (ESA) (Government of Ontario 2007)	• The ESA prohibits killing, harming, harassing or capturing of Endangered and Threatened species and protects their habitats from damage and destruction.	• Based on the screening completed in the TOR, suitable habitat for Eastern Meadowlark is present in the study area. • Based on field surveys, no SAR were documented from the subject property. • Bobolink was recorded from west of the property, in a hayfield which is being managed as grassland bird compensation habitat relating to other development projects. Eastern Meadowlark was recorded by other consultants from the Corseed lands to the southeast. Neither observation has implications for this project.
Migratory Birds Convention Act (Government of Canada 1994)	• 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 window, with timing of breeding bird season generally extending between late March to late August. • "Incidental take" is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service.	• Numerous species protected by the *Migratory Birds Convention Act* were identified in background screening for the study area and confirmed as present during surveys. • The timing of construction activities, in particular vegetation clearing for the collector road, must have consideration for the MBCA.

Policy/Legislation	Description	Project Relevance
Fish and Wildlife Conservation Act (Government of Ontario 1997)	• The FWCA provides protection for certain bird species, not protected under the MBCA (i.e. raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (*Vulpes vulpes*) and Striped Skunk (*Mephitis mephitis*). • The FWCA provides protection for fish	• The timing of construction activities, in particular vegetation clearing, must have consideration for bird nesting and den sites for furbearing mammals. • No dens (active or inactive) were noted within the subject property and none would exist within the wetland portion of the study area. • Wildlife sweeps by qualified biologists may be warranted prior to any vegetation removals/clearing. • Fish habitat is not present on-site.
Grand Valley Official Plan (Town of Grand Valley 2017b)	• The OP does not permit new developments or site alterations within PSW boundaries, or within or adjacent to Significant Woodlands, Environmentally Significant Areas or Streams. • If developments or site alterations are being proposed within or adjacent to (within 120m of) Core Areas under the OP, an environmental impact assessment is required to ensure there will be no negative impacts on the natural features or their ecological functions.	• Schedule B-1 – Natural Heritage does not identify the wetland as Locally Significant or Unevaluated, however the presence of wetland was confirmed and therefore an Unevaluated Wetland is present. • The OP acknowledges that the boundaries of the Environmental Conservation designation (shown on Map 1) may be imprecise and refined through an environmental study. The identification of a greater extent of wetland through field surveys requires that this layer be refined (enlarged) to reflect the unevaluated wetland as shown on Map 2 with consideration for the removal of a portion of the wetland for the collector road.
Dufferin County Official Plan (Dufferin County 2017)	• The Natural Heritage policies aim to protect, restore or where possible enhance natural heritage features and the environment and foster the creation of an enhanced and connected natural heritage system. • Development and site alteration are to be directed away from significant natural heritage features and areas. • Natural heritage features and areas will be protected for the long-term. • Schedule E1 identifies a preliminary county-wide Natural Heritage System.	• No portion of the wetland feature is identified in Schedule E1 (Natural Heritage System) of the OP Preliminary Natural Heritage System • The full extent of the on-site wetland is considered Significant Groundwater Recharge Area.

Policy/Legislation	Description	Project Relevance
	• Development and site alteration will not be permitted in significant wetlands, and will not be permitted in significant woodlands, valleylands, SWH or ANSIs unless it can be demonstrated that there will be no negative impact on the feature or its ecological function.	
Grand Valley Zoning By-law (Town of Grand Valley 2018)	• The by-law establishes various zones as outlined in Schedules A-1, A-2 and A-3. • The Environmental Protection (EP) zone boundaries are intended to generally identify the location of potentially hazardous environmental features. • The boundaries of the EP Zone can be refined in consultation with the Conservation Authority. Where detailed resource mapping and/or site inspection occurs, this may result in a minor re-interpretation of the limits of the EP Zone boundary. Additionally, a technical evaluation, approved by the Conservation Authority may be used to further delineate the limits of the EP Zone.	• The Town Zoning By-law identifies almost all of the southern extent of the property as Open Space that is contiguous with the Environmental Protection designation that includes Boyne Creek to the west and a small area in the southwest corner of the property. This designation is indicated on Schedule A-2 of the Town OP (and is shown on Map 1). • The Environmental Conservation layer should be refined to include the extent of wetland as mapped in this report (Map 2) with consideration for the removal of a portion of the wetland for the collector road.
Town of Grand Valley Tree By-law 2019-10 (Town of Grand Valley 2019)	• A by-law outlining the manner in which the Town of Grand Valley will protect and enhance the tree canopy and natural vegetation in the Town. • The Town requires developers to include provisions for preserving, replacing and enhancing trees and natural vegetation in the approved plans. • Private property owners are encouraged to replace cut trees using native tree species.	• The clearing of a small number of young trees (less than 10cm Diameter at Breast Height) will be required for the proposed Collector Road alignment crossing the southern extent of the property. • Enhancement and mitigation measures relating to the removal of natural habitat for the road will include the planting of trees and shrubs in the retained feature to compensate for vegetation removal and reduce impacts of the development on the wetland and wildlife.

3.0 Field Methods

A NRSI biologist conducted a reconnaissance site visit in November 2018, which included preliminary delineation of Ecological Land Classification (ELC) communities using the ELC system for southern Ontario (Lee et al. 1998) and an assessment of candidate SAR habitat and SWH. A summary of findings was provided to the Team to identify the general extent of wetland and the types of surveys that would be required for the TOR.

The details of each survey are summarized in Table 2.

3.1 Vegetation Surveys

All vegetation communities were mapped using the ELC system for southern Ontario (Lee et al. 1998) (Map 2). An inventory of vascular plants was completed for each ELC community including composition, dominance, uncommon species, soil characterization, topography and evidence of human impacts. An inventory of plants was conducted during the spring and summer of 2019 with high level vegetation data collected in November 2018.

3.2 Breeding Bird Surveys

Early morning breeding bird surveys were conducted on 2 mornings in June with favourable weather conditions. An area search of the entire property was conducted on each visit, with breeding evidence recorded as per the Ontario Breeding Bird Atlas protocol (OBBA 2001). Locations of SAR observations were documented and are shown on Map 3.

3.3 Amphibian Surveys

A total of 3 evening anuran call surveys were conducted with 1 visit in each of April, May and June. Survey stations focused on suitable habitat within and adjacent to the subject property. Surveys followed the Marsh Monitoring Protocol (BSC 2009) noting species diversity and abundance from 2 monitoring stations indicated on Map 2.

3.4 Additional Wildlife

Incidental observations of all wildlife were recorded on each site visit. In addition to the biota listed above, observations included odonates (damselflies and dragonflies), butterflies, reptiles and mammals.

Table 2. Field Survey Summary

Survey Type	Protocol	Date[1]	Start and End Time	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Vegetation								
Vegetation Community Mapping	Lee et al. 1998	May 24	0915-1245	11	1	25	None	P. Deacon, A. Reinert
Vascular Flora Inventories	Systematic search by ELC polygon	May 24	0915-1245	11	1	25	None	P. Deacon, A. Reinert
		June 28	0720-0920	20	0	50	None	P. Deacon
Wetland Boundary Review	OWES 2014	May 24	0915-1245	11	1	25	None	P. Deacon, R. Messier, L. Warner
Bird Surveys								
Breeding Bird Survey	OBBA 2001	June 14	0730-0800	8	3	40	None	B. Woodman
		June 28	0647-0718	18	0	75	None	P. Deacon
Amphibian Surveys								
Anuran Call Survey	BSC 2009	April 18	2020-2037	16	3	100	Light rain	P. Deacon, L. Knopf
		May 21	2115-2141	10	1	90	None	J. Lance, T. Vance
		June 18	2143-2159	20	0	50	None	L. Knopf, H. Manoharan
Preliminary Assessment								
Preliminary ELC	Lee et al. 1998	Nov. 29, 2018	0930-1130	-1	1	75	None	T. Brenton
SAR & SWH Assessment	MNRF 2015							
Incidental Wildlife								
All species	Recorded by ELC polygon	Incidental wildlife observations during each survey						

[1]All surveys were completed in 2019 with exception of the preliminary assessment.

4.0 Existing Conditions

4.1 Soil, Terrain and Drainage

Soil in the northern extent of the site is comprised of silty till known as Tavistock Till with glaciofluvial sands in the southern extent of the site (Ministry of Northern Development and Mines 2006). Soil sampling during ELC surveys identified silty loam soil within the wetland with soil mottling ranging from 5cm to 15cm below the surface with bore holes slowly filling with groundwater.

The subject property is gently sloping to the south with elevations ranging from 480 masl to 470 masl (GM BluePlan 2020a). A 200m long berm which was constructed as an erosion control structure, as part of the Mayberry Hill Phase 1 development, collects surface drainage near the southern extent of the site. A small outlet culvert directs overflow from this feature southward through the cultural meadow (CUM) in a riprap-lined channel and into the mineral thicket swamp (SWT2). These features are shown on Map 2. The drainage within the wetland continues south of the elevated Upper Grand Trailway corridor through concrete box culverts at two locations (one along the southern property boundary, the other further west in the vicinity of the BMB-002 monitoring station).

The preliminary SWH screening that was conducted to inform the TOR (Appendix I) identified that seeps and/or springs may be present within the subject property. No vegetation indicator species or iron staining was observed during 2019 surveys that would suggest the presence of seepage areas.

4.2 Vegetation

4.2.1 Vegetation Communities

The following vegetation communities were delineated within and adjacent to the subject property and are shown on Map 2.

Cultural Meadow (CUM)

Within the southern portion of the subject property, cultural meadow is present to the north and south of a soil berm, which was constructed to form an erosion control feature for Phase 1 of the Mayberry development. The southern reach of the meadow transitions into the swamp thicket community, with Reed Canary Grass (*Phalaris arundinacea*) dominant, while the northern portion of the meadow is largely cool season grasses, New England Aster (*Symphyotrichum*

novae-angliae) and Canada goldenrod (*Solidago canadensis*). Ponding on the north side of the berm has resulted in the establishment of a Willow (*Salix* sp.) thicket, interspersed with Broad-leaved Cattail (*Typha latifolia*). Several small stands of the highly invasive Common Reed (*Phragmites australis* ssp. *australis*) are present within this feature. A triangular area of cultural meadow is also present among the swamp thicket, extending north from the Upper Grand Trailway corridor.

Swamp Thicket (SWT2)

The swamp thicket that comprises the southern extent of the subject property is a mixture of shrub stands and marsh openings. The eastern half of the wetland, which is on the subject property, is relatively low diversity with the western half transitioning to a higher diversity of wetland plants. Shallow standing water had dissipated by early May 2019, with soils remaining saturated near the surface into July. A series of ponds present in the north of the wetland (to the west of the subject property) appear to have been excavated in the past and have naturalized with aquatic vegetation and woody species around the perimeter of each. The wetland drains to the south through 2 box culvert structures which pass beneath the rail corridor. Species diversity is relatively high in the western portion of the feature, with Reed Canary Grass dominating the eastern third.

Cultural Plantation (CUP)

A Scot's Pine (*Pinus sylvestris*) plantation is present to the south of the rail corridor. This community varies from closed canopy to patchy establishment of trees and areas of cultural meadow inclusions. This feature was assessed from the rail corridor.

Meadow Marsh (MAM)

An area of meadow marsh is present to the south of the rail trail corridor and was assessed from the trail. Within the swamp thicket on the north side of the rail trail there are a number of areas dominated by grasses and forbs, with limited shrub cover, that constitute inclusions of this community type. These inclusions are not indicated on the vegetation community mapping (Map 2). The area where the collector road is proposed is comprised of meadow marsh with no tree or shrub cover present (Map 3).

Coniferous Hedgerow (H1)

A hedgerow comprised of mid-age Norway Spruce (*Picea abies*) borders the southeast corner of the site, with a residential property present on the other side. The hedgerow extends along the rear of lots which front onto Melody Lane.

4.2.2 Vascular Flora

Multi-season vascular plant surveys documented a total of 69 species from the study area. No provincially or regionally significant species were observed. Species, such as Showy Lady's Slipper (*Cypripedium reginae*), Alder-leaved Buckthorn (*Rhamnus alnifolia*), Pale Sedge (*Carex pallescens*) and Beaked Sedge (*Carex utriculata*) occur in openings within the swamp thicket (SWT2) and are conservative species indicative of high-quality habitat (Oldham et al. 1995). These species are largely restricted to the west of the subject property and would not be directly impacted by the collector road development.

Non-native invasive species include European Buckthorn (*Rhamnus cathartica*), Black Locust (*Robinia pseudo-acacia*) and Purple Loosestrife (*Lythrum salicaria*). All are present in low to moderate numbers. The limited diversity within areas of cultural meadow (CUM) is comprised largely of early successional species and cool season agricultural forage grasses.

A complete list of the vascular plant species reported for the Study Area and observed by NRSI in 2019 is provided in Appendix II.

4.3 Wildlife

Wildlife species lists that include data collected through the background as well as species observations noted by NRSI biologists during surveys are provided in Appendix III to Appendix VII.

4.3.1 Birds

A total of 84 bird species are reported from the study area based on the OBBA (BSC et al. 2006) for Square 17NJ56. Breeding bird surveys, as well as incidental observations of birds within the study area, documented a total of 26 bird species. A full list of bird species reported from the study area during 2019 surveys, is provided in Appendix III.

The combination of cultural meadow, a pond and early successional swamp thicket communities, both within the subject property and extending to the southwest, exhibited good bird diversity. Four sparrow species, including Song Sparrow (*Melospiza melodia*), Savannah Sparrow (*Passerculus sandwichensis*), Field Sparrow (*Spizella pusilla*) and Clay-coloured Sparrow (*Spizella pallida*) were recorded from the wetland and cultural meadow habitats. Bird presence within the agricultural field was limited to Horned Larks (*Eremophila alpestris*). Bobolink (*Dolichonyx oryzivorus*), a SAR, was documented from a field to the west which is currently being managed by Thomasfield Homes as grassland bird habitat compensation for other projects.

GRCA staff indicated that Eastern Meadowlark (*Sturnella magna*) was documented from the adjacent Corseed proposed subdivision (Natolochny pers. comm. 2019). This species was identified in the SAR screening (Appendix I) as potentially present based on the available suitable habitat. Surveys conducted in 2019 did not observe this species within the subject property (or greater study area) and as such, regulated habitat for the species is not present on the Mayberry Hill Phase 3B lands.

The SWH screening exercise (Appendix I) had identified the potential for Open Country Bird Breeding Habitat to be present. Surveys in 2019 only documented 1 of the 6 indicator species listed in the Ecoregion 6E Criteria Schedules (MNRF 2015), a single Savannah Sparrow, which does not constitute significance.

4.3.2 Herpetofauna

A total of 9 herpetofauna species are reported from the study area based on the Ontario Reptile and Amphibian Atlas data (Ontario Nature 2018). A total of 6 species of anurans were documented from the study area during evening calling anuran surveys. These included Spring Peeper (*Pseudacris crucifer*), American Toad (*Anaxyrus americanus*), Gray Treefrog (*Hyla versicolor*), Northern Leopard Frog (*Lithobates pipiens*), Green Frog (*Lithobates clamitans melanota*) and Wood Frog (*Lithobates sylvaticus*). The largest pond to the southwest of the subject property contained 5 of the 6 species, with Gray Treefrog documented on the south side of the rail trail.

Although no snake or turtle species were observed during the surveys, the pond features to the southwest of the subject property provide suitable basking habitat for turtles and the agricultural fields may provide suitable nesting substrates.

The SWH screening had identified the potential presence of Anuran breeding habitat (Wetland). Table 3 provides a summary of the frog call survey results from 2019. Based on the survey data, this SWH type was not confirmed to be present due to count numbers being too low to constitute significance. Although the data does not indicate SWH, the presence of 5 anuran species from within the pond speaks to the quality of the wetland habitat that will be retained to the west of the proposed collector road.

The SAR and SCC screening (Appendix I) had identified habitat for Common Snapping Turtle (*Chelydra serpentina serpentina*) to be present within the subject property. This species was not observed during the 2019 surveys. The ponds to the west of the Phase 3B lands (in particular the eastern-most pond) are suitable for basking and overwintering; however, the marsh and swamp thicket within the subject property does not contain standing water and would not be utilized by turtles for breeding. In general, there are no existing wetlands, ponds or other habitat types in close proximity to the north, east or south of the study area and therefore the function of the wetland to facilitate turtle movement is minimal. Any turtle species which could be present in the study area would likely utilize Boyne Creek to the west as a movement corridor.

The screening had also identified candidate SWH for Turtle Nesting Habitat. Based on criteria used to define this SWH type (MNRF 2015), it was determined that the small ponds could not support 5 or more Midland Painted Turtles (*Chrysemys picta marginata*) but a single Snapping Turtle could be present. As surveys did not observe a Snapping Turtle and soils within the nearby agricultural fields are predominantly silt-loam and not conducive to turtle nesting (sand or gravel preferred), nesting habitat was not confirmed to be present within the study area.

Table 3. Anuran Call Survey Results from 2019

Anuran Call Station	Species	Anuran Call Survey[1]			Number of Species	Total Number of Individuals	SWH?
		1	2	3			
ANR-001	American Toad	*			5	9+	No, numbers too low and a full chorus for 2 species not recorded.
	Green Frog			1 (7)			
	Gray Treefrog						
	Spring Peeper	3	3	*			
	Northern Leopard Frog		1 (1)				
	Wood Frog	1 (1)					
ANR-002	American Toad		*		2	3	No, numbers are too low.
	Green Frog						
	Gray Treefrog		1 (2)	*			
	Spring Peeper						
	Northern Leopard Frog						
	Wood Frog						

*Species calling from outside of plot.
[1]Marsh monitoring anuran call code with estimated number of individuals in brackets, "3" indicating full chorus.

4.3.3 Mammals

A total of 43 mammal species are reported from the study area based on the Ontario Mammal Atlas (Dobbyn 1994). The Ontario Mammal Atlas identifies that several SAR bats have potential to be present within the study area as well; however, the subject property contains no mature trees that would provide suitable roosting habitat. Observations of mammals within the study area were limited to signs of browse by White-tailed Deer (*Odocoileus virginianus*) within the cultural meadow and thicket swamp communities.

4.3.4 Other Wildlife

The Ontario Butterfly Atlas (Macnaughton et al. 2019) identifies only 2 species, both of which are common in Ontario (Appendix VI). NRSI biologists did not observe any butterflies during the 2019 surveys. Similarly, the Ontario Odonata Atlas (MNRF 2019c) identifies 13 common species; with no observations made from the subject property in 2019.

The SWH screening (Appendix I) had noted that Terrestrial Crayfish Habitat may be present within the wetland feature. Surveys in 2019 did not observe any crayfish chimneys to warrant SWH; although the saturated soils throughout the feature do provide suitable habitat.

5.0 Significance and Sensitivity of Natural Features

5.1 Wetlands

The southern portion of the subject property is comprised of wetland which directs flow to the south and west, toward Boyne Creek approximately 300m away (Map 1). No portion of this wetland feature is identified in Schedule E1 (Natural Heritage System) of the Dufferin County OP Preliminary Natural Heritage System; however, the full extent of the on-site wetland is considered Significant Groundwater Recharge Area (Dufferin County 2017). Photographs of the wetland are provided in Appendix VIII.

The Town of Grand Valley OP (2017b) identifies the full extent of the natural feature as Open Space (including a section of the rail corridor), with an area of Environmental Protection (EP) to the immediate west that includes the watercourse and wetland. The Town OP (2017b) (Schedule B-1 – Natural Heritage) does not identify any wetlands (PSW, Locally Significant or Unevaluated) from within the study area. As wetland was confirmed to be present within the subject property through the 2019 surveys, and verified with GRCA staff in the field (May 24, 2019), this report assumes the presence of an unevaluated wetland which is an extension of the wetland captured under the EP zoning. The extent of wetland, as verified, should constitute a refinement in the EP layer.

Although a full wetland evaluation was not completed, several criteria support that PSW designation would be unlikely. No SAR which utilize wetland habitat were observed within the wetland on the north side of the trail during surveys and wetlands associated with Boyne Creek are generally small and separated by large distances. The nearest existing PSW unit is the Luther Marsh which, although hydrologically connected to the subject property wetland by Boyne Creek, is greater than 4.5 km to the northwest and complexing requires distances of 750m or less under the Ontario Wetland Evaluation System (MNRF 2014).

The location of the proposed collector road, at the furthest eastern extent of the wetland in an area dominated by Reed Canary Grass, a non-native, invasive species, and this area shows relatively low diversity in comparison to the area south of the excavated ponds. The existing stormwater retention berm outlet flows to the wetland through a small corrugated steel pipe. Under present conditions, the wetland does not contain any channel that directs concentrated flow southward toward Boyne Creek. The 2 concrete box culverts beneath the rail corridor

direct flow to the south where a Wellhead Protection Area Zone is identified in the OP (Town of Grand Valley 2017b).

During spring anuran surveys, calls were documented primarily within the pond feature to the west, as well as wetland to the south of the rail trail corridor. With the exception of the pond, the wetland does not provide habitat for breeding anurans. During the spring, the wetland contains patchy shallow pools of water among saturated grass, but water depth and hydroperiod do not support anuran breeding.

The wetland hydrology relies largely on the surface water input originating from the general vicinity of the proposed subdivision. The Hydrogeological Study (GM BluePlan 2020a) notes that while the northern part of the site accepts a small rate of recharge (<30 mm/yr) runoff is estimated to be <300 mm/yr. The wetland in the south showing the opposite with high recharge (<290 mm/yr) and runoff comparatively low at <20 mm/yr. The report then identifies that maintaining the recharge function of the wetland and the inclusion of flow dissipation at the outlet will be important considerations for the design of the stormwater management feature.

The western portion of the wetland, to the south of the pond features, exhibits a saturated and hummocky groundcover which suggests that groundwater upwelling may contribute to the wetland hydrology. A reconnaissance survey completed as part of the Hydrogeological Study (GM BluePlan 2020a) had identified that groundwater levels were roughly coincident with the surface within the wetland. No well-defined groundwater seepage areas were observed during the field surveys completed by NRSI.

In order to maintain the form and function of the wetland, surface water and groundwater inputs should be maintained. Particular attention should be given to positioning the SWM feature outlet as close as possible to the existing outlet from the erosion control pond (understanding that the collector road will limit the exact position of the outlet point). If the outlet is located too far west or east along the southern edge of the road, this could result in an alteration to the hydrology of the wetland.

5.2 Significant Wildlife Habitat

The SWH screening conducted as part of the TOR (Appendix I) had identified 6 candidate SWH including Turtle Nesting Habitat, Seeps and Springs, Amphibian Breeding Habitat (Wetland),

Open Country Bird Breeding Habitat, Terrestrial Crayfish Habitat and Habitat for Special Concern and Rare Species. Through the surveys conducted in 2019, none of these SWH types were confirmed as being present within the subject property and surrounding lands.

5.3 Buffers

The proposed collector road minimizes the encroachment into the wetland to the extent possible by locating the road as far east as possible while maintaining the required alignment for road safety and connection to the Corseed Lands to the south.

Although a PSW is typically afforded a buffer of 30m or greater, a reduced buffer can be applied to non-PSW wetlands such as the swamp thicket feature in the south of the subject property. The Town OP identifies that the width of a setback that protects the water quality should consider the development type, site drainage and slope and will be determined in consultation with the Conservation Authority (Town of Grand Valley 2017b).

The retained wetland within the subject property is largely Reed Canary Grass marsh (visible by lighter beige tones on the air photo on Map 2). The swamp thicket and higher-quality communities are restricted to the west (in the adjacent Phase 4 lands), essentially west of the triangle of cultural meadow that extends from the rail bed. As discussed in Section 5.1, the eastern extent of wetland is of lower quality than the western extent.

Earlier versions of the SWM design had afforded a 15m no-touch buffer to the wetland with the naturalized SWM block to the immediate north of that. However; in order to prevent the concentrated outlet of SWM flow to a single point at the wetland edge, the Team proposes a flow dissipation feature to direct flow across the naturalized buffer and into the wetland across a greater area. The intention of this feature is to ensure that water quantity entering the wetland better reflects pre-development conditions and channelization within the wetland can be avoided.

This design is shown in the GM BluePlan drawings and has been indicated on Map 3. Given that the south edge of the SWM feature can be graded without any machinery encroachment in the wetland, and considering that the SWM ponds will be naturalized as a contiguous extension of the buffer, a reduced no touch buffer can be supported. Within 15m from the wetland edge, the design proposes a delineated 5m no touch buffer leading to a naturalized spreader swale within 6-10m of the wetland and 4 SWM outfall features (lined with riprap) ranging from approximately 8m to 13m from the wetland edge. The dissipation feature, as indicated in the

GM BluePlan drawings, utilizes granular material and perforated pipe to collect and distribute SWM outflow across a wider area. The granular material will be top-dressed with topsoil, and the topsoil and low berm can be planted with herbaceous vegetation to create wet meadow conditions within the buffer.

6.0 Impact Analysis

Potential impacts arising from the proposed Mayberry Hill Phase 3B residential development and the collector road are determined by comparing the details of these proposed development components with the characteristics of the existing natural features and their functions, as shown on Map 3. Where the development proposals overlap with natural features or their vegetation protection zones, impacts may arise. The following is a description of the types of impacts which will be discussed:

- Direct impacts to the natural features within the study area associated with disruption or displacement caused by the actual proposed 'footprint' of the undertaking.
- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality.
- Induced and cumulative impacts associated with impacts after the development components are constructed, such as subsequent demand on the resources created by increased habitation/use of the area and vicinity over time.

The alignment of the collector road, and ultimately the layout of the subdivision was an iterative process that involved discussion between the Town, GRCA, the consulting team and the landowners of the Corseed property. The alignment and grading limits developed by GM BluePlan were reviewed by Astrid J. Clos Planning and NRSI and further refined to accommodate the development requirements while minimizing encroachment into the wetland to the extent possible.

The details relating to stormwater management for the site are outlined in the Functional Servicing Report (GM BluePlan 2020b). Under pre-development conditions, a large proportion of the surface water from the site drains southward, into the wetland, from a high point near the northern extent of the Phase 3B lands. Site drainage modelling indicates that 2 catchments (600 and 700) direct flow from Phase 3B and toward Boyne Creek totaling 23.82ha with 0% impervious surface. Other smaller catchments direct flow to existing stormwater infrastructure in Phase 1 to the east. The pre-construction annual runoff to Boyne Creek is 60,078m^3.

The proposed SWM design will attenuate runoff directed to Boyne Creek to the flow rate under existing conditions during the 2, 5, and 100-year design storm events as well as during

the Regional storm (GM BluePlan 2020b). The design will also provide a long-term average removal of 80% of TSS on an annual loading basis from all runoff leaving the site.

Post-development conditions will result in 2 catchments (301 and 302 – which is part of Phase 4) directing flow from the development to Boyne Creek. Combined, these total 20.82ha with 53% and 5% impervious surface respectively. The 5% impervious value for Catchment 302 will increase to 53% upon Phase 4 build out and additional SWM pond capacity will be constructed to incorporate this increase. The post-construction annual runoff to Boyne Creek will be 67,202m^3 (previously 79,630m^3 without dissipation feature); an increase of 7,124m^3 over the pre-construction figure. At ultimate build out (including Phase 4), the annual runoff to Boyne Creek will be 89,386m^3 (previously 102,070m^3 without dissipation feature); an increase of 29,308m^3 over the pre-construction figure. The reader is directed to Table 20, 21 and 22 in the Functional Servicing Report (GM BluePlan 2020b) for pre-, post- and ultimate development water balance calculations.

The SWM pond feature has been designed to provide more than the required permanent pool storage capacity with 4 catch basin outlet structures and an overflow weir that regulate stormwater outflow entering the wetland and ultimately Boyne Creek.

Under the post-development SWM outflow conditions, NRSI had raised the issue of large amounts of SWM pond outflow entering the wetland at the concentrated location of the catch basin pipes and the potential impact this could have on the wetland. An energy dissipation feature is proposed to mitigate this potential impact. The dispersion of outflow across a greater length of the wetland boundary will help to alleviate the concern for channel formation that could occur with a single discharge point. Additionally, by dispersing outflow across a greater area of the wetland, the feature is better suited to receiving increased runoff. The energy dissipation structure is detailed by GM BluePlan (2020b) and essentially proposes a 105m long bed of clearstone (500mm deep) surrounding a perforated pipe that is overlaid with 150mm of topsoil that will provide additional capacity and will be naturalized as wet meadow. A low, vegetated berm (150mm in height from the topsoil grade) runs the length of the feature on the side adjacent to the wetland (down slope) to allow accumulated water to gradually spill over the berm onto approximately 5m (up to 15m) of naturalized wetland buffer. The sheet flow across the buffer provides a final stage of water polishing prior to entering the wetland. As the SWM

outflow water is not entering Boyne Creek directly and the wetland does not contain vernal pools, thermal considerations for water entering the wetland are not a major concern.

The construction of this feature will require an encroachment into the 15m wetland buffer that will be completely naturalized following installation. Based on the site conditions and the benefit of flow dissipation and dispersion, this encroachment is justified and will help to maintain the form and function of the wetland.

The SWM design maintains surface water quality through a “treatment train” approach that employs a combination of measures to improve water quality to and beyond the SWM pond. Lot-level measures include directing roof flows across lawn to assist in filtering water as well as grading that directs flow to rear yard swales with topsoil to a depth of 300mm to promote infiltration. The silt-heavy native soils on site have poor infiltration, therefore the creation of topsoil swales adds a small amount of recharge capacity among the future lots where typically (under agricultural land use) much of the flow would run overland directly to the wetland. Conveyance controls utilize the storm sewer system to collect heavier sediments during storm events that will be periodically removed from the system through clean-out and maintenance of manholes and catch basins. Within the SWM pond, 2 sediment forebays at the pipe inlet locations and a shallow permanent pool provide further enhancement of water quality.

In summary, the approach to stormwater management aims to enhance water quality and address the increase in runoff that will occur as a result of the increase in impervious surfaces under ultimate build out conditions. As a palustrine wetland feature connected to Boyne Creek, and with a grade change of approximately 2m from the northern wetland boundary to the southern extent along the rail bed, the thicket swamp does not hold appreciable amounts of water on the surface and the hydrology is dynamic with a constant north to south movement through the feature. There is water storage capacity within the wetland soils and among the microtopographic depressions all of which is conveyed to Boyne Creek via 2 box culverts and westward flow along the north side of the rail bed. The increase in runoff, directed through the dissipation feature and naturalized buffer, will not have negative direct or indirect impacts to the form and function of the wetland.

A summary of the potential impacts and recommended mitigation measures, relating primarily to the wetland, is provided in Table 4.

Table 4. Summary of Natural Features, Potential Impacts and Recommended Mitigation

Significant Natural Feature	Relevant Policies	Potential Impacts	Recommended Mitigation
Wetland	• GRCA Ontario Regulation 150/06 (Government of Ontario 2015) • Town of Grand Valley Official Plan (Town of Grand Valley 2017b) • Provincial Policy Statement (MMAH 2014)	**Direct Impacts** • A portion of the wetland (approximately 0.089 ha) is proposed to be removed to allow for the construction of a collector road, with associated grading along the south side (Map 3). • The 26m right of way and associated 3:1 slope for the collector road at the eastern extent of the wetland will require an encroachment of approximately 10-15m for a 50m section of road (~12.68m maximum encroachment as indicated on GM BluePlan future collector road cross-section drawing Section C-C). • Potential for erosion and sedimentation to impact the wetland during construction. **Indirect Impacts** • To the south of the SWM feature, an encroachment into the 15m wetland buffer is proposed to construct an energy dissipation feature to fan flows out to enter the wetland. A 5m (no touch) buffer will be maintained with the full 15m extent (that includes the dissipation feature) naturalized. • There is potential for changes to water quality and quantity reaching the wetland both during and following construction. During construction there is potential for erosion and sediment deposition;	• The curving alignment of the collector road balances a feasible road layout with minimized intrusion into the wetland. The section of wetland that is proposed to be removed to accommodate the collector road and required grading, is of lower diversity than the portion of wetland further west. The naturalization of the 3:1 slope for the road, the wetland buffer and SWM pond with site-appropriate native plants will help to offset the removal through protection of the retained wetland. The total area that will be naturalized totals approximately 1.5ha within Phase 3B and an additional 0.5ha of buffer (plus future SWM expansion naturalization) available on lands to the west (Phase 4) (see Map 3). As road safety allows, the 3:1 collector road slope should be planted with a dense cover of low-growing shrubs with the buffer, dissipation feature and SWM ponds incorporating a variety of herbaceous openings with node plantings of deciduous and coniferous trees and shrubs. The plantings should be monitored for a period of 2 years following installation with 1:1 woody stem replacement for below 70% survival at the end of year 2. A planting plan should be prepared and circulated to the agencies to indicate that details of the naturalization planting. The planting, which includes areas currently existing as Smooth Brome meadow, is seen as suitable mitigation for the removal of 0.089ha of wetland. • In order to disperse SWM flow entering the wetland, a naturalized energy dissipation feature within the 15m is proposed. With the exception of the collector road footprint, a 5m no touch buffer will be afforded with the full extent of a 15m buffer naturalized following the installation of the dissipation feature. The 5m no touch buffer will be delineated with paige wire erosion fence that will extend along the toe-of-slope of the collector road embankment (at the edge of the retained wetland). Details of buffer extent are provided on the appended GM BluePlan grading plans.

Significant Natural Feature	Relevant Policies	Potential Impacts	Recommended Mitigation
		following construction the increase in impervious surfaces will increase runoff. • In general, the proposed eastern SWM pond will receive much of the flow from the Phase 3B lands. The eastern SWM pond is connected to the western pond by a pipe passing beneath the collector road and all outflow from the ponds enters the wetland through catch basins and an overflow weir at the southern edge of the western pond. Grit and oil will accumulate from stormwater directed from the roads toward the SWM ponds. • A monthly water budget analysis indicates an increase in recharge and runoff reaching the wetland between June and March, with a decrease during April and May. • The construction of the stormwater feature and proximity of wetland may result in wildlife mortality on the collector road. • Dust from the construction site may have a temporary impact on wetland vegetation during construction. • Light pollution may occur during construction and once the subdivision is settled. • The root system of a portion of the Norway Spruce hedgerow, adjacent to	• As the average runoff volume will increase following Phase 3B and ultimate development (Phase 4), the SWM ponds have been sized to intercept the increased runoff and regulate the flow entering the wetland (and ultimately Boyne Creek). The SWM design includes 2 ponds, the western pond with 2 forebays, and a series of 4 catch basin outlets and an overflow weir. The energy dissipation feature will slow the speed of water entering the wetland and fan this contribution to the wetland hydrology over a broader area (105m in length). • A 300mm culvert will pass beneath the collector road just north of the rail trail and will direct surface flow from a small catchment (vicinity of Norway Spruce hedgerow) into the wetland. Under existing conditions, a small catchment directs water into the eastern reach of the wetland and this pipe will maintain that input. • Oil and grit separators (Catchment 303 and 304) and 2 forebays in the western pond will serve to maintain water quality prior to the discharge point to the wetland. Periodic clean-out of the forebays will be required (approximately every 5 and 16 years respectively as noted in the Servicing Report. • The construction of a SWM feature in close proximity to the retained wetland may result in wildlife movement and in turn wildlife mortality (frogs in particular) on the collector road. Sloped curbs or a pedestrian crossing curb cut along the collector road between the 2 SWM ponds will reduce wildlife stranding on the road and in turn reduce mortality. A permanent barrier within the western SWM block and toe of the collector road embankment is not recommended.

Significant Natural Feature	Relevant Policies	Potential Impacts	Recommended Mitigation
		the proposed road and SWM feature may be impacted by grading. • Direction of run-off from the development will increase oil and grit entering the stormwater feature and potentially reaching the wetland. • The re-fuelling of equipment, on-site storage of fuel or lubricants and the operation of machinery all have potential to cause spills that may infiltrate the soil or migrate toward the natural feature. **Induced Impacts** • Grading in close proximity to the retained natural feature has the potential to introduce aggressive non-native species such as Common Reed. • Local residents may create informal trails leading into the natural feature. • Dumping of yard waste and other materials into the feature may occur, resulting in additional non-native and potentially invasive vegetation species.	• The two existing box culverts that pass beneath the rail trail will continue to allow flows that enter the wetland from the north to move in a southerly and westerly direction toward Boyne Creek. Situated at the low elevation of the swamp thicket wetland, these features are key to maintaining the hydrology by allowing percolating flow to move from the north side of the rail bed to the south and ultimately toward Boyne Creek. • The extent of erosion and sediment control fence is indicated on the grading plans and delineates the extent of grading and protects the root zone of the Norway Spruce hedgerow. Heavy-duty ESC fence (paige wire with filter fabric keyed-in) will be installed prior to the commencement of any vegetation clearing and construction activities. • Bare soils, including soil stockpiles or graded slopes (including the 3:1 collector road embankments), should be stabilized using a nurse crop of Annual Rye (*Lolium multiflorum*) or Oats (*Avena sativa*) if soils are to remain bare for greater than 30 days. • During construction, ESC fence should be regularly inspected by an Environmental Monitor and/or on-site inspector, to ensure that it is functioning properly and any deficiencies (holes, sections un-keyed, excessive accumulation of silt) are addressed. • The ESC fence will limit the potential for wildlife (turtles, snakes and anurans) to enter the work site during construction. Should any wildlife be encountered within the fenced area of graded lands, crews will ensure that their presence is demarcated and an NRSI biologist will be contacted for further guidance.

Significant Natural Feature	Relevant Policies	Potential Impacts	Recommended Mitigation
			• To the extent possible, excavation and grading for the SWM pond, energy dissipation feature and southern edge of the collector road should be conducted from the north as opposed to equipment operating immediately adjacent to the ESC fence and retained wetland. • Dust suppression measures (water truck, nurse crop, wind breaks using materials on site) should be implemented during construction during dry and/or windy periods, both to protect wetland vegetation, wildlife and for neighbouring residents. • In order to limit light pollution during construction, activity should only occur during daylight hours and the use of flood lights in laydown yards should be minimized. Street lighting and residential lighting should use directional fixtures where possible. • During the construction of the SWM feature and collector road, all pooled surface water that requires pumping will utilize filter bags to ensure water entering the wetland is clean. Pumps should be maintained 30m or more from the wetland and filter bags should not be placed on slopes with bare soils that are prone to erosion. Proactive erosion control measures such as the excavation of swales, installation of check dams and seeding of bare soils with nurse crop within 30 days of being inactive should all be considered as means to minimize erosion and water turbidity. • In order to prevent the spread of Common Reed or other non-native, invasive species, equipment should arrive on site clean and free of plant materials and mud. The Clean Equipment Protocol for Industry (Halloran et al. 2013) outlines methods for regularly cleaning of machinery tracks, blades, buckets both prior to arrival and upon departure from the site.

Significant Natural Feature	Relevant Policies	Potential Impacts	Recommended Mitigation
			• Common Reed is scattered in the existing erosion control pond in small numbers (none present within the wetland). It is recommended that the existing plants be excavated with machinery and the soil containing root material be removed from the southern part of the property. The on-site EM or NRSI staff can direct the excavation and relocation. • Develop a Spill Response Plan and maintain one or more spill kits on site at all times. • Equipment storage, re-fueling and maintenance is to occur in designated areas away from the natural features (>30m, ideally in the northern portion of the site and away from existing catch basins).
Breeding Bird Habitat	• Migratory Birds Convention Act (Government of Canada 1994)	**Direct Impacts** • Vegetation removal within the breeding bird season may result in incidental take of bird species protected under the MBCA and the removal of breeding habitat. **Indirect Impacts** • During and following construction, road traffic and new residences may lead to lightwash and increased noise within the retained natural feature. **Induced Impacts** • None.	• Vegetation removal is recommended to occur outside of the breeding and nesting season for migratory birds as established by the Canadian Wildlife Service. The peak breeding period for birds in southern Ontario extends from approximately late March to late August (Government of Canada 2017). • If grading is proposed during the bird breeding window, nest sweeps where the grassy area overlaps the proposed road alignment may be conducted. Sweeps would be conducted by a qualified biologist and, should no active nests be encountered, a letter providing 48 hours clearance for grading works would be issued. The observation of an active nest will require a nest buffer to be applied until the young have fledged.

7.0 Summary

NRSI was retained by Thomasfield Homes to prepare a Scoped EIS for the Mayberry Hill Phase 3B subdivision development in Grand Valley, Ontario. Natural features within the property are limited to an area of cultural meadow and wetland in the southern extent of the property. This report summarizes the natural heritage features that are present, their significance, and provides an assessment of the impacts associated with the proposed development and collector road. Mitigation and enhancement measures are identified to minimize the impacts and protect sensitive natural features.

Surveys conducted in 2019 did not identify any SAR or SCC within the subject property. Two grassland bird species; Bobolink and Eastern Meadowlark have been observed in the study area, on adjacent properties. The cultural meadow and wetland within the property provide suitable habitat for these species; however, no signs of foraging or nesting were documented. In support of other development projects, Thomasfield is currently managing a hayfield to the west of the subject property as grassland bird habitat where Bobolink have been confirmed to be utilizing the managed habitat.

Although several SWH types were identified through a screening exercise conducted as part of the TOR (Appendix I), none of these habitats were confirmed to be present during the 2019 surveys.

Direct impacts with the project focus on the removal of wetland (and a portion of cultural meadow) to allow for the construction of a collector road linking the Mayberry development with the proposed Corseed subdivision and Water Street to the southeast of the rail trail corridor. This will require extensive grading and vegetation removal.

Potential indirect impacts associated with the development include alterations to the wetland hydrology as an existing erosion control pond which directs surface water from the project footprint into the wetland will be removed and a SWM feature constructed. There is also potential for temporary disturbance to wildlife during construction.

The development may have induced impacts to the retained natural features, including the establishment of non-native invasive species during construction or through yard waste

dumping from residents. The open and seasonally dry nature of the wetland may result in the creation of informal trails and dumping of garbage.

In order to mitigate these impacts, it is recommended that the southern extent of grading (the collector road and western SWM pond) be delineated with paige wire fence with keyed-in Erosion and Sediment Control (ESC) fence affixed. The ESC fence should also extend at least 100m up the western boundary of the Phase 3B lands to prevent wildlife entry into the work site. An Erosion and Sediment Control Plan should be developed by the project engineer at the detailed design or site plan stage. The ESC fence will act to prevent machinery encroachment into the wetland and limit the potential for sediment and on-site materials to reach the retained natural feature.

As construction of the SWM features may encourage wildlife movement across the collector road, the erection of wildlife crossing signs where the collector road bisects the SWM ponds should be considered. A pedestrian crossing with curb cuts will also alleviate the stranding of wildlife on the road due to curbs.

A robust buffer planting of native species should be installed along the southern edge of the collector road. The dense planting of trees and shrubs will serve as a screen to limit light, noise and human access from impacting the retained wetland. As these plantings will occur within the retained wetland, low-impact machinery or hand-planting are recommended. A planting plan, which utilizes native tree and shrub species known to occur in the vicinity of Grand Valley, should be developed for the SWM feature and any landscaping trees should consider the use of native species. The establishment of the buffer planting should be monitored for a period of 2 years following installation with a target of 100% herbaceous groundcover at the end of the first year, and a minimum survival of 70% of planted woody species at the end of the second year and subject to replacement, as necessary.

The impact of vegetation clearing on birds protected under the MBCA can be minimized by completing site grading for the collector road outside of a late March to late August timing window when birds will be nesting.

In order to prevent the establishment of aggressive invasive species like Common Reed, all heavy machinery should arrive on site clean and free of plant materials and mud. All areas of

bare soil within the SWM pond and adjacent to the collector road should be seeded with a nurse crop to discourage invasive species establishment and reduce the potential for soil erosion. This seeding should occur where the bare soils are inactive for greater than 30 days or within 30 days of completion of final grading.

The provided recommendations are intended to minimize the direct, indirect, induced and cumulative impacts that may arise during the proposed development and to ensure that mitigation measures are effective.

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Appendix I
Terms of Reference

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

April 16, 2019 2201

Mark Kluge, Planner
Township of East Luther Grand Valley
5 Main Street North
Grand Valley, ON L9W 5S6

Dear: Mr. Kluge,

RE: Mayberry Hill Subdivision Phase 3B, Grand Valley - Scoped Environmental Impact Study Terms of Reference

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide the following Terms of Reference (TOR) to prepare a Scoped Environmental Impact Study (EIS) for the proposed residential development and associated stormwater management facility, known as "Mayberry Hill Subdivision Phase 3B" in the Town of Grand Valley, Ontario.

The subject property, almost entirely comprised of active agricultural fields (13.082ha in area), is located west of Taylor Drive, with existing residential development to the east, agricultural lands to the west, planned residential development to the north and cultural meadow and thicket habitats to the south as shown on Map 1. The property is identified as Open Space, Urban Residential and Environmental Conservation on Schedule A-1 in the Town of Grand Valley Official Plan (OP 2017a). The southwest corner of the property is within the Grand River Conservation Authority (GRCA) regulation limit (Ontario Regulation 150/06) due to the presence of Floodplain. An EIS is required to determine potential impacts as the residential development is proposed within and immediately adjacent to the GRCA regulation limit and the Town's Environmental Conservation lands.

The Scoped EIS will characterize the natural features within and adjacent to the subject property and assess potential impacts arising from the proposed residential development, as well as the Town's Collector Road as shown in their Transportation Master Plan (2017b). Mitigation measures to reduce potential impacts will be summarized, as well as restoration and monitoring recommendations. The following TOR outlines steps required to complete the Scoped EIS for the proposed residential development and Collector Road in accordance with the GRCA *Environmental Impact Study Guidelines and Submission Standards for Wetlands* (2005) and the Town of Grand Valley OP (2017a).

Should you have any questions or comments regarding this proposal, please do not hesitate to contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.

Tara M. Brenton, B.Sc., P.Biol., Certified Arborist
Project Manager, Senior Terrestrial & Wetland Biologist

Cc:	Graham Buck	Management Biologist, MNRF, Guelph District
	Fred Natolochny	Supervisor of Resource Planning, GRCA
	Astrid Clos	Planning Consultant, AJC Planning Consultants
	Katherine McLaughlin	Thomasfield Homes Limited
	Tom Krizsan	Thomasfield Homes Limited

Mayberry Hill Subdivision Phase 3B, Grand Valley
Scoped Environmental Impact Study
Terms of Reference
April 16, 2019

Introduction

The 13.082ha subject property is located west of Taylor Drive and northwest of Melody Lane in the south end of the Town of Grand Valley (Map 1). The subject property is primarily comprised of active agricultural fields and is bordered to the east by residential development, agricultural lands to the west, planned residential development to the north and cultural meadow and thicket habitats to the south.

The property is identified as Open Space, Urban Residential and Environmental Conservation on Schedule A-1 in the Town of Grand Valley Official Plan (OP 2017a) (Map 1). The southwest corner of the property is within the Grand River Conservation Authority (GRCA) regulation limit (Ontario Regulation 150/06) due to the presence of Floodplain. An EIS is required to determine potential impacts as the residential development and associated stormwater management facility are proposed within and immediately adjacent to the GRCA regulation limit and the Town's Environmental Conservation lands.

Proposed Undertaking

The development includes a proposed residential draft plan of subdivision with a related stormwater management facility. The exact layout cannot be confirmed until the alignment of a collector road is finalized.

Associated Studies

To ensure a fulsome analysis of potential environmental impacts and to meet both the Town's and GRCA's EIS requirements, associated reporting will be completed by the consulting team to provide detailed information on site topography, drainage, hydrology, soils and hydrogeological conditions. This will supplement the natural characterization reporting to be completed by NRSI and will inform the impact assessment for the Scoped EIS. Technical support work will include:

- Hydrogeology Study (GM BluePlan);
- Servicing and Stormwater Management Report (GM BluePlan);
- Surveying and Topography (GM BluePlan);
- Planning (AJC Planning Consultants)

The approach to stormwater management will incorporate opportunities to use Low Impact Design (LID). The Scoped EIS will review the proposed approach and assess potential impacts to natural features based on the design. Opportunities for mitigation will be highlighted where appropriate.

Scoped Environmental Impact Study

Characterization of Natural Features

NRSI conducted a preliminary site visit on November 29, 2018 to review the overall site conditions and identify potential wetland communities. The Collector Road as identified in the Town's Transportation Master Plan (2017b), is proposed to run through the Mayberry Hill Subdivision Phase 3B and falls within the limits of the wetland areas identified by NRSI in November 2018.

The following work plan is based on NRSI's knowledge of the subject property, preliminary review of background documents, including the draft Corseed Development EIS (Azimuth Environmental Consulting Inc. 2016) and discussions with both the Town and GRCA during the team meeting on February 14, 2019.

Collection and Review of Background Information

The following background information sources assisted in guiding the study approach outlined in this TOR:

- GRCA EIS Guidelines (2005);
- GRCA Ontario Regulation 150/06 (2013);
- Town of Grand Valley Official Plan (2017a);
- Town of Grand Valley Transportation Master Plan (2017b);
- Natural Heritage Information Centre (NHIC) database (MNRF 2019);
- GRCA – Grand River Conservation Network: Interactive Mapping Tool (2018);
- Government of Canada SARA Registry (2018);
- Ontario Breeding Bird Atlas (OBBAA) (BSC et al. 2008);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas Online (Macnaughton et al. 2018);
- Ontario Odonata Atlas (2019)

Review of Potential Significant Species in the Area

A review of background information, including the sources mentioned above, was conducted to determine significant species that are reported to occur in the vicinity of the subject property and to further inform the scope for the field survey and impact analysis portions of the Scoped EIS. A screening exercise to determine the potential for Species at Risk (SAR) to occur within the subject property is provided in Appendix I.

SAR are those listed on the Species at Risk in Ontario (SARO) List (MNRF 2018) and include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Species Concern. For the purposes of this TOR, SAR will include species listed as Endangered or Threatened due to the protection afforded to their habitat under the Endangered Species Act (ESA) (Government of Ontario 2007).

Species of Conservation Concern (SCC), including species listed as Special Concern under the ESA are discussed further within the context of Significant Wildlife Habitat (SWH).

Review of Candidate Significant Wildlife Habitat

The collection and review of background information informed the preliminary screening for candidate SWH within the study area. This review compared site conditions with criteria set out in the SWH Ecoregion 6E Criterion Schedule (MNRF 2015) to determine the presence of any candidate SWH. One category of SWH includes habitat for SCC which includes species that are:

- Designated provincially as Special Concern;
- Assigned a conservation status (S-Rank) of S1 to S3 or SH (i.e. critically imperiled, imperiled, vulnerable, or historical);
- Designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2017), but not provincially by the COSSARO. These species are protected by the federal Species at Risk Act (SARA) but not provincially by the ESA.

The results of the SWH screening informed surveys required to confirm such habitat within or adjacent to the subject property and are provided in Appendix II.

Field Surveys

The following surveys will be undertaken to characterize the natural features within and adjacent to the subject property:

- Vegetation community mapping following the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998);
- 2 season vascular flora inventories within each vegetation community (spring, summer);
- Wetland boundary delineation during the spring season and on-site review with GRCA staff;
- 3 evening amphibian call surveys following the Marsh Monitoring Protocol (1 visit in each April, May and June) if suitable conditions are present;
- 2 early morning breeding bird surveys during the breeding season (mid-May – early July);
- Documentation of candidate habitat for SAR, SCC and SWH, such as seeps and springs, bat maternity habitat, etc.;
- Incidental observation of all wildlife, including signs such as tracks, scat, dens during each site visit.

Data Analysis

Based on the field surveys and background information review, sensitive biological features on the subject property will be identified, along with appropriate buffers. This analysis will take into consideration all relevant policies relating to natural features, provincial and local species listings, and wildlife habitats.

Identified constraints will be mapped on a digital base map and will include: vegetation communities, designated natural features, wetland boundaries, and any significant species and

their habitats. Candidate and confirmed SWH identified within and adjacent to the subject property will also be mapped.

Implications of development (residential development and Collector Road) within or adjacent to the identified natural features based on current policies and regulations will be identified, including the GRCA Wetlands Policy (2005), the Town's OP (2017a) and the Provincial Policy Statement (OMMAH 2014).

Impact Analysis

The details and rationale of the proposed undertaking, including the concept plan, stormwater management strategy, Collector Road details, and grading and drainage plans will be reviewed and compared to the existing conditions on the subject property. Any areas of conflict between significant natural features, buffers, etc. and the development components will be considered and options for minimizing impacts will be recommended. Impacts will be determined based on direct, indirect and induced effects of the proposal.

The Scoped EIS will include an evaluation of significance for SWH and Habitat for Significant Species.

Recommendations & Monitoring

Recommendations with regard to mitigation of construction and residual impacts will be made and opportunities for enhancement will be highlighted (e.g. buffer enhancements, impacts associated with pedestrian traffic). The Scoped EIS will reiterate the approach and monitoring recommendations in the stormwater management report and hydrogeological study to ensure surface and groundwater functions, and conditions within the adjacent natural features will be maintained.

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Appendix I

SAR Screening Table

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[2]	COSEWIC[3]	SARA	Background Source	Habitat Preference[4]	Suitable Habitats within Subject Property	Carried Forward to EIS?	Rationale
Birds										
Riparia riparia	Bank Swallow	S4B	THR	T		BSC et al. 2008	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	No. Suitable habitat not present based on preliminary site visit in November 2018.	No	Suitable habitat is not present for this species.
Hirundo rustica	Barn Swallow	S4B	THR	T		BSC et al. 2008	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	No. Suitable habitat not present based on preliminary site visit in November 2018.	No	No buildings which may offer nesting habitat are present.
Hylocichla mustelina	Wood Thrush	S4B	SC	T		BSC et al. 2008	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. Suitable breeding habitat is not present.	No	Sizable tracts of forest are not present within the subject property.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	BSC et al. 2008	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	No. Suitable breeding habitat is not present.	No	Sizable tracts of grassland are not present within the subject property.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	BSC et al. 2008	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	Yes. Suitable breeding habitat is present. Breeding bird surveys will be conducted throughout the subject property to confirm presence/absence	Yes	The southern portion of the subject property may provide suitable nesting habitat for this species.
Herpetofauna										
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	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.	Yes. Agricultural fields and the thicket and meadow communities may be utilized by Snapping Turtle.	Yes	A small pond and areas of wetland are present to the south. Candidate SWh for turtle nesting has been identified for the agricultural fields adjacent to the natural features in the south of the property.
Mammals										
Myotis lucifungus	Little Brown Myotis	S5	END	E	Schedule 1	Dobbyn 1994	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	No. Suitable habitat is not present.	No	The cultural meadow and swamp thicket in the south of the property do not offer suitable habitat.
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	Dobbyn 1994	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.	No. Suitable habitat is not present.	No	The cultural meadow and swamp thicket in the south of the property do not offer suitable habitat.

[1]MNRF 2019a; [2]MNRF 2019b, [3]Government of Canada 2018; [4]OMNR 2000

Appendix II

SWH Screening Table

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 sheeet water, or depression areas within the active agricultural field (currently corn). **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: 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.	Suitable habitat not present within the subject property. **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: 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.	Suitable habitat not present within the subject property. **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: 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 Natural 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.	Suitable habitat not present within the subject property. **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: 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.	Big Brown Bats have been documented in the vicinity of the study area; however, no known hibernacula within 200 m of the subject property. **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: 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.	Suitable habitat not present within the subject property. **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: 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[cxiix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Suitable habitat not present within the subject property. **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: Snake 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[i] • 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.	Based on preliminary site visit conducted in November 2018, suitable habitat is not present within the subject property. **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: 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	Based on preliminary site visit conducted in November 2018, suitable habitat is not present within the subject property. **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: 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.	Suitable habitat not present within the subject property. **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: 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.	Suitable habitat not present within the subject property. **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: 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.	Subject property not within 5 km of Lake Ontario. **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.	Subject property not within 5 km of Lake Ontario. **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 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, í]. • 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.	Deer yarding habitat not identified within or adjacent to the subject property. **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.	Deer overwintering habitat not identified within or adjacent to the subject property. **Not SWH.**

Significant Wildlife Habitat Assessment Tables

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Significant Wildlife Habitat Assessment Tables

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

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

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

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

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

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

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: 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 small pond feature does not provide suitable habitat for 5 or more nesting Midland Painted Turtles but may be suitabel for Snapping Turtle. **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[cxlx, 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	Unlikely to be present within the subject property or adjacent forested area; however, 2019 field surveys will be conducted to determine the presence of this habitat. **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 (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Suitable habitat not present within the subject property. **Not SWH**

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (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.	Wetland habitats present on-site. Amphibian call surveys being conducted in 2019 to confirm presence of this habitat type. **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
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix] • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Suitable habitat not present within the subject property. **Not SWH**

Significant Wildlife Habitat Assessment Tables

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

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

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[i]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv] • 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.	Cultural meadows identified on-site are <30ha; however, breeding bird surveys will be conducted in 2019 to confirm the presence of this habitat type. **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[cbxiv] 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 [cbxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[l]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #33 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the subject property. **Not SWH**

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

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

Significant Wildlife Habitat Assessment Tables

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

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[í]. <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	Residential development is located east of the subject property, with active agricultural fields and no other significant natural features present to the north and west to provide movement corridor opportunity. **Not SWH**

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

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

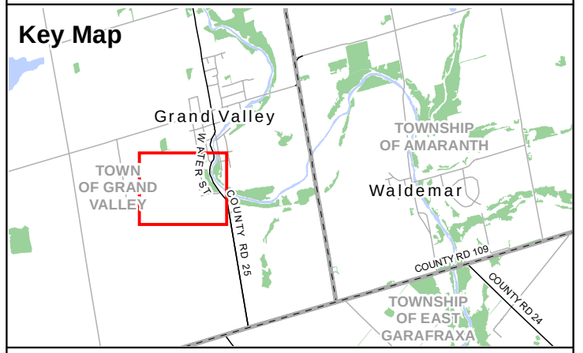
Map

Map 1

Mayberry Hill Phase 3B Subdivision

Study Area and Natural Features

Key Map



Legend

- Subject Property
- Railway
- Contour (5m Interval)
- Permanent Watercourse
- Water Body
- Floodplain (GRCA)
- Regulation Limit (GRCA)
- Wooded Area
- Environmental Conservation

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2201 Date: March 20, 2019	NAD83 - UTM Zone 17 Size: 11x17" **1:3,500**

0 50 100 150 200 Metres

N

Path: X:\2201_MayberryHillPhase3B_GrandValley\NRSI_2201_Map1_StudyArea_NaturalFeatures_3K_2019_03_20_KEF.mxd

Appendix II
Vascular Plant Species Reported from the Study Area

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Dufferin County[5]	NHIC Data[1]	NRSI Observed
Pteridophytes	**Ferns & Allies**										
Equisetaceae	**Horsetail Family**										
Equisetum arvense	Field Horsetail	0	0		S5				X		X
Equisetum hyemale ssp. *affine*	Scouring-rush	2	-2		S5				X		X
Equisetum variegatum	Variegated Horsetail	5	-3		S5				X		X
Gymnosperms	**Conifers**										
Pinaceae	**Pine Family**										
Picea abies	Norway Spruce		5	-1	SE3				I		X
Picea glauca	White Spruce	6	3		S5				X		X
Dicotyledons	**Dicots**										
Anacardiaceae	**Sumac or Cashew Family**										
Rhus hirta	Staghorn Sumac	1	5		S5				X		X
Apiaceae	**Carrot or Parsley Family**										
Daucus carota	Wild Carrot		5	-2	SE5				I		X
Asclepiadaceae	**Milkweed Family**										
Asclepias syriaca	Common Milkweed	0	5		S5				X		X
Asteraceae	**Composite or Aster Family**										
Achillea millefolium ssp. *millefolium*	Common Yarrow		3	-1	SE?				I		X
Antennaria neglecta	Field Pussytoes	3	5		S5				X		X
Arctium minus ssp. *minus*	Common Burdock		5	-2	SE5				I		X
Cirsium arvense	Canada Thistle		3	-1	SE5				I		X
Cirsium vulgare	Bull Thistle		4	-1	SE5				I		X
Eurybia macrophylla	Large-leaved Aster	5	5		S5				X		X
Hieracium caespitosum ssp. *caespitosum*	Field Hawkweed		5	-2	SE5				I		X
Leucanthemum vulgare	Ox-eye Daisy		5	-1	SE5				I		X
Solidago canadensis	Canada Goldenrod	1	3		S5				X		X
Solidago nemoralis ssp. *nemoralis*	Gray Goldenrod	2	5		S5				X		X
Solidago rugosa ssp. *rugosa*	Rough Goldenrod	4	-1		S5				X		X
Symphyotrichum novae-angliae	New England Aster	2	-3		S5				X		X
Symphyotrichum puniceum	Purple-stemmed Aster				S5						X
Taraxacum officinale	Common Dandelion		3	-2	SE5				I		X
Tragopogon pratensis ssp. *pratensis*	Meadow Goat's-beard		5	-1	SE5				I		X
Tussilago farfara	Coltsfoot		3	-2	SE5				I		X
Caprifoliaceae	**Honeysuckle Family**										
Viburnum lentago	Nannyberry	4	-1		S5				X		X
Cornaceae	**Dogwood Family**										
Cornus stolonifera	Red-osier Dogwood	2	-3		S5				X		X

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Dufferin County[5]	NHIC Data[1]	NRSI Observed
Fabaceae	**Pea Family**										
Lotus corniculatus	Bird's-foot Trefoil		1	-2	SE5				I		X
Robinia pseudo-acacia	Black Locust		4	-3	SE5				I		X
Vicia cracca	Tufted Vetch		5	-1	SE5				I		X
Vicia villosa	Hairy Vetch		5	-1	SE5						X
Hydrophyllaceae	**Water-leaf Family**										
Hydrophyllum virginianum	Virginia Water-leaf	6	-2		S5				X		X
Lamiaceae	**Mint Family**										
Lycopus americanus	Cut-leaved Water-horehound	4	-5		S5				X		X
Lythraceae	**Loosestrife Family**										
Lythrum salicaria	Purple Loosestrife		-5	-3	SE5				X		X
Onagraceae	**Evening-primrose Family**										
Oenothera biennis	Common Evening-primrose	0	3		S5				X		X
Plantaginaceae	**Plantain Family**										
Plantago rugelii	Rugel's Plantain	1	0		S5				X		X
Ranunculaceae	**Buttercup Family**										
Anemone canadensis	Canada Anemone	3	-3		S5				X		X
Ranunculus acris	Tall Buttercup		-2	-2	SE5				I		X
Rhamnaceae	**Buckthorn Family**										
Rhamnus alnifolia	Alder-leaved Buckthorn	7	-5		S5				X		X
Rhamnus cathartica	European Buckthorn		3	-3	SE5				I		X
Rosaceae	**Rose Family**										
Fragaria virginiana	Wild Strawberry				S5						X
Geum laciniatum	Rough Avens		-3		S4						X
Prunus virginiana ssp. *virginiana*	Choke Cherry	2	1		S5				X		X
Rosa acicularis	Prickly Rose	7	3		S5				X		X
Sorbus americana	American Mountain-ash	8	-1		S5				X		X
Spiraea alba	Narrow-leaved Meadow-sweet	3	-4		S5				X		X
Rubiaceae	**Madder Family**										
Galium palustre	Marsh Bedstraw	5	-5		S5				X		X
Salicaceae	**Willow Family**										
Populus tremuloides	Trembling Aspen	2	0		S5				X		X
Salix alba var. alba	White Willow			-2	SE4				X		X
Salix discolor	Pussy Willow	3	-3		S5				X		X
Scrophulariaceae	**Figwort Family**										
Veronica serpyllifolia ssp. *serpyllifolia*	Thyme-leaved Speedwell	0	-3		SE5				I		X

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Dufferin County[5]	NHIC Data[1]	NRSI Observed
Violaceae	**Violet Family**										
Viola labradorica	Alpine Violet				S4S5						X
Monocotyledons	**Monocots**										
Cyperaceae	**Sedge Family**										
Carex aurea	Golden-fruited Sedge	4	-4		S5				X		X
Carex flava	Yellow Sedge	5	-5		S5				X		X
Carex granularis	Meadow Sedge	3	-4		S5				X		X
Carex hystericina	Porcupine Sedge	5	-5		S5				X		X
Carex pallescens	Pale Sedge	5	3		S5						X
Carex stipata	Awl-fruited Sedge	3	-5		S5				X		X
Carex tenera	Straw Sedge	4	-1		S5				X		X
Carex utriculata	Beaked Sedge	7	-5		S5				X		X
Carex vulpinoidea	Fox Sedge	3	-5		S5				X		X
Scirpus atrovirens	Dark-green Bulrush	3	-5		S5				X		X
Juncaceae	**Rush Family**										
Juncus effusus	Soft Rush	4	-5		S5				X		X
Orchidaceae	**Orchid Family**										
Cypripedium reginae	Showy Lady's Slipper	7	-4		S4				X		X
Poaceae	**Grass Family**										
Dactylis glomerata	Orchard Grass		3	-1	SE5				I		X
Glyceria striata	Fowl Meadow Grass	3	-5		S5				X		X
Phalaris arundinacea	Reed Canary Grass	0	-4		S5				X		X
Phragmites australis ssp. *australis*	European Common Reed				SNA						X
Poa pratensis ssp. *pratensis*	Kentucky Bluegrass	0	1		S5				X		X
Typhaceae	**Cattail Family**										
Typha latifolia	Broad-leaved Cattail	3	-5		S5				X		X
[1]MNRF 2019a; [2]MNRF 2019b; [3]COSEWIC 2019; [4]Government of Canada 2019; [5]Riley 1989									**Total**	**0**	**69**

LEGEND	
SRANK	
S1	Critically Imperiled
S2	Imperiled
S3	Vulnerable
S4	Apparently Secure
S5	Secure
SU	Unrankable
SNA	Unranked
SX	Presumed Extirpated
SH	Possibly Extirpated (Historical)
S#?	Rank Uncertain
B	Breeding population (birds)
N	Non-breeding population (birds)
COSSARO/COSEWIC	
END/E	Endangered
THR/T	Threatened
SC/SC	Special Concern
NAR/NAR	Not at Risk
DD/DD	Data Deficient
EXP/XT	Extirpated
SARA Schedule	
Schedule 1	Officially protected under SARA
Schedule 2	Threatened/Endangered; may be reassessed for consideration for inclusion to Schedule 1
Schedule 3	Special Concern; may be reassessed for consideration for inclusion to Schedule 1

Appendix III
Bird Species Reported from the Study Area

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Grand River Conservation Priority[5]	OBBA[6]	NHIC Data[1]	NRSI Observed
Anatidae	**Ducks, Geese & Swans**								
Branta canadensis	Canada Goose	S5					CO		X
Anas platyrhynchos	Mallard	S5					PR		X
Anas discors	Blue-winged Teal	S4				√	PR		
Anas crecca	Green-winged Teal	S4					PO		
Phasianidae	**Partridges, Grouse & Turkeys**								
Meleagris gallopavo	Wild Turkey	S5					CO		
Columbidae	**Pigeons & Doves**								
Columba livia	Rock Pigeon	SNA					PO		
Zenaida macroura	Mourning Dove	S5					PR		
Trochilidae	**Hummingbirds**								
Archilochus colubris	Ruby-throated Hummingbird	S5B				√	PO		
Rallidae	**Railes, Gallinules & Coots**								
Porzana carolina	Sora	S4B				√	PO		
Charadriidae	**Plovers**								
Charadrius vociferus	Killdeer	S5B, S5N					PR		
Scolopacidae	**Waders**								
Scolopax minor	American Woodcock	S4B				√	PO		X
Actitis macularia	Spotted Sandpiper	S5				√	PR		
Ardeidae	**Herons & Bitterns**								
Ardea herodias	Great Blue Heron	S4B					CO		X
Cathartidae	**Vultures**								
Cathartes aura	Turkey Vulture	S5B				√	PO		
Accipitridae	**Hawks, Kites, Eagles & Allies**								
Pandion haliaetus	Osprey	S5B				√			X
Circus cyaneus	Northern Harrier	S4B	NAR	NAR		√	CO		
Accipiter striatus	Sharp-shinned Hawk	S5	NAR			√	PO		
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR		√	PO		
Buteo lineatus	Red-shouldered Hawk	S4B	NAR	NAR	Schedule 3	√	PO		
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR			PO		
Strigidae	**Typical Owls**								
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR			PR		
Alcedinidae	**Kingfishers**								
Megaceryle alcyon	Belted Kingfisher	S4B					CO		X
Picidae	**Woodpeckers**								
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B				√	CO		
Dryobates pubescens	Downy Woodpecker	S5					PO		
Colaptes auratus	Northern Flicker	S4B					PO		
Dryocopus pileatus	Pileated Woodpecker	S5				√	PO		

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Grand River Conservation Priority[5]	OBBA[6]	NHIC Data[1]	NRSI Observed
Falconidae	**Caracaras & Falcons**								
Falco sparverius	American Kestrel	S4				√	PO		
Tyrannidae	**Tyrant Flycatchers**								
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC			PO		
Empidonax alnorum	Alder Flycatcher	S5B				√	PO		PR
Empidonax traillii	Willow Flycatcher	S5B					PO		
Empidonax minimus	Least Flycatcher	S4B				√	PO		
Sayornis phoebe	Eastern Phoebe	S5B				√	CO		
Myiarchus crinitus	Great Crested Flycatcher	S4B					PO		
Tyrannus tyrannus	Eastern Kingbird	S4B				√	CO		
Vireonidae	**Vireos**								
Vireo gilvis	Warbling Vireo	S5B					PO		PO
Vireo olivaceus	Red-eyed Vireo	S5B					CO		
Corvidae	**Crows & Jays**								
Cyanocitta cristata	Blue Jay	S5					CO		
Corvus brachyrhynchos	American Crow	S5B					CO		PR
Corvus corax	Common Raven	S5							X
Alaudidae	**Larks**								
Eremophila alpestris	Horned Lark	S5B				√	CO		PO
Hirundinidae	**Swallows**								
Tachycineta bicolor	Tree Swallow	S4B					CO		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B				√	CO		
Riparia riparia	Bank Swallow	S4B	THR	T		√	CO		
Petrochelidon pyrrhonota	Cliff Swallow	S4B				√	CO		
Hirundo rustica	Barn Swallow	S4B	THR	T		√	CO		
Paridae	**Chickadees & Titmice**								
Poecile atricapillus	Black-capped Chickadee	S5				√	CO		
Sittidae	**Nuthatches**								
Sitta canadensis	Red-breasted Nuthatch	S5				√	PO		
Troglodytidae	**Wrens**								
Troglodytes aedon	House Wren	S5B					PO		
Troglodytes hiemalis	Winter Wren	S5B					PO		
Regulidae	**Kinglets**								
Regulus satrapa	Golden-crowned Kinglet	S5B				√	PO		
Turdidae	**Thrushes**								
Catharus fuscescens	Veery	S4B				√	PR		
Hylocichla mustelina	Wood Thrush	S4B	SC	T			PR		
Turdus migratorius	American Robin	S5B					CO		PO
Mimidae	**Mockingbirds, Thrashers & Allies**								
Dumetella carolinensis	Gray Catbird	S4B				√	PO		X
Toxostoma rufum	Brown Thrasher	S4B				√	CO		
Sturnidae	**Starlings**								

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Grand River Conservation Priority[5]	OBBA[6]	NHIC Data[1]	NRSI Observed
Sturnus vulgaris	European Starling	SNA					CO		X
Bombycillidae	**Waxwings**								
Bombycilla cedrorum	Cedar Waxwing	S5B					PR		
Passeridae	**Old World Sparrows**								
Passer domesticus	House Sparrow	SNA					CO		
Fringillidae	**Finches & Allies**								
Carpodacus mexicanus	House Finch	SNA					PO		
Carpodacus purpureus	Purple Finch	S4B				√	PO		
Spinus tristis	American Goldfinch	S5B				√	CO		PR
Parulidae	**Wood Warblers**								
Seiurus aurocapillus	Ovenbird	S4B				√	PR		
Parkesia noveboracensis	Northern Waterthrush	S5B				√	PO		
Mniotilta varia	Black-and-white Warbler	S5B				√	PO		
Oreothlypis ruficapilla	Nashville Warbler	S5B				√	PO		
Geothylpis trichas	Common Yellowthroat	S5B					PR		X
Setophaga ruticilla	American Redstart	S5B				√	PO		
Setophaga petechia	Yellow Warbler	S5B					PR		PR
Setophaga coronata	Yellow-rumped Warbler	S5B				√	PO		
Setophaga virens	Black-throated Green Warbler	S5B				√	PO		
Emberizidae	**New World Sparrows & Allies**								
Spizella passerina	Chipping Sparrow	S5B					CO		
Spizella pallida	Clay-colored Sparrow	S4B				√	PO		PR
Spizella pusilla	Field Sparrow	S4B				√			X
Pooecetes gramineus	Vesper Sparrow	S4B				√	PO		
Passerculus sandwichensis	Savannah Sparrow	S4B				√	PR		PR
Melospiza melodia	Song Sparrow	S5B					CO		PR
Melospiza georgiana	Swamp Sparrow	S5B				√	PO		
Zonotrichia albicollis	White-throated Sparrow	S5B				√	PR		
Cardinalidae	**Cardinals, Grosbeaks & Allies**								
Cardinalis cardinalis	Northern Cardinal	S5					CO		
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B					PR		X
Passerina cyanea	Indigo Bunting	S4B					PO		
Icteridae	**Blackbirds**								
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	√	PR		PO
Agelaius phoeniceus	Red-winged Blackbird	S4					CO		PR
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	√	PR		
Quiscalus quiscula	Common Grackle	S5B					CO		PR
Molothrus ater	Brown-headed Cowbird	S4B					PR		
Icterus galbula	Baltimore Oriole	S4B					PO		X
						Total	**84**	**0**	**26**

[1]MNRF 2019a; [2]MNRF 2019b; [3]COSEWIC 2019; [4]Government of Canada 2019; [5]Couturier 1999; [6]BSC et al. 2006

Appendix IV
Herpetofauna Species Reported from the Study Area

Herpetofauna Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	ORAA[6]	NHIC Data[1]	NRSI Observed
Turtles								
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	X		
Snakes								
Storeria occipitomaculata occipitomaculata	Northern Red-bellied Snake	S5				X		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5				X		
Toads and Frogs								
Anaxyrus americanus	American Toad	S5				X		X
Hyla versicolor	Tetraploid Gray Treefrog	S5				X		X
Pseudacris crucifer	Spring Peeper	S5				X		X
Lithobates clamitans melanota	Northern Green Frog	S5				X		X
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR		X		X
Lithobates sylvaticus	Wood Frog	S5				X		X
					Total	**9**	**0**	**6**

[1]MNRF 2019a; [2]MNRF 2019b; [3]COSEWIC 2019; [4]Government of Canada 2019; [#]Ontario Nature 2018

Appendix V
Mammal Species Reported from the Study Area

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Mammal Atlas[5]	NHIC Data[1]	NRSI Observed
Didelphimorphia	**Opossums**							
Didelphis virginiana	Virginia Opossum	S4				X		
Insectivora	**Shrews and Moles**							
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				X		
Lasiurus borealis	Eastern Red Bat	S4				X		
Lasiurus cinereus	Hoary Bat	S4				X		
Myotis leibii	Eastern Small-footed Myotis	S2S3	END			X		
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	X		
Myotis septentrionalis	Northern Myotis	S3	END	E	Schedule 1	X		
Perimyotis subflavus	Tri-colored Bat	S3?	END	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	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		
Tamiasciurus hudsonicus	Red Squirrel	S5				X		
Tamias striatus	Eastern Chipmunk	S5				X		
Zapus hudsonius	Meadow Jumping Mouse	S5				X		

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Ontario Mammal Atlas[5]	NHIC Data[1]	NRSI Observed
Carnivora	**Carnivores**							
Canis latrans	Coyote	S5				X		
Mephitis mephitis	Striped Skunk	S5				X		
Mustela erminea	Ermine	S5				X		
Mustela frenata	Long-tailed Weasel	S4				X		
Mustela vison	American Mink	S4				X		
Procyon lotor	Northern Raccoon	S5				X		
Ursus americanus	American Black Bear	S5	NAR	NAR		X		
Vulpes vulpes	Red Fox	S5				X		
Artiodactyla	**Deer and Bison**							
Odocoileus virginianus	White-tailed Deer	S5				X		X
					Total	**43**	**0**	**1**

[1]MNRF 2019a; [2]MNRF 2019b; [3]COSEWIC 2019; [4]Government of Canada 2019; [5]Dobbyn 1994

Appendix VI
Lepidoptera Species Reported from the Study Area

Lepidoptera Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	TEA Atlas[5]	NHIC Data[1]	NRSI Observed
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**							
Satyrium liparops	Striped Hairstreak	S5				X		
Nymphalidae	**Brush-footed Butterflies**							
Vanessa cardui	Painted Lady	S5				X		
					Total	**2**	**0**	**0**

[1]MNRF 2019a; [2]MNRF 2019b; [3]COSEWIC 2019; [4]Government of Canada 2019;
[5]Macnaughton et al. 2019

Appendix VII
Odonata Species Reported from the Study Area

Odonata Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	SARO[2]	COSEWIC[3]	SARA Schedule[4]	Odonate Atlas[5]	NRSI Observed
Calopterygidae	**Broadwinged Damselflies**						
Calopteryx aequabilis	River Jewelwing	S5				X	
Calopteryx maculata	Ebony Jewelwing	S5				X	
Hetaerina americana	American Rubyspot	S4				X	
Lestidae	**Spreadwings**						
Lestes rectangularis	Slender Spreadwing	S5				X	
Coenagrionidae	**Narrow-winged Damselflies**						
Argia moesta	Powdered Dancer	S5				X	
Enallagma annexum	Northern Bluet	S4				X	
Enallagma antennatum	Rainbow Bluet	S4				X	
Enallagma civile	Familiar Bluet	S5				X	
Enallagma exsulans	Stream Bluet	S5				X	
Enallagma hageni	Hagen's Bluet	S5				X	
Gomphidae	**Clubtails**						
Phanogomphus exilis	Lancet Clubtail	S5				X	
Corduliidae	**Emeralds**						
Epitheca spinigera	Spiny Baskettail	S5				X	
Libellulidae	**Skimmers**						
Plathemis lydia	Common Whitetail	S5				X	
					Total	**13**	**0**

[1]MNRF 2019a; [2]MNRF 2019b; [3]COSEWIC 2019; [4]Government of Canada 2019; [5]MNRF 2019c

Appendix VIII
Subject Property Photographs

Photograph 1: Area of Reed Canary Grass (*Phalaris arundinacea*) marsh where road alignment and stormwater feature are proposed (May 24, 2019).

Photograph 2: East box culvert beneath the rail corridor (May 24, 2019).

Photograph 3: West box culvert beneath the rail corridor located south of the pond (May 24, 2019).

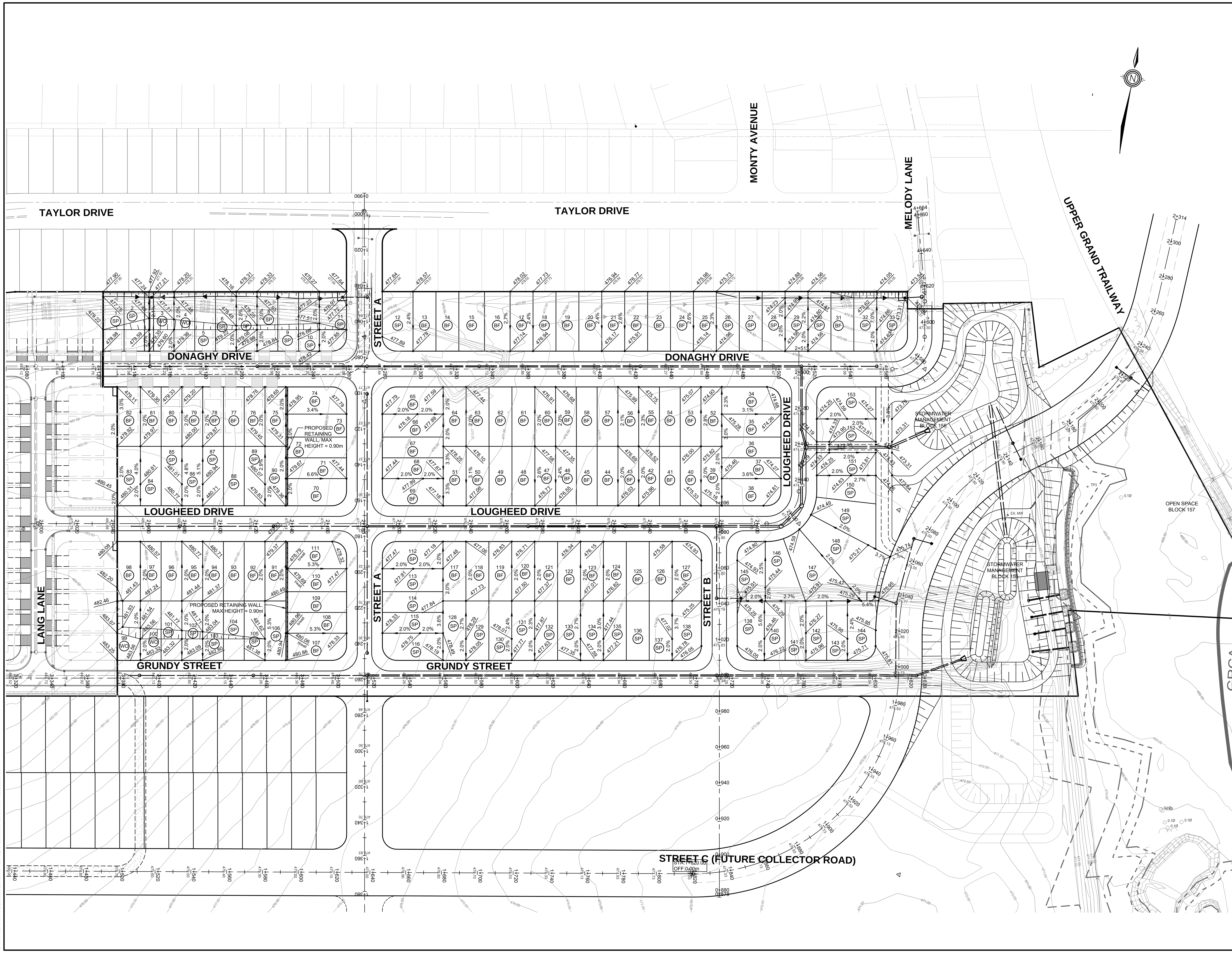
Photograph 4: Pond feature to west of subject property which provides anuran habitat (April 18, 2019).

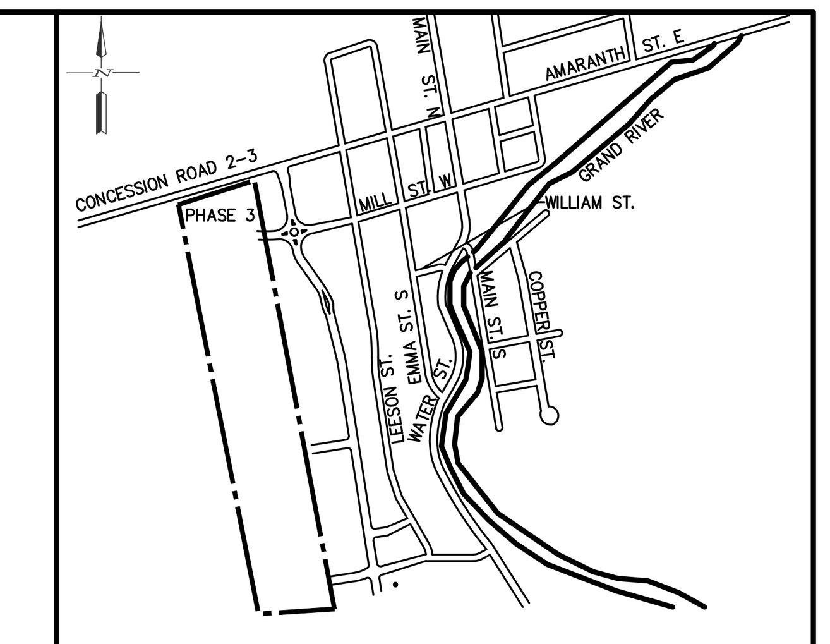
Photograph 5: View from the rail trail, looking west, along approximate location of proposed road alignment (November 29, 2018).

Photograph 6: A patch of Alder-leaved Buckthorn (*Rhamnus alnifolia*) within the proposed road alignment (May 24, 2019).

Photograph 7: A small population of Showy Lady's Slipper (*Cypripedium reginae*) in the western portion of the wetland (June 28, 2019).

Maps





TOWN OF GRAND VALLEY

KEY PLAN

NOT TO SCALE

NOTES :

1. TOPOGRAPHIC AND EXISTING FEATURES SURVEY COMPLETED BY GM BLUEPLAN ENGINEERING ON APRIL 30, 2018. ADDITIONAL TOPOGRAPHIC SURVEY OF BOYNE CREEK AND THE UPPER GRAND TRAILWAY COMPLETED BY GM BLUEPLAN ENGINEERING ON NOVEMBER 25, 2019.
2. DRAFT PLAN PREPARED BY ASTRID J CLOS PLANNING CONSULTANTS, DATED OCTOBER 31, 2019.
3. EXISTING INFRASTRUCTURE INVERT INFORMATION PROVED BY GM BLUEPLAN ENGINEERING AS RECORDED DRAWINGS, 10, 11, 14, 15, 16, AND 17 DATED APRIL, 28, 2014.

BENCH MARKS :

STATION: 00819798443 - ELEV: 479.355m
TWO STOREY BRICK AND ALUMINUM SIDING HOUSE ON EAST SIDE OF HWY 25 AND NORTH SIDE OF FIFE RD. 0.9 KM NORTH OF THE ROYAL BANK AT GRAND VALLEY, 19.0m NORTH OF CENTERLINE OF FIFE RD, 30.3m EAST OF CENTERLINE OF HWY 25. TAB LEFT IS SET HORIZONTALLY IN WEST FACE OF CONCRETE FOUNDATION, 3.08m SOUTH OF N.W. CORNER 18cm BELOW BRICKWORK AND 18cm ABOVE GROUND LEVEL

STATION: 00819798442 - ELEV: 472.478m
TWO STORY RED BRICK HOUSE ON WEST SIDE OF HWY 25, 1.2KM SOUTH OF ROYAL BANK AT GRAND VALLEY, 1.5km NORTH OF WEST JCT HWYS 25 AND 9 AND 21.5m WEST OF CENT0ERLINE OF HWY 25. TABLET IS SET HORIZONTALLY IN SOUTH FACE OF STONE FOUNDATION, 51cm EAT OF S.W. CORNER, 16cm BELOW BRICKWORK AND 11cm ABOVE GROUND LEVEL.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

NO.	DATE	REVISION DESCRIPTION	CH'KD
1	--/--/----	ISSUED FOR DRAFT PLAN APPROVAL	A.E.K.

GM BluePlan ENGINEERING

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
330 TRILLIUM DRIVE, UNIT D, KITCHENER, ON N2E 3J2
TEL. 519-748-1440 www.gmblueplan.ca

MAYBERRY HILL SUBDIVISION PHASE 3B

THOMASFIELD HOMES LTD

TOWN OF GRAND VALLEY

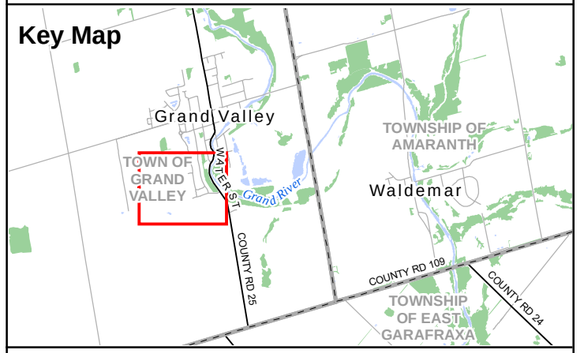
CONCEPTUAL GRADING PLAN

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
E.B.	A.E.K.	115049	4
DESIGNED BY :	DATE :	SCALE :	
A.E.K.	NOVEMBER 2019	1:1000	

Map 1

Mayberry Hill Subdivision Phase 3B

Study Area and Natural Features



Legend

- Subject Property
- Railway
- Contour (5m Interval)
- Permanent Watercourse
- Water Body
- Floodplain (GRCA)
- Regulation Limit (GRCA)
- Wooded Area
- Environmental Conservation

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2201 Date: March 6, 2020	NAD83 - UTM Zone 17 Size: 11x17" **1:3,500**

0 50 100 150 200 Metres

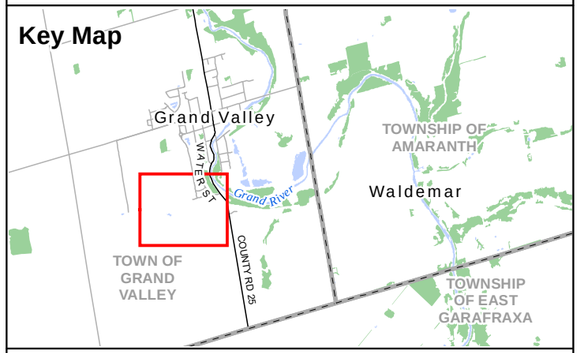
N

Path: X:\2201_MayberryHillPhase3B_GrandValley\NRSI_2201_Map1_StudyArea_NaturalFeatures_3K_2020_03_06_GCS.mxd

Map 2

Mayberry Hill Subdivision Phase 3B

Vegetation Communities and Survey Locations



554200 554400 554600 554800 555000

4860000 4859800 4859600 4859400

TAYLOR DRIVE
LEESON ST
WATER ST
MONTY AVE
MELODY LANE
COUNTY RD 25
Annual Row Crop
CUM
BMB-001
Erosion Control Pond
Constructed Berm
Culvert
H
ANR-001
ANR-002
SWT2
CUP
MAM
BMB-002
Boyne Creek

Legend

- Subject Property
- Railway
- Permanent Watercourse
- Water Body
- Breeding Bird Survey Station (BMB)
- Calling Anuran Survey Station (ANR)
- Wetland Boundary (Reviewed with GRCA May 24, 2019)
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow
(CUP) Plantation
(H) Hedgerow
(MAM) Meadow Marsh
(SWT2) Mineral Thicket Swamp Ecosite

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2201
Date: March 30, 2020

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

N

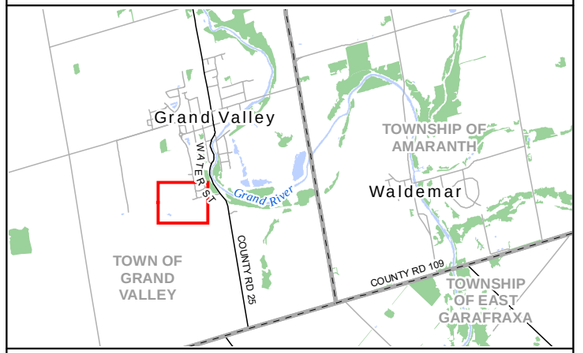
0 50 100 150 200 Metres

Path: X:\2201_MayberryHillPhase3B_GrandValley\NRSI_2201_Map2_ELC_SurveyLocations_3K_2020_03_30_KEF.mxd

Map 3

Mayberry Hill Subdivision Phase 3B

Natural Heritage Constraints and Opportunities



Legend

- Subject Property
- Site Plan
- Upper Grand Trailway
- Wetland Boundary (Reviewed with GRCA May 24, 2019)
- Proposed Wetland Removal (excludes slope or retaining wall)
- SWM Pond Naturalization Planting Opportunity
- Wetland Buffer (15m) Naturalization Planting Opportunity
- Additional Enhancement Area
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow

(CUP) Plantation

(H) Hedgerow

(MAM) Meadow Marsh

(SWT2) Mineral Thicket Swamp Ecosite

SAR Observations

- Bobolink (west of Subject Property)
- Eastern Meadowlark (Corseed Property)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2201
Date: March 31, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:2,000

0 40 80 120 Metres

N

Path: X:\2201_MayberryHillPhase3B_GrandValley\NRSI_2201_Map3_Constraints_Opps_2K_2020_03_31_KEF.mxd

554400 554600 554800

4860000 4859800 4859600

Inset

Erosion Control Pond

CUM

SWT2

Annual Row Crop

MONTY AVE

LEESON ST

MELODY LANE

H

0.089ha

See Inset

CUP

MAM