BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Environmental Impact Study Northlands Estates Plan of Subdivision City of Port Colborne Niagara Region

Prepared For:

2600261 Ontario Inc.

Prepared By:

Beacon Environmental Limited

Date: *Project:*

July 2022 **221368**

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1. Introduction

Beacon Environmental Limited (Beacon) was retained by 2600261 Ontario Inc. (the Proponent) to undertake an Environmental Impact Study (EIS) in support of the proposed Northlands Estates Plan of Subdivision (the development) on lands located west of West Side Road, and south of Barrick Road in the City of Port Colborne (the City), herein referred to as the subject lands (**Figure 1**).

The development plan presented in this EIS (**Appendix A**) has been prepared by Upper Canada Consultants (UCC). The proposed plan has a street accessed from Northland Avenue, and includes single family residential, street towns residential, mix use residential/commercial, and parkland.

This EIS has been prepared following the requirements of the Regional Municipality of Niagara Environmental Impact Study Guidelines (2018). For the subject lands, and adjacent lands, a background review, field investigations and assessment of natural heritage features and functions was undertaken by Beacon.

1.1 Overview of Study Area

The 16.8 ha subject lands support a mosaic of cultural vegetation communities including woodland, shrub thicket and field meadow on clay soils. Mature upland and swamp forests are found along the western boundary. The Niagara Peninsula Conservation Authority (NPCA) identifies a watercourse along the south boundary of the subject lands that flows westward though municipal drains in farm fields to the main Eagle Marsh Drain. The Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) in 2009 mapped and evaluated a wetland unit of the Non-Provincially Significant Onondaga Escarpment Wetland Complex which extends into the western boundary of the subject lands. The eastern boundary along West Side Road abuts the rear of residential lots and the Port Colborne Mall in the south. The rear of residential lots along Barrick Road defines the northern boundary and the rear of residential lots along Coronation Drive are found along the southern boundary (**Figure 1**).

Schedule A City-Wide Land Use (2012) of the City's Official Plan (updated 2017) shows that the subject lands are entirely contained within the City's Urban Boundary and lie along the western limits of the Urban Boundary. The lands are currently designated Urban Residential. The City's Official Plan Schedule B Natural Heritage (2012) does not identify Environmental Protection Area (EPA) to be associated with the subject lands or immediate adjacent lands. Environmental Conservation Area (ECA) is identified along and within a portion the western boundary and represents Significant Woodland/Non-Provincially Significant Wetland as detailed on Schedule B2 Environmental Area.

1.2 Previous Studies

In April 2014 Groundwater Environmental Management Services (GEMS) was retained by the landowner to complete an EIS for the subject lands in support of a proposed residential development plan, the Northlands Estates Subdivision, with draft plan approval 26-T-12-2000-02. The EIS completed by GEMS undertook detailed field surveys of fauna, vegetation communities, and an assessment of natural heritage features and functions. In 2020 GEMS completed a Northlands Development Constraints Summary Report for the subject lands. For the constraints report GEMS prepared a Terms of Reference (dated December 5, 2018) in order to update the original GEMS 2014 EIS completed for

the subject lands. The Terms of Reference was submitted to the NPCA, the Region of Niagara (Region), the City and the MNDMNRF. For the constraints assessment GEMS undertook additional field surveys in October 2018 and June 2020.

The natural heritage information detailed in these two reports was utilized for this EIS. The GEMS reports are provided in **Appendix B and C** and should be reviewed as part of this EIS with respect to existing natural heritage features and functions.

2. Policy and Regulations

The subject lands lie within the Urban Boundary of the City within the Niagara Region. This area lies outside of the jurisdiction of the Niagara Escarpment Plan (2017) and Greenbelt Plan (2017). In addition, as the subject lands lie within the Urban Boundary of the City, the natural heritage features and development policies of the Growth Plan (2020) are not applicable.

2.1 Provincial Policy Statement (2020)

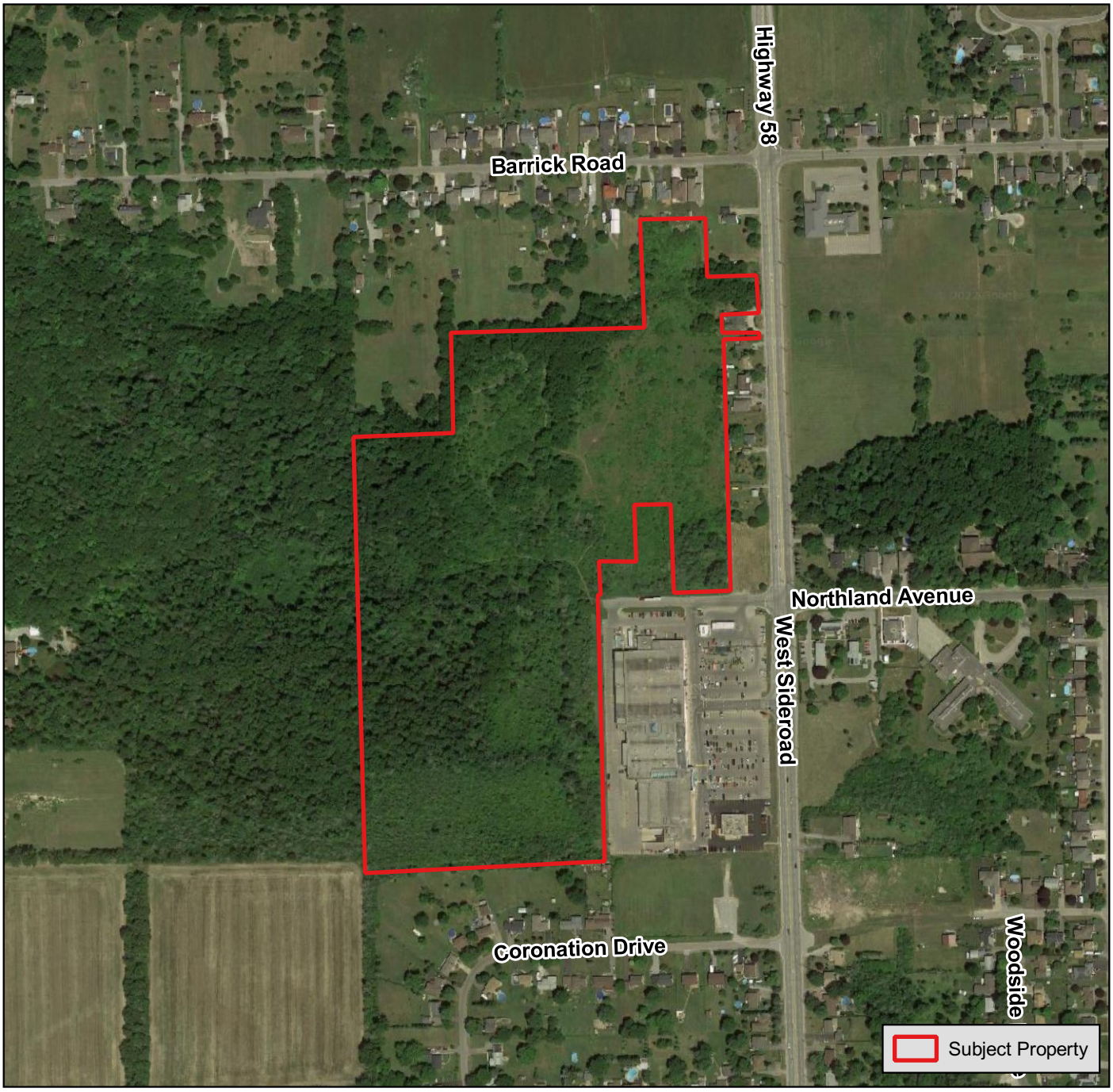
The current Provincial Policy Statement came into effect May 1, 2020. It replaces the Provincial Policy Statement issued April 30, 2014.

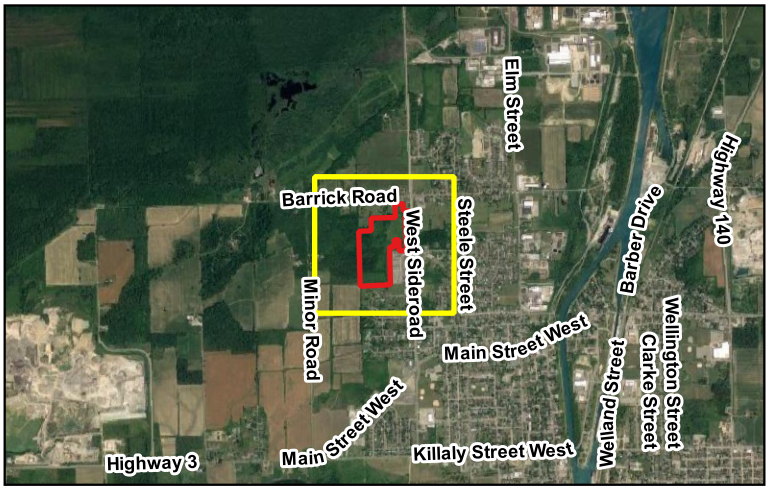
Section 2.1 of the PPS provides direction to regional and local municipalities regarding planning policies specifically for the protection and management of natural heritage features and resources.

Section 2.1 of the PPS describes eight natural heritage features and provides planning policies for each listed below:

- *Significant wetlands;*
- *Significant coastal wetlands;*
- *Significant habitat of endangered and threatened species;*
- *Fish habitat;*
- *Significant woodlands;*
- *Significant valleylands;*
- *Significant Areas of Natural and Scientific Interest (ANSIs); and*
- *Significant wildlife habitat.*

Each of these features are afforded varying levels of protection as detailed in Sections 2.1.4 through 2.1.8. The development policies of the current official plans of the Region and City are in conformity with Section 2.1 Natural Heritage of the PPS, therefore, conformity with these official plans ensures conformity with the PPS.





Site Location	Figure 1
Northlands Estates, City of Port Colborne	
BEACON ENVIRONMENTAL	Project: 221368 Last Revised: January 2022
Client: 2600261 Ontario Inc.	Prepared by: BD Checked by: RH
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Orthoimagery Baselayer: FBA Niagara Region (2018)

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In terms of implementation, identification of the various natural heritage features noted above it is a responsibility shared by the Ministry of the Environment, Conservation and Parks (MECP), MNDMNRF and the municipal planning authority. The MECP is responsible for the confirmation of habitat of endangered species and threatened species, and for its regulation (under the *Endangered Species Act*). The MNDMNRF is responsible for the identification of Provincially Significant Wetlands (PSWs) and Areas of Natural and Scientific Interest (ANSIs). Local and regional planning authorities are responsible for the identification of Significant Woodlands, Significant Valleylands, and Significant Wildlife Habitat, with support from applicable guidance documents (i.e., Natural Heritage Reference Manual, OMNR 2010; Significant Wildlife Habitat Technical Guidelines, OMNR 2000; Significant Wildlife Habitat Criteria for Ecoregion 6E or 7E, MNRF 2015. Fish habitat is regulated by the Department of Fisheries and Oceans (DFO) pursuant the *Fisheries Act.*

2.2 Niagara Region Official Plan (2014)

The Natural Heritage polices of the Region are detailed in *Section 7- Environment* of the Official Plan (2015) and natural heritage features are identified on Schedule C - Core Natural Heritage.

According to Policy 7.B.1.1:

> *The Core Natural Heritage System consists of:*
> - *Core Natural Areas, classified as either Environmental Protection Areas or Environmental Conservation Areas;*
> - *Potential Natural Heritage Corridors connecting the Core Natural Areas;*
> - *The Greenbelt Natural Heritage and Water Resources Systems; and*
> - *Fish Habitat.*

Environmental Protection Area (EPA)

Outside of the Greenbelt Natural Heritage System, Environmental Protection Areas (EPA) include Provincially Significant Wetlands; Provincially Significant Life Science Areas of Natural and Scientific Interest (ANSIs); and significant habitat of endangered and threatened species (Policy 7.B.1.3).

Policy 7.B.1.10 states that development and site alteration is not permitted within EPA lands, with the exception of a) forest, fish and wildlife management; b) conservation and flood or erosion control projects where it has been demonstrated that they are necessary in the public interest and other alternatives are not available; and c) small scale, passive recreational uses and accessory uses such as trails, boardwalks, footbridges, fences, docks and picnic facilities that will have no significant negative impact on natural features or ecological functions of the Core Natural Heritage System.

Policy 7.B.1.11 states that development and site alteration may be permitted without an amendment to this Plan on adjacent lands to EPA as set out in Table 7-1 except for those lands within vegetation protection zones associated with EPA in the Greenbelt Natural Heritage System. The subject property is not located within the Greenbelt area. Outside of the Greenbelt development is permitted on lands adjacent to EPA if it has been demonstrated by an EIS that over the long term, there will be no significant negative impact on Core Natural Heritage System components and the proposed development or site alteration is not prohibited by other policies in the Official Plan.

Environmental Conservation Area (ECA)

According to Policy 7.B.1.4, Environmental Conservation Areas (ECA) include; significant woodlands, significant wildlife habitat significant habitat of species of concern, regionally significant Life Science ANSIs, other evaluated wetlands, significant valleylands, savannahs and tallgrass prairies, and alvars, and publicly owned conservation lands.

Policy 7.B.1.11 states that development and site alteration may be permitted within ECA lands and their adjacent lands if it has been demonstrated by and EIS that, over the long term, there will be no significant negative impact on the Core Natural Heritage System components and the proposed development or site alteration is not prohibited by other policies in the Plan. Adjacent lands for an ECA feature such as a Significant Woodland or Significant Wildlife Habitat is 50 m.

Policy 7.B.1.18 states that where development or site alteration is approved in or adjacent to components of the Core Natural Heritage System new lots thus created shall not extend into either the area to be retained in a natural state as part of the Core Natural Heritage System or the buffer zone identified through an EIS.

Key Hydrologic Features

Policy 7.B.1.6 defines Key Hydrologic Features as permanent and intermittent streams, lakes and their littoral zones, seepage areas, springs and wetlands.

Fish Habitat

Policy 7.B.1.15 states that development and site alteration may be permitted within fish habitat and on adjacent lands if it will result in no net loss of the productive capacity of fish habitat as determined by the Department of Fisheries and Oceans (DFO). A naturally vegetated buffer zone, a minimum 30 metres in width, measured from the stable top of bank is generally required for lands adjacent to Type 1 Critical Fish Habitat. A minimum 15 metre buffer from the stable top of bank is required for lands adjacent to Type 2 Important or Type 3 Marginal Fish Habitat. A narrower buffer may be considered where the EIS has demonstrated that it will not harm fish or fish habitat, but in no case shall the buffer adjacent to Critical Fish Habitat be less than 15 metres.

Valleylands

Valleylands are considered natural heritage features but are addressed in Hazard Land policies. Policy 7.A.6.5 states that for development and site alteration along valleylands, where the valley bank height is equal to or greater than 3 metres, the following provisions apply:

- *A minimum setback of 7.5 metres from the stable top of the valley slope, as identified by the Conservation Authority, shall be required for all new structures, including swimming pools and subsurface sewage disposal systems, and for site alterations;*
- *Where the Conservation Authority finds evidence of slope instability or where the angle of the valley slope exceeds 3:1 (Horizontal Distance: Vertical Distance) a geotechnical report prepared by a qualified engineer shall be submitted with an application for new development or site alteration. A setback greater than 7.5 metres*

may be required where the Conservation Authority has determined, after considering the geotechnical report, that an increased setback is needed to address site specific conditions;

- *Within Urban Boundaries the Region supports the maximum use of land for development while avoiding hazardous conditions. A reduced setback may be considered where an existing lot provides insufficient depth to accommodate the required setback provided that a geotechnical report submitted by the applicant and approved by the Conservation Authority finds that the reduced setback, with mitigative measures, will maintain long term bank stability with no adverse environmental impacts, will not create new hazards or increase existing ones, and that no development or site alteration will be permitted below the top of the valley bank;*
- *Where possible existing vegetation should be maintained within the setbacks required under this policy. Vegetation below the top of the valley slope shall not be disturbed; and*
- *New lots created through plan of subdivision, plan of condominium or consent shall not extend below the top of the valley slope as determined by the Conservation Authority. Lands below the top of the valley slope in plans of subdivision and plans of condominium shall be maintained as one block. The Region shall encourage dedication of these lands for conservation purposes either to the appropriate local municipality or to another public agency where there is a willing recipient.*

Significant Woodland

Policy 7.B.1.5 contains criteria for identification of significant woodlands. In order to be considered significant, the woodland must meet one or more of the following criteria:

- *Contain threatened or endangered species or species of concern;*
- *In size, be equal to or greater than:*
  - *2 hectares, if located within or overlapping Urban Area Boundaries;*
  - *4 hectares, if located outside Urban Areas and north of the Niagara Escarpment; and*
  - *10 hectares, if located outside Urban Areas and south of the Escarpment;*
- *Contain interior woodland habitat at least 100 metres in from the woodland boundaries;*
- *Contain older growth forest and be 2 hectares or greater in area;*
- *Overlap or contain one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4; or*
- *Abut or be crossed by a watercourse or water body and be 2 or more hectares in area.*

Wildlife Corridor

Policy 7.B.1.13 states that where development or site alteration is proposed in or near a Potential Natural Heritage Corridor, the Corridor shall be considered in the development review process. Development should be located, designed and constructed to maintain and, where possible, enhance the ecological functions of the Corridor in linking Core Natural Areas or an alternative corridor should be developed.

2.3 City of Port Colborne Official Plan (2013 – Updated 2017)

Natural heritage development policies are detailed in Section 4 of the Official Plan. Section 4.1 identifies that the Core Natural Heritage System consists of:

- Environmental Protection Areas;
- Environmental Conservation Areas;
- Environmental Corridors and Linkages; and
- Significant Valleylands, Stream Corridors and Fish Habitat Areas.

Environmental Protection Area (EPA)

Section 4.2 Environmental Protection Areas identifies that EPA include lands that are classified as PSW's, Provincially Significant ANSI's, the Significant Habitat of Threatened and Endangered species and Natural Hazard Areas as identified on Schedule B1.

Sections 4.2.1 through 4.2.3 detail that development is not permitted in PSW's, Provincially Significant ANSI's, and the Significant Habitat of Threatened and Endangered species. Development on adjacent lands can be permitted if supported by the findings of an EIS that there will be no negative impact on the features and their ecological function. Adjacent lands are defined as follows:

- PSW - adjacent lands within 120 metres;
- ANSI – adjacent lands within 50 metres; and
- Significant Habitat of Threatened and Endangered species - adjacent lands within 50 metres.

Environmental Conservation Area (ECA)

Section 4.3 identifies that ECA include Regionally Significant ANSI's, Non- Provincially Significant Wetlands, Significant Wildlife Habitat, Significant Woodlands, Significant Valleylands, Habitats of Species of Concern and Environmental Corridors and Linkages as identified on Schedule B2. Significant Woodlands are identified in accordance with the criteria provided in Section 7.B of the Regional Policy Plan.

Sections 4.3.2 through 4.3.5 detail that development within and adjacent to ECA is permitted when supported by the findings of an EIS that there will be no negative impact on the features and their ecological function. Section 4.3.1 (f) identifies adjacent lands to an ECA feature is 50 m.

Environmental Corridor and Linkages

Section 4.3.6 Environmental Corridors and Linkages details that where an environmental corridor or linkage area has been identified on Schedule B as a Natural Heritage Feature, that in instances where a development proposal may impact on the corridor/linkage that an EIS is required to assess potential impacts.

Significant Valleylands, Stream Corridors and Fish Habitat Areas

Section 4.3.7 identifies that Significant Valleylands, Stream Corridors and Fish Habitat Areas are identified on Schedule B2. Section 4.3.7.1 General Policies details that development within Significant Valleylands is permitted if it has been demonstrated by an EIS that there will be no negative impacts on the natural features or their ecological functions. Along Significant Valleylands where the valley bank height is equal to or greater than 3 metres, a minimum setback of 7.5 m is required.

Where development may impact fish habitat, development and site alteration shall not be permitted except in accordance with provincial and federal requirements and where there is no net loss of productive capacity. The proponent shall be required to prepare an EIS to the satisfaction of the Department of Fisheries and Oceans (DFO) or its designate. A naturally vegetated buffer area of at least 30 metres in width from the stable top of bank will be required adjacent to Type 1 Critical Fish habitat as identified on Schedule B. A minimum 15 metre vegetative buffer from the stable top of bank will be required adjacent to Type 2 Important or Type 3 Marginal Fish habitat. A buffer narrower than 15 metres may be considered for important or marginal fish habitat where the Environmental Impact Study has demonstrated that there will be no harmful destruction to the fish habitat.

2.4 Niagara Peninsula Conservation Authority – Ontario Regulation 155/06 (2006)

Wetlands, watercourses and valleylands and their adjacent lands are regulated within the jurisdiction of the Niagara Peninsula Conservation Authority (NPCA) pursuant to Ontario Regulation 155/06 *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Under the Regulation the NPCA has regulatory power to prevent or restrict development within defined regulated areas. For the permitting and enforcement associated with *Ontario Regulation 155/06* the NPCA Policy Document: Policies for the Administration of Ontario Regulation 155/06 and the *Planning Act* 2018, provides direction as detailed below.

Valleylands

Section 6 details development policies with respect to valleylands. The policies for erosion hazards associated with apparent valleys apply where the bank height is equal to or greater than 3 metres in height (approximately 10 feet), the slope is steeper than 3 (horizontal) to 1 (vertical) and includes adjacent lands. The physical top of slope is defined as the evident transition point between the plateau lands and the face of the slope. Where the physical top of slope is required to be established, site inspections with the applicant and Authority staff are to be undertaken. The physical top of slope and the stable top of slope may be coincident. However, in some cases, due to specific on-site conditions (such as slope inclination, proximity of the watercourse to the toe of slope, soil conditions, erosion, etc.) the stable top of slope may not be located at the physical top of slope, but rather may be located landward from the physical top of slope. The stable top of slope is to be established by a professional geotechnical engineer. For new development along a valley's table lands, a setback of 7.5 m is required from either of the stable top of slope or the physical top of slope.

Wetlands

Section 8 provides policies for proposed development within and adjacent to wetlands. For wetlands the regulated areas include the wetland area and 120 m of the adjacent lands for PSW's and wetland areas greater than 2 ha in size, and 30 m for wetland areas less that 2 ha in size. Generally, no new development is permitted within 30 m of a wetland. However, reductions to the setback limit will be considered based on a site-specific evaluation by NPCA staff to determine whether a reduction is warranted, depending on scale, nature and proximity of the proposed development. Policy 8.2.3.4 does not support lot creation within wetlands. Policy 8.2.2.8 identifies that NPCA will consider compensation for the alteration/removal of non-provincially significant wetlands.

Watercourse

Section 9 provides policies for development where a watercourse can be impacted. For the application of the Regulation, a watercourse is defined as an identifiable depression in the ground in which a flow of water regularly or continuously occurs. In general, interference with a watercourse shall not be permitted. However, the NPCA will consider alterations to a watercourse provided that:

- The need for the watercourse alteration has been demonstrated to the satisfaction of the NPCA;
- The proposed works are in accordance with NPCA standards;
- The proposed watercourse alteration does not increase flood plain elevations, flood frequency, erosion rates or erosion frequency along either side of the watercourse, upstream and/or downstream of the proposed works;
- The works are designed to ensure that the storage capacity of the flood plain is maintained;
- The works will not adversely affect the ecological and hydrological function of the watercourse and riparian zone;
- Adequate erosion protection measures are utilized when required;
- Sediment control measures are incorporated during the construction phase to the satisfaction of the NPCA; or
- They are considered minor works as defined by the NPCA.

Section 9.2.5.1 states that, where development and site alteration is proposed adjacent to a watercourse, the NPCA shall require the establishment of a natural buffer of between 15 metres (49 feet) and 10 metres (33feet) based on the following:

- A 15 metre natural buffer for watercourses containing permanent flow, cool water or coldwater systems or specialized aquatic or riparian habitat (such as but not limited to fish spawning areas, habitat of species at risk or species of concern, forested riparian areas or Type 1 Critical Fish Habitat);
- A 10 metre natural buffer for watercourses containing intermittent flow, warmwater systems or general/impacts aquatic or riparian habitat, or Type 2 Important Fish Habitat or Type 3 Marginal Fish Habitat; and
- Other considerations which may impact pollution or the conservation of land.

3. EIS Assessment Methodology

3.1 GEMS Reports

As noted in Section 1.3 above detailed field survey and assessment of natural heritage features and functions associated with the subject lands has been completed by GEMS and documented in two reports that are provided in **Appendix B and C.** The information in these reports was used for this EIS, therefore these reports should be reviewed as part of this EIS.

3.2 Background Review

For this EIS a background review of the following documents was undertaken:

- Environmental Impact Study, Northlands Estates Subdivision, City of Port Colborne (GEMS 2014);
- Constraints Summary Report, Northlands Development (GEMS 2020);
- City of Port Colborne Official Plan (2013, updated 2017);
- Section 7-Environment of the Official Plan for the Niagara Planning Area (Consolidated Official Plan for August 2015);
- Schedule C Regional Municipality of Niagara Core Natural Heritage (Consolidated Official Plan for August 2015);
- NPCA Policy Document: Policies for the Administration of Ontario Regulation 155/06 and the *Planning Act*. NPCA 2018;
- MNDMNRF Natural Heritage Information Centre, 2022; and
- Niagara Region Environmental Impact Study Guidelines, Version 2, January 2018.

3.3 Beacon Field Surveys 2021-2022

For the 2014 and 2020 GEMS reports detailed field surveys that were conducted to document the subject lands fauna and vegetation communities and this field survey effort was not repeated for this EIS.

In 2021 Beacon terrestrial ecologists conducted three days of field investigations of the subject lands; August 9, September 7, and December 1, 2021. These surveys were undertaken to conduct an in the field review and verification of the information presented in the GEMS reports. During the August and September surveys a floral inventory was undertaken, and vegetation communities were mapped and assessed following the protocols of the Ecological Land Classification (ELC) System for Southern Ontario (Lee et al. 1998).

In 2022 Beacon terrestrial ecologists conducted a leaf-off bat habitat survey on March 28 and a breeding bird survey and floral inventory on June 2.

3.3.1 Feature Staking

For the December 1, 2021 survey the dripline boundary of a FOD 9-2 Maple-Oak- Hickory Deciduous Forest was delineated by Beacon and surveyed by UCC. In addition, during this survey four GEMS 2019 wetland boundary stakes were surveyed to confirm location.

3.3.2 2022 Leaf-Off Bat Roost/Maternity Habitat Assessment

As noted, the detailed field assessment was undertaken by GEMS in 2014 and 2020 to document fauna, however, an assessment of potential bat roosting and maternity habitat had not been undertaken. To address this information gap, on March 28, 2022, Beacon conducted a leaf off survey of the subject lands. This survey was undertaken following Phase II Identification of Suitable Maternity Roost Trees of the MNRF Guelph District most current bat habitat survey protocol for Species at Risk Bats within Treed Habitats (MNRF 2017). Two survey methods were employed, transect searches were undertaken for most of the small Cultural Woodlands (**Photograph 1**) to identify and assess individual snag trees, and plot counts were undertaken in a number of locations (**Photograph 2**). The location of plot count surveys is provided in **Appendix D.** All trees with a dbh of 10 cm or greater were assessed with respect to presenting potential roosting/maternity habitat. All snag or cavity trees observed were provided a unique code and the following parameters were documented:

- Species;
- Location;
- Approximate tree height;
- Diameter beast height (DBH);
- Number of cavities;
- Characteristics of cavity;
- Approximately height of cavities; and
- Tree condition.

Photograph 1. Cultural Woodland where Transect Searches for Bat Snag Trees Were Undertaken

Photograph 2. Plot Survey for Snag Trees in the FOD9-2 Maple-Oak-Hickory Deciduous Forest

3.3.3 Assigned Beacon Staff

Project Manager Mr. Ron Huizer, B.Sc.
Principal, Senior Ecologist/EA Specialist
Mr. Ron Huizer conducted all field investigations and is the author of this EIS report. Mr. Huizer is a Senior Ecologist/EA Specialist with over 25 years' experience undertaking field assessment of terrestrial and aquatic environments. His experience includes undertaking detailed bio-inventories of flora and fauna and environmental impact assessments as both project manager and as part of a multi-disciplinary team. He is a recognized wetlands expert in Ontario and has been a technical advisor to the MNRF WETT Committee and been retained by the Ministry of Municipal Affairs and Housing on a number of occasions as an expert witness for wetland-development issues before the Ontario Municipal Board. Ron has completed numerous Environment Impact Studies (EIS) that address protection of Natural Heritage in support of plan of subdivision developments throughout south Ontario. He has completed Class EAs for a variety of projects following several EA processes, including: the *Canadian Environmental Assessment Act* (CEAA), both screenings and comprehensive studies; Municipal Class EA for Water and Road Projects; and Ministry of Transportation's Provincial Highways Class EAs for Provincial Transportation Facilities.

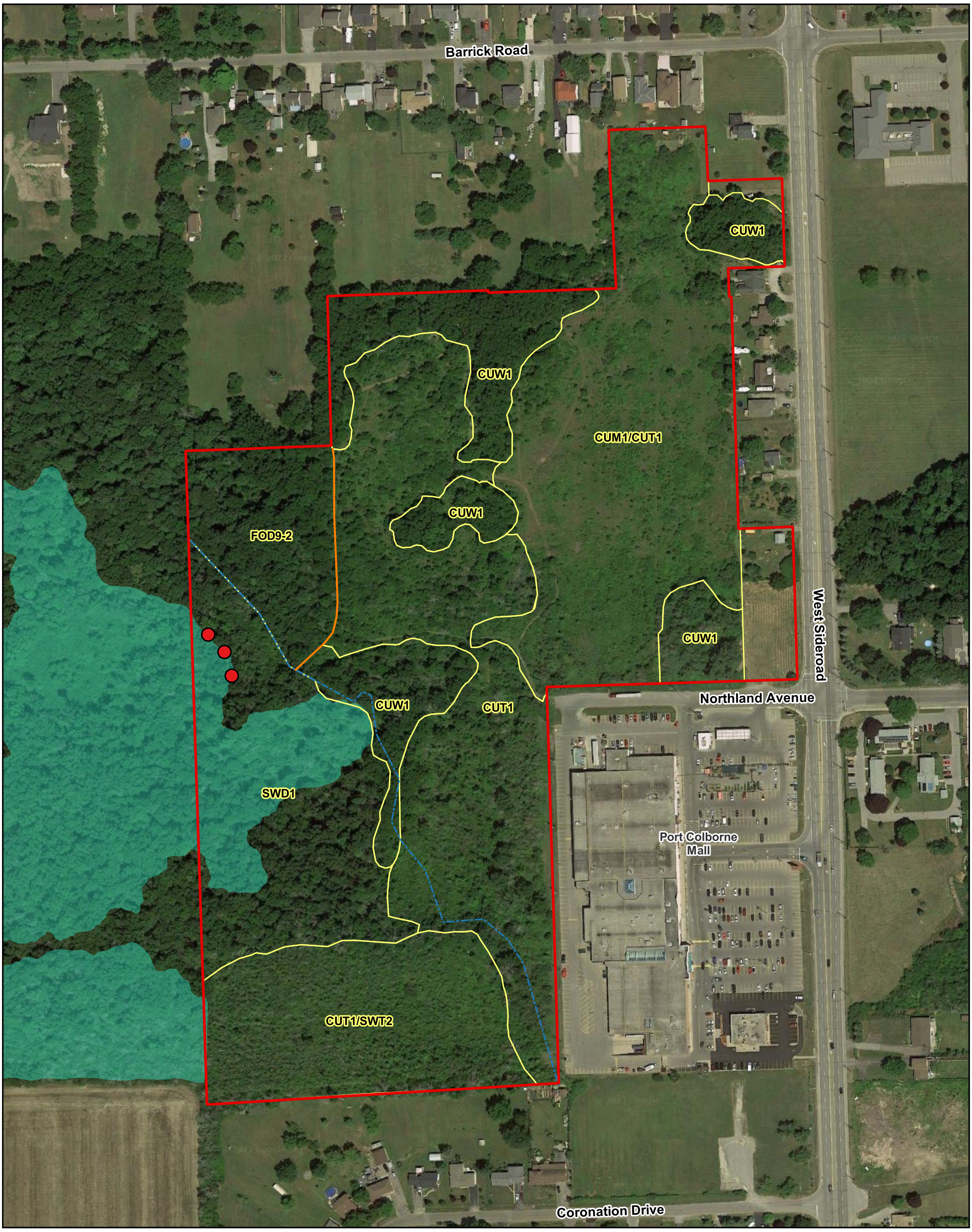
Grace Bolton BSc. Ecologist.
Grace is a terrestrial ecologist with three years of experience in the environmental field. She has participated in a variety of environmental studies in both terrestrial and aquatic ecosystems including bat habitat assessments, herpetofaunal surveying, water quality monitoring and environmental impact assessments. Her areas of expertise include, terrestrial species at risk surveys, tree assessments and GIS mapping. Grace regularly compiles background research, conducts data analyses, contributes to report writing.

4. Description and Assessment of Existing Environment

The following subsections provide a summary of the findings of the various ecological investigations and assessments of the natural heritage features and functions within the boundaries of the subject lands based on field surveys conducted by Beacon in 2021 and 2022 and documented in GEMS reports provided in **Appendix B and C. Figure 2** presents the features that are detailed in the following sections of the report.

4.1 Aquatic Resources and Fish Habitat

The only watercourse associated with the subject lands is a shallow ditch that runs along the southern boundary of the subject lands which support ephemeral flows. No permanent watercourses or water bodies that could directly support fish habitat is associated the subject lands or immediate adjacent lands. The Eagle Marsh Drain, located approximately 500m to the south has been identified by the Ministry of Natural Resources watercourse evaluation as a Type 2 Important fish habitat.



Legend

- Subject Property
- Locally Significant Onondaga Escarpment Wetland Complex Wetland (GEMS Boundary Survey August 7, 2019)
- FOD 9-2 Forest Surveyed Edge Dripline 2021
- MNRF 2009 Approved Boundary of the Onondaga Escarpment Wetland Complex
- Ecological Communities
- S3 Black Gum Trees

Code	Wetland Communities
SWD1	Oak Mineral Deciduous Swamp
	Forest Communities
FOD9-2	Fresh - Moist Oak - Maple Deciduous Forest
Code	**Cultural Communities**
CUW1	Mineral Cultural Woodland
CUT1/SWT2	Cultural Thicket/Shrub Thicket Swamp Complex
CUT1	Mineral Cultural Thicket
CUM1/CUT1	Cultural Meadow/Cultural Thicket Complex

Existing Conditions | **Figure 2**

Northlands Estates, City of Port Colborne

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Project: 221368
Last Revised: June 2022

Client: 2600261 Ontario Inc.

Prepared by: BD
Checked by: RH

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4.2 Vegetation Communities

Based on 1934 aerial photography (see the Figure 2 the GEMS report in **Appendix B**) historically the majority of the subject lands had been cleared and farmed. Therefore, current vegetation associated with the subject lands represents cultural communities at various stages of re-vegetation.

The vegetation communities were mapped and assessed by Beacon based on field surveys conducted in the summer and early fall of 2021 and are detailed below and presented on **Figure 2**. The existing vegetation communities document by Beacon are similar to those documented in the GEMS reports.

4.2.1 Natural Communities

Fresh-Moist Maple-Oak-Hickory Deciduous Forest (FOD9-2)

A small area of natural woodland is found in the northwest corner of the subject lands (**Photographs 3 & 4**). This forested area can be seen in the 1934 aerial photography noted above. The forest canopy is dominated by Sugar Maple (*Acer saccharum*) and mature Red Oak (*Quercus rubra*), with a subcomponent of Shagbark Hickory (*Carya ovata*). Other mature trees of the canopy include Bur Oak (*Quercus macrocarpa*), Black Cherry (*Prunus serotina*), Red Maple (*Acer rubrum*) and Green Ash (*Fraxinus pennsylvanica*).

Photograph 3. FOD9-2 Maple-Oak-Hickory Deciduous Forest

Photograph 4. FOD9-2 Maple-Oak-Hickory Deciduous Forest

Oak Mineral Deciduous Swamp (SWD1)

This forest swamp can also be seen to be present in the 1934 aerial photography. The canopy is dominated by mature White Swamp Oak (*Quercus bicolor*) and Red Maple, with a subcomponent of Green Ash and Shagbark Hickory. Ground cover is patchy supporting wetland shrubs, sedges, grasses and forbes. Standing water ponds within this community support Buttonbush Thicket Swamp (SWT2-4) (**Photograph 5**).

Photograph 5. Pocket of Buttonbush Thicket Swamp in Swamp Forest SWD1

This treed swamp community was mapped by the MNDMNRF in 2009 as part of a wetland unit of the Non-Provincially Significant Onondaga Escarpment Wetland Complex. Field survey conducted by Beacon found a clear swamp forest wetland – upland forest boundary that was used by the MNDMNRF to delineate the wetland unit (**Photographs 6 & 7**).

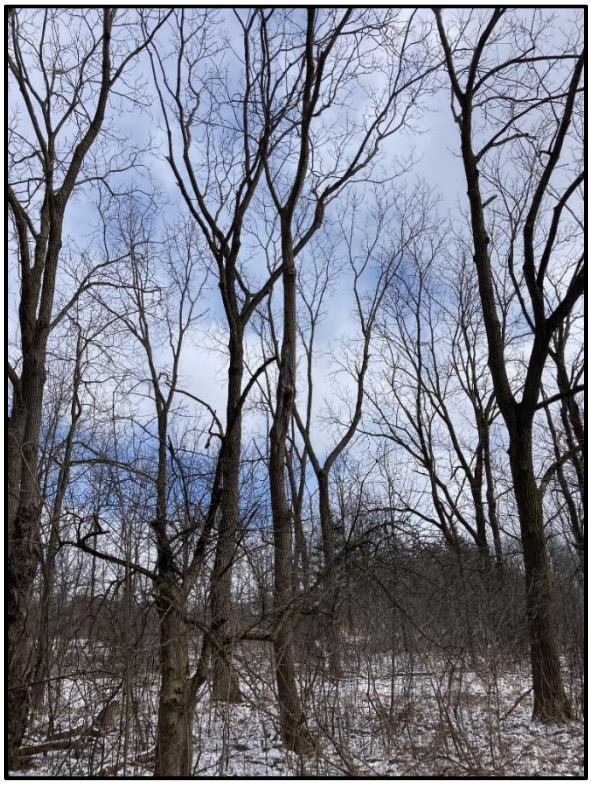
Photograph 6. MNDMNRF Upland (left)- Wetland (right) Boundary of the Swamp Forest SWD1

Photograph 7. MNDMNRF Upland (right)- Wetland (left) Boundary of the Swamp Forest SWD1

4.2.2 Cultural Communities

Mineral Cultural Woodland (CUW1)

Five small pockets or narrow bands of cultural woodland, with a combined area of 2.4 ha, are found throughout the subject lands. These areas support an open tree canopy and an understory of dense shrub cover (**Photographs 8 & 9)**. Black Walnut (*Juglans nigra*) is a dominate tree species, and these trees may have been planted. Other tree species include a scattered mix of White Elm (*Ulmus americana*), Green Ash, Red Maple, Shagbark Hickory, and Bur Oak. Shrubs include a mix of Common Buckthorn (*Rhamnus cathartica*), Prickly-ash (*Zanthoxylum americanum),* Staghorn Sumac (*Rhus typhina*) and Raspberry (*Rubus spp*). Ground cover is represented by common field weeds and grasses.



Photograph 8. Cultural Woodland (CUW1) – December 2021

Photograph 9. Cultural Woodland (CUW1) – June 2022

Mineral Cultural Thicket (CUT1)

A 3.5 ha band of cultural thicket extends north to south across the central portion of the subject lands (**Photographs 10 & 11**). The community supports a dense thicket of a variety of shrubs, including Common Buckthorn (Rhamnus cathartica), Staghorn Sumac (Rhus typhina), Prickly-ash (*Zanthoxylum americanum*), Gray Dogwood (*Cornus foemina*), Black raspberry (Rubus occidentalis), Pin Cherry (Prunus pennsylvanica) and vines of Wild Grape (*Vitis riparia*) and Virginia Creeper (Parthenocissus quinquefolia). Young trees of Black walnut (Juglans nigra), White elm (*Ulmus americana*), White Ash (*Fraxinus americana*), Hawthorn (*Crataegus ssp*) and Common Pear (*Pyrus communis*) and Apple (*Malus pumila*) are found scattered through the community. The ground cover supports field grasses and weeds.

Photograph 10. Cultural Thicket (CUT1) – June 2022

Photograph 11. Cultural Thicket (CUT1) – June 2022

Mineral Cultural Meadow/Cultural Thicket (CUMT1/CUT1)

A large area of the subject lands along West Side Road north of the Port Colborne Mall supports a community that is a mosaic of pockets of cultural thicket, where low shrubs dominated, and areas of cultural meadow, where common field weeds and grasses dominate (**Photographs 12 & 13**).

Photograph 12. Cultural Meadow/Cultural Thicket Community – June 2022

Photograph 13. Cultural Meadow/Cultural Thicket Community – June 2022

Mineral Cultural Thicket - Thicket Swamp (CUT1/SWT2)

This 2.6 ha community is located along the southern boundary of the subject lands in an area that was historically cleared and farmed (see 1934 aerial photograph in the GEMS report noted above). The community supports a mix of shrub species (**Photographs 14 &15)**, but is dominated by Common Buckthorn, Prickly Ash, Gray Dogwood (*Cornus foemina*), Rambler Rose (*Rosa multiflora*), Hawthorn (*Crataegus ssp*) and young Common Pear and Common Apple trees. Pockets within the community support a higher density of wetland shrubs, i.e., Red-osier Dogwood (*Cornus stolonifera*), Spireia (*Spiraea* alba). However, overall, the plant community is represented by species that have an affinity for upland conditions. This area was not evaluated to be wetland by the MNDMNRF in 2009 as part of the Non-Provincially Significant Onondaga Escarpment Wetland Complex.

Photograph 14. Buckthorn Cultural Thicket (CUT1)/Thicket Swamp (SWT2)

Photograph 15. Buckthorn Cultural Thicket (CUT1)/Thicket Swamp (SWT2)

4.2.3 Rare Vegetation Communities

The NHIC identifies rare vegetation communities for Ontario (NHIC 2022), with S-ranks of S1, S2, and S3. Only one vegetation community considered to be rare for the province was found to occur within the subject lands, Buttonbush Thicket Swamp (SWT2-4) which has a rank of S-3. As detailed in Section 3.2.2 above, small pockets of this community occur in the MNDMNRF evaluated swamp forest.

4.2.4 GEMS 2019 Wetland Boundary Revision

The GEMS 2020 report (**Appendix C**) notes that the wetland boundary of the MNDMNRF 2009 evaluated wetland unit of the Non-Provincially Significant Onondaga Escarpment Wetland Complex along the western limit of the subject lands was revised by GEMS. The revised boundary was staked by GEMS on August 7, 2019, in collaboration with NPCA and Region staff.

Beacon has conducted an in the field assessment of the revised boundary, stakes are still present, and cannot support the proposed new wetland boundary. As noted in Section 4.2.1 and **Photographs 6 and 7** above the MNDMNRF 2009 evaluated boundary is distinct with respect to a boundary between upland and wetland trees. For the proposed revised wetland boundary field investigations conducted by Beacon found no distinct change in wetland vegetation (trees, shrubs, forbs) that would support the location of the new wetland boundary. The 2020 GEMS report does not provide rational for what vegetation was used to support the location of the new wetland boundary, and there is no letter that Beacon is aware of that was provided to the MNDMNRF to review and approve the new wetland boundary. This MNDMNRF review and approval is required, and a change to a wetland boundary is to be provided by the MNDMNRF to the Niagara Region as an update to the boundary of an MNDMNRF evaluated wetland. The GEMS boundary change is currently not found in the MNDMNRF Land Information Ontario (LIO) Database.

Based on Beacon's field survey and absence of MNDMNRF change to the wetland boundary, the revised wetland boundary as detailed on Figure 2 in the 2020 GEMS report (**Appendix C**) is not supported.

4.2.5 GEMS 2019 Proposed Woodland Boundary

A proposed woodland boundary within the subject lands was staked by GEMS on June 10, 2019, and confirmed by NPCA and Region staff during the wetland staking activity on August 7, 2019. The boundary of the woodland as proposed by GEMS is detailed on Figure 2 in the GEMS 2020 report (**Appendix C**).

Beacon has conducted an ELC assessment of the vegetation communities within the subject lands which is detailed in Section 4.2.1 and presented in **Figure 2** of this report. Based on Beacon's ELC mapping, lands within the GEMS proposed woodland boundary includes large areas of cultural thicket CUT1. The location of the boundaries of the CUT1 and CUW1 communities as mapped by Beacon is supported by the tree survey that was completed for the GEMS 2020 report and presented in Figure 2 of that report (**Appendix C**). Therefore, Beacon does not support the proposed woodland boundary within the subject lands as detailed on Figure 2 in the 2020 GEMS report.

Beacon has surveyed the dripline edge of the naturally occurring FOD9-2 forest as shown on **Figure 2**, see **Photograph 16** below. The trees along the surveyed edge represent a narrow band of Black Walnut

trees common to the of cultural thicket community that lies adjacent to the FOD9-2 forest. As can be seen in **Photograph 16** an ATV trail defines the dripline.

Photograph 16. Edge of Black Walnut trees Adjacent to the Natural FOD 9-2 forest (right) and Cultural Thicket (left)

4.3 Fauna and Flora

4.3.1 Fauna

Detailed survey of fauna undertaken by GEMS in 2012 and 2020. GEMS recorded Twenty-one (21) species of birds. In June of 2022, Beacon conducted a breeding bird survey and documented an additional twenty-three (23) species for a total of forty-four (44) species, which are presented in Table 1 in **Appendix E**. The majority represent species that are common to the urban/rural areas of the City and Niagara Region.

Detailed amphibian surveys conducted by GEMS documented six species of frogs and toads that are common to the Niagara Region (Yagi et al 2009). Cover board surveys (GEMS 2014) identified the presence of Blue-spotted Salamander (*Ambystoma laterale*). Amphibian breeding ponds are located in the swamp forest (SWD1) as can be seen in **Photographs 5 through 7** above.The cover board survey found two species to occur, the Garter Snake (*Thamnophis sirtalis*) and Milksnake (*Lampropeltis triangulum*). No species of turtle were observed.

4.3.2 Flora

Field studies undertaken by GEMS did not include an inventory of vascular plants. To address this information gap, Beacon undertook the inventory of vascular plants in August and September of 2021 and June 2022.

A total of 193 species were recorded. A species list is provided in **Appendix E.** Except for one species, the species are common to Ontario, with an S-rank of S5 and S4, and the Niagara Region (Oldham 2010). One tree species, Black Gum (*Nyssa sylvatica*), is considered to be rare in province with an S-rank of S3 (Vulnerable). Typical for the species, Black Gum, a trees wase found along the MNDMNRF 2009 evaluated forest swamp boundary where standing water was present along the boundary of the FOD9-2 upland forest (**Photographs 6 & 7**).

Of the species present, fifty-eight (58) are non-native species, representing 30% of the plant community. In Niagara Region vegetation communities typically support a floristic composition that is 65% native species and 35% non-native/introduced species (Oldham et al 1995). For the subject lands the higher occurrence of native species can be attributed the presence of the natural FOD9-2 forest and swamp forest, with most of the non-native species occurring in the cultural woodlands, thickets and meadows.

4.4 Species at Risk

The GEMS 2014 and 2020 reports provide a detailed assessment of the Species at Risk that could potential occur within and adjacent to the subject lands. GEMS completed specific field surveys to determine the occurrence of SAR.

Only one species was documented to occur, the Common Nighthawk (*Chordeiles minor*) which is listed as Special Concern. Common Nighthawk generally prefer open, vegetation free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and riverbanks (COSEWIC 2007). These habitat types do not occur within the subject lands. Within urban environments nesting habitat is often large flat rooftops, often with gravel cover. The GEMS 2014 EIS notes that Common Nighthawk were observed flying over the Canadian Tire building in the Port Colborne Mall. It can be expected that the large flat rooftops of the buildings associated with the adjacent Port Colborne Mall is a nesting site for the Common Nighthawk.

The breeding bird survey conducted by Beacon in June 2022 documented two additional Species at Risk, the Eastern Wood-Pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*). Both species are listed as Special Concern. These species inhabit mature forest habitats, and both species were recorded to occur in the FOD9-2 Maple-Oak-Hickory forest and Swamp Forest.

4.4.1 Endangered Bats

Based on snag survey results (**Appendix D**) an acoustic monitoring program was identified as required. The program is to occur in June 2022 with eight monitors deployed, within the Cultural Woodland and FOD9-2 maple-oak-hickory woodlands. The findings of the monitoring with respect to endangered bats will be provide as an addendum to this EIS report when completed.

4.5 Provincially Significant Wetlands or ANSIs

No ANSI's at the provincially or regional level are identified by the MNDMNRF to occur within or directly adjacent to the subject lands.

No PSW's are identified by the MNDMNRF to occur within or adjacent to the subject lands.

4.6 Significant Wildlife Habitat (SWH)

Under the PPS the identification of Significant Wildlife Habitat (SWH) is the responsibility of Regional and Local planning authorities. Schedule C of the Niagara Region Official Plan does not specifically identify areas that are considered to represent SWH. In addition, Section 7 Environment of the Niagara Region Official Plan does not provided criteria for the identification of SWH. Similarly, the City's Official Plan does not identify or provide criteria for SWH.

The MNDMNRF has identified generic categories and criteria that **could potentially** be used by a planning authority to identify SWH within a large area of southern Ontario which includes southwestern Ontario and the Niagara Region (MNRF 2015). **Table 1** presents an assessment of potential SWH for the subject lands based on the MNDMNRF Ecoregion E7 categories and criteria.

Based on the assessment most specialized wildlife habitats and functions are absent. However, the FOD9-2 forest and SWD1 swamp forest along the western boundary of the subject lands can be considered to support a number of SWH habitats.

Table 1. Assessment of Potential Significant Wildlife Habitat for the Subject Lands

Wildlife Habitat Category	Presence or Absence on Subject Lands Based on MNRF Criteria for Ecoregion 7E	
	Absent	Present
Seasonal Concentration Areas for Wildlife Species		
Waterfowl Stopover and Staging Areas (Terrestrial)	X	
Waterfowl Stopover and Staging Areas (Aquatic)	X	
Shorebird Migratory Stopover Area	X	
Raptor Wintering Area	X	
Bat Hibernacula	X	
Bat Maternity Colonies		Potential in FOD9-2 forest and SWD1 swamp forest within and adjacent to the west boundary of the subject lands
Bat Migratory Stopover Area		Potential in FOD9-2 forest and SWD1 swamp forest within and adjacent to the west boundary of the subject lands
Turtle Wintering Areas	X	
Reptile Hibernaculum	X	

Wildlife Habitat Category	Presence or Absence on Subject Lands Based on MNRF Criteria for Ecoregion 7E	
	Absent	Present
Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)	X	
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs)	X	
Colonially-Nesting Bird Breeding Habitat (Ground)	X	
Migratory Butterfly Stopover Areas	X	
Land bird Migratory Stopover Areas	X	
Deer Yarding Areas	X	
Deer Winter Congregation Areas	X	Potential in FOD9-2 forest and SWD1 swamp forest within and adjacent to the west boundary of the subject lands
Rare Vegetation Communities		
Cliffs and Talus Slopes	X	
Sand Barren	X	
Sand Barren	X	
Alvar	X	
Old Growth Forest	X	
Tallgrass Prairie	X	
Savannah	X	
Provincially Rare S1, S2 and S3 vegetation communities		Buttonbush Thicket Swamp (SWT2-4) which has a rank of S-3 occurs in the MNDMNRF evaluated swamp forest.
Regionally or Locally Rare vegetation communities	X	
Specialized Habitats of Wildlife considered SWH		
Waterfowl Nesting Area	X	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	X	
Woodland Raptor Nesting Habitat		Potential in FOD9-2 forest and SWD1 swamp forest within and adjacent to the west boundary of the subject lands
Turtle Nesting Areas	X	
Seeps and Springs	X	
Amphibian Breeding Habitat (Woodland)		Present in small ephemeral ponds in the SWD1 forest swamp along the west boundary of the subject lands
Amphibian Breeding Habitat (Wetlands).	X	
Woodland Area-Sensitive Bird Breeding Habitat		Yes in FOD9-2 forest and SWD1 swamp forest within and adjacent to the west boundary of the subject lands

Wildlife Habitat Category	Presence or Absence on Subject Lands Based on MNRF Criteria for Ecoregion 7E	
	Absent	Present
Habitats of Species of Conservation Concern considered SWH		
Marsh Bird Breeding Habitat	X	
Open Country Bird Breeding Habitat > 30 ha in size	X	
Shrub/Early Successional Bird Breeding Habitat > 10 ha in size	X	
Terrestrial Crayfish	X	
Special Concern and Rare Wildlife Species		Wood Thrush and Eastern Wood Pewee in the FOD9-2 forest and SWD1 swamp forest within and adjacent to the west boundary of the subject lands
Animal Movement Corridors		
Amphibian Movement Corridors	X	
Bird and Mammal Movement Corridor	X	

4.7 Significant Woodland

Section 7.B.1.5 of the Niagara Region Official Plan provides criteria for the identification Environmental Conservation Area – Significant Woodlands as follows:

- Contain threatened or endangered species or species of concern;
- In size, be equal to or greater than:
    - 2 hectares, if located within or overlapping Urban Area Boundaries;
    - 4 hectares, if located outside Urban Areas and north of the Niagara Escarpment; and
    - 10 hectares, if located outside Urban Areas and south of the Escarpment;
- Contain interior woodland habitat at least 100 m in from the woodland boundaries;
- Contain older growth forest and be 2 ha or greater in area;
- Overlap or contain one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4; or
- Abut or be crossed by a watercourse or water body and be 2 or more hectares in area.

The cultural woodlands within the subject lands are small (<1ha), narrow and/or fragmented and do not represent significant woodlands. The FOD9-2 forest and SWD1 swamp forest within and adjacent to the west boundary of the subject lands do meet the criteria to be considered Significant Woodland within the City or Region's natural heritage system.

4.8 Significant Valleylands

Generally, Significant Valleylands are defined as distinctive landforms that have a degree of naturalness, importance of ecological functions, potential for restoration, or historical and cultural values. The subject lands are flat and no defined relief slope that is 3 m or greater in height occurs. Therefore, as defined by the NPCA no valleyland is present.

4.9 City and Niagara Region EPA and ECA

4.9.1 EPA

Schedule C – Core Natural Heritage of the Niagara Region Official Plan, and Schedule B of the City Official Plan do not identify EPA to occur within or directly adjacent to the subject lands. Detailed assessment of the subject lands did not identify a feature that would meet any of the criteria to be identified as EPA.

4.9.2 ECA

Schedule C – Core Natural Heritage of the Niagara Region Official Plan and Schedule B2 identify ECA to occur within, and adjacent to, the western boundary of the subject lands. The ECA represents Locally Significant Wetland, a wetland unit of the MNDMNRF evaluated Non-Provincially Significant Onondaga Escarpment Wetland Complex, and the surrounding Significant Woodlands. This EIS has also determined that these Significant Woodlands areas also support Significant Wildlife Habitat.

5. Assessment of Natural Heritage Constraints to Development

Based the assessment of the natural heritage features and functions undertaken by this EIS and the natural heritage development policies of the Niagara Region, City of Port Colborne, and the NPCA, the following constraints to development are identified (see **Figure 2**).

EPA High Constraint – no development within the feature:

- No area of high constraint is associated the subject lands or the immediate adjacent lands.

Moderate Constraint – development/alteration can be considered provided no significant negative impact to the feature will occur, and/or the impact can be mitigated:

- MNDMNRF evaluated wetland unit of the Non-Provincially Significant Onondaga Escarpment Wetland Complex;
- ECA within and adjacent to the subject lands - the forest communities FOD9-2 and SWD1 meet the test of Significant Woodlands and Significant Wildlife Habitat; and
- Adjacent Lands (50m) to the ECA feature.

Low Constraint - development/alteration can be considered with mitigation:

- CUT1/SWT2 Community.

No Constraint – full development with no or limited construction mitigation:

- Cultural Woodlands (CUW1);
- Cultural Thicket (CUT1); and

- Cultural Meadow/Thicket (CUM1/CUT1).

The development policies of the Region and City detail that development is permitted in an area identified as ECA and their 50 m adjacent land if it has been demonstrated by an EIS that over the long term there will be no significant negative impact on the ECA. Therefore, the MNDMNRF evaluated Non-Provincially wetland, the Significant the forest communities FOD9-2 and SWD1 that support Significant Woodlands and Significant Wildlife Habitat are identified as a moderate constraint to development as well as the 50 m adjacent lands.

The CUT1/SWT2 community in the southern portion of the property ***is not*** evaluated as part of the Non-Provincially Significant Onondaga Escarpment Wetland Complex. Though it is Beacon's opinion that this community as a whole supports greater than 50% upland vegetation, and therefore is not wetland as defined by the Ontario Wetland Evaluation System (OWES), for this EIS the area will be regarded as a low-quality wetland area and regulated by the NPCA. Policy 8.2.2.8 identifies that NPCA will consider compensation for the alteration/removal of non-provincially significant wetlands. Therefore, this community is considered to represent a low constraint to development.

The cultural thicket and cultural woodland communities (CUT1, CUW1) do not support significant natural heritage features or functions and are common community types in the Port Colborne and Niagara area, and therefore no development constraint with limited construction mitigation is identified for these communities.

6. Proposed Development

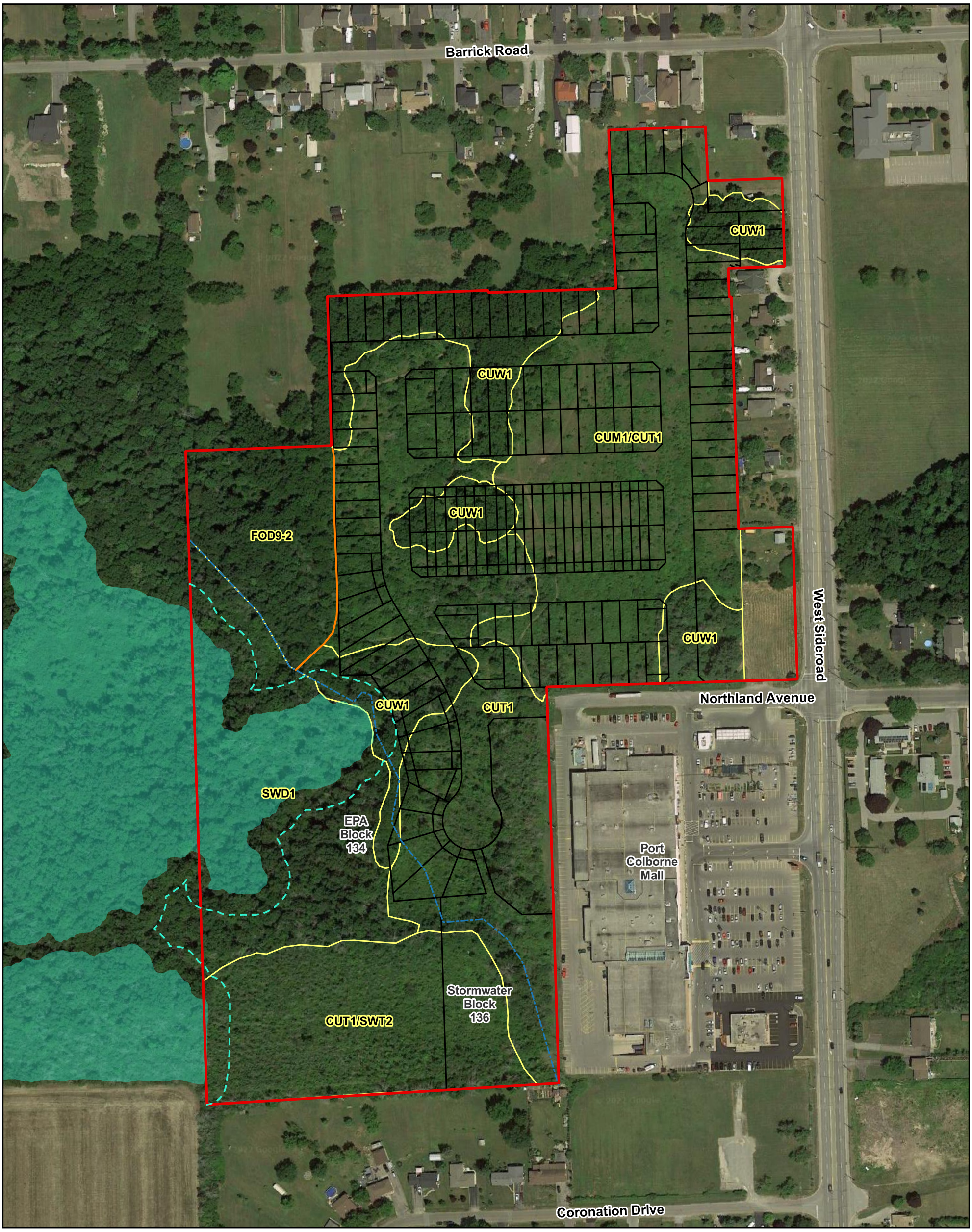
6.1 Proposed Plan of Subdivision

The general elements of the proposed development plan are presented on **Figure 3. Appendix A** presents the plan in more detail. The plan was developed based on the natural heritage constrains assessment detailed in Section 4 above. The plan will include a street network along which a mix of land uses will be developed, including, single family residential (Lots 1-122), street town residential (Blocks 123-132), and mixed residential and commercial (Block 133). The subdivision will be accessed via two intersections with Northland Avenue.

Block 134 along west side of the subject lands is identified as a 5.7 ha Environmental Protection Area (EPA), representing 34% of the subject lands total area. The EPA includes the MNDMNRF evaluated non-provincially significant wetland, the ECA significant woodland/wildlife habitat and 1.7 ha of the CUT1/SWT2 community along the southern boundary of the subject lands. The rear of single- family residential lots 52 through 74 will abut the eastern boundary of the EPA block. The east boundary of the subject lands that lie adjacent to the existing Port Colborne Mall will support a Park (Block 135 - 0.5ha) and a 0.96 ha Stromwater Management Area within Block 136.

6.2 Site Servicing

Details of the site servicing are provided in a Functional Servicing Report and Stormwater Management Plan Report prepared by UCC (UCC 2022a,b). The following provides a brief summary.



Legend

- Subject Property
- Ecological Communities
- Locally Significant Onondaga Escarpment Wetland Complex Wetland (GEMS Boundary Survey August 7, 2019)
- FOD 9-2 Forest Surveyed Edge Dripline 2021
- Proposed Development
- MNRF 2009 Approved Boundary of the Onondaga Escarpment Wetland Complex
- Evaluated Wetlands + 15 m

Code	Wetland Communities
SWD1	Oak Mineral Deciduous Swamp
	Forest Communities
FOD9-2	Fresh - Moist Oak - Maple Deciduous Forest
	Cultural Communities
CUW1	Mineral Cultural Woodland
CUT1/SWT2	Cultural Thicket/Shrub Thicket Swamp Complex
CUT1	Mineral Cultural Thicket
CUM1/CUT1	Cultural Meadow/Cultural Thicket Complex

Proposed Development | **Figure 3**

Northlands Estates, City of Port Colborne

BEACON ENVIRONMENTAL

Project: 221368
Last Revised: July 2022

Client: 2600261 Ontario Inc.

Prepared by: BD
Checked by: RH

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Water and sanitary servicing will be located within the street network and connect to the existing services along Northland Avenue and West Side Road.

For stormwater management, grading of the rear of lots 55 through 77 will direct surface water flows to the west to the EPA lands. Most of the stormwater will be collected by a curb and gutter system in the street network and directed southward to a stormater pond to be located in Block 136. The pond will outfall to a proposed channel that will begin at the south-east corner of subject lands the site, providing an outlet for stormwater flows discharging from the adjacent commercial property (287 West Side Road) and surrounding residential lands. The channel will continue west within the existing natural gas easement to the south-west corner of the development and then turn south ultimately outletting to the Eagle Marsh Drain approximately 500m to the south. The Eagle Marsh Drain has been identified by the Ministry of Natural Resources watercourse evaluation as a Type 2 Important fish habitat. Based on this fish habitat criteria the corresponding MECP level of protection for stormwater management quality practices shall be Normal Protection (70% TSS removal).

7. Environmental Impact Assessment and Mitigation

The following sections detail the potential impacts of the proposed development to the natural heritage features and function associated with the subject lands. Mitigation measures are identified that will reduce the potential impacts.

7.1 Assessment of Direct Impacts and Mitigation

The following details an assessment of direct impacts the proposed plan of subdivision will have on natural heritage features that have been identified for the subject lands and proposed mitigation measures.

7.1.1 Removal of Cultural Meadow and Thicket Vegetation Communities

7.1.1.1 Impact

The proposed development plan will result in the removal of 5 ha of cultural meadow and thicket (CUM1/CUT1). This EIS has determined that these communities do not represent EPA or ECA as defined by the Region or City and that they are of low function supporting common species of flora and fauna. Therefore the removal of these communities will not result in a significant negative impact.

7.1.1.2 Mitigation

No specific mitigation measures are identified as required for the removal of these areas.

7.1.2 Removal of Cultural Woodland Communities

7.1.2.1 Impact

The proposed development plan will result in the removal of four small areas of cultural woodland (CUW1), representing a total area of 2.4. ha. Three of the four areas are small/narrow disjoined pockets and this EIS has determined that these communities do not represent EPA or ECA as defined by the Region or City and that they are of low function supporting common species of flora and fauna. Therefore, the removal of these communities will not result in a significant negative impact.

One area of cultural woodland, 0.61 ha in size, will be removed by the development that is contiguous with the FOD9-2 and SWD1 forests which have been identified as ECA supporting significant woodland and wildlife habitat. Though part of a contiguous forest, the cultural woodland is of lower quality and function. The ECA forest lands within the subject lands are part of a 60 ha forest block that extends 1 km to the west of the subject lands. The removal of the 0.61 ha of cultural woodland represents only 1.0% of the entire ECA forest block. The Niagara Region defines significant impact to ECA in regard to a change in the spatial extent as an increase or decrease of over 20% in the area. Given the low function of the cultural woodland and the small area to be removed, no significant impact to the significant woodland/wildlife habitat ECA will occur.

7.1.2.2 Mitigation

This EIS has determined that three disjoined cultural woodland pockets do not represent EPA or ECA as defined by the Region or City and that they are of low function supporting common species of flora and fauna, therefore no specific mitigation measures are identified as required for the removal of these areas.

For the removal of the small area (0.61 ha) of cultural woodland that is contiguous with ECA woodlands, as a general requirement a tree preservation plan is to be developed and mitigation for the loss of some of the cultural woodlands can be achieved by the planting of native trees in the retained EPA block. In, addition along the new woodland edge as a result of the removal of the cultural woodland, an edge management plan will be required (see section 7.2.2.2).

7.1.3 Removal of the CUT1/SWD2 Community

7.1.3.1 Impact

A storm water management block will be located within the eastern portion of this community resulting in the removal of 0.96 ha. No significant features or functions have been identified for the areas that will be removed, therefore the removal of this small area of wetland will not result in a significant negative impact.

7.1.3.2 Mitigation

To mitigate the removal of 0.96 ha of this community, wetland enhancement measures will be undertaken in the retained 1.64 ha CUT1/SWD2 community within the EPA Block to the west of the storm pond block. There is also enhancement opportunities within the SWD1 wetland community to the

north. Enhancements measures that will be detailed in an enhancement plan will include the following elements:

- Creation of deep-water marsh wetlands;
- Creation of amphibian breed ponds;
- Erection of waterfowl and bat nest boxes;
- Removal of non-native trees and shrubs;
- Planting of native tree species; and
- A public recreational trail system, including natural history interpretation stations.

Details for these proposed enhance measures will be determined in consultation with the Region and NPCA and a plan will be prepared that will require approval by the Region and NPCA environmental staff prior to implementation. The NPCA permit requirement and their review and approval of the proposed wetland enhancement plan is to be identified as a condition on Draft Plan approval.

7.1.4 ECA – Locally Significant Onondaga Escarpment Wetland Complex

7.1.4.1 Impact

The swamp forest (SWD1) wetland unit as mapped by the the MNDMNRF in 2009 will be entirely located within the EPA Block. Therefore, no direct loss of wetland area will occur.

7.1.4.2 Mitigation

The plan identifies a minimum 15 m (rear of lots 68,69, and 70) or greater buffer to the wetland boundary. These buffer lands are densely vegetated and will provide adjacent lands functions and will be an effect physical barrier to indirect impacts to the wetland.

7.1.5 Impacts on Wetland Water Balance

A water balance study to assess potential post development impacts to wetland areas with and adjacent to the subject lands was undertaken by Terra-Dynamics Consulting Inc. (Terra-Dynamics 2022). This report is provided under a separate cover. In summary, the study concludes that, post development, that preconstruction water balance condition that supports these wetland areas will not be significantly altered and that no negative impact to the wetland areas will occur. The report identifies that the following mitigation measures are to be implemented:

- Implement rear yard lot drainage towards the wetland/EPA for adjacent lots; and
- Grade surface water drainage in the northwest corner of the Environmental Protection Area towards the SWD-1 wetland.

7.1.6 ECA - Significant Woodlands and Wildlife Habitat

7.1.6.1 Impact

This EIS has determined the Maple-Oak-Hickory (FOD9-2) forest in the northwest portion of the subject lands and the SWD1 forest swamp meet the criteria for an ECA designation for Significant Woodlands and Wildlife Habitat based on number of wildlife functions identified in Table 1 in Section 3.6. These communities will be located within the EPA Block and therefore no direct loss of area will occur.

7.1.6.2 Mitigation

With retention within the EPA Block no specific mitigation measures is identified with respect to direct impacts on the ECA.

7.1.7 ECA - Species at Risk and Provincially Rare Species

7.1.7.1 Impact

This EIS has identified two Species at Risk, the Wood Thrush and Eastern Wood Pewee, and one provincially rare plant, the Black Gum tree, to occur within the subject lands. Habitat for all three species will be entirely located within the EPA Block. Therefore, no direct loss of habitat will occur.

7.1.7.2 Mitigation

With retention within the EPA Block no specific mitigation measures is identified with respect to direct impacts on these three species.

7.1.8 Endangered Bats

At this time the results of a June 2022 bat acoustic monitory program for the subject lands are not available. Therefore, it is not known if endangered of bat are present.

However, extensive forest habitat will be retained within the EPA along the western boundary of the subject lands, and extensive forest to the west is contiguous with the subject lands forested lands. Therefore, extensive bat habitat is present that will not be impacted by the proposed development. The findings of the acoustic monitoring will be provided as an addendum to this EIS. Should endangered bats be identified to occur, mitigation measures and permit requirements will be determined in consultation the MECP species at risk biologists. At this time the assessment of habitat for endangered bats and required permit/mitigation requirements is to be identified as a condition on Draft Plan approval.

7.2 Assessment of Potential Indirect Impacts and Mitigation

7.2.1 Potential Indirect Impacts

Based on the proposed development and site conditions the following indirect impacts have the potential to occur:

- Post development Impacts on the EPA Block along the western boundary of the subject lands;
- Impacts on wildlife during site clearing;
- Impacts to retained EPA during construction;
- Post development visual, noise and light impacts on wildlife use of the EPA Block;
- Post development, removal of vegetation along the boundary of the EPA Block and composting and dumping waste yard waste with the EPA boundary; and
- Transport of sediment and downstream transport during construction which could potentially impact on the wetlands and vegetation with the EPA Block and downstream Type 2 fish habitat associated with the Eagle Marsh Drain.

These potential indirect impacts can be mitigated by standard construction and design mitigation measures which are detailed below.

7.2.2 Mitigation

7.2.2.1 Lands Adjacent to the Locally Significant Wetland

The development plan has been designed so that a 15m or greater naturally vegetated buffer will be retained around the boundary of the MNDMNRF evaluated locally significant wetland. As a specific mitigation measure, as identified in the water balance study, the rear of lots of 52 though 74 will be graded so that surface water is directed to the wetland area.

7.2.2.2 EPA Block 134

Rear of lots 52 through 74 and the west boundary of the Stormwater Management Area Block 134 will be adjacent to the east boundary of the EPA. The rear of lots 52 through 60 will be located at or just within the Beacon surveyed dripline of the FOD9-2 forest edge. As noted in Section 4.2.5 the trees along the surveyed edge represent a narrow band of Black Walnut trees common to the cultural thicket community that lies adjacent to the FOD9-2 forest. Therefore, the location of the rear of these lots along the dripline will not impact the trees of the EPA significant woodland FOD9-2 forest or the significant wildlife habitat associated with the EPA forest. The rear of lots 61 through 74 will lie adjacent to Cultural Woodland.

To address potential indirect impacts to the natural heritage features and function that are associated with the EPA lands as detailed in this EIS the following mitigation measure are identified to be implemented.

Edge Management Plan

The development will result in the creation of a new vegetation edge along the boundary of the EPA. The removal of trees and shrubs will result in gaps in the vegetation that will need be mitigated. Therefore, for the removal of vegetation along the EPA boundary, an edge management plan is to be developed. The plan is to be approved by the Niagara Region and NPCA.

Permanent Fencing

Along the perimeter of the EPA Block a 1.5 m High Chain link Fence will be constructed. The location of the fence should be detailed in final plans for subdivision. In addition, “a no gate” condition should be identified by the City.

Construction Exclusion Filter Fabric and Paige Wire Fencing

To help ensure that site clearing and grading, or movement of heavy equipment does not impose on the EPA during construction, for the duration of the construction phases paige wire fencing with filter fabric for the first 1 m should be installed along the boundary of the EAP lands. Fencing should be installed by April 1st of the first year of construction and maintained during the entire development process. The fencing should be removed only when development work is completed.

Sediment and Erosion Control

For the protection against erosion and sediment transport into the EPA lands and the Eagle Marsh Drain an Erosion and Sediment Control Plan is required which is to be approved by the NPCA. The plan should be developed based on the Erosion & Sediment Control Guidelines for Urban Construction (2006) for the Greater Golden Horseshoe Area Conservation Authorities.

Material Storage and Fueling

Storage of equipment and materials and the fueling of equipment should not permitted within 30 m of a watercourse or PSW boundary. Ontario Provincial Standard Specification 180 is to be followed for the management of excess materials.

Timing of Site Clearing

For the protection of nesting migratory birds as required by the federal *Migratory Bird Convention Act* and other wildlife such as bats, the clearing of vegetation (trees, shrubs, meadow habitat) should not be undertaken from April through to the end of September.

7.3 Assessment of Residual Impacts to Natural Heritage

The proposed development will result in the removal of four small areas of cultural woodland (CUW1), representing a total area of 2.4. ha, and 5 ha of cultural meadow and thicket (CUM1/CUT1). In addition,

the stormwater management block will result in the removal of 0.96 ha of a cultural thicket/thick swamp community. These communities have been assessed to be common in Port Colborne area and of low function supporting common species of flora and fauna and do not meet the criteria to be identified as either EPA or ECA. Therefore, removal of this vegetation will not result in significant residual impact to the local populations of common urban tolerant species of flora and fauna within the City or Niagara Region.

This EIS has identified that the subject lands support features and functions that meet the criteria for ECA, including locally significant wetland, significant woodlands and significant wildlife habitat. These features and functions will be retained within an EPA Block that represents 34% of the subject lands total area. In addition, mitigation measures have been identified that will address potential indirect impacts to the retained EPA. Therefore, the proposed development will not result in significant residual impact to the ECA core natural heritage feature of the City or Niagara Region natural heritage system.

7.4 Cumulative Impacts

The assessment of cumulative impacts as a result of the urbanization of rural areas of the City of Port Colborne or the rural areas of the Niagara Region is outside the scope of this EIS. This EIS has detailed that the significant natural heritage features associated with the subject lands will be retained with an EPA Block and that area of the subject lands that will be developed do not support significant natural heritage features or functions. The removal of 0.161ha of cultural woodland that is contiguous with the ECA significant forest lands represents only 1.0% of the entire forest feature that extends for 1 km to the west of the subject lands. The removal of this small area does not represent a significant negative impact. The EIS has identified that no significant residual impact will occur to significant natural heritage features or functions of the City's or Region natural heritage system.

At the local level the subject lands lie at western limit of the City's Urban Boundary and residential development has already occurred along the north, east and southern boundaries of the subject lands. Extensive future development to the west of the subject lands is significantly constrained due the presence of ECA lands. The development will utilize exiting municipal services and no new servicing that could support additional development is associated with the approval of the proposed Northlands Estates development.

Based on the above, the approval of the proposed development will not result in significant cumulative impacts the natural heritage system of the City or Niagara Region.

8. Policy Conformity

8.1 Provincial Policy Statement

The natural heritage development policies of the current Official Plans of the Niagara Region and City of Port Colborne are in conformity with Section 2.1 Natural Heritage of the Provincial Policy Statement (PPS, 2020), which is directed at a province wide protection and management of natural heritage resources. Therefore, conformity with these Official Plans ensures conformity with the PPS.

8.2 Niagara Region and City of Port Colborne Natural Heritage Policies

8.2.1 Environmental Protection Area (EPA)

Neither the Region or City have identified EPA to occur within or directly adjacent to the subject lands. This EIS has not identified natural heritage features or functions to be associated with the subject lands that would support an EPA designation. Therefore, the proposed development plan is in conformity with the City and Niagara Region's Natural Heritage Policies for EPA.

8.2.2 Environmental Conservation Area (ECA)

Schedule C – Core Natural Heritage of the Niagara Region Official Plan and Schedule B2 identify ECA to occur within and adjacent to the western boundary of the subject lands. The ECA represents Locally Significant Wetland, a wetland unit of the MNDMNRF evaluated Non-Provincially Significant Onondaga Escarpment Wetland Complex, and the surrounding Significant Woodlands as per the Regions criteria for significant woodlands. This EIS has also determined that these Significant Woodlands also support Significant Wildlife Habitat.

No development will occur within the wetland unit of the MNDMNRF evaluated Non-Provincially Significant Onondaga Escarpment Wetland Complex. The FOD9-2 Maple-Oak-Hickory forest, and SWD1 swamp forest have been identified by this EIS to support a ECA designation for Significant Woodlands and Wildlife Habitat. These communities will be retained and designated EPA. As required by development policy no lot lies will extend into the EPA. In addition, this EIS has identified mitigation measure to protect and/or enhance the edge of the EPA Block.

Based on the above, the proposed development plan is in conformity with the City and Niagara Region's Natural Heritage Policies for ECA.

8.2.3 Fish Habitat

No fish habitat is identified to be associated with the subject lands or adjacent lands, therefore no direct impact to fish habitat will occur. For the protection of Type 2 fish habitat identified down stream Eagle Marsh Drain, the requirement for a construction sediment control plan has been identified and the stormwater management design will meet the MECP required level of protection for Type 2 fish habitat.

Based on the above the proposed development plan is in conformity with the Region's and City policies for the protection of fish habitat and the regulations of the *federal Fisheries Act*.

8.2.4 Endangered and Threatened Species

No species regulated under the Ontario *Endangered Species Act* (ESA, 2007), have been identified to occur within or adjacent to the subject lands and therefore the development plan is in conformity with the Region's and City policies for the protection habitat for endangered and threatened species and the regulations of the *Endangered Species Act*.

8.2.5 Significant Valleylands

No significant valleylands as defined by the Region or City occur within or adjacent to the subject lands. Therefore, the proposed development plan is in conformity with the City and Niagara Region's Natural Heritage Policies for Significant Valleylands.

8.2.6 Natural Heritage Movement Corridor

Both the Niagara Region and City require that proposed developments consider maintaining, and/or enhancing identified natural heritage movement corridors. The natural heritage planning schedules of the City and Region do not show a movement corridor to be associated with the subject lands. Nevertheless with the creation of the EPA Block along the western boundary of the subject lands, an existing local north-south movement corridor will be retained. Therefore, development plan is in conformity with the Region's and City policies for the protection and enhancement of natural heritage movement corridors.

8.3 Niagara Peninsula Conservation Authority

The following addresses the proposed developments conformity with respect to NPCA development policies pursuant to Ontario Regulation 155/06 *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*.

8.3.1 Wetlands

The NPCA development polices regulate development within and adjacent to wetlands. For wetlands the regulated areas include the wetland area and 120 m of the adjacent lands for provincially significant wetlands and wetland areas greater than 2 ha in size. No development will occur within the MNDMNRF evaluated wetland unit of Non-Provincially Significant Onondaga Escarpment Wetland Complex. In addition, a minimum 15 buffer the wetland boundary has been identified and in accordance with Policy 8.2.3.4 no new lot creation will occur in the wetland or buffer land as they will be located within an EPA. Therefore, the proposed development is in conformity NPCA development polices for the locally significant wetland within the subject lands.

For the development, a 0.96 ha Stromwater Management Area within Block 139 with be located in the eastern portion of the 2.6 ha CUT/SWT2 community identified by this EIS. Though field investigations have identified that the community is dominated by Common Buckthorn and supports a large number of upland plants, for this EIS the area is considered to represent low quality wetland habitat. No significant features or functions have been identified for the area that will be removed.

NPCA Policy 8.2.2.8 identifies that the NPCA will permit for the alteration/removal of non-provincially significant wetlands provide a set of criteria can be met. The following details an assessment of the criteria in support of the proposed stormwater management area development in the wetland.

a. The wetland has been evaluated in accordance with OWES Protocol and approved by the MNRF;

The MNRF conducted and evaluation of wetlands in the local area and did not include the area within the Onondaga Escarpment Wetland Complex.

b) The wetland (as evaluated in (a) above) is not a Provincially Significant Wetland under the OWES Protocol to the satisfaction of the MNRF;

The MNRF evaluated the Onondaga Escarpment Wetland Complex as a Non-Provincially Significant Wetland. Based on exiting conditions of wetland area, an independent OWES wetland evaluation would not assess the wetland to be a PSW. In addition, adding this wetland area as a wetland unit of the Wetland Complex, would not result in a revised PSW designation for the complex as a whole.

c) The reconfigured wetland and proposed development will not have a negative impact on any species of concern, significant habitat types or species at risk;

This EIS has established that no species of concern or at risk or significant habitats or wildlife functions are associated with the wetland were development is proposed.

d) The reconfigured wetland and proposed development will not have a negative impact on the hydrological or ecological function of the wetland;

A water balance assessment of the wetland areas within and adjacent to the subject lands has been completed by Terra-Dynamics Consulting Inc. The study identifies that surface water flows are southward into the wetland area where development is proposed. In addition, no wetland areas lie immediately down gradient for the wetland area. Therefore no impact to the hydrological function of other wetland areas will occur. Also, development with the eastern portion of the wetland area will not impact of the low ecological function of the retained area to the west.

e) A restoration plan for the reconfigured wetland is provided for review and approval;

This EIS has identified that wetland enhancement measures will be undertaken within the retained EPA block to the west and north of the storm pond block. Elements of the enhancement measures have been identified in this EIS, and a detailed plan will be developed in consultation with the NPCA.

f) A multi-year monitoring program is required (minimum five years) to ensure the longterm establishment of the reconfigured wetland;

The proponent will agree to undertake a five-year monitoring program that will be developed in consultation with NCPA.

g) A security deposit in an amount approved by the NPCA to establish the reconfigured wetland and ensure its establishment;

The proponent will agree to provide a security deposit in the amount identified by the NPCA.

h) An EIS is provided for review and approval to demonstrate conformity with Section 8.2.2.8;

An EIS has been completed a conformity with Section 8.2.2.8 is provided here to the NPCA.

i) The applicant is required to enter into a restoration agreement with the NPCA that will be registered on the title of the property containing the reconfigured wetland that will provide the necessary details to implement Section 8.2.2.8; and

The proponent will agree to enter into a agreement with the NPCA to implement Section 8.2.2.8. This EIS identified that NPCA review and approval of the proposed wetland enhancement plan is to be identified as a condition on Draft Plan approval.

j) Additional information, such as an EIS, hydrologic study, restoration plan and or other studies as required depending on site-specific characteristics.

An EIS and hydrologic study have been completed and will be provide to the NPCA. A detailed plan will be prepared in consultation with the NCPA.

Based on the above the development plan is in conformity with NPCA development policies for wetlands.

9. Summary

This EIS has determined that with the implementation of identified protection measurers and enhancement plans the proposed Northlands Estates plan of subdivision will not result in a significant negative impact to the natural features or functions of the Core Natural Heritage System of the Niagara Region or the City of Port Colborne. This EIS has demonstrated that the proposed development plan is in conformity with the Natural Heritage planning policies of the City, Niagara Region and NPCA, as well as the Province's Natural Heritage Polices under the Provincial Policy Statement (PPS 2020). The EIS has identified the need for NPCA review and permit requirements for the proposed development of lands within an wetland area pursuant to *Ontario Regulation 155/06*.

10. Recommendation

This EIS concludes that with the implementation of the recommended design and construction mitigation measures, the proposed Northlands Estates plan of subdivision is supported with respect to maintaining the natural heritage system of the City of Port Colborne, Niagara Region and the Province.

Report prepared by:
Beacon Environmental

Ron Huizer, B. Sc.
Principal, Senior Ecologist

Report reviewed by:
Beacon Environmental

Lindsey Waterworth, B.Sc.
Senior Ecologist

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Appendix A

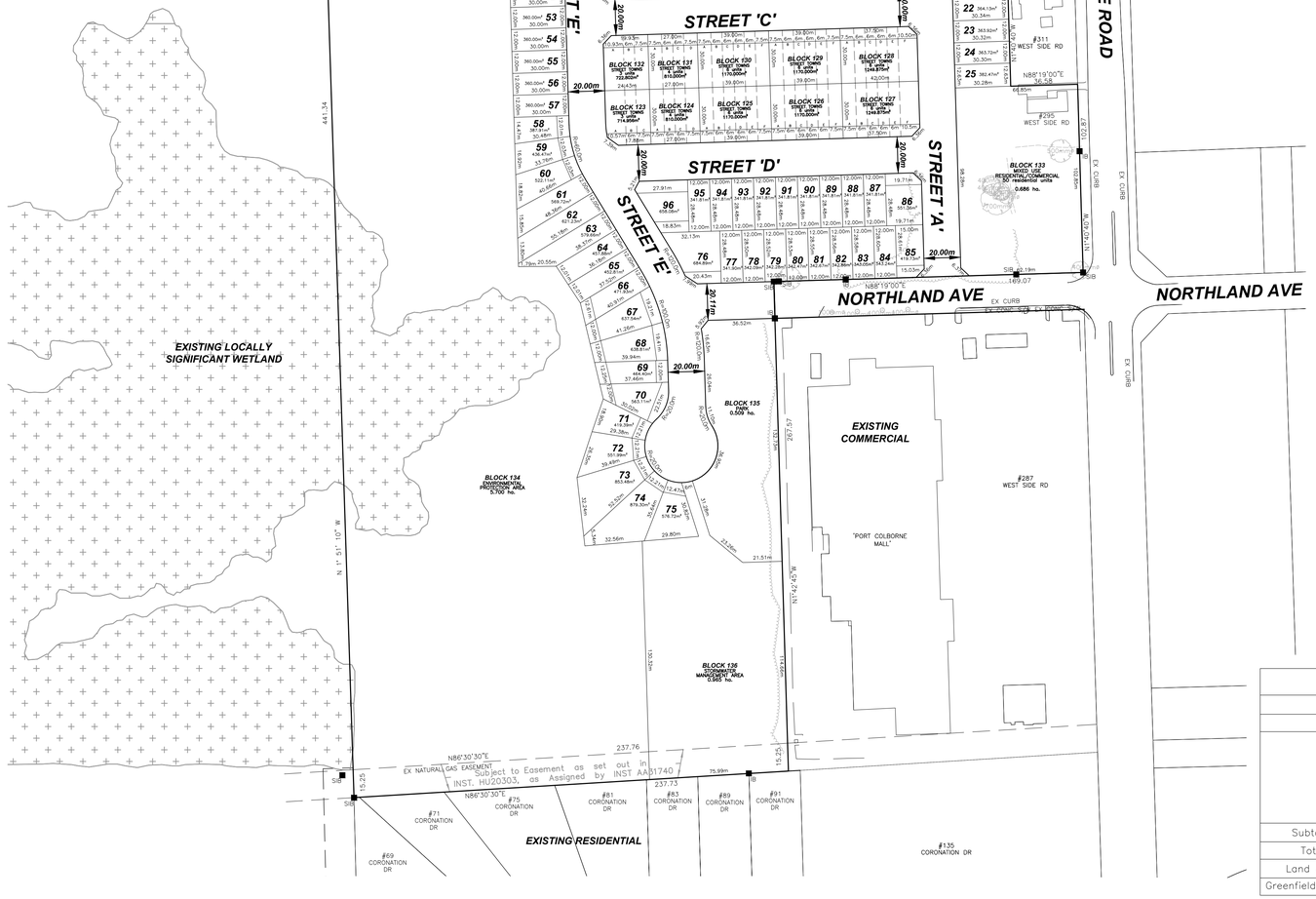
Proposed Plan of Subdivision

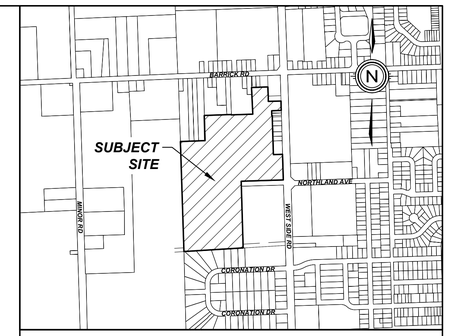
NORTHLAND ESTATES
CITY OF PORT COLBORNE

STREET TOWNHOUSE BLOCK UNIT AREA

BLOCK 123 TOTAL AREA = 714.956m²	
UNIT A	309.956m²
B	180.000m²
C	225.000m²
BLOCK 124 TOTAL AREA = 810.000m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	225.000m²
BLOCK 125 TOTAL AREA = 1170.000m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	180.000m²
E	180.000m²
F	225.000m²
BLOCK 126 TOTAL AREA = 1170.000m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	180.000m²
E	180.000m²
F	225.000m²
BLOCK 127 TOTAL AREA = 1249.875m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	180.000m²
E	180.000m²
F	304.875m²

BLOCK 128 TOTAL AREA = 1249.875m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	180.000m²
E	180.000m²
F	304.875m²
BLOCK 129 TOTAL AREA = 1170.000m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	180.000m²
E	180.000m²
F	225.000m²
BLOCK 130 TOTAL AREA = 1170.000m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	180.000m²
E	180.000m²
F	225.000m²
BLOCK 131 TOTAL AREA = 810.000m²	
UNIT A	225.000m²
B	180.000m²
C	180.000m²
D	225.000m²
BLOCK 132 TOTAL AREA = 722.802m²	
UNIT A	317.802m²
B	180.000m²
C	225.000m²





KEY PLAN
N.T.S.

DRAFT PLAN OF SUBDIVISION

LEGAL DESCRIPTION

PART OF LOT 31, CONCESSION 2
GEOGRAPHIC TOWNSHIP OF HUMBERSTONE
CITY OF PORT COLBORNE
REGIONAL MUNICIPALITY OF NIAGARA

OWNER'S CERTIFICATE

BEING THE REGISTERED OWNER, I HEREBY AUTHORIZE UPPER CANADA CONSULTANTS TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF PORT COLBORNE FOR APPROVAL.

2600261 ONTARIO INC. — JUNE 24, 2022 DATE

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ARE CORRECTLY SHOWN.

ROY S. KIRKUP, B.Sc., O.L.I.P., Ontario Land Surveyor DATE
KIRKUP MASCOE URE SURVEYING
(a Division of J.D. Barnes Limited)

REQUIREMENTS OF SECTION 51(17) OF THE PLANNING ACT

a) SEE PLAN
b) SEE PLAN
c) SEE PLAN
d) SEE PLAN
e) SEE PLAN
f) SEE PLAN
g) SEE PLAN
h) MUNICIPAL WATER
i) VARIOUS TEXTURES OVER BEDROCK
j) SEE PLAN
k) FULL SERVICE
l) SEE PLAN

LAND USE SCHEDULE

LAND USE	LOT/BLOCK	# OF UNITS	AREA(ha)	AREA(%)
SINGLE FAMILY RESIDENTIAL	LOT 1–122	122	5.014	30.11
STREET TOWNS RESIDENTIAL	BLOCK 123–132	50	1.024	6.15
MIXED USE RESIDENTIAL/COMMERCIAL	BLOCK 133	50	0.686	4.12
ENVIRONMENTAL PROTECTION AREA	BLOCK 134		5.700	34.23
PARK	BLOCK 135		0.509	3.06
STORMWATER MGMT AREA	BLOCK 136		0.965	5.80
0.3m RESERVE	BLOCK 137–138		0.001	0.01
FUTURE DEVELOPMENT	BLOCK 139		0.051	0.31
ROADWAY			2.700	16.22
TOTAL		222	16.650	100.00

DEVELOPABLE AREA = 10.95 ha.
DEVELOPABLE DENSITY = 20.27 units/ha

GREENFIELD DENSITY CALCULATION

	People		Jobs		
	Units	Ratio	Units	Ratio	Total
	222 Dwellings	2.28 people per dwelling[1]	222 Dwellings	5% "at home" employment	11.10 Jobs
			16,576.42ft² of commercial space	1 employee per 500ft² of commercial space[2]	33.15 Jobs
Subtotal	506.16 people		44.25 jobs		
Total	550.41 people and jobs				
Land Area	10.95 hectares (exclusive of the Environmental Protection Area)				
Greenfield Density	50.27 people and jobs per hectare				

#	REVISION	DATE	INIT
.	.	.	.
.	.	.	.
0	ISSUED FOR APPROVAL	2022-06-29	M.K

UPPER CANADA CONSULTANTS
ENGINEERS / PLANNERS

DRAWING TITLE
DRAFT PLAN OF SUBDIVISION

DRAFTING	MK
DATE	MAY 13, 2022
PRINTED	JUNE 29, 2022
SCALE	1:1500
DWG No.	21132-DP
REV	0

DRAWING FILE: F:\21132\Engineering\21132-BASE.dwg PLOTTED: Jun 29, 2022 – 11:25am PLOTTED BY: mark

BEACON ENVIRONMENTAL

Appendix B

GEMS 2014 EIS Report

Environmental Impact Study

Northlands Estates Subdivision
City of Port Colborne

Prepared For:

Masongsong Associates Engineering Ltd.

April 2014

Submitted by:

Groundwater Environmental Management Services Inc.
69 Connie Crescent
Concord, Ontario L4K 1L3
Ref# **13-13272**

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Appendices

1.0 INTRODUCTION

1.1 Existing Conditions

The property that will be referred to in this report as the Northland Subdivision property is part of Lot 31, Concession 3 bounded by Barrick Street to the north, Minor Road to the west, West Side Road to the east, and Main Street to the south, within the City of Port Colborne (Figure 1). This Environmental Impact Study (EIS) is in support of a proposed residential development plan with draft plan approval 26-T-12-2000-02.

Groundwater Environmental Services Inc. (GEMS) was retained by Masongsong Associates Engineering Ltd. to undertake an EIS to assess the potential impact on the surrounding natural features and environmental processes for the development of the Northland Subdivision property.

1.2 Current Land Use

At present, the property is comprised of approximately 19 ha of undeveloped woodlands, thickets and meadows. With the exception of a pocket of moist oak woodland along the eastern boundary of the property, the natural features are influenced by past agricultural land use. Historically, the majority of the land was cleared for agriculture (Figure 2) and this is reflected in the extant vegetation community. Both the soils (i.e., clay mixtures) and hydrological influence of the adjacent wetland complex create an environment that was likely too moist for agriculture and would have required draining. To support this assessment plowed drainage trenches were observed during both field investigations and aerial photography review. Currently, the southwest block of the property is bounded by a shopping plaza; whereas, the north and south boundary of the property border residential areas.

1.3 Literature Review

A review of existing information related to environmental functions and features of the study area, species of concern, existing mapping and other data was completed. The background review included correspondence with Niagara Peninsula Conservation Authority (NPCA) and the Ontario Ministry of Natural Resources (MNR).

Figure 1 Location and Boundary of Northland Estates Property.

Figure 2 Aerial photograph of the study property taken in 1934 (left panel) and 2006 (right panel).

2.0 RELEVANT POLICY & LEGISLATION

2.1 Provincial Policy Statement Ontario

A review of the Provincial Policy Statement, specifically regarding Natural Heritage policies, (OMMAH 2005. Section 2.1 of the Provincial Policy Statement) indicated that no development shall occur within:

- Significant habitat of endangered species and threatened species
- significant wetlands in ecoregion 5E, 6E and 7E1;
- significant coastal wetlands

Development may be permitted in the following features, if an EIS can demonstrate that the features and functions will not experience negative impacts:

- significant wetlands in the Canadian Shield north of ecoregions 5E, 6E and 7E1;
- significant woodlands south and east of the Canadian Shield;
- significant valley lands south and east of the Canadian Shield;
- significant wildlife habitat; and
- significant areas of natural or scientific interest (ANSI)

Although there are no provincially significant wetlands (PSW) or coastal wetlands on the property, there is an identified PSW (i.e.Wainfleet Bog) adjacent (~ 1 km) to the northwest property limit that has been identified through this study and was noted by NPCA prior to this study.

2.2 City of Port Colborne

Planned development involves lands containing Regional Core Natural Heritage Features. Under section 7.B.1 of the regional plan, an EIS on the property is required due to the presence of environmental conservation areas (ECAs) located on the property (i.e., significant woodland and wetland).

2.3 Conservation Authorities Act

The Niagara Peninsula Conservation Authority (NPCA) is the Conservation Authority for the area. Due to the presence of a locally significant wetland (> 2 ha in size), the study property is protected under section 3.24.1 of Ontario Regulation 155/06. As the property contains NPCA regulated lands, the NPCA requires an EIS including ELC community mapping, ECA boundary delineation, and Species at Risk surveys in accordance with the Region of Niagara Environmental Impact Study Guidelines.

2.4 Endangered Species Act

The Endangered Species Act is administered by the Ministry of Natural Resources (MNR) which determines and lists all provincially threatened and endangered species. The purpose of the act is to identify and protect species at risk and their habitats; promote recovery; and promote stewardship

activities to assist in protection and recovery of identified species and habitat. The Act states that a person shall not damage or destroy the habitat of a species that is listed as an endangered or threatened species. See Section 3.3 for a list of species, which are protected under the ESA that are either known or suspected to occur within the study property.

3.0 ASSESMENT OF ECOLOGICAL FUNCTIONS

3.1 Terrestrial Resources

3.1.1 Field Investigation Methods

GEMS terrestrial ecologists conducted site investigations on November 20, 2012 and July 6, 2013 to document existing conditions including vegetation communities, and soil types. Identified vascular and non-vascular plants will be checked for their population status at local, regional, and provincial levels. Soils were classified as per the Ontario Institute of Pedology (1985).

3.1.2 Ecological Land Classification

As stated, the majority of the site has, historically, been used for agriculture since at least 1934 as documented through air photo imagery (Figure 2). Consequently, vegetation communities within this area reflect past anthropogenic disturbance. In both the historical documentation and site visits, there was evidence that following clearing for agriculture, the land was also trenched for drainage, particularly in the southern block of the property. This has created fine-scale microsite conditions, where hydrophilic plants (such as livid sedge; *Carex livida*) are growing amongst species associated with drier conditions (such as buckthorn; *Rhamnus cathartica*).

The vegetation community names and codes have been adapted from the Ecological Land Classification System (Lee, 1998). The ELC system does not include all vegetation types, especially culturally influenced vegetation types as found on much of this property. The botanical field investigations undertaken by GEMS identified a total of four (4) ELC Community Series units. These vegetation units are illustrated on Figure 3 and a photographic log is included in Appendix A.

CUT/CUM – Cultural Thicket/Meadow – This ecosite occurs on well-drained, fresh, loam soils, and is a reflection of anthropogenic disturbance. Both historic and current air photo imagery, from 1934 and 2006, provides evidence that the land had been cleared and used for agriculture. Although the area has been left to regenerate naturally, the influence of the adjacent disturbed land (i.e., residential lots and roads), as well as active ATV paths create an environment favourable to early successional (i.e., ruderal) and invasive species (native and non-native). Dominant shrub species include staghorn sumac (*Rhus typhina*), wild black raspberry (*Rubus occidentalis*), buckthorn (*Rhamnus cathartica*), pin cherry (*Prunus pennsylvanica*) and willows (*Salix* spp.). The understory consists of Virginia creeper (*Parthenocissus quinquefolia*), asters (*Aster* spp), wild rose (*Rosa*

acicularis), goldenrod (*Solidago Canadensis*), common yarrow (*Achillea millefolium*), wild grape (*Vitis* spp.), tufted vetch (*Viccia cracca*), Queen Anne's lace (*Dauca carota*), wild garlic (*Allium vineale*), Canada anemone (*Anemone Canadensis*), wild bergamot (*Monarda fistulosa*), common milkweed (*Ascelepias syriaca*) and cow wheat (*Melampyrum pretense*). However, the shrub strata is absent in some portions of the ecosite, allowing resources to be allocated to the ground-layer creating a productive grassland. These areas are dominated by timothy grass (*Phleum pretense*), blue-joint grass (*Calamagrostis canadensis*), and forbs listed above. Black walnut (*Juglans nigra*) was sparsely dispersed throughout the grasslands portion of the ecosite, including two older individuals that are present in the 1934 air photo.

CUW – Cultural Woodland – This ecosite occurs on imperfectly drained, deep clay soils that have been previously trenched for drainage. This trenching and the perched soils created fine-scale microsites throughout the ecosite. Along the trenching, there were typical riparian species, including sedges (*Carex* spp.) and feathermosses (*Brachythecium* spp.). The canopy was dominated by young trees and shrubs including prickly-ash (*Zanthoxylum americanum*), white elm (*Ulmus americana*), spicebush (*Lindera benzoin*) and common buckthorn (*Rhamnus cathartica*). Tree planting has occurred along the eastern boundary of this ecosite; likely a mitigation effort during the construction of the adjacent shopping plaza.

FOD9 – Moist Oak Deciduous Forest – This ecosite occurs on moderately-well drained, loamy clay soils. The overstory is dominated by red oak (*Quercus rubra*) and white swamp oak (*Quercus bicolor*) and mixed with shagbark hickory (*Carya ovate*) red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*). The understory was dominated by shade-tolerant species, including spotted jewelweed (*Impatiens capensis*), Virginia creeper (*Parthenocissus quinquefolia*), wild rose (*Rosa acicularis*), Canada anemone (*Anemone canadensis*), meadowrue (*Thalictrum* sp.), speckled alder (*Alnus tenufolia*), bladder sedge (*Carex intumenscens*) and stinging nettle (*Urtica dioica*). There were also many non-vascular species including tree moss (*Climacium dendroides*), wiry fern moss (*Thuidium abietinum*) and leafy mosses (*Plagiomnium* spp.)

SWD1 – Oak Mineral Deciduous Swamp – This ecosite, considered the most ecologigally sensitive on the property, occurs on poorly drained, deep clay soils. The overstory is dominated by white swamp oak (*Quercus bicolor*) mixed with other hardwood species, including shagbark hickory (*Carya ovate*) red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*). The understory is relatively depauperate, with a mix of common forest understory herbs in the dry areas and hydrophilic plants in the wet areas, such as marsh marigold (*Caltha palustris*), haircap moss (*Polytrichium commune*) and sedges (*Carex* spp.).

Figure 3 ELC communities within the property boundary

3.2 Wildlife (Breeding Birds, Herpetofauna and other fauna)

3.2.1 Breeding Birds

Field Methods

Bird Surveys were completed on June 8 and 22, and on July 5 and 6, 2013 between the hours of 6:00 am and 9:00 am or during evening hours, beginning half an hour after sunset. Daytime surveys were conducted in accordance with the Ontario Breeding Bird Atlas, using transects and point count surveys. Nighttime surveys were conducted following the Eastern Whip-poor-will (*Caprimulgus vociferous*) and Common Nighthawk (*Chordeiles minor)* Survey Protocol developed by the MNR Guelph District**.** The entire area surrounding the proposed development was monitored with survey stations located within each vegetation community (see figure 4 for survey locations). Birds were identified visually and by song. Observed bird species were recorded and potential breeding status was documented. Additionally, birds were surveyed by song during evening amphibian surveys and during ELC surveys.

Results

Nineteen bird species were recorded during the Breeding Bird Surveys including: song sparrow, (*Melospiza melodia)*, brown headed cowbird, (*Molothrus ater)*, common grackle (*Quiscalus quiscula)*, field sparrow, (*Spizella pusilla)*, tree swallow (*Tachycineta bicolour)*, american robin (*Turdus migratorius)*, red-winged blackbird (*Agelalus phoneniiceus*), cedar waxwing (*Bombycilla cedrorum),* common yellowthroat *(Geothlypis trichas),* killdeer *(Charadrius vociferous),* rock dove (*Columba livia*), northern cardinal (*Cardinalis cardinalis*), American crow (*Corvus brachyrhynchos*), yellow warbler (*Dendroica petechial*), pileated woodpecker (*Dryocopus pileatus*), yellow oriole (*Icterus galbula*), American Goldfinch (*Carduelis tristis*), starling (*Stumus vulgaris*), and northern flicker (*Colaptes auratus*). Two great blue herons *(Ardea Herodias)* were observed flying over the site. The open meadow area was dominated by red winged blackbirds.

During the June 9th amphibian survey, red winged blackbirds were heard, as were nighthawks, one of which was observed flying over the Canadian Tire adjacent to the site. Whip-poor-wills were not observed on site.

Bobolink and eastern meadowlark were not observed on site, nor would they be expected to be breeding in this habitat as the open meadow is succeeding into shrub thicket and trees.

Survey Methods

Pre-Survey: GEMS set up 2 parallel transects crossing the field lengthwise at an approximate 250 m interval which included locate point count stations along the transects, at 250 m intervals (as shown in figure 4). Point counts were located to provide a good view of the surrounding fields, and the locations were recorded using a handheld GPS unit. The same locations were used for nighttime

surveys. Due to the relatively large number of shrubs and trees in the area, observation point locations were to be field fit to maximize observation efficiency. Areas in close proximity to roadways and development were avoided in order to limit bias created by human disturbance.

Conditions: Surveys were conducted in optimum weather conditions, with no rain or wind, and good visibility was maintained throughout the survey. Nighttime surveys were conducted away from development to reduce the chance of noise and light interference.

Survey: GEMS staff carried binoculars, writing materials, a hand-held GPS unit, a compass, watch and camera during the survey. Daytime surveys were conducted between the hours of 6:00am and 9:00am, and nighttime surveys began roughly 30 minutes after sunset. Observations were documented at each point count for 10 minutes for daytime surveys, and 3 minutes at each listening station for nighttime surveys.

Repeat visits: GEMS staff completed two site visits for daytime point count surveys. Surveys took place on June 8, 2013 and July 6, 2013 with each survey separated by a week or more from previous surveys. Two nighttime surveys were conducted on June 22 and July 5, 2013 using the daytime observations point locations (Figure 4).

Habitat: Overall, meadow areas were succeeding into shrubs and thickets, resulting in limited open areas critical to Meadowlark and Bobolink breeding but offering a diverse range of arboreal nesting opportunities. More specifically habitat within the surveyed area consisted of meadow with scattered shrubs (approximately 50%), thicket (approximately 25%) and woodland (approximately 25%).

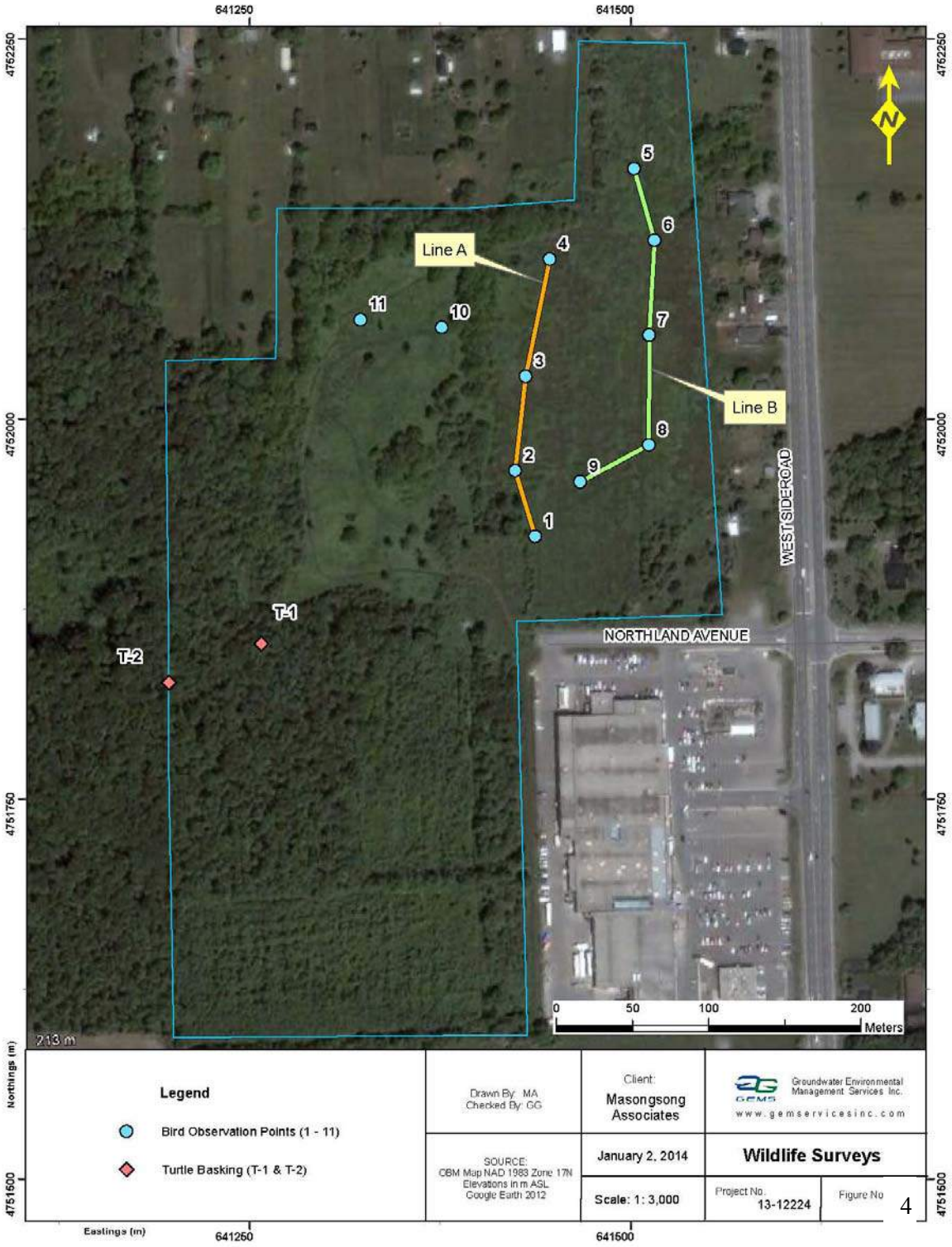


Figure 4 Bird and Basking Turtle Survey location points

3.2.2 Herpetofauna

Field Methods

To detect both early and late breeders, three nocturnal amphibian surveys were completed within the property focusing on the oak mineral deciduous swamp (station 1) and the cultural woodland (station 2). Surveys were conducted on April 20, May 5, and June 9, 2013 between the hours of 9:00 pm and 11:00 pm at the two stations selected for 3 minute call surveys. For each amphibian survey, weather conditions were calm with less than 20% cloud coverage and temperatures of 5°C, 15°C, and 20°C respectively.

For reptilian investigation, cover board surveys following Casper and Hecnar (2011) were completed on April 20, May 5, June 8, July 6, August 24, September 8, October 25, 2013. Six cover board locations were selected and approved by MNR on a field walk in early April 2013 as the primary objective of the surveys was to document if the study property was used by eastern massasauga rattlesnake (*Sistrurus catenatus*), and to estimate the population within the area, if utilized. The cover boards were placed in areas near standing water, but within the forest. The cover boards were checked approximately once per month to reduce frequent lifting known to disrupt the microenvironment under the board, and discourage use by snakes. Animals observed underneath the cover boards were identified and released. Cover boards were placed in April and removed in late October, 2013. Cover board inspections took place either in the early morning or late afternoon during periods when snakes would most likely be utilizing them for refuge or thermoregulation.

Visual basking turtle surveys were conducted on April 20, May 5, and June 8, 2013. Basking turtle surveys were completed by visually surveying open water areas with natural features conducive to basking practices by turtles (e.g. basking logs, large rocks, etc.). See Figure 4 and 5 for survey station locations.

Results

The three amphibian nocturnal surveys resulted in the following species being recorded;

- April 20, 2013 -Spring peepers (*Pseudacris crucifer*), wood frogs (*Rana sylvatica*) Western chorus frog (*Psuedacris triseriata),*
- May 5 – Leopord Frog (*Rana pipiens*) and American Toad (*Anaxyrus americanus*),
- June 9 – Green Frog (*Rana clamitans*).

Leopard Frogs were also observed on the entrance trail during August surveys for coverboards.

The seven coverboard surveys resulted in the following species being recorded;

- May 5, 2013 – garter snake *(Thamnophis sirtalis)* at CB3,
- June 8, 2013 – garter snake, milksnake *(Lampropeltis triangulum)* at CB6, blue-spotted salamander *(Ambystoma laterale)* at CB2,
- July 6, 2013 – blue-spotted salamander at CB2,
- September 8, 2013 – garter snake at CB4, leopard frogs and blue-spotted salamander observed on the entrance path and near Canadian Tire.

No massassauga rattlesnakes were observed on the property.

The three basking turtle surveys resulted in the following species being recorded;

No turtles or evidence of turtles (e.g., Turtle shells, nest, hatched eggshells, etc.) were observed on the property.

3.2.3 Other Fauna

During all site investigations wildlife observations were noted. Relatively fresh coyote (*Canis latrans*) feces were observed in the woodland throughout the surveys indicating active utilization. Although direct observation, or identification of other signs, were not noted it is expected that this area is used by other mammals that are regionally common, including but not limited to; cottontail rabbit, possum, whitetail deer, raccoon, groundhog, red and grey squirrels, mice and voles.

Figure 5 Coverboard and Amphibian survey locations

3.3 Threatened and Endangered

The Natural Heritage Information Centre (NHIC) database, maintained by the Ministry of Natural Resources (MNR), records locations of rare species, Areas of Natural and Scientific Interest (ANSI), wetlands, and other significant natural features. A search of the NHIC database identified seven (7) species element occurrence within a 3 km radius of the proposed development (Table 1).

Table 1. NHIC search results of species-at-risk within 3 km of the property boundary.

Scientific Name	English Name	G-rank	S-rank	COSEWIC	SARO
Tyto alba	barn owl	G5	S1	END	END
Pantherophis spiloides	gray ratsnake (Carolinian)	G5T1	S1	END	END
Ixobrychus exilis	least bittern	G5	S4B	THR	THR
Sternotherus odoratus	eastern musk turtle	G5	S3	THR	THR
Sistrurus catenatus	Massasauga rattle snake	G3G4	S3	THR	THR
Chlidonias niger	black tern	G4	S3B	NAR	SC
Icteria virens	yellow-breasted chat	G5	S2B	SC	SC

Southern Ontario is the northern extent of the natural range of the barn owl (*Tyto alba*). The owl nests and roosts in barns and abandoned buildings, and uses orchards, grasslands and farmlands as its hunting grounds. The loss of suitable nesting and hunting grounds, mainly due to urbanization, has threatened the population of the barn owl; which is provincially listed as endangered and thus receives protection under the Endangered Species Act (2007). As of 2008, there were only five known mating pairs in Ontario (MNR, 2008). Current site conditions of the property are not conducive as habitat for the barn owl.

The grey ratsnake (*Pantherophis spiloides*) is Ontario's largest snake and is made up of two genetically distinct sub-species; the Frontenac Axis population and the Carolinian population. The Carolinian population of grey ratsnake is found in small sections of Carolinian forest along the northern edge of Lake Erie. The sub-species habituate in wooded areas, but can also be found in meadows and fields (MacCulloch, 2002). Habitat loss and predation by raccoons and hawks have put pressure on the population; which is provincially listed as endangered and thus received protection under the Endangered Species Act (COSEWIC, 2007). No grey ratsnakes were identified on the property during herpetofaunal surveys.

The least bittern (*Ixobrychus exilis*) is a small cryptic bird that requires large, undisturbed marsh systems for nesting. The species is provincially listed as threatened due to population declines that are likely a result of habitat loss; and thus received protection under both the Endangered Species

Act and the Migratory Birds Convention Act (Austen et al. 1994). The habitat requirements of the least bittern are not likely to be met on the study property.

In Ontario, the eastern musk turtle (*Sternotherus odoratus*) is mostly confined to shallow, slow-moving waters in the Georgian Bay and the southern edge of the Precambrian Shield (MacCulloch, 2002). Shoreline development is a major cause of population declines, as well as accidental death by aquatic recreational use, including fishing and boat propellers. The animal is provincially listed as threatened and thus receives protection under the Endangered Species Act (Edmonds, 2000). Based on its ecology, the musk turtle is not likely to be found on the property.

Massasauga rattlesnake (*Sistrurus catenatus*) utilizes a variety of open habitat types depending on seasonality. In the summer, they prefer dry, upland sites, and are found in forested wetlands for the remainder of the year; where they forage on small mammals and birds. Massasaugas are most commonly found on the Bruce Peninsula, but there is a small, isolated population at Wainfleet Bog; a provincially significant wetland ~ 1 km northwest of the study property. This species is provincially listed as threatened, as populations have declined due to habitat loss and fragmentation, and human persecution. Massasaugas receive protection under the Endangered Species Act (Weller and Parsons, 1991). No massasauga rattlesnakes were identified on the property during herpetofaunal surveys.

The black tern (*Chlidonias niger*) is a small migratory bird that, in Ontario, breeds mainly in marshes along the edges of the Great Lakes. The population has declined in Ontario, which is reflective of wetland drainage and alteration, water pollution and human disturbance. The species is provincially listed as special concern and is protected under the Migratory Birds Convention Act (Austen et al. 1994). The breeding requirements of the black tern are not likely to be met on the study property.

South-western Ontario is the northern limit of the yellow-breasted chat (*Icteria virens*); a large, but cryptic, warbler that prefers early successional habitats with a dominant shrub layer. Habitat loss as a result of increased agriculture has put pressure on the population which is provincially listed as special concern and protected under the Migratory Birds Convention Act (Cadman and Page, 1994). No yellow-breasted chat were identified on the property during breeding bird surveys.

3.4 Natural Heritage Features

The NPCA has identified both a locally significant wetland (deciduous swamp) and woodlands as natural heritage features on the Northland Subdivision property.

Wetlands, including swamps, are critically important ecosystems, providing: water storage, storm protection and flood mitigation, shoreline stabilization and erosion control, groundwater recharge, and water purification through retention of nutrients, sediments, and pollutants. Wetland conservation can help maintain hydrologic flow patterns and mitigate some of the environmental impacts of climate change. In addition, wetlands provide critical habitat and breeding grounds for many species plants and animals, including a number of species at risk.

Across the landscape, woodlands function to increase biodiversity, regulate nutrient cycling and form carbon stores. Woodlands also provide vital habitat, breeding grounds and corridors for wildlife. Conservation of woodlands is imperative to ensure that these ecosystem services are not disrupted.

In Ontario, protections for wetlands and woodlands are found primarily in policy documents including the 2005 Provincial Policy Statement (PPS) issued under the Planning Act.

4.0 DEVELOPMENT OPPORTUNITIES AND CONSTRAINTS

4.1 Description of Development

At present, the property has draft plan approval from the City of Port Colborne. Current draft plan approval was for land uses comprising single family lots and multiple residential units consisting of townhouses and apartments, totaling 215 units. It is anticipated that the proposed limit of development will yield similar or a slightly higher number of units. The approved draft plan also included one emergency/utility access block, two reserve blocks, one parkland block and one storm water management area block (Figure 6). However, the development has been revised to increase the allotment of multiple residential units, while including a larger park area and preserving more environmental features, principally the Oak Mineral Deciduous Swamp (SWD1) ecosite (Figure 7) which extends into the adjacent property and may be considered a Regionally significant wetland and may be classified as a Provincially Significant Wetland (PSW) when permission to properly survey it is granted. The following is a discussion of potential opportunities and environmental impacts of the proposed development.

4.2 Opportunities

The proposed development includes dedicated passive parkland along the forested western boundary of the property limit. This revision to the original plan was made so that conservation of the entire ELC designated swampland could be achieved. The conversion of the swampland from residential

use to a passive “natural feature” park provides an excellent opportunity to preserve the feature and ensure hydrological and ecological function is maintained throughout the entire swampland. This conversion will service the community by maintaining natural capital, the sensitive ecology of the swampland area (i.e., factors contributing to the diversity of the Niagara region, species of interests, characteristics of the ecosystem, wetland functions, etc.) and retain natural features within the development area, such as nesting habitat for migratory birds and breeding sites for amphibians and reptiles.

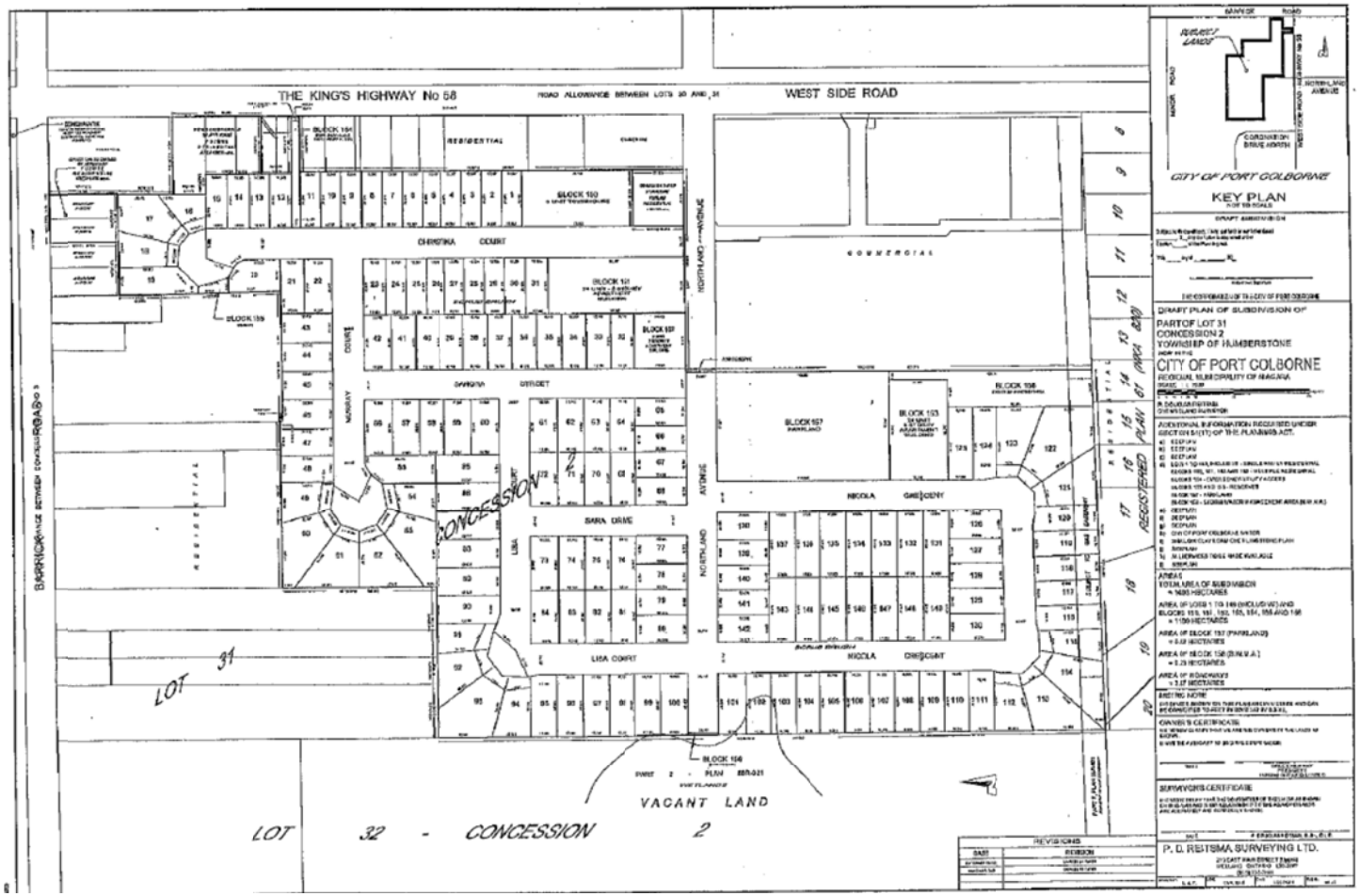
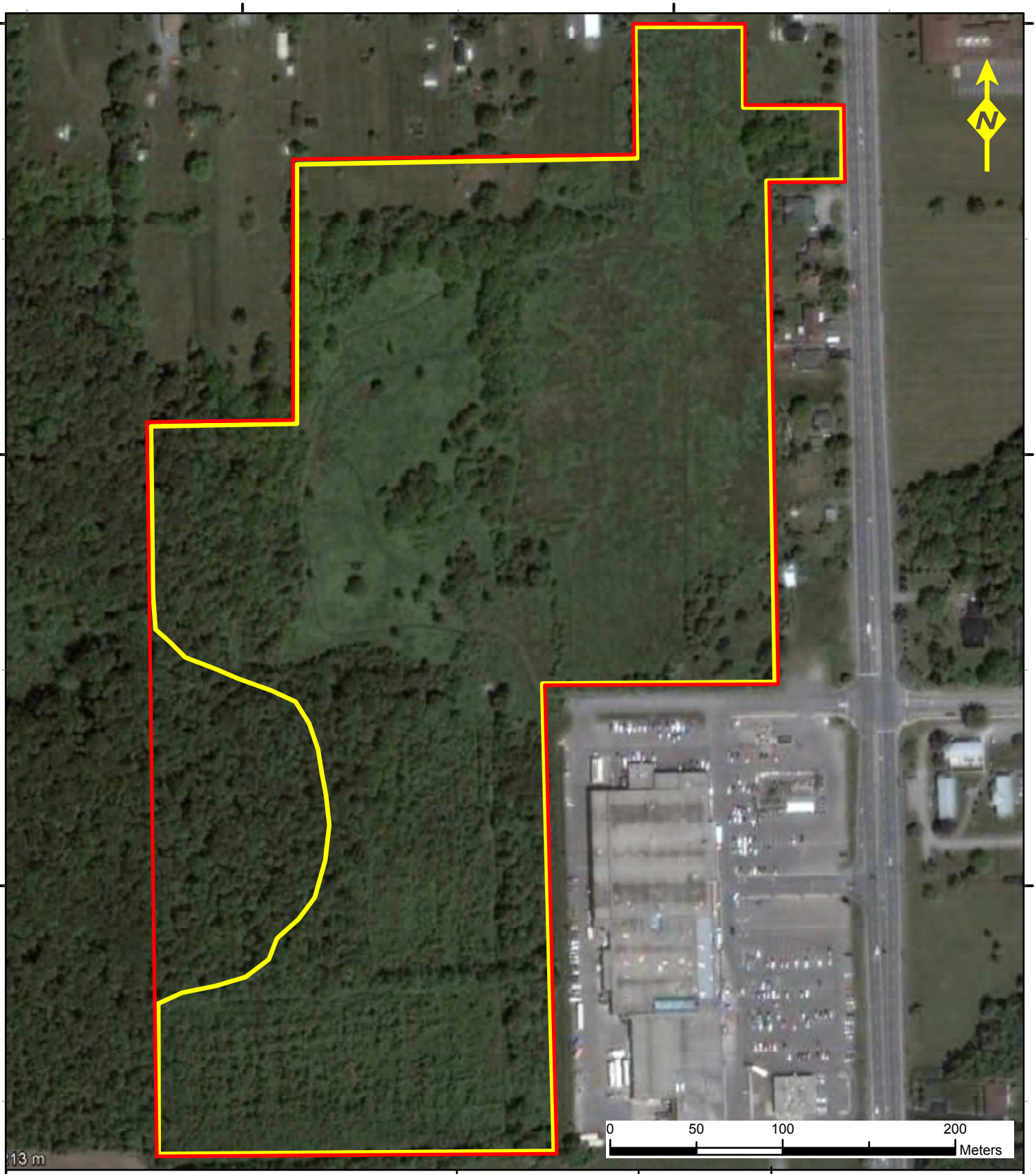


Figure 6 Approved draft plan of Northland Estates Subdivision



Legend

- Property Boundary
- Development Limits

Northings (m)

Eastings (m)

641250

641500

Drawn By: MC Checked By: RM	Client: Masongsong Associates	Groundwater Environmental Management Services Inc. www.gemservicesinc.com
SOURCE: OBM Map NAD 1983 Zone 17N Elevations in m ASL Google Earth 2012	January 2, 2014	**Proposed Development Limits**
	Scale: 1: 3,000	Project No. 13-12224 / Figure No. 7

The current land use has attempted to protect the entire swampland area extending into the property in an attempt to retain sensitive natural features that had originally been designated for removal. It is understood that the areas for which revisions have been made to preserve ecological function are areas that do not provide corridor habitat and are on the edge of larger features, however, the importance of retention in any form was considered and has been incorporated into this plan.

4.3 Environmental Effects of the Development Proposal

As mentioned, natural features found on site include a hardwood swamp and significant woodlands. Although these areas have been approved in concept for development (draft plan approval – plan of subdivision 26-T-12-2000-02), the proposed limit of development retains the entire swamp ecosite as this area is felt to be the most ecologically sensitive ecosite on the property. This preservation results in retention of the swamp ecosite along the west boundary to lessen impacts on the hydrology and ecological function on the swampland as a whole, most of which is located on adjacent property to the west. Overall, the property is on the periphery of regionally significant woodlands and wetland complex and a potentially provincially significant wetland complex, but does not represent a corridor as it does not connect to natural features on the north, east or south border. Thus, GEMS does not anticipate a negative effect on the connectivity of the surrounding natural systems. In addition, the revised proposed development will include edge management best practices within the development limit, to increase conservation of natural features.

The revised development limit results in minimal removal of the dominant canopy within the swampland area, and the majority of developable land is of cultural, not natural, origin. The development will also likely decrease surface water infiltration due to the creation of impervious surfaces, but decreased infiltration will be negated through the use of Low Impact Development (LID) water retention and infiltration techniques, with particular attention to areas adjacent to the swampland.

Best management practices and recommendations, including methods to mitigate negative impacts, outlined below in section 4.4 will be incorporated into the design and construction works to prevent impacts.

4.4 Mitigation Measures

The following recommendations provided below can be used to minimize potential impact to the swampland area during construction activities and upon construction completion. Use of these recommendations can be adopted into further site reporting, such as the water balance.

1) Designated swamp areas found on site will be preserved. Woodland areas on site will be cleared however edge management best practices will be utilized where applicable.

2) Existing naturalized areas along the property edge (proposed development limit) will be maintained.

3) Adaptation to the design of the on-site stormwater management facility and use of bio-swales to provide infiltration to adjacent wetted features should be considered during water balance and storm water management studies, to ensure that surrounding ecological feature form and function are preserved.

4) Required tree removal will be performed outside of the migratory bird breeding period (March 15 – July 31) with the proper tree removal permits.

5) An erosion and sediment control plan will be implemented to ensure that the site is contained prior to and during construction and will remain in effect until disturbed soil is stabilized. Siltation control fencing will be installed along the perimeter of the property/construction disturbance area within the limit of development. The site will be evaluated prior to installation of erosion and sediment control measures to address areas of specific concern regarding water flow during rain events.

6) Any removal of water from excavations will be contained and treated on-site utilizing an adequately sized sediment bag for removal of fines prior to release into the natural environment.

7) Inspection of erosion and sediment control measures will be conducted by a qualified individual on a weekly basis and following major rain and thaw events, with any deficiencies repaired immediately, as per the *Erosion and Sediment Control Guideline for Urban Areas, GGHCA, December 2006*.

8) All activities, including the maintenance of construction machinery, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the natural environment. Petroleum products will be kept at minimum 30 metres from the limit of development to prevent any impact to the natural area.

9) The prevention of increased runoff can be obtained through proposed LID stormwater management techniques. LID measures include direction of stormwater runoff from parking areas and roads to bioretention areas using filter buffer strips to mitigate hydrocarbons and TSS. At the time of each site plan development for the lots and blocks, LID should be implemented to include measures such as porous paving, infiltration systems, cisterns for grey rain water reuse, green roofs, etc.

10) All plantings / landscaping adjacent to the natural area will be made up of native plant species that reflect extant vegetation.

Providing that the above recommendations are implemented for the duration of construction activities, the site is sufficiently stabilized upon completion, and activities following occupancy of the development have regard for the adjacent natural feature, it is anticipated that no adverse impacts to the adjacent natural feature will result from the proposed development.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The majority of the land on the Northland Subdivision property was actively farmed until at least 1934, and is a reflection of both current and post cultural disturbance. However, the western portion of the property, as well as adjacent green space, is of natural origin and represents significant wetlands and woodlands. At present, the approved draft plan of development (see Section 4.1) does not include a vegetative buffer along this boundary. However, the proposed Limit of Development provides the conserve the entire swamp ecosite found on the property as this area is felt to be the most ecologically sensitive ecosite on the property.

Based on the known ecology of the proposed development site, it is unlikely that there will be significant adverse impacts to species at risk.

At present, GEMS believes that there are no constraints to development of the Northland Subdivision development.

LIMITATIONS

This report was prepared for the assessment of natural heritage features and evaluation of site specific development impact for the Northland Estate Subdivision, located in the City of Port Colborne, Ontario. Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the sole responsibility of such third parties.

GEMS has relied in good faith on the data and information provided within identified materials as noted in this report. GEMS has assumed that the information provided was factual and accurate. GEMS accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

We trust this information will meet your current requirements. Please do not hesitate to contact the undersigned should you have any questions or require additional information.

Yours truly,
Groundwater Environmental Management Services Inc.

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Gretel Green M.Sc.
Ecologist

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Appendix A - Photographic log of ecosites

CUT/CUM – Cultural Thicket


07/06/2013 09:06

Appendix A Photographic log of ecosites (con't)

CUW1 – Mineral Cultural Woodland

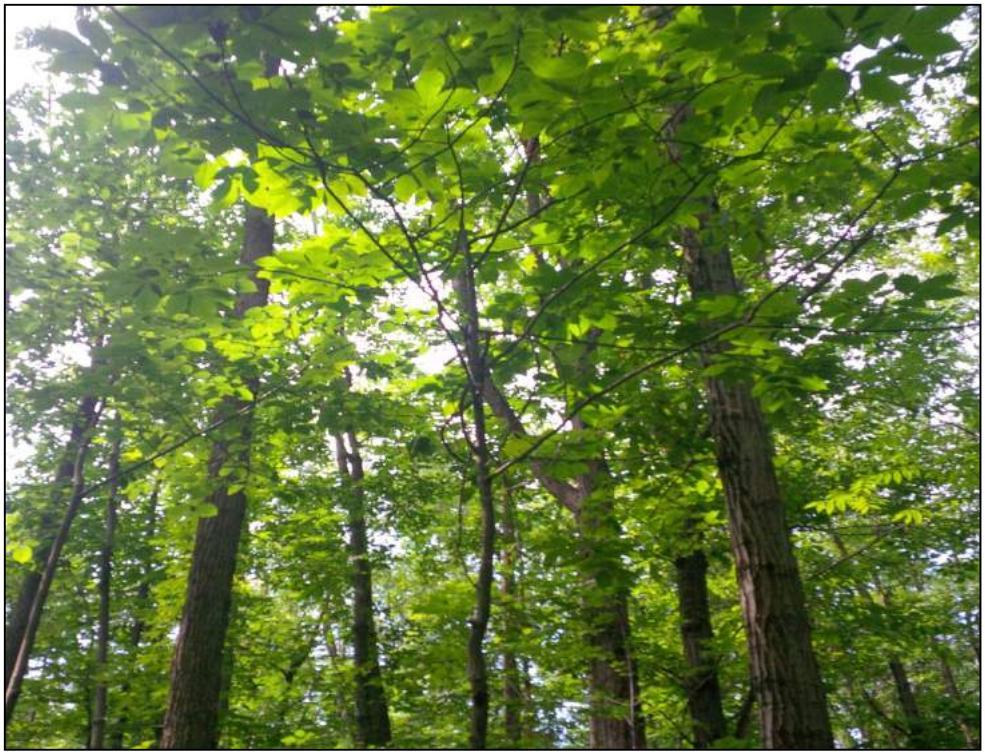
Appendix A Photographic log of ecosites (con't)

FOD9 – Moist Oak Deciduous Forest




Appendix A Photographic log of ecosites (con't)

SWD1 – Oak Mineral Deciduous Swamp



APPENDIX B: Birds observed at the proposed Northland Estates located in Port Colborne

Common Name	*Scientific Name*	Species at Risk (federally)	G-Rank	S-Rank	Species at Risk (Provincial)
Red winged blackbird	*Agelalus phoneniiceus*	Not At Risk	G5	S4	Not At Risk
Cedar waxwing	*Bombycilla cedrorum*	Not At Risk	G5	S5	Not At Risk
Common yellowthroat	*Geothlypis trichas*	Not At Risk	G5	S5B	Not At Risk
Killdeer	*Charadrius vociferus*	Not At Risk	G5	S4B	Not At Risk
Rock dove	*Columba livia*	Not At Risk	G5	S5B	Not At Risk
Northern Cardinal	*Cardinalis cardinalis*	Not At Risk	G5	S5	Not At Risk
American crow	*Corvus brachyrhynchos*	Not at Risk	G5	S5B	
Yellow warbler	*Dendroica petechia*		G5	S4B	
Pileated woodpecker	*Dryocopus pileatus*	Not At Risk	G5	S5	Not At Risk
Yellow oriole	*Icterus galbula*	Not At Risk	G5	S4B	Not At Risk
American Goldfinch	*Carduelis tristis*	Not At Risk	G5	S5B	Not At Risk
Song sparrow	*Melospiza melodia*	Not At Risk	G5	S5	Not At Risk
Brown headed cowbird	*Molothrus ater*	Not At Risk	G5	S4B	Not At Risk
Common grackle	*Quiscalus quiscula*	Not At Risk	G5	S5B	Not At Risk
Field sparrow	*Spizella pusilla*	Not At Risk	G5	S5B	Not At Risk
Starling	*Stumus vulgaris*	Not At Risk	G5	S5B	Not At Risk
Tree swallow*	*Tachycineta bicolor*	Not At Risk	G5	S5B	Not At Risk
American robin	*Turdus migratorius*	Not At Risk	G5	S5	Not At Risk
Northern flicker	*Colaptes auratus*	Not At Risk	G5	S5B	Not At Risk

CODES:

G- Rank - Global Ranks

G5 – Very Common, demonstrable secure under present conditions

S-Rank – Sub national ranks

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

S5 - **Secure**—Common, widespread, and abundant in the nation or state/province

S#B – Breeding season status

APPENDIX C: Field Survey Forms

Breeding Bird Field Forms – Whip-poor-will and Common Nighthawk Surveys

Whip-Poor-Will & Knighthawk Survey Data Sheet

Date: June 22, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

GEMS Data Sheet 1 of 2

Site Location: See map Full moon - moon rise 8:14 pm Survey Start 9:20pm Sunset 9:04pm

Beaufort Sky Code: 1 Some clouds Beaufort Wind Code: 1

Survey started 9:20 pm # of Individuals Ended survey 10:10pm

Listening Station #	Species	Observed	Heard	# of minutes at Station	NOTES
1		None	None	3min	
2		None	None	walked by 1min	grasses dominate
3		None	None	3min	grasses dominate
4		None	None	1min	Grasses dominate
5		None	None	1min	seasonal sumac sumgrass
6		None	None	3min	sumac sumgrass
7		None	None	1min	50/50 grass/shrub
8		None	None	3min	50/50 grass shrub
9		None	None	1min	trees / shrubs grasses
10		None	None	3min	thicket w/some open spots
11		None	None	1min	thicket w/some open spots

Weather Clear (P. Cloudy) Overcast Rain | **Wind** Calm (Light) Strong | **Air (°C)** 23°C

VWG Type open field (meadow) / (thicket) woodlands marsh bog fen swamp Other?

Surface Water seasonal wet (dry)

Primary Vegetation (grasses) (thickets) trees coniferous deciduous mixed

% of area surveyed covered in trees	0	(1-25)	25-50	>50
% of area surveyed covered in shrubs	0	1-25	(25-50)	>50
% of area surveyed covered in grasses	0	1-25	(25-50)	>50

ELC Community

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	(Light)	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	(Partly Cloudy) (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Listening Stations surveyed 30 minutes after sunset on full moon evenings.

Notes: *(activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N ↑

Additional Comments/Notes to Project Manager: June 22, 2013

☆ 2-3 Knighthawks heard overhead on Amphibian Survey June 9.

One seen landing on Canadian Tire roof

Not sure why none where observed during this survey

Whip-Poor-Will & Knighthawk Survey Data Sheet

Date: July 5, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map New moon rise 3:45 am Sunset 8:58

Beaufort Sky Code: 1 Beaufort Wind Code: 0 Survey started 9:15

GEMS Data Sheet 1 of 2

Survey start 9:15 pm # of Individuals Survey ended 10:15 pm

Listening Station #	Species	Observed	Heard	# of minutes at Station	NOTES
1		0	0	3	Stations with
2		0	0	1	good surveying
3		0	0	3	views were
4		0	0	1	areas where
5		0	0	1	
6		0	0	3	3 min surveys
7		0	0	1	completed.
8		0	0	3	
9		0	0	1	
10		0	0	3	
11		0	0	1	

Weather Clear (P. Cloudy) Overcast Rain **Wind** (Calm) Light Strong **Air (°C)** 24°C

VWG Type open field (meadow) (thicket) woodlands marsh bog fen swamp Other?

Surface Water seasonal wet (dry)

Primary Vegetation (grasses) (thickets) trees coniferous deciduous mixed

% of area surveyed covered in trees	0	1-25	25-50	>50	Some areas dom Hydromag
% of area surveyed covered in shrubs	0	1-25	25-50	>50	Some areas shrubs
% of area surveyed covered in grasses	0	1-25	25-50	>50	4-5 areas all grasses

ELC Community

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	(Calm)	Smoke Rises Vertically
1	2	3.2	(Light)	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Listening Stations surveyed 30 minutes after sunset on full moon evenings.

Notes: *(activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

Additional Comments/Notes to Project Manager:

Breeding Bird Field Forms – Meadowlark and Bobolink Surveys

Meadowlark/Bobolink Survey Data Sheet

GEMS

Data Sheet ____ of ____

Date: June 8, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map Sunrise 5:36 am

Beaufort Sky Code: 2 cloudy Beaufort Wind Code: 0 calm

Survey start 5:55 # of Individuals 8:05 Am

Transect Line # and Station # (TL#/S#)	Species	Observed	Heard	# of minutes at Station	NOTES
1		0	0	10 min	
2		0	0	10 min	
3		0	0	10 min	
4		0	0	5 min	
5		0	0	10 min	
6		0	0	5 min	
7		0	0	10 min	
8		0	0	10 min	
9		0	0	5 min	
10		0	0	5 min	
11		0	0	10 min	

Weather Clear P. Cloudy (Overcast) Rain **Wind** (Calm) Light Strong **Air (°C)** 17°C

VWG Type open field (meadow) (thicket) (woodlands) marsh bog fen swamp Other?

Surface Water seasonal wet (dry)

Primary Vegetation (grasses) (thickets) (trees) coniferous deciduous mixed

% of area surveyed covered in trees	0	1-25	(25-50)	>50	in
% of area surveyed covered in shrubs	0	1-25	(25-50)	>50	
% of area surveyed covered in grasses	0	1-25	(25-50)	>50	

ELC Community

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Stations set up along parallel transects 250m apart. Listen at each station for 10 minutes. 3 surveys one week apart at dawn.

Notes: *(activity observed, management concerns, human impacts/disturbances)*

The meadow areas are succeeding into shrubs/ thickets
not enough open area. much sumac + rose of sharon
SAW a number of red wing blackbirds, goldfinch

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N ↑

Additional Comments/Notes to Project Manager:

Meadowlark/Bobolink Survey Data Sheet

Date: July 6 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map Sunrise 5:43 Am

Beaufort Sky Code: 0 Sunny/Hot Beaufort Wind Code: 0

GEMS

Data Sheet ____ of ____

: Start Sunny 5:50 Am # of Individuals End 7:50 Am

Transect Line # and Station # (TL#/S#)	Species	Observed	Heard	# of minutes at Station	NOTES
1		0	0	10 min	
2		0	0	10 min	
3		0	0	3 min	
4		0	0	10 min	
5		0	0	10 min	
6		0	0		
7		0	0		
8		0	0		
9		0	0		
10		0	0		
11		0	0		

Weather (Clear) P. Cloudy Overcast Rain **Wind** Calm Light Strong **Air (°C)** 24°C

VWG Type open field (meadow) (thicket) (woodlands) marsh bog fen swamp
Other?

Surface Water seasonal wet (dry)

Primary Vegetation (grasses) (thickets) (trees) coniferous deciduous mixed

% of area surveyed covered in trees	0	1-25	(25-50)	>50	
% of area surveyed covered in shrubs	0	1-25	(25-50)	>50	Mix Succeeding
% of area surveyed covered in grasses	0	1-25	(25-50)	>50	

ELC Community

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Stations set up along parallel transects 250m apart. Listen at each station for 10 minutes. 3 surveys one week apart at dawn.

Notes: *(activity observed, management concerns, human impacts/disturbances)*

red winged blackbirds
saw cedar waxwing (see bird list other note)

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N ↑

Additional Comments/Notes to Project Manager:

Tons of mosquitoes – bring strong bug repellant
lots of ticks!

Amphibian Survey Field Forms

Amphibian Survey Data Sheet (Frogs & Toads)

GEMS

Data Sheet 1 of 2

Date: Apr. 20, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See Map LOCATION 1

Visual (#'s)	Time:	Start: 7:30	End: 7:45	Total: 15
Species	Adult	Subadult	Larvae/Tadpole	Egg Mass
NONE				

Calling	Time	Start: 8:20	End: 8:23	Total: 3 min		
Species	Spring Peeper	Chorus frog	Wood frog			
None Heard						
Individual Counted - no overlapping calls (one)						
Individual Counted - no overlapping calls (two)		5	3-5			
Calls Distinguishable - calls overlapping						
Full Continuous Chorus - calls not distinguishable	X					

Weather Clear P. Cloudy Overcast Rain **Wind** Calm Light Strong Air (°C) 4°C

Water Color Clean Stained **Turbidity** Clear Cloudy Water (°C)

Origin Natural Man Made **Drainage** Permanent Occasional None

Description (Other?) Lake/Pond Perm/Temp Marsh Bog/Fen Stream Perm/Inter River Spring Perm/Inter Beaver Pond Oxbow

Flow None Slow Moderate Fast **Depth** <1m 1-2m >2m

Primary Substrate Silt/Mud Sand/Cobble Cobble Bedrock Other

% of area surveyed with emergent vegetation 0 1-25 25-50 >50

Emergent veg. sp. (order of abundance)

Notes: (*activity observed, management concerns, human impacts/disturbances*)

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

See MAP attached for location

X edge of ponded water

Additional Comments/Notes to Project Manager:

Amphibian Survey Data Sheet (Frogs & Toads)

GEMS

Data Sheet 1 of 2

Date: May 5, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See Map LOCATION 1

Visual (#'s)	Time:	Start:	End:	Total:
	Species	Adult	Subadult	Larvae/Tadpole	Egg Mass
	Too Dark to See				

Calling	Time	Start: 9:25	End: 9:28	Total: 3 min

Species	Leopard frog	American toad				
None Heard						
Individual Counted - no overlapping calls (one)						
Individual Counted - no overlapping calls (two)	5-7	3-4				
Calls Distinguishable - calls overlapping						
Full Continuous Chorus - calls not distinguishable						

Weather (Clear) P. Cloudy Overcast Rain **Wind** Calm (Light) Strong Air (°C) 15°C

Water Color Clean Stained **Turbidity** Clear Cloudy Water (°C)

Origin (Natural) Man Made **Drainage** Permanent Occasional (None)

Description Lake/Pond (Marsh) Bog/Fen Stream River Spring Beaver Pond Oxbow

(Other?) Perm/Temp Perm/Inter Perm/Inter

Flow (None) Slow Moderate Fast **Depth** (<1m) 1-2m >2m

Primary Substrate (Silt/Mud) Sand/Cobble Cobble Bedrock Other

% of area surveyed with emergent vegetation 0 (1-25) 25-50 >50

Emergent veg. sp. (order of abundance)

Notes: (*activity observed, management concerns, human impacts/disturbances*)

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N ↑

See Attached map for site location

Additional Comments/Notes to Project Manager:

On way to Sampling heard
Nighthawks - 2
think they are nesting on
Canadian Tire.

Amphibian Survey Data Sheet (Frogs & Toads)

Date: June 9, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See Map LOCATION 1

GEMS

Data Sheet ___ of ___

Visual (#'s)	Time:	Start:	End:	Total:	
	Species	Adult	Subadult	Larvae/Tadpole	Egg Mass
	NA				

Calling	Time	Start: 9:10	End: 9:13	Total: 3 min	
Species		Green			
None Heard					
Individual Counted - no overlapping calls (one)					
Individual Counted - no overlapping calls (two)		6			
Calls Distinguishable - calls overlapping					
Full Continuous Chorus - calls not distinguishable					

Weather Clear (P. Cloudy) Overcast Rain **Wind** (Calm) Light Strong Air (°C) 20°C

Water Color Clean Stained **Turbidity** Clear Cloudy Water (°C)

Origin (Natural) Man Made **Drainage** (Permanent) Occasional None

Description (Other?) Lake/Pond Perm/Temp Marsh Bog/Fen Stream Perm/Inter River Spring Perm/Inter Beaver Pond Oxbow

Flow (None) Slow Moderate Fast **Depth** (<1m) 1-2m >2m

Primary Substrate (Silt/Mud) Sand/Cobble Cobble Bedrock Other

% of area surveyed with emergent vegetation 0 (1-25) 25-50 >50

Emergent veg. sp. (order of abundance)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

A number of ATV's in property & be careful

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N ↑

Heard Knighthawks atleast 2

Saw one settle on Canadian Tire roof may be nesting there.

Additional Comments/Notes to Project Manager:

Amphibian Survey Data Sheet (Frogs & Toads)

GEMS

Data Sheet 1 of 2

Date: April 20, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See Map LOCATION 2

Visual (#'s)	Time:	Start: 8:45	End: 8:48	Total: 3 min
	Species	Adult	Subadult	Larvae/Tadpole	Egg Mass
	N/A				

Calling	Time	Start: 8:45	End: 8:48	Total: 3 min
Species						
None Heard	X					
Individual Counted - no overlapping calls (one)						
Individual Counted - no overlapping calls (two)						
Calls Distinguishable - calls overlapping						
Full Continuous Chorus - calls not distinguishable						

Weather	Clear	(P. Cloudy)	Overcast	Rain	**Wind**	Calm	(Light)	Strong	Air (°C) 4°C
Water Color	Clean	Stained	NA		**Turbidity**	Clear	Cloudy		Water (°C)

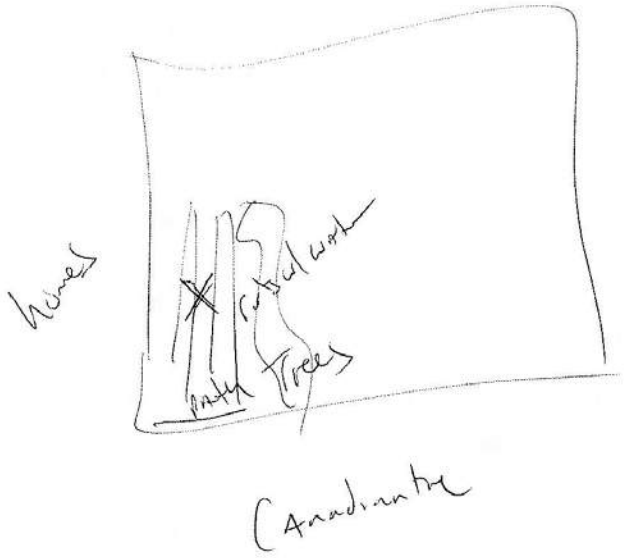
Origin	Natural	(Man Made)	**Drainage**	Permanent	Occasional	(None)			
Description (Other?)	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow	
	Perm/Temp			(Perm/Inter)	Seasonal	Perm/Inter			
Flow	(None)	Slow	Moderate	Fast	**Depth**	(<1m)	1-2m	>2m	
Primary Substrate		(Silt/Mud)	Sand/Cobble	Cobble	Bedrock	Other			
% of area surveyed with emergent vegetation		(0)	1-25	25-50	>50				
Emergent veg. sp. (order of abundance)									

Notes: *(activity observed, management concerns, human impacts/disturbances)*

Adjacent to residential development
water pooled in tire ruts

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N



Additional Comments/Notes to Project Manager:

Amphibian Survey Data Sheet (Frogs & Toads)

Date: May 5, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See Map LOCATION 2

GEMS

Data Sheet ___ of ___

Visual (#'s)	Time:	Start: 9:08	End: 9:13	Total: 5min
Species	Adult	Subadult	Larvae/Tadpole	Egg Mass

Calling	Time	Start: 9:08	End: 9:08 13	Total: 5min
Species				
None Heard	X			
Individual Counted - no overlapping calls (one)				
Individual Counted - no overlapping calls (two)				
Calls Distinguishable - calls overlapping				
Full Continuous Chorus - calls not distinguishable				

Weather (Clear) P. Cloudy Overcast Rain **Wind** Calm (Light) Strong Air (°C) 15°C

Water Color Clean Stained **Turbidity** Clear Cloudy Water (°C)

Origin Natural (Man Made) **Drainage** Permanent Occasional (None)

Description Lake/Pond Marsh Bog/Fen (Stream) River Spring Beaver Pond Oxbow

(Other?) Perm/Temp Road Ruts (Perm/Inter) Perm/Inter

Flow (None) Slow Moderate Fast **Depth** (<1m) 1-2m >2m

Primary Substrate (Silt/Mud) Sand/Cobble Cobble Bedrock Other

% of area surveyed with emergent vegetation (0) 1-25 25-50 >50

Emergent veg. sp. (order of abundance)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

adjacent to residential development

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

See Attached Map

Additional Comments/Notes to Project Manager:

Amphibian Survey Data Sheet (Frogs & Toads)

GEMS

Date: June 9, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See Map LOCATION 2

Data Sheet ___ of ___

Visual (#'s)	Time:	Start:	End:	Total:
	Species	Adult	Subadult	Larvae/Tadpole	Egg Mass

Calling	Time	Start: 9:20	End: 9:25	Total: 5 minutes

Species						
None Heard						
Individual Counted - no overlapping calls (one)						
Individual Counted - no overlapping calls (two)						
Calls Distinguishable - calls overlapping						
Full Continuous Chorus - calls not distinguishable						

Weather Clear (P. Cloudy) Overcast Rain | **Wind** (Calm) Light Strong | Air (°C) 20 °C

Water Color Clean Stained | **Turbidity** Clear Cloudy | Water (°C)

Origin Natural (Man Made) | **Drainage** Permanent Occasional None

Description Lake/Pond Marsh Bog/Fen Stream River Spring Beaver Pond Oxbow

(Other?) Perm/Temp ruts (Perm/Inter) Perm/Inter

Flow None Slow Moderate Fast | **Depth** <1m 1-2m >2m

Primary Substrate (Silt/Mud) Sand/Cobble Cobble Bedrock Other

% of area surveyed with emergent vegetation (0) 1-25 25-50 >50

Emergent veg. sp. (order of abundance)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

tire ruts

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

Additional Comments/Notes to Project Manager:

Reptilian Field Forms

Amphibian Survey Data Sheet (Snakes & Salamanders)

GEMS

Data Sheet 1 of 2

Date: April 30 / 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 1 partly Cloudy Beaufort Wind Code: 1 light

Time Start: 6:15	End: 6:40	Total: 35 m.n	
Species	**Adult**	**Subadult**	**Larvae/Tadpole**	**LOCATION**
None	0			CB1
None				CB2
None				CB3
None				CB4
None				CB5
None				CB6

Weather	Clear	P. Cloudy	Overcast	Rain	**Wind**	Calm	Light	Strong	Air (°C) 4°C
Water Color		~~Clean~~	Stained		**Turbidity**	Clear	Cloudy		Water (°C)

Origin	Natural	Man Made		**Drainage**	Permanent		Occasional	None
Description	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow
(Other?)	Perm/Temp			Perm/Inter		Perm/Inter		
Flow	None	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m
Primary Substrate		Silt/Mud	Sand/Cobble	Cobble	Bedrock	Other		
% of area surveyed with emergent vegetation				0	1-25	25-50	>50	
Emergent veg. sp. (order of abundance)								

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

Very cold for April

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)* N ↑

See map attached for Snake cover board locations 1 through 6 approved during walk with MNR

Additional Comments/Notes to Project Manager:

Amphibian Survey Data Sheet (Snakes & Salamanders)

GEMS

Data Sheet 1 of 2

Date: MAY 5, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 0 clear Beaufort Wind Code: 1 light

Time Start: 6:30 pm	End: 6:50pm	Total: 20 min	
Species	**Adult**	**Subadult**	**Larvae/Tadpole**	LOCATION
				CB1
				CB2
Common garter snake	1			CB3
				CB4
				CB5
				CB6

Weather	Clear	P. Cloudy	Overcast	Rain	**Wind**	Calm	Light	Strong	Air (°C) 5°C
Water Color		Clean	Stained		**Turbidity**	Clear	Cloudy		Water (°C)

Origin	Natural	Man Made		**Drainage**	Permanent		Occasional	None
Description	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow
(Other?)	Perm/Temp			Perm/Inter		Perm/Inter		
Flow	None	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m
Primary Substrate		Silt/Mud	Sand/Cobble	Cobble		Bedrock	Other	
% of area surveyed with emergent vegetation				0		1-25	25-50	>50
Emergent veg. sp. (order of abundance)								

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

Additional Comments/Notes to Project Manager:

Ticks + mosquitoes

Amphibian Survey Data Sheet (Snakes & Salamanders)

GEMS

Data Sheet 1 of 2

Date: June 8, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 1 calm Beaufort Wind Code: 1 cloudy

Time Start: 9:00 AM	End: 9:35 AM	Total: 35 min	
Species	**Adult**	**Subadult**	**Larvae/Tadpole**	**LOCATION**
common garter snake	1			CB6
milk snake	1			CB6
blue spotted salamander	1			CB2
Ø				CB1
Ø				CB3
Ø				CB4
Ø				CB5

Weather	Clear P. Cloudy (Overcast) Rain	**Wind**	(Calm) Light Strong	Air (°C)	17°C
Water Color	Clean Stained	**Turbidity**	Clear Cloudy	Water (°C)	

Origin	Natural	Man Made	**Drainage**	Permanent		Occasional		None	
Description	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow	
(Other?)	Perm/Temp			Perm/Inter		Perm/Inter			
Flow	None	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m	
Primary Substrate		Silt/Mud	Sand/Cobble	Cobble		Bedrock	Other		
% of area surveyed with emergent vegetation				0		1-25	25-50	>50	
Emergent veg. sp. (order of abundance)									

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

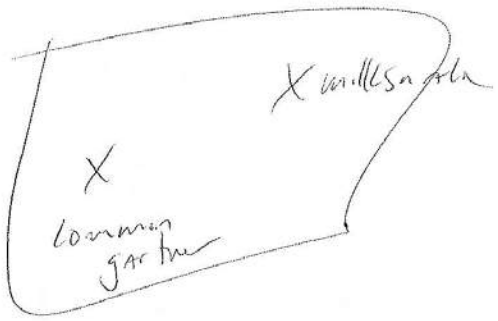
Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

blue spotted salamander pregnant

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N



Additional Comments/Notes to Project Manager:

Mosq. best + tick very bad

Amphibian Survey Data Sheet (Snakes & Salamanders)

GEMS

Data Sheet 1 of 2

Date: July 6, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 1 a few clouds Beaufort Wind Code: 0 calm

Time Start: 9:35	End: 10:00	Total: 25 min	
Species	**Adult**	**Subadult**	**Larvae/Tadpole**	**LOCATION**
Blue spotted	1			CB2
∅				CB1
∅				CB3
∅				CB4
∅				CB5
∅				CB6
				HOT

Weather	Clear	P. Cloudy	Overcast	Rain	**Wind**	Calm	Light	Strong	Air (°C) 22°C
Water Color	Clean	Stained			**Turbidity**	Clear	Cloudy		Water (°C)

Origin	Natural	Man Made		**Drainage**	Permanent	Occasional	None	
Description	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow
(Other?)	Perm/Temp			Perm/Inter		Perm/Inter		
Flow	None	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m
Primary Substrate	Silt/Mud	Sand/Cobble	Cobble	Bedrock	Other			
% of area surveyed with emergent vegetation	0	1-25	25-50	>50				
Emergent veg. sp. (order of abundance)								

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: (*activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

Additional Comments/Notes to Project Manager:

Amphibian Survey Data Sheet (Snakes & Salamanders)

GEMS

Data Sheet ____ of ____

Date: August 24, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 0 no wind Beaufort Wind Code: 0 no clouds

Time Start: 9:30am	End: 9:55	Total: 25 minutes

Species	Adult	Subadult	Larvae/Tadpole	LOCATION
0				CB1
0				CB2
0				CB3
0				CB4
0				CB5
0				CB6

Weather	Clear	P. Cloudy	Overcast	Rain	**Wind**	Calm	Light	Strong	Air (°C) 22°C
Water Color		Clean	Stained		**Turbidity**		Clear	Cloudy	Water (°C)

Origin	Natural	Man Made		**Drainage**		Permanent	Occasional	None
Description	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow
(Other?)	Perm/Temp			Perm/Inter		Perm/Inter		
Flow	None	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m
Primary Substrate		Silt/Mud	Sand/Cobble	Cobble		Bedrock	Other	
% of area surveyed with emergent vegetation				0		1-25	25-50	>50
Emergent veg. sp. (order of abundance)								

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: (*activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

Additional Comments/Notes to Project Manager:

Amphibian Survey Data Sheet (Snakes & Salamanders)

GEMS

Data Sheet 1 of 2

Date: September 8, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 0 Sunny Beaufort Wind Code: 1 light

Time Start: 8:45 AM	End: 9:20 AM	Total: 35min	
Species	**Adult**	**Subadult**	**Larvae/Tadpole**	LOCATION
garter snake (common)	1			CB4
ø				CB1
ø				CB2
ø				CB3
ø				CB5
ø				CB6
leopard frog	5			along path
blue spotted salamander	1			along path under Particle Bow

Weather	Clear	P. Cloudy	Overcast	Rain	**Wind**	Calm	Light	Strong	Air (°C) 18°C
Water Color		Clean	Stained		**Turbidity**	Clear	Cloudy		Water (°C)

Origin	Natural	Man Made		**Drainage**	Permanent		Occasional		None
Description	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow	
(Other?)	Perm/Temp			Perm/Inter		Perm/Inter			
Flow	None	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m	
Primary Substrate		Silt/Mud	Sand/Cobble	Cobble	Bedrock	Other			
% of area surveyed with emergent vegetation				0	1-25	25-50	>50		
Emergent veg. sp. (order of abundance)									

Beaufort Wind Codes

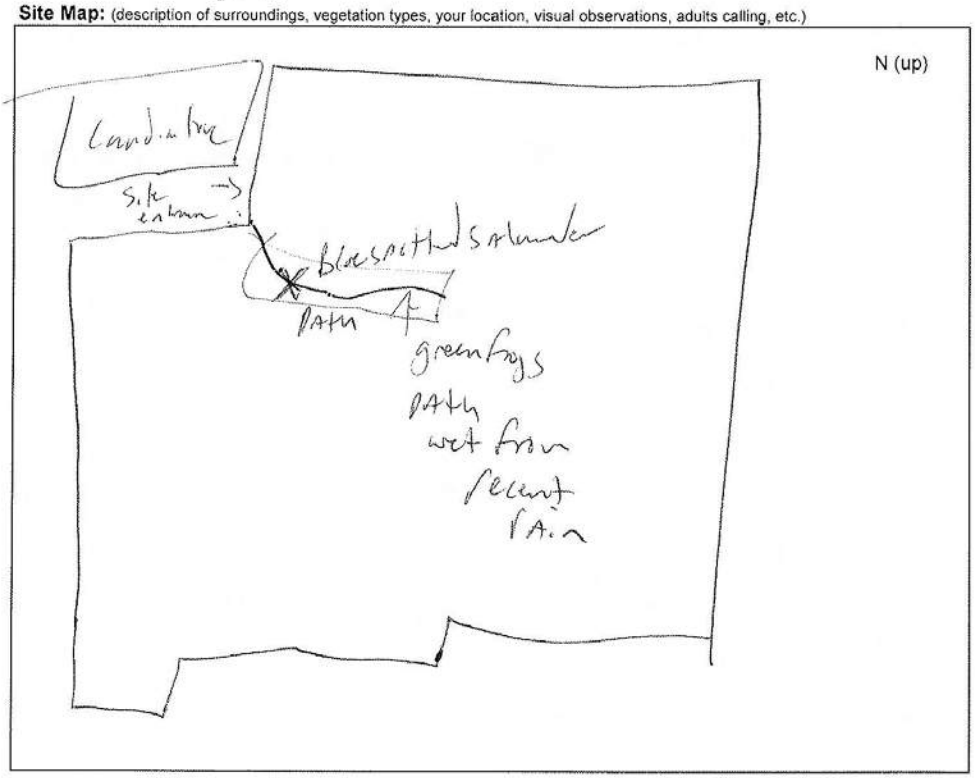
Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Sept 8

Site Map: (description of surroundings, vegetation types, your location, visual observations, adults calling, etc.)



Additional comments:

Amphibian Survey Data Sheet (Snakes & Salamanders)

GEMS

Data Sheet ____ of ____

Date: Oct 25 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: Cloudy 1 Beaufort Wind Code: Light 1

Time Start:	End:	Total:

Species	Adult	Subadult	Larvae/Tadpole	LOCATION
Ø				CB1
Ø				CB2
Ø				CB3
Ø				CB4
Ø				CB5
Ø				CB6

Weather	Clear	P. Cloudy	Overcast	Rain	**Wind**	Calm Light Strong	Air (°C) 9°C
Water Color	Clean	Stained			**Turbidity**	Clear Cloudy	Water (°C)

Origin	Natural	Man Made		**Drainage**	Permanent	Occasional	None	
Description	Lake/Pond	Marsh	Bog/Fen	Stream	River	Spring	Beaver Pond	Oxbow
(Other?)	Perm/Temp			Perm/Inter		Perm/Inter		
Flow	None	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m
Primary Substrate		Silt/Mud	Sand/Cobble	Cobble	Bedrock	Other		
% of area surveyed with emergent vegetation				0	1-25	25-50	>50	
Emergent veg. sp. (order of abundance)								

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N ↑

Additional Comments/Notes to Project Manager:

Basking Turtles Field Forms

Turtle Survey Data Sheet

Date: April 20, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 1 partly cloudy Beaufort Wind Code: 1 slight wind

GEMS

Data Sheet ____ of ____

# of Individuals			
Observed Activity *(basking, resting, etc.)*	**Species**	**Observed Habitat**	**NOTES**
NONE			

Weather	Clear	(P. Cloudy)	Overcast	Rain	**Wind**	Calm	(Light)	Strong	**Air (°C)** 4°C
Water Color	Clean	(Stained)			**Turbidity**	Clear	Cloudy		**Water (°C)**

Origin	Natural	Man Made	**Drainage**	Permanent	Occasional	None		
Description (Other?)	Lake/Pond Perm/Temp	(Marsh)	Bog/Fen	Stream Perm/Inter	River	Spring Perm/Inter	Beaver Pond	Oxbow
Flow	(None)	Slow	Moderate	Fast	**Depth**	(<1m)	1-2m	>2m
Primary Substrate	(Silt/Mud)	Sand/Cobble	Cobble	Bedrock	Other			
% of area surveyed with emergent vegetation	0	(1-25)	25-50	>50				
Emergent veg. sp. (order of abundance)								

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
6	28	44.8	Strong Breeze	Larger Branches Move
7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: (*activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

Additional Comments/Notes to Project Manager:

Turtle Survey Data Sheet

Date: May 5, 2013 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map - all locations

Beaufort Sky Code: 0 clear Beaufort Wind Code: 0 calm

GEMS

Data Sheet ____ of ____

# of Individuals			
Observed Activity *(basking, resting, etc.)*	**Species**	**Observed Habitat**	**NOTES**
NONE			

Weather	(Clear)	P. Cloudy	Overcast	Rain	**Wind**	(Calm)	Light	Strong	**Air (°C)** 15°C
Water Color	Clean	(Stained)			**Turbidity**	Clear	Cloudy		**Water (°C)**
Origin	(Natural)	Man Made	**Drainage**	(Permanent)		Occasional		None	
Description (Other?)	Lake/Pond Perm/Temp	(Marsh)	Bog/Fen	Stream Perm/Inter	River	Spring Perm/Inter	Beaver Pond	Oxbow	
Flow	(None)	Slow	Moderate	Fast	**Depth**	<1m	1-2m	>2m	
Primary Substrate		(Silt/Mud)	Sand/Cobble	Cobble	Bedrock	Other			
% of area surveyed with emergent vegetation		0	(1-25)	25-50	>50				
Emergent veg. sp. (order of abundance)									

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	Calm	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
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12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	Partly Cloudy (scattered or broken)
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: *(activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

Additional Comments/Notes to Project Manager:

Turtle Survey Data Sheet

Date: June 8, 2014 Project No. 13-12224

Project Name: EIS Northland Estates - Port Colborne

Staff: Gretel Green

Site Location: See map

Beaufort Sky Code: 1 Overcast Beaufort Wind Code: 0 calm

GEMS

Data Sheet ____ of ____

# of Individuals			
Observed Activity *(basking, resting, etc.)*	**Species**	**Observed Habitat**	**NOTES**
NONE			

Weather	Clear	P. Cloudy	(Overcast)	Rain	**Wind**	(Calm)	Light	Strong	**Air (°C)**
Water Color	Clear	(Stained)			**Turbidity**	Clear	Cloudy		**Water (°C)**

Origin	(Natural)	Man Made	**Drainage**		(Permanent)		Occasional	None
Description (Other?)	Lake/Pond Perm/Temp	(Marsh)	Bog/Fen	Stream Perm/Inter	River	Spring Perm/Inter	Beaver Pond	Oxbow
Flow	(None)	Slow	Moderate	Fast	**Depth**	<1m	(1-2m)	>2m
Primary Substrate		(Silt/Mud)	Sand/Cobble	Cobble	Bedrock		Other	
% of area surveyed with emergent vegetation			0	1-25	(25-50)		>50	
Emergent veg. sp. (order of abundance)								

Beaufort Wind Codes

Wind Code	Wind Speed (mph)	Wind Speed (km/h)	Description	Visual Cues
0	1	1.6	(Calm)	Smoke Rises Vertically
1	2	3.2	Light	Smoke Drifts
2	5	8	Light Breeze	Leaves Rustle
3	10	16	Gentle Breeze	Light Branches Sway
4	15	24	Moderate Breeze	Dust & Branches Move
5	21	33.6	Fresh Breeze	Small Trees Sway
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7	35	56	Moderate Gale	Trees Move
8	42	67.2	Fresh Gale	Twigs Break
9	50	80	Strong Gale	Branches Break
10	59	94.4	Whole Gale	Trees Fall
11	69	110.4	Storm	Violent Blasts
12	75	120	Hurricane	Structures Shake

Beaufort Sky Codes

Sky Code	Description
0	Clear (no cloud at any level)
1	(Partly Cloudy (scattered or broken))
2	Continuous Layer(s) of Blowing Snow
3	Sandstorm, Dust Storm, or Blowing Snow
4	Fog, Thick Dust or Haze
5	Drizzle
6	Rain
7	Snow or Snow and Rain Mixed
8	Shower(s)
9	Thunderstorm(s)

Notes: (*activity observed, management concerns, human impacts/disturbances)*

Site Map: *(description of surrounding, vegetation types, your location, visual observations, egg masses, adults calling, etc.)*

N

Additional Comments/Notes to Project Manager:

Appendix C

GEMS 2020 Constraint Report

Groundwater Environmental Management Services

Groundwater Environmental Management Services Inc.

Constraints Summary Report

Northlands Development

Prepared For:
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GEMS Project: 19-181012

October 14, 2020
Revised: December 16, 2020

GEMS
Groundwater Environmental Management Services

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1.0 Introduction

Groundwater Environmental Management Services (GEMS) was retained by 2600261 Ontario Inc. to complete an Environmental Impact Study (EIS). Prior to the EIS the constraints to development on the property known as Northlands Subdivision located at part of Lot 31, Concession 3 in Port Colborne, Ontario (Site) are required. This Constraints Summary Report is being completed to outline the developable limits on the Site, which will form part of the conditions regarding the development of the land. The location of the Site is depicted on Figure 1.

This Summary Report will specifically provide a discussion of existing natural heritage features on and immediately adjacent to the Site that would impact the developable area within the property boundaries. A brief discussion on the potential impacts to these features due to the proposed residential development is also included. Figure 2 depicts the Site and proposed developable limits based on field-truthing and aerial imagery.

GEMS prepared a Terms of Reference (dated December 5, 2018) in order to update the original GEMS EIS completed for the site. The Terms of Reference was submitted to Niagara Peninsula Conservation Authority (NPCA), the Region of Niagara (Region), the City of Port Colborne (City) and the Ministry of Natural Resources and Forestry (MNRF). Comments about the Terms of Reference were provided on March 4, 2019 by the Region.

Appendix A includes a copy of the Terms of Reference and correspondence. Once the proposed development limits are confirmed GEMS will work with the engineering team to provide an updated EIS for the development.

1.1 Current Conditions

The Site is currently undeveloped with evidence of trails. Historically, the Site was farmed, and periodically mowed following cessation of farming activities. Successional thicket-type vegetation comprises a large area of the Site to the east while the west side of the Site transitions into wetland and a large woodland area.

The portion of the wetland that is within the Site was staked in consultation with NPCA and the Region to confirm accurate boundaries. The boundary of the wetland on the Site was staked by GEMS on August 7, 2019 in collaboration with NPCA and Region staff. Correspondence between GEMS and NPCA is provided in Appendix A and the staked wetland boundary can be seen on Figure 2.

Regional criteria have been used to determine if the woodland present can be classified as ‘Significant Woodland’ and is further discussed in Section 4.2.

1.2 Previous Report

A previous EIS report prepared by GEMS dated April 2014 and provided under separate cover, was completed for the Site. The report was completed in support of a residential development plan with draft plan approval (26-T-12-2000-02) and outlined the current conditions at that time. The 2014 relevant policy applicable to the Site, the findings of field investigations and the

opportunities, constraints and mitigation measures for the proposed development were also included within the report.

It was concluded that a majority of the land on the Site would be developable based on historical farming activities, aerial photography and field-truthing. Since 2014 Site conditions have changed and the developable limits have decreased. The absence of maintenance activities has resulted in successional growth and the expansion of the wetland and woodland.

1.3 Policy Brief

The Provincial Policy Statement (PPS), Growth Plan for the Greater Golden Horseshoe and the Niagara Region Official Plan will all provide policy context and guidance for the proposed development on the Site.

The *PPS* (MMAH, 2020) provides a policy framework under the *Planning Act* to guide development "while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment". Section 2.1 (Natural Heritage) and Section 2.2 (Water) of the PPS are applicable to the Site.

A Place to Grow (Growth Plan for the Greater Golden Horseshoe, 2020) is a provincial policy document focused on growth management in the urbanized core of Ontario, including the Region of Niagara. Since the Site is within a designated "Settlement Area" natural heritage policies do not apply.

Currently, the Region is developing a new Official Plan for the Niagara Region, therefore the previous 2014 version is still in effect. *Chapter 7: Natural Environment* of the Niagara Region Official Plan (dated 2014, consolidated August 2015) was reviewed for natural heritage guidelines applicable to the Site.

2.0 Physical Setting of the Site

The physical setting of the Site includes natural features that support the overall local ecology of an area. These features can include woodlands, valleylands, watercourses, wetlands and other significant wildlife habitat. A review of existing available information on the environmental functions and features of the study area has been completed.

2.1 Sources of Information on Physical Setting

Background data collection for the Site included a literature and database search and requests for information. Sources of information included the following:

- Maps including topographic and survey maps, soil maps, geology maps, aerial photographs, Ontario base maps and any other available relevant maps
- Land use of the Site and surrounding properties including the location of buildings, residential land use and the location of surface water features
- Databases and online regulatory data
- Applicable policies and regulations
- Other available data and reports

2.2 Landscape Context

The Site is comprised of approximately 19 ha of wetlands, woodlands, thickets and meadows. With the exception of a pocket of moist oak woodland along the western boundary of the Site, the natural features are influenced by past agricultural land use. Historically, the majority of the land was cleared for agriculture which is reflected in the existing vegetation community as well as on aerial photography (historical and current aerial imagery is provided in Appendix B). Currently, the southeast block of the Site is bounded by a commercial shopping plaza; whereas, the north and south boundary of the Site border residential areas.

The previous GEMS report identified *Regionally Significant* wetlands within and adjacent to the Site. Wetlands provide water storage, storm protection and flood mitigation, shoreline stabilization and erosion control, groundwater recharge, and water purification through retention of nutrients, sediments, and pollutants. In addition, wetlands provide critical habitat and breeding grounds for many species of plants and animals, including a number of species at risk.

Woodlands function to increase biodiversity, regulate nutrient cycling and form carbon stores; they also provide vital habitat, breeding grounds and corridors for wildlife. Protection of Significant Woodlands ensures that these ecosystem services are not disrupted.

2.3 Geological, Hydrogeological and Physiographic Features

The Site is located within the broad physiographic region known as the Haldimand Clay Plains (Chapman and Putnam, 2007). A review of quaternary geology for the Site indicates that the overburden within the southwest portion of the site consists predominantly of “fine-textured glaciolacustrine deposits” (a mixture of silt and clay, with minor amounts of sand and gravel), while the north east portion of the site consists of Paleozoic bedrock (Ontario Geological Survey, 2010). Based on a review of published bedrock geology mapping, the Site and surrounding area are underlain by bedrock comprised of shale, limestone and dolostone of the Detroit River Group; Onondaga Formation (Ontario Geological Survey, 2011).

GEMS reviewed the Government of Ontario’s “Water Well Information System” online mapping and database for records pertaining to the vicinity of the Site. No water well records were identified within the limits of the Site. GEMS reviewed three well records within the surrounding area (Well IDs 7117365, 6604935, 6603627). Based on these records, the stratigraphy within the area was generally noted as comprised of variable mixtures of sand, loam and gravel silt. Bedrock was not noted as being encountered within completion depths of approximately 20 and 50 feet, and as such it can be expected that the Site is not located within a shallow bedrock area. Water was encountered between 3.9 and 22 metres below ground surface (mbgs).

Elevations across the Site range from approximately 185 masl to 183 masl gradually sloping south, the Site is relatively flat with evidence of past agricultural grading. The regional topography is very hilly but generally decreases in a southerly direction towards Lake Erie (Google Earth, 2020).

2.4 Surface Water Features

The Site is located within the Lake Erie North Shore Watershed and is partially located within the Onondaga Escarpment Wetland Complex which is designated as Non-Provincially Significant. The Wainfleet Bog Wetland Complex is located approximately 740 m west of the Site and is considered Provincially Significant.

2.5 Species at Risk and Significant Wildlife Habitat

Available information on species at risk and significant wildlife habitat is available through two sources of data. These sources are:

- Request for information from the Ministry of Natural Resources and Forestry (MNRF) now the Environment, Conservation and Parks (MECP)
- MNRF Natural Heritage Information Centre (NHIC) online mapping application (MNRF, 2016b)

2.5.1 MNRF/MECP REQUEST FOR INFORMATION

GEMS forwarded a formal request to the MNRF's Guelph District office on November 6, 2018 for information regarding SAR and natural heritage information related to the Site. GEMS received a written response from the MNRF on November 26, 2018 which indicated that there is potential for the spotted turtle, Blanding's turtle, whip-poor-will, bank swallow, Henslow's sparrow, massasauga rattlesnake, grass pickerel, yellow-breasted chat, wood thrush, bobolink, snapping turtle, eastern meadowlark, red-headed woodpecker, Acadian flycatcher, bald eagle, Canada warbler and eastern ribbonsnake.

A copy of the correspondence with MNRF is provided in Appendix C. None of the species listed above were observed on Site during any of the field investigations. Based on the species noted there is no suitable habitat within the proposed developable area.

2.5.2 NATURAL HERITAGE INFORMATION CENTRE MAPPING

The MNRF's Natural Heritage Information Centre (NHIC) "Make-a-Map: Natural Heritage Areas" online mapping application (MNRF, 2020) was reviewed for information pertaining to tracked species (rare or at-risk) with records of occurrence within the vicinity of the Site. Mapping provided in Appendix B.

At-risk species are put into 1 of 5 categories based on the species geographic range in Ontario and the condition of the species across is broader geographic range inside and outside of Ontario (Endangered Species Act, 2007). The categories are:

- Special Concern – lives in the wild in Ontario, is not endangered or threatened but may become either because of biological characteristics or other threats
- Threatened – lives in the wild in Ontario, is not endangered but likely to become endangered if steps are not taken to address threatening factors
- Endangered – lives in the wild in Ontario but is facing imminent extinction or extirpation
- Extirpated – no longer lives in the wild in Ontario but can be found elsewhere
- Extinct – no longer lives anywhere in the world

GEMS conducted a search of the NHIC database on June 8, 2020, these results are included in Table 1, below.

Table 1. NHIC Species-at-Risk Within 3 km of the Site Boundary - 2020

Scientific Name	English Name	S-rank[1]	COSEWIC[2]	SARO[3]
Hylocichla mustelina	Wood Thrush	S4B	THR	SC
Charadrius melodus	Piping Plover	S1B	END	END
Sistrurus catenatus pop. 2	Massasauga Rattle Snake	S1	END	END
Thamnophis sauritus	Eastern Ribbonsnake	S4	SC	SC

[1]Subnational Rank (S-rank), conservation status of a species or plant community within a province, territory or state (Table provided in Appendix C)

[2]Committee on the Status of Endangered Wildlife in Canada (COSEWIC), provides advice regarding the status of wildlife that are nationally at risk of extinction or extirpation (Table provided in Appendix C)

[3]Species at Risk in Ontario (SARO), under the Endangered Species Act to identify the SAR in Ontario uses the Committee on the Status of Species at Risk in Ontario's classification of species (Table provided in Appendix C)

Based on the current available habitat the species within 3 km of the Site that may be present are:

- Gray ratsnake
- Massasauga rattlesnake
- Yellow-breasted chat
- Wood thrush
- Eastern ribbonsnake

3.0 Biophysical Inventory Methodology and Results

GEMS conducted a field investigation on October 30, 2018 to describe the existing ecological conditions at the Site and determine if there were any significant changes to the findings of the original field investigations completed by GEMS on November 20, 2012 and July 6, 2013. GEMS also confirmed the results of previous ecological conditions on June 12, 2020. Photographs taken during all Site visits are provided in Appendix D. A description of the Site conditions and assessment of available wildlife habitat are provided in the following sections.

Table 2 provides a summary of field investigation information.

Table 2. Field Investigation Information

Survey Type	GEMS Staff	Date	Time	Weather
Breeding Bird Survey (Day)	Gretel Green	June 8, 2013	5:55 am – 8:05 am	Calm, partly cloudy, warm
Breeding Bird Survey (Day)	Gretel Green	July 6, 2013	5:50 am – 7:50 am	Calm, sunny, hot
Breeding Bird Survey (Night)	Gretel Green	June 22, 2013	9:20 pm – 10:10 pm	Light wind, partly cloudy, warm

Survey Type	GEMS Staff	Date	Time	Weather
Amphibian Survey (Frogs & Toads)	Gretel Green	April 20, 2013	7:30 pm – 8:48 pm	Partly cloudy, light wind, cool
Amphibian Survey (Frogs & Toads)	Gretel Green	May 5, 2013	9:08 pm – 9:25 pm	Clear, light wind, warm
Amphibian Survey (Frogs & Toads)	Gretel Green	June 9, 2013	9:10 pm – 9:25 pm	Partly cloudy, calm, warm
Amphibian Survey (Snakes and Salamanders)	Gretel Green	April 20, 2013	6:15 pm – 6:40 pm	Partly cloudy, light wind, cold
Amphibian Survey (Snakes and Salamanders)	Gretel Green	May 5, 2013	6:30 pm – 6:50 pm	Clear, light wind, warm
Amphibian Survey (Snakes and Salamanders)	Gretel Green	June 8, 2013	9:00 am – 9:35 am	Overcast, calm warm
Amphibian Survey (Snakes and Salamanders)	Gretel Green	July 6, 2013	9:35 am – 10:00 am	Clear/partly cloudy, calm, hot
Amphibian Survey (Snakes and Salamanders)	Gretel Green	August 24, 2013	9:00 am – 9:25 am	Clear, light wind, hot
Amphibian Survey (Snakes and Salamanders)	Gretel Green	September 8, 2013	8:45 am – 9:20 am	Clear, light wind, warm
Amphibian Survey (Snakes and Salamanders)	Gretel Green	October 25, 2013	N/A	Partly cloudy, light wind, cool
Turtle Survey	Gretel Green	April 20, 2013	N/A	Partly cloudy, light wind, cool
Turtle Survey	Gretel Green	May 5, 2013	N/A	Clear, calm, warm
Turtle Survey	Gretel Green	June 8, 2013	N/A	Overcast, calm
ELC	Gretel Green	November 20, 2012	N/A	Unknown
ELC	Gretel Green	July 6, 2013	N/A	Unknown
ELC (update)	Kim Logan Joelle Pecora	October 30, 2018	N/A	Clear, cool, light wind

Survey Type	GEMS Staff	Date	Time	Weather
Woodland Staking	Kim Logan Joelle Pecora Thomas Exton	July 10, 2019	N/A	Partly cloudy, hot, light wind
Wetland Staking and Confirmation	Kim Logan Joelle Pecora	August 8, 2019	N/A	Overcast, very windy, rain
Tree Tagging	Kim Logan Joelle Pecora	November 5 – 7, 2019	9:00 am-4:00 pm	Overcast, snow, cold
Tree Tagging	Kim Logan	May 26, 2020	9:00 am – 4:00 pm	Clear, very hot
Tree Tagging	Joelle Pecora	June 2, 2020	10:00 am – 5:00pm	Clear, warm, light wind
Tree Tagging	Joelle Pecora	June 12, 2020	10:00 am – 4:00 pm	Partly cloudy, warm
Tree Tagging	Joelle Pecora	June 26, 2020	10:00 am – 3:00 pm	Partly cloudy, hot
Tree Tagging and Butternut Assessments	Joelle Pecora	July 21, 2020	10:00 am – 4:00 pm	Partly cloudy, warm

3.1 Natural Feature Staking

NPCA required the wetland on Site to be staked to confirm the outer limits of the feature. NHIC mapping suggests the wetland is just a small pocket on the west side of the Site which connects into a bigger wetland area off-site. The boundary was staked by GEMS on August 7, 2019 in collaboration with NPCA and Region staff. Updated aerial imagery and boundary mapping show the wetland has expanded on Site and is larger than previous mapping depicts. Although the wetland has increased on Site it is still well within the boundaries of the woodland.

The woodland boundary was staked by GEMS on June 10, 2019 and confirmed by NPCA and Region staff during the wetland staking activity. Boundary staking was done by determining the outer edge of the contiguous tree dripline. It was discussed that the successional part of the woodland within the staked boundaries may be developed provided the denser portion and the wetland remain untouched. Consideration for promoting homeowner stewardship within the remaining natural features by trail maintenance and signage was also mentioned as an incentive for development. GEMS will discuss mitigation of any woodland removal in the EIS.

Figure 2 shows the staked boundaries of both features.

3.2 Vegetation Community Survey

During the original EIS the majority of the site was noted to have been historically used for agriculture (since at least 1934 as documented through air photo imagery provided in Appendix B). Consequently, vegetation communities within this area reflect past anthropogenic disturbance. In both the historical documentation and previous site visits there was evidence that following clearing for agriculture, the land was tilled for drainage particularly in the southern block of the Site. This has created fine-scale microsite conditions, where hydrophytic plants (such as sedge species) are growing amongst species associated with drier conditions (such as Canada goldenrod; *Solidago canadensis).*

The vegetation community names and codes were updated from the previous Ecological Land Classification System (Lee, 1998) to Southern Ontario Ecological Land Classification (Lee, 2008). The botanical field investigations undertaken by GEMS identified a total of four (4) ELC Community Series units. These vegetation communities are illustrated on Figure 3.

The ELC vegetation communities confirmed on the most recent 2020 Site visit are noted as follows:

THDM 2/MEMM3 – Dry-Fresh Deciduous Shrub Thicket Ecosite/Dry-Fresh Mixed Meadow Ecosite (Previously: *CUT/CUM* – Cultural Thicket/Meadow) – This ecosite occurs on well-drained, fresh, loam soils, and is a reflection of anthropogenic disturbance. Both historic and current air photo imagery, from 1934 and 2006, provides evidence that the land had been cleared and used for agriculture. Although the area has been left to regenerate naturally, the influence of the adjacent disturbed land (i.e., residential lots and roads), as well as active ATV paths create an environment favourable to early successional (i.e., ruderal) and invasive species (native and non-native). Dominant shrub species include staghorn sumac (*Rhus typhina*), wild black raspberry (*Rubus occidentalis*), common buckthorn (*Rhamnus cathartica*), pin cherry (*Prunus pennsylvanica*) and willows (*Salix* spp.). The understory consists of Virginia creeper (*Parthenocissus quinquefolia*), asters (*Aster* spp), wild rose (*Rosa acicularis*), Canada goldenrod, common yarrow (*Achillea millefolium*), wild grape (*Vitis riparia),* tufted vetch (*Viccia cracca*), Queen Anne's lace (*Dauca carota*), wild garlic (*Allium vineale*), Canada anemone (*Anemone Canadensis*), wild bergamot (*Monarda fistulosa*), common milkweed (*Asclepias syriaca*) and cow wheat (*Melampyrum lineare*). However, the shrub strata is absent in some portions of the ecosite, allowing resources to be allocated to the ground-layer creating a productive grassland. These areas are dominated by timothy grass (*Phleum pratense*), blue-joint grass (*Calamagrostis canadensis*), and forbs listed above. Black walnut (*Juglans nigra*) was sparsely dispersed throughout the grasslands portion of the ecosite, including two older individuals that are present in the 1934 air photo.

WO – Woodland (Previously: CUW – Cultural Woodland) – This ecosite occurs on imperfectly drained, deep clay soils that have been previously trenched for drainage. This trenching and the perched soils created fine-scale microsites throughout the ecosite. Along the trenching, there were typical riparian species, including sedges (*Carex* spp.) and feathermosses (*Brachythecium* spp.). The canopy was dominated by young trees and shrubs including prickly-ash (*Zanthoxylum americanum*), white elm (*Ulmus americana*), spicebush (*Lindera benzoin*) and common buckthorn (*Rhamnus cathartica*). Tree planting has occurred along the eastern

boundary of this ecosite; likely a mitigation effort during the construction of the adjacent shopping plaza. Other species noted during the Fall 2018 Site investigation were large amounts of raspberry throughout the ecosite and sumac bordering the edge between the WO and FODM9 ecosites.

FODM9 – Fresh - Moist Oak – Maple - Hickory Deciduous Forest (Previously: *FOD9* – Fresh - Moist Oak – Maple - Hickory Deciduous Forest) – This ecosite occurs on moderately-well drained, loamy clay soils. The overstory is dominated by red maple (*Acer rubrum*) black cherry (*Prunus serotina*) and shagbark hickory (*Carya ovata*) mixed with some green ash (*Fraxinus pennsylvanica*). Previously, the understory was dominated by shade-tolerant species, including spotted jewelweed (*Impatiens capensis*), Virginia creeper, wild rose, Canada anemone, meadowrue (*Thalictrum* sp.), speckled alder (*Alnus incana*), bladder sedge (*Carex intumescens*) and stinging nettle (*Urtica dioica*). There were also many non-vascular species including tree moss (*Climacium dendroides*), moss (*Thuidium* spp.) and leafy mosses (*Plagiomnium* spp.) Based on the updated fall 2018 Site visit, species were somewhat consistent with the 2014 investigation. Species not noted previously include: raspberry, staghorn sumac and common buckthorn.

SWDM1 – Oak Mineral Deciduous Swamp (Previously: *SWD1* – Oak Mineral Deciduous Swamp) – This ecosite, considered the most ecologically sensitive on the Site, occurs on poorly drained, deep clay soils. The overstory is dominated by swamp white oak (*Quercus bicolor*) mixed with other hardwood species, including shagbark hickory, red maple (*Acer rubrum*) and green ash. The understory is relatively depauperate, with a mix of common forest understory herbs in the dry areas and hydrophytic plants in the wet areas, such as marsh marigold (*Caltha palustris*), common buckthorn and sedges.

It is GEMS' opinion that based on the current conditions observed during the most recent 2020 field investigation, the vegetation communities remained relatively similar to those documented in the previous reports. Changes to wetland boundaries as well as additional flora and fauna species were observed and recorded.

3.3 Tree Inventory

GEMS retained a certified landscape architect and arborist designated as a Butternut Health Assessor (Into the Woods) to provide a detailed tree inventory and preservation plan for the Site. A tree inventory was completed for all of the possible trees that will need to be removed or impacted because of the proposed development, this included trees outside of the staked wetland boundary and the woodland area. The trees tagged were any trees above 20 cm diameter at breast height; dead trees were not tagged.

GEMS and Into the Woods were on Site for a total of 3 days in November 2019 and 4 days throughout the spring and summer months of 2020 to tag the trees and assess the potential SAR butternuts that were found. Based on the ministry accepted assessment protocol, the butternuts were classified as hybrids. Hybrids do not require protection under the Endangered Species Act.

Appendix E includes a copy of the tree inventory and map of staked trees. The preservation plan is provided under separate cover.

3.4 Wildlife Surveys and Fauna Observations

Various types of surveys were completed during the original EIS to obtain accurate species information about the Site, the surveys completed were:

- Breeding Bird Survey (Day and night)
- Herpetofauna Surveys
    - Amphibian Breeding Survey
    - Coverboard Survey
    - Turtle Basking Survey
- Fauna observations

Figure 4 shows the survey locations. Appendix F includes copies of the field sheets used for surveys.

The species recorded at the site during the investigations completed by GEMS between 2012 and 2020 are included in Table 3.

Table 3. Species Observed by GEMS between 2012 - 2020

Scientific Name	English Name
Agelaius phoeniceus	Red-winged Blackbird
Ambystoma laterale	Blue-spotted Salmander
Anaxyrus americanus	American Toad
Bombycilla cedrorum	Cedar Waxwing
Canis latrans x Canis lycaon	Coyote
Cardinalis cardinalis	Northern Cardinal
Cathartes aura	Turkey Vulture
Charadrius vociferus	Killdeer
Chordeiles minor	Common Nighthawk*
Colaptes auratus	Northern Flicker
Columbia livia	Rock Dove
Corvus brachyrhynchos	American Crow
Dryocopus pileatus	Pileated Woodpecker
Geothlypis trichas	Common Yellowthroat
Icterus nigrogularis	Yellow Oriole
Lampropeltis triangulum	Milksnake
Lithobates pipiens	Leopard Frog
Lithobates sylvaticus	Wood Frog

Scientific Name	English Name
Melospiza melodia	Song Sparrow
Molothrus ater	Brown Headed Cowbird
Pseudacris crucifer	Spring Peeper
Pseudacris triseriata	Western Chorus Frog
Quiscalus quiscula	Common Grackle
Rana clamitans	Green Frog
Sciurus carolinensis	Eastern Grey Squirrel
Setophaga petechia	Yellow Warbler
Spinus tristis	American Goldfinch
Spizella pusilla	Field Sparrow
Sturnus vulgaris	Common Starling
Tachycineta bicolor	Tree Swallow
Thamnophis sirtalis sirtalis	Eastern Garter Snake
Turdus migratorius	American Robin

** - Species marked with an asterisk indicate a species at risk*

Only the Common Nighthawk is considered a species at risk designated as ‘Special Concern’ in Ontario and ‘Threatened’ in Canada. Under the Endangered Species Act (2007) species listed as ‘Special Concern’ do not receive species or habitat protection. Since the Common Nighthawk is listed as ‘Threatened’ under the Species at Risk Act (2002) and is also protected under the Migratory Birds Convention Act (1994), it does qualify for protection for the species as well as any nests if they are found.

The Common Nighthawk was heard on Site but also visually observed immediately adjacent to the Site flying over the Canadian Tire to the south east. The preferred habitat for the species consists of open areas with little to no ground vegetation such as logged or burned over areas, forest clearings, rock barrens, peat bogs, lakeshores and mine tailings, as well as nesting in cultivated fields, orchards, urban parks, and along gravel roads and railways and natural sites (Ontario, 2019). Previous Site conditions are considered to be more suitable habitat for this species however, since the cessation of maintenance activities the successional growth has altered the Site to the point where any suitable habitat that was available has significant declined or no longer exists.

Due to the location of the Site within an area with both natural wooded features and residential communities, it is expected that wildlife within the area also consists of species typically found within naturalized and urban settings

4.0 Significant Feature Discussion

Both the wetland and woodland on Site pose constraints to development. Both features have been staked and confirmed as per requirements and guidelines outlined by NPCA and the Region. The boundaries for development are outlined on Figure 2. The following provides explanation and justification regarding the significance of each feature.

4.1 Wetland

The wetland present on Site is partially located within the Onondaga Escarpment Wetland Complex and has been designated as “Non-Provincially Significant” under the Port Colborne Official Plan (dated November 2013, office consolidation September 2017). Development proposals for lands that are within or adjacent to lands which are classified as Non-Provincially Significant Wetlands must be accompanied by an EIS. The EIS must demonstrate there will be no negative impacts to the feature or its function.

The previous GEMS report identified the wetland as “Regionally Significant”, which means development may be permitted if no significant impact can be demonstrated.

4.2 Woodland

There are two distinct areas within the woodland area present on Site; the less dense, successional wooded area to the east and the denser older growth area to the west, closest to the wetland. It is GEMS opinion that this denser portion be considered “Significant Woodland” and remain undeveloped.

The Niagara Region has become the main delegating authority when it comes to policies related to woodlands in the Region. Although the western portion of woodland may be considered ‘Significant’, the removal of portions that do not meet the significance criteria can be removed. Using Policy 7.B.1.5 of the Regional Official Plan (dated 2014, consolidated August 2015), Table 4 below includes a rationale for each criteria listed to determine significance:

Table 4. Significant Woodland Criteria and Rationale

Criteria	Rationale of Significance
Contain threatened or endangered species or species of concern	Field surveys completed on Site identified the presence of Common Nighthawk. The woodland extends beyond the Site with NHIC records for SAR. The successional part of the woodland does not include habitat for threatened, endangered or known species of concern within the area.

In size, be equal to or greater than: i. 2 hectares, if located within or overlapping Urban Area Boundaries; ii. 4 hectares, if located outside Urban Areas and north of the Niagara Escarpment; iii. 10 hectares, if located outside Urban Areas and south of the Escarpment	The entire connected woodland as shown on NHIC is approximately 93 ha and is south of the Escarpment. The area proposed for removal is approximately 5 ha and still meets this criteria as it is contiguous with the larger woodland.
Contain interior woodland habitat at least 100 m in from the woodland boundaries	Yes, interior habitat of over 100 m from woodland boundaries is present. Although the removal of some trees on the Site is proposed, interior habitat still exists beyond the limit of proposed removals.
Contain older growth forest and be 2 hectares or greater in area	Yes, the portion of woodland to the west of the Site contains older growth forest extending into the larger segment of woodland which is greater than 2 ha. The area proposed for removal is successional (approximately 15 years old) and has regenerated on lands that were historically agricultural and spread due to the proximity of the larger woodland area to the west.
Overlap or contain one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4	Policy 7.B.1.4 (Environmental Conservation Areas) listed other evaluated wetlands as a significant natural heritage feature, which is located within the woodland. The wetland present will remain protected through the 30 m vegetated buffer.
Abut or be crossed by a watercourse or water body and be 2 or more hectares in area	According to NHIC mapping there is a segment of a watercourse located in the western portion of the woodland southwest of the termination of Barrick Road.

Using the criteria provided by the Niagara Region Official Plan policy, it has been determined that the woodland present on Site, extending to the west and south is a “Significant Woodland”. The completion of an EIS is required to demonstrate that there will be no negative impacts to natural heritage features as a result of the proposed works. Once the proposed limits of development are confirmed by the Region the appropriate studies can be completed.

5.0 Conclusion

Based on the staked boundaries of the wetland and woodland present, the limits of these features are clearly identified. The area of woodland proposed to be removed measures approximately 41,760 m^2 (4.17 ha) and consists of successional growth.

Using Regional and NPCA regulatory and policy documents it has been determined that the wetland present is significant and requires appropriate protection. The successional portion of woodland can be developed without significant impact to the identified features. Significant Wildlife Habitat criteria has not been met for the eastern edge of the woodland (41,760 m^2). The EIS will discuss potential impacts, mitigation and compensation.

6.0 Legal Limitations

Groundwater Environmental Management Services Inc. (GEMS) has prepared this report for our client and its agents exclusively. GEMS accepts no responsibility for any damages that may be suffered by third parties as a result of decisions or actions based on this report.

The findings and conclusions are site-specific and were developed in a manner consistent with that level of care and skill normally exercised by environmental professionals currently practicing under similar conditions in the area. Changing assessment techniques, regulations, and site conditions means that environmental investigations and their conclusions can quickly become dated, so this report is for use now. The report should not be used after that without GEMS review/approval.

We note that this report was subject to a third-party peer review, completed by a qualified ecologist and certified environmental professional, retained by the applicant. This step was taken to ensure the findings and recommendations presented in this report were vetted in advance of the Regional review. This Constraints Summary Report, however, remains the property of GEMS, including the data and recommendations. As such, no formal credit is provided to the peer reviewers.

The project has been conducted according to our instructions and work program. Additional conditions, and limitations on our liability are set forth in our work program/contract. No warranty, expressed or implied, is made.

7.0 References

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8.0 Closing

We trust this information will meet your current requirements. Please do not hesitate to contact the undersigned should you have any questions or require additional information.

Yours truly,

Groundwater Environmental Management Services Inc.

Prepared By:

Joelle, Pecora, B.A., Cert. Ecol. Rest.
Ecologist

Reviewed By:

Kim Logan, P.Geo. (Limited), P.Biol
Project Manager/Senior Ecologist

Figures

Figure 1: Site Location

Legend

Site Boundary

Drawn By: JP
Checked By: KL

Client:
Constraints Summary Report
Northlands Development

GEMS Groundwater Environmental Management Services Inc.
http://www.gemservicesinc.com

Source:
ESRI Basemap
NAD 1983 Zone 17N

Date:
December 2020

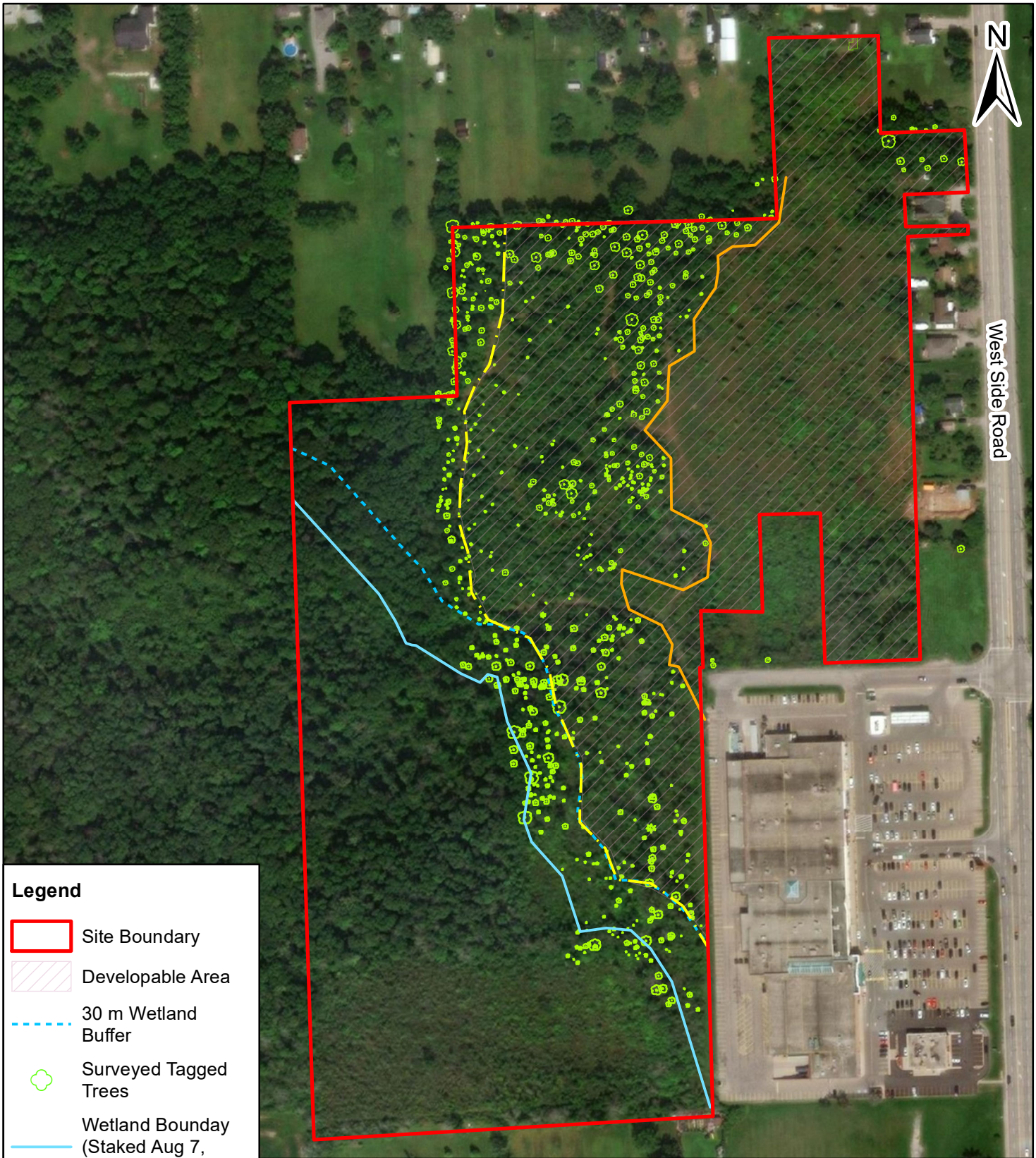
Title:
Site Location

Scale:
0 500 1,000
Meters

Project No.
19-181012

Figure No.
1

Figure 2: Development Limits

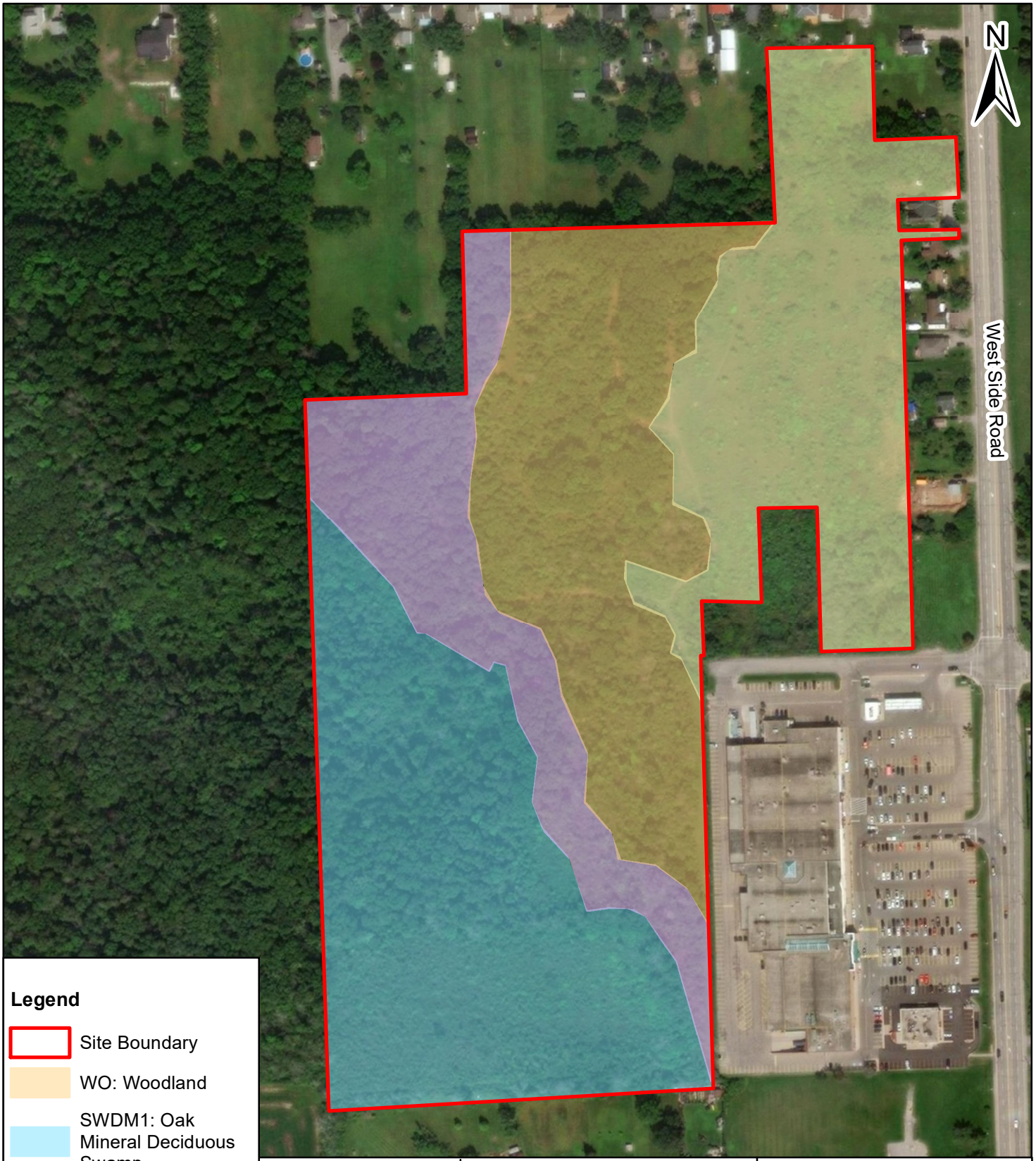


Legend

- Site Boundary
- Developable Area
- 30 m Wetland Buffer
- Surveyed Tagged Trees
- Wetland Bounday (Staked Aug 7, 2019)
- Woodland Boundary (Staked June 10, 2019)
- Proposed New Significant Woodland Boundary

Drawn By: JP Checked By: KL	Client: Constraints Summary Report Northlands Development	GEMS Groundwater Environmental Management Services Inc. http://www.gemservicesinc.com
Source: ESRI Basemap NAD 1983 Zone 17N	Date: December 2020	Title: Development Limits
	Scale: 0 55 110 Meters	Project No. 19-181012
		Figure No. 2

Figure 3: Vegetation Communities

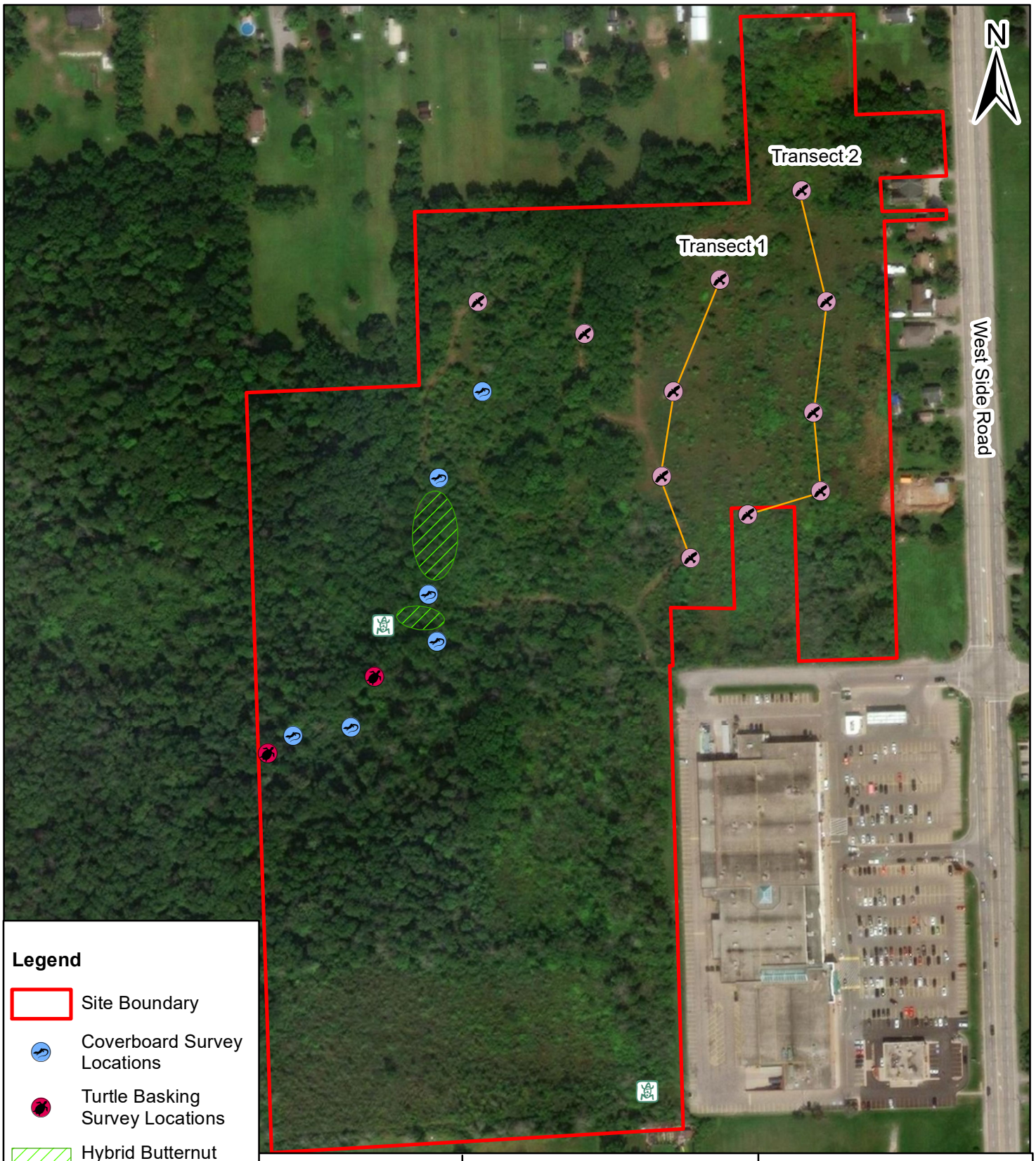


Legend

- Site Boundary
- WO: Woodland
- SWDM1: Oak Mineral Deciduous Swamp
- FODM9: Fresh-Moist Oak-Maple-Hickory Deciduous Forest
- THDM2: Dry-Fresh Deciduous Shrub Thicket Ecosite

Drawn By: JP Checked By: KL	Client: Constraints Summary Report Northlands Development	GEMS Groundwater Environmental Management Services Inc. http://www.gemservicesinc.com
Source: ESRI Basemap NAD 1983 Zone 17N	Date: December 2020	Title: Vegetation Communities
	Scale: 0 55 110 Meters	Project No. 19-181012 Figure No. 3

Figure 3: Survey Locations



Legend

- Site Boundary
- Coverboard Survey Locations
- Turtle Basking Survey Locations
- Hybrid Butternut Locations (Approx.)
- Amphibian Breeding Survey Locations
- 2013 Bird Survey Locations (Day and Night)

Drawn By: JP Checked By: KL	Client: Constraints Summary Report Northlands Development	GEMS Groundwater Environmental Management Services Inc. http://www.gemservicesinc.com	
Source: ESRI Basemap NAD 1983 Zone 17N	Date: December 2020	Title: Survey Locations	
	Scale: 0 50 100 Meters	Project No. 19-181012	Figure No. 4

Appendix A

Terms of Reference and Correspondence

December 6, 2018

Niagara Peninsula Conservation Authority
3rd Floor West, 250 Thorold Rd,
Welland, ON L3C 3W2

Attention: David Deluce, Lisa Price

Re: Terms of Reference (TOR) for an Updated Environmental Impact Study Update – Northlands Estates Subdivision, City of Port Colborne, Ontario

Project No. 19-181012

1.0 BACKGROUND

Groundwater Environmental Management Services Inc. (GEMS) is pleased to provide this Terms of Reference (TOR) as a proposed scope of work to update the Environmental Impact Study (EIS) completed in 2014 at the property located at Lot 31 and Concession 3, also known as the Northlands Estates Subdivision, City of Port Colborne Ontario (hereafter referred to as the "Site"). GEMS understands that the previous owners have sold the property with the proposed development plans, therefore an updated EIS is required. This TOR has been prepared for submission and approval to Niagara Peninsula Conservation Authority (NPCA), the Region of Niagara (the "Region"), the City of Port Colborne (the "City") and the Ministry of Natural Resources and Forestry (MNRF). Following acceptance of the TOR, GEMS is prepared to complete the update to the EIS. GEMS has also reviewed the pre-consultation notes provided by Masongsong Associates (the former owner and current engineer for the new owner).

2.0 PROPOSED STUDY REQUIREMENTS

2.1 Background Information Review

GEMS will review available literature and background information from the following sources as relevant to the Site:

- Topographic and survey maps, soil maps, geology maps, aerial photographs, Ontario base maps and any other available relevant maps;
- Land use of the Site and surrounding properties, including the location of buildings, residential land use and the location of surface water features;
- Applicable policies and regulations including NPCA and City of Port Colborne Official Plans and;
- NPCA, Niagara Region, Port Colborne and MNRF information on the Site and surrounding area

The background information review will occur concurrently to the NPCA, Region and City approval of this TOR.

2.2 Field Inventories

The following are the proposed field inventories proposed to complete the update to the EIS, as per the NPCA memo:

1. Vegetation Inventory / Ecological Land Classification (ELC)

GEMS will describe the existing vegetation communities in accordance with standard Ecological Land Classification for Southern Ontario (ELC) protocols (Lee at al., 1998) and update the 2013 data collected where applicable based on the site investigation completed October 30, 2018. Notes on plant species assemblages, surface soils, and potential existing wildlife habitat have been compared against the previous data. GEMS also confirmed/compared the descriptions of the habitat on site as it relates to Species at Risk (SAR) and significant wildlife habitat noted in the correspondence provided from the MNRF in the fall of 2018.

2. Incidental Wildlife Observations and Species Surveys

All incidental observations of on-site fauna and fauna habitat were recorded during the previous spring and summer 2013 site visits and updated and confirmed on the October 30, 2018 site visit. Targeted species surveys such as; amphibian and reptile, turtle and breeding bird surveys were completed in 2013 at the specific direction of involved regulatory agencies following correspondence for SAR with MNRF. Although the previous surveys were completed in 2013, since the October 2018 Site visit did not find any new species or significant habitat changes it can be assumed that the 2013 data is still relevant and accurate.

Field Inventory Summary:

Inventory	Time/Inventory Period/Method
Vegetation Inventory / ELC (to verify 2013 vegetation communities)	1 visit, completed on October 20, 2018 ELC for Southern Ontario (Lee *et al*., 1998)
Incidental wildlife observations (to verify previous results)	1 visit, completed on October 30, 2018 direct and indirect evidence

2.3 Reporting

Following the completion of background information updates, TOR approval and field inventories, GEMS will prepare an updated EIS report to summarize the findings of this work. The report will aim to identify and delineate existing natural heritage features at the Site, discuss required development setbacks from such features, provide a discussion of potential environmental impacts from the proposed development, and recommend ecologically suitable measures to mitigate such potential impacts. The report will also discuss and delineate the proposed development envelope as well as any associated features and address any potential impacts to the natural heritage features on site. Existing and proposed surface water contribution to the

adjacent wetland will be addressed through a Functional Servicing Report/Hydrogeological Report that will be completed for the Site. The updated EIS report will be submitted to NPCA, Niagara Region and the City of Port Colborne for review and approval.

3.0 CLOSING

We trust the presented TOR presented for the EIS update will meet the requirements of the NPCA, Niagara Region and the City of Port Colborne. Please contact us if you have any questions.

Sincerely yours,

Groundwater Environmental Management Services Inc.

Prepared by:

Joelle Pecora, B.A., Cert. Ecol. Rest.
Environmental Technician

Reviewed by:

Kim Logan, P.Geo. (Limited), P.Biol (AB)
Project Manager/Senior Ecologist

From:	Kim Logan
To:	Joelle Pecora
Subject:	FW: Port Colborne EIS (Northland Estates)
Date:	October 5, 2020 9:30:20 AM
Attachments:	image001.png NorthlandAve.pdf Niagara Region EIS Guidelines v2 Jan 2018.pdf Tree Saving Plan Requirements.pdf SWH Screening Example.pdf

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GEMS is still offering all our services and will continue to stay updated on the COVID-19 situation.
We ask that site personnel maintain a 2 meter spacing with our staff on-site and communicate via text/phone, where possible, to help keep everyone safe and avoid spread of the virus.

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Environmental Management Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: Whittard, Jennifer <Jennifer.Whittard@niagararegion.ca>
Sent: March-04-19 1:05 PM
To: Kim Logan <kim@gemservicesinc.com>
Subject: RE: Port Colborne EIS (Northland Estates)

Hi Kim,

I have reviewed the draft Terms of Reference (TOR) for the proposed Northland Estates development and provide the following comments:

1. Following an update to the Memorandum of Understanding and protocol between Niagara Region and the Niagara Peninsula Conservation Authority (NPCA), the Region is now responsible for review and comment on planning applications with respect to Significant Woodlands, Significant Wildlife Habitat and other Core Natural Heritage System (CNHS) features as per Chapter 7 of the Niagara Region Official Plan. As shown on the attached map, Regional CNHS mapping identifies Environmental Conservation Areas (ECAs) associated with both Significant Woodlands and Locally Significant Wetland (LSW) (Onondaga Escarpment Wetland Complex) located on and adjacent to the subject property. As per Niagara Region Official Plan (ROP) Policy 7.B.1.11 and Table 7-1, the EIS is required to demonstrate no negative impact on these features over the long term. This requirement should be captured in the updated Policy & Legislation review. The Region's EIS Guidelines (January 2018) are attached for your reference.

2. The TOR refers to Ministry of Natural Resources and Forestry (MNRF) correspondence in Fall 2018 regarding Species at Risk (SAR) and Significant Wildlife Habitat (SWH). The EIS should include screenings for SAR by means of a completed Information Gathering Request Form to the Ministry of Natural Resources and Forestry (MNRF), as well as a screening for SWH by means of a completed SWH Screening Table (example attached). The EIS should address any additional requirements for SAR or SWH surveys and follow appropriate protocols (e.g., Recommended Survey Method for SAR Bats within Treed Habitats, MNRF, 2017).

3. If any SAR or sensitive species (ranked S1-S3) are found on site or within adjacent lands, their locations must be mapped and the extent of their habitat delineated and included within the impact assessment to ensure no negative impact to the species or its habitat. The EIS should also include any mitigation required by MNRF (e.g., vegetation removals outside the breeding bird and active bat timing windows, that is between October 1st and March 15th). All MNRF correspondence should be included in an appendix to the EIS.

4. The EIS should refine the attached Significant Woodland boundary mapping (refer to the criteria provided in ROP Policy 7.B.1.5 regarding significance criteria) and overlay this onto the proposed development envelope/concept plan, including recommended buffers as applicable to protect its natural heritage features or functions. This should be incorporated in a constraints map which identifies all natural heritage and hydrologic features with established minimum buffer requirements and/or zones of influence, if any. New lots are not to extend into the feature or its buffer as per ROP Policy 7.B.1.18. The MNRF and/or NPCA is responsible for approving any proposed boundary refinements to the MNRF's LSW mapping as per the attached map.

5. The EIS should include an assessment of whether the development proposal, combined with any design changes and mitigation measures, will result in any residual negative impact on the woodland and wetland (and/or other ecological features as identified, if applicable) or their ecological function. This includes (but is not limited to) the feature-based water balance requested by NPCA at the pre-consultation meeting held June 28, 2018.

6. Tree removals within Significant Woodlands trigger the requirement for a Tree Saving Plan in accordance with ROP Policy 7.B.1.19. This plan can be recommended as a mitigation measure and completed separately from the EIS as part of the conditions of approval. Further details regarding the Tree Saving Plan requirements are attached for reference.

Please note that the NPCA continues to be responsible for review and comment on

planning applications related to their regulated features, which in this case includes the wetland on the property. As such, the NPCA should continue to be consulted with respect to their comments and potential Work Permit requirements pursuant to Ontario Regulation 155/06.

Please feel free to contact me if you have any questions or require further information.

Thanks,
Jen

Jennifer Whittard, B.E.S., PMP
Manager, Environmental Planning
Planning and Development Services, Niagara Region
Phone: 905-980-6000 ext. 3430 Toll-free: 1-800-263-7215
Cell: 289-668-4812
www.niagararegion.ca

From: Kim Logan <kim@gemservicesinc.com>
Sent: Thursday, February 28, 2019 10:05 AM
To: David Deluce <ddeluce@npca.ca>; Whittard, Jennifer <Jennifer.Whittard@niagararegion.ca>
Subject: RE: Port Colborne EIS (Northland Estates)
Importance: High

Good morning David and Jennifer,

I am following up to the email sent February 7, 2019 below. Can you please let us know if any changes are required to the TOR that was submitted. We have updated our scope with the client and will be heading to site in the spring to stake the natural features (Wetland) and will require confirmation of the staking either on site or through aerial approval in order to move forward with the proposed plans.

Please let us know ASAP as spring will approach sooner than later and we need to be prepared for any additional surveys you may require.

Thank you,
Kim

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Management Environmental Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: Kim Logan

Sent: 02/07/2019 7:43 PM
To: 'David Deluce' <ddeluce@npca.ca>; 'Whittard, Jennifer' <Jennifer.Whittard@niagararegion.ca>
Subject: RE: Port Colborne EIS (Northland Estates)
Importance: High

David and Jennifer,

I am checking in to see if a formal response will be ready for our Terms of Reference in time for any surveys that may need to be added. Our client, the landowner, is looking to get moving on the application for the development and we would like your feedback/approval on our terms of reference.

With respect to the NPCA review I only received some emailed comments from Lisa but nothing formal has come through since we submit the TOR in December.

Thank you,
Kim

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Management Environmental Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: Kim Logan
Sent: 12/12/2018 10:42 AM
To: David Deluce <ddeluce@npca.ca>
Cc: Whittard, Jennifer <Jennifer.Whittard@niagararegion.ca>
Subject: RE: Port Colborne EIS (Northland Estates)

Thank you David.

Jennifer please find a copy of our terms of reference to update an EIS in Port Colborne (Northland Estates). If you have any questions please don't hesitate to contact me.

Regards,
Kim

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Management Environmental Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: David Deluce <ddeluce@npca.ca>
Sent: 12/12/2018 10:32 AM
To: Kim Logan <kim@gemservicesinc.com>
Cc: Whittard, Jennifer <Jennifer.Whittard@niagararegion.ca>
Subject: RE: Port Colborne EIS (Northland Estates)

Hi Kim,

I suggest sending the TOR to Jennifer Whittard (copied on this email). She will be able to have the TOR reviewed accordingly. Let me know if you have any other questions.

Regards,

David Deluce, MCIP, RPP
Manager, Regulations and Compliance
Niagara Peninsula Conservation Authority (NPCA)
250 Thorold Road West, 3rd Floor, Welland, ON, L3C 3W2
905-788-3135, ext. 224
ddeluce@npca.ca
www.npca.ca

From: Kim Logan <kim@gemservicesinc.com>
Sent: December 12, 2018 9:16 AM
To: David Deluce <ddeluce@npca.ca>
Subject: RE: Port Colborne EIS (Northland Estates)

Hi David,

As noted below could you please let me know who we need to send the TOR to at the Region so we can make sure things are addressed in a timely matter with all parties.

Thank you,
Kim

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Management Environmental Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: Kim Logan
Sent: 12/06/2018 3:19 PM
To: David Deluce <ddeluce@npca.ca>
Cc: Joelle Pecora <Joelle@gemservicesinc.com>

Subject: RE: Port Colborne EIS (Northland Estates)

Hi David and Lisa,

Please find attached a terms of reference for your review with respect to what we propose for the EIS update. If you could let us know the best contact at the Region it would be much appreciated.

Regards,
Kim

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Management Environmental Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: Lisa Campbell <lcampbell@npca.ca>
Sent: 12/04/2018 7:26 PM
To: Kim Logan <kim@gemservicesinc.com>; David Deluce <ddeluce@npca.ca>
Cc: Joelle Pecora <Joelle@gemservicesinc.com>
Subject: RE: Port Colborne EIS (Northland Estates)

Thanks Kim. I'm sure there is substantial data and information already completed which can be used to reduce the scope.

Lisa

From: Kim Logan <kim@gemservicesinc.com>
Sent: December 4, 2018 1:16 PM
To: David Deluce <ddeluce@npca.ca>
Cc: Lisa Campbell <lcampbell@npca.ca>; Joelle Pecora <Joelle@gemservicesinc.com>
Subject: RE: Port Colborne EIS (Northland Estates)

Thank you David. As noted originally we would like to update not amend the EIS. We can provide a TOR for both NPCA and the Region. As per my original request we wanted to know if the single visit to confirm the findings in the original report to reduce the scope of the field investigation. We do plan to incorporate the details listed in the memo provided by Lisa. We will send a TOR tomorrow to both yourself and the region outlining what we intend in the update of the EIS.

Thanks again,
Kim

Kim Logan, P.Geo. (Limited), QP , P.Biol.

CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Management Environmental Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: David Deluce <ddeluce@npca.ca>
Sent: 12/04/2018 1:04 PM
To: Kim Logan <kim@gemservicesinc.com>
Cc: Lisa Campbell <lcampbell@npca.ca>
Subject: FW: Port Colborne EIS (Northland Estates)

Hi Kim,

Sorry for the delay; please see the attached memo and email below. If you have any questions, please let me know.

David Deluce, MCIP, RPP
Manager, Regulations and Compliance
Niagara Peninsula Conservation Authority (NPCA)
250 Thorold Road West, 3rd Floor, Welland, ON, L3C 3W2
905-788-3135, ext. 224
ddeluce@npca.ca
www.npca.ca

From: Lisa Campbell
Sent: November 28, 2018 3:55 PM
To: David Deluce <ddeluce@npca.ca>
Subject: RE: Port Colborne EIS (Northland Estates)

Hi David,

Please find attached a memo regarding the EIS requirements for the Northland Subdivision application. Given that this is a new application and the changes in MOU and other policies, an EIS addendum will not be sufficient. As well, I strongly encourage involvement of the Region of Niagara a soon as possible to help set the TOR to address their interests as well.

Please let me know if you have nay questions.

Lisa

From: David Deluce
Sent: November-26-18 3:16 PM
To: Lisa Campbell <lcampbell@npca.ca>
Subject: FW: Port Colborne EIS (Northland Estates)

Hi Lisa,

Please reply to Kim on her question below. There is a pre-con in CV for this proposed subdivision: PLPIMC201800607 and PLPIMC201700814. The previous EIS referenced below can be found in MPR 6.12.22, which I placed on your desk. Please respond by Friday November 30. If you have any questions, please let me know.

Regards,

David Deluce, MCIP, RPP
Manager, Regulations and Compliance
Niagara Peninsula Conservation Authority (NPCA)
250 Thorold Road West, 3rd Floor, Welland, ON, L3C 3W2
905-788-3135, ext. 224
ddeluce@npca.ca
www.npca.ca

From: Kim Logan <kim@gemservicesinc.com>
Sent: November 26, 2018 1:36 PM
To: Darren MacKenzie <DMacKenzie@npca.ca>
Cc: David Deluce <ddeluce@npca.ca>
Subject: RE: Port Colborne EIS (Northland Estates)

Hi Darren,

I have yet to hear from David. We would like to confirm that we are addressing the surveys needed for the update on the EIS that was completed in 2014.

Thanks,
Kim

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
Senior Ecologist
Groundwater Management Environmental Services Inc.
8800 Dufferin Street, Suite 303, Concord ON L4K 0C5
Office: (905) 907-3077 ext.304 | Mobile: 416-717-2447 | Fax: (905) 907-6617

From: Darren MacKenzie <DMacKenzie@npca.ca>
Sent: 10/26/2018 1:41 PM
To: Kim Logan <kim@gemservicesinc.com>
Cc: David Deluce <ddeluce@npca.ca>
Subject: Re: Port Colborne EIS (Northland Estates)

Hi Kim,

That is beyond my scope.

I have copied David Deluce my manager in this question.

Thank you.

Darren MacKenzie, C.Tech., rcsi
Supervisor, Construction Permit Approvals
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, ON, L3C 3W2
P: 905-788-3135 ext. 229
F: 905-788-1121
Email: dmackenzie@npca.ca
Website: www.npca.ca

From: Kim Logan <kim@gemservicesinc.com>
Sent: Friday, October 26, 2018 1:30:28 PM
To: Darren MacKenzie
Cc: David Deluce
Subject: RE: Port Colborne EIS (Northland Estates)

Thank you Darren,

Can you confirm if the fall visit will be sufficient and if you require a full TOR submission at this time?

Regards,
Kim

Kim Logan, P.Geo. (Limited), QP_{ESA}, P.Biol.
CAN-CISEC, Cert. Ecol. Rest.
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From: Darren MacKenzie <DMacKenzie@npca.ca>
Sent: 10/26/2018 1:27 PM
To: Kim Logan <kim@gemservicesinc.com>
Cc: David Deluce <ddeluce@npca.ca>
Subject: Re: Port Colborne EIS (Northland Estates)

Hello Kim,

As part of a permit application I would be receiving the information for our technical staff to review.

Thank you.

Darren MacKenzie, C.Tech., rcsi
Supervisor, Construction Permit Approvals
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, ON, L3C 3W2
P: 905-788-3135 ext. 229
F: 905-788-1121
Email: dmackenzie@npca.ca
Website: www.npca.ca

From: Kim Logan <kim@gemservicesinc.com>
Sent: Friday, October 26, 2018 1:04:03 PM
To: Darren MacKenzie
Subject: Port Colborne EIS (Northland Estates)

Good afternoon Darren,

We are updating a report that we completed in 2014 for a new land owner at a site in Port Colborne (proposed development is almost the same with some slight adjustments) and I'm wondering if you are the one that we will be addressing our info to at NPCA. Extensive field work was completed at the site previously and for the update we are looking to confirm the findings next week. Can you let me know if you need a full TOR from us or if we are ok to update with one visit.

Thank you,
Kim

GEMS *Your ONE CALL Environmental Solutions Provider*

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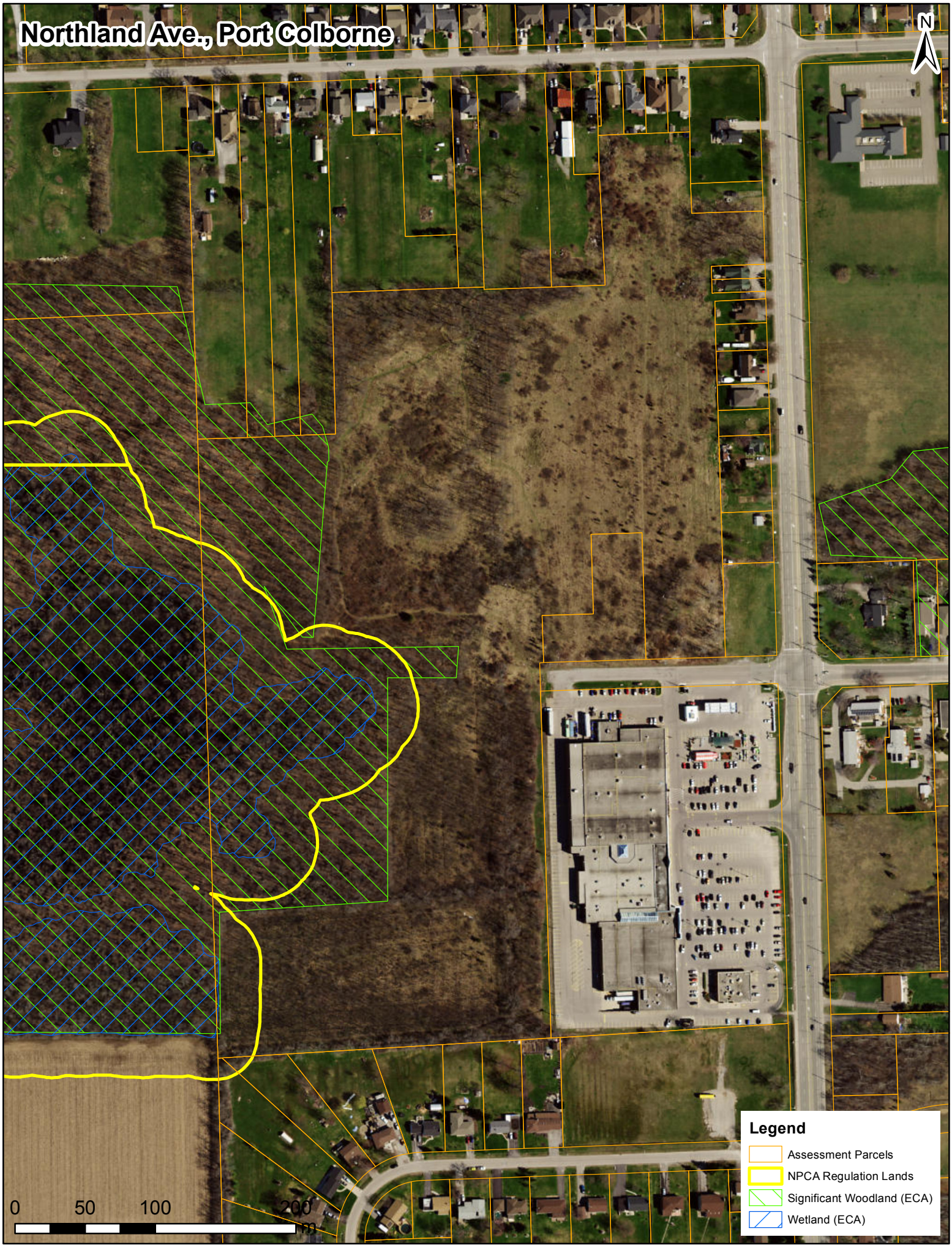
Northland Ave., Port Colborne
N
Legend
Assessment Parcels
NPCA Regulation Lands
Significant Woodland (ECA)
Wetland (ECA)
0
50
100
200
m

Appendix D

Bat Habitat Data

Appendix D

Bat Habitat Data

Table 1. Candidate Bat Maternity Roost Plot Surveys March 28, 2022

Tree #	Plot #	Tree Species	Number of Cavities	Diameter at Breast Height (cm)	Tree Height (m)	Loose Bark	Decay Class (a)	Leaf Nests	Easting	Northing
1	N/A	Ash	0	38	5	30%	5	0	641280	4751854
2	N/A	Shagbark	0	36	7.5	0	1	0	641280	4751854
3	N/A	Black Cherry	0	36	10	0	5	0	641217	4751851
4	N/A	Black Cherry	1	26	7.5	0	4	0	641315	4751860
5	N/A	Ash	2	38	12	40%	4	0	641313	4751831
6	1	Red Maple	1	36	10	0	1	0	641264	4751893
7	3	Red Oak	1	36	4	0	6	0	641199	4751969
8	3	Red Maple	1	50	15	0	2	0	641192	4751968
9	3	Shagbark	0	36	10	0	1	0	641192	4751964
10	3	Red Oak	0	43, 34, 36	15	0	1	0	641207	4751963
11	4	Red Oak	1	55	15	0	1	0	641246	4751978
12	N/A	Walnut	5	62	10	0	1	0	641354	4751974
13	8	Walnut	1	70	7.5	0	1	0	641412	4752123
14	8	Walnut	1	22	7.5	0	2	0	641428	4752122
15	N/A	Walnut	1	73	10	0	2	0	641547	4752178

a - Decay class as listed in the Ministry of Natural Resources and Forestry - Guelph Distric's *Bat and Bat Habitat Surveys of Tree Habitats*. Updated April 2017.

Plot Density Calculations				
ELC Unit	Polygon Size	Plot #	# of Snag or Cavity Trees	Total Snag Density (#snag or cavity trees/ha)
FOD9	0.05	1	1	0.05
FOD9	0.05	3	4	0.20
FOD9	0.05	4	1	0.05
CUW1	0.05	8	2	0.10

Appendix E

Beacon 2021-2022 Field Survey Data

Appendix E

Field Survey Data

Table 1. Breeding Birds Documented for the Subject Lands by Beacon June 2022

Common Name	*Scientific Name*	Status
Turkey Vulture*	*Cathartes aura*	S5
Red-tailed Hawk*	*Buteo jamaicensis*	S5
Wild Turkey	*Meleagris gallopavo*	S5
Killdeer	*Charadrius vociferus*	S5
Spotted Sandpiper	*Actitis macularia*	S5
Ring-billed Gull*	*Larus delawarensis*	S5
Pigeon	*Columba livia*	SNA
Mourning Dove	*Zenaida macroura*	S5
Red-bellied Woodpecker	*Melanerpes carolinus*	S5
Downy Woodpecker	*Picoides pubescens*	S5
Northern Flicker	*Colaptes auratus*	S5
Pileated Woodpecker	*Dryocopus pileatus*	S5
Eastern Wood-Pewee	*Contopus virens*	S4/SC
Great Crested Flycatcher	*Myiarchus crinitus*	S4
Eastern Kingbird	*Tyrannus tyrannus*	S5
Tree Swallow	*Tachycineta bicolor*	S4
American Crow*	*Corvus brachyrhynchos*	S5
Blue Jay	*Cyanocitta cristata*	S5
Black-capped Chickadee	*Poecile atricapillus*	S5
House Wren	*Troglodytes aedon*	S5
Wood Thrush	*Hylocichla mustelina*	S4/SC
American Robin	*Turdus migratorius*	S5
Northern Mockingbird	*Mimus polyglottus*	S4
Grey Catbird	*Dumetella carolinensis*	S5
European Starling	*Sturnus vulgaris*	SNA
Cedar Waxwing	*Bombycilla cedrorum*	S5
Warbling Vireo	*Vireo gilvus*	S5
Red-eyed Viero	*Vireo olivaceus*	S5
Yellow Warbler	*Dendroica petechia*	S5
Common Yellowthroat	*Geothlyphis trichas*	S5
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4
Indigo Bunting	*Passerina cyanea*	S4
Eastern Towhee	*Pipilio erythrophthalmus*	S4
Northern Cardinal	*Cardinalis cardinalis*	S5
Song Sparrow	*Melospiza melodia*	S5
Chipping Sparrow	*Spizella passerine*	S5
Field Sparrow	*Spizella pusilla*	S4
Savannah Sparrow	*Passerculus sandwichensis*	S4
Brown-headed Cowbird	*Molothrus ater*	S5
Common Grackle	*Quiscalus quiscula*	S5

Common Name	*Scientific Name*	Status
Red-winged Blackbird	*Agelaius phoeniceus*	S5
Baltimore Oriole	*Icterus galbula*	S5
American Goldfinch	*Cardeulis tristis*	S5
House Sparrow	*Passer domesticus*	SNA

Species Highlighted are additional species documented by the Beacon 2022 Survey
Random Walk Field Survey Conducted June 2
Start 7:30am – Finish 11:30 am, 12c^0, Cloud Cover 2/8, Wind Beaufort Scale 2

KEY
* Species Not Considered to be Breeding within the Subject Lands
COSEWIC = Committee on the Status of Endangered Wildlife in Canada
COSSARO = Committee on the Status of Species at Risk in Ontario
END = Endangered, THR = Threatened, SC = Special Concern, NAR = Not at Risk
SRANK = Natural Heritage Information Centre occurrence status
S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (exotic, i.e. non-native)

Table 2. Vascular Plants Documented for the Subject Lands by Beacon 2021- 2022

Scientific Name	English Name	Srank	COSEWIC	COSSARO	Niagara
Equisetum arvense	Field Horsetail	S5			
Athyrium filix-femina	Lady Fern	S5			
Dryopteris marginalis	Marginal Wood-fern	S5			
Onoclea sensibilis	Sensitive Fern	S5			
Polystichum acrostichoides	Christmas Fern	S5			
Thelypteris palustris	Marsh Fern	S5			
Picea abies	Norway Spruce	SE3			
Picea glauca	White Spruce	S5			
Pinus resinosa	Red Pine	S5			
Pinus strobus	Eastern White Pine	S5			
Juniperus communis	Ground Juniper	S5			
Juniperus virginiana	Eastern Red Cedar	S5			
Typha angustifolia	Narrow-leaved Cattail	S5			
Sparganium emersum	Greenfruit Bur-reed	S5			
Alisma triviale	Northern Water-plantain	S5?			
Agrostis stolonifera	Spreading Bentgrass	S5			
Bromus ciliatus	Fringed Brome	S5			
Bromus inermis	Brome Grass	SE5			
Calamagrostis canadensis	Blue-joint Reedgrass	S5			
Dactylis glomerata	Orchard Grass	SE5			
Digitaria ischaemum	Smooth Crabgrass	SE5			
Digitaria sanguinalis	Hairy Crabgrass	SE5			
Elymus repens	Quack Grass	SE5			
Elymus virginicus	Virginia Wild Rye	S5			
Festuca pratensis	Meadow Fescue	SE5			
Glyceria grandis	American Mannagrass	S4S5			
Glyceria striata	Fowl Manna-grass	S4S5			
Muhlenbergia mexicana	Mexican Muhly	S5			
Panicum capillare	Old Witch Panic-grass	S5			
Poa compressa	Canada Bluegrass	S5			

Scientific Name	English Name	Srank	COSEWIC	COSSARO	Niagara
Poa palustris	Fowl Bluegrass	S5			
Poa pratensis	Kentucky Bluegrass	S5			
Carex bebbii	Bebb's Sedge	S5			
Carex brunnescens	Brownish Sedge	S5			
Carex crinita	Fringed Sedge	S5			
Carex gracillima	Graceful Sedge	S5			
Carex granularis	Meadow Sedge	S5			
Carex hystericina	Porcupine Sedge	S5			
Carex intumescens	Bladder Sedge	S5			
Carex lupulina	Hop Sedge	S5			
Carex scirpoidea	Spike Sedge	S5			
Carex stipata	Stalk-grain Sedge	S5			
Carex vulpinoidea	Fox Sedge	S5			
Scirpus atrovirens	Dark-green Bulrush	S5			
Scirpus cyperinus	Cottongrass Bulrush	S5			
Arisaema triphyllum	Jack-in-the-pulpit	S5			
Lemna minor	Lesser Duckweed	S5			
Juncus bufonius	Toad Rush	S5			
Juncus dudleyi	Dudley's Rush	S5			
Juncus effusus	Soft Rush	S5			
Juncus tenuis	Path Rush	S5			
Erythronium americanum	Yellow Trout-lily	S5			
Iris versicolor	Blueflag	S5			
Sisyrinchium montanum	Strict Blue-eyed-grass	S5			
Epipactis helleborine	Eastern Helleborine	SE5			
Populus deltoides	Eastern Cottonwood	SU			
Populus tremuloides	Trembling Aspen	S5			
Salix bebbiana	Bebb's Willow	S5			
Carya cordiformis	Bitter-nut Hickory	S5			
Carya ovata	Shag-bark Hickory	S5			
Juglans nigra	Black Walnut	S4			
Carpinus caroliniana	American Hornbeam	S5			
Ostrya virginiana	Ironwood	S5			
Quercus bicolor	Swamp White Oak	S4			
Quercus macrocarpa	Bur Oak	S5			
Quercus palustris	Pin Oak	S4			
Quercus rubra	Northern Red Oak	S5			
Ulmus americana	American Elm	S5			
Polygonum convolvulus	Black Bindweed	SE5			
Polygonum virginianum	Virginia Knotweed	S4			
Rumex crispus	Curly Dock	SE5			
Chenopodium capitatum	Strawberry Goosefoot	S5			
Cerastium fontanum	Mouse-ear Chickweed	SE5			
Anemone canadensis	Canada Anemone	S5			
Clematis occidentalis	Purple Clematis	S4S5			
Ranunculus acris	Tall Butter-cup	SE5			
Ranunculus gmelinii	Small Yellow Water Crowfoot	S5			
Ranunculus repens	Creeping Butter-cup	SE5			
Berberis vulgaris	European Barberry	SE5			

Scientific Name	English Name	Srank	COSEWIC	COSSARO	Niagara
Podophyllum peltatum	May Apple	S5			
Lindera benzoin	Spicebush	S5			
Alliaria petiolata	Garlic Mustard	SE5			
Hesperis matronalis	Dame's Rocket	SE5			
Lepidium campestre	Field Pepper-grass	SE5			
Lepidium virginicum	Poor-man's Pepper-grass	S5			
Ribes cynosbati	Prickly Gooseberry	S5			
Ribes triste	Swamp Red Currant	S5			
Agrimonia gryposepala	Tall Hairy Groovebur	S5			
Crataegus crus-galli	Cockspur Hawthorn	S5			
Crataegus mollis	A Hawthorn	S5			
Crataegus punctata	Dotted Hawthorn	S5			
Crataegus spp	A Hawthorn	S?			
Fragaria virginiana	Virginia Strawberry	S5			
Geum aleppicum	Yellow Avens	S5			
Geum canadense	White Avens	S5			
Malus pumila	Common Apple	SE5			
Potentilla norvegica	Norwegian Cinquefoil	S5			
Potentilla recta	Rough-fruited Cinquefoil	SE5			
Prunus avium	Sweet Cherry	SE4			
Prunus pensylvanica	Pin Cherry	S5			
Prunus serotina	Wild Black Cherry	S5			
Prunus virginiana	Choke Cherry	S5			
Pyrus communis	Common Pear	SE4			
Rosa blanda	Smooth Rose	S5			
Rosa multiflora	Rambler Rose	SE4			
Rubus allegheniensis	Common Blackberry	S5			
Rubus idaeus	Red Raspberry	S5			
Spiraea alba	Meadow-sweet	S5			
Medicago lupulina	Black Medic	SE5			
Melilotus alba	White Sweet Clover	SE5			
Trifolium pratense	Red Clover	SE5			
Trifolium repens	White Clover	SE5			
Vicia americana	American Purple Vetch	S5			
Vicia cracca	Tufted Vetch	SE5			
Geranium maculatum	Wild Crane's-bill	S5			
Geranium robertianum	Herb-robert	SE5			
Zanthoxylum americanum	Northern Prickley Ash	S5			
Rhus radicans ssp. negundo	Poison Ivy	S5			
Rhus radicans ssp. rydbergii	Poison Ivy	S5			
Rhus typhina	Staghorn Sumac	S5			
Acer negundo	Manitoba Maple	S5			
Acer rubrum	Red Maple	S5			
Acer saccharum	Sugar Maple	S5			
Impatiens capensis	Spotted Jewel-weed	S5			
Rhamnus cathartica	Buckthorn	SE5			
Rhamnus frangula	Glossy Buckthorn	SE5			
Parthenocissus vitacea	Virginia Creeper	S5			
Vitis riparia	Riverbank Grape	S5			
Tilia americana	American Basswood	S5			

Scientific Name	English Name	Srank	COSEWIC	COSSARO	Niagara
Hypericum perforatum	Common St. John's-wort	SE5			
Viola cucullata	Marsh Blue Violet	S5			
Viola pubescens var. pubescens	Yellow Violet	S5			
Lythrum salicaria	Purple Loosestrife	SE5			
Nyssa sylvatica	Black Gum	S3			
Circaea alpina	Small Enchanter's Nightshade	S5			
Oenothera biennis	Common Evening-primrose	S5			
Cicuta bulbifera	Bulb-bearing Water-hemlock	S5			
Daucus carota	Queen Anne's Lace	SE5			
Hydrocotyle americana	American Water-pennywort	S5			
Pastinaca sativa	Wild Parsnip	SE5			
Cornus alternifolia	Alternate-leaf Dogwood	S5			
Cornus foemina	Gray Dogwood	S5			
Cornus stolonifera	Red-osier Dogwood	S5			
Lysimachia terrestris	Swamp Loosestrife	S5			
Fraxinus americana	White Ash	S5			
Fraxinus pennsylvanica	Green Ash	S5			
Syringa vulgaris	Common Lilac	SE5			
Apocynum androsaemifolium	Spreading Dogbane	S5			
Asclepias syriaca	Common Milkweed	S5			
Convolvulus arvensis	Field Bindweed	SE5			
Echium vulgare	Common Viper's-bugloss	SE5			
Myosotis scorpioides	True Forget-me-not	SE5			
Lycopus europaeus	European Bugleweed	SE5			
Prunella vulgaris	Self-heal	S5			
Solanum dulcamara	Climbing Nightshade	SE5			
Linaria vulgaris	Butter-and-eggs	SE5			
Verbascum thapsus	Common Mullein	SE5			
Veronica officinalis	Common Speedwell	SE5			
Plantago lanceolata	English Plantain	SE5			
Plantago major	Common Plantain	SE5			
Cephalanthus occidentalis	Common Buttonbush	S5			
Galium asprellum	Rough Bedstraw	S5			
Galium mollugo	Great Hedge Bedstraw	SE5			
Galium palustre	Marsh Bedstraw	S5			
Lonicera involucrata	Fly Honeysuckle	S5			
Lonicera oblongifolia	Swamp Fly-honeysuckle	S5			
Lonicera tatarica	Tartarian Honeysuckle	SE5			
Viburnum lentago	Nannyberry	S5			
Viburnum recognitum	Southern Arrow-wood	S4			
Dipsacus fullonum	Fuller's Teasel	SE5			
Achillea millefolium	Yarrow	S5			
Ambrosia artemisiifolia	Annual Ragweed	S5			
Anaphalis margaritacea	Pearly Everlasting	S5			
Arctium lappa	Greater Burdock	SE5			
Artemisia biennis	Biennial Wormwood	SE5			

Scientific Name	English Name	Srank	COSEWIC	COSSARO	Niagara
Bidens tripartita	Beggar-ticks	S5			
Chrysanthemum leucanthemum	Oxeye Daisy	SE5			
Cichorium intybus	Chicory	SE5			
Cirsium arvense	Canada Thistle	SE5			
Cirsium vulgare	Bull Thistle	SE5			
Erigeron philadelphicus	Philadelphia Fleabane	S5			
Eurybia macrophylla	Large-leaf Aster	S5			
Hieracium aurantiacum	Orange Hawkweed	SE5			
Hieracium caespitosum	Yellow Hawkweed	SE5			
Solidago altissima	Tall Goldenrod	S5			
Solidago canadensis	Canada Goldenrod	S5			
Solidago rugosa	Rough-leaf Goldenrod	S5			
Symphyotrichum cordifolium	Heart-leaf Aster	S5			
Symphyotrichum ericoides	White Heath Aster	S5			
Symphyotrichum lanceolatum	Panicled Aster	S5			
Symphyotrichum novae-angliae	New England Aster	S5			
Taraxacum officinale	Brown-seed Dandelion	SE5			
Tragopogon pratensis	Meadow Goat's-beard	SE5			

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S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure)
SE (exotic, i.e. non-native)
R= Rare in Niagara Region (Oldham 2010)