Environmental Impact Statement

for the

Proposed Peaks Meadows Development, Block 46, Town of The Blue Mountains, Grey County

Prepared for
Peppermill Construction Ltd.

Prepared by
Hensel Design Group Inc.

August 2017

Hensel Design Group INC.

Advancing Sustainable Development Solutions

Hensel Design Group INC.

Advancing Sustainable Development Solutions

August 18, 2017

Mr. Ian MacLeod
Peppermill Construction Limited
1270 Vandorf Sideroad
Aurora, ON L4G 0N8

Dear Mr. MacLeod:

Re: EIS for Peaks Meadows Development, Town of The Blue Mountains, Gre County

On behalf of the project team, Hensel Design Group Inc. (HDG) is pleased to submit the Environmental Impact Statement (EIS) related to the proposed Peaks Meadows Development located on Dorothy Drive, Town of The Blue Mountains, Grey County. This report will also be forwarded to the applicable review agencies. The scope of this EIS has fully considered the requirements of the Provincial Policy Statement, Town of The Blue Mountains and Grey County Official Plans using the information available to date.

HDG has concluded that the development proposal is feasible from an environmental prospective in so long as the mitigation measures outlined herein are implemented.

We have greatly appreciated being a part of your team. If you should have any questions or concerns regarding this submission, please do not hesitate to contact us.

Sincerely,
HENSEL DESIGN GROUP INC.

Michael J. Hensel, OALA, CSLA
Senior Development Consultant

MJH:sh

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1. Introduction

Hensel Design Group Inc. (HDG) was retained by Peppermill Construction Ltd. in October 2016 to prepare an Environmental Impact Study (EIS) related to the proposed Peaks Meadows Development located on Dorothy Drive in the Town of The Blue Mountains, Grey County. HDG is part of a multi-disciplinary team which includes KLM Planning Partners Inc. (planning), C.F. Crozier & Associates Inc. (engineering), and HDG (environmental). Each of these consultants have prepared studies and/or plans to support the planning application. This report prepared by HDG should be read in conjunction with the works of the other project team members.

1.1 Site Location

The subject lands are described as Plan 16M20 Block 46. The subject lands are located on the south side of Dorothy Drive and east of Camperdown Road. The lands both on the north side of Dorothy Drive and on the west side of Camperdown Road are approved for development with some houses built or under construction. The lands to the south and to the east of the subject lands remain undeveloped (See Figure 1).

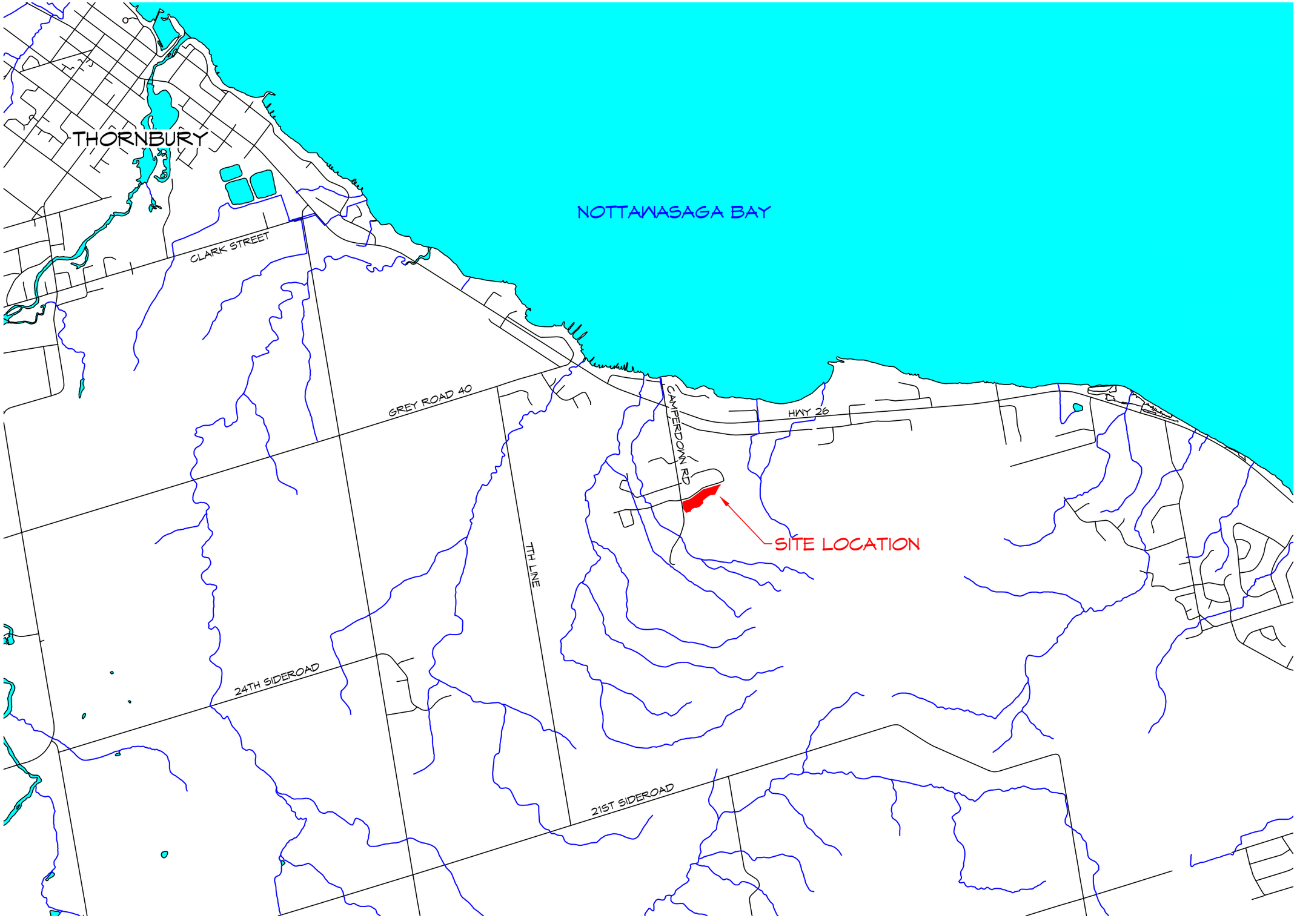
1.2 Study Goals and Objectives

The purpose of this EIS is to provide a detailed description and background review of the physical and ecological characteristics of the natural heritage features from the subject property including the functions, significance and sensitivity using information available to date. Additionally, this report will address potential impacts to these features and outline how impacts can be minimized or mitigated. In consideration of this information, recommended protection and/or mitigation measures will ensure that the proposed development conforms to the requisite policies as outlined herein.

The policies and technical requirements of the Official Plans for The Blue Mountains and Grey County as well the Niagara Escarpment Commission (NEC), Grey Sauble Conservation Authority (GSCA) and the Provincial Policy Statement (PPS) have been considered as part of this study.

The goal of this EIS is to provide the following:

a) Ensure that the proposed development can proceed in a manner that will not result in negative impacts to significant ecological features and functions.
b) Demonstrate conformity to the Provincial Policy Statement, the Grey County Official Plan, the Town of The Blue Mountains Official Plan, and the Conservation Authorities Act.



Key Plan (n.t.s.)

Legend

ROADS
WATERCOURSE
WATERBODY

N

0 150 300 600 900 1200 m

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No.	Revision	Date	Init

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY ERRORS OR OMISSIONS TO THE CONSULTANT BEFORE COMMENCING OR PROCEEDING WITH ANY WORK.

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Hensel Design Group
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PROJECT

PEAKS
MEADOWS
Town of the Blue Mountains, Ontario

TITLE

SITE
LOCATION

SEAL

SEAL

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
MICHAEL J. HENSEL
OALA
MEMBER

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Fig 1

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The specific objectives that will be completed as part of this EIS include the following:

a) Provide an evaluation of the ecological features and functions of the subject property detailed background review. Complete in-season field investigations to identify and map any and all significant features (i.e. any significant habitat for Species at Risk), key ecological attributes, and sensitivities of the subject property.
b) Confirm the appropriate development proposal, buffers and setbacks to adjacent features through an evaluation of the ecological features and functions.
c) Determine the need for buffers for any and all natural features and provide recommendations for the mitigation and protection of natural heritage features and functions.
d) Complete a detailed assessment of potential impacts to natural heritage features;
e) Identify appropriate mitigation that minimizes the potential impact of each component of the development proposal; and
f) Assess long term and cumulative effects of the proposed development along with adjacent land use.

2. Natural Heritage Policy

Provincial and municipal planning policies guided the preparation of natural heritage constraints and opportunities for the proposed development on the subject property. Existing background policy information sources were reviewed to identify any mapped natural heritage features that may occur on or within 5km to the subject property. In addition, a review of background data from various sources pertaining to the subject property and adjacent lands was also completed. These policies and background information sources include:

a) Ontario Provincial Policy Statement (2014);
b) Grey County Official Plan (2013);
c) Town of The Blue Mountains Official Plan (2016);
d) Grey Sauble Conservation Authority - Ontario Regulation 151/06 (2006)
e) Niagara Escarpment Plan (Office Consolidation 2015)
f) Ministry of Natural Resources Natural Heritage Reference Manual (2010) and the Significant Wildlife Habitat Technical Guide (2000);
g) Ontario Natural Heritage Information Centre database (2016) (www.nhic.mnr.gov.on.ca);
h) The Ontario Breeding Bird Atlas (www.birdsontario.org);
i) The Species At Risk Public Registry (www.sararegistry.gc.ca);
j) Ontario *Endangered Species Act* (2007);
k) Federal *Species At Risk Act* (2002);
l) Aerial photographs.

2.1 Provincial Policy Statement (PPS)

The Provincial Policy Statement addresses the protection of Natural Heritage Features in relation to development.

According to the Provincial Policy Statement (2014), various provincially defined natural features shall be protected for the long term. Relevant sections state:

"2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of *natural heritage systems*, should be maintained, restored or, where possible, improved, recognizing linkages between and among *natural heritage features* and *areas, surface water features* and *ground water features.*

2.1.4 *Development* and *site alteration* shall not be permitted in :

a) significant wetlands in Ecoregions 5E, 6E and 7E, and

b) significant coastal wetlands

2.1.5 *Development* and *site alteration* shall not be permitted in:

a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E and 7E;
b) *significant woodlands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
c) *significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
d) *significant wildlife habitat*; and
e) *significant areas of natural and scientific interest;* and
f) coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b)

unless it has been demonstrated that there will be no *negative impacts* on the natural features or the *ecological functions*.

2.1.6 *Development* and *site alteration* shall not be permitted in *fish habitat* except in accordance with *provincial and federal requirements.*

2.1.7 *Development* and *site alteration* shall not be permitted in *habitat of endangered species* and *threatened species*, except in accordance with *provincial* and *federal requirements*.

2.1.8 *Development and site alteration* shall not be permitted *on adjacent lands* to the *natural heritage features and areas* identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the *ecological function* of the *adjacent lands* has been evaluated and it has been demonstrated that there will be no *negative impacts* on the natural features or on their *ecological functions*."

2.1.1 Relevance to the Development Proposal

This development proposal shall be consistent with policy statements made under the Act.

2.2 Grey County Official Plan

According to Section 1.6.3 of the County of Grey Official Plan, the objectives with regards to the environment are to identify lands with environmental constraints and/or the presence of sensitive natural heritage features and establish policies to promote the protection, preservation, conservation, maintenance and enhancement of such areas.

The Official Plan establishes policies to ensure only appropriate and compatible development occurs on lands having inherent environmental hazards such as poor drainage, flood susceptibility, erosion, steep slopes, or any other condition, which could be hazardous to development or where development would be hazardous to the environment. The policies will also protect the areas of ground water recharge, cold-water streams, lakes and other surface waters for their habitat, recreational, ecological and drinking water benefits. It considers the cumulative effects of new development on the natural environment and surrounding land uses. Section 2.8 of the Official Plan addresses Natural Environment policies including Significant Woodlands. Section 2.8.4, Significant Woodlands notes the following:

"In order to be considered significant a woodland must be either greater than or equal to forty (40) hectares in size outside of settlement areas, or greater than or equal to four (4) hectares in size within settlement area boundaries. If a woodland fails to meet those criteria, a woodland can also be significant if it meets any two of the following three criteria:

(a) Proximity to other woodlands i.e. if a woodland was within 30 meters of another significant woodland, or

(b) Overlap with other natural heritage features i.e. if a woodland overlapped the boundaries of a Provincially Significant Wetland or an area of natural and Scientific Interest, or

(c) Interior habitat of greater than or equal to eight (8) hectares, with a 100 metre interior buffer on all sides.

(1) No development or site alteration may occur within Significant Woodlands or their adjacent lands unless it has been demonstrated through an Environmental Impact Study, as per section 2.8.7 of the Plan, that there will be no negative impacts on the natural features or their ecological functions. The adjacent lands are defined in section 6.19 of the Plan.

Notwithstanding the above, projects undertaken by a Municipality or Conservation Authority may be exempt from the Environmental Impact Study requirements, provided said project is a public work or conservation project.

(2) Notwithstanding paragraph (1), where it can be proven that a woodland identified as significant has ceased to exist, or ceased to exhibit characteristics of significance, prior to November 1, 2006, an Environmental Impact Study will not be required. Site photographs or a site visit by a qualified individual may be necessary to determine that a woodland no longer exists.

(3) Notwithstanding paragraph (1), tree cutting and forestry will be permitted in accordance with the County Forest Management By-law.

(4) Notwithstanding paragraph (1) and (3), fragmentation of significant woodlands is generally discouraged."

2.2.1 Relevance to the Development Proposal

A large portion of the development proposal also is located within lands identified by the Grey County Official Plan on Appendix B – Map 2 as Significant Woodland. The subject and adjacent lands are also identified as Special Policy Karst on Appendix A – Map 2 of the Grey County Official Plan. Appendix B – Map 2 also identifies a small portion of the subject lands as ANSI (See Appendix A).

2.3 Town of The Blue Mountains Official Plan

The Goals and Objectives outlined in Section A3 of the Official Plan provide a general guideline for the review of all proposed development. All goals, objectives and policies of the Official Plan are designed to reflect the municipality's long-term vision for the future, and to have regard for the Provincial Policy Statement, not in conflict with the Niagara Escarpment Plan, and also in conformity with the County of Grey Official Plan.

According to Section A3.2.2 it is a strategic objective of the Official Plan to:

1. Protect *significant* natural heritage and hydrologic features and their associated habitats and *ecological functions*.

2. Ensure that an understanding of the natural environment, including the values, opportunities, limits and constraints that it provides, guides land use decision-making in the Town.

3. Make planning decisions that contribute to the protection, conservation and enhancement of water and related resources on a watershed and sub watershed basis.

4. Maintain and *enhance* surface and *groundwater resources* in sufficient quality and quantity to meet existing and future needs on a sustainable basis.

5. Discourage the loss or fragmentation of *significant* woodlands and the habitats and *ecological functions* they provide.

6. Recognize that an interconnected system of open spaces and natural heritage features contributes to the health and *character* of a community.

7. Prohibit the loss or fragmentation of *Provincially Significant Wetland*s and *significant* habitat of endangered and *threatened species*.

8. Maintain and *enhance significant* areas of natural and scientific interest, *significant* valleylands, escarpment slopes and related landforms, and *significant wildlife habitat* areas.

9. Promote and establish programs to increase the forest cover of the Town.

Section B5 addresses the policies specific to Natural Heritage Features.

2.3.1 Relevance to the Development Proposal

The Official Plan Appendix 1 Constraints Mapping identifies a portion of the subject lands as Significant Woodlands, Karst and ANSI. (See Appendix B).

2.4 Grey Sauble Conservation Authority

Ontario Regulation 151/06 is the Generic Regulation of the Conservation Authorities Act, which came into effect in May 2006, specific to the regulation of development, interference with wetlands, and alterations to shorelines and watercourses. Under this regulation, hazardous lands, wetlands, shorelines and areas susceptible to flooding, and associated allowances within the Authority are delineated by the "Regulation Limit" shown on maps that are filed by the Authority. HDG acquired GSCA mapping of the Hazard Regulation Limit(s) for the subject lands. The Generic Regulation layer indicates that the areas adjacent to the existing watercourses located within the subject lands are a potential flood and meander hazard.

Regulation 151/06, **'***Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation*', requires that a permit be obtained from the Authority when undertaking any of the following:

- Straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse or interfering in any way with a wetland;
- Development adjacent or close to the shoreline of inland lakes, in river or stream valleys, hazardous lands, wetlands or lands adjacent to wetlands.

Development as defined by the Conservation Act includes:

- The construction, reconstruction, erection or placing of a building or structure of any kind, or changes to an existing building or structure to alter its size or purpose;
- Site grading;
- The temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

The intent of the permit process is to ensure that activities in these areas will not result in a risk to public safety or property damage and that the natural features are protected through the conservation of land.

Under Ontario Regulation 151/06 Section 2, development is prohibited in or on the areas within the GSCA jurisdiction that are prone to flooding or meander hazards. The flood hazard line of the Regulation Limit is typically associated with the stable top of bank or regulatory floodplain plus a setback to facilitate access to the top of bank. Similarly, the meander belt line is depicted as the maximum extent of the predicted meander belt of the watercourse plus an allowance of 15m on each side. The Regulation Limit follows the maximum extent of the combined floodplain and meander belt limits. Under this regulation, written permission to develop within prohibited areas or alter a

watercourse is required. Acquisition of this permission requires the completion of an Application for Permission to be filed with the Authority. It should therefore be assumed that an authorization would be required for any fill or alterations within the Regulation Limit area. If the extent of the fill or alterations identified in the Development Plan were deemed significant, an Environmental Impact Study may be triggered.

2.4.1 Relevance to the Development Proposal

The subject lands are partially within the GSCA Regulation Limits (See Figure 2).

2.5 Niagara Escarpment Commission

The *Niagara Escarpment Planning and Development Act* provides the objectives for the Niagara Escarpment Plan, which are to "provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment and to ensure only such development occurs as is compatible with that natural environment" (NEC, 2015). With regards to development on the Niagara Escarpment, Section 1.8 of the Niagara Escarpment Plan states the following requirements:

- To minimize any adverse effects of recreational activities on the Escarpment environment.
- To provide areas where new recreational and associated development can be concentrated around established, identified or approved downhill ski centers.
- To provide areas where new recreational and associated development can be concentrated around established, identified or approved lakeshore cottage areas in Grey and Bruce Counties.
- To ensure that future recreational development is compatible with cultural and natural heritage values (e.g. fisheries and wildlife habitats) in the area.

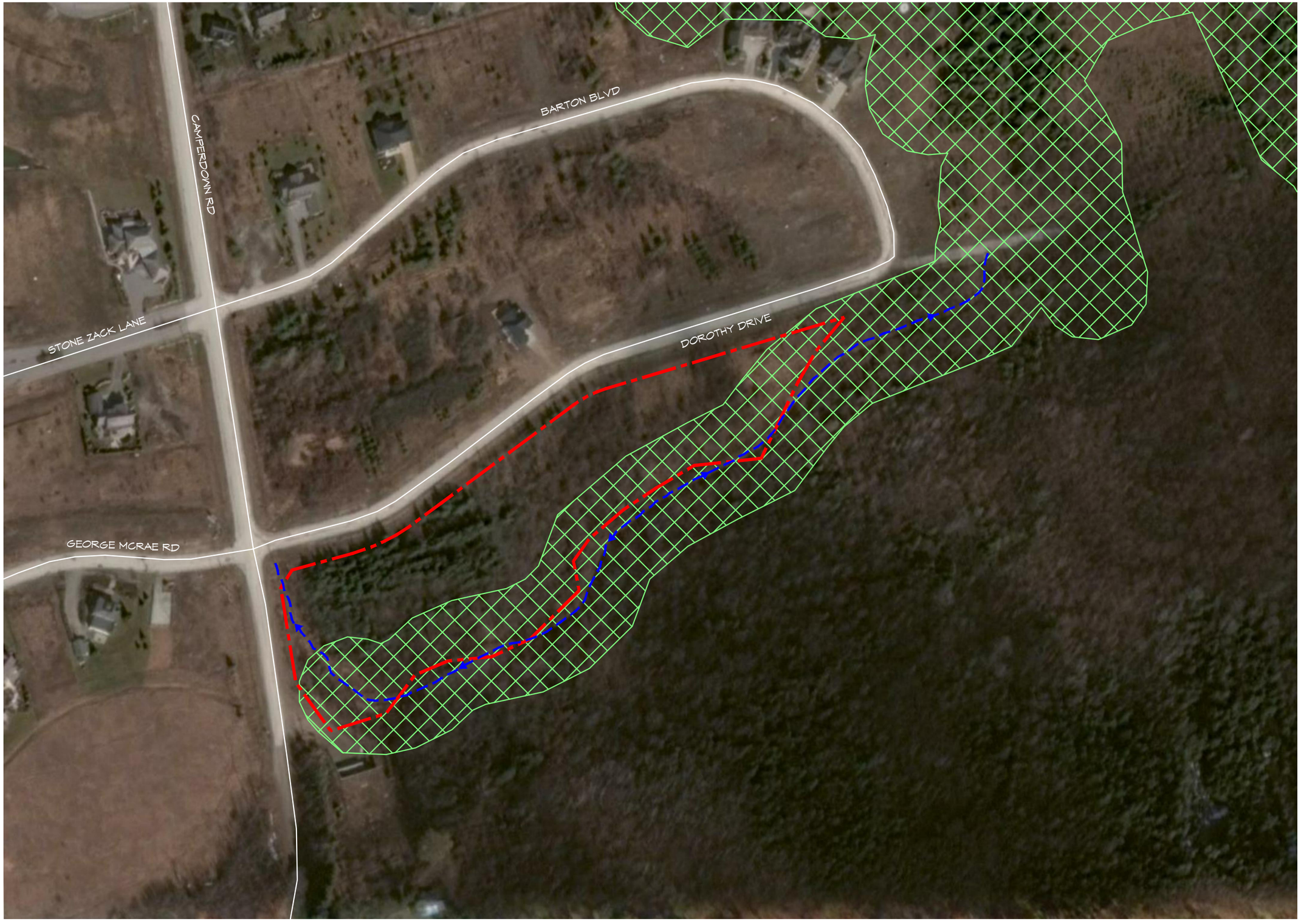
2.5.1 Relevance to the Development Proposal

The Niagara Escarpment Commission designates the subject lands as an Escarpment Recreation Area on Map 6: County of Grey. According to the Niagara Escarpment Plan, designated Escarpment Recreation Areas are areas that of existing or potential recreational development associated with the Escarpment. Such areas may include both seasonal and permanent residences.

2.6 Endangered Species Act

The Provincial *Endangered Species Act* (2007) protects the endangered species that are listed on the regulations under the act. It specifically prohibits willful harm to endangered species that are listed in regulations under the Act and the willful destruction of, or interference with, their habitats. Species thought to be at risk are assessed by The Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent body that reviews species based on the best available science, including community knowledge, and Aboriginal Traditional Knowledge. There are several components of species at risk protection that, under the new Act are now legal regulations.

- the Species at Risk in Ontario (SARO) list,
- General regulations to provide greater flexibility, and
  Habitat Regulations to describe the habitat of a species.



Key Plan *(n.t.s.)*

Legend

- APPROXIMATE PROPERTY BOUNDARY
- ROADS
- INTERMITTENT SWALE (FLOW DIRECTION)
- GSCA REGULATION LIMITS

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Phone: 705-443-8394 Fax.: 705-443-8494

PROJECT

PEAKS
MEADOWS
Town of the Blue Mountains, Ontario

TITLE

Grey Sauble Conservation Authority
Regulation Limits (GSCA)

SEAL

SEAL

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO
MICHAEL J. HENSEL
OALA
MEMBER

Scale:	1:2,000
Date:	August 2017
CAD File:	HDG-PM-Fig2
Drawn by:	CM
Checked by:	MH
Job No.:	-

Drawing No.

Fig 2

Date Plotted: August 10, 2017 File Location: Q:\Projects\HDG\Peaks Meadow\ACAD\DWG\HDG\HDG-PM-Fig2.dwg

The Natural Heritage Information Centre tracks and maintains data on Ontario's endangered species and was consulted as to the listed species on or within a one kilometre grid surrounding the subject lands.

2.6.1 Relevance to the Development Proposal

The search of the Natural Heritage Information Centre (NHIC) revealed the presence of 7 element occurrences for rare species on or directly adjacent to the subject lands. None of species reported are listed as endangered, threatened or special concern and none were observed during the 2017 field studies.

2.7 Species at Risk Act

The Federal *Species at Risk Act* (2002) is designed to prevent wildlife species from becoming extinct or extirpated; help in the recovery of extirpated, endangered or threatened species; and to ensure that species of special concern do not become endangered or threatened.

The Act maintains an on-line registry of species at risk (Schedule 1) which is the official Federal list of wildlife species at risk. Species are classified as being either extirpated, endangered, threatened or special concern. Once the species becomes listed, the measures to protect and recover a listed wildlife species are implemented.

2.7.1 Relevance to the Development Proposal

No flora or fauna Species At Risk (SAR) were observed or reported on the subject property. None of the plant or wildlife species are considered rare on either a federal, provincial, municipal or local level.

3. Study Area

3.1 Field Investigations

3.1.1 Collection and Review of Background Information

Background natural environment data was solicited through various platforms from the Ministry of Natural Resources & Forestry (MNRF), Grey Sauble Conservation Authority (GSCA), The Town of Blue Mountains and County of Grey. Data was collected prior to and during the site reconnaissance and inventories of the subject property vegetation cover in 2017. The Town's Official Plan was also consulted for information on land use and natural environment designations pertaining to the subject property (Town of Blue Mountains 2016).

Coloured orthophotos (Grey County 2010, 2015) that provided coverage of the subject property and abutting lands was obtained and used as field base maps. The preliminary boundaries and types of

vegetation communities were overlaid onto the 2010 coloured orthophoto and subsequently refined through ground-truthing.

Types of vegetation communities included natural terrestrial vegetation communities such as white ash-hardwood forest (FODM4-2); hawthorn-white spruce mixed woodland (WOMM3-1b); white ash deciduous woodland (WODM4-2); white ash regeneration thicket (THDM4-2); and red-osier dogwood shrub thicket (THDM2-11). The remaining feature on-site is a cultural mixed meadow (MEMM3). Surrounding land uses were noted including the types, extent and connectivity.

Documentation and other sources reviewed for natural environment data included but were not limited to:

- **Natural Heritage Resources of Ontario: Bibliography of Life Science Areas of Natural and Scientific Interest in Ecological Site Regions 6E and 7E, Southern Ontario** (Riley *et al.* 1997);
- **Significant Natural Areas Along the Niagara Escarpment: A Report on Nature Reserve Candidates and Other Scientific Natural Areas in the Niagara Escarpment Planning Area** (Cuddy and Macdonald 1976);
- **Ecological Survey of the Niagara Escarpment Biosphere Reserve: Volume 1: Significant Natural Areas. Volume II. Technical Appendices** (Riley et al 1996);
- **Natural Heritage Information Centre (NHIC) Internet Database/Biodiversity Explorer** (NHIC 2017);
- **County of Grey Official Plan** (County of Grey 2013);
- **County of Grey Digital Orthorectified Imagery** (County of Grey 2006, 2010, and 2015);
- **Grey County Natural Heritage System Study "Grey in Grey"** (MSH and NRSI 2016);
- **A Checklist of Vascular Plants for Bruce and Grey Counties, Ontario** (Bruce-Grey Plant Committee 1995);
- **Town of the Blue Mountains Official Plan** (Town of the Blue Mountains 2016); and,
- **Existing Conditions Report – The Barton Group** (Gartner Lee Limited 2003)

In addition to the reports listed above, various databases were searched for flora and fauna records on-site or in the surrounding area. These websites and databases included:

- **Atlas of the Mammals of Ontario** (Dobbyn 1994)
- **Ontario Breeding Bird Atlas (OBBA)** (Bird Studies Canada *et al.* 2006)
- **Ontario's Reptile and Amphibian Atlas** (Ontario Nature 2016)

Background information was also garnered to assess the subject property for potential Species At Risk (SAR) and Candidate Significant Wildlife Habitat (SWH) in and abutting the property, based on either species presence and/or habitat types arising from the wildlife surveys.

Agency Contacts

The following resource agency staffs were contacted regarding natural environment data for the subject lands and abutting properties.

- Kathy Dodge, Habitat Biologist – Ministry of Natural Resources & Forestry (MNRF) Owen Sound District Office
- Andrew Sorensen, Environmental Planning Coordinator – Grey Sauble Conservation Authority (GSCA)

3.1.2 Field Reconnaissance and Inventories

Site inspections and inventories of the natural terrestrial and wetland features within the subject lands were undertaken on May 27, June 15, June 17 and July 25, 2017. Field surveys were undertaken to ensure complete coverage of the natural and cultural features and inherent flora, including abutting lands along the subject property perimeter. During all site visits, botanical, soils, drainage and wildlife data were also noted and recorded, along with a photographic record, where applicable.

Vertebrate terrestrial species (birds, mammals, amphibians and reptiles) were documented on each site visit based on visual contact (direct sightings) and/or on the basis of indirect evidence (e.g. vocalizations, tracks, scats, pellets, burrows, nests, feathers, browse, etc.). Survey methods used to identify, delineate and characterize the vegetation communities, floristics, wildlife and wildlife habitat, and ecological functions on and abutting the property follow MNRF and Bird Studies Canada protocols.

3.1.3 Vegetation Resources

The boundaries of the vegetation communities were delineated through aerial photographic interpretation (2010 and 2015 orthophotos) and verify through ground-truthing. The botanical inventories included those features on the subject property and abutting the property perimeter. Field visit dates for detailed botanical surveys were conducted on May 27, June 15, June 17 and July 25, 2017 and supplemented with observations garnered through the wildlife inventories.

All vegetation features were characterized following the protocols and terminology of the Ecological Land Classification (ELC) system of the MNRF including adaptions, entitled "**Southern Ontario Ecological Land Classification – Vegetation Type List**" (Lee 2008). This protocol is a revision and update of the "**Ecological Land Classification for Southern Ontario – First Approximation and Its Application**" (Lee *et al.* 1998). In addition to the ELC system, additional characterization and potential rarity of the on-site vegetation communities was aided through a review of the Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1997).

The classification of the general vegetation communities were characterized according to species composition and physiognomic characteristics. The nomenclature for the flora observed is consistent with and relied on the following authorities:

- Lycopodiaceae to Aspleniaceae Cody, W. J., and D. F. Britton. 1989. **Fern and Fern Allies of Canada.**
  Publication 1829/E, Agriculture Canada, Research Branch, Ottawa.
- Taxaceae to Orchidaceae – Voss, E. G. 1972. **Michigan Flora. Part 1: Gymnosperms**

and Monocots.
Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 55.

- Saururaceae to Cornaceae – Voss, E. G. 1985. **Michigan Flora. Part 2: Dicots.** Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 59.
- Pyrolaceae to Compositae – Voss, E. G. 1996. **Michigan Flora. Part 3: Dicots**. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 61.
- Newmaster, S. G., A. Lehela, P. W. C. Uhlig, S. McMurray, M. J. Oldham, and Ontario Forest Research Institute. 1998. **Ontario Plant List.** FRI Paper No. 123.
- Bradley, D. J. 2013. **Southern Ontario Vascular Plant Species List.** 3rd Edition. Science & Information Branch Southern Science and Information Section. Ontario Ministry of Natural Resources, Peterborough, Ontario. SIB SSI SR-03, 78 p.

The rarity or significance for vegetation communities and vascular plants (floristics) on the subject property was determined from standard status lists, published literature and the NHIC dataquery web-site (NHIC 2017). Sources for flora included Bakowsky (1997), Argus and Pryer (1990), Environment Canada (2002), COSEWIC (2017), Province of Ontario (2007), MNRF (2017), Oldham and Brinker (2009), Argus *et al.* (1982-1987) and Bruce – Grey Plant Committee (1995). Rare plant species (Species At Risk in Ontario – SARO) included those listed and regulated under the Federal ***Species At Risk Act, 2002*** and the Province of Ontario ***Endangered Species Act, 2007***, as amended. The determination for plant species rarity consisted of a straightforward comparison of the plant species recorded on-site with those listed in these source references.

3.2 Background Reports

As part of the subject land assessment, available relevant reports were reviewed for information relating to natural heritage features and functions of the subject lands. This included the Functional Servicing Report prepared by C.F Crozier & Associates Inc. (June 2016) and the Gartner Lee Existing Conditions Report (March 2003).

3.3 Physiography, Topography and Drainage

A Karst investigation was completed for the subject lands, including a site specific field investigation, which determined that the proposed building envelope is not situated on a significant feature (See Appendix C). The site visit was completed on December 7, 2016 on the subject lands with no snow on the ground, to determine the presence/absence of karst. All twelve proposed lots were walked and assessed for karst related hazards and potential karst developing topographic features. During this visit no significant hazardous karst features that would impede development were noted within the proposed development footprint. It was determined that karstic type features, specifically springs, would likely be noted further to the south along the escarpment face, and that the Block 46 development resides approximately 150 m north of the escarpment toe.

Karst features such as sinkholes and dolines that potentially provide structural constraints are more likely found at the top of the escarpment, and none were observed in the field.

3.4 Vegetation

3.4.1 Regional Vegetation

The subject property lies within the Huron-Ontario Section of the Great Lakes-St. Lawrence Forest Region Based based on Rowe (1972), which extends from the southern portion of Georgian Bay to Lake Ontario. Sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*) were common over the whole area. Typical woody associates include white ash (*Fraxinus americana*), red ash (*Fraxinus pennsylvanica*), basswood (*Tilia americana*), yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), white oak (*Quercus alba*) and bur oak (*Quercus macrocarpa*). Other trees include eastern white cedar (*Tsuga occidentalis*), white birch (*Betula papyrifera*), eastern hemlock (*Tsuga canadensis*), eastern white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), largetooth aspen (*Populus grandidentata*), trembling aspen (*Populus tremuloides*), hop hornbeam (*Ostrya virginiana*), black cherry (*Prunus serotina*) and bitternut hickory (*Carya cordiformis*). Trees in river-bottoms and swamps include eastern white cedar, silver maple (*Acer saccharinum*), white elm (*Ulmus americana*), black ash (*Fraxinus nigra*) and green ash (*Fraxinus pennsylvanica var. subintegerrima*).

3.4.2 Site Vegetation

The subject property fronts onto the southern edge of part of Dorothy Drive, and the east edge of Camperdown Drive and backs onto the bottom slopes of the mesa (See Appendix D, Photographs 1, 2 and 3).

3.4.2.1 Terrestrial Features

The subject property is predominantly covered in a mosaic of early successional white ash-hardwood forest, with smaller stands of mixed and deciduous woodland, pockets of regenerating and shrub thicket, and a perimeter of mixed meadow. There are also very small pockets of cattail marsh and common reed marsh, which are inclusions within the mixed meadow but are too small to map. These both border the west edge of the intermittent swale/intermittent creek on the west side of the property.

Terrestrial and cultural features include: Dry-Fresh White Ash – Hardwood Deciduous Forest (FODM4-2); Dry-Fresh Hawthorn – White Spruce Mixed Woodland (WOMM3-1b); White Ash Deciduous Woodland (WODM4-2); White Ash Regeneration Thicket (TDHM4-2); Red-osier Dogwood Deciduous Shrub Thicket (THDM2-11); and Dry-Fresh Mixed Meadow (MEMM3). The only wetland features are very small pockets of common reed marsh and cattail marsh in the floodplain of the intermittent swale/intermittent creek that borders the west edge of the property. Neither of these features were inventoried as separate ELCs, only photographed, with both being inclusions within MEMM3.

Field visits were undertaken on-site during the late spring and summer seasons (May 27, June 15, June 17 and July 25, 2017 to ensure all representative vegetation communities and floristics were covered and inventoried. The botanical data was supplemented from incidental observations noted during the wildlife surveys.

The following sub-sections in conjunction with Table 1 (ELCs) and the representative photographs in Appendix D provide qualitative descriptions and a visual perspective of the terrestrial, cultural, wetland and aquatic features that lie on and abut the subject property.

Dry-Fresh White Ash – Hardwood Deciduous Forest (FODM4-2)

The eastern half of the subject property consists mainly of early successional white ash – hardwood forest (See Appendix D, Photographs 4, 5 and 6). White ash is dominant in the overstory with a dense to scattered distribution, but more or less of the same age class. The understory consists mainly of hawthorn (*Crataegus spp*.) and common buckthorn (*Rhamnus cathartica*) and common apple (*Malus pumila*), indicative of past disturbances (farming and possibly livestock grazing). Other woody associates include black cherry, white elm, basswood, scattered eastern white cedar and red oak, tartarian honeysuckle (*Lonicera tatarica*), wild red raspberry (*Rubus idaeus*), choke cherry (*Prunus virginiana*), riverbank grape (Vitis riparia), poison ivy (*Rhus radicans*), red-osier dogwood (*Cornus stolonifera*) and round-leaved dogwood (*Cornus rugosa*). There is also a proliferation of white ash seedlings throughout the stand.

The weedy disturbed groundcover is comprised of the following species:

Taraxacum officinale	common dandelion
Agrimony gryposepala	common agrimony
Osmorhiza claytonii	sweet cicely
Myosotis sylvatica	woodland forget-me-not
Solidago altissima	tall goldenrod
Fragaria vesca	woodland strawberry
Arctium minus	common burdock
Carex gracillima	graceful sedge
Pteridium aquilinum	eastern bracken fern
Poa compressa	Canada bluegrass
Geranium robertianum	herb-robert
Clinopodium vulgare	wild basil
Circaea lutetiana	enchanter’s nightshade
Carex deweyana	Dewey’s sedge
Inula helenium	elecampane
Geum aleppicum	yellow avens
Daucus carota	wild carrot
Vicia cracca	cow vetch
Alliaria petiolata	garlic mustard
Ranunculus repens	creeping buttercup
Equisetum arvense	field horsetail
Waldsteinia fragarioides	barren strawberry
Fragaria virginiana	common strawberry
Asclepias syriaca	common milkweed
Cerastium fontanum	mouse-eared chickweed
Dactylis glomerata	orchard grass
Bromus inermis	awnless brome grass

Table 1. List of Vegetation Communities (ELC Units) on the Dorothy Road Property, Town of the Blue Mountains

ELC Code	Vegetation Type	Summary Description
FODM4-2	Dry-Fresh White Ash – Hardwood Deciduous Forest	- upland stand dominated by young white ash (homogeneous age class) with a dense to scattered distribution - woody associates in understory include basswood, white elm, black cherry, and scattered eastern white cedar and red oak - the dense shrub stratum is dominated by hawthorn, common buckthorn, and common apple, with associates such as tartarian honeysuckle, wild red raspberry, choke cherry, riverbank grape, poison ivy, red-osier dogwood, and round-leaved dogwood - typical groundflora includes field horsetail, common dandelion, woodland strawberry, eastern bracken fern, herb-robert, wild basil, enchanter's nightshade, yellow avens, wild carrot, garlic mustard, creeping buttercup, Canada bluegrass and common burdock
WOMM3-1b	Dry-Fresh Hawthorn – White Spruce Mixed Woodland	- situated in the northwest corner is a treed block (woodland) dominated by hawthorn, white spruce and Norway spruce - other tree species include basswood, eastern white cedar, and black cherry - shrubs and vines include choke cherry, common apple, common buckthorn, riverbank grape and poison ivy - the groundflora ranges from sparse, clumped to barren (needle duff) due to the lack of light penetration
WODM4-2	White Ash Deciduous Woodland	- a young, relatively even-aged woodland stand dominated by white ash with a dense shrub stratum component - woody associates include white elm, basswood, black cherry, common buckthorn, hawthorn, tartarian honeysuckle, wild red raspberry, riverbank grape, Virginia creeper, Morrow's honeysuckle, red-osier dogwood, round-leaved dogwood, wild rose and poison ivy - the weedy groundcover contains species similar to those found in FODM4-2

THDM4-2	White Ash Regeneration Thicket	- a small copse dominated by immature white ash, situated at the east end - other woody species include trembling aspen, eastern white cedar, hawthorn, apple, white elm, tartarian honeysuckle, poison ivy, red-osier dogwood, choke cherry and alternate-leaved dogwood - the weedy groundflora consists of common strawberry, field horsetail, cow vetch, red clover, white clover, common buttercup, Kentucky bluegrass, Canada bluegrass, orchard grass, awnless brome grass, spotted knapweed, purslane, New England aster, tall goldenrod and common dandelion
THDM2-11	Red-osier Deciduous Shrub Thicket	- situated along the top of the berm that borders the southern property edge is an upland shrub thicket dominated by red-osier dogwood and round-leaved dogwood - other woody associates include common buckthorn, tartarian honeysuckle, wild red raspberry, pasture gooseberry and high-bush cranberry - groundcover consists of weeds, common grasses and herbaceous forbs similar in composition to those found in MEMM3
MEMM3	Dry-Fresh Mixed Meadow	- this cultural feature borders the perimeter of the property and includes two small wetland features in the floodplain of the intermittent swale/intermittent tributary on the west side - scattered woody vegetation includes wild red raspberry, poison ivy, common buckthorn, pasture gooseberry, wild rose, black raspberry, slender willow, red-osier dogwood, round-leaved dogwood and honeysuckles
ELC Code	**Vegetation Type**	**Summary Description**
FODM4-2	Dry-Fresh White Ash – Hardwood Deciduous Forest	- upland stand dominated by young white ash (homogeneous age class) with a dense to scattered distribution - woody associates in understory include basswood, white elm, black cherry, and scattered eastern white cedar and red oak - the dense shrub stratum is dominated by hawthorn, common buckthorn, and common apple, with associates such as tartarian honeysuckle, wild red raspberry, choke cherry, riverbank grape, poison ivy, red-osier dogwood, and round-leaved dogwood - typical groundflora includes field horsetail, common dandelion, woodland strawberry, eastern bracken fern, herb-robert, wild basil, enchanter's nightshade, yellow avens, wild carrot, garlic mustard, creeping buttercup, Canada bluegrass and common burdock

WOMM3-1b	Dry-Fresh Hawthorn – White Spruce Mixed Woodland	- situated in the northwest corner is a treed block (woodland) dominated by hawthorn, white spruce and Norway spruce - other tree species include basswood, eastern white cedar, and black cherry - shrubs and vines include choke cherry, common apple, common buckthorn, riverbank grape and poison ivy - the groundflora ranges from sparse, clumped to barren (needle duff) due to the lack of light penetration
WODM4-2	White Ash Deciduous Woodland	- a young, relatively even-aged woodland stand dominated by white ash with a dense shrub stratum component - woody associates include white elm, basswood, black cherry, common buckthorn, hawthorn, tartarian honeysuckle, wild red raspberry, riverbank grape, Virginia creeper, Morrow's honeysuckle, red-osier dogwood, round-leaved dogwood, wild rose and poison ivy - the weedy groundcover contains species similar to those found in FODM4-2
THDM4-2	White Ash Regeneration Thicket	- a small copse dominated by immature white ash, situated at the east end - other woody species include trembling aspen, eastern white cedar, hawthorn, apple, white elm, tartarian honeysuckle, poison ivy, red-osier dogwood, choke cherry and alternate-leaved dogwood - the weedy groundflora consists of common strawberry, field horsetail, cow vetch, red clover, white clover, common buttercup, Kentucky bluegrass, Canada bluegrass, orchard grass, awnless brome grass, spotted knapweed, purslane, New England aster, tall goldenrod and common dandelion
THDM2-11	Red-osier Deciduous Shrub Thicket	- situated along the top of the berm that borders the southern property edge is an upland shrub thicket dominated by red-osier dogwood and round-leaved dogwood - other woody associates include common buckthorn, tartarian honeysuckle, wild red raspberry, pasture gooseberry and high-bush cranberry - groundcover consists of weeds, common grasses and herbaceous forbs similar in composition to those found in MEMM3

MEMM3	Dry-Fresh Mixed Meadow	- this cultural feature borders the perimeter of the property and includes two small wetland features in the floodplain of the intermittent swale/intermittent tributary on the west side - scattered woody vegetation includes wild red raspberry, poison ivy, common buckthorn, pasture gooseberry, wild rose, black raspberry, slender willow, red-osier dogwood, round-leaved dogwood and honeysuckles

Dry-Fresh Hawthorn – White Spruce Mixed Woodland (WOMM3-1b)

This woodland feature is dominated by hawthorn, white spruce (*Picea glauca*), Norway spruce (*Picea abies*) and white ash (See Appendix D, Photographs 7, 8 and 9). There are scattered basswood, eastern white cedar and black cherry along the outer perimeter. The shrub and vine stratums consist of choke cherry, common apple, common buckthorn, riverbank grape and poison ivy. The groundcover is sparse, clumped and barren (needle duff) as a result of the lack of light penetration through the conifers.

White Ash Deciduous Woodland (WODM4-2)

Young, even-aged white ash dominate this woodland feature, which has a dense shrub stratum component (See Appendix D, Photographs 10, 11 and 12). Other woody associates in the overstory and understory are minimal and include white elm, basswood, black cherry, common buckthorn, hawthorn, tartarian honeysuckle, wild red raspberry, riverbank grape, Virginia creeper (*Parthenocissus inserta*), Morrow's honeysuckle (*Lonicera morrowii*), red-osier dogwood, round-leaved dogwood, wild rose (*Rosa multiflora*), and poison ivy.

The weedy groundcover contains species in the same general distribution and composition as to those found in FODM4-2).

White Ash Regeneration Thicket (THDM4-2)

A small copse dominated by immature white ash is situated at the east end of the property (See Appendix D, Photographs 13 and 14). Other woody vegetation noted in this regeneration thicket are trembling aspen, eastern white cedar, hawthorn, common apple, white elm, tartarian honeysuckle, poison ivy, red-osier dogwood, choke cherry, and alternate-leaved dogwood (*Cornus alternifolia*).

The weedy groundflora includes typical species such as common strawberry, field horsetail, cow vetch, red clover (*Trifolium pratense*), white clover (*Trifolium repens*), common buttercup (*Ranunculus acris*), Kentucky bluegrass (*Poa pratensis*), Canada bluegrass, orchard grass, awnless brome grass, spotted knapweed (*Centaurea stoebe*), purslane (*Portulaca oleracea*), New England aster (*Symphyotrichum novae-angliae*), tall goldenrod and common dandelion.

Red-osier Dogwood Deciduous Shrub Thicket (THDM2-11)

Bordering the south edge of the subject property is a berm in conjunction with a man-made drainage swale. On top of part of the berm is an upland shrub thicket dominated by red-osier dogwood and round-leaved dogwood (See Appendix D, Photograph 15). Other woody vegetation includes common buckthorn, tartarian honeysuckle, wild red raspberry, pasture gooseberry (*Ribes cynosbati*), and high-bush cranberry. The groundcover is comprised of weeds, grasses and herbaceous forbs similar to those noted in MEMM5.

3.4.2.2 Cultural Features

Dry-Fresh Mixed Meadow (MEMM3)

This cultural feature borders the perimeter of the subject property and includes two small wetland features in the floodplain of the drainage swale/intermittent tributary on the west side (See Appendix

D, Photographs 16, 17 and 18). The scattered woody vegetation includes wild red raspberry, poison ivy, common buckthorn, pasture gooseberry, wild rose, black raspberry (*Rubus occidentalis*), slender willow (*Salix petiolaris*), red-osier dogwood, round-leaved dogwood, and honeysuckles.

Typical groundflora includes:

Dactylis glomerata	orchard grass
Bromus inermis	awnless brome grass
Vicia cracca	cow vetch
Trifolium pratense	red clover
Trifolium repens	white clover
Hypericum perforatum	common St. John's-wort
Daucus carota	wild carrot
Centaurea stoebe	spotted knapweed
Pteridium aquilinum	eastern bracken fern
Cirsium vulgare	bull thistle
Cirsium arvense	Canada thistle
Tussilago farfara	coltsfoot
Taraxacum officinale	common dandelion
Verbascum thapsus	common mullein
Poa compressa	Canada bluegrass
Poa pratensis	Kentucky bluegrass
Phleum pratense	timothy
Phalaris arundinacea	reed canary grass
Carex deweyana	Dewey's sedge
Typha angustifolia	narrow-leaved cattail
Impatiens capensis	spotted jewelweed
Inula helenium	elecampane
Asclepias syriaca	common milkweed
Phragmites australis	common reed
Fragaria virginiana	common strawberry
Ranunculus acris	common buttercup
Ranunculus repens	creeping buttercup
Euphorbia cyparissias	cypress spurge
Elymus repens	quackgrass
Trifolium aureum	low hop clover
Myosotis laxa	forget-me-not

3.4.2.3 Aquatic Features

There is a man-made intermittent drainage swale/intermittent tributary that collects seepage and surface runoff from the based on the escarpment drains across the back and west edges of the property (See Appendix D, Photographs 19 and 20).

3.4.3 Floristics

In terms of floristics, Appendix E contains a list of plant species found on-site during the 2017 botanical surveys.

3.5 Wildlife Methods

The Dorothy Drive property was inventoried to determine and document the inherent wildlife species and wildlife usage contained therein on various dates in 2017 (May 26, June 6, June 7, June 9, June 14, June 17 and July 6). The inventories included two dawn breeding bird surveys (at 3 point count stations) on June 7 and June 17 following the Ontario Breeding Bird Atlas (OBBA) inventory protocols (Bird Studies Canada 2006). Nocturnal wildlife surveys were also undertaken in June and July during the full moon phases to determine the presence, if any, of eastern whip-poor-will (*Caprimulgus vociferus*) – Threatened (THR) and common nighthawk (*Chordeiles minor*) – Special Concern species, based on OBBA site records identified during the background data review. All observations and data collection were completed by an experienced field biologist.

Two evening amphibian call surveys (2 call count stations per survey) were conducted following the protocols outlined in the Marsh Monitoring Program (Bird Studies Canada *et al.* 2009). The survey dates were May 26 and June 14, 2017. All observations and data collection were completed by an experienced field biologist. A property near the Collingwood Hyundai dealership property in Collingwood on Highway 26 was surveyed in tandem with the on-site amphibian call surveys, as a control site.

Incidental wildlife observations (birds, mammals, amphibians and reptiles) were also recorded during all botanical inventories. Evidence of presence of wildlife included direct sightings, calls, tracks, scats, nests, dens, browse, carcasses, etc. All wildlife surveys were conducted under the favourable weather conditions according to the MNRF protocols. There were no marginal or adverse weather conditions encountered during any of the surveys. The following subsections provide details on the methods used to ascertain wildlife and wildlife usage within and abutting the subject property.

3.5.1 Birds

3.5.1.1 Dawn Breeding Bird Surveys

The first dawn breeding bird survey (June 7 2017) was conducted between 5:30a.m.and 6:15a.m., with the second survey undertaken on June 17, 2017 between 5:45am and 6:30am. The breeding bird point counts (3 stations) followed standard MNRF protocols, with site surveys spaced more than one week apart under suitable weather conditions (low wind, little or no precipitation) following the breeding evidence of the Ontario Breeding Bird Atlas (Bird Studies Canada 2006). All bird species seen and heard on or abutting the property were tallied. Observations were coded using behavioural codes of the OBBA (e.g., S – Singing Male, P – Pair, etc.).

3.5.1.2 Nocturnal Wildlife Survey

Nocturnal bird and other wildlife surveys were conducted on three evenings: June 6th, June 9th and July 6th, 2017. All surveys were coincident with the full moon phase and the recommended timing following the 2015 Ontario Whip-poor-will Surveys technical guide by MNRF (2015). Primary focus was on the detection of SAR birds – eastern whip-poor-will (Threatened) and common nighthawk (Special Concern) that were listed on previous OBBA surveys (Bird Studies Canada *et al.* 2006). Surveys were conducted under favourable weather conditions at the breeding bird point count station. The point count duration was 10 minutes.

3.5.2 Amphibians

As the start of this project was commenced in early May, only two evening amphibian call count surveys were conducted. Amphibian surveys were conducted on May 26th and June 14th, 2017 following the protocols outlined in the Marsh Monitoring Program (Bird Studies Canada *et al.* 2009). Given the lack of on-site and abutting water during the breeding season, this level of effort was adequate to assess the presence of any calling amphibians during their breeding season. The surveys were all conducted within accepted limits and there were no concerns regarding reduced activity due to inclement weather. As during all site visits, incidental wildlife observations were recorded to add to the subject property database.

3.5.3 Mammals

Observations of mammals were noted during all daytime and nocturnal field surveys related to wildlife, as well as incidental observations garnered during the botanical surveys. Observation dates were May 26th, May 27th, June 6th, June 9th, June 14th, June 15th, June 17th, July 7th, and July 25th, 2017

3.5.4 Reptiles

Observations of reptiles were noted during all daytime and nocturnal field surveys related to wildlife, as well as incidental observations garnered during the botanical surveys. Observation dates were May 26th, May 27th, June 6th, June 9th, June 14th, June 15th, June 17th, July 7th, and July 25th, 2017.

Standard lists and published literature used to determine the status or rarity of fauna included Environment Canada (2002), COSEWIC (2017), Province of Ontario (2007), MNRF (2017), Austen *et al.* (1994), Bird Studies Canada *et al.* (2006), Dobbyn (1994) and Cadman *et al.* (2007). The determination for wildlife species rarity consisted of a straightforward comparison of the subject property and abutting lands wildlife species found during the various surveys, with those listed in the source references.

3.5.5 Fish and Fish Habitat

The only surface water on and abutting the subject property was the intermittent swale/intermittent tributary that conveys surface drainage and seepage to the east and west from the escarpment. The water depths in this feature were not sufficient or of duration sufficient enough to contain fish or provided fish habitat. No fish species (e.g., cyprinids) were noted at the west end where this aquatic feature drains into a storm drain.

3.6 Wildlife and Wildlife Habitat

The natural terrestrial features (FODM4-2, WOMM3-1b, WODM4-2, THDM4-2, THDM2-11) on and abutting the subject property are comprised mainly of: dry-fresh white ash – hardwood forest (FODM4-2); dry-fresh hawthorn – white spruce mixed woodland (WOMM3-1b); white ash deciduous woodland (WODM4-2); white ash regeneration thicket (THDM4-2) and red-osier deciduous shrub thicket (THDM2-11). The lone cultural feature (MEMM3) is comprised of: dry-fresh mixed meadow (MEMM3). The mixed meadow contains small inclusions of sward of cattails and a clump of willow shrubs in the floodplain of the intermittent swale/intermittent tributary on along the west edge, which eventually drains into a storm drain.

All of these terrestrial and cultural features cover all of the subject property and provide wildlife habitat – life cycle opportunities (e.g., breeding, nesting, resting, roosting, feeding) for birds, mammals and amphibians that were noted and recorded during specific wildlife field inventories or as incidental observations noted during the botanical inventories. Figure 3 shows the type and extent of each of the vegetation communities (wildlife habitats) mapped and inventoried 2017. Most of the bird species encountered and determined to be possible or probable breeders are considered rural-tolerant and urban-tolerant wildlife species.

The following sub-sections provide summaries of the wildlife inventories conducted on the subject property during the late spring and summer months of 2017.

3.6.1 Birds

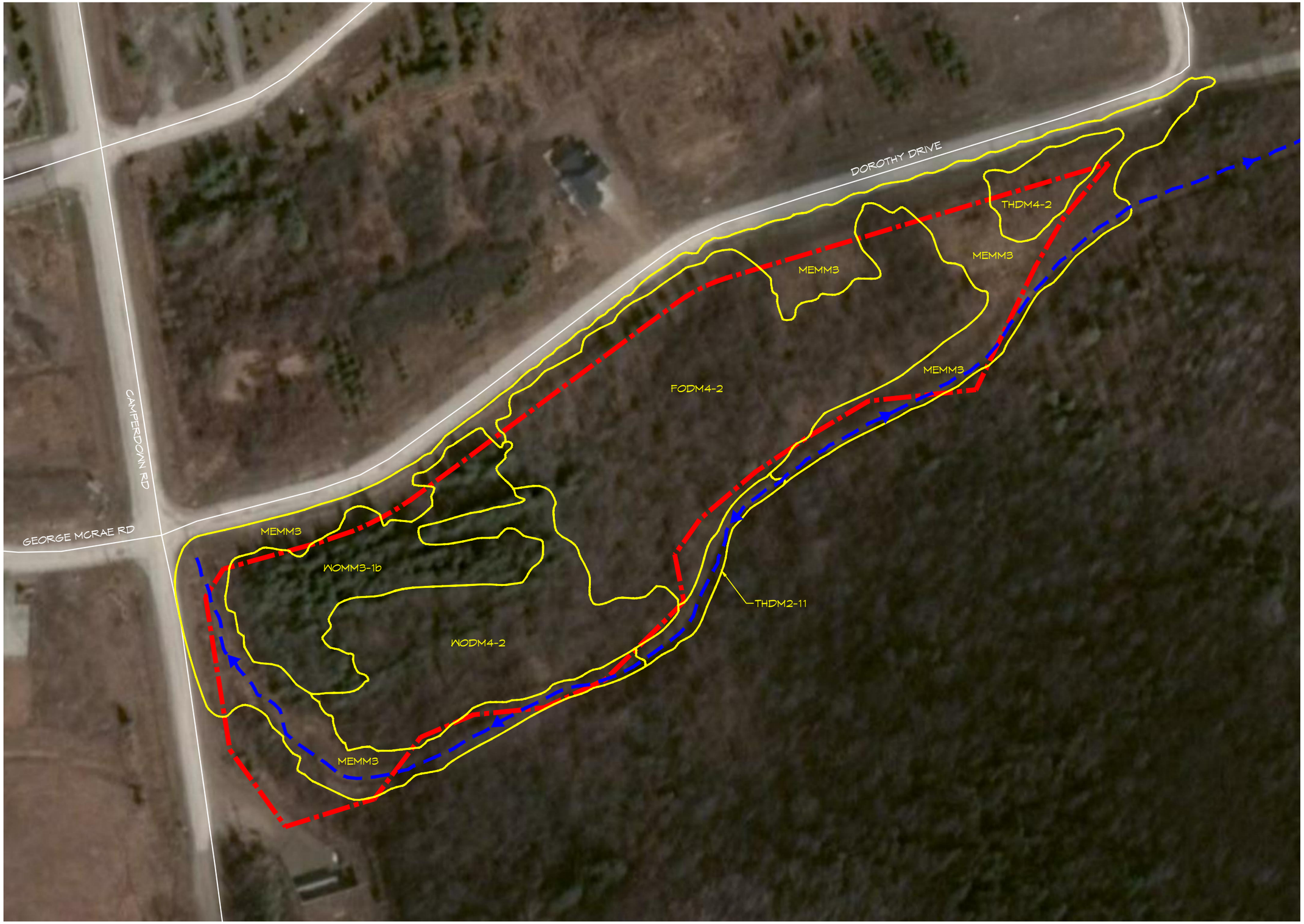
Thirty-one (31) bird species were detected during the dawn breeding bird surveys conducted at 3 point count stations (as shown on Figure 4), and as listed in Table F. Of these species, twenty-two (22) species showed some evidence of breeding (possible, probable, or confirmed) in the habitats on the subject property. The other nine (9) species were either flying overhead (with no breeding evidence) or were observed in suitable habitat but with no breeding evidence noted.

Examples of bird species considered common and breeding on the subject property and within this geographic area include: northern cardinal (*Cardinalis cardinalis*), mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), chipping sparrow (Spizella passerina), brown-headed cowbird (*Molothrus ater*), black capped chickadee (*Poecile atricapillus*), yellow warbler (*Setophaga petechia*), common grackle (*Quiscalus quiscula*), American goldfinch (*Carduelis tristis*), and American robin (*Turdus migratorius*),

No whip-poor-will or common nighthawk were heard or observed during the three nocturnal wildlife surveys conducted during the full moon phases on June 6th, June 9th and July 6th, 2017.

3.6.2 Mammals

Appendix G contains a summary of the mammal species detected on and abutting the subject property. The list includes the following mammal species (and NHIC SRank): eastern cottontail (*Sylvilagus floridanus*, S5); eastern chipmunk (*Tamias striatus*, S5); eastern gray squirrel (*Sciurus carolinensis*, S5); northern raccoon (*Procyon lotor*, S5); and white-tailed deer (*Odocoileus virginianus*,



Key Plan (n.t.s.)

Legend

- PROPERTY BOUNDARY
- ROADS
- INTERMITTENT SWALE (FLOW DIRECTION)
- ECOLOGICAL LAND CLASSIFICATION

ELC ID	DESCRIPTION
FODM4-2	Dry-Fresh White Ash - Hardwood Deciduous Forest
WOMM3-3	Dry-Fresh Hawthorn - White Spruce Mixed Woodland
WODM4-2	White Ash - Deciduous Woodland
THDM4-2	White Ash Regeneration Thicket
THDM2-11	Red-Osier Dogwood Deciduous Shrub Thicket
MEMM3	Dry-Fresh Mixed Meadow

N

0 5 10 20 0 40 50 m

1 : 1250

No.	Revision	Date	Init

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY ERRORS OR OMISSIONS TO THE CONSULTANT BEFORE COMMENCING OR PROCEEDING WITH ANY WORK.

DO NOT SCALE THIS DRAWING.

Hensel Design Group
Advancing Sustainable Development Solutions
372 Peel St, Collingwood, Ontario, L9Y 3W4
Phone: 705-443-8394 Fax: 705-443-8494

PROJECT

PEAKS
MEADOWS
Town of the Blue Mountains, Ontario

TITLE

ECOLOGICAL LAND CLASSIFICATION

SEAL

SEAL

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
MICHAEL J. HENSEL
OALA
MEMBER

Scale:	1:1,250
Date:	August 2017
CAD File:	HDG-PM-Fig□
Drawn by:	CM
Checked by:	MH
Job No.:	-

Drawing No.

Fig □

Date Plotted: August 10, 2017 File Location: Q:\Projects\HDG\Peaks Meadow\ACAD\DWG\HDG\HDG-PM-Fig□.dwg

Key Plan (n.t.s.)

Legend

- APPROXIMATE PROPERTY BOUNDARY
- ROADS
- INTERMITTENT SWALE (FLOW DIRECTION)
- # EVENING AMPHIBIAN CALL STATION
- # DAWN BREEDING BIRD CALL COUNT STATION

N

0 5 10 20 0 40 50 m

1 : 1250

No.	Revision	Date	Init

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY ERRORS OR OMISSIONS TO THE CONSULTANT BEFORE COMMENCING OR PROCEEDING WITH ANY WORK.

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372 Peel St, Collingwood, Ontario, L9Y 3W4
Phone: 705-443-8394 Fax: 705-443-8494

PROJECT

PEAKS
MEADOWS
Town of the Blue Mountains, Ontario

TITLE

BREEDING BIRDS
BREEDING AMPHIBIANS

SEAL

SEAL

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
MICHAEL J. HENSEL
OALA
MEMBER

Scale:	1:1,250
Date:	August 2017
CAD File:	HDG-PM-Fig4
Drawn by:	CM
Checked by:	MH
Job No.:	-

Drawing No.

Fig 4

Date Plotted: August 10, 2017 File Location: Q:\Projects\HDG\Peaks Meadow\ACAD\DWG\HDG\HDG-PM-Fig4.dwg

S5). None of these species is listed as a Species At Risk (SAR) under the ***Endangered Species Act, 2007*** (Province of Ontario 2007).

3.6.3 Herpetofauna

Appendix G contains a list of herpetofauna (amphibians and reptiles) detected on and abutting the subject property. Amphibian species detected or observed in very low numbers included: spring peeper (*Pseudacris crucifer*); western chorus frog (*Pseudacris triseriata*); northern leopard frog (*Rana pipiens*), gray treefrog (*Hyla versicolor*). A single eastern garter snake (*Thamnophis sirtialis sirtalis*) was noted in MEMM5 on the east side of the property.

The results of evening amphibian calling surveys (Call Stations 1-2 as shown on Figure 4) revealed minimal calling activity (Code 1, with minimal numbers of 1-2), with no abundant calls at any of the Call Stations. Call Stations were surveyed on May 26th and June 14th, 2017. Note: spring peeper (*Pseudacris crucifer*), western chorus frog (*Pseudacris triseriata*), northern leopard frog (*Lithobates pipiens*) and gray treefrog (*Hyla versicolor*) were all heard calling in abundance at the Collingwood Hyundai dealership property on Highway 26 (UTM 17T 564582 E 4927319 N), during the subject property surveys. This comparison with the subject property leads to the conclusion that the subject property does not provide quality terrestrial and/or aquatic amphibian breeding habitat, due primarily to the lack of water during breeding season.

Call activity of May 26, 2017 ((Start Time 2100hr, Air Temperature 13^{O}C, Beaufort Wind 2 - WNW, Cloud Cover 50%, Precipitation - None, Background Noise – 1, Observer D. G. Cunningham) included the following with abundance codes: Call Station 1 – gray treefrog 1(1); Call Station 2 – spring peeper 1(1) and western chorus frog 1(1).

Calling activity of June 14, 2017 (Start Time 22:00, Air Temperature 20^{O}C, Beaufort Wind 3 - SE, Cloud Cover 0%, Precipitation - Nil, Background Noise – 1, Observer D. G. Cunningham) included the following: Call Station 1 – grey treefrog 1(2) and northern leopard frog (2 observed but not calling); Call Station 2 – None.

The only reptile species noted was eastern gartner snake (*Thamnophis sirtalis sirtalis*), observed within the mixed meadow habitat (MEMM3) on the east side of the property.

3.6.4 Habitat Connectivity/Linkage

Natural habitats (terrestrial and wetland vegetation communities) are lacking in the vicinity of the Dorothy Drive property to the north and west. Most of the land use on these adjacent lands is as-built, under construction or approved residential lots, which lack any substantive woodland cover. These adjacent lands are fragmented by the intervening road system, namely Dorothy Drive, Barton Boulevard and Camperdown Road. Therefore habitat connectivity and ecological linkage functions are lacking or are of poor quality for wildlife.

Habitat connectivity and ecological linkages primarily in the form of upland and lowland forest cover are of high quality and abundant to the south and east of the subject property. The abutting lands to the south and east are part of the Niagara Escarpment, and therefore are protected through various planning policies, zoning and the Niagara Escarpment Plan (Province of Ontario 2017).

4. Significant Natural Heritage Features

The following is an assessment of significant natural heritage features that must be included in the environmental assessment of proposed developments. Under the Provincial Policy Statement, it is the responsibility of the planning authorities to identify significant natural heritage features, including significant valleylands, wetlands, woodlands, and wildlife habitat. The following sections provide an evaluation of the subject lands' existing features in context with the MNR criteria for the identification of significance under the Provincial Policy Statement and the related potential impacts associated with the development proposal. These criteria are then compared to the actual site conditions to determine if the potential for significance exists. These criteria are detailed in the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement (April 2010).

4.1 *Significant Valleylands*

There are no significant valleylands on the subject lands.

4.2 *Significant Woodlands*

The PPS states that development and site alteration may be permitted in significant woodlands provided that there will be no negative impacts to the identified natural features and functions that lend significance to the woodland. Woodlands as defined by the PPS are:

"treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products.
Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels."

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

The Natural Heritage Reference Manual outlines the recommended Significant Woodland Evaluation Criteria and Standards using woodland size, ecological function, possession of uncommon characteristics and economic and social values to determine the woodland's significance. Those criteria are explained and weighed against the characteristics of the subject lands below.

4.2.1 Woodland Size

- Woodland areas are considered to be generally continuous even if intersected by narrow gaps 20 m or less in width between crown edges.

- Size value is related to the scarcity of woodland in the landscape derived on a municipal basis with consideration of differences in woodland coverage among physical sub-units (e.g., watersheds, biophysical regions).
- Size criteria should also account for differences in landscape-level physiography (e.g., moraines, clay plains) and community vegetation types.

4.2.2 Ecological Function

a) Woodland Interior

- Interior habitat more than 100 m from the edge (as measured from the limits of a continuous woodland as defined above) is important for some species.
- For purposes of this criterion, a maintained public road would create an edge even if the opening was not wider than 20 m and did not create a separate woodland.

b) Proximity to other woodlands or other habitats

- Woodlands that overlap, abut or are close to other significant natural heritage features or areas could be considered more valuable or significant than those that are not.
- Patches close to each other are of greater mutual benefit and value to wildlife.

Interior habitats are identified as important woodland features. A rule of thumb used to identify woodland interior uses 100 m as the edge zone. Therefore, a woodland with some portions of the stand more than 100 m from any edge would possess interior habitats. Using this calculation there is only a small narrow portion of interior habitat on the subject lands.

c) Linkages

- Linkages are important connections providing for movement between habitats.
- Woodlands that are located between other significant features or areas can be considered to perform an important linkage function as “stepping stones” for movement between habitats.

The treed portion of the subject lands is linked to an off-site forested tract south and east of the subject lands.

d) Water Protection

- Source water protection is important.
- Natural hydrological processes should be maintained.

The subject lands are not located within a sensitive or threatened watershed.

e) Woodland Diversity

- Certain woodland species have had major reductions in representation on the landscape and may need special consideration.
- More native diversity is more valuable than less diversity.

The diversity of trees on the subject lands should not qualify the woodlands as significant.

4.2.3 Uncommon Characteristics

- *Woodlands that are uncommon in terms of composition, cover type, quality, age and age structure should be protected;*
- *Older woodlands (i.e. woodlands greater than 100 years old) are particularly valuable for several reasons including their contributions to genetic, species and ecosystem diversity.*

The woodlands present on the subject lands do not contain any uncommon woodland types.

4.2.4 Economic and Social Values

- *Woodlands that have high economic or social values through particular site characteristics or deliberate management should be protected.*

There are no managed woodlands on the subject lands.

4.3 *Significant Wetlands*

There are no Provincially Significant Wetlands on the subject lands.

4.4 *Areas of Natural and Scientific Interest (ANSI)*

The Grey County Official Plan has identified a small portion of the subject lands as a Life Science ANSI (relatively undisturbed vegetation and landforms, and their associated species and communities). This small area of ANSI is identified in the south west portion of the subject lands and is not scheduled for development (See Appendix A).

4.5 *Significant Wildlife Habitat*

The Natural Heritage Policies of the PPS (Section 2.3.1) identify four principal components of Significant Wildlife Habitat. These are:

1. Seasonal Concentrations of Animals;
2. Animal Movement Corridors;
3. Rare Vegetation Communities or Specialized Habitats; and
4. Habitats of Species of Conservation Concern.

Significant Wildlife Habitat can be difficult to appropriately determine at the site-specific level, as in many cases the assessment must incorporate information from a wide geographic area and consider other factors such as regional resource patterns and landscape effects. Under the Provincial Policy Statement, the planning authorities have the responsibility to identify Significant Wildlife Habitat. The following sections include the four component parts of Significant Wildlife Habitat under the Provincial Policy Statement (OMNR, 1999).

4.5.1.1 Seasonal Concentrations of Animals

Some species of animals gather together from geographically wide areas at certain times of year. This could be to hibernate or to bask (e.g., some reptiles), over-winter (e.g., deer yards) or to breed (e.g., Bullfrog breeding and nursery areas). Maintenance of the habitat features that result in these concentrations can be critical in sustaining local or even regional populations of wildlife.

No seasonal concentration of animals was observed on the subject lands.

4.5.1.2 Animal Movement Corridors

Landscape connectivity (often referred to as “wildlife corridors”) has become recognized as an important part of natural heritage planning and a wide range of benefits have been attributed to the maintenance or re-connection of the undisturbed landscape. In essence, corridors are relatively protected passageways for animals to move between areas of high habitat importance. Conservation of distinct habitat types to protect species is not effective unless the corridors between them are also protected.

Habitat connectivity and ecological linkage functions to the north and west of the subject lands are lacking or are of poor quality for wildlife. Habitat connectivity and ecological linkages primarily in the form of upland and lowland forest cover are of high quality and abundant to the south and east of the subject property.

4.5.1.3 Rare Vegetation Communities or Specialized Habitats

Rare vegetation communities apply to the maintenance of biodiversity and of rare plant communities (rather than individual rare species).

Specialized habitat conditions can include species of breeding birds that are associated with large blocks of wetland (generally >25 ha) that also include interior habitat (i.e., that which is more than 100 m from an edge).

Specialized habitats for wildlife can include habitat for species of breeding birds that are associated with large blocks of habitat (i.e., area-sensitive birds), old-growth forests, calving areas for moose, cliffs and a variety of other specialized habitats.

No rare vegetation or specialized habitats were observed during 2017 field investigations on the subject lands.

4.5.1.4 Species of Conservation Concern

This category is quite complex and includes species that may be locally rare or in decline but have not yet reached the level of rarity that is normally associated with Endangered or Threatened designations. The Significant Wildlife Habitat Technical Guide (MNR, 2000) suggests that the highest priority for protection be provided to habitats of the most rare species (on a scale of global through to local municipality); and that habitats that support large populations of a species of concern should be considered significant. The determination of Significant Wildlife Habitat under the Species of Concern category (and under other categories) is a comparative process that must extend across the jurisdiction of the planning authority to be considered definitive.

No species of conservation concern were observed on the subject lands during 2017 field investigations.

4.6 Natural Heritage Information Centre

A search of the Natural Heritage Information Centre (NHIC) for data squares 17KN4830 and 17NK4831 revealed the presence of 7 element occurrences for rare species on or directly adjacent to the subject lands (See Appendix F). None of the species reported are listed as endangered, threatened or special concern and none were observed during the 2017 field studies. The species identified and their habitat requirements are:

Shrubby St. John's-wort (*Hypericum prolificum*) EO ID 2036 is a plant species with an SRank of S2. Habitat is open and field areas and some wet areas.

Smith's Bulrush (*Schoenoplectiella smithii*) EO ID 3085 is a plant species usually found in intertidal marshes, mudflats and shorelines. The SRank for this species is S2S3.

Variegated Meadowhawk (*Sympetrum curruptum)* is a dragonfly species with an SRank of S3. Habitat for this species includes marshy lakes and ponds, slow streams and vegetated pools of rivers.

A plant species, Stiff Yellow Flax (*Linum medium* var. *medium*) EO ID 59926 has an S3? S-Rank. Habitat requirements for this species include wet woods, coastal meadow marshes, bogs, marshes and damp sands.

Rough Dropseed (*Sporobolus compositus*) EO ID 65004 is a plant species with an SRank of S4. It prefers mild to moderately disturbed areas including old fields and roadsides.

A lichen species, *Melanelia subargentifera* EO ID 67809 with an S-Rank of S1S3 was observed in 1976. This lichen has not yet been assigned an S Rank by the NHIC, nor is it listed on the *Endangered Species Act*.

4.7 Endangered Species Act (Species at Risk in Ontario – SARO)

No flora or fauna Species At Risk (SARO) were observed or reported on the subject property. None of the plant or wildlife species are considered rare on either a federal, provincial, municipal or local level.

4.8 Species at Risk Act

No flora or fauna Species At Risk (SAR) were observed or reported on the subject property. None of the plant or wildlife species are considered rare on either a federal, provincial, municipal or local level.

4.9 Fisheries Act

No fisheries resources exist on the subject lands.

5. Proposed Development Concept

The proposed development for the subject lands is a Draft Plan of Subdivision for 12 single family dwellings (See Figure 5). It should be noted that the subject lands were previously reviewed by all agencies for development and were Draft Plan approved in 2008 to permit 65 residential units.

The post development drainage plan for the proposed 12 single family lot development concept was prepared by Crozier & Associates and is described in their Functional Servicing Report, dated June 2016. Stormwater will be captured in the proposed development lands by the existing storm sewer network and overland flow to the Dorothy Drive right-of-way. Sanitary servicing will be provided via connection to existing municipal services.

6. Impacts Assessment

Potential impacts to the existing natural heritage systems located on the subject and adjacent lands resulting from the proposed development plan were compiled through research of literature and relevant authorities.

The current plan for the proposed development is based on efforts to avoid impacts to the natural heritage features and functions of the subject and adjacent lands, achieve an economically feasible development, and accommodate engineering requirements.

A summary of anticipated impacts from development and proposed mitigation is outlined in Table 2.

Key Plan *(n.t.s.)*

Legend

- PROPOSED DEVELOPMENT
- ROADS
- WATERCOURSE

N

0 10 20 40 60 80 m

1 : 2000

No.	Revision	Date	Init

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY ERRORS OR OMISSIONS TO THE CONSULTANT BEFORE COMMENCING OR PROCEEDING WITH ANY WORK.

DO NOT SCALE THIS DRAWING.

Hensel Design Group
Advancing Sustainable Development Solutions
372 Peel St, Collingwood, Ontario, L9Y 3W4
Phone: 705-443-8394 Fax.: 705-443-8494

PROJECT

PEAKS
MEADOWS
Town of the Blue Mountains, Ontario

TITLE

PROPOSED
DEVELOPMENT

SEAL

SEAL

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
MICHAEL J. HENSEL
OALA
MEMBER

Scale:	1:2,000
Date:	August 2017
CAD File:	HDG-PM-Fig5
Drawn by:	CM
Checked by:	MH
Job No.:	-

Drawing No.

Fig 5

Date Plotted: August 10, 2017 File Location: Q:\Projects\HDG\Peaks Meadow\ACAD\DWG\HDG\HDG-PM-Fig5.dwg

Table 2 Summary of Potential Impacts to Natural Heritage Features

Category	Function of Feature	Potential Impact	Anticipated Impacts/Proposed Mitigation
Hydrology	Groundwater Recharge	Surface run-off will increase due to the creation of hard surfaces. Water quality will be impacted by the addition of suspended sediments and/or chemicals.	With implementation of best management practises as a part of the SWM plan prepared by Crozier & Associates (See Functional Servicing and Stormwater Management Report, June 2016), post development runoff (quality and quantity) will be managed such that off-site flows will not exceed pre-development rates and water quality objectives are met.
Vegetation	Upland Communities	The proposed development will result in the clearing of some vegetation in the wooded areas. The majority of the subject lands are identified as Significant Woodlands in the Grey County Official Plan. This designation was added to the land since the original Draft Plan Approval (2008). The woodland does not contain any rare or significant plant or animal species. The proposed development plan reduces the development intensity from 65 lots down to 12 lots.	The reduction in lot intensity from 65 lots to 12 lots provides an increased opportunity for tree retention of individual lots. As each lot is planned/designed for home location, driveway and grading, opportunities to maximize existing tree retention will be identified. The removal of vegetation on the subject lands will be partially mitigated by proposed landscape plantings.
Wildlife	Bird, Mammal, Herptefaunal habitat	Removal of some of the wooded area will reduce its function as habitat for area sensitive bird species; species with a low tolerance level for urban disturbance would be replaced by species more tolerant of urban settings. Species tolerant of urban settings would likely occur in higher numbers than elsewhere in non-developed areas; this would lead to some nuisance problems, as well as an increased rate of predation on native birds, mammals and amphibians from an urban area's symptomatic increase in raccoons, skunks, possums, domestic dogs and cats, and feral cats. The increased vehicular traffic may result in an increase in wildlife road mortalities.	Develop and promote a public and resident awareness program stressing the importance of preserving any retained habitat on site and educating all who frequent the site about the species and the naturalistic landscape planting functions that have been implemented.
Fisheries	Aquatic Resources	The proposed stormwater flows from the proposed development may directly or indirectly impact fisheries resources.	With implementation of best management practises as a part of the SWM plan prepared by Crozier & Associates (See Functional Servicing and Stormwater Management Report, June 2016), post development runoff (quality and quantity) will be managed such that off-site flows will not exceed pre-development rates and water quality objectives are met.
Significant Natural Habitat	Landscape Connectivity	The wooded area on the subject lands is contiguous to a larger wooded area to the south and east of the subject lands.	Habitat connectivity and ecological linkage functions to the north and west of the subject lands are lacking or are of poor quality for wildlife. Habitat connectivity and ecological linkages primarily in the form of upland and lowland forest cover are of high quality and abundant to the south and east of the subject property.

7. Additional Recommendations

Anticipated impacts and proposed mitigation is outlined above in Table 2 and this section presents additional recommendations that should also be considered as part of the detailed design for implementation prior to, during and post-construction to help reduce or eliminate impacts to the identified natural heritage features and functions within or adjacent to the subject lands. As well, these additional recommendations provide guidance to the final detailed design of the development plan as the project proceeds through the individual lot site design process:

1. Prior to the commencement of construction, temporary barrier fencing should be installed to protect natural heritage features warranting protection from construction impacts. The barrier fence functions to avoid inadvertent intrusion from operation of machinery or other activities. The fencing should be installed under the supervision of a biologist or landscape architect, and maintained and remain in place until final grading and landscaping has been completed.

2. Barrier fencing should be placed at the property line or at the drip-line of trees where trees identified for retention and/or protection are identified. Avoid inadvertent root compaction. In the event that roots or branches of trees to be protected are inadvertently damaged during construction, they should be clean cut as soon as possible. Exposed roots should then be covered with topsoil and mulched under the guidance of a biologist, arborist or landscape architect.

3. Soft engineering and bioengineering techniques are recommended in favour of hard engineering and hardened structures (i.e. rip rap, concrete) to control surface erosion wherever possible.

4. A construction work plan should designate specific locations for stockpiling of soils and other materials, as well as ensuring that vehicle refueling occurs off-site.

5. Areas that are to be cleared for development but are planned to later undergo landscape plantings should implement plans that includes native planting materials wherever appropriate.

6. Vegetation clearing should occur outside of the breeding bird season (April 15 to July 30) to prevent nest destruction.

7. No further studies are required to supplement the understanding of the natural heritage features of the subject lands.

8. Conclusion

Based on the second source data and 2017 field investigations relative to the subject lands and the corresponding proposed development plan, we conclude that the proposed development is feasible from a natural heritage perspective, in so long as the recommendations and mitigations identified herein are implemented. If designed and constructed as planned, the conclusion of the EIS is that the development will not impact the ecological features or functions of the natural heritage features located on and adjacent to the subject lands.

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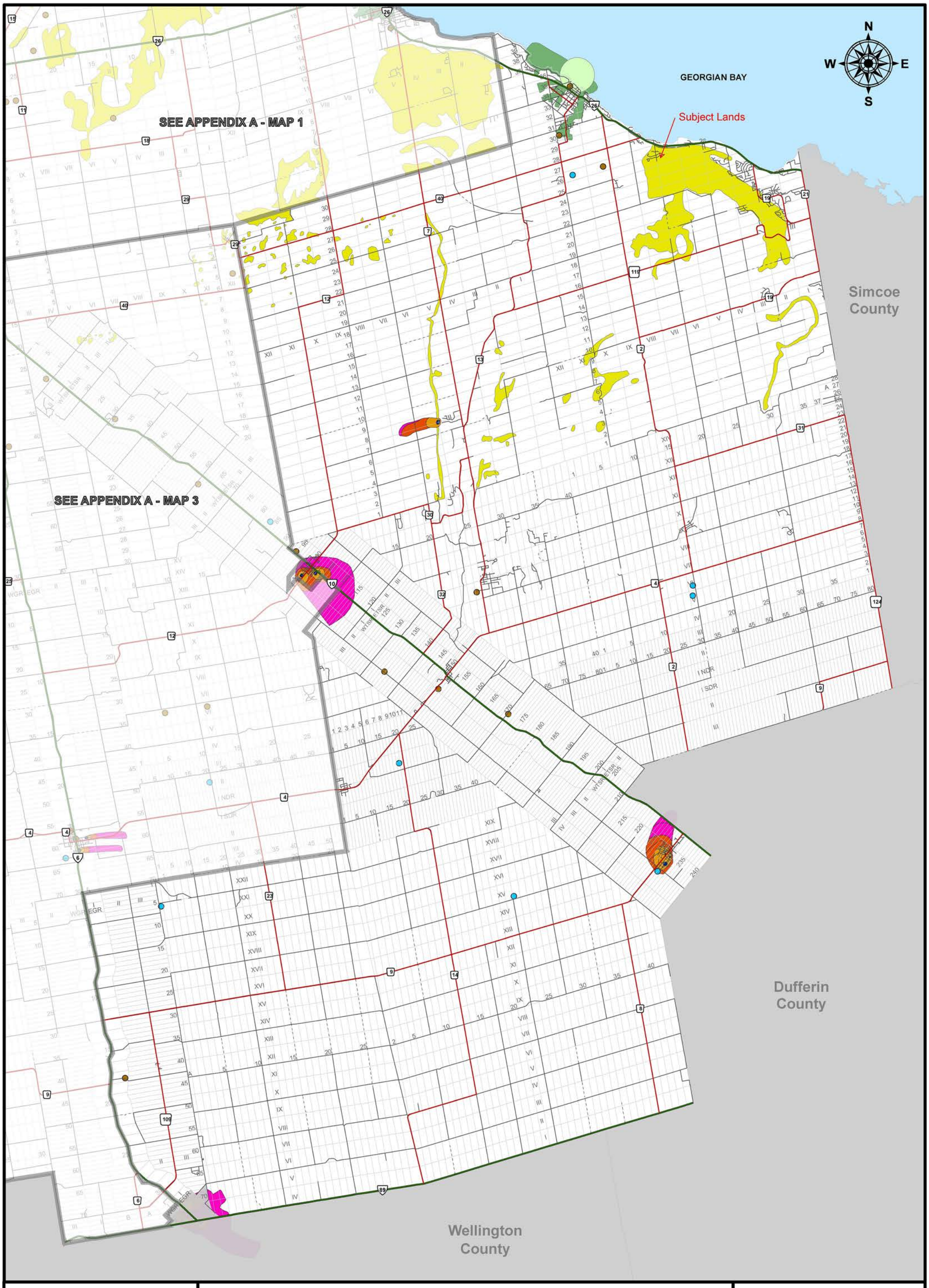
Appendix A

Grey County Official Plan

- **Appendix A – Map 2**
- **Appendix B – Map 2**

Hensel Design Group Inc



THE COUNTY OF GREY OFFICIAL PLAN

APPENDIX A
Constraint Mapping

MAP 2

LEGEND

- Provincial Highway
- County Road
- Local Road
- Seasonal Road
- Abandoned Landfills
- Existing Landfills
- Special Policy Area (Karst)
- Intake Protection Zone 1
- Intake Protection Zone 2

Wellhead Protection Areas

- Zone A
- Zone B
- Zone C
- Zone D

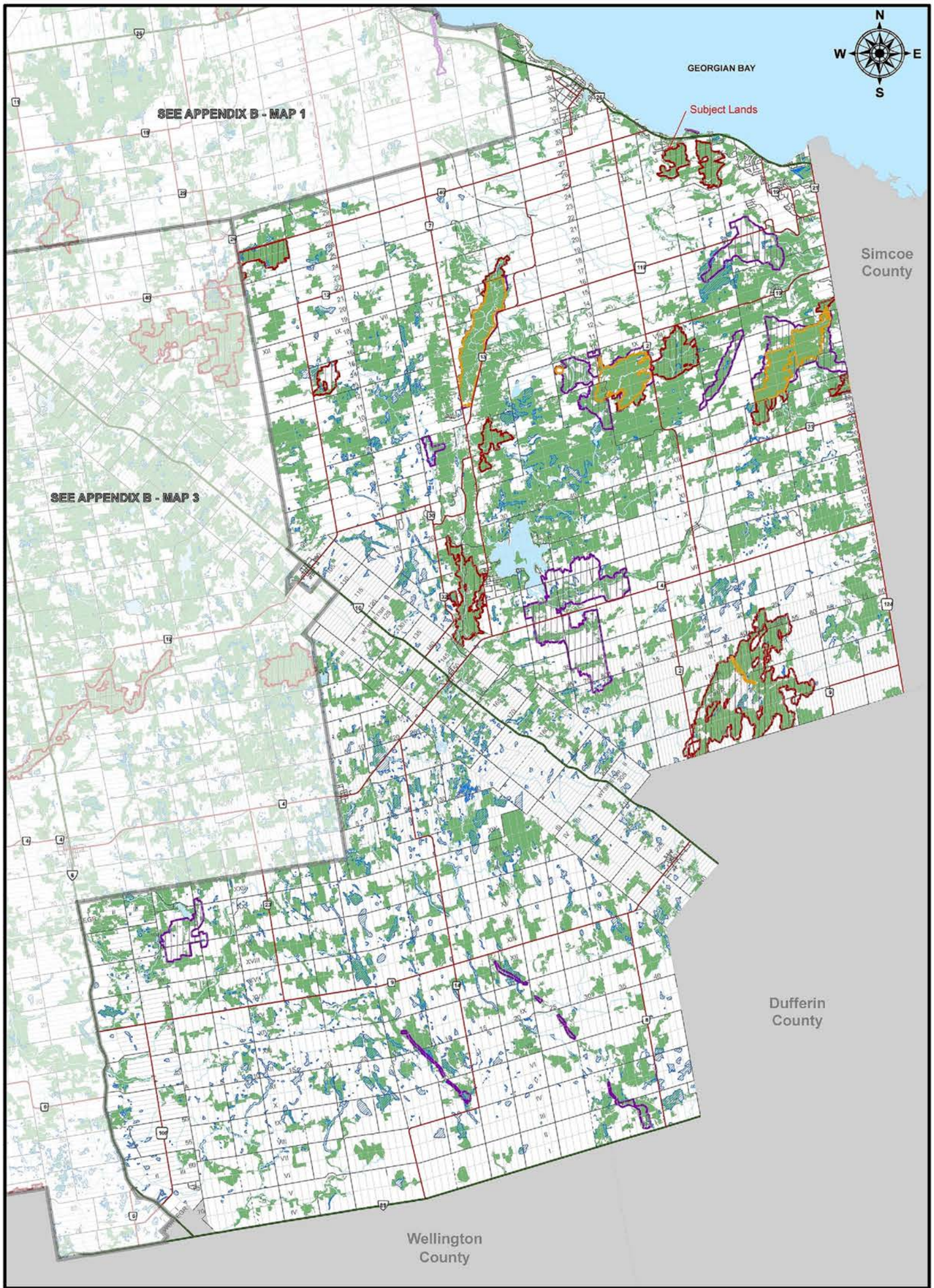
SCALE 1:95,000

0 1,125 2,250 4,500 6,750 9,000 Meters

AUTHOR:	Grey County Planning and Development
FILE NAME:	GR_OP_ApdxA_Map2EastX36.mxd
APPLICATION:	ArcMap
DATE:	Consolidated to June 25, 2013
PROJECTION:	UTM zone 17N / NAD83
SOURCE:	Teranet / Ontario Ministry of Natural Resources

INTERACTIVE MAP: maps.grey.ca
DOWNLOAD PDF: grey.ca

This map is for illustrative purposes only. Do not rely on this map as being a precise indicator of routes, location of features or surveying purposes. This map may contain cartographical errors or omissions.



Grey County

THE COUNTY OF GREY
OFFICIAL PLAN

APPENDIX B
Constraint Mapping

MAP 2

LEGEND

- Provincial Highway
- County Road
- Local Road
- Seasonal Road
- Stream / River
- Other Identified Wetlands
- Lakes
- Earth & Life ANSI
- Earth ANSI
- Life ANSI
- Significant Woodlands

SCALE 1: 95,000

0 1,125 2,250 4,500 6,750 9,000 Meters

AUTHOR: Grey County Planning and Development
FILE NAME: GR_OP_ApdxB_Map2easOt36.mxd
APPLICATION: ArcMap
DATE: Consolidated to June 25, 2013
PROJECTION: UTM zone 17N / NAD83
SOURCE: Teranet / Ontario Ministry of Natural Resources

INTERACTIVE MAP: maps.grey.ca
DOWNLOAD PDF: grey.ca

This map is for illustrative purposes only. Do not rely on this map as being a precise indicator of routes, location of features or surveying purposes. This map may contain cartographical errors or omissions.

Appendix B

Town of The Blue Mountains Official Plan

- **Appendix 1**

The Blue Mountains Constraint Mapping Appendix 1

Designations

- 100 Year Flood Elevation
- Stream / River
- Aggregate Resource Area
- ANSI
- Deer Wintering Area
- Escarpment Plan Boundary
- Karst
- Mineral Resource Extraction
- Permanent Water Area
- Provincially Significant Wetlands
- Other Wetlands
- Sewage Treatment Plant Buffer
- Significant Woodlands

0 0.5 1 2 3 4 5 Kilometers

N W E S

Note: This Schedule forms part of the Official Plan and must be read and interpreted in conjunction with the text. The information depicted on this Schedule has been compiled from various sources.While every effort has been made to accurately depict the information, data/mapping errors may exist.

Download PDF: www.thebluemountains.ca

June 2016

Subject Lands

Deer Wintering Area

Heathcote

Ravenna

Subject to Special Study Area Policies in Section B3.7.6.16

Refer to Secondary Plan mapping

TOWN OF THE BLUE MOUNTAINS

Lot 41 Lot 40 Lot 39 Lot 38 Lot 37 Lot 36 Lot 35 Lot 34 Lot 33 Lot 32 Lot 31 Lot 29 Lot 28 Lot 27 Lot 26 Lot 25 Lot 24 Lot 23 Lot 22 Lot 21 Lot 20 Lot 19 Lot 18 Lot 17 Lot 16 Lot 15 Lot 14 Lot 13 Lot 12 Lot 11 Lot 10 Lot 9 Lot 8 Lot 7 Lot 6 Lot 5 Lot 4 Lot 2 Lot 1

XII XI X IX VIII VII VI V IV III II I

Appendix C

Karst Investigation for the Subject Lands

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
Environmental Assessments & Approvals

January 2, 2017 AEC 16-438

Attention: Mike Hensel
Senior Development Consultant
Hensel Design Group Inc.

Re: Karst Investigation
Block 46, Lot 25, Concession 6,Town of The Blue Mountains, County of Grey.

Dear Mr. Hensel:

Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to submit our Karst Investigation Report for the Block 46 (Subject Site) proposed twelve lot development. Block 46 is located approximately 6 km's south east of the Town of Clarksburg along the south portion of Dorothy Drive off of Camperdown Road in the Township of Grey Highlands. Although the Site is not located in a defined Special Policy Area for Karst as per the constraint mapping issued by both the Township of Grey Highlands and the County of Grey, the Niagara Escarpment Commission (NEC) and Nottawasaga Valley Conservation Authority (NVCA) have indicated a requirement that a Karst Investigation be completed by a qualified professional. The purpose of this investigation is to determine potential environmental impacts for all twelve lots with regards to the location of both the residence and septic system in a potential karst area, as well as to confirm an excessive amount of fill would not be required to facilitate construction of either the residence or septic bed. It is understood that the concern regarding karst topography is derived from the Ontario Geological Survey (OGS) mapping which identifies the subject site as being located within 4 km of "Potential" and "Known" karst features.(Brunton& Dodge, 2008). The Block 46 properties are also located adjacent to the toe of the Niagara(Blue Mountain) escarpment. The toe of an escarpment slope is often where karst related seeps may reappear.

This investigation included a desktop review of available geological mapping, as well as local water well records to develop an understanding of the environmental setting. A field program was also completed that included a site inspection for karst features. The

following sections summarize the findings of this investigation and include a determination of the suitability of the proposed development.

SITE LOCATION AND DESCRIPTION

The subject site is located along Dorothy Drive off of Camperdown Road in the Township of Grey Highlands, Ontario (Figure 1). Legally, the subject site is included as Part of Lot 25, Concession 6, County of Grey. The exact dimensions of the proposed residential and septic developments for each of the lots is currently unknown, however while field operations were being conducted it was noted that most surrounding lots contained single residential dwellings of approximately 140 - 185 m^2.Sewer catch basins, a fire hydrant, and white PVC sewer piping hook ups were noted on lots adjacent the Block 46 development and the municipal water pumping station abuts the property. It is assumed all lots will be municipally serviced with regard to water and wastewater.

ENVIRONMENTAL SETTING

Physiography, Topography & Drainage

The subject property sits within the physiographic region referred to as the Beaver Valley adjacent to the Niagara Escarpment (Chapman and Putnam, 1984). The Subject Site is located directly north of the Blue Mountains Peaks escarpment upon an historic glacial beach terrace capping the underlying limestone bedrock. The Beaver Valley region originated as a river pre dating the local Beaver River. Through advance and melt of glacial action the sides and bottom of the valley were eroded over time with the suspended sediments being washed toward the mouth of the valley and into Georgian Bay.

The Niagara Escarpment, which is situated immediately south of the Site is the most prominent of several escarpments formed in the bedrock of southern Ontario. It is traceable from the Niagara River to northern Michigan, forming the spine of the Bruce Peninsula and Manitoulin and other islands in northern Lake Huron. It also extends into New York State and Wisconsin, roughly encircling the Michigan structural basin in the bedrock. The Escarpment rises to more than 400 m above Georgian Bay. Its existence is due to the resistance to erosion of the cap rock, the Amabel Formation.

At the mouth of the Beaver Valley, physiographic region is a crescent shaped terrace of gravel and beach sand materials which sit upon the underlying limestone bedrock. The terrace represents both a delta and beach depositional unit. The Subject Site is located roughly 4 meters from the Niagara Escarpment and upon the southernmost edge of the

terrace. Sediments at the subject site location are likely to represent erosion material from the escarpment face and Beaver Valley mixed with back beach material from the Nipissing Stage retreat of glacial Lake Iroquois approximately 4000 - 6000 years ago. Chapman and Putnam describes the terrace as agriculturally useless and mostly suitable for cottages, soils vary from fine sands to silts with occasional boulders. The topography of the Site is relatively flat with a slight slope dipping toward the east. An elevation decrease of 240 masl to 230 masl is noted from the south west to the north east corner of the subject site.

Local drainage upon the subject site was noted to follow the topographic decline toward the north and east and is suspected to be diverted down to Camperdown Road by the Dorothy Drive roadside concrete ditching. Since the subject site is in close proximity to the escarpment face, preliminary concerns were noted regarding spring melt and surficial runoff flooding the properties during periods of high precipitation, however during the site visit on December 7th, 2016 a large berm with machine cut ditching was noted running along the southern border of all the Block 46 lots. The berm averages ~2 meters in height, while in some portions of the ditching gravel and cobble limestone riprap can be seen reinforcing the ditch against erosion and providing drainage. The west side ditching connects to the local Camperdown Road ditch at the back of Lot 1, while the eastern ditch outlet empties roughly 20 m to the east of lot 12 down into a valley east of the development and escarpment. Pictures related to the ditching can be found in Appendix B. The escarpment face was also viewed while onsite and two seasonal melt runoff features were noted. The first feature was noted upon the escarpment slope to the south of Lot 1. The feature was actively diverting a drainage swale into the ditching created behind the lots, which emptied into a wet ditch within the Camperdown Road drainage. The second drainage feature was noted upon the escarpment to the south of lot 6. A moderately defined valley drainage structure was noted flowing in to the ditching created behind the lots. It is suspected the majority of the runoff will flow along the ditching to the east, however evidence of a small seep and seasonal runoff was noted at the back of lot 6 within the Block 46 boundaries and soil berm. A small patch of *Phragmites* along with other wetland plants were noted at the base of the interior berm which suggests at least some seasonal runoff pools within this zone during the spring melt and high precipitation events. The feature should be taken in to account when addressing the house placement designs. The two drainage features along with the small seep location can be seen on Figure 2. Pictures related to the escarpment drainage features and seep can be seen in Appendix B

Surficial Geology

The overburden sediments on the subject site consist of glaciofluvial ice-contact deposits (OGS, 2000). The sediments are predominantly gravel and sand with minor till forming from esker, kame, moraine, ice-marginal delta, and subaqueous fan depositional features.

According to the water well records from the Ministry of the Environment & Climate Change (MOECC) online database, there are numerous wells within a 500 m radius of the Site. The stratigraphic descriptions provided in these records confirm the local geological conditions stated above listingsand and gravel with underlying silt being the dominant surficial material. The thickness of the glaciofluvial sediments within the Camperdown Road area is noted to be between 7 - 12 m. Bedrock outcrop and bedrock boulders are noted along the escarpment face and along the shoreline near Georgian Bay.

In addition to the geological literature, a field visit was completed on December7th, 2016 to investigate the overburden properties at the Site. As stated previously the site has a topographic decline of approximately 10 m from the southwest to the north east. Foliage upon the west lots of the property specifically Lots 1 to 4 is dense with vegetation consisting of successional Trembling Aspen and White Spruce suggesting a dry environment. Vegetation on Lots 5 to12 is less dense and consists of small shrubs and saplings such as Hawthorn, also suggesting a typically dry growing environment. A soil sample was collected during the site visit using a hand held auger at a depth of 1 m below ground surface (bgs) between Lots 2 and 3. The sample composition was analyzed using an MBS-10 microscope and was noted to contain mostly fine sand with trace amounts of silt. An acid test was conducted using 50% dilute hydrochloric acid which yielded no reaction revealing the soil to be siliciclastic and not alkaline, hence there is little buffering capacity from the analyzedsample during acid precipitation. Additionally during the site visit a large stockpile of soil, roughly 2000 tonnes (1000m^3) was noted upon Lots 11 and 12.

Bedrock Geology

Georgian Bay shale and limestone was encountered along the south edge of the Subject Site within the escarpment face. The Georgian Bay Formation is a green - blue shale interbedded with fine grained fossiliferous limestone. A sample of the Georgian Bay Formation was collected from the drainage ditch below the bedrock outcrop. HCl was applied to the sample and exhibited a strong reaction. Multiple crinoid fossil stems can be noted when examining the fossil surfaces.

Beneath the Georgian Bay Formation is the Blue Mountain Shale which can be seen clearly along the Georgian Bay shoreline and at the beaches of Collingwood. The Blue Mountain Shale is a dark blue grey to dark gray finely bedded and brittle unit. While reviewing the MOECC water well records most records encountered this unit between 7 to 12 mbgs.

Hydrogeology

In reviewing the water well records for the area, it is evident that the primary supply aquifer for the local properties not connected to municipal water are drilled bedrock wells with total depths ranging between 18 and 25 m within a 2 km radius of the Site, with most wells being greater than 21 m in depth. Most wells are noted to target the fractured upper units of the Blue Mountain Shale formation, capturing the perched groundwater moving along the overburden boundary towards Georgian Bay.

Noting the fire hydrant and sewage hook ups on vacant lots across the street, each of the lots are likely to be municipally serviced and will likely not require the installation of domestic wells.

Karst Assessment

As discussed above, the location of the Subject Site within proximity to the Niagara Escarpment face and within reasonable distance of "Potential" and "Known" karst area has necessitated the need to evaluate the potential environmental risks associated with the proposed development. The development of karst features occurs where acidic precipitation encounters shallow bedrock and creates enhanced dissolution of the bedrock. This occurs where the infiltrating waters enter the rock along fissures and fracture planes. As dissolution occurs, the fissures and fractures are widened, and can become karstic features that become the primary permeability of the rock unit.

During the site visit no significant surficial karst features were observed. A visual representation of the route surveyed can be seen in Figure 2. All twelve potential lots were surveyed, no infiltration features or sinks were noted while completing the site visit. No bedrock outcrop features were noted besides those viewed within the escarpment slope south of the Site.

The presence of a more significant glacial till overburden thickness (2 m to >3 m) with limited permeability (i.e. $<10^{-6}$ m/s; T-Time > 50 min/cm) and significant carbonate content in the area of the proposed development (house & septic) provides a shielding function. Ford (2010) indicates that epikarst formation beneath carbonate overburden is

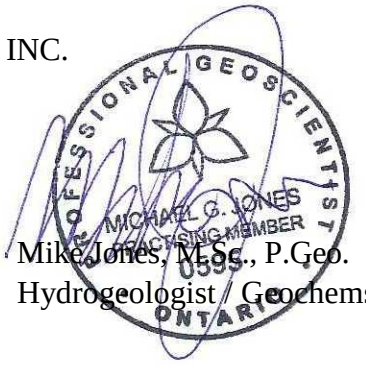
limited when the overburden is more than a meter thick. This indicates karst processes beyond the escarpment face are likely limited. Although the soil sample collected at 1 mbgs did not show an alkaline soil composition it is indeed beyond the escarpment face and the overburden thickness within the area according to local water well records is in excess of 6 m which is likely to provide a sufficient shielding affect for the underlying bedrock.

The likely placement of the building envelopes within 50 feet of Dorothy Drive were surveyed in detail and no karstic features such as sinkholes or solution-enhanced fracturing were identified. Similarly, the drainage around the Site was traced and is not related to karst development, and most likely represents surface runoff toward Dorothy Drive which will be directed down slope north on Camperdown Drive. Escarpment drainage and melt water runoff will likely be redirected to the east and west around the Block 46 property by the berm and ditching installed along the south edge of the development.

Based on the above review of the environmental setting, including site specific field investigation, it is concluded that the proposed development of Block 46 is not limited by significant karstic features.

If there are any questions regarding the above assessment, please contact the undersigned.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Steven Krbavcic, B.Sc. G.I.T.
Environmental Scientist

Mike Jones, M.Sc., P.Geo.
Hydrogeologist / Geochemsit

cc: Mike Hensel

REFERENCES:

Armstrong D.K. and Dodge J.E.P. 2007. Paleozoic Geology of Southern Ontario; Ontario Geological Survey, Sedimentary Geoscience Section.

Brunton, F.R. and Dodge, J.E.P. 2008.Karst of southern Ontario and Manitoulin Island; Ontario Geological Survey, Groundwater Resources Study 5.

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Ford, D., 2011. Report upon Karst Features and Groundwater Behaviour Observed in the Proposed Highland Quarry Property and its Environs, With Discussion.

Ontario Ministry of Environment & Climate Change, 2016. Ontario Water Well Online Database (https://www.ontario.ca/environment-and-energy/map-well-records)

The Ontario Geological Survey, 2003.Surficial Geology of Southern Ontario.

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APPENDIX A

Figures

LEGEND:

Approx. Property Boundary

REG MAP

250m 0 750m

HORIZONTAL SCALE 1: 25,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

Block 46 Karst Screening,
Town of Blue Mountains, ON

DATE ISSUED: *January 2017*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *16-438*	1
REFERENCE: *MNRF*	

DAYSTAMP: M:\16 Projects\16-438 Block 46 Karst Screening - Blue Mountains\04.0 - Drafting\16-438.dwg

Plotted by: JMCCARTNEY on January 4, 2017 at 1:16pm
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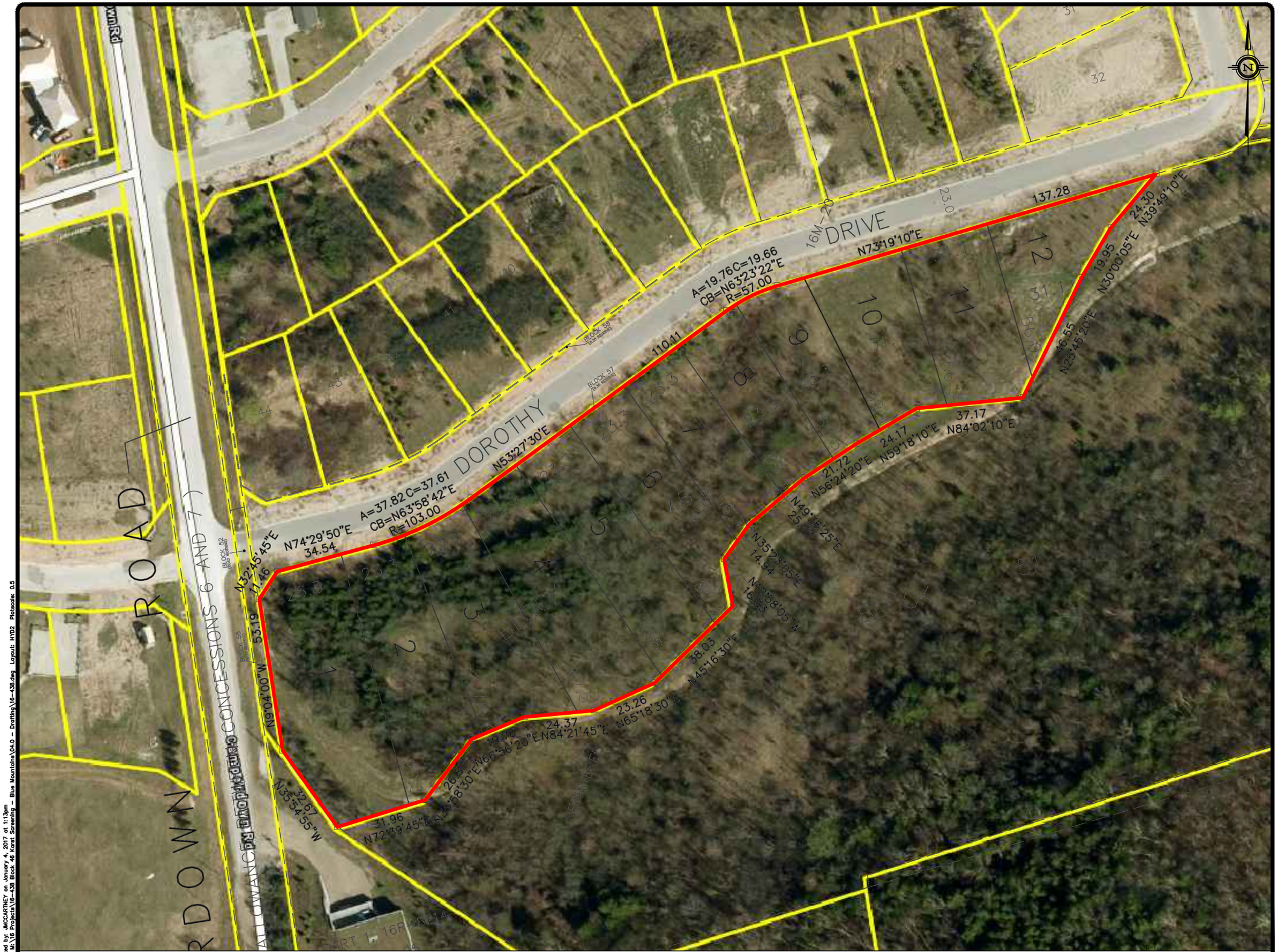

LEGEND:

Approx. Property Boundary

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Lot Boundaries

Block 46 Karst Screening,
Town of Blue Mountains, ON

DATE ISSUED:	*January 2017*	Figure No. 2
CREATED BY:	*JLM*	
PROJECT NO.:	*16-438*	
REFERENCE:	*First Base Solutions*	

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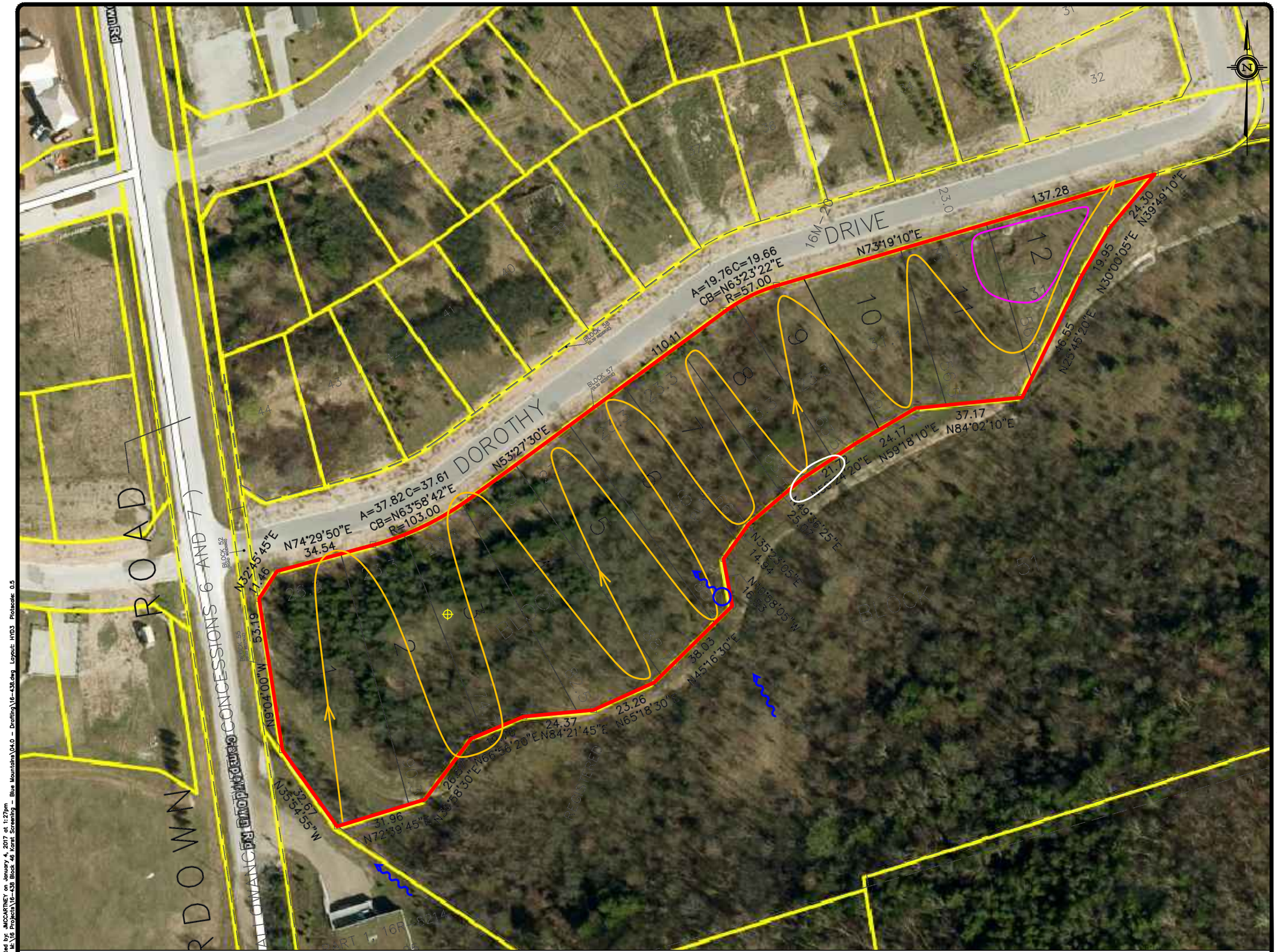

LEGEND:

- *Approx. Property Boundary*
- *Field Work Route*
- *Imported Fill*
- *Bedrock Outcrop (white)*
- *Escarpment Drainage*
- *Potential Seep*
- *Soil Sample Location*

15m 0 30m

HORIZONTAL SCALE 1:1,250

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Lot Boundaries

Block 46 Karst Screening,
Town of Blue Mountains, ON

DATE ISSUED:	*January 2017*	Figure No.
CREATED BY:	*JLM*	2
PROJECT NO.:	*16-438*	
REFERENCE:	*First Base Solutions*	

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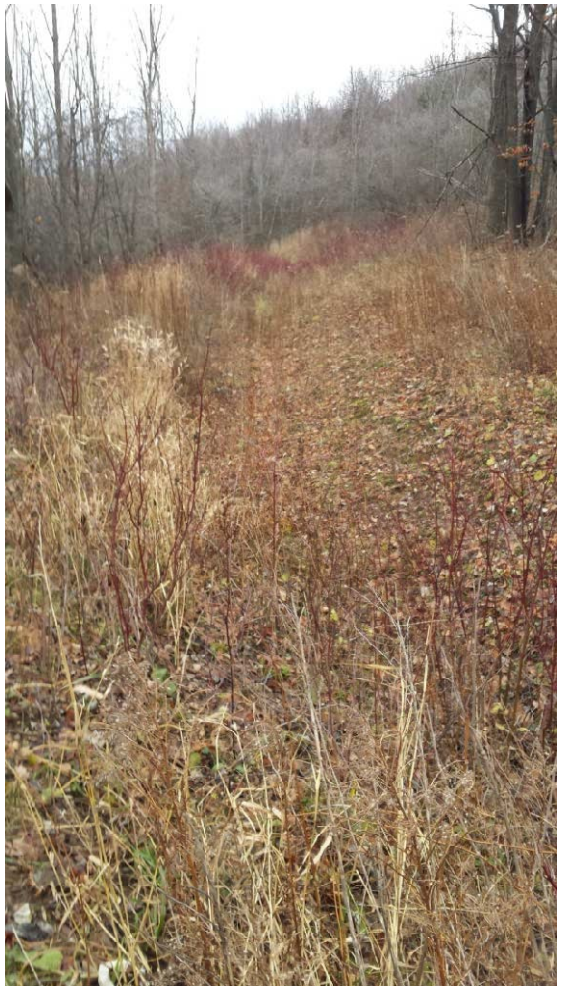
File: M:\16 Projects\16-438 Block 46 Karst Screening - Blue Mountains\04.0 - Drafting\16-438.dwg Layout: HYD3 Plotscale: 0.5

APPENDIX B

Site Pictures

Appendix B: Photographic Record

PHOTOGRAPH 1: Ditching south of Lot 1, facing west toward Camperdown Road



PHOTOGRAPH 2: Drainage ditching along south of Block 46 parcel

Karst Assessment Block 46 Subdivision,
Dorothy Drive
Town of The Blue Mountains, Ontario.

December 2016

Appendix B: Photographic Record

PHOTOGRAPH 3: Escarpment drainage valley south of Lot 6.

PHOTOGRAPH 4: Potential escarpment toe seep location south side edge of lot 6.

Appendix B: Photographic Record

PHOTOGRAPH 5: Imported fill mound on Lots 11 and 12

PHOTOGRAPH 6: Soil sample beneath microscope

Appendix B: Photographic Record

PHOTOGRAPH 7: Georgian Bay Formation sample from escarpment. Note the strong reaction with HCl

Appendix D

Photographs of Plant Species Observed on the Subject Lands

Photograph 1. Westward view of Dorothy Drive, with subject property fronting onto south edge, with approved and registered lots on the north side of road

Photograph 2. Eastward view of Dorothy Drive with subject property fronting onto the south side of this subdivision road

Photograph 3. View of part of Niagara Escarpment to the south of the subject property, forested with a flat-topped mesa, part of the Manitoulin Formation

Photograph 4. View of east edge of early successional white ash - hardwood forest (FODM4-2), with a distinct shrub stratum dominated by common buckthorn, hawthorns and apple, indicative of past farming uses

Photograph 5. View inside a portion of early successional white ash - hardwood forest (FODM4-2) showing weedy groundcover, other trees include black cherry, white elm, basswood and scattered eastern white cedar

Photograph 6. View of part of FODM4-2, showing dense shrub stratum and weedy groundcover

Photograph 7. View inside part of dry-fresh hawthorn - white spruce mixed woodland (WOMM3-1b), also contains Norway spruce, white ash, basswood, eastern white cedar and black cherry along other edges

Photograph 8. View inside WOMM3-1b showing relatively young white spruce and a sparse to barren groundcover

Photograph 9. View of hawthorn - white spruce mixed woodland (WOMM3-1b) containing white ash, choke cherry, common buckthorn and common apple

Photograph 10. View of west portion of part of white ash deciduous woodland (WODM4-2), with white elm, basswood, black cherry, hawthorn, buckthorn, tartarian honeysuckle, wild red raspberry, dogwoods and wild rose

Photograph 11. View inside part of WODM4-2 showing an inclusion dominated by hawthorns and common buckthorn, with a weedy groundflora

Photograph 12. South edge of WODM4-2 showing immature white ash, an open to semi-open canopy, dense shrub stratum and weedy groundcover

Photograph 13. View of a small stand of immature white ash, part of a white ash regeneration thicket (THDM4-2), also contains common apple, honeysuckle, hawthorn, dogwood and choke cherry

Photograph 14. View of THDM4-2, dominated by immature white ash with a weedy and grassed groundcover

Photograph 15. View of upland dogwood shrub thicket (THDM2-11), dominated by red-osier dogwood and round-leaved dogwood, along top of man-made berm along south property perimeter

Photograph 16. View of part of dry-fresh mixed meadow (MEMM3) on top of man-made berm along south edge of subject property, dominated by grasses, weeds and herbaceous forbs

Photograph 17. View of part of mixed meadow (MEMM3) in floodplain along edge of intermittent swale/intermittent tributary, with an inclusion of a small pocket of cattail marsh and other aquatic sedges, ferns and forbs

Photograph 18. View a small block of mixed meadow (MEMM3) along property frontage onto Dorothy Drive

Photograph 19. Eastward view of intermittent swale/intermittent tributary at base of escarpment that convey surface runoff and seepage along south edge of property perimeter

Photograph 20. View of intermittent swale/intermittent tributary along property perimeter at the west end, with an edge of mixed meadow habitat (MEMM3)

Appendix E

Vascular Plant Species Observed on the Subject Lands

Appendix E. List of Vascular Plants Observed on the Dorothy Drive Property

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	*SARA, 2002*	*ESA, 2007*
Acer negundo	Manitoba maple	G5	S5		
Acer rubrum	red maple	G5	S5		
Acer saccharum	sugar maple	G5	S5		
Achillea millefolium	common yarrow	G5	SNA		
Agrimonia gryposepala	hooked agrimony	G5	S5		
Agrostis gigantea	redtop	G5	S5		
Agrostis stolonifera	creeping bent grass	G5	SNA		
Alliaria petiolata	garlic mustard	GNR	SNA		
Ambrosia artemisiifolia	annual ragweed	G5	S5		
Anemone canadensis	Canada anemone	G5	S5		
Anemone virginiana	thimbleweed	G5T5	S5		
Apocynum androsaemifolium	spreading dogbane	G5	S5		
Aralia nudicaulis	wild sarsaparilla	G5	S5		
Arctium minus	common burdock	GNR	SNA		
Asclepias syriaca	common milkweed	G5	S5		
Athyrium filix-femina	northeastern lady fern	G5T5	S5		
Barbarea vulgaris	yellow rocket	GNR	SNA		
Betula papyrifera	white birch	G5	S5		
Brassica kaber	field mustard	GNR	SNA		
Bromus inermis	awnless brome brass	G5TNR	SNA		
Calamagrostis canadensis	Canada bluejoint grass	G5	S5		
Capsella bursa-pastoris	common shepherd's purse	GNR	SNA		
Carex bebbii	Bebb's sedge	G5	S5		
Carex deweyana	Dewey's sedge	G5	S5		
Carex gracillima	graceful sedge	G5	S5		
Carex stipata	awl-fruited sedge	G5	S5		
SCIENTIFIC NAME	**COMMON NAME**	**G-RANK**	**S-RANK**	***SARA, 2002***	***ESA, 2007***

Appendix E. List of Vascular Plants Observed on the Dorothy Drive Property

Carex vulpinoidea	fox sedge	G5	S5		
Caulophyllum thalictroides	blue cohosh	G4G5	S5		
Centaurea stoebe	spotted knapweed	GNR	SNA		
Cerastium fontanum	mouse-eared chickweed	GNR	SNA		
Chenopodium album	lamb's quarters	G5	SNA		
Chrysanthemum leucanthemum	ox-eye daisy	GNR	SNA		
Cichorium intybus	chicory	GNR	SNA		
Circaea lutetiana	enchanters' nightshade	G5T5	S5		
Cirsium arvense	Canada thistle	GNR	SNA		
Cirsium vulgare	bull thistle	GNR	SNA		
Clinopodium vulgare	wild basil	G5	S5		
Cornus alternifolia	alternate-leaved dogwood	G5	S5		
Cornus rugosa	round-leaved dogwood	G5	S5		
Cornus stolonifera	red-osier dogwood	G5	S5		
Crataegus macracantha	large-thorned hawthorn	GNRTNR	SU		
Cystopteris bulbifera	bulblet fern	G5	S5		
Dactylis glomerata	orchard grass	GNR	SNA		
Daucus carota	wild carrot	GNR	SNA		
Digitaria ischaemum	smooth crabgrass	GNR	SNA		
Dipsacus fullonum	common teasel	GNR	SNA		
Dryopteris carthusiana	spinulose wood-fern	G5	S5		
Echinocystis lobata	wild cucumber	G5	S5		
Echium vulgare	common vIper's-bugloss	GNR	SNA		
Eleocharis erythropoda	red-stemmed spike-rush	G5	S5		
Elymus repens	quackgrass	GNR	SNA		
Epipactis helleborine	helleborine	GNR	SNA		
Equisetum arvense	field horsetail	G5	S5		
SCIENTIFIC NAME	**COMMON NAME**	**G-RANK**	**S-RANK**	***SARA, 2002***	***ESA, 2007***
Erigeron canadensis	Canada horseweed	G5	S5		
Erigeron hyssopifolius	daisy fleabane	G5	S5		

Appendix E. List of Vascular Plants Observed on the Dorothy Drive Property

Erythronium americanum	yellow trout-lily	G5	S5		
Euphorbia cyparissias	cypress spruge	G5	SNA		
Eurybia macrophylla	large-leaved aster	G5	S5		
Eutrochium maculatum	spotted Joe-pye weed	G5T5	S5		
Fragaria vesca	woodland strawberry	G5	S5		
Fragaria virginiana	common strawberry	G5	S5		
Fraxinus americana	white ash	G5	S4		
Galium triflorum	fragrant bedstraw	G5	S5		
Geranium robertianum	herb-robert	G5	S5		
Geum aleppicum	yellow avens	G5	S5		
Geum canadense	white avens	G5	S5		
Glyceria striata	fowl mannagrass	G5	S5		
Hesperis matronalis	dame's rocket	G4G5	SNA		
Hieracium lachenalii	common hawkweed	GNR	SNA		
Hypericum perforatum	common St. John's-wort	GNR	SNA		
Impatiens capensis	spotted jewelweed	G5	S5		
Inula helenium	elecampane	GNR	SNA		
Juncus tenuis	path rush	G5	S5		
Leonurus cardiaca	motherwort	GNR	SNA		
Lepidium campestre	field peppergrass	GNR	SNA		
Lonicera morrowii	Morrow's honeysuckle	GNR	SNA		
Lonicera tatarica	tartarian honeysuckle	GNR	SNA		
Lotus corniculatus	bird's-foot trefoil	GNR	SNA		
Lycopus europaeus	European water-horehound	*GNR*	*SNA*		
Lythrum salicaria	purple loosestrife	G5	SNA		
SCIENTIFIC NAME	**COMMON NAME**	**G-RANK**	**S-RANK**	***SARA, 2002***	***ESA, 2007***
Maianthemum canadense	wild lily-of-the-valley	G5	S5		
Maianthemum stellatum	starry false solomon's-seal	G5	S5		
Malus pumila	common apple	G5	SNA		
Matricaria matricarioides	pineapple-weed	G5	SNA		

Appendix E. List of Vascular Plants Observed on the Dorothy Drive Property

Matricaria perforata	scentless camomile	G5	SNA		
Melilotus albus	white sweet-clover	G5	SNA		
Mentha arvensis	field mint	G5	S5		
Myosotis laxa	forget-me-not	G5	S5		
Myosotis sylvatica	woodland forget-me-not	G5	S5		
Nepeta cataria	catnip	GNR	SNA		
Oenothera biennis	common evening primrose	G5	S5		
Onoclea sensibilis	sensitive fern	G5	S5		
Osmorhiza claytonii	sweet cicely	G5	SNA		
Oxalis stricta	European wood-sorrel	G5	S5		
Panicum capillare	common panic grass	G5	S5		
Parthenocissus quinquefolia	Virginia creeper	G5	S4?		
Phalaris arundinacea	reed canary grass	G5	S5		
Phleum pratense	timothy	GNR	SNA		
Phragmites australis	common reed	G5T4	S4?		
Picea abies	Norway spruce	GNR	SNA		
Picea glauca	white spruce	G5	S5		
Pinus strobus	white pine	G5	S5		
Pinus sylvestris	Scotch pine	GNR	SNA		
Plantago lanceolata	English plantain	G5	SNA		
Plantago major	common plantain	G5	S5		
Poa annua	annual bluegrass	GNR	SNA		
Poa compressa	Canada bluegrass	GNR	SNA		
SCIENTIFIC NAME	**COMMON NAME**	**G-RANK**	**S-RANK**	***SARA, 2002***	***ESA, 2007***
Poa pratensis ssp. pratensis	Kentucky bluegrass	G5T5	S5		
Populus grandidentata	large-tooth aspen	G5	S5		
Populus tremuloides	trembling aspen	G5	S5		
Portulaca oleracea	common purslane	GU	SNA		
Potentilla recta	common cinquefoil	GNR	SNA		
Prunella vulgaris ssp. vulgaris	self-heal	G5TU	SNA		

Appendix E. List of Vascular Plants Observed on the Dorothy Drive Property

Prunus serotina	black cherry	G5	S5		
Prunus virginiana	choke cherry	G5	S5		
Pteridium aquilinum	eastern bracken fern	G5	S5		
Quercus rubra	red oak	G5	S5		
Ranunculus acris	common buttercup	G5	SNA		
Ranunculus repens	creeping buttercup	GNR	SNA		
Rhamnus cathartica	common buckthorn	GNR	SNA		
Rhus radicans	poison ivy	G5	S5		
Rhus typhina	staghorn sumac	G5	S5		
Ribes cynosbati	pasture gooseberry	G5	S5		
Rosa multiflora	multiflora rose	GNR	SNA		
Rubus idaeus ssp. idaeus	wild red raspberry	G5T5	SNA		
Rubus occidentalis	black raspberry	G5	S5		
Rumex crispus	curly dock	GNR	SNA		
Salix discolor	pussy willow	G5	S5		
Sambucus canadensis	common elderberry	G5T5	S5		
Saponaria officinalis	bouncing bet	GNR	SNR		
Setaria viridis	green foxtail	GNR	SNA		
Silene latifolia	baldder campion	GNR	SNA		
Solanum dulcamara	deadly nightshade	GNR	SNA		
Solidago altissima ssp. altissima	tall goldenrod	GNR	S5		
SCIENTIFIC NAME	**COMMON NAME**	**G-RANK**	**S-RANK**	***SARA, 2002***	***ESA, 2007***
Solidago canadensis	Canada goldenrod	G5T5	S5		
Sonchus oleraceus	common sow-thistle	GNR	SNA		
Symphyotrichum cordifolium	heart-leaved aster	G5	S5		
Symphyotrichum novae-angliae	New England aster	G5	S5		
Syringa vulgaris	common lilac	GNR	SNA		
Taraxacum officinale	common dandelion	G5	SNA		
Thalictrum dioicum	early meadow-rue	G5	S5		
Thlaspi arvense	field penny-cress	GNR	SNA		

Appendix E. List of Vascular Plants Observed on the Dorothy Drive Property

Thuja occidentalis	eastern white cedar	G5	S5		
Tilia americana	basswood	G5	S5		
Tragopogon pratensis	goat's-beard	GNR	SNA		
Trifolium campestre	low hop clover	GNR	SNA		
Trifolium pratense	red clover	GNR	SNA		
Trifolium repens	white clover	GNR	SNA		
Tussilago farfara	colt's-foot	GNR	SNA		
Typha angustifolia	narrow-leaved cattail	GNR	SNA		
Ulmus americana	white elm	G5?	S5		
Urtica dioica ssp. dioica	European stinging nettle	G5T5?	SNA		
Verbascum thapsus	common mullein	GNR	SNA		
Veronica officinalis	common speedwell	G5	SNA		
Viburnum lentago	nannyberry	G5	S5		
Viburnum trilobum	high-bush cranberry	G5	S5		
Vicia cracca	cow vetch	GNR	SNA		
Viola pubescens var. pubescens	downy yellow violet	G5T5	S5		
Viola sororia	woolly blue violet	G5	S5		
Vitis riparia	riverbank grape	G5	S5		
Waldsteinia fragarioides	barren strawberry	G5	S5		

Legend

Provincial Rank (SRANK)	***SARA, 2002***	***ESA, 2007***
S1 - Critically Imperiled	*NAR - Not at Risk*	*NAR - Not at Risk*
S2 - Imperiled	*SC - Special Concern*	*SC - Special Concern*
S3 - Vulnerable	*T - Threatened*	*THR - Threatened*
S4 - Apparently Secure	*E - Endangered*	*END - Endangered*
S5 - Secure		
SNA - Non Applicable or equivalent to non-native		

Appendix F

Breeding Birds Observed on the Subject Lands

Appendix F. Bird Species List for Dorothy Drive Property

			Point Count Station[3]				Conservation Rank Information[2]			
FAMILY	**SCIENTIFIC NAME**	**COMMON NAME**	**1**	**2**	**3**	**Breeding Evidence[1]**	**S RANK**	**G RANK**	**SARO STATUS**	**COSEWIC Status**
Anatidae	*Branta canadensis*	Canada goose	FO			None	S5	G5		
Anatidae	*Cathartes aura*	turkey vulture	FO			None	S5B	G5		
Ardeidae	*Ardea herodias*	great blue heron	FO			None	S4	G5		
Cardinalidae	*Cardinalis cardinalis*	northern cardinal		P		Probable	S5	G5		
Cathartidae	*Cathartes aura*	turkey vulture	FO			None	S5B	G5		
Charadriidae	*Charadrius vociferus*	killdeer	H			Possible	S5B,S5N	G5		
Columbidae	*Zenaida macroura*	mourning dove		C	C	Probable	S5	G5		
Corvidae	*Corvus brachyrhynchos*	American crow		C		Probable	S5B	G5		
Corvidae	*Cyanocitta cristata*	blue jay		C	C	Probable	S5	G5		
Emberizidae	*Melospiza melodia*	song sparrow	C			Probable	S5B	G5		
Emberizidae	*Zonotrichia albicollis*	white-throated sparrow		C		Possible	S5B	G5		
Emberizidae	*Spizella passerina*	chipping sparrow			C	Probable	S5B	G5		
Fringillidae	*Carduelis tristis*	American goldfinch		P	P	Probable	S5B	G5		
Icteridae	*Agelaius phoeniceus*	red-winged blackbird			P	Probable	S4	G5		
Icteridae	*Molothrus ater*	brown-headed cowbird		C		Possible	S4B	G5		
Icteridae	*Quiscalus quiscula*	common grackle	C	C	C	Possible	S5B	G5		
Icteridae	*Icterus galbula*	Baltimore oriole			S	Probable	S4B	G5		
Laridae	*Larus delawarensis*	ring-billed gull	FO			None	S5B,S4N	G5		
Mimidae	*Dumetella carolinensis*	gray catbird		C	C	Possible	S4B	G5		
Paridae	*Poecile atricapillus*	black-capped chickadee		C	C	Probable	S5	G5		
Parulidae	*Geothlypis trichas*	common yellowthroat			P	Probable	S5B	G5		
Parulidae	*Setophaga petechia*	yellow warbler	S	S	S	Probable	S5B	G5		
Parulidae	*Setophaga coronata*	yellow-rumped warbler		S	S	Possible	S5B	G5		
Phasianidae	*Meleagris gallopavo*	wild turkey		X	X	None	S5	G5		
Picidae	*Colaptes auratus*	northern flicker		C	C	Possible	S4B	G5		
Picidae	*Picoides pubescens*	downy woodpecker		X	X	None	S5	G5		
Picidae	*Sphyrapicus varius*	yellow-bellied sapsucker		X	X	None	SB5	G5		
Sittidae	*Sitta canadensis*	red-breasted nuthatch			C	Possible	S5	G5		
Sturnidae	*Sturnus vulgaris*	European starling			X	None	SNA	G5		
Turdidae	*Turdus migratorius*	American robin	C	N	FY	Confirmed	S5B	G5		
Tyrannidae	*Myiarchus crinitus*	great crested flycatcher		H	H	Possible	S4B	G5		

Point Count Survey Duration - at least 10 minutes/station

Dawn Bird Survey Observation Conditions:
June 7, 2017; Start Time 0530hr/ End Time 06:15hr; Observer - David G. Cunningham (Cunningham Environmental Associates)

June 17, 2017; Start Time 05:45hr/ End Time 0630hr; Observer - David G. Cunningham (Cunningham Environmental Associates

[1]Highest level of breeding evidence detected based on Ontario Breeding Bird Atlas (OBBA) criteria and Breeding Evidence Codes

[2]Conservation Rank - from Ontario Ministry of Natural Resources & Forestry, Natural Heritage Information Centre, Species at Risk in Ontario Lists and Environment Canada/COSEWIC Lists

S-rank - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common NAR - Not at Risk

G-Rank - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure

[3]Breeding Evidence Codes: e.g, **S** Singing male detected during 2017 surveys

Breeding Evidence	*Breeding Evidence Codes*
None	FO - Species observed Flying Over showing no signs of use of subject or adajcent lands
Observed	X - Species observed, no evidence of breeding
Possible	H - Species observed in its breeding season in suitable nesting habitat
Note	S or C - Singing male(s) present (S), or breeding calls heard (C), in suitable nesting habitat in breeding season
Probable	P - Pair observed in suitable nesting habitat in nesting season
Probable	D - Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
Probable	V - Visiting probable nest site
Probable	A - Agitated behaviour or anxiety calls of an adult
Probable	B - Brood Patch on adult female or cloacal protuberance on adult male
Probable	N - Nest-building or excavation of nest hole.
Confirmed	DD - Distraction display or injury feigning.
Confirmed	NU - Used nest or egg shells found (occupied or laid within the period of the survey)
Confirmed	FY - Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight
Confirmed	AE - Adult leaving or entering nest sites in circumstances indicating occupied nest
Confirmed	FS - Adult carying fecal sac.
Confirmed	CF - Adult carying food for young.
Confirmed	NE - Nest containing eggs.
Confirmed	NY - Nest with young seen or heard

Note : Possible if only one observation of S or C, Probable if evidence of S or C in same place on two or more dates a week or more apart

Appendix G

Mammals and Herptofauna Observed on the Subject Lands

Appendix G. List of Mammal and Herpetofauna Species Observed or Heard on or Abutting the Dorothy Drive Property

Common Name	**Scientific Name**
Mammals	
eastern cottontail	*Sylvilagus floridanus*
eastern chipmunk	*Tamias striatus*
eastern gray squirrel	*Sciurus carolinensis*
northern raccoon	*Procyon lotor*
white-tailed deer	*Odocoileus virginianus*
Amphibians and Reptiles	
spring peeper	*Pseudacris crucifer*
western chorus frog	*Pseudacris triseriata*
northern leopard frog	*Lithobates pipiens*
gray treefrog	*Hyla versicolor*
eastern garter snake	*Thamnophis sirtalis sirtalis*

Appendix H

NHIC Records for the Subject and Adjacent Lands

Appendix F

NHIC Data 17NK4831

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OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
948315	SPECIES	Shrubby St. John's-wort	Hypericum prolificum	S2			1943-08-19	2036
948315	SPECIES	Smith's Bulrush	Schoenoplectiella smithii	S2S3			1943-08-19	3085
948315	SPECIES	Variegated Meadowhawk	Sympetrum corruptum	S3			1927-09-11	41555
948315	SPECIES	Shining-branch Hawthorn	Crataegus magniflora	S3			1975-06-12	59755
948315	SPECIES	Stiff Yellow Flax	Linum medium var. medium	S3?				59926
948315	SPECIES	Rough Dropseed	Sporobolus compositus	S4			1995-08-24	65004
948315	SPECIES	A Lichen	Melanelia subargentifera	S1S3			1976-07-27	67809

S1 Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.
S2 Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences; often susceptible to extirpation.
S3 Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances. Most species with an S3 rank are assigned to the watch list, unless they have a relatively high global rank.
S4 Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.
S5 Very common and demonstrably secure in Ontario.
SH Historically known from Ontario, but not verified recently (typically not recorded in the province in the last 20 years); however suitable habitat is thought to be still present in the province and there is reasonable expectation that the species may be rediscovered.
SR Reported for Ontario, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.
SRF Reported falsely from Ontario.
SX Apparently **extirpated** from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.
SE Exotic; not believed to be a native component of Ontario's flora.
C Captive/Cultivated; existing in the province only in a cultivated state; introduced population not yet fully established and self-sustaining.
S? Not Ranked Yet, or if following a ranking, **Rank Uncertain** (e.g. S3?). S? species have not had a rank assigned.
SU Unrankable, often because of low search effort or cryptic nature of the species, there is insufficient information available to assign a more accurate rank; more data is needed.

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
948314	SPECIES	Shrubby St. John's-wort	Hypericum prolificum	S2			1943-08-19	2036
948314	SPECIES	Smith's Bulrush	Schoenoplectiella smithii	S2S3			1943-08-19	3085
948314	SPECIES	Variegated Meadowhawk	Sympetrum corruptum	S3			1927-09-11	41555
948314	SPECIES	Stiff Yellow Flax	Linum medium var. medium	S3?				59926
948314	SPECIES	Rough Dropseed	Sporobolus compositus	S4			1995-08-24	65004
948314	SPECIES	A Lichen	Melanelia subargentifera	S1S3			1976-07-27	67809

S1 Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.
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S5 Very common and demonstrably secure in Ontario.
SH Historically known from Ontario, but not verified recently (typically not recorded in the province in the last 20 years); however suitable habitat is thought to be still present in the province and there is reasonable expectation that the species may be rediscovered.
SR Reported for Ontario, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.
SRF Reported falsely from Ontario.
SX Apparently **extirpated** from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.
SE Exotic; not believed to be a native component of Ontario's flora.
C Captive/Cultivated; existing in the province only in a cultivated state; introduced population not yet fully established and self-sustaining.
S? Not Ranked Yet, or if following a ranking, **Rank Uncertain** (e.g. S3?). S? species have not had a rank assigned.
SU Unrankable, often because of low search effort or cryptic nature of the species, there is insufficient information available to assign a more accurate rank; more data is needed.