FINAL

Environmental Impact Study

9243 McArton Road, Beckwith Township, Ontario

Prepared for:

Douglas Landing Developments
1 Forillon Cres
Kanata, Ontario, K2M 2W5

Attn: Gillian Espie

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TABLE OF CONTENTS

1.0 INTRODUCTION 4
2.0 POLICY CONTEXT 4
2.1 Provincial Policy Statement 4
2.2 Lanark County Sustainable Community Official Plan 6
2.3 Beckwith Township Official Plan 6
2.4 Ontario Regulation 41/24 6
3.0 STUDY METHODOLOGY 7
3.1 Desktop Background Review 7
3.2 Field Assessment 7
3.2.1 Vegetation Surveys 7
3.2.2 Wetland Assessment 8
3.2.3 Watercourse Assessment 8
3.2.4 Woodland Assessment 9
3.2.5 Species at Risk 9
3.2.6 Incidental Wildlife Observations 9
4.0 EXISTING CONDITIONS 10
4.1 Landforms, Soils, and Geology 10
4.2 Vegetation Surveys 11
4.2.1 Vascular Plants 11
4.2.2 Vegetation Communities 11
4.3 Wetland Assessment 12
4.4 Watercourse Assessment 13
4.5 Woodland Assessment 14
4.6 Incidental Wildlife Observations 14
4.7 Species at Risk Screening 14
4.8 Significant Wildlife Habitat Screening 15
4.9 Natural Heritage System and Ecological Connectivity 16
5.0 PROPOSED DEVELOPMENT 16
6.0 IMPACT ASSESSEMENT 17
6.1 Direct Impacts 17
6.2 Indirect Impacts 17
6.3 Residual and Cumulative Effects Assessment 18
7.0 RECOMMENDED MITIGATION MEASURES 18
8.0 CLOSURE 21
9.0 REFERENCES 22
10.0 LIMITATIONS 23

APPENDICES

APPENDIX A	FIGURES
APPENDIX B	SUPPLEMENTARY INFORMATION
APPENDIX C	VASCULAR PLANT LIST
APPENDIX D	SELECTED SITE PHOTOGRAPHS
APPENDIX E	SPECIES AT RISK SCREENING TABLE
APPENDIX F	CONCEPTUAL SITE PLAN

1.0 INTRODUCTION

Douglas Landing Developments (Client) has retained Pinchin Ltd. (Pinchin) by to conduct a Scoped Environmental Impact Study (EIS) of the subject property located at 9243 McArton Road, Beckwith Township, Ontario (Site). The location of the Site and its general surrounding area is shown on Figure 1 in **Appendix A**. The EIS was requested by the Client in anticipation of the application requirements of the Beckwith Township and Mississippi Valley Conservation Authority (MVCA) for the proposed development. The proposed development is for rural residential use with associated amenities.

Pinchin understands that the Site, approximately 21.9 hectares (54.2 acres), is vacant, with previously severed farmland. Pinchin has identified the Site and its immediately surrounding area extending 120 m farther as the Study Area, as depicted on Figure 2 in Appendix A. Natural heritage features within the Study Area include watercourse, woodland, unevaluated wetlands and drainage features.

Pinchin prepared this EIS to: identify natural heritage features present on, or immediately adjacent to, the Site, and characterize their ecological functions; evaluate aspects of the development proposal that might reasonably be expected to adversely affect those natural features; and provide recommendations of measures to avoid or otherwise mitigate potential impacts. We have prepared this EIS report in general accordance with Beckwith Township Official Plan (2017) and with relevant guidelines from the Provincial Policy Statement (2024), the *Endangered Species Act* (2007), and MVCA.

2.0 POLICY CONTEXT

Pinchin reviewed the following provincial, regional, and municipal legislation and policies prior to undertaking our evaluation of the natural heritage features, functions, and conditions of the Site and adjacent areas:

- Provincial Policy Statement (2024);
- Lanark County Sustainable Community Official Plan (2017);
- Beckwith Township Official Plan (2017); and
- Ontario Regulation 41/24.

The sections below provide a summary of the above legislation and policies applicable to Site development planning and approval.

2.1 Provincial Policy Statement

The Provincial Policy Statement 2024 (PPS) sets a policy foundation for regulating development and land use in the Province of Ontario. It sets out guidelines for development while protecting resources of interest to the province, public health and safety and the quality of the natural environment (Ministry of Municipal Affairs and Housing, 2020).

While the PPS supports development and improved land use for planning, management, and growth, it does so in ways to enhance communities through efficient land use, and environmental management and protection.

Section 4 of the PPS provides direction for wise use and management of resources by conserving and protecting natural areas and their features to their benefit. Section 4.1 stipulates that natural features and areas are to be protected for the long term. Section 4.2 states that diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, are to be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features, and ground water features. Section 4.3 stipulates that the natural heritage systems are to be identified in Ecoregions 6E and 7E1, recognizing that natural heritage systems vary in size and form in settlement areas, rural areas, and prime agricultural areas.

As the Study Area falls within Ecoregion 6E, and as stipulated in section 4.5, no development and site alteration is to be permitted that affects significant wetlands and significant coastal wetlands. No development and site alteration is to be permitted, unless it has been demonstrated that there will be no negative impacts on these natural features or their ecological functions:

a) significant woodlands in Ecoregions 6E (excluding islands in Lake Huron and the St. Mary's River);
b) significant valleylands in Ecoregions 6E (excluding islands in Lake Huron and the St. Mary's River);
c) significant wildlife habitat;
d) significant areas of natural and scientific interest; and
e) coastal wetlands in Ecoregion 6E that are not subject to policy 4.1.4 (b)

Development and Site alteration is not to be permitted in the habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. Section 4.8 notes that development and site alteration is not to be permitted on land adjacent to natural heritage features and areas unless the ecological functions of the adjacent lands have been demonstrated and that there will be no negative impacts affecting the condition of those features or functions.

The PPS provides overall policy direction and should be read in conjunction with other provincial and municipal plans. Where the policies from various plans overlap, the more stringent policy is to be implemented unless otherwise stated.

2.2 Lanark County Sustainable Community Official Plan

The most recent consolidation of the Lanark County Sustainable Community Official Plan was adopted in 2013, with the most recent modifications made in 2017. Schedule A of that Official Plan shows the Site within the designated “Rural Area”. A map showing that designation is provided in **Appendix B.** Section 3.0 of the Official Plan contains the policies applicable to Rural Areas within the region. General Policies for development or redevelopment of rural properties state that Local Official Plans are to contain area-specific policies for ensuring that land-use changes do not result in additional negative environmental impacts.

2.3 Beckwith Township Official Plan

The most recent consolidation of the Town of Beckwith Official Plan (TBOP) was released in 2017. The Site is classified as “Rural Lands”, as shown in Schedule A in **Appendix B**. Section 4.6.8 outlines how the TBOP follows the Province of Ontario Natural Heritage Reference Manual for lands adjacent to natural heritage features, as identified on Schedule A. The OP states that, in considering development or site alteration within a set distance from a natural heritage feature, an environmental impact assessment is required. As shown on Schedule B, also included in **Appendix B**, the Site does not fall within development constraints laid out by the Township.

2.4 Ontario Regulation 41/24

In accordance with the *Conservation Authorities Act*, 1990, the Mississippi Valley Conservation Authority (MVCA) is authorized to implement and enforce the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulations 153/06). That regulation states that development in or on areas it defines (e.g., river or stream valleys, hazardous land, and wetlands) requires permission from MVCA. MVCA may grant permission for development in or on those areas only if it will not affect control of flooding, erosion, dynamic beaches, pollution, or conservation of land. The Regulation also states that it is prohibited to straighten, change, divert, or interfere in any way with the existing channel of a river, creek, stream, or watercourse, or change or interfere in any way with the wetland, without permission from MVCA (Government of Ontario, 2024).

It is noteworthy that, since April 1, 2024, Ontario Regulation 41/24 that revoked previous regulations for Conservation Authorities has been in effect, including the Ontario Regulation 148/06 for the MVCA. Ontario Regulation 41/24 is applicable to this Site, as it contains a watercourse and wetland.

3.0 STUDY METHODOLOGY

3.1 Desktop Background Review

Pinchin conducted a background assessment of available information sources relating to the Study Area before doing our site reconnaissance. Included in our review were natural heritage features present on the Study Area, historical species occurrences available from the NHIC, existing wildlife data records, Species of Conservation Concern lists, and other relevant information. Additionally, we reviewed information and documents available from the Client, including Fish Assessment Report, site history, and site survey. The Fish Assessment Report can be found in **Appendix B**. We completed this EIS report in accordance with applicable policies and guidelines, including the Town of Beckwith Official Plan. Those documents reference the Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Reference Manual, PPS, Ontario Regulation 41/24 under the *Conservation Authorities Act*, and *Endangered Species Act*, all of which we reviewed for this report. We identified natural heritage features with potential to be present within the Study Area from:

- Land Information Ontario (MNRF, 2020a); and
- Google Earth.

Our review of historical occurrence records for Species of Conservation Concern within or adjacent to the Study Area included:

- Natural Heritage Information Centre (MNRF, 2020b);
- Atlas of the Breeding Birds of Ontario (BSC, 2024);
- Atlas of the Mammals of Ontario (Dobbyn, 1994);
- Ontario Reptile and Amphibian Atlas (ON, 2024);
- Ontario Butterfly Atlas (TEA, 2024);
- Ontario Regulation 230/08 Species at Risk in Ontario List (COSSARO, 2024); and
- Provincial and federal assessments, recovery strategies, and management plans.

3.2 Field Assessment

Pinchin conducted field studies to characterize the natural heritage features present on the Site and in the surrounding landscape. We summarise fieldwork methodologies below.

3.2.1 Vegetation Surveys

Vegetation communities within the Study Area were assessed and described using the provincial Ecological Land Classification system.

The Ecological Land Classification for Southern Ontario: First Approximation and its Application and the Second Approximation (Lee et al., 1998 and 2008) were referenced to classify the habitats to ecosite. Ecosites classified within the Study Area were then applied to polygons that were mapped using aerial imagery.

The vegetation communities were sampled for their structure, species composition, distribution, and habitat characteristics. This information was supplemented by floristic surveys at the time of each visit. Species names generally follow the nomenclature of Flora Ontario (Newmaster and Ragupathy, 2012) and the NHIC.

3.2.2 Wetland Assessment

Assessment of Study Area wetlands followed the criteria set out in the *Ontario Wetland Evaluation System* (OWES) 3rd Edition (MNRF, 2013). Although the area in question on the Site is too small to be fully assessed using the OWES framework, the evaluation criteria therein provide an appropriate benchmark to apply. In particular, soil classification, the “50% rule” and the presence of wetland species and wetland indicator species form a useful basis for evaluation of the upland-wetland transition on the Site. According to the OWES, the “50% rule” is defined as: if 50% or more of the relative vegetation cover in a given area consists of wetland plants (including wetland tolerant species and wetland indicator species), then the area should be considered a “wetland”. Wetland indicator species are plants that cannot live in upland areas, as compared with wetland species, which include both wetland indicators and plants that can tolerate both wetland and upland habitats. Additionally, in our assessment we used the Coefficient of Wetness (CW), an indicator varying from -5 (obligate wetland) to 5 (obligate upland) that describes the tolerances to wetness of individual plant species.

3.2.3 Watercourse Assessment

Watercourse assessment in the Study Area followed criteria set out in the Ontario Stream Assessment Protocol (OSAP) Version 10 (Stanfield, 2017). The Site was identified and documented at the screening level in accordance with OSAP guidelines. Rapid assessment of watercourses was conducted on the Site and within the Study Area, with access and safety considerations as constraints.

The physical processes and channel structures were documented during the Site visit. Important, valued, and contributing functions were analyzed through the field data collected and observations of suitable, seasonal, or contributing fish habitat on the Site and within the Study Area.

3.2.4 Woodland Assessment

The Township of Beckwith does not have its own evaluation criteria for significant woodlands, and instead defers to the criteria established by the MNRF in its Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement. For municipalities with woodland cover of 15% to 30%, such as the one where the Site is located, one or more of the following criteria must be met for a woodland to be considered significant (MNRF, 2012):

a) Woodlands 20 ha in area or larger;

b) 2 ha of interior habitat, defined as being more than 100 m from woodland edge;

c) 0.5 ha to 20 ha in area (depending on circumstances) and within 30 m of a significant natural feature or fish habitat;

d) 1 ha to 20 ha in area (depending on circumstances) and located between two other significant features, each of which is within 120 m;

e) 0.5 ha to 10 ha in area (depending on circumstances) and within 50 m of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse of fish habitat; and

f) 0.5 ha to 10 ha in area (depending on circumstances) and older than 100 years or having rare species composition.

Each woodland evaluation criterion is discussed in Section 4.3 below.

3.2.5 Species at Risk

The *Endangered Species Act 2007* (ESA) provides protection from harm, harassment, or captures, to species listed as extirpated, endangered, or threatened on the Species at Risk Ontario List. Additional protection is provided to the habitat of endangered or threatened species on that same list.

Habitat for a species includes anywhere members of the species depend on for reproduction, rearing, hibernation, migration, or feeding; or prescribed habitat as defined in Ontario Regulation 242/08 of the General Regulation.

The likelihood of occurrence of a Species at Risk (SAR) was assessed qualitatively based on the ability of the habitat to meet one or more life requisites for each SAR identified during the desktop assessment. If habitat suitable for SAR was identified, additional survey effort was applied in that area. If incidental SAR were observed, they were recorded throughout the field assessment within and adjacent to the Site.

3.2.6 Incidental Wildlife Observations

Wildlife surveys involved general coverage, recording all species observations and signs, including tracks and trails, scat, burrows, dens, browse, and vocalizations. Wildlife surveys were done during the coincident surveys for vegetation communities and vascular plants.

Significant wildlife habitat was be assessed according to the MNRF Natural Heritage Reference Manual (MNRF 2010) and the MNRF Significant Wildlife Habitat Technical Guide (MNRF 2000).

4.0 EXISTING CONDITIONS

4.1 Landforms, Soils, and Geology

The Site is bounded by ditches that have been dug to the east and south, and agricultural fields to the north and west. Beyond the ditch to the east are single family residential dwellings, and beyond the ditch to the south is a private, undeveloped property. The Study Area consists of a mix of agricultural fields, rural residences. and undeveloped lands.

The Ontario Geological Survey classifies the bedrock underlying the Study Area as consisting primarily of Middle Ordovician (approximately 470 million years ago to 458.4 million years ago) limestone, dolostone, shale, arkose, and sandstone of the Ottawa Group, with the northeast corner being Lower Ordovician (approximately 485.4 million years ago to 470 million years ago) dolostone and sandstone of the Beckmantown Group. The quaternary geology on the Site is a mix of glaciomarine and marine deposits of silt and clay basins and quiet-water deposits in the northwest, with the southeastern corner being Paleozoic bedrock (Ontario Geological Survey, 1991). The surficial geological features of the Site consist of bedrock in the southeast, and fine-textured glaciomarine deposits of silt and clay, with minor sand and gravels in the northwest.

The Study Area is situated within Ecodistrict 6E-11, which forms part of the Lake Simcoe – Rideau Ecoregion in the Mixedwood Plains. Ecodistrict 6E – 11 is also known as the Smiths Falls Ecodistrict and is found between Highway 417 in the north and Upper Beverley Lake in the south. This landscape consists of a large and continuous tract of shallow calcareous morainal material substrates over Paleozoic bedrock. The vegetation within this Ecodistrict is primarily pasture and cropland, with deciduous and mixed forests present throughout. The soils in the Study Area are classified by Agriculture Canada and the Ministry of Agriculture and Food as organic muck in the south central area, Osgoode Orthic Humic Gleysols that have been disturbed by agriculture in the northwest, and Farmington Series well-drained soils of primarily silty loams over bedrock throughout the remainder of the Site. Soil samples taken at the time of our visit indicated primarily silty loam soils with some organic soils within the wetland areas. Wetland indicators (mottles and gley) were found within several vegetation communities described below. Gley occurs when the oxygen in the soil becomes depleted (due to water saturation) resulting in the iron being completely reduced taking on a blue-grey colouration. This reduced iron is also mobile and can re-oxidize, producing reddish, yellow, or orange spotting, known as mottling. Both of these variations are indicators of wetland presence owing to the water table being close to the surface.

A detailed review and analysis on the vegetation communities and potential natural features on the Site is provided in Section 4.2 below.

4.2 Vegetation Surveys

4.2.1 Vascular Plants

A fall season field assessment was conducted on November 6, 2020, to assess natural features present on the Site within the Study Area. A map of the natural heritage features present on the Site and the wider Study Area is provided on Figure 2 in Appendix A. The weather during field assessments was 12º Celsius and sunny. A total of 48 plant species were identified on the Site from the vegetation surveys. Of these 48 species, 19 are non-native species, many of which are typical in old-field and disturbed habitats. These species are generally widespread and abundant within the area. A full vascular plant species inventories as observed on the Site during the field assessment program throughout the Site is provided in Table 1 in **Appendix C**.

4.2.2 Vegetation Communities

In total, seven vegetation communities were identified on the Site: Annual Row Crop, Fresh – Moist White Cedar Coniferous Forest, Fresh – Moist Mixed Meadow, Naturalized Deciduous Hedgerow, Speckled Alder Mineral Deciduous Swamp, Reed – Canary Grass Graminoid Mineral Meadow Marsh, and Dry – Fresh Mixed Meadow. These vegetation communities with their ELC polygons surveyed on the Site and the surrounding area are mapped on Figure 3 in **Appendix A**. Selected photographs of the vegetation communities are included in **Appendix D**.

Annual Row Crop (OAGM1) fields were bare at the time of visit, though there was evidence that the field had been used for corn (*Zea mays)* and soybean (*Glycine max*) in past years. This community is found at the northwestern corner of the Site and extends offsite onto adjacent properties.

The **Fresh – Moist White Cedar Coniferous Forest (FOCM4-1)** community is present in both the western and eastern halves of the site, separated by the thicket swamp and meadow marsh described below. The dense canopy of this community consists of a monoculture of White Cedar (*Thuja occidentalis)* trees. In gaps between the White Cedars, hardwood trees such as Paper Birch (*Betula papyrifera)* and Trembling Aspen (*Populus trembuloides)* can be found. There was little found within the understorey of this community, potentially due to the late season visit. A soil sample taken from within this community showed silty loam soils to a depth of 60 cm, at which point bedrock was found. Mottling was observed within this community, found at a depth of 25 cm, and gley was observed at 40cm. Some minimal refuse dumping was also found within this community.

The **Fresh – Moist Mixed Meadow (MEMM4)** community is present primarily in the western half of the Site, with a small patch near the northeastern corner, and is dominated by common meadow species and invasives such as Queen Anne's Lace (*Daucus carota)*, Red Clover (*Trilobium pretense)*, Smooth Brome (*Bromus inermis)* and Field Strawberry (*Fragaria vesca)*. The occasional patch of Common Juniper (*Juniperus communis)* or White Cedar can also be found.

A soil sample from within this community showed high quality loam soils, with these soils fairly shallow, being between 15 cm and 25 cm deep over bedrock. There are rock piles found throughout this community, some of which are clearly the remains of old building foundations. There is also minimal refuse dumping within this community.

The **Naturalized Deciduous Hedgerow (FODM11)** is a small community at the northwestern corner of the Site, between the agriculture field on the Site and the fields on an adjacent property. This community is a thin strip of Trembling Aspen trees, with little vegetation in the understorey.

The **Reed – Canary Grass Graminoid Mineral Marsh (MEMM1-3)** community is present in the middle of the Site, along the sides of the watercourse. The dominant species within this community is Reed Canary Grass (*Phalaris arundinacea)*, with secondary cover of Narrow leaved Cattail (*Typha angustifolia)*, Aster (*Symphyotrichum* sp.*)* and Manna grass (*Glyceria grandis)*. A soil sample taken from this community showed two distinct horizons: an A horizon consisting of a fine sandy loam for approximately 15 cm, with mottling found at 5cm and gley at 7cm; and a B horizon consisting of a much coarser sand for more than 10 cm.

The **Speckled Alder Mineral Deciduous Swamp (SWTM1-1)** community is found throughout the Site, generally found in the lowland areas, between the watercourse and the upland forest and meadows. There is also a patch of this community found at the southeast corner of the Site. This community is dominated by wetland shrubs, primarily Speckled Alder (*Alnus incana)*, Red-osier Dogwood (*Cornus sericea)* and Willows (*Salix* sp.*)*. Some trees found within this community are Black Ash (*Fraxinus nigra)*, Paper Birch, and White Cedar. There was little vegetation in the understorey, likely due to the season of the visit. A soil sample taken from within this community was similar to the soils within the Reed – Canary Grass Graminoid Mineral Marsh described above.

The **Dry – Fresh Mixed Meadow (MEMM3)** community is found at the northern edge of the Site, behind the barn and house on the adjacent property to the north, and has been cleared and used as a parking area in the past for the farming operations. The vegetation present within this community consists of early successional species, mainly goldenrods and common grasses. There has been extensive refuse dumping there, including barrels, fill, and other farming materials.

The **Intermittent Watercourse (OAO)** community is found in the central portion of the Site where the watercourse flows along the eastern boundary.

4.3 Wetland Assessment

Following the criteria from OWES and ELC, the Fresh–Moist Mixed Meadow (**MEMM4)**, Fresh – Moist White Cedar Coniferous Forest (**FOCM4-1)**, Dry – Fresh Mixed Meadow (**MEMM3)**, Naturalized Deciduous Hedgerow (**FODM11)**, and Annual Row Crops **(OAGM1)** communities are considered to be “upland”.

There are minimal wetland indicator species present, with those wetland species covering much less than 50% of the relative area. Analysis of the Speckled Alder Mineral Deciduous Swamp (**SWTM1-1)** and the Reed – canary Grass Graminoid Mineral Meadow Marsh (**MAMM1-3)**, are similarly unambiguous, with many wetland indicator species present. None of these wetlands are evaluated.

Furthermore, soil core samples were taken under ELC methodology from each vegetation community following OWES protocol, with the results matching the vegetation survey. In total, ten soil core samples were taken throughout the Site, with sampling locations being chosen at random for representative results and at least one soil core sample taken from each vegetated community. These soil samples were used to support the analysis of wetland presence.

4.4 Watercourse Assessment

A fall season field watercourse assessment was conducted on November 28, 2024, to assess the drainage features present on the Site within the Study Area. The weather during field assessments was 12º Celsius and sunny.

The watercourse is found on the central portion of the Site and flows along the eastern portion. The watercourses are located within the Lower Mississippi watershed. Results from the most recent watershed report card evaluated the surface water quality within the watershed to be “B-Good” due to presence of *Escherichia coli* (“E. coli”), total phosphorus concentration, and benthic invertebrate scores. Forest conditions within the watershed have a grade of “C-Fair” due to low forest cover (MVCA, 2023). A rapid watercourse assessment of the watercourse on the Site was conducted assess its existing functions, conditions, and characteristics.

The intermittent watercourse on the site flows from the wetland, traversing the northern and eastern boundaries before draining into the drainage feature within the Study Area. The watercourse has a bankfull width ranging from approximately 0.2 m to 1.3 m, a bankfull depth of about 0.6 m, and a wetted width varying from 0.3 m to 1 m. Its bed consists of an organic substrate with significant amounts of in-stream aquatic vegetation and some cobbles. The head of the watercourse originates from an area of flooding, resembling groundwater upwelling, and flows southward through the wetland before curving to follow the Site’s northern and eastern boundaries northward.

There are two man-made drainage features on the Site and Study Area, as shown in Figure 3 in **Appendix A**. The drainage feature on the Site is abandoned, but still conveys water southward to the drainage feature off-Site in the Study Area. The southern drainage feature has been referred as Munro Municipal Drain and receives flow from drainage features on the Site. This westward-flowing watercourse can be described as a roadside ditch that has been excavated into the bedrock surface.

Mitigation measures to protect the watercourses on the Site are discussed in section 7.0.

4.5 Woodland Assessment

As described in Section 3.2.3, the Beckwith Township does not have its own evaluation criteria for significant woodlands, and instead defers to the MNRF criteria we have listed.

Based on the MNRF significant woodland assessment criteria listed in Section 3.2.3, Fresh – Moist White Cedar Coniferous Forest within the Study Area would not be considered a candidate significant woodland. The woodland is found in three patches on the Site, with the northeast patch having an aerial canopy cover of approximately 7.5 ha, and the remaining patches having an aerial canopy cover of less than 20 ha. The Fresh – Moist White Cedar Coniferous Forest patches on the Site are smaller than 20 ha, has less than 2 ha of interior habitat, is not located within 30 m of fish habitat or a significant natural feature, and does not provide habitat to old or rare vegetation. The woodlands on the Site do not meet the criteria to qualify as a significant woodland.

Mitigation measures are discussed in Section 7.0.

4.6 Incidental Wildlife Observations

The following incidental wildlife were observed based on their sound, sight, scat, or a combination during the subsequent field surveys for vegetation on the Site and within the Study Area: Black-capped Chickadee (*Poecile atricapillus)*, White-tailed Deer (*Odocoileus virginianus)*, Raccoon (*Procyon lotor)*, Blue Jay (*Cyanocitta cristata)*, and Red-breasted Nuthatch (*Sitta canadensis)*. All species observed are common in the rural and suburban environment, owing to the variety of ecosites in the area, and have adapted to various habitats.

4.7 Species at Risk Screening

A comprehensive Species at Risk (SAR) screening identified a total of 24 SAR as having potential to inhabit the Study Area, based on background review of the NHIC records and other available data sources for the Study Area surrounding the Site. Information about those 24 species screened, including the listing status, last observed date and sources used to identify their presence in the Study Area, and their habitat requirements, is provided in the Species at Risk Screening Table in **Appendix E**. Based on the background review and field assessment, Pinchin determined that habitat suitable for ten of the SAR is available within the Study Area, but confirmed observations of none of those species have been made in the Study Area.

Based on the background review and field assessment, 15 SAR were determined to have suitable habitat on the Site. No species had confirmed presence on the Site, and additional surveys would be required to determine presence.

Three plant species, Butternut (*Juglans cinerea*), Broad Beech Fern (*Phegopteris hexagonoptra*) and Eastern Prairie Finged Orchid (*Platanthera leucophaea*) were identified as having potential habitat on the Site. The Butternut and Broad Beech Fern prefer moist soils and deciduous forests, features present on the Site. The Eastern Prairie Finged Orchid prefers wet prairies and old fields, which are also present on the Site. None of those species were observed during the field visit.

Six bird species were identified to have potential habitat on the Site. Open meadows and grasslands that are present on the Site are potential habitat for the Bobolink (*Dolichonyx oryzivorus*) and the Eastern Meadowlark (*Sturnella magna*). The deciduous forests and forest edges on the Site provide potential habitat for the Olive-sided Flycatcher (*Contopus cooperi*), Eastern Wood-Pewee (*Contopus virens*), Wood Thrush (*Hylocichla mustelina*), and Eastern Whip-poor-will (*Caprimulgas vociferus*). None of these species were observed on the Site, but a focussed bird survey was not conducted given that surveys were made post-migration.

One insect species, the Monarch butterfly (*Danaus plexippus*), has potential to be present on the Site. It utilizes fields that have Milkweed present, which the Site does have.

Suitable habitat for three bat species is available on the Site: the Little Brown Bat (*Myotis lucifuga*), Tricoloured Bat (*Pipistrellus subflavus*), and Eastern Small-footed Bat (*Myotis leibii*). All three species can form summer colonies within attics, and abandoned buildings and barns, and within established deciduous forests with availability of loose bark and tree cavities. The Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*), and Silver-haired Bat (*Lasioncyteris noctivagans*) were not species listed on the Species at Risk Ontario (SARO) list, but based on the species assessments conducted by COSSARO, they have been assessed as Endangered, and will be officially listed in January 2025 under the ESA 2007. During our fieldwork, snags were observed on the Site that have potential to provide habitat for these bat species.

During the vegetation survey, several Black Ash were observed within the Speckled Alder Mineral Deciduous Swamp. Black Ash is listed as *Endangered* under the SARA 2007.

Recommendations and mitigation measures to protect SAR on the Site are provided in section 7.0 below.

4.8 Significant Wildlife Habitat Screening

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (The MNRF, 2015) was consulted to screen the wildlife habitat for significance on Site. Field assessments were also undertaken to assess the quality of the habitat in relation to Significant Wildlife Habitat (SWH). Assessment results aided our determination of absence of potential SWH in the Study Area.

According to the Significant Wildlife Habitat Criteria reviewed for this EIS, candidate SWH was also identified on the Site for Waterfowl Stopover and Staging Areas (Aquatic), Bat Maternity Colonies, Colonially - Nesting Bird Breeding Habitat (Trees and Shrubs), Waterfowl Nesting Area, Turtle Nesting Areas, Marsh Bird Breeding Habitat, and Special Concern and Rare Wildlife Species. Breeding bird, breeding amphibian, turtle basking, and bat habitat surveys were not conducted during the Site survey as they were outside of the scope of this project.

Measures to mitigate potential effects on SWH within and around the Site are discussed in section 7.0 below.

4.9 Natural Heritage System and Ecological Connectivity

To protect the diversity and connectivity of natural features and long-term ecological function of the area, an ecological function assessment needs to be completed. This ecological function assessment assesses the Site by its ecological functions by providing avenues in which plants and animals can propagate, move and replenish from other natural areas.

The Site consists of agricultural fields, mixed meadows, swamps, forests and hedgerows, with the wetlands found more centrally, and the upland communities generally found around the outside. The agricultural field and heavily disturbed mixed meadow are found close to the northern boundary of the Site, while the more natural communities are found closer to the southern boundary. To the north and west of the Site there are agricultural fields, and to the east is a residential development in progress. South of the Site is primarily undeveloped lands, including forests and Provincially Significant Wetlands. The area is zoned as “Rural” in both the County and City Official Plans. Although a good portion of the Site is largely undisturbed or naturalized, due to the immediate surrounding areas being mostly urbanized or used for agricultural purposes, the Site does not provide significant value for the dispersal of both flora and fauna. There are natural areas to the south, which are hydrologically connected to the vegetation communities present within the Site and would provide high a high-quality corridor for species movement. The wetlands on the Site provide good value to the area for both flood control and wildlife habitat and could be included in the Provincially Significant Manion Corners (Long Swamp) Wetland Complex following OWES methodology. Overall, there is some ecological connectivity value present within the Site.

Further recommendations, mitigations and avoidance measures can be found in Section 8.0.

5.0 PROPOSED DEVELOPMENT

Pinchin understands that the proposed development is to construct a subdivision with multiple rural housing units, parking areas, and associated access roads. A Concept Site Plan showing the proposed development and setbacks from natural features is provided in **Appendix F.**

The purpose of this EIS is to understand the current constraints on the Site and within the rest of the Study Area for the proposed development, and the potential impacts of development on those areas. The impact assessment following in Section 6.0 is based on the Site Plan proposed by the Client.

6.0 IMPACT ASSESSEMENT

6.1 Direct Impacts

The proposed development will be contained within the development envelopes. Direct impacts of the proposed development on natural heritage features (i.e., watercourse, meadow, and woodlands) would include those from the following construction aspects:

- Stripping of vegetation and topsoil on the Site;
- Selective removal of trees and shrubs on the Site; and
- Displacement of wildlife on the Site.

To accommodate the proposed development, stripping of vegetation and topsoil will be restricted to the woodlands and meadow on the Site. The Site may provide seasonal habitat to birds and other wildlife using the woodland for foraging and feeding. Potential effects on wildlife can be avoided by prudent timing of vegetation and topsoil removal. The proposed development will be entirely contained within the development envelope of the Site. Potential direct impacts on the Site from the proposed development are mainly those from selective removal of trees and shrubs on the Site. The wildlife utilizing the Site will be displaced permanently post-construction.

It is likely that all communities except for the Reed Canary Grass Mineral Meadow Marsh and Speckled Alder Mineral Deciduous Swamp will be directly impacted by vegetation removal. The meadow, hedgerow, and row crop communities will be stripped of vegetation and topsoil to make place for the construction of the housing developments.

6.2 Indirect Impacts

The potential indirect impacts to the natural heritage features (i.e. wetlands, and watercourse) based on the development proposals may include the following:

- Effects on plants and wildlife adjacent to the Site from construction noise, dust, and vibration;
- Sedimentation of the natural heritage features by construction activities; and
- Alteration of water quality and flow regime in the adjacent natural heritage features.

Indirect impacts on the watercourse and wetland communities will likely be limited to associated plants and wildlife inhabiting areas close to the Site. It is likely that, during the construction periods, birds, mammals, reptiles, and other wildlife that seasonally use these natural heritage features for foraging and breeding may be disturbed temporarily, while over time the wildlife will likely return to the watercourse, and wetland areas on the Site.

Stormwater runoff from construction has potential to affect nearby natural heritage features. Development of a Stormwater Management Report with an Erosion and Sediment Control Plan for the Site is recommended prior to construction to identify ways to mitigate impacts on natural heritage features. Recommendations and measures to mitigate potential impacts of development on the Site are described in Section 7.0 below.

6.3 Residual and Cumulative Effects Assessment

Residual environmental effects are any permanent, immitigable changes in an identified valued ecosystem component. As residual environmental effects on the natural environment cannot, by definition, be addressed through mitigation, they are likely to persist following project completion.

Residual effects may result in cumulative effects through the interaction among residual effects of the project and those associated with other identified past, present, and reasonably anticipated projects and activities. Due to the short-term, local construction of the proposed development within the Site surrounded by roadways, wooded areas, and agricultural areas, residual effects from the Site development are projected to be low significance in magnitude, geographic extent, duration, and frequency. Residual adverse effects are not expected from the future residential development on the Site as all of the direct and indirect impacts identified above can be addressed through appropriate mitigation.

With sufficient and effective mitigation measures implemented prior to and during construction activities, no cumulative impacts are anticipated as a result of the proposed development. This conclusion supports the Provincial Policy Statement rule regarding no negative impacts on natural heritage features present on the Site. Recommendations and mitigation measures to address the potential impacts are detailed in Section 7.0 below.

7.0 RECOMMENDED MITIGATION MEASURES

Based upon the above impact assessment, according to the Beckwith Township OP, Pinchin has identified direct and indirect impacts on the natural environment present on the Site and within the Study Area, including the wetlands and watercourse. Proposed mitigation measures to address all potential, identified negative impacts, including recommended timing windows and other specifications for implementation, are included in this EIS. Furthermore, mitigation measures relating to protection of setbacks and buffers during onsite works (such as exclusion fencing) must be implemented prior to commencement of construction work to protect sensitive natural features.

As avoidance is the most effective approach to mitigating potential environmental impacts, the proposed development will not affect a majority of the wetlands and watercourses on the Site. A minimum 15 m setback with exclusion fencing installed is recommended to protect the watercourses and wetlands prior to tree removal and other construction activities. Encroachment into the wetland buffer is anticipated. Restoration planting within buffer on the Site is recommended to compensate for the encroachment. The MVCA permits new infrastructure, including roadways, within wetland areas under certain conditions. In this case, the encroachment is minimal, and no significant negative impacts to the wetland feature are anticipated.

The current Site plan indicates encroachment into the watercourse and its associated buffer. Based on consultation with the Client, a watercourse re-alignment approach is being pursued to address this issue. Consultation with the MVCA is necessary to assess the feasibility of creek re-alignment and to identify any additional studies required to evaluate its plausibility. Furthermore, it is anticipated that culverts will be installed on either side of the proposed roadway to ensure hydrological continuity of the watercourse, maintaining natural flow patterns and minimizing disruption to the community. Protective fencing and tree barriers are to be established so that no development activities including Site grading and construction will take place within protected areas.

The watercourse on the Site may contribute to flood hazards due to its potential for increased runoff or overflow during heavy rainfall. As such, there may be concerns regarding flood risks that could impact both the site and surrounding areas. It is recommended to contact the MVCA to determine whether a flood hazard study is required to assess these risks and ensure proper mitigation measures are implemented.

The watercourse and wetlands provides significant ecological value for plant and wildlife and protecting those features during development will help to preserve these natural heritage features. Protection of those features is also warranted to prevent soil erosion and sediment-laden water from entering these valuable natural heritage features during site construction.

Additionally, restoration and enhancement plan for the Site must be effectively implemented in a timely way to prevent potential negative impacts on the woodland post-construction. The following recommendations are provided for the protection of the natural heritage features prior to construction or site alteration.

Tree and vegetation removal:

- Restrict the extent of potential tree and vegetation removal within the Site to the construction footprint as far as practicable.

- To minimize or avoid impacts on breeding birds and roosting bats, remove vegetation within the Site outside of the associated breeding periods for bird and bat species, between April 1 and September 30. If trees need to be removed within this timing constraint window, deploy a qualified Biologist to conduct bird nest and bat roost surveys prior to any tree removal and to conduct ongoing monitoring.

Erosion and sediment control:

- Develop an Erosion and Sediment Control Plan as part of the Stormwater Management Report for the construction on the Site, and include protection measures applicable to the surrounding natural features.
- Prior to construction and site alteration, establish adequate erosion, and sediment control (ESC) measures, including sediment fencing, around the Site upgradient from the natural heritage features until the disturbed area is restored upon construction completion.
- Establish sufficient buffers to the adjacent natural features through protection zones.
- Conduct repairs and maintenance of the installed ESC measures regularly and as required until construction completion.
- Immediately stabilize disturbed areas post construction to prevent site erosion and sedimentation.

Significant Wildlife Habitat:

Breeding amphibians, breeding birds, bat suitability, and turtle basking are recommended and may be required, as a Candidate Significant Wildlife Habitat has been identified on the Site, as described in Section 4.7.***Species at Risk:***

- As several SAR have been identified as having suitable habitat on the Site, Pinchin recommends conducting a tree inventory and wildlife surveys, including those for breeding amphibians, breeding birds, bat suitability, and turtle basking, to confirm the presence of this habitat on the Site..
- As Black Ash trees were identified within the Speckled Alder Swamp on the Site, Pinchin recommends having a detailed tree inventory conducted by a qualified arborist to identify the location of Black Ash. Removal of Black Ash would contravene the ESA (2007). The Black Ash present on the Site require a prescribed buffer, determined based on their condition and ecological significance through a Tree Inventory. If removal of a Black Ash tree is necessary for development, consultation with the MECP will be required.

Wildlife and Species at Risk encounter protocol:

- If wildlife is encountered during construction, cease work immediately and allow the animal to naturally move out of the construction zone. If the animal does not leave the area for a prolonged period, please consult with a qualified Biologist for possible response or mitigation measures.
- If an animal is injured or deceased, or if a Species at Risk is found on the Site, contact the Ministry of Environment, Conservation and Parks for guidance and handling.

Restoration and enhancement:

- Develop a Restoration Plan, if required, for any restoration and enhancement on the Site; appropriate restoration for the replaced or removed trees and shrubs on the Site through this restoration plan is of utmost importance to prevent adverse effects of construction on natural features.
- Compensate for removed trees by planting native deciduous or coniferous tree species on the Site or in an area designated by the town or conservation authority to provide for enhanced natural habitats.

8.0 CLOSURE

There are environmental opportunities and constraints identified on the Site as described in this EIS report. The assessed impacts, including direct and indirect impacts, can be avoided or otherwise mitigated through effective stormwater and environmental management measures. Pinchin notes that should additional wildlife surveys be conducted on the Site, the mitigation measures may be adjusted to reflect updated information regarding Site conditions.

With the implementation of the environmental plans sought out in this EIS and recommended Stormwater Management Plan, and Landscape Plan, the proposed development would preserve the ecological functions of the adjacent natural features and enhance natural landscape on the Site through the potential installation of restoration and enhancement measures on the Site post construction.

With the above recommendations considered and diligently implemented on the Site, no adverse negative impacts on the ecological integrity of the adjacent natural heritage features will result from the proposed development.

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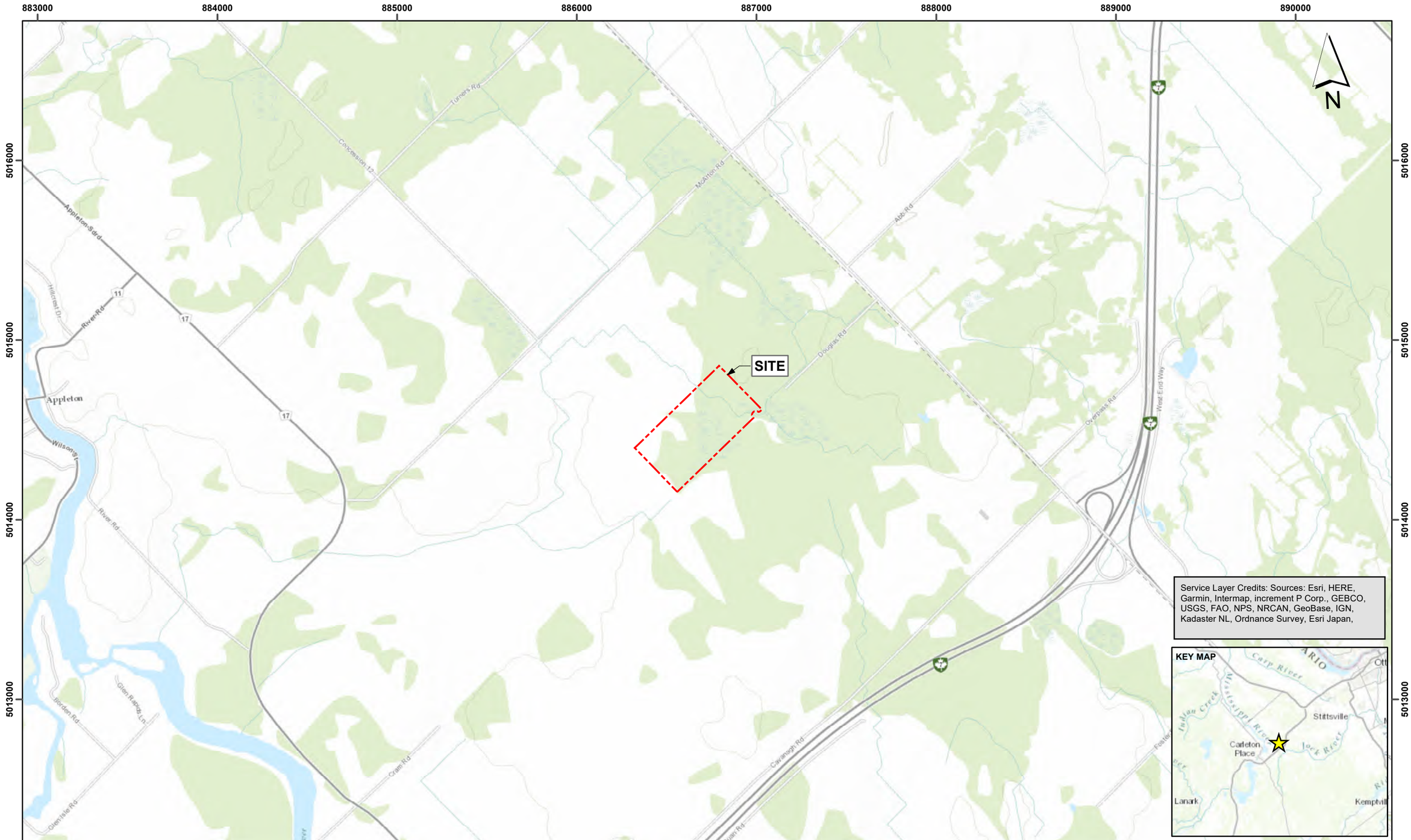
10.0 LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project. Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

APPENDIX A
FIGURES



PINCHIN

PROJECT NAME:	Environmental Impact Study
CLIENT NAME:	Ms. Gillian Espie
PROJECT LOCATION:	9243 McArton Road, Beckwith Township, Ontario
FIGURE NAME:	Site Location
PROJECT NO.	283258.000
DATE:	December 2021
SCALE:	1:20,000
FIGURE NO.	1

LEGEND

Site Boundary

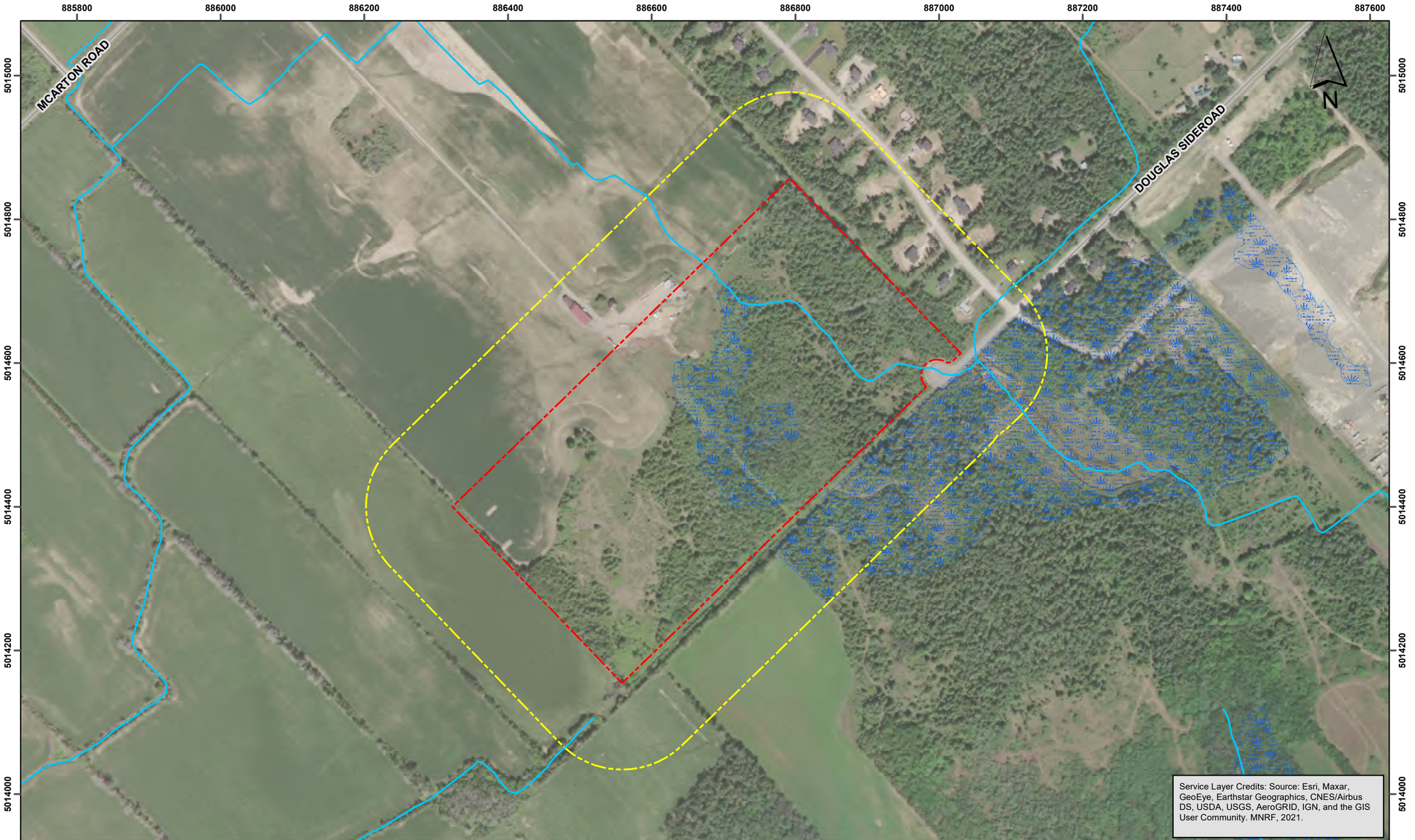
NOTES

1. All features and measurements are approximate and subject to field verification. This map is for planning purposes only
2. Use dimensions as shown, do not scale drawing
3. This map is not to be used for legal purposes

0 200 400 800 Metres

Coordinate System: WGS 1984 UTM Zone 17N
Projection: Transverse Mercator
Datum: WGS 1984

DRAWN BY: MH REVIEWED BY: RY REVISION: 1



PINCHIN

PROJECT NAME: Environmental Impact Study

CLIENT NAME: Ms. Gillian Espie

PROJECT LOCATION: 9243 McArton Road, Beckwith Township, Ontario

FIGURE NAME: Study Area

PROJECT NO. 283258.000

DATE: December 2021

SCALE: 1:5,000

FIGURE NO. 2

LEGEND

- Site Boundary
- Study Area (120 m)
- Wetland (Unevaluated)
- Watercourse
- Roadway

NOTES

1. All features and measurements are approximate and subject to field verification. This map is for planning purposes only
2. Use dimensions as shown, do not scale drawing
3. This map is not to be used for legal purposes

0 50 100 200 Metres

Coordinate System: WGS 1984 UTM Zone 17N
Projection: Transverse Mercator
Datum: WGS 1984

DRAWN BY: MH REVIEWED BY: RY REVISION: 1

PINCHIN

PROJECT NAME: Environmental Impact Study

CLIENT NAME: Ms. Gillian Espie

PROJECT LOCATION: 9243 McArton Road, Beckwith Township, Ontario

FIGURE NAME: Ecological Land Classification

PROJECT NO. 283258.000

DATE: December 2024

SCALE: 1:1,800

FIGURE NO. 3

LEGEND

- Site Boundary
- Drainage Channels

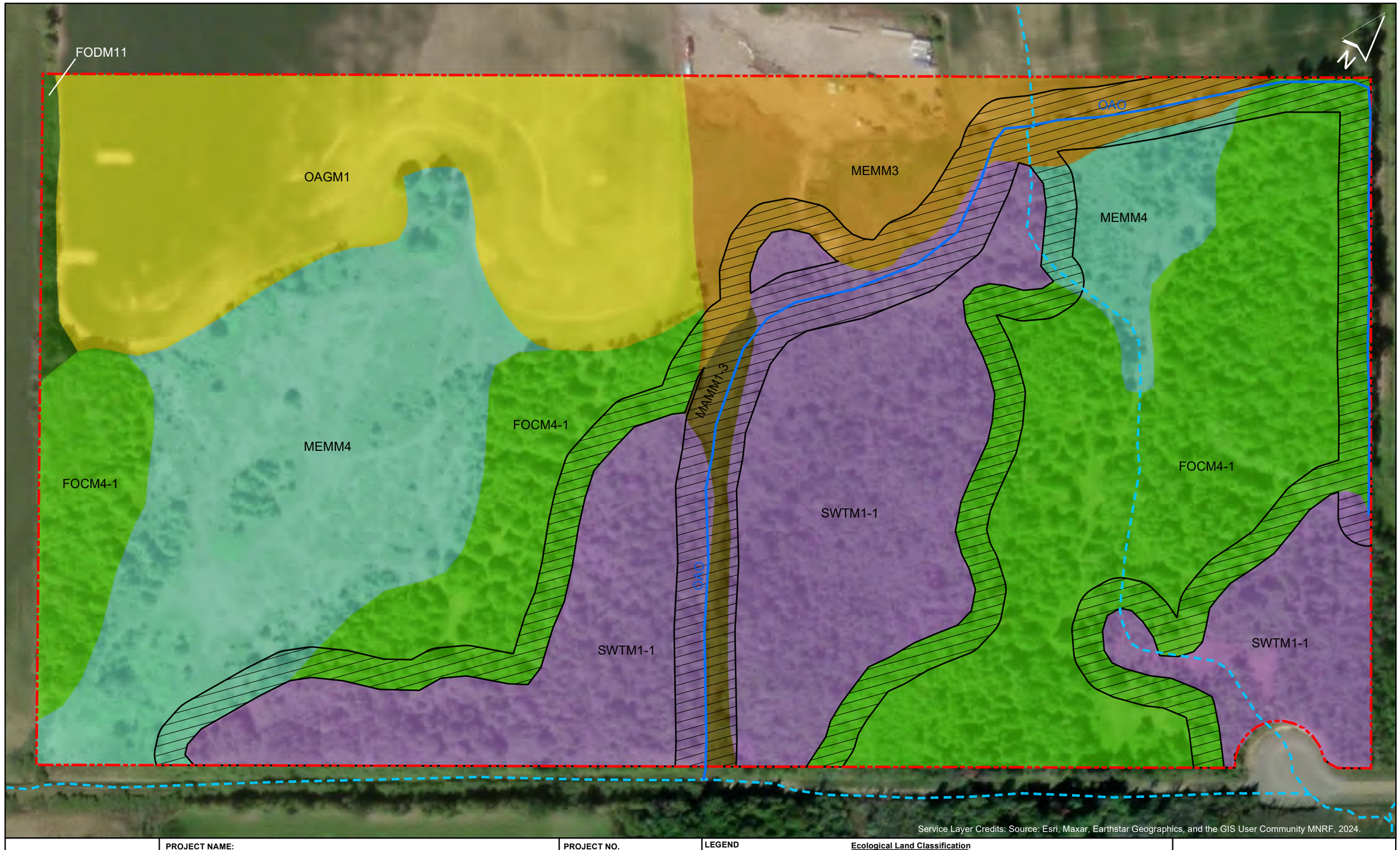
Ecological Land Classification

- FOCM4-1: Fresh – Moist White Cedar Coniferous Forest
- MEMM4: Fresh – Moist Mixed Meadow
- OAGM1: Annual Row Crops
- FODM11: Naturalized Deciduous Hedgerow
- SWTM1-1 Speckled Alder Mineral Deciduous Swamp
- MAMM1-3: Reed-canary Grass Graminoid Mineral Meadow Marsh
- MEMM3: Dry – Fresh Mixed Meadow
- OAO: Intermittent Watercourse

0 20 40 80 Metres

Coordinate System: WGS 1984 UTM Zone 17N
Projection: Transverse Mercator
Datum: WGS 1984

DRAWN BY: MH REVIEWED BY: KH REVISION: 3



PINCHIN

PROJECT NAME: Environmental Impact Study

CLIENT NAME: Ms. Gillian Espie

PROJECT LOCATION: 9243 McArton Road, Beckwith Township, Ontario

FIGURE NAME: Environmental Constraints

PROJECT NO. 283258.000

DATE: December 2024

SCALE: 1:1,800

FIGURE NO. 4

LEGEND

- Site Boundary
- Drainage Channels
- Recommended Setback Area
  - Wetlands (SWTM1-1 and MAMM1-3) = 15 m
  - Watercourse (OAO) = 15 m

Ecological Land Classification

- FOCM4-1: Fresh – Moist White Cedar Coniferous Forest
- MEMM4: Fresh – Moist Mixed Meadow
- OAGM1: Annual Row Crops
- OAO: Intermittent Watercourse
- FODM11: Naturalized Deciduous Hedgerow
- SWTM1-1 Speckled Alder Mineral Deciduous Swamp
- MAMM1-3: Reed-canary Grass Graminoid Mineral Meadow Marsh
- MEMM3: Dry – Fresh Mixed Meadow

0 20 40 80 Metres

Coordinate System: WGS 1984 UTM Zone 17N
Projection: Transverse Mercator
Datum: WGS 1984

DRAWN BY: MH REVIEWED BY: KH REVISION: 0

NOTE: 0606_Douglas_Landing_Site_Plan_241216.dwg shown. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community MNRF, 2024.

PINCHIN

PROJECT NAME: Environmental Impact Study

CLIENT NAME: Ms. Gillian Espie

PROJECT LOCATION: 9243 McArton Road, Beckwith Township, Ontario

FIGURE NAME: Constraints Overlay with Site Plan

PROJECT NO. 283258.000

DATE: December 2024

SCALE: 1:1,800

FIGURE NO. 5

LEGEND

- Site Boundary
- Drainage Channels
- Proposed Site Plan
- Recommended Setback Area
  - Wetlands (SWTM1-1 and MAMM1-3) = 15 m
  - Watercourse (OAO) = 15 m

Ecological Land Classification

- FOCM4-1: Fresh – Moist White Cedar Coniferous Forest
- MEMM4: Fresh – Moist Mixed Meadow
- OAGM1: Annual Row Crops
- OAO: Intermittent Watercourse
- FODM11: Naturalized Deciduous Hedgerow
- SWTM1-1 Speckled Alder Mineral Deciduous Swamp
- MAMM1-3: Reed-canary Grass Graminoid Mineral Meadow Marsh
- MEMM3: Dry – Fresh Mixed Meadow

0 20 40 80 Metres

Coordinate System: WGS 1984 UTM Zone 17N
Projection: Transverse Mercator
Datum: WGS 1984

DRAWN BY: MH REVIEWED BY: AR REVISION: 0

APPENDIX B
SUPPLEMENTARY INFORMATION

Douglas Side Road Fish Habitat Assessment
Lot 25, Concession 12, Beckwith Township, Lanark County

Revision: 0 (Final)

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Project Number: 17-200-1

Document ID: 17-200-1 Douglas Side Rd. Fish Habitat Assessment_R0

June 12, 2017

Title:	Douglas Side Road Fish Habitat Assessment, Lot 25, Concession 12, Beckwith Township, Lanark County	
Client:	Gillian Espie	
Project Number:	17-200-1	
Document ID:	17-200-1 Douglas Side Rd. Fish Habitat Assessment_R0	
Revision Number:	0	Date: June 12, 2017
Prepared by:	Drew Paulusse, Taylor Warrington	
Reviewed by:	Glen Briscoe	
Approved by:	 Drew Paulusse	

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 Purpose 1

2 METHODOLOGY 1
2.1 Desktop Review 1
2.2 Field Investigations 1
2.3 Data Analysis 2

3 EXISTING CONDITIONS ASSESSMENT 2
3.1 General Land Use 2
3.2 Physical Setting 2
3.3 Wetlands 3
3.4 Watercourses and Headwater Drainage Features 3
3.4.1 MMD1 4
3.4.1.1 MMD1-H1 4
3.4.1.2 MMD1-H2 4
3.4.2 MMD2 4
3.4.2.1 MMD2-H1 4
3.4.2.2 MMD2-H2 5
3.4.2.3 MMD2-H3 5
3.4.2.4 MMD2-H4 5
3.5 Barriers to Fish Migration 5
3.6 Fish Communities 5

4 FISH HABITAT ASSESSMENT 5

5 CONCLUSIONS AND RECOMMENDED MITIGATION MEASURES 6

6 CLOSURE 7

7 REFERENCES 8

LIST OF TABLES

Table 2.1 Summary of Field Investigations 1

LIST OF APPENDICES

APPENDIX A Report Figures
APPENDIX B Site Photographs
APPENDIX C Complete Correspondence
APPENDIC D Project Staff CVs

1 INTRODUCTION

Geofirma Engineering Ltd. was retained by Ms. Gillian Espie to complete a Fish Habitat Assessment in support of a land severance application for Lot 25, Concession 12 in Beckwith Township. The site location is provided on Figure A.1 in Appendix A.

1.1 Purpose

The property owner is seeking to sever the southern portion of the property for future rural residential development purposes. This fish habitat assessment has been completed to confirm the presence and orientation of watercourses and potential for fish habitat in the vicinity of the site to aid in the assessment of potential road access to the proposed severance parcel. The site layout, including mapped watercourses is provided on Figure A.2 in Appendix A, along with a copy of the proposed severance parcel location.

2 METHODOLOGY

2.1 Desktop Review

To complete this Fish Habitat Assessment, current and historical digital aerial photographs from various sources were used to identify wetlands, watercourses and Headwater Drainage Features (HDF) on site and within 1 km of the site.

Additional information on the natural environment of the site used to delineate surface water features, wetlands, and forested areas was gathered through the use of Land Information Ontario (MNR, 2011). A Natural Heritage Information Request was sent to the Kemptville district MNRF office to obtain a list of locally significant natural heritage features and aquatic flora or fauna that may inhabit the site. A response was received on March 20, 2017 and is included in Appendix C. A permit to collect fish for scientific purposes was requested and received from the Kemptville District MNRF and is also included in Appendix C.

2.2 Field Investigations

A series of field investigation were undertaken during and after the spring freshet to confirm the orientation and potential presence of fish habitat at the site. Field investigations undertaken in support of this Fish Habitat Assessment are summarized in Table. 2.1 below.

Table 2.1 Summary of Field Investigations

Date	Time	Temp	Precipitation / Cloud Cover	Wind (Beaufort)	Purpose
April 3, 2017	11:40-12:45	10°C	Clear	3	Initial site visit, flow and T°C, trap deployment
April 4, 2017	08:50-09:30	3°C	Rain	1	Trap recovery

Date	Time	Temp	Precipitation / Cloud Cover	Wind (Beaufort)	Purpose
April 12, 2017	09:00-12:40	14°C	Clear	2	Watercourse and HDF assessment
May 8, 2017	09:55-11:30	1°C	Snow	2	Third site visit, flow and T°C, trap deployment
May 9, 2017	09:15-10:00	3°C	Partly Cloudy	1	Trap Recovery

Photographs of site features taken during the field investigation are provided in Appendix B and illustrated on Figure A.4.

2.3 Data Analysis

Information gathered through desktop review and field investigations was analysed following the protocols outlined in the Ontario Stream Assessment Protocol (Stanfield, 2013) particularly Section 4. Additional guidance on the analysis of fish and fish habitat was provided in review and application of the methodologies outlined in Section 6 of the Ministry of Transportation Environmental Guide for Fish and Fish Habitat (MTO, 2009).

3 EXISTING CONDITIONS ASSESSMENT

3.1 General Land Use

The existing site's setting is that of a large rural property within a larger mixed rural residential and agricultural area. The existing site is bound to the north by McArton Road and the unopened road allowance of Douglas Side Road to the south. To the east, the site is bound by the newly established Ridgemount Drive residential subdivision and to the west by agricultural lands on Lot 24, Concession 12.

3.2 Physical Setting

The site is situated on an east-west orientated ridge which represents a regional topographic high and also forms part of the watershed divide between the Mississippi River and Rideau River watersheds.

The topography of the northern portion of the site is relatively flat with a gentle grade descending towards the north, west and south from the southeast portion of the site. The elevation of the site is between approximately 136 and 132 metres above sea level (mASL).

The site lies within the limestone plains of the Smiths Falls Limestone Plain physiographic region as mapped by Chapman and Putnam (1984) and is located within the watershed catchment area of the Mississippi River.

Bedrock at the site, as determined by the Ontario Geological Survey (2010), is comprised of limestone and dolostone of the Gull River formation.

3.3 Wetlands

Located over a portion of the proposed severance area and extending off-site to the south and east is a large unevaluated wetland. This wetland can be described as a White Cedar Mineral Coniferous Swamp following the Ecological Land Classification System for Southern Ontario (Lee, 2008). It should be noted that a wetland evaluation was not completed as part of this scope of work and that wetland boundaries were not delineated following the protocols outlined in the Ontario Wetland Evaluation System for Southern Ontario.

3.4 Watercourses and Headwater Drainage Features

On-site and off-site watercourses were traversed in the field to document channel morphology, flow conditions, in-stream and riparian vegetation and to document the presence of fish habitat. The primary watercourse within the study area is the Munro Municipal Drain (MMD) which provides drainage of the above mentioned wetland through a series of Headwater Drainage Features (HDF). Wetland, watercourses, and HDFs are illustrated on Figures A.2 and A.3.

As determined by historical air photos of the area, both branches of the MMD (MMD1 and MMD2 on Figures A.2 andA.3) have existed on the landscape since prior to 1976, however, the defined channel of MMD2 appears to end at the current confluence with the drainage feature MMD2-H1 in the 1976 air photo. Historical drainage of the wetland described in Section 3.3 was provided through a series of small interwoven and poorly defined channels.

The watercourse mapped on various sources including the Township Official Plan and illustrated as an abandoned channel on Figures A.2 andA.3, was not identifiable in air photos reviewed from 1976, 1991, 1999, 2002 and 2008. The origin of this mapped watercourse is unknown but is likely the result of topographic mapping and misinterpreted air photos. Photographs of this abandoned channel are provided in Appendix B photos 1, 6, 19, 20 and 24.

Between 2008 and 2010 the unopened road allowance between Concession 11 and Concession 12 (Douglas Side Road) was cleared and at that time, MMD2 was extended to the northwest linking with the existing drainage ditches located along Douglas Side Road.

During the same time period between 2008 and 2010, the property owner of the land southeast of Concession 11 undertook efforts to provide further drainage of the large unevaluated wetland which were tied into the existing MMD2 watercourse. Photographs of these watercourse alterations are provided in Appendix B, photos 4 and 12.

Between 2014 and 2015 further drainage features were established to provide lot and roadside drainage for the Ridgemont Drive residential subdivision. Photographs of these drainage ditches are provided in Appendix B, photos 7, 8 and 9.

The following sections provide a brief summary of the various watercourses and HDFs illustrated on Figures A.2 and A.3.

3.4.1 MMD1

This branch of the Munro Municipal Drain receives flow from drainage features MMD1-H1 and MMD1-H2 and various field tile drain outlets. This northerly flowing watercourse is characteristic of an agricultural drain with steep slopes, a well defined channel and intermittent flow. Substrate within this feature is primary comprised of silty clayey sand with sparse coarse fragments. In-stream vegetation is primarily comprised of reed-canary grass and other terrestrial herbaceous vegetation. Riparian vegetation is primarily comprised of graminoid species, there is no canopy vegetation.

3.4.1.1 MMD1-H1

This HDF provides drainage from field tile drains and flows in a westerly direction before discharging to the MMD1 watercourse. A photo of this HDF is provided in Appendix B as photo 18.

3.4.1.2 MMD1-H2

This HDF primarily provides drainage from the unevaluated wetland and flows in a northerly direction before discharging to the MMD1 watercourse. Photos of this HDF are provided in Appendix B as photos 16 and 17.

3.4.2 MMD2

This branch of the Munro Municipal Drain receives flow from drainage features MMD2-H1, MMD2-H2, MMD2-H3 and MMD2-H4. This westerly flowing watercourse can be described as a roadside ditch which has been excavated into the bedrock surface (photo 25); the portion of MMD2 located downstream of the confluence with drainage feature MMD2-H1 has naturalized over time (photo 13) in comparison to the recently excavated portions of this watercourse upstream of MMD2-H1.

An Unconfined Headwater Drainage Feature Assessment was completed for MMD2 during the spring freshet (April 12, 2017) near the confluence of the mapped abandoned channel. The assessment indicated that flow within the channelized watercourse was minimal which correlates well with the measured slope aspect of 0.5%. The channel bankfull width was measured to be 2.54 m with a bankfull depth of 0.65 m, substrate was determined to be bedrock surface and no sediment transport or groundwater inflow was observed.

Riparian vegetation within 1.5 m was determined to be meadow on the left bank and scrubland on the right bank, from 1.5 – 10 m vegetation on the left bank and right banks was scrubland and beyond 10 m on both banks was wetland. No in-stream vegetation was observed.

A series of photographs of this watercourse are provided in Appendix B and are identified and illustrated on Figure A.4.

3.4.2.1 MMD2-H1

This HDF primarily provides drainage from the on-site portion of the unevaluated wetland and primarily flows in a southerly direction before discharging to the MMD2 watercourse. This well established HDF has a bankfull width of 1.3 m in width with a bankfull depth of 0.49 m and minimal flow. Photos of this HDF are provided in Appendix B as photos 14 and 15.

3.4.2.2 MMD2-H2

This off-site HDF primarily provides drainage from the unevaluated wetland and flows in a north-easterly direction before discharging to the MMD2 watercourse. A photo of this HDF is provided in Appendix B as photo 12.

3.4.2.3 MMD2-H3

This off-site HDF primarily provides roadside drainage along the southern portion of Douglas Side Road and flows in a westerly direction before discharging to the MMD2 watercourse. Photos of this HDF are provided in Appendix B as photos 9 and 10.

3.4.2.4 MMD2-H4

This off-site HDF and its various reaches (MMD2-H4-R1, -R2, -R3) provide drainage from the unevaluated wetland and rear lot drainage and road side drainage from the Ridgemont Drive residential subdivision. This HDF flows primarily in a southerly direction discharging to the MMD2 watercourse. Photos of this HDF are provided in Appendix B as photos 7 and 8.

3.5 Barriers to Fish Migration

No barriers to fish migration were documented in the MMD2 watercourse (which is the primary watercourse of interest to the project), however, there are a series of locations within MMD2 where in runs and riffles flowing over the bedrock surface during the spring freshet may be dry or of insufficient depth to enable fish migration during summer months.

3.6 Fish Communities

No fish catchment data was readily available for review, however, as the Munro Municipal Drain has a direct hydraulic connection to the Mississippi river it is possible that a variety of common small-bodied fish species such as bluntnose minnow (*Pimephales notatus*), brook stickleback (*Culaea inconstans*), creek chub (*Semotilus atromaculatus*), longnose dace (*Rhinichthys cataractae*) and white sucker (*Catostomus commersonii*) and larger fish of the *Esox* genus could be found within the Munro Municipal Drain.

A search of the Ministry of Natural Resources and Forestry's Natural Heritage Information Centre (MNRF, 2017) did not indicate the presence of any occurrence records within 1 km of the site for any fish species which are identified as a species at risk in Ontario.

4 FISH HABITAT ASSESSMENT

The protection of fish and fish habitat is a federal responsibility and is administered by the Department of Fisheries and Oceans Canada (DFO). Fish habitat as defined in the Fisheries Act means "spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes."

On April 3, and May 8, 2017 a wire fish cage was deployed within MMD2 in two separate locations, one upstream of the confluence with MMD2-H2 and one in the location of the confluence of the

abandoned channel and MMD2. On both April 3 and May 8, 2017 the fish cage was baited and left completely submerged within the centre of the channel for approximately 24 hours. No fish were captured during either time the fish cages were deployed. Furthermore, during the five site investigations completed between April 3 and May 9, 2017 no large or small-bodied fish species were observed in any on-site or off-site watercourse or HDF.

While off-site, downstream locations within the MMD watercourse are likely to provide fish habitat for various fish species, the MMD2 portion is not considered fish habitat due to absence of fish species observed and the poor quality habitat located within MMD2 proximate to the proposed severance parcel.

5 CONCLUSIONS AND RECOMMENDED MITIGATION MEASURES

The watercourse as mapped on the Township Official Plan and portions of which are included in MVCA mapping no longer cross the unopened road allowance between Concession 11 and 12, the existing watercourse (MMD2) is located only on the south side of the unopened road allowance. However, MMD2-H1 crosses the unopened road allowance approximately 410 m southwest of traveled portion of Douglas Side Road.

The MMD2 watercourse within the project area is not used directly for fish habitat, however, it does contribute base flow to downstream potential fish habitat.

As the existing watercourse is located on the south side of the unopened road allowance, the proponent of the proposed severance will not be required to cross an existing watercourse or alter or disturb any fish habitat to establish frontage and road access for the proposed severance parcel.

To avoid harm to potential downstream fish habitat Geofirma offers the following recommendations;

- The Best Management Practices (BMPs) for erosion and sediment control, as outlined in the Ministry of Transportation Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects (MTO, 2015) should be employed during any future road construction activities.
- Standard construction best practices should be employed to ensure no damage is incurred to natural features on-site or adjacent to the site through encroachment by machinery, storage of construction materials, excessive soil compaction, stormwater runoff or excessive clearing and grading.
- Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized.
- To protect trees not identified to be removed during road construction, identification and fencing of the critical root zone should be undertaken. The critical root zone is defined as 10 cm from the base of the tree for every centimeter in diameter of the tree trunk measured at breast height.

6 CLOSURE

This report has been prepared for the exclusive use of Gillian Espie, using a methodology for conducting fish habitat assessments that is acceptable within the profession. Data obtained from site visits represents the conditions at the time of the investigation and are subject to temporal variability.

The undersigned certify that the information contained within this report is accurate and complete, to the best of their knowledge.

Geofirma Engineering Ltd. has exercised professional judgment in collecting and analyzing the information and in formulating recommendations based on the results of the study. The mandate at Geofirma is to perform the given tasks within guidelines prescribed by the client and with the quality and due diligence expected within the profession. No other warranty or representation expressed or implied, as to the accuracy of the information or recommendations is included or intended in this report.

Geofirma Engineering Ltd. hereby disclaims any liability or responsibility to any person or party, other than the party to whom this report is addressed, for any loss, damage, expense, fines or penalties which may arise or result from the use of any information or recommendations contained in this report by any other party. Any use of this report constitutes acceptance of the limits of Geofirma's liability. Geofirma's liability extends only to its client and only for the total amount of fees received from the client for this specific project and not to other parties who may obtain this report.

Respectfully submitted,

Geofirma Engineering Ltd.

Drew Paulusse, B.Sc.
Biologist

Glen Briscoe, P Eng., PMP
Senior Project Manager

7 REFERENCES

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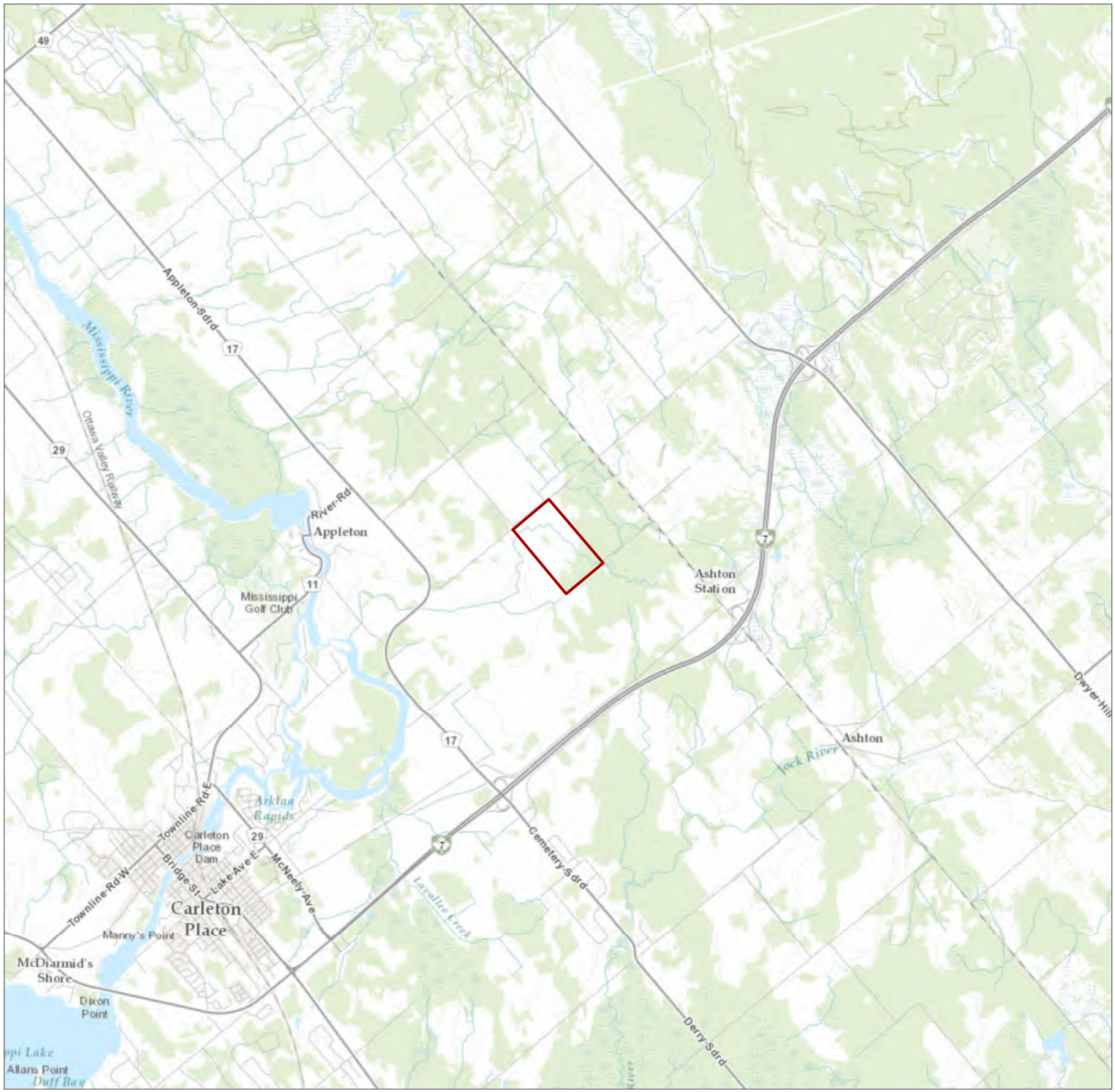
APPENDIX A

Report Figures

Figure A.1 – Site Location
Figure A.2 – Site Layout
Figure A.3 – Watercourses and Fish Habitat
Figure A.4 – Site Photographs



LEGEND

Property Boundary

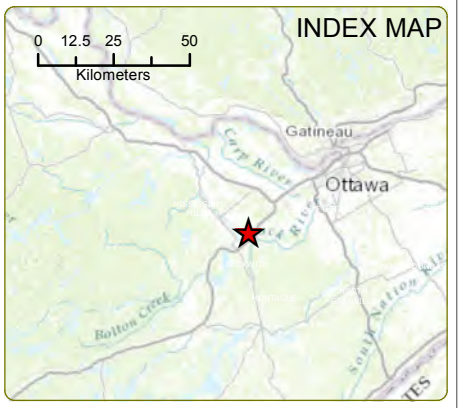


Figure A.1
Site Location

N

Scale 1:75,000

0 0.5 1 2 3 4
Kilometers

Coordinate System: NAD 1983 UTM Zone 18N
Service Layer Credits: MNR, Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

PROJECT No. 17-200-1

PROJECT

Fish Habitat Assessment
Lot 25, Concession 12
Township of Beckwith, Lanark County

DESIGN: ADG
CAD/GIS: ADG
CHECK: DMP
REV: 0

DATE: 09/05/2017

Geofirma Engineering Ltd

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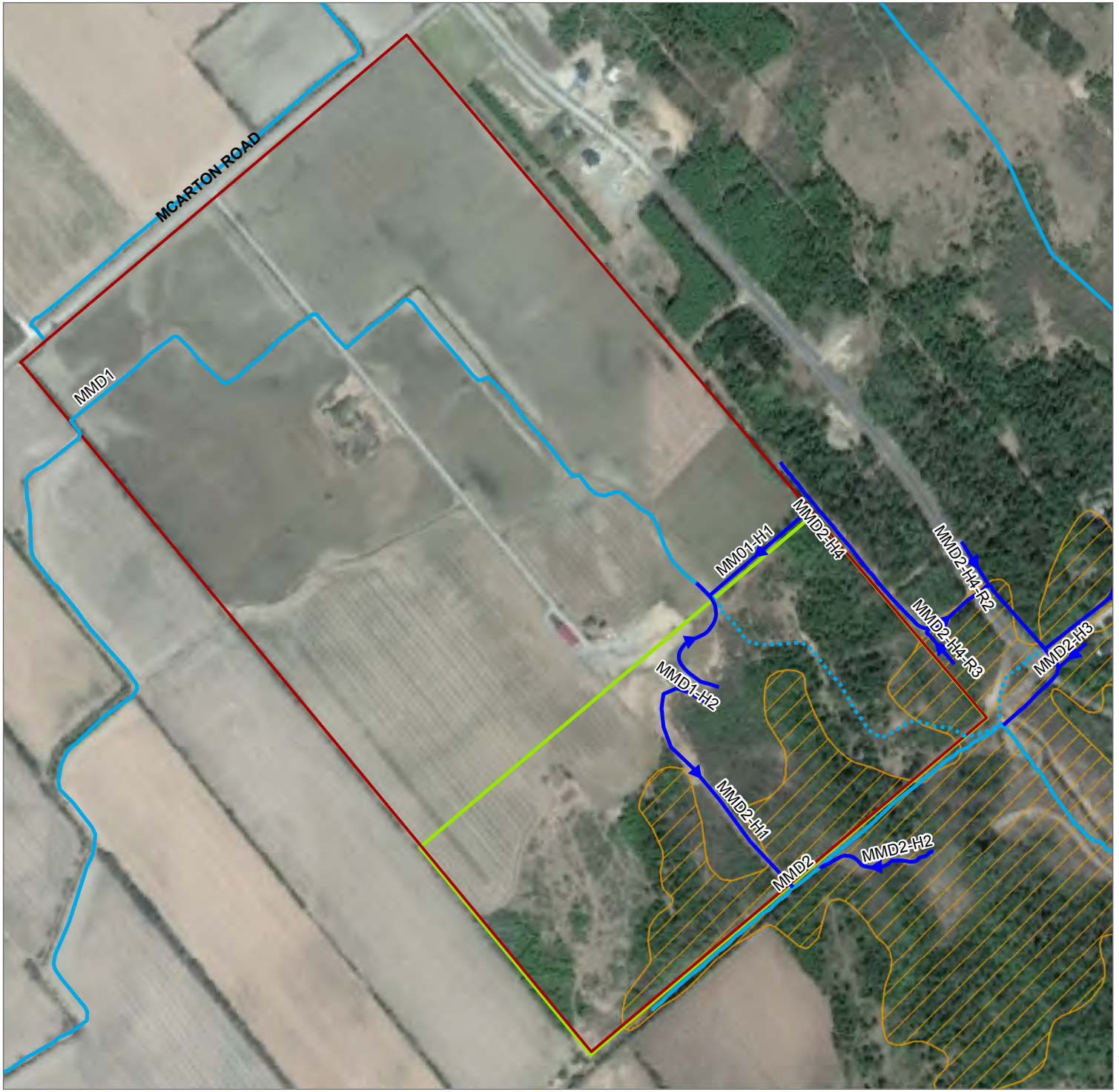

LEGEND

- Headwater Drainage Feature
- Municipal Drain
- Abandonded Channel
- Property Boundary
- Proposed Severance
- Unevaluated Wetland

Figure A.2
Site Layout

N

Scale 1:7,100

0 50 100 200 300 400
Meters

Coordinate System: NAD 1983 UTM Zone 18N
Source: Google Earth April 2016 air photo, Geobase Canada, LIO, MNR

PROJECT No. 17-200-1

PROJECT
Fish Habitat Assessment
Lot 25, Concession 12
Township of Beckwith, Lanark County

DESIGN: ADG
CAD/GIS: ADG/TEW
CHECK: DMP
REV: 0

DATE: 31/05/2017

Geofirma Engineering Ltd

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LEGEND

- Abandonded Channel
- Municipal Drain
- Headwater Drainage Feature
- Proposed Severance
- Property Boundary

Figure A.3
Watercourses and Fish Habitat

Scale 1:3,124

0 20 40 80 120 160

Meters

Coordinate System: NAD 1983 UTM Zone 18N
Source: Google Earth April 2016 air photo, Geobase Canada, LIO, MNR

PROJECT No. 17-200-1

PROJECT
Fish Habitat Assessment
Lot 25, Concession 12
Township of Beckwith, Lanark County

DESIGN: ADG
CAD/GIS: TEW
CHECK: DMP
REV: 0

DATE: 23/05/2017

Geofirma Engineering Ltd

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LEGEND

- Photographs
- Headwater Drainage Feature
- Municipal Drain
- Abandonded Channel
- Property Boundary
- Proposed Severance
- Unevaluated Wetland

Figure A.4
Site Photographs

N

Scale 1:2,600

0 15 30 60 90 120

Meters

Coordinate System: NAD 1983 UTM Zone 18N
Source: Google Earth April 2016 air photo, Geobase Canada, LIO, MNR

PROJECT No. 17-200-1

PROJECT

Fish Habitat Assessment
Lot 25, Concession 12
Township of Beckwith, Lanark County

DESIGN: ADG
CAD/GIS: TEW
CHECK: DMP
REV: 0

DATE: 31/05/2017

Geofirma Engineering Ltd

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APPENDIX B

Site Photographs

Photo 1, 3-Apr-17 – Abandoned Channel, Looking Off-site to the NE

Photo 2, 3-Apr-17 – MMD2, Looking SW

Photo 3, 3-Apr-17 – MMD2, Looking NE

Photo 4, 3-Apr-17 – MMD2, Looking Off-site to the SW

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Photo 5, 12-Apr-17 – Location of Abandoned Channel at MMD2, Looking NE

Photo 6, 12-Apr-17 – Location of Abandoned Channel at MMD2, Looking NW

Photo 7, 12-Apr-17 – Ridgemont Dr. Drainage Ditch, Looking NW

Photo 7, 12-Apr-17 – Ridgemont Dr. Drainage Ditch, Looking NW

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Photo 9, 12-Apr-17 – MMD2-H3, Looking SE

Photo 10, 12-Apr-17 – MMD2 At Edge of Douglas Side Road, Looking SW

Photo 11, 12-Apr-17 – MMD2, Looking NE

Photo 12, 9-May-17 – Confluence of MMD2 & MMD2-H2, Looking East

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Photo 13, 12-Apr-17 – Confluence of MMD2 & MMD2-H1, Looking SW

Photo 14, 12-Apr-17 – MMD2-H1, Looking NW

Photo 15, 12-Apr-17 – MMD2-H1, Looking NW

Photo 16, 12-Apr-17 – MMD1-H2, Looking North

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Photo 17, 12-Apr-17 – MMD1-H2, Looking South

Photo 18, 12-Apr-17 – MMD1-H1, Looking NW

Photo 19, 12-Apr-17 – Abandoned Channel, Looking South

Photo 20, 12-Apr-17 – Abandoned Channel, Looking South

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Photo 21, 8-May-17 – MMD2, Looking NE Past Abandoned Channel

Photo 22, 8-May-17 – MMD2, Looking NE with Fish Cage in Foreground

Photo 23, 8-May-17 – MMD2, Looking SW

Photo 24, 9-May-17 – Abandoned Channel, NE

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Photo 25, 9-May-17 – Recently Excavated Channel of MMD2, Looking SW

APPENDIX C

Completed Correspondence

-Ministry of Natural Resources and Forestry

Ministry of Natural Resources and Forestry

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Ontario

Mon. Mar 20, 2017

Drew Paulusse
Geofirma Engineering Ltd.
1 Raymond St., Suite 200
Ottawa, Ontario K1R 1A2
(613) 232-2525 ext 338
dpaulusse@geofirma.com

Attention: Drew Paulusse

Subject: Information Request - Infrastructure (Drain, Bridge, Culvert)
Project Name: Douglas Side Rd Fisheries Assessment
Site Address: 9249 McArton Road, Beckwith
Our File No. 2017_BEC-3949

Natural Heritage Values

The Ministry of Natural Resources and Forestry (MNRF) Kemptville District has carried out a preliminary review of the area in order to identify any potential natural resource and natural heritage values.

The following Natural Heritage values were identified for the general subject area:

- Municipal Drain, Munro Municipal Drain
- Municipal Drain, Rotsford Branch Municipal Drain
- Unevaluated Wetland (Not evaluated per OWES)

Municipal Official Plans contain information related to natural heritage features. Please see the local municipal Official Plan for more information, such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality. Many municipalities require environmental impact studies and other supporting studies be carried out as part of the development application process to allow the municipality to make planning decisions which are consistent with the Provincial Policy Statement (PPS, 2014).

The MNRF strongly encourages all proponents to contact partner agencies and appropriate municipalities early on in the planning process. This provides the proponent with early knowledge regarding agency requirements, authorizations and approval timelines; Ministry of the Environment

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and Climate Change (MOECC) and the local Conservation Authority may require approvals and permitting where natural values and natural hazards (e.g., floodplains) exist.

As per the Natural Heritage Reference Manual (NHRM, 2010) the MNRF strongly recommends that an ecological site assessment be carried out to determine the presence of natural heritage features and species at risk and their habitat on site. The MNRF can provide survey methodology for particular species at risk and their habitats.

The NHRM also recommends that cumulative effects of development projects on the integrity of natural heritage features and areas be given due consideration. This includes the evaluation of the past, present and possible future impacts of development in the surrounding area that may occur as a result of demand created by the presently proposed project.

Drainage Works

Where drainage works are proposed within wetland areas, the MNRF is concerned is the impacts to the hydrology and ecology of the wetland, which may have impacts on species and their habitats. For example, changing water levels as a result of drainage works may impact turtles or nesting birds, some of which may be protected under legislation such as the Endangered Species Act (ESA) or the Fish and Wildlife Conservation Act. Therefore a consideration for direct and indirect impacts to species and their habitats is imperative.

Where drainage works occur within the originally approved drainage footprint, as per the Drainage Act, there are no Public Lands Act requirements from the MNRF. However, other MNRF legislation may apply including, but not limited to, the ESA. Some drainage works may be eligible to proceed without a permit from MNRF provided that regulatory conditions are met. For more information please check out the following link http://www.ontario.ca/environment-and-energy/ditch-and-drainage-work-and-endangered-or-threatened-species

Species at Risk

A review of the Natural Heritage Information Centre (NHIC) and internal records indicate that there is a potential for the following threatened (THR) and/or endangered (END) species on the site or in proximity to it:

- Sensitive Species (END)
- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)

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- Eastern Meadowlark (THR)
- Sensitive Species (END)

All endangered and threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance to the individuals as well as their habitat (e.g. nesting sites). General habitat protection applies to all threatened and endangered species. Note some species in Kemptville District receive regulated habitat protection. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under the ESA. For more on how species at risk and their habitat is protected, please see: https://www.ontario.ca/page/how-species-risk-are-protected.

If the proposed activity is known to have an impact on any endangered or threatened species at risk (SAR), or their habitat, an authorization under the ESA may be required. It is recommended that MNRF Kemptville be contacted prior to any activities being carried out to discuss potential survey protocols to follow during the early planning stages of a project, as well as mitigation measures to avoid contravention of the ESA. Where there is potential for species at risk or their habitat on the property, an Information Gathering Form should be submitted to Kemptville MNRF at sar.kemptville@ontario.ca.

The Information Gathering Form may be found here:
http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&TAB=PROFILE&ENV=WWE&NO=018-0180E

For more information on the ESA authorization process, please see:
https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization

One or more special concern species has been documented to occur either on the site or nearby. Species listed as special concern are not protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act and/or Migratory Birds Convention Act. Again, the habitat of special concern species may be significant wildlife habitat and should be assessed accordingly. Species of special concern for consideration:

- Black Tern (SC)
- Snapping Turtle (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNRF

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should be contacted and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNRF.

Breeding birds may be present on site. The Migratory Birds Convention Act and the ESA may be triggered if these birds are affected. Negative impacts may be avoided by clearing vegetation outside of the breeding bird season (April 15th – August 15th) or by surveys conducted by a qualified professional to ensure no breeding birds are present before clearing of vegetation.

No work should occur in turtle overwintering habitat from October 16th – March 15th in order to protect hibernating turtles. Turtles can be found travelling on land during the active season (April 1st – October 30th). If the proposed works are to occur during these times, the MNRF recommends fencing off the site prior to work being undertaken in order to prevent turtles from accessing the site.

Please note that information regarding species at risk is based largely on documented occurrences and does not necessarily include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. For specific questions regarding the Endangered Species Act (2007) or SAR, please contact MNRF Kemptville District at sar.kemptville@ontario.ca.

The approvals processes for a number of activities that have the potential to impact SAR or their habitat have recently changed. For information regarding regulatory exemptions and associated online registration of certain activities, please refer to the following website: https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization.

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Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species; or
- Additional occurrences of species are discovered on or in proximity to the site.

This letter is valid until: Tue. Mar 20, 2018

For any questions or concerns, please do not hesitate to contact me.

Sincerely,

Leanne Marcoux
A/Management Biologist
leanne.marcoux@ontario.ca

Encl.\
-ESA Infosheet
-NHIC/LIO Infosheet

Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

Licence to Collect Fish for Scientific Purposes

Permis pour faire la collecte de poissons à des fins scientifiques

Licence No. / Nº de permis	1085460
Local Reference No. / Nº de référence local	
Issuer Account No. / Nº de compte du delivreur de permis.	10000846

This licence is issued under Part I of the Fish Licensing Regulation made under the Fish and Wildlife Conservation Act, 1997 to:

Ce permis est délivré en vertu de la Partie I du règlement sur la délivrance de permis de pêche formulé conformément à la Loi sur la protection du poisson et de la faune de 1997 à:

Name of Licencee
Nom du titulaire du permis

Last Name / Nom de famille	First Name / Prénom	Middle Name / Second Prénom
Mr. Paulusse	Drew	Michael

Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant)

Geofirma Engineering Ltd.

Mailing address of Licencee
Adresse postale du titulaire du permis

Street Name & No./PO Box/RR#/Gen. Del./ N° rue/C.P./R.R./poste restante

1 Raymond Street Suite 200

City/Town/Municipality / Ville/village/municipalité	Province/State / Province/État	Postal Code/Zip Code / Code Postal/Zip
Ottawa	ON	K1R 1A2

to collect the species, size and quantites of fish from the waters as set out below.
Pour faire la collecte des espèces suivantes (stade et nombre indiqués ci-dessous):

Species / Espèces	Eggs / Oeuf X	Juvenile / Fretin X	Adults / Adulte X	Numbers / Nombre	Name of Waterbody / Nom de l'étendue d'eau
All Species as encountered	X	X	X	99999	Munro Municipal Drain. Beckwith Township Lanark County

Yes/Oui ☐ Additional species/Waterbody list attached / Liste d'espèces/d'étendue d'eau additionnelles ci-jointe

Purpose of collection
But de la collecte

Inventory / Assessment

Licence Dates
Dates du permis

Effective Date / Date d'entrée en vigueur (YYYY-MM-DD)	Expiry Date / Date d'expiration (YYYY-MM-DD)
2017-01-20	2017-12-31

Licence conditions
Conditions du permis

This licence is subject to the conditions contained in Schedule A if included. / Ce permis doit respecter les conditions de l'annexe A si celle-ci est jointe.

Yes/Oui ☒ No/Non ☐ Schedule A included. / Annexe A ci-jointe

Issued by (please print) / Délivré par (veuillez écrire en caractères d'imprimerie)	Signature of issuer / Signature du délivreur	Date of Issue/Date de délivrance (YYYY-MM-DD)
Scott Lee		2017-01-20

Signature of Licencee / Signature du titulaire du permis	Date (YYYY-MM-DD)
	2017-01-20

Personal information contained on this form is collected under the authority of the Fish and Wildlife Conservation Act, 1997 and will be used for the purpose of licencing, identification, enforcement, resource management and customer service surveys. Please direct further inquiries to the District Manager of the MNR issuing district.

Les renseignements personnels dans ce formulaire sont recueillis conformément à la Loi sur la protection du poisson de la faune, 1997 , et ils seront utilisés aux fins de délivrance de permis, d'identification, d'application des règlements, de gestion des ressources et de sondage sur les services a la clientèle. Veuillez communiquer avec le chef du district du MRN qui délivré le permis si vous avez des questions.

FW0032 (04/00)

Licence to Collect Fish for Scientific Purposes
Permis pour faire la collecte de poissons à des fins scientifiques
Schedule A - Licence Conditions
Annexe A - Conditions du permis

Licence No. 1085460
No de permis _____

This licence is subject to the conditions listed below.

1. This Licence is valid to collect for the persons, species, numbers, and calendar year indicated.

2. Mandatory report forms documenting the sampling conducted under this licence must be submitted to the licence issuer within 30 days of the termination date, but in no case later than January 31 next following the year of issue. The Mandatory Report form (Part 1) must be completed for each Sampling Program and the Site Collection Reports (Part 2) must be completed for each collection site. A separate map clearly indicating the location of each collection site must be attached to the Site Collection Reports. Attach the Site Collection Reports and maps to the Mandatory Report Form and submit to the "Planning Biologist, Ministry of Natural Resources, Kemptville District, 10 Campus Drive, P.O. Box 2002, Kemptville, ON, K0G 1J0 ". The submission of a satisfactory report is a prerequisite to any subsequent renewals.

3. Before carrying out any operation under the licence in any area the licensed person shall inform the Area Supervisor or District/Lake Manager of his or her intentions at least one week before commencing work and include information as to the type of operation, location, duration, and the names of personnel involved.

4. A copy of the original licence must be at the designated collections sites while sampling is occurring and carried by the licenced person or a designated assistant.

5. This licence is not valid in Provincial Parks, park reserves, or National Parks without the written permission from the authorized person in charge of the area concerned.

6. This licence does not allow access to any property without permission of the landowner.

7. Name of assistants covered under this Licence are as follows: Geofirma Engineering staff as required.

8. Capture gear shall be inspected regularly and live holding traps must be inspected at least once daily. All capture gear shall be clearly marked with the licencee name and the licence number of this licence.

9. Licencee may collect fish with; Dip Nets, Minnow Traps.

10. All persons working under the authority of this licence must be trained in proper fish handling procedures prior to conducting any activity authorized by the licence.

11. All persons using electrofishing equipment must be certified for use of that equipment prior to conducting any activity authorized by this licence.

12. The licencee shall follow the best management practices for the collection, handling, transportation and holding of fish identified in FS Bulletin 2008-01 (June 10, 2008) included with the licence in order to minimize the risk of spreading aquatic invasive species and diseases.

13. All field equipment must be de-contaminated prior to use on each water body in order to prevent the spread of exotic species and disease

14. Due to potential spawning activity by resident or migratory fish species, visual inspection of all sampling areas must be done prior to sampling with seine or dip nets. Should spawning activity or redds be observed all sampling must be stopped in order to prevent disturbance to the fish and habitats.

15. Unless specified otherwise, all captured fish will be released alive at the capture site except for voucher specimens, approved permanent collections and/or when further examination is necessary in the laboratory. Voucher specimens shall be deposited in the Royal Ontario Museum collection for taxonomic verification and voucher retention.

16. Any person acting under the authority of this licence, shall immediately report the capture of any invasive species (e.g. ruffe, tubenose goby,round goby, rusty crayfish, Asian carp, etc.) found outside its previously known range (as determined by the distribution information available at: www.invadingspecies.com/indexen.cfm, to the appropriate Area Biologist at the local MNR District office. Any such specimens captured outside of their established range (not already naturalized) shall be euthanized (not returned to the water) and kept for identification purposes.

17. Unless specifically authorized by a separate Endangered Species Act (ESA) permit and/or Federal Species at Risk Act (SARA) permit, no person shall attempt to catch a Species at Risk.

18. Any person acting under the authority of this licence, shall photograph and release live any fish Species at Risk captured (e.g. atlantic salmon, redside dace, black redhorse, river redhorse, channel darter, eastern sand darter, northern brook lamprey (and american brook lamprey for comparison). The photographs must be forwarded to the appropriate Area Biologist or Species At Risk Biologist at the local MNR District office for identification and confirmation.

19. GPS coordinates (UTM) of the capture location must be submitted for any species at risk, as per the Species at Risk in Ontario (SARO) list that are encountered during this project and submitted to MNR.

20. Sampling must cease immediately in an area when a fish Species at Risk is caught.

21. Sampling locations must be reported using GPS location data using: Projection: Universal Transverse Metres.

Signature of Licencee / Signature du titulaire du permis **Date**

APPENDIX D

Project Staff CVs

DREW M. PAULUSSE
Biologist
GEOFIRMA ENGINEERING LTD.

Education:

- 2007, Trent University, B.Sc., Biology
- 2004, Sir Sandford Fleming College, Environmental Technician

Experience:

Apr. 2007 - Present	Environmental Scientist, Geofirma Engineering Ltd., Ottawa ON
Apr. 2006 - Sept. 2006	Wetland Conservation Officer, CWS, Environment Canada, Downsveiw ON
Apr. 2005 – Sept. 2005	Environmental Monitoring Assistant, City of Ottawa, Ottawa, ON
Apr. 2004 – Sept. 2004	Junior Marine Technician, Environment Canada, Burlington, ON

Related Training:

- Headwater Drainage Feature Training Course – Rideau Valley Conservation Authority, Spring 2017
- Delegate: Ontario Stone, Sand and Gravel Association – Species at Risk Workshop, Spring 2017
- Attendee: Rideau Valley Conservation Authority – Headwaters Workshop, Fall 2016
- Delegate: Federal Contaminated Sites Conference, Montreal, Summer 2016
- Ecological Land Classification System certification, Ministry of Natural Resources and Forestry, June 2015
- Delegate: Canadian Brownfields Network Conference, Toronto, Spring 2015
- Delegate: Federal Contaminated Sites Conference, Ottawa, Spring 2014
- 120-hour Ecological Risk Assessment Training Course – AEHS Foundation, Spring 2011
- Ontario Benthic Biomonitoring Network certification, July 2011
- Physical Hydrogeology: Carleton University, 2009

Professional Affiliations:

- Canadian Society of Environmental Biologists – since 2009
- Ontario Association for Impact Assessment – since 2014

Selected Professional Experience:

- Conducted fish habitat assessments of roadside ditches along Highway 417 in support of a large culvert replacement project. Work included fish investigations, analysis of fish habitat using Ministry of Transportation protocols and reporting for Ministry of Natural Resources approval.
- Lead biologist responsible for completing Species at Risk (SAR) assessment and Migratory Bird Survey (MBS) at a municipal park for the City of Ottawa in support of a park expansion project.
- Field biologist and Project Manager for the preparation of numerous Environmental Impact Assessments and Statements in Eastern Ontario. Work included liaison with Ministry of Natural Resources and Forestry, Conservation Authorities and Municipal Planners, identification of species at risk (SAR)and SAR habitat, identification of significant natural features, breeding bird surveys, application of the Southern Ontario Ecological Land Classification system and Significant Wildlife Habitat Mitigation Support Tool, mitigation measure development and reporting.
- Lead field biologist for the completion of a Preliminary Quantitative Ecological Risk Assessment completed for the National Capital Commission (NCC) to assess risks posed to aquatic receptors in a deciduous swamp from a former landfill. Work included terrestrial and aquatic habitat assessments, species at risk surveys, benthic invertebrate community impairment study, toxicity assessment, literature review, risk calculations and reporting.
- Lead field biologist for a surface water and sediment study to assess the effects of fireworks to a surface water body in the national capital region for the NCC. Work included; research on fireworks' chemical components and their effect on the natural environment, 2-year sampling program for surface water and sediment, benthic habitat assessment, development of trigger values, risk analysis and remedial options for the site.

- Lead field crews conducting song bird surveys and marsh monitoring programs following Bird Studies Canada and Canadian Wildlife Service monitoring protocols
- Lead biologist for benthic habitat impairment studies. Work included establishing benthic community monitoring program following Ontario Benthic Bio-monitoring Network (OBBN) protocols, collection and identification of benthic invertebrates, assessment of quality and quantity of groundwater seepage, groundwater level monitoring, statistical analysis of benthic community data and risk assessment reporting.
- Field biologist responsible for leading field crews in the collection and preservation of macro-benthic invertebrates for the Canadian Wildlife Service at many coastal wetlands on the Great Lakes.
- Participated in several coastal wetland assessments with the Canadian Wildlife Service collecting data on terrestrial and aquatic community attributes.
- Project manager and lead QP_{RA} for a Tier I human health and ecological risk assessment conducted for Confederation Park in downtown Ottawa. Work included study design, conceptual model development, identification of valued ecosystem components, assessment of risk under modified receptor scenarios and reporting.
- Conducted terrestrial ecological site surveys, providing data on species at risk, valued ecosystem components, song bird community attributes, etc., for use in various ecological risk assessments in the Ottawa area.
- Assisted in the creation of a provincially wide air photo inventory of all coastal wetland complexes in Ontario, including geo-referencing and layering of multiple years of air photos.
- Field biologist responsible for terrestrial and aquatic habitat assessment for use in a Detailed Ecological Risk Assessment in Gatineau, Quebec. Work included vascular plant surveys, wildlife inventory, and fish habitat assessment.
- Assisted with numerous Tier I and Tier II Ecological Risk Assessments in the Ottawa and Gatineau areas. Work included; study design, conceptual model development, terrestrial ecology site surveys for avian, mammalian and amphibian species, identification of species at risk and their habitat, selection of valued ecosystem components, causality relationship analysis, selection of assessment endpoints, statistical analysis and reporting.
- Collection of surface water samples from a treatment wetland for analysis of effluent toxicity to Daphina magna and Oncorhynchus mykiss for elevated concentrations of unionized ammonia. Work included study design, sample collection, interpretation and reporting to the Ministry of Environment and Climate Change.
- Completion of a Tier I Human Health and Ecological Risk Assessment for a former bulk fuel storage facility contaminated with Petroleum Hydrocarbons (PHC), PAHs and Volatile Organic Compounds (VOC), located on a small peninsula in the Ottawa River. Work was completed to assess the potential risk to human health and ecological receptors following a partial remediation of soil and groundwater on site.
- Assisted in the preparation of a Human Health and Ecological Risk Assessment for a former landfill site contaminated with PAH, metals, PHC and VOCs on federally-owned land in Ottawa, adjacent to the Rideau River. Assessment of risk to human, ecological and aquatic receptors through exposure to contaminated soil, groundwater, sediment and surface water.
- As a Wetland Conservation Officer with the Canadian Wildlife Service, participated in several Marsh Monitoring Program surveys at various Coastal Wetlands in Lake Ontario and Lake Erie. Work included collection of presence and relative abundance data on amphibians and migratory birds.
- Field biologist responsible for carrying out Canadian Wildlife Service field surveys on macro-benthic invertebrate communities in Coastal Wetlands. Work included selection of sampling sites, species collection, identification and preservation.
- Participated in assessment of aquatic vegetation diversity and abundance studies collecting data on emergent and submergent aquatic vegetation community attributes using quadrate sampling methods.
- Design and conducted a hydrologic investigation program for a small inland lake. Work included; assessing thermal stratification during various seasons, determining turnover rates, quantifying sediment and contaminate loading, and developing a conceptual site model illustrating the meromictic anomalies and their effect on lake processes.
- Completed an assessment to quantify the volume of groundwater discharging to a small surface water body. Work included; installation of a water level control structure, installation of dedicated data loggers, flow measurements, interpretation of logger data, and establishment of water level – flow curves for various flooding scenarios.
- Assisted with a mass flux and mass transport analysis of management wetland to a surface water body. Work included; determining flow rates from data loggers, surface water sampling, and completion of a 150+ point

survey of elevations to create a 3D model of the management wetland used for determining volume at various water levels, data interpretation and reporting.

- Participated in a pelagic benthic invertebrate community study in Lake Erie. Work was conducted on Environment Canada's research vessel CCGS Limnos for the National Water Research Institute. Work included; analysis benthic samples collected via deep water dredge, species identification and preservation.
- Participated in a storm water pond management study with Environment Canada, providing technical assistance to industry leaders on the fate of toxic chemicals and contaminates in the aquatic environment.
- Assisted in collection and sampling of heavily contaminated sediment cores from Hamilton Harbor. Work completed for the Canadian Center for Inland Waters.
- Participated in an extensive surface water quality program for the management of E. Coli, and other surface water pathogens for the City of Ottawa's beach monitoring program. Work included; liaising with concerned citizens, sampling, reporting, and presentation preparation.
- Assisted with the implementation of the City of Ottawa's Biosolids program, work included; collection of potable water samples, consultations with landowners and background monitoring.

TAYLOR WARRINGTON
Biologist
GEOFIRMA ENGINEERING LTD.

Education:

- 2016, Niagara College, Graduate Certificate, Ecosystem Restoration
- 2015, McMaster University, B.Sc., Life Sciences

Experience:

January 2016, - Present	Biologist, Geofirma Engineering Ltd., Ottawa, ON
May 2016 – Nov. 2016	Junior Field Biologist, Dillon Consulting, Little Current, ON
May 2014 – Aug. 2014	Laboratory/Research Assistant, McMaster University, Hamilton, ON

Related Training:

- Class 2 Electrofishing License: Backpack Crew Leader
- Ontario Benthos Biomonitoring Network certification
- Standard First Aid and CPR-C, Canadian Red Cross

Selected Professional Experience:

Biological and Ecological Projects

- Junior Field Biologist responsible for completing Species at Risk (SAR) assessment and Migratory Bird Survey (MBS) at a municipal park for the City of Ottawa in support of a park expansion project.
- Junior Field Biologist responsible for post construction monitoring of wildlife impacts at a large scale wind farm operation. Work included identification of avian and mammalian wildlife species, processing of bird and bat carcasses for Ministry review, determining scavenging rates and weekly buffer vegetation assessments.
- Research assistant responsible for assisting a Master's student in the collection, and analysis of water quality samples. Parameters examined included: turbidity, total nitrogen, total phosphorus, total chloride and chlorophyll a.
- Student Project Coordinator for a citizen science program in Hamilton, Ontario. Work included: water quality collection and analysis, benthic community assessment, watershed summaries, and volunteer organization.
- Looked at long-term changes in ecosystem health of Frenchman's Bay (Pickering, ON). Analyzed data using excel and SAS JMP 10. Created watershed land-use and sampling location maps, and digitized wetland vegetation cover using GIS. Written final draft and formal symposium presentation.
- Member of a research team at Niagara College assessing frog and toad populations on the Niagara on the lake (NOTL) campus as well as assess habitat availability on campus. Work included visual and audible surveys throughout the fall and spring, as well as vegetation assessments and Ecological Land Use Classification along banks and in lagoons.

Environmental Site Assessments and Risk Assessments

- Assisted with fish habitat assessment and stream flow measurements
- Assisted with SAR and Migratory bird screening assessment

Geographical Information Systems

- Mapped a reach of Twelve Mile Creek, work included heads-up digitizing of thalweg, and stream banks, and object data creation. Final map product displayed OBBN data and stream stability for multiple thalweg sections.
- Represented and analyzed data in 3D using ArcGIS: processed total station survey data, to create a 3D surface layer (TIN), and created cross sectional profiles using the 3D analyst extension for Six Mile Creek.
- Conducted a Road Mortality and Drift Fencing Analysis by examining snake and turtle mortality along a road before and after the installation of drift fencing. Analyzed the impact of fence installation on road mortality rates using Q GIS for spatial analysis and SAS JMP 10 for statistical analysis.

- Created numerous watershed and site maps, outlining site parameters and areas of interest, including watershed delineation using ArcHydro and mapping of tributary and land use inputs

Hydrological Investigations

- Performed a Wetland Restoration Analysis by examining groundwater runoff from a McMaster hill slope to determine the size and sustainability of restoring a cold water marsh to the campus. Work included, well and piezometer installation, data collection and management for slug tests, tracer studies, rain gauge measurements, through fall estimations, and infiltration rates. Final report presented data results and recommendations of marsh size.
- Established a water balance, identified water inputs and outputs to better recognize the hydrology within Malcolmson Eco Park, and to facilitate better management strategies. This was done using ArcGIS Hydro, piezometers and hydraulic head analysis as well as stage-discharge weirs and evapotranspiration data.
- Using HEC-HMS, modeled 24-h, 2-yr and 100-yr return period rainfalls, and generated 2-yr and 100-yr hydrographs for Twelve Mile Creek headwaters.
- Total Station Survey completed for Four Mile Creek headwaters. Work included centering, leveling and operating a Nikon NPR-332 and NPR-322 to measure coordinates of geological features (including benchmarks, stream channel thalwegs and stream banks) for Six Mile Creek.
- Conducted an auto level survey of Six Mile Creek to create a cross sectional stream profile.

Remediation and Restoration Projects

- Assisted with a site assessment and restoration plan for Dicks' Creek, through Niagara College. Work included field measurements: Rapid Geomorphic Assessment, Pebble Count, Rosgen stream classification, flow measurements, OBBN survey and habitat mapping. Final report outlined proposed solutions of v-notch weirs and newbury weir installation to redirect flow, improve conductivity and improve pool-riffle sequencing.
- Completed an Environmental Assessment and Restoration Plan regarding the long-term management of a Southern Ontario savannah ecosystem, through Niagara College. Conducted ELC analysis of vegetation and soil, to assess the health of the savannah and provided suggestions and budgeting for improvements to the ecosystem.

2010 Official Plan of the Township of Beckwith

Schedule B
Constraints

Scale 1:20000

500 250 0 500 1000 1500 2000 2500 m
1500 750 0 1500 3000 4500 6000 7500 ft

township boundary
provincial highway (7)
primary local road
unopened row
county road (17)
secondary local road
private road

legend:

Constraints

- Special Service Overlay
- Flood Plain
- Special Policy Area 1
- Special Policy Area 2
- Special Policy Area 3

NOTE:
Prior to making any planning applications please consult with the Township regarding Species at Risk evaluation requirements.

Prepared: June, 2010
Revised:
Printed: 15-Sep-10

NOTE: Approved with modifications by the minister of Municipal Affairs on _____, 2010.
Adopted by Council Sept 7, 2010.

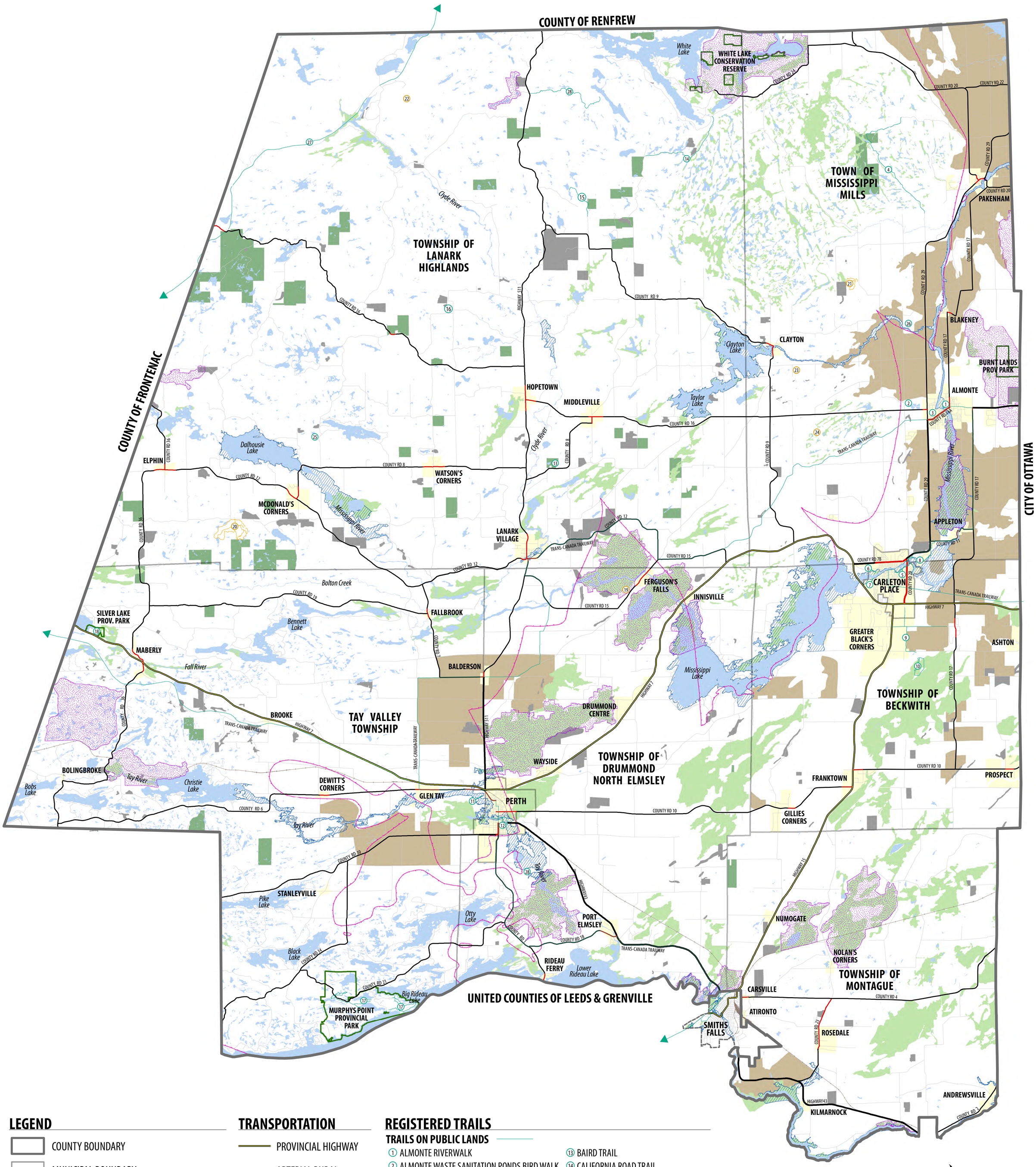
J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

File Location: J:\11\09_01 Official Plan Review\ALR DWG\Beckwith\OPSked_OP_Sched_Const.dwg

SUSTAINABLE COMMUNITIES OFFICIAL PLAN
SCHEDULE A

Land Use Designations

LANARK COUNTY



LEGEND

- COUNTY BOUNDARY
- MUNICIPAL BOUNDARY
- SETTLEMENT AREAS
- AGRICULTURAL LANDS
- LICENSED AGGREGATE EXTRACTION OPERATION
- WATER BODIES & COURSES
- PROVINCIALLY SIGNIFICANT WETLANDS
- AREAS OF NATURAL AND SCIENTIFIC INTEREST
- SIGNIFICANT WOODLANDS
- CANADIAN SHIELD
- FLOODPLAIN

TRANSPORTATION

- PROVINCIAL HIGHWAY
- ARTERIAL RURAL
- COLLECTOR RURAL
- ARTERIAL URBAN
- COLLECTOR URBAN
- LOCAL
- RAILWAY

REGISTERED TRAILS

TRAILS ON PUBLIC LANDS

1. ALMONTE RIVERWALK
2. ALMONTE WASTE SANITATION PONDS BIRD WALK
3. GEMMILL METCALFE PARK TRAILS
4. CARBINE ROAD TRAILS
5. MISSISSIPPI RIVERWALK
6. O-KEE-LEE PARK TRAIL
7. RIVERSIDE PARK TRAIL
8. ROTARY CENTENNIAL TRAIL
9. BECKWITH TRAIL
10. BECKWITH PARK TRAIL
11. TAY RIVER PATHWAY
12. TAY RIVER TOWPATH TRAIL
13. BAIRD TRAIL
14. CALIFORNIA ROAD TRAIL
15. KATE'S LAKE TRAIL
16. LAMMERMOOR ROAD TRAIL
17. MURPHY'S POINT PARK
18. SILVER LAKE PROVINCIAL PARK TRAILS
25. PURDON CONSERVATION AREA TRAILS
26. MILL OF KINTAIL TRAILS
27. K&P TRAIL
28. PERTH WILDLIFE RESERVE TRAILS
29. DARLING LONG LAKE TRAIL

PUBLIC ACCESS TRAIL ON PRIVATE PROPERTY

19. TEMPLES SUGAR BUSH TRAIL
20. WHEELER'S SUGAR CAMP TRAILS
21. FULTONS SUGAR BUSH TRAILS
22. BLUEBERRY MOUNTAIN TRAIL
23. BELL-BUSH PROPERTY TRAILS
24. WEBBER WOODS OF WOLF GROVE TRAILS

PROVINCIAL PARK AND CONSERVATION RESERVE BOUNDARY

N W E S

0 1.5 3 6 9 12
Kilometers

McINTOSH PERRY

CREATED: APRIL 16, 2013

2010 Official Plan of the Township of Beckwith

Schedule A
Land Use

Scale 1:20000

500 250 0 500 1000 1500 2000 2500 m
1500 750 0 1500 3000 4500 6000 7500 ft

township boundary
provincial highway (7)
county road (17)
primary local road
secondary local local road
unopened row
private road

legend:

Community Development Areas
- Residential
- Commercial
- Industrial
- Institutional

Rural Areas
- Agriculture
- Mineral Aggregate Pit
- Mineral Aggregate Quarry
- Wetlands
- Rural Lands
- Mobile Home Park
- Wrecking Yard
- Airport
- Waste Disposal Site
- Hauled Septage Disposal Site
- Rural Residential - Special policy Area
- Highway 7 Corridor Area

Prepared: June 2011
Revised: November 16, 2012
Printed: 20-Nov-12

NOTE: Approved with modifications by the Minister of Municipal Affairs and Housing on September 17, 2012. Adopted by Council September 7, 2010.

J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

File Location: J:\11\09_01 Official Plan Review\ALR DWG\Beckwith\OPBeck_OP_Sched_Landuse_MxdMAP.dwg

APPENDIX C
VASCULAR PLANT LIST

Table 1: Plant List

Scientific Name	Common Name	S-Rank	CC	CW
Abies balsamea	Balsam Fir	S5	5	-3
Acer saccharum	Sugar Maple	S5	4	3
Alnus incana	Grey Alder	S5	6	-3
Ambrosia artemisiifolia	Common Ragweed	S5	0	3
Arctium minus	Common Burdock	SNA		3
Asclepias syriaca	Common Milkweed	S5	0	5
Barbarea vulgaris	Bitter Wintercress	SNA		0
Betula papyrifera	White Birch	S5	2	3
Bidens frondosa	Devil's Beggarticks	S5	3	-3
Bromus inermis	Smooth Brome	SNA		5
Carex cristatella	Crested Sedge	S5	3	-3
Cirsium arvense	Canada Thistle	SNA		3
Cornus sericea	Red Osier Dogwood	S5	2	-3
Daucus carota	Queen Anne's Lace	SNA		5
Dryopteris intermedia	Evergreen Wood Fern	S5	5	0
Fragaria vesca	Woodland Strawberry	S5	4	3
Fraxinus nigra	Black Ash	S4	7	-3
Glyceria striata	Fowl Mannagrass	S5	3	-5
Juniperus communis	Common Juniper	SNA		3
Melilotus albus	White Sweet-clover	SNA		3
Nabalus altissima	White Rattlesnakeroot	S5	6	3
Ostrya virginiana	Ironwood	S5	4	3
Phalaris arundinacea	Reed Canary Grass	S5	0	-3
Phluem pratense	Common Timothy	SNA		3
Picea glauca	White Spruce	S5	6	3
Picea pungens	Blue Spruce	SNA		3
Pinus strobus	White Pine	S5	4	3
Poa pratensis	Kentucky Bluegrass	S5	0	3
Populus balsamifera	Balsam Poplar	S5	4	-3
Populus grandidentata	Large-toothed Aspen	S5	5	5
Populus tremuloides	Trembling Aspen	S5	2	0
Potentilla simplex	Old-field Cinquefoil	S5	3	3

Prunus virginiana	Choke Cherry	S5	2	3
Rhamnus cathartica	Common Buckthorn	SNA		0
Robinia pseudoacacia	Black Locust	SNA		3
Rubus idaeus	Common Red Raspberry	S5	2	3
Setaria pumila	Yellow Foxtail	SNA		0
Solanum dulcamara	Bittersweet Nightshade	SNA		0
Tanacetum vulgare	Common Tansy	SNA		5
Taraxacum officinale	Common Dandelion	SNA		3
Thuja occidentalis	Eastern White Cedar	S5	4	-3
Tilia americana	American Basswood	S5	4	3
Trifolium pratense	Red Clover	SNA		3
Trifolium repens	White Clover	SNA		3
Typha latifolia	Broad-leaved Cattail	S5	1	-5
Verbascum thapsus	Common Mullein	SNA		5
Vicia cracca	Tufted Vetch	SNA		5
Vitis riparia	Riverbank Grape	S5	0	0

APPENDIX D
SELECTED SITE PHOTOGRAPHS

SELECTED SITE PHOTOGRAPHS

Photo 1 – View of the Fresh – Moist White Cedar Coniferous Forest.

Photo 2 – View of the Segment 2 watercourse on the Site.

Photo 3 – View of the Reed-canary Grass graminoid Mineral Meadow Marsh on the Site.

Photo 4 – View of the Annual Row Crops on the Site.

APPENDIX E
SPECIES AT RISK SCREENING TABLE

Table 1. Species at Risk Screening for the Study Area

Type	Common Name	Scientific Name	Srank	SARO Status	COSEWIC Status	Last Obs Date	Background Information Source						Notes on Preferred Habitat [1]	Observed on Site	Suitable Habitat on Site
							NHIC Grid 18VR1404, 18VR1403	Atlas of Ontario Mammals (Dobbyn 1994)	Atlas of the Breeding Bird of Ontario (Cadman 2009)	Ontario Reptile and Amphibian Atlas (ON 2024)	Ontario Butterfly Atlas (Macnaighton 2024)	Rare Vascular Plants of Ontario (Oldham & Brinker, 2009)			
REPTILE	Snapping Turtle	*Chelydra serpentina*	S3	SC	SC	2019				♦			Prefer shallow, slow-movnig waters with abundant vegetation, but can also live in deeper water habitats. During the nesting season June-July, they can be gound on gravelly or sandy areas on land.	No	No, there are no large wetlands or shallow bodies of permanent water.
	Blanding's Turtle	*Emydoidea blandingii*	S3	THR	THR	2019				♦			Shallow waters, usually in large wetlands and shallow lakes with lots of plants. Hibernate in muddy bottoms of permanent water bodies.	No	No, the wetlands on Site are not suitable for this species.
	Eastern Musk Turtle	*Sternotherus odoratus*	S3	THR	THR	2013				♦			Ponds, lakes, marshes and rivers that have slow-moving waters and abundant emergent vegetation. Muddy bottoms for winter hibernation is likely.	No	No, the wetlands on Site are not suitable for this species.
PLANT	Butternut	*Juglans cinerea*	S2?	END	END							♦	Grows alone or in small groups in deciduous forests. Prefers moist, well-drained soil and is often found along streams.	No	Yes, there is potential habitat in the woodland on Site. However, none were observed during the vegetation survey.
	American Ginseng	*Panax quinquefolius*	S2	THR	END							♦	Rich, undisturbed, mature sugar maple-dominated forest. Often on moist, yet well-drained, soil, often on limestone or marble bedrock	No	No, there are no sugar-maple forests on the Site.
	Broad Beech Fern	*Phegopteris hexagonoptra*	S3	SC	SC							♦	Rich, moist deciduous forests, often at bases of slopes, edges of seeps, and along streams	No	Yes, there are deciduous forests on the Site this species could utilize. However, none were observed during the vegetation survey.
	Eastern Prarie Finged Orchid	*Platanthera leucophaea*	S2	END	END							♦	Fens, limestone shorelines, wet mesic prairies and old fields	No	Yes, there are old fields on Site that this species could utilize. However, none were observed during the vegetation survey.
	White Prairie Gentian	*Gentiana alba*	S1	END	END							♦	Prairies, savannahs, woodlands and glades generally with drier soils and prolonged periods of sunlight	No	No, there is no suitable habitat on the Site.

BIRD	Bank Swallow	*Riparia riparia*	S4B	THR	THR	2005			♦				Nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on river banks, but can be found in sand and gravel pits.	No	No, there is no habitat on the Site for this species.
	Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR	2005	♦		♦				Can be found in tallgrass prairie, open meadows, hayfields, and dense grasses. They build their nests on the ground amongst the dense vegetation .	No	Yes, there are meadows on the Site for this species to utilize. However, none were observed during the vegetation survey.
	Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR	2005	♦		♦				Breed primarily in moderately tall grasslands such as pastures, hayfields and weedy borders of croplands, roadsides and other open areas.	No	Yes, there are meadows on the Site for this species to utilize. However, none were observed during the vegetation survey.
	Eastern Wood-Pewee	*Contopus virens*	S4B	SC	SC	2005			♦				Live in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundandtly found in intermediate-age mature forest stands with little understory vegetation.	No	Yes, there are forest edges that this species could utilize on the Site. However, none were observed during the vegetation survey.
	Common Nighthawk	*Chordeiles minor*	S4B	SC	SC	2005			♦				Rocky areas with little vegetation and clearings. Can use gravel roads, flat roofs, and fields. [3]	No	No, there is no suitable habitat for this species on the Site.
	Wood Thrush	*Hylocichla mustelina*	S4B	SC	THR	2005			♦				Lives in mature deciduous and mixed forests, seeking moist stands of trees with well-developed undergrowth and tall trees for perching. They prefer large forests, but will also use smaller stands of trees, building their nests in saplings, trees or shrubs, usually of Sugar Maple or American Beech.	No	Yes, there are moist stands of trees on the Site that this species could utilize. However, none were observed during the vegetation survey.
	Evening Grosbeak	*Coccothraustes vespertinus*	S4B	SC	SC	2005			♦				Open, mature mixed-wood forests dominated by fir species, White Spruce and or Trembling Aspen. Its abundane is linked to its primary prey of Budworm.	No	No, there is no suitable habitat for this species on the Site.
	Chimney Swift	*Chaetura pelagica*	S4B, S4N	THR	THR	2005			♦				Historically have nested on cave walls and in hollow trees, but are more likely to be found in urban settlements nesting in chimneys and manmade structures. They tend to stay close to water where flying insects congregate for foraging.	No	No, there is no habitat on the Site for this species.

BIRDS	Barn Swallow	*Hirundo rustica*	S4B	SC	SC	2005			♦				Nest along human-made structures such as open barns, under bridges and in culverts. Attracted to open structures to build their nests, including ledges. They prefer rough-cut wood structures as the mud nests adheres better.	No	No, there are no structures on the Site that this species could utilize.
	Eastern Whip-poor-will	*Caprimulgus vociferus*	S4B	THR	THR	2005			♦				Areas with a mix of open and forested areas such as savannahs, woodlands or openings in more mature deciduous, coniferous and mixed forests. It forages in open areas and uses forested areas for roosting.	No	Yes, there are woodlands, marshes and open areas that this species could utilize. However, none were observed during the vegetation survey.
	Olive-sided Flycatcher	*Contopus cooperi*	S4B	SC	SC	2001-2005			♦				Natural forest edge and openings. Tends to use forests that have been logged or burned that have ample snags. Breeds in coniferous or mixed forests adjacent to wetlands or rivers.	No	Yes, there are forest openings and edges near wetlands this species could utilize. However, none were observed during the vegetation survey.
INSECT	Monarch	*Danaus plexippus*	S4B	SC	SC	2019					♦		Caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adults forage on a variety of wildflowers and milkweed.	No	Yes, there is Milkweed and other wildflowers present on the SiteHowever, none were observed during the vegetation survey.
MAMMAL	Little Brown Bat	*Myotis lucifuga*	S4	END	END	-		♦					Roost in trees and buildings such as attics, abandoned builings and barns. Generally found in coniferous or deciduous forests along edge habitat, foraging in clearings near sources of water.	No	Yes, there are cavity trees and older homes on the property this species could utilize as nesting habitat. However, none were observed during the vegetation survey.
	Tri-coloured Bat	*Pipistrellus subflavus*	S3	END	END	-							Forms day roosts and maternity colonies in older forests but can also be found in barns or other structures. Forage over water along streams in the forest. Overwinter in caves from October-April.	No	Yes, there are cavity trees and older homes on the property this species could utilize as nesting habitat. However, none were observed during the vegetation survey.
	Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END	END	-							Roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines or hollow trees	No	Yes, there are cavity trees and older homes on the property this species could utilize as nesting habitat. However, none were observed during the vegetation survey.
	Northern Myotis	*Myotis septentrionalis*	S3	END	END	-							Roost under loose bark and in cavities of trees. Hibernate from October/November to March/April most often in caves or abandoned mines	No	Yes, there are cavity trees and older homes on the property this species could utilize as nesting habitat. However, none were observed during the vegetation survey.

SARO	Species at Risk Ontario (O. Reg. 230/08)
COSEWIC	Committee on the Status of Endangered Wildlife in Canada

COSEWIC Definitions

The federal review process is implemented by COSEWIC. They are an independent advisor panel to the MECP that meets twice a year to assess the status of wildlife species at risk of extinction

Endangered (END)	Species facing imminent extirpation or extinction
Threatened (THR)	Species likely to become endangered if nothing is done to reverse the factors leading to their extirpation or extinction
Special Concern (SC)	Species that may become threatened or endangered because of a combination of biolodical characteristics and identified threats
Extirpated (EXR)	Species which no longer exist in the wild in Ontario, but exist elsewhere in the world
DD	Data defficient
Not at Risk (NAR)	Not at risk

SARO Definitions

Provincial status from MECP

Endangered (END)	Species facing imminent extirpation or extinction
Threatened (THR)	Species likely to become endangered if nothing is done to reverse the factors leading to their extirpation or extinction
Special Concern (SC)	Species that may become threatened or endangered because of a combination of biolodical characteristics and identified threats
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DD	Data defficient
Not at Risk (NAR)	Not at risk

NHIC Srank (Subnational) Legend

S1	Critically imperiled, at very high risk of extirpation.
S2	Imperiled, at high risk of extirpation.
S3	Vulnerable, at moderate risk of extirpation.
S4	Apparently secure, at fairly low risk of extirpation.
S5	Secure, at low or no risk of extirpation.
B	Conservation status refers to breeding population.
N	Conservation status refers to non-breeding population.
SH	Possibly Extirpated

Subnational ranks are used by the NHIC to set protection priorties for rare and natural communities. Those ranksa re not legal designations and are only within the political boundaries of Ontario.

References

1 Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. Peterborough: Queen's Printer for Ontario.

2 Government of Canada. 2011. Species at Risk Public Registry: A to Z Species Index. Ottawa: Government of Canada. Accessed June 2024. http://sararegistry.gc.ca/sar/index/default_e.cfm.

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4 MNRF. 2024. Make a Map: Natural Heritage Areas. Accessed on August 2024 from https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage.Natural_Heritage&locale=en-CA

5 Ministry of the Environment, Conservation and Parks. 2018. Species at Risk in Ontario. Accessed June 2024. https://www.ontario.ca/page/species-risk-ontario#section-3.

6 Bird Studies Canada. 2022. Atlas Data Summary. Retrieved in August 2024 from Atlas of the Breeding Birds of Ontario: https://www.birdsontario.org/jsp/datasummaries.jsp

7 Alan Macnaughton, Ross Layberry, Rick Cavasin, Bev Edwards and Colin Jones. 2024. Ontario Reptile and Amphibian Atlas - Toronto Entomologists Association. Accessed August 2024 at: https://www.ontarioinsects.org/herp/

8 Alan Macnaughton, Ross Layberry, Rick Cavasin, Bev Edwards and Colin Jones. 2022. Ontario Butterfly Atlas - Toronto Entomologists Association. AccessedAugust 2024 at: www.ontarioinsects.org/atlas_online.htm

9 Oldham, M. J. and S. R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. 188 pp.

Table 2. Significant Wildlife Habitat Assessment	
Significant Habitat Type	**Site Assessment**
Seasonal Wildlife Concentration Areas	
Waterfowl Stopover and Staging Areas (Terrestrial)	No meadows with evidence of spring flooding found on the Site. **Unlikley SWH**
Waterfowl Stopover and Staging Areas (Aquatic)	Marsh communities were found on the Site. **Candidate SWH**
Shorebird Migratory Stopover Area	No shorelines present on the Site. **Not SWH**
Raptor Wintering Area	No forest communities greater than 20 ha are found within the Site. **Not SWH**
Bat Hibernacula	No caves or crevices are found within the Site. **Not SWH**
Bat Maternity Colonies	Snags were observed on the Site. **Candidate SWH**
Turtle Wintering Areas	No large, permanent water bodies are found within the Site. **Not SWH**
Reptile Hibernaculum	No rock piles or similar features observed on the Site. **Not SWH**
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	No large banks or cliffs observed on Site. **Not SWH**
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Wetlands are found on the Site. **Candidate SWH**
Colonially - Nesting Bird Breeding Habitat (Ground)	No rocky islands or peninsulas within lakes or large rivers found within the Site. **Not SWH**
Migratory Butterfly Stopover Area	Meadow communities over 10 ha in size are not found on the Site. **Not SWH**
Landbird Migratory Stopover Area	No woodlots greater than 10 ha and within 5 km of Lake Erie or Lake Ontario found on the Site. **Not SWH**
Deer Yarding Areas	No stratum I or II habitats were identfied on the Site. **Not SWH**
Deer Winter Congregation Area	No forested areas greater than 50 ha found on the Site. **Not SWH**
Rare Vegetation Communities or Specialized Habitat for Wildlife	
Cliffs and Talus Slopes	No cliffs or talus slopes found within the Site. **Not SWH**
Sand Barren	No sand barrens found within the Site. **Not SWH**
Alvar	No alvars found within the Site. **Not SWH**
Old Growth Forest	No old growth forest present on the Site. **Not SWH**
Savannah	No savannahs found within the Site. **Not SWH**
Tallgrass Prairie	No tallgrass prairies found within the Site. **Not SWH**
Other Rare Vegetation Communities	No other provincially rare plant communities are found within the Site. **Not SWH**
Specialized Habitat for Wildlife	
Waterfowl Nesting Area	Wetlands are found on the Site. **Candidate SWH**
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	No forests directly to shorelines are present. **Not SWH**
Woodland Raptor Nesting Habitat	No forested ecosites greater than 30 ha are found within the Site **Not SWH**
Turtle Nesting Areas	A watercourse with gravel and sand banks are present. **Candidate SWH**
Seeps and Springs	No seeps or springs observed within the Site. **Not SWH**
Amphibian Breeding Habitat (Woodland)	No wetlands, ponds, or woodlands with vernal pools within woodlands on the Site. **Not SWH**
Amphibian Breeding Habitat (Wetlands)	No wetlands with water are found on the Site. **Not SWH**
Woodland Area - Sensitive Bird Breeding Habitat	No forest over 60 years old and larger than 30 ha found within the Site. **Not SWH**
Habitat for Species of Conservation Concern (Not Including Endangered or Threatened Species)	
Marsh Bird Breeding Habitat	Marshes with swallow water was observed on the the Site. **Candidate SWH**
Open Country Bird Breeding Habitat	No large grassland areas bigger than 30 ha found within the Site. **Not SWH**
Shrub/Early Successional Bird Breeding Habitat	No shrub thickets greater than 10 ha found within the Site. **Not SWH**
Terrestrial Crayfish	No wet meadows or marshed on the Site and not terrestrial crayfish observed on the Site. **Not SWH**
Special Concern and Rare Wildlife Species	Black Ash was found on the Site. **Candidate SWH**
Animal Movement Corridors	
Amphibian Movement Corridors	No confirmed amphibian breeding habitat on the Site. **Not SWH**
Deer Movemnet Corridors	No deer movement corridors were identified on the Site. **Not SWH**

SWH Assessment Criteria

Unlikley: Refers to areas where it is generally considered that significant wildlife habitat is not present based on assessments or known criteria

Confirmed: Identfied as significant wildlife habitat based on thorough assessments and evidence that demonstrate the presence of important species or habitat features

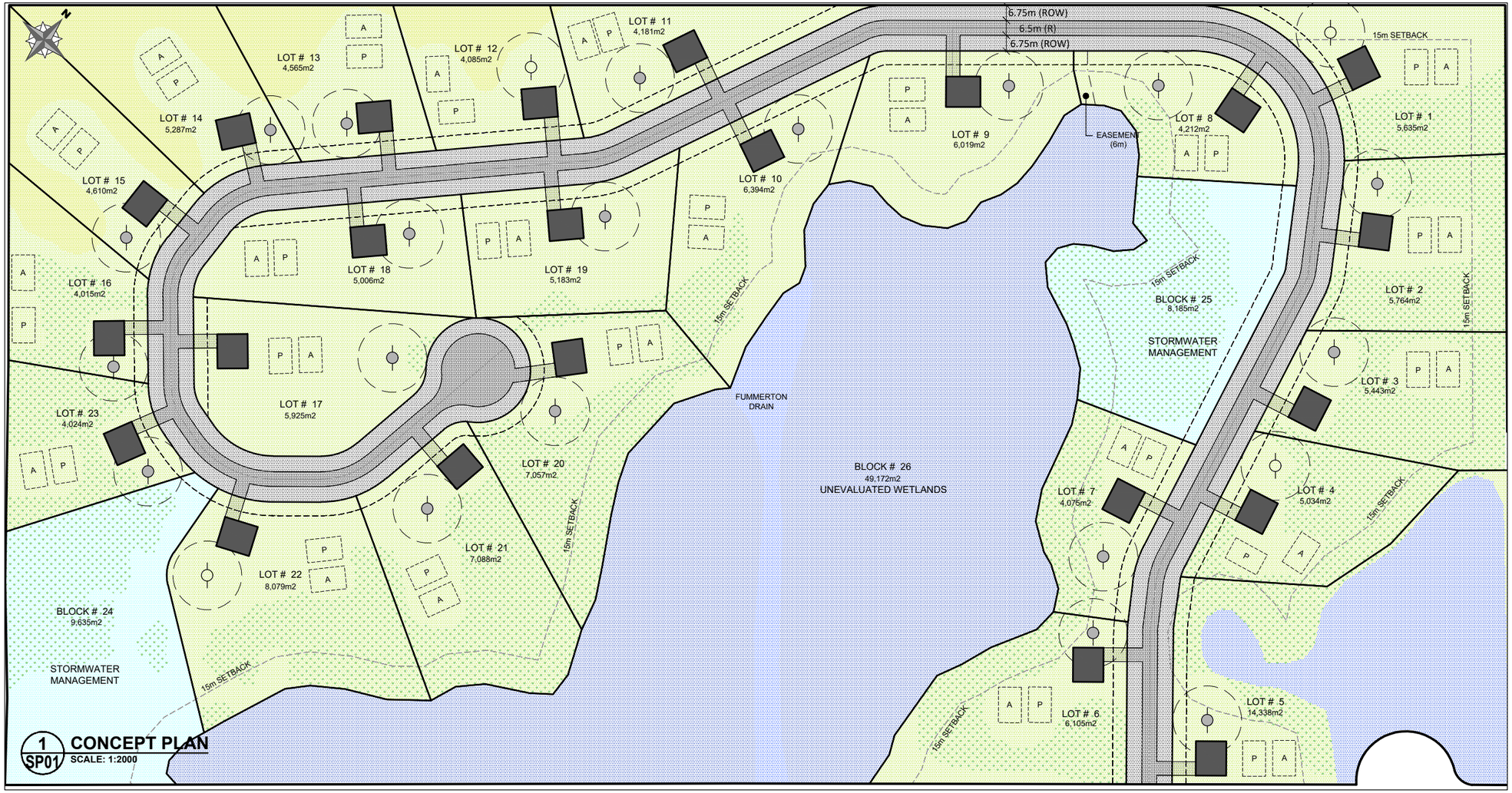
Not significant: refers to areas that have been assessed and found not to meet the criteria for significant wildlife habitat

References

Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Crieteria Schedules for Ecoregion 6E. Queen's Printer for Ontario

Ministry of Natural Resources and Forestry. 2000. Significant Wildlife Habitat Technical Guide. Peterborough, ON.

APPENDIX F
CONCEPTUAL SITE PLAN



1 SP01 **CONCEPT PLAN**
SCALE: 1:2000

2 SP01 **KEY PLAN**

LEGEND

- LOT
- UNEVALUATED WETLANDS
- FUMMERTON DRAIN
- ROAD
- STORM WATER MANAGEMENT
- ROW
- TREES
- FARM LAND
- LOT
- ROAD
- FRONTAGE
- 15m SETBACK FROM UNEVALUATED WETLANDS
- DWELLING
- P — PRIMARY SEPTIC
- A — ALTERNATIVE SEPTIC
- EXISTING WELL (15m SETBACK)
- PROPOSED WELL (15m SETBACK)

LOT	AREA (m²)	AREA (Hectare)	FRONTAGE (m)
LOT 1	5,635	0.56	85.48
LOT 2	5,764	0.58	76.97
LOT 3	5,443	0.54	50.7
LOT 4	5,034	0.50	70.61
LOT 5	14,338	1.43	90.49
LOT 6	6,105	0.61	71.63
LOT 7	4,075	0.41	85.17
LOT 8	4,212	0.42	127.18
LOT 9	6,019	0.60	92.41
LOT 10	6,394	0.64	90.05
LOT 11	4,181	0.42	123.94
LOT 12	4,085	0.41	64.99
LOT 13	4,565	0.46	60.39
LOT 14	5,287	0.53	47.51
LOT 15	4,610	0.46	45.57
LOT 16	4,015	0.40	48.97
LOT 17	5,925	0.59	52.09
LOT 18	5,006	0.50	99.94
LOT 19	5,183	0.52	97.30
LOT 20	7,057	0.71	74.13
LOT 21	7,088	0.71	60.65
LOT 22	8,079	0.81	67.14
LOT 23	4,024	0.40	74.41
BLOCK 24	9,635	0.96	16.67
BLOCK 25	8,185	0.82	120.95
BLOCK 26	49,172	4.92	
TOTAL	199,116	19.91	
AVERAGE	5,998	0.60	

P² concepts
2200 THURSTON DR., UNIT 203
OTTAWA, ONTARIO, K1G 6E1

No.	REVISIONS	DATE
05	ISSUED FOR COUNTY APPROVAL	2025-01-13
04	ISSUED FOR COORDINATION	2024-12-13

PROJECT
DOUGLAS LANDING

DRAWING TITLE
CONCEPT PLAN

DATE
2025-01-13

PROJECT
0606

SP01