Natural Environment Level 1 and 2 Technical Report

Proposed Teedon Pit Extension

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PROPOSED TEEDON PIT EXTENSION
NATURAL ENVIRONMENT LEVEL 1 AND 2 TECHNICAL REPORT

GOODBAN ECOLOGICAL CONSULTING INC.

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1.0 INTRODUCTION

1.1 Background

In March 2012, Cedarhurst Quarries and Crushing Limited. submitted a Township of Tiny Official Plan Amendment and Zoning By-law Amendment and a Ministry of Natural Resources and Forestry (MNRF) Class A Category 3 pit application to permit an extension to the existing Teedon Pit. The subject site is located on the North ½ of Lot 80, Concession 1 W.P.R. and Part of the original road allowance between Lots 80 and 81, Concession 1 W.P.R., Geographic Township of Tiny, County of Simcoe (**Figure 1**).

The original Natural Environment report was completed by the Lindsay Environmental Services Group (LESG). This report was peer reviewed by the Severn Sound Environmental Association on behalf of the Township. The Severn Sound Environmental Association signed-off on the application in November 19, 2014. **Attachment A** summarizes the Township's peer review process:

1. SSEA letter, June 25, 2012
2. SSEA letter, October 31, 2012
3. SSEA letter, April 16, 2013
4. SSEA letter, June 11, 2013
5. SSEA letter, February 27, 2014
6. SSEA letter, July 22, 2014
7. SSEA letter, October 15, 2014
8. SSEA letter, November 19, 2014

In May 2017, CRH Canada Group Inc. acquired the existing Teedon Pit and the Teedon Pit Extension land. CRH has assumed responsibility of the Aggregate Resources Act application on behalf of Cedarhurst Quarries and Crushing Limited. CRH retained Goodban Ecological Consulting Inc. (GEC) to complete additional site investigations to supplement the natural heritage information prepared by Lindsay Environmental Group and to prepare an updated Natural Environment Technical Report.

As a result of CRH's review and this updated Natural Environment Technical Report, CRH is proposing to further reduce the licence area to 15.3 hectares and the extraction area to 13.5 hectares. This is a 64 % reduction of the original licensed area and 65% reduction in the original extraction area that was submitted in 2012. **Figure 2** illustrates the revisions made to the application since it was originally submitted in 2012.

This Natural Environment Technical Report has been prepared to incorporate the previous work completed by Lindsay Environmental Group, the additional site investigations completed by GEC, the reduced extraction area and incorporates the required mitigation resulting from the Severn Sound Environmental Association review process.

1.2 Natural Environment Level 1 and 2 Technical Report Requirements under the Aggregate Resources Act (ARA)

Under the *Aggregate Resources Act* there is a requirement to complete a Natural Environment Level 1 study and also a Natural Environment Level 2 study where significant natural features are identified within 120 m of the site during the Level 1 investigations.

The requirements for a Natural Environment Level 1 study are:

> *Determine whether any of the following features exist on and within 120 m of the site: significant wetland, significant portions of the habitat of endangered and threatened species, fish habitat, significant woodlands (south and east of the Canadian Shield), significant valley lands (south and east of the Canadian Shield), significant wildlife habitat, and significant areas of natural and scientific interest* (MNR 1997).

The requirements for a Natural Environment Level 2 study are:

> *Impact assessment where the Level 1 study identified any features on or within 120 m of the site in order to determine any negative impacts on the natural features or ecological functions for which the area is identified, and any proposed preventative, mitigative, or remedial measures* (MNR 1997).

Policy 2.01.07 compiled by the Lands and Waters Branch of the Aggregate and Petroleum Resources Section of MNR (2006) summarizes the guiding principles of a Natural Environment Report:

> *The purposes of the Natural Environment report are to determine the presence of significant natural heritage features/areas and fish habitat in accordance with the Provincial Policy Statement 2005, and to ensure that any necessary preventative, mitigative or remedial measures are undertaken for their protection.*

The Provincial Policy Statement (2014) is now in effect. Key natural heritage policies include 2.1.4 and 2.1.5, as follows:

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

  a) *significant wetlands* in Ecoregions 5E, 6E and 7E1; and

  b) *significant coastal wetlands*.

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

  a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;

  b) *significant woodlands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

  c) *significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

  d) *significant wildlife habitat*;

  e) *significant areas of natural and scientific interest*; and

  f) *coastal wetlands* in Ecoregions 5E, 6E and 7E1 that are not subject to policy 2.1.4(b)

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

The following are significant natural heritage features listed above that could potentially occur in the local area:

- Habitats of Endangered Species and Threatened Species
- Significant Wetlands in Ecoregion 6E
- Significant Woodlands in Ecoregion 6E
- Significant Valleylands in Ecoregion 6E
- Significant Wildlife Habitat
- Significant Areas of Natural and Scientific Interest (ANSI)

1.3 Organization of this Report

This Natural Environment Level 1 and 2 Technical Report is organized under the following headings:

- 2.0 Level 1 Report
- 3.0 Conclusions and Recommendations
- 4.0 Introduction to the Level 2 Report
- 5.0 Existing Conditions
- 6.0 Habitat of Endangered Species and Threatened Species
- 7.0 Significant Woodlands
- 8.0 Significant Wildlife Habitat
- 9.0 Summary of Significant Natural Heritage Features
- 10.0 Description of the Proposed Extraction, Operational Plan, Forest Edge Management Plan and Rehabilitation Plan
- 11.0 Potential Effects on Significant Natural Heritage Features
- 12.0 Summary and Conclusions
- 13.0 Literature Cited

2.0 LEVEL 1 REPORT

2.1 Level 1 Methods

The study area is defined as the proposed licensed area and the surrounding 120 m (adjacent lands), as shown on **Figure 4**. The Level 1 assessment involved a review of available background information and ecological field surveys in 2018. The details of the field surveys are provided below in **Section 4.1**.

Background information sources included the following:

- Lindsay Environmental Services Group (LESG). 2011, revised 2015. Environmental Impact Statement and Natural Environment Level 1 and 2 Technical Report.
- Schedules from the County of Simcoe and Township of Tiny Official Plans.
- Lands Information Ontario (LIO) mapping.
- Natural Heritage Information Centre (NHIC) database.

2.2 Significant Wetlands and Significant Coastal Wetlands

A review of Land Information Ontario (LIO) natural heritage mapping indicates that there are no Significant Wetlands within the study area. Schedule 5.2.2 (Streams and Evaluated Wetlands) of the County of Simcoe Official Plan and Schedule B (Natural Features) of the Township of Tiny do not show any evaluated wetlands within kilometres of the study area.

Because the property is distant from the shorelines of the Great Lakes, there are no Significant Coastal Wetlands present.

2.3 Habitat of Endangered Species and Threatened Species

Cerulean Warbler (Threatened) was recorded from approximately 100 m north of the licence boundary during the June 6, 2018 breeding bird survey. It was not recorded during the second breeding bird survey on June 28, 2018.

Forked Three-awned Grass (Endangered) was recorded by GEC in 2018 from a disturbed area on the licensed property immediately south of the extension property.

Cerulean Warbler and Forked Three-awned Grass will be discussed further as part of the Level 2 Report below.

2.4 Fish Habitat

There are no watercourses within the study area. There is no fish habitat within the study area.

2.5 Significant Woodlands

As shown on **Figure 3**, a portion of the proposed licensed area is mapped as part of the County of Simcoe's Greenlands System on Schedule 5.1 (Land Use) in the Official Plan. The entire proposed licensed area is mapped as Significant Woodland on Schedule B (Natural Features) of the Township of Tiny Official Plan.

Significant Woodlands will be discussed further as part of the Level 2 Report below.

2.6 Significant Valleylands

No Significant Valleylands have been identified within the study area.

2.7 Significant Wildlife Habitat (SWH)

The only Significant Wildlife Habitat (SWH) or "areas" that are identified on the Township of Tiny Official Plan Schedule B are Deer Wintering Areas. A Deer Wintering Area is identified to the north of the study area, i.e. just beyond the 120 m adjacent lands boundary.

Based on GEC's 2018 breeding bird surveys and consideration of the Significant Wildlife Habitat Technical Guide (MNRF 2000), Natural Heritage Reference Manual 2nd Edition (MNRF 2010) and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E, an area located north and west of the proposed licensed area is identified as Significant Wildlife Habitat (SWH) for woodland area-sensitive breeding bird habitat and Special Concern bird species.

The area mapped on **Figure 8** as candidate SWH for woodland area sensitive bird species is habitat for the following 7 area sensitive bird species listed in the Ecoregion Criteria Schedules:

1. Cerulean Warbler
2. Black-throated Blue Warbler
3. Black-throated Green Warbler
4. Ovenbird
5. Scarlet Tanager
6. Veery
7. Yellow-bellied Sapsucker

The woodlands are mature and form part of a much larger forest patch. MNRF recommends identifying SWH for woodland area-sensitive breeding bird habitat when the presence of nesting or breeding pairs of 3 or more of the listed bird species is confirmed. In this case, 7 of the listed area sensitive bird species were identified during the breeding season.

The same woodland area is mapped on **Figure 8** as SWH for breeding habitat of special concern bird species. This area was determined to be the best habitat for Eastern Wood Peewee and Wood Thrush within the study area.

Significant Wildlife Habitat will be discussed further as part of the Level 2 Report below.

2.8 Significant Areas of Natural and Scientific Interest

There are no Areas of Natural and Scientific Interest (ANSI) within the study area, based on a review of Lands Information Ontario (LIO) mapping.

Schedule 5.2.3 of the County of Simcoe Official Plan does not show any ANSI's within kilometres of the study area.

3.0 LEVEL 1 CONCLUSIONS AND RECOMMENDATIONS

Of the six potential natural heritage features that are identified under the PPS, 2014 and listed above in **Section 1.2**, three occur on or adjacent to the proposed licensed area. These are as follows:

- Habitat of Endangered Species and Threatened Species;
- Significant Woodlands; and,
- Significant Wildlife Habitat.

The features and functions of these three types of natural heritage features must be described in more detail in the Level 2 report that is presented below. In addition, the proposed gravel pit must be described and its potential effects upon these features and their functions must be discussed.

PART 2: LEVEL 2 REPORT

4.0 INTRODUCTION TO THE LEVEL 2 REPORT

The Level 1 report determined that a Level 2 report is required and that it should identify the significant features and functions associated with the Habitat of Endangered Species and Threatened Species, Significant Woodlands and Significant Wildlife Habitat.

The Level 2 report summarizes the methods that were undertaken to complete the analysis, presents the results of botanical and wildlife inventories, characterizes the significant features and functions of the natural heritage features, summarizes the proposed extraction and rehabilitation of the pit, and analyzes the potential impacts of the proposed pit on the significant natural heritage features. The final section of the report identifies mitigation measures required to minimize impacts and presents a summary of the report and its conclusions.

4.1 Level 2 Methods

4.1.1 Vegetation

Surveys of vegetation and flora were completed by Mr. Anthony Goodban on May 8, August 31, October 16 and November 1, 2018.

Vegetation communities were classified and mapped following Lee et al.'s (1998) *Ecological Land Classification for Southern Ontario: A First Approximation* and the updated *Vegetation Type List* (Lee 2008).

Vascular plant species status was assessed for Ontario (Oldham and Brinker 2009) and the County of Simcoe (Reznicek 1986, as listed in Riley 1989).

4.1.2 Wildlife

Breeding bird surveys were completed on June 6 and 28, 2018 by T. Hoar. Breeding birds were surveyed by 5-minute stationary point counts following the Second Ontario Breeding Bird Atlas methodology (Cadman et al. 2007). The locations of the 12 point count stations are shown on **Figure 6a**. Between point counts, a slow wandering transect was conducted through natural habitat areas on the site and all birds were recorded to supplement the point count. All species and daily numbers of individuals were recorded during each of the site visits.

The breeding bird codes from the Ontario Breeding Bird Atlas (Cadman et al. 2007) were not used in this study because they are not appropriate for a more intensive study on a small site. The purpose of the Atlas is to determine the highest level of breeding evidence in 10- by 10-km squares. Birds seen within a square of this size have a good probability of nesting somewhere in the square provided that suitable habitat is present. However, the application of these codes to a small site can result in an incorrect assessment of the breeding status of a species. As an example, if a Barn Swallow was observed at the site on more than two occasions and more than a week apart, then according to the Atlas project this would qualify it as a probable breeder,

even though there is no suitable nesting habitat for it onsite or nearby. All bird species that were located on the proposed license area and adjacent lands were recorded. A conservative approach was adopted for the surveys and all species were considered to be breeding unless there was convincing evidence to the contrary.

The June 6, 2018 survey extended from 0730 to 1020 hours. Weather conditions were mostly cloudy, with winds of 1 to 2 on the Beaufort wind scale and temperature 9 to 11°C. The June 28, 2018 survey extended from 0800 to 1055 hours. The weather was a mix of sun and cloud, wind initially 2 on the Beaufort wind scale, becoming 3 later in the survey, and temperature 18 to 21°C.

An Eastern Whip-poor-will nocturnal survey was completed on July 4-5 2018. That night the moon was 68.9% illuminated. The survey extended from 2350 to 0230 hours. The weather was clear, wind was 1 on the Beaufort wind scale and temperature 25 to 24°C. Twenty-three (23) listening stops (3 minutes each) were made at the locations shown on **Figure 6b**.

4.1.3 Input to Proposed Extraction Footprint, Operational Plan and Rehabilitation Plan

GEC attended a site meeting with CRH Canada Group Inc. staff on November 1, 2018 to review the proposed extraction footprint in the field. GEC proposed the extraction footprint and setbacks shown on **Figure 9**.

GEC also provided input to the ARA Site Plans, in particular the Operational Plan (Sheet 2 of 4) and Rehabilitation Plan (Sheet 3 of 4). Site Plan details were provided by GEC for the timing of tree clearing, the Forest Edge Management Plan, reforestation of the 5 m setback and reforestation of side slopes.

5.0 EXISTING CONDITIONS

5.1 Terrain Setting

5.1.1 Physiography, Surficial Geology, and Soils

The study area is located in MNRF's Ecodistrict 6E-6 and the Simcoe Uplands physiographic region. Ontario Research Foundation Map 2226 *Physiography of the South Central Portion of Southern Ontario* shows the study area as a till plain with shorecliffs at the west end, set within a broader, lower-lying sand plain.

The study area is mainly an ice-contact stratified drift deposit with the west end falling steeply down to a glaciolacustrine plain situated just west of the study area boundary. The aggregate deposit is identified as a high potential mineral aggregate resource area (sand and gravel resources) on Schedule 5.2.4 of the County of Simcoe Official Plan. The deposit is primarily sand with around 35% gravel.

The land is highest along the south boundary of the proposed license area in the central section, at around 294 mASL. Further east the land drops fairly rapidly from 290 mASL down to around 260 mASL at the east limit of the study area. At the west end, the land gradually slopes down to west from around 290 mASL to 286 mASL, and then drops rapidly down to 260 mASL beyond the west limit of the study area.

The soils are mainly Vasey sandy loam (steep phase) which is derived from light grey, calcareous and non-calcareous till (Hoffman et al. 1962). Topography varies from smooth, moderately to steeply sloping. The soils are moderately to very stony. Surface reaction is slightly to medium acid. The open porous character of the soils and rolling topography provide good drainage (Hoffman et al. 1962).

5.1.2 Hydrology and Hydrogeology

Surface drainage within the study area is westward, northward and eastward. There are no surface watercourses within the study area, but there is a defined seasonal surface flow path the drains from the sump pond on the existing Teedon Pit northeastwards and then eastwards to Highway 93 and beyond.

The established water table is estimated by GHD (2018) on their Figure 5 (Maximum Observed Groundwater Elevation Contours) to vary from 238 mASL at the east end of the study area, down to 236 mASL at the west end of the study area.

Within the study area the only surface water feature is the sump pond on the existing Teedon Pit to the south, a portion of which just falls within the 120 m adjacent lands. The sump pond is underlain by a local aquitard, Thorncliffe silt and clay (GHD 2018: Figures 2 and 3).

5.1.3 Landscape Setting

Figure 1 shows the location of the proposed licensed area within the local landscape. The proposed Teedon Pit Extension is situated immediately north of the existing Teedon Pit. The nearest roads are Stamp Sideroad to the north, Marshall Road and Carpenter Sideroad to the northwest, Darby Road and Highway 93 to the east and Vasey Road far to the south.

The County of Simcoe identified a section of Greenlands within the study area identified as Tiny-Tay Peninsula (TTP4), Wye River Valley. Most of the proposed licensed property is part of a 353.7 ha woodland (part of TTP4). LSEG (2015) reported that the size of the Wye River watershed is 21343.5 ha and forest cover in 2011 was 7205.7 ha, or 33.8% of the total watershed area. Mature upland forests in the local area are mainly Sugar Maple and Sugar Maple - Red Oak stands.

5.2 Aquatic Habitat

The only aquatic feature is the sump pond on the existing Teedon Pit, which was excavated by the previous operator for operational purposes. There are no other aquatic habitats within the study area.

5.3 Terrestrial Habitat

5.3.1 Vegetation Communities

Summary descriptions of vegetation communities observed within the study area are provided in **Table 1**. Vegetation community polygons are mapped on **Figure 5**. A series of representative site photographs taken by GEC during 2018 are presented in **Attachment B**.

Much more than half of the study area was previously in agricultural use (hay/pasture), as clearly shown on the 1954 air photo (see **Figure 7**). The entire proposed license area is former agricultural land. The proposed extraction area includes the following vegetation communities:

FODM5-1a	Dry – Fresh Sugar Maple Deciduous Forest Type
FODM5-1b / TAGM1-1f	Dry – Fresh Sugar Maple Deciduous Forest Type / Coniferous Plantation (Scots Pine)
FODM5-3a	Dry – Fresh Sugar Maple – Oak Deciduous Forest Type
FODM11a	Naturalized Deciduous Hedgerow Ecosite
FODM11c	Naturalized Deciduous Hedgerow Ecosite
TAGM1-1a	Coniferous Plantation (Red Pine)
TAGM1-1b	Coniferous Plantation (Red Pine)
THCM1a	Dry - Fresh Mixed Regeneration Thicket Ecosite
THMM1a	Dry - Fresh Mixed Regeneration Thicket Ecosite
THDM2a	Dry-Fresh Deciduous Shrub Thicket Ecosite
THDM2-1a	Sumac Deciduous Shrub Thicket Type
MEGM3a	Dry - Fresh Graminoid Meadow Ecosite

Within the proposed extraction area the deciduous forest patches (FODM5-1a, FODM5-1b, FODM5-3a) are all very young stands of Sugar Maple (*Acer saccharum* ssp. *saccharum*) with some Red Oak (*Quercus rubra*), which have become established on former agricultural land. The conifer plantations range in age from 20 to 35 years old. There is virtually no native tree regeneration or native groundcover plants evident in Unit TAGM1-1a, which covers 4.41 ha (see **Attachment B: Photos 20** to **23**). Other vegetation within the proposed extraction area includes scrubby thickets, old field and remnant hedgerows (see **Attachment B: Photos 27** to **31**).

Mature and higher quality Sugar Maple - Red Oak forest stands occur to the northwest (FODM5-3c) and west (FODM5-3b) of the proposed extraction area. In these areas there are a number of trees more than 100 years old and the ground flora is species rich, relative to the rest of the study area. There are some signs of past cutting but none appear recent. These stands have a mix of age classes. Unit FODM3-5b occurs on west-facing slopes that are deeply incised and have complex topography. North of the proposed license area Unit FODM5-3c has some natural canopy gaps where large mature trees have fallen down. See **Attachment B: Photos 10** to **17**.

Units FODM5-3b and FODM5-3c are considered by GEC to be examples of *primary woodland*, which is defined here as a woodland occupying a site which has been continuously wooded even though it may have been clear-cut, provided that the clear-cutting does not break the woodland continuity (i.e. the woodland regenerated). **Figure 7** (1954 aerial photograph) clearly shows that Units FODM5-3b and FODM5-3c contained mostly mature deciduous forest at that time. **Figure 8** shows the *primary woodland* boundary interpreted by GEC from the 1954 aerial photography and 2018 field observations. The areas identified as *primary woodland* generally comprise mature forest with a more intact native ground flora, relative to the rest of the study area.

Wetland features are limited to a tiny patch of deciduous swamp (SWDM4a) dominated by Trembling Aspen (*Populus tremuloides*), which barely extends in the east end of the study area (see **Figure 5**) and is more than 100 m away from the proposed extraction area. This swamp receives some water from Pond A during high water periods. It contained little standing water on May 8, 2018 (see **Attachment B: Photo 32**). A portion of Pond A falls within the study area, in the existing Teedon Pit. Pond A is the Sump Pond that is part of the pit operation (see **Attachment B: Photo 19**). Pond B is a smaller dug pond downstream of Pond A and it has a fringe of Narrow-leaved Cattail (*Typha angustifolia*)(see **Attachment B: Photo 33**).

5.3.2 Plant Species

A checklist of the vascular plants recorded during the 2010-2011 field surveys by LESG (2015) and during the 2018 field surveys by GEC is provided in **Attachment C**. A total of 237 vascular

plant species have been recorded to date. Fifty (50) taxa, or 21.1% of the flora, are considered non-native and introduced to southern Ontario.

With one exception, all of the vascular plant species recorded during the field surveys are common and widespread in southern and south-central Ontario. Forked Three-awned Grass (*Aristida basiramea*) was found by GEC in 2018 in a disturbed area on the existing Teedon Pit. This species is Endangered in Ontario and it is ranked S2 by the Natural Heritage Information Centre (NHIC). Forked Three-awned Grass is discussed further in **Sections 6.2.1** and **11.1**. Most of the plant species with more conservative habitat requirements, i.e. those with Coefficient of Conservatism (CC) values of 6 or higher, are associated with the forest communities identified as *primary woodlands* (FODM5-3b, FODM5-3c).

5.4 Wildlife

Amphibians and Reptiles

During the 2010-2011 field surveys by LESG and 2018 field surveys by GEC, the following amphibian species were recorded: Wood Frog, Spring Peeper, Northern Leopard Frog, American Toad, Gray Treefrog and Green Frog. The Northern Leopard Frogs and Green Frogs were observed in the sump pond on the existing Teedon Pit. Wood Frog, Spring Peeper and Gray Treefrog were seen and/or heard at the far east end of the study area, associated with the wetland that is mostly outside of the study area (i.e. Unit SWD4a on **Figure 5**).

No snakes or turtles were observed during the field surveys.

Breeding Birds

A checklist of birds recorded during the 2010-2011 field surveys by LESG (2015) and the 2018 breeding bird surveys by GEC is provided in **Attachment D**. Point count data from the 2018 surveys are provided in **Attachment E**.

During the 2010-2011 LESG field surveys a total of 30 bird species were recorded. Dark-eyed Junco, Golden-crowned Kinglet, Hairy Woodpecker, Hermit Thrush and Ruby-crowned Kinglet were recorded by LESG in 2010-2011, but not recorded during the 2018 breeding bird surveys; most are either migrants or winter residents.

A total of 49 bird species were observed during the 2018 breeding bird surveys by GEC. Of the 48 species observed, only Ring-billed Gulls are considered non-breeders. The most widespread species were Red-eyed Vireo, Ovenbird, Wood Thrush, American Robin, and Song Sparrow. The most abundant species were Red-eyed Vireo, Ovenbird, Wood Thrush, American Robin, and Eastern Wood-pewee. The relative intact mature deciduous forest on the adjacent property to the north and the mature Sugar Maple - Red Oak dominated forest on the west side of the property contribute to this species makeup.

Seven (7) area-sensitive bird species listed in the Ecoregion Criteria Schedules for Ecoregion 6E were recorded from the mature forests to the northwest and west of the proposed license area in 2018: Cerulean Warbler, Black-throated Blue Warbler, Black-throated Green Warbler, Ovenbird, Scarlet Tanager, Veery and Yellow-bellied Sapsucker. Area-sensitive bird species are discussed further in **Sections 8.2.2** and **11.3**.

Cerulean Warbler is listed as Threatened in Ontario. A Cerulean Warbler was recorded on adjacent property more than 100 m north of point count station 5 (see **Figure 6**) during the first

survey on June 6, 2018. It was not recorded during the second survey on June 28, 2018. Cerulean Warbler was considered a breeding species on the adjacent property but a non-breeder within the proposed license area. Cerulean Warblers require mature deciduous forest as habitat, within which they nest in/around canopy gaps (i.e. where a tree has fallen). The singing Cerulean on the adjacent property was located within one of those canopy gaps. Protecting the mature canopy on the west side of the property will allow for this species to breed here when an over mature tree dies/falls. Cerulean Warbler is discussed further in **Sections 6.2.2** and **11.1**.

Eastern Wood Pewee is listed as Special Concern in Ontario. Within the study area this species is widespread within the mature forests located northwest and west of the site. One singing individual was recorded on both visits calling from a mixed forest area immediately adjacent to the active pit. Eastern Wood Pewee is discussed further in **Sections 8.3** and **11.3**.

Wood Thrush is listed as Special Concern in Ontario. The species is widespread within the study area this species was widespread within the mature forests. It was readily found in the far west areas of the property and on the adjacent property to the north. Wood Thrush is discussed further in **Sections 8.3** and **11.3**.

Mammals

During the 2010-2011 field surveys by LESG and 2018 field surveys by GEC, the following mammal species were recorded: Coyote, Eastern Chipmunk, Eastern Cottontail, Eastern Gray Squirrel, Northern Raccoon, Red Fox, Red Squirrel and White-tailed Deer.

Other Wildlife

Seven (7) Monarch (*Danaus plexippus*) butterflies were observed by GEC during the 2018 field surveys.

6.0 HABITAT OF ENDANGERED SPECIES AND THREATENED SPECIES

6.1 Site Screening for Endangered Species and Threatened Species

Lindsay Environmental Services Group (LESG 2015) conducted an initial screening for Endangered and Threatened Species circa 2011, as documented in their Table 4 which assessed Endangered, Threatened and Special Concern species with ranges that overlap with their larger study area. LESG identified a single Butternut (*Juglans cinerea*) sapling located close to Darby Road; Butternut is Endangered in Ontario. This sapling is located more than 400 m east of the east limit of the current 120 m study area boundary. LESG (2015) stated that no other Endangered or Threatened species where found on the property or in the 120 m adjacent lands of their larger study area.

GEC adapted LESG's Table 4 and updated it to reflect changes to species status and other new information, as presented in **Table 2** of this report. This species at risk screening and consultation with MNRF served to focus GEC's 2018 field survey efforts. Appropriately-timed detailed searches for American Ginseng, Butternut and Forked Three-awned Grass were completed during the growing season. Breeding bird surveys included point count stations and wandering transects in the mature deciduous forests that had potential to support Cerulean Warbler and other area-sensitive breeding bird species. A nocturnal survey for Eastern Whip-poor-will was completed on July 4, 2018, when the moon was 68.9% illuminated.

6.2 Confirmed Endangered Species and Threatened Species

During the 2018 field surveys by GEC, one endangered species and one threatened species were observed on adjacent lands. No Endangered or Threatened species were observed within the proposed licensed area.

6.2.1 Forked Three-awned Grass (*Aristida basiramea*) - Endangered

Staff from CRH Canada Group Inc. and their consultants met with MNRF Midhurst District staff on October 9, 2018. At the meeting Ms. Jodi Benvenuti (MNRF Management Biologist) recommended that GEC check areas of suitable habitat (i.e. trail edges, gaps in plantations, disturbed areas) for the presence of Forked Three-awned Grass (*Aristida basiramea*), which is a late-flowering annual grass species. Ms. Benvenuti noted that Forked Three-awned Grass occurs at the Huronia Airport, which is located 8 km northwest of the study area. She also noted that this species is often associated with relict beach features associated with post-glacial Lake Algonquin. Interestingly, the steep slopes at the west end of the study area are former beach features of Lake Algonquin, which had a higher water level than present day Lake Huron.

GEC assiduously searched all areas of suitable habitat for Forked Three-awned Grass within the study area on October 17, 2018. Approximately 100 Forked Three-awned Grass plants were found by GEC in a disturbed area at the edge of the active Teedon Pit, south of the proposed licensed area. This population was growing in a sandy area that had been stripped of topsoil decades ago (judging from the size/age of woody species growing on nearby spoil piles). There is scattered regeneration of stunted Red Pine (*Pinus resinosa*), Scots Pine (*Pinus sylvestris* +), White Birch (*Betula papyrifera*) and Balsam Poplar (*Populus balsamifera*). The groundcovers are sparse and include Canada Blue Grass (*Poa compressa* +), Poverty Oat Grass (*Danthonia spicata*), Sand Dropseed (*Sporobolus cryptandrus*), Gray Goldenrod (*Solidago nemoralis*), Ensheathed Dropseed (*Sporobolus neglectus*), Showy Tick-trefoil (*Desmodium canadense*), Umbel-like Sedge (*Carex* cf. *tonsa* var. *rugosperma*) and knapweeds (Centaurea spp. +).

CRH Canada Group Inc. has registered the existing Teedon Pit under Ontario Regulation 242/08, Section 23.14 (Pits and Quarries), for the Endangered Forked Three-awned Grass. A Mitigation Plan for Forked Three-awned Grass is in preparation and implementation will commence in time for the 2019 mining season. In the interim, CRH staff and GEC visited the site on November 1, 2018 and the disturbed area containing the Forked Three-awned Grass was marked with wooden stakes and pink flagging tape. Pit operations staff were instructed to avoid this area in order to prevent any inadvertent disturbance.

6.2.2 Cerulean Warbler (*Dendroica cerulea*) - Threatened

As described above in **Section 5.4**, a Cerulean Warbler was observed singing on adjacent property more than 100 m north of point count station 5 (see **Figure 6**) during the first breeding bird survey on June 6, 2018. It was not recorded during the second survey on June 28, 2018. Cerulean Warbler was considered a breeding species on the adjacent property but a non-breeder within the proposed license area. The singing Cerulean on the adjacent property was located at a canopy gap created by the downing of a large tree.

Ninety-five (95) percent of the Canadian population of the Cerulean Warbler is in Ontario, within two main geographic clusters. One cluster is in the Carolinian Zone of southwestern Ontario

and the other extends from southeastern Georgian Bay eastwards along the contact line with the Canadian Shield to the Frontenac Axis (Francis 2007).

The main breeding habitat for Cerulean Warbler is typically described as large, mature deciduous forest, with structurally mature hardwood species in mesic or floodplain conditions containing a closed or semi-open canopy (COSEWIC 2010). In the upper Great Lakes, Cerulean Warblers are mainly associated with large, dry, upland forests embedded within a larger matrix of forested wetlands (COSEWIC 2010; Thogmartin *et al*. 2004). Cerulean Warblers in Ontario typically prefer mature deciduous forest dominated by oak-maple, often in association with swampy bottomlands (COSEWIC 2010). On the breeding grounds, the Cerulean Warbler feeds mainly on Homopterans, Lepidopterans (larvae), Dipterans and Coleopterans (Hamel 2000). The parents feed larval Lepidopterans to nestlings and fledglings.

The Cerulean Warbler exhibits high site fidelity throughout its range. This species often nests in loose colonies, probably due to conspecific attraction (COSEWIC 2010). Average territory size has been estimated between 0.7 ha to 1.0 ha, using various estimation techniques (COESWIC 2010). Cerulean Warblers strongly prefer certain microhabitats within their territories. Territories usually have large diameter trees with tall canopies, and they tend to avoid areas with a dense understory (COSEWIC 2010). It appears that canopies showing a heterogeneous forest structure (e.g., foliage stratification, gap distribution, tree species distribution) may be important in predicting breeding habitat suitability (Barg 2002). The territorial activity of Cerulean Warblers seems to be concentrated in core areas associated with forest canopy gaps that have a somewhat broken spatial distribution of singing post trees (COSEWIC 2010). Males are usually selective in terms of singing posts, preferring large trees (COSEWIC 2010). Individuals spend the majority of their time foraging and singing above the middle of trees, but not right at the top (Robbins et al. 1992).

The occurrence within the study area fits well with the habitat descriptions provided above. The habitat is a relatively mature Sugar Maple - Red Oak forest and the male was singing at a canopy gap created by the downing of a large tree. Considering the average territory size of the Cerulean Warbler (0.7 to 1.0 ha) and that the species was only recorded on one occasion within the study area on one of the two breeding bird surveys, this suggests that it occurs at quite low densities in the local area. One of the higher densities of breeding Cerulean Warblers in Ontario occurs in the Awenda - Coldwater area, and this 2018 record from the study area is likely related to that population.

As noted above, the preferred breeding habitat of the Cerulean Warbler is mature deciduous forest with well-spaced large trees and high canopies. Diameter-cut forest harvesting removes most of the mature trees and reduces the tall canopy cover. The creation of young even-aged stands through short harvest rotations degrades and reduces the available habitat for Ceruleans, reducing productivity and survival. This is especially problematic when the high site fidelity of the species is also considered. Potentially suitable habitat for the Cerulean Warbler was purposefully excluded from the proposed extraction footprint, and the forest extending westward to Marshall Road will not be used for tree harvesting. Over time additional canopy gaps should form as mature trees fall down due to windfall, insect pests (e.g. White Ash and Emerald Ash Borer) and senescence. Allowing natural gap dynamics to redevelop should gradually improve habitat quality for the Cerulean Warbler in this area.

Cerulean Warbler is discussed further in **Section 11.1**.

7.0 SIGNIFICANT WOODLANDS

The County of Simcoe (Official Plan Policy 3.8.14) recommends that local municipalities use the following criteria to identify Significant Woodlands:

"SIGNIFICANT WOODLANDS means an area which is:

a) ecologically important in terms of features such as species composition, age of trees and stand history;

b) functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or

c) economically important due to site quality, species composition, or past management history.

These are to be identified using criteria established by the Ontario Ministry of Natural Resources and Forestry.

Local municipalities may map significant woodlands in local official plans. Significant woodlands can also be determined through an Environmental Impact Statement.

...Outside of a *settlement area* where a woodlot is determined not to be ecologically or economically important, its potential importance shall be determined by a minimum patch established in the *local municipal* official plan. In determining the minimum patch size in *local municipal* Official Plans, the following size criteria established by the Ontario Ministry of Natural Resources and Forestry will be used unless appropriate justification is provided to use different criteria:

- where woodland cover is less than 5% of the land cover in the *local municipality*, *woodlands* 2 ha in size or larger should be considered *significant*

- where woodland cover is 5-15% of the land cover in the *local municipality*, *woodlands* 4 ha in size or larger should be considered *significant*

- where woodland cover is 16-30% of the land cover in the *local municipality*, *woodlands* 20 ha in size or larger should be considered *significant*

- where woodland cover is 31-60% of the land cover in the *local municipality*, *woodlands* 50 ha in size or larger should be considered *significant*

For the purposes of this definition:

- A patch is a distinct, separate area of contiguous woodlands. The edge of a patch is delineated by the outermost dripline.

- Woodlands remain contiguous even if interrupted by natural clearings, or clearings for agricultural uses, other rural land uses, or infrastructure, provided the clearing is not more than 20 metres wide, edge to edge.

- Patch size is not deemed to terminate if the woodland crosses municipal, county, or regional boundaries."

The County of Simcoe identified a section of Greenlands within the study area identified as Tiny-Tay Peninsula (TTP4), Wye River Valley (large area of woodlands). Most of the proposed licensed property is part of a 353.7 ha woodland (part of TTP4). The woodland has been identified as significant due the large size of the woodland, the presence of trees more than 100 years old in some areas and the presence of forest interior habitat (LESG 2015).

LSEG (2015) reported that the size of the Wye River watershed is 21343.5 ha and forest cover in 2011 was 7205.7 ha, or 33.8% of the total watershed area. The woodland is far greater in size than the 50 ha size threshold for significance when local forest cover is 31-60% of the land cover.

Mature and higher quality Sugar Maple - Red Oak forest stands occur to the northwest (FODM5-3c) and west (FODM5-3b) of the proposed extraction area. In these areas there are a number of trees more than 100 years old and the ground flora is species rich, relative to the rest of the study area. There are some signs of past cutting but none appear recent. These stands have a mix of age classes. Unit FODM3-5b occurs on west-facing slopes that are deeply incised and have complex topography. North of the proposed license area Unit FODM5-3c has some natural canopy gaps where large mature trees have fallen down. These units provide important habitats for area-sensitive breeding birds, including the Cerulean Warbler (Threatened).

Units FODM5-3b and FODM5-3c are considered by GEC to be examples of *primary woodland*, which is defined here as a woodland occupying a site which has been continuously wooded even though it may have been clear-cut, provided that the clear-cutting does not break the woodland continuity (i.e. the woodland regenerated). In contrast, a *secondary woodland* is defined as a woodland growing on a previously unwooded site, for example if the site had been cleared at some former time for agriculture then abandoned. **Figure 7** is a 1954 aerial photograph that clearly shows that Units FODM5-3b and FODM5-3c contained mostly mature deciduous forest at that time. **Figure 8** shows the *primary woodland* boundary interpreted by GEC from the 1954 aerial photography and 2018 field observations.

The Greenlands and Significant Woodland boundaries shown on the County and Township Official Plan Schedules are mapped at a large scale and the boundaries are general in nature. **Figures 5** and **8** show the Significant Woodland boundary recommended by GEC, based on the 2018 field surveys and aerial photo interpretation. The portion of the proposed license area that is identified as Significant Woodland in this report was formerly in agricultural use and this area was essentially treeless in 1954, except for a few hedgerow trees and scattered shade trees (see **Figure 7**). The woodland communities comprise lower quality stands including conifer plantations (TAGM1-1) and very young Sugar Maple (FODM5-1) and Sugar Maple - Red Oak (FODM5-3a) stands.

8.0 SIGNIFICANT WILDLIFE HABITAT

The Natural Heritage Reference Manual (NHRM) (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000) identify four main types of Significant Wildlife Habitat (SWH): seasonal concentrations of animals; rare and specialized habitats for wildlife; habitats of species of conservation concern; and animal movement corridors. These are discussed below in relation to the natural features on and adjacent to the site.

The SWHTG recommends that only the most significant habitats within a planning jurisdiction be designated as significant, and this is the primary method that is used below. The SWH Criteria Schedules for Ecoregion 6E (MNRF 2015) were also consulted.

8.1 Seasonal Concentrations of Animals

The SWHTG identifies 14 types of seasonal concentrations of animals that may be considered Significant Wildlife Habitat. They are as follows:

- winter deer yards;
- moose late winter habitat;
- colonial bird nesting sites;
- waterfowl stopover and staging areas;
- waterfowl nesting areas;
- shorebird migratory stopover areas;
- landbird migratory stopover areas;
- raptor winter feeding and roosting areas;
- Wild Turkey winter range;
- Turkey Vulture summer roosting areas;
- reptile hibernacula;
- bat hibernacula;
- bullfrog concentration areas; and,
- migratory butterfly stopover areas.

Of the above 14 types of seasonal concentrations of animals, only winter deer yards are potentially applicable to the study area.

Winter Deer Yards

Significant Wildlife Habitat (SWH) or "areas" are identified on the Township of Tiny Official Plan Schedule B. Deer Wintering Areas are the only SWH identified. North of the study area, just beyond the 120 m adjacent lands boundary, a Deer Wintering Area is identified on Schedule B.

8.2 Rare and Specialized Habitats

8.2.1 Rare Habitats

Rare habitats are considered to be those vegetation communities that are considered rare in Ontario. Generally, these are communities that have been ascribed an S-rank of S1 to S3 by the NHIC. There are no cliffs and talus slopes, sand barrens, alvars, tallgrass prairies or savannahs within the study area. No vegetation communities with S-ranks of S1 to S3 by Bakowsky (1996) and/or the NHIC were identified within the study area.

All of the vegetation communities described above in **Section 5.3.1** are common and widespread in southern Ontario.

8.2.2 Specialized Habitats

The SWHTG defines 14 specialized habitats that may be considered Significant Wildlife Habitat. They are as follows:

- habitat for area-sensitive species;
- forests providing a high diversity of habitats;
- old-growth or mature forest stands;
- foraging areas with abundant mast;
- amphibian woodland breeding ponds;
- turtle nesting habitat;
- specialized raptor nesting habitat;
- moose calving areas;
- moose aquatic feeding areas;
- mineral licks;
- mink, otter, marten, and fisher denning sites;
- highly diverse areas;
- cliffs; and
- seeps and springs.

Of the above 14 features, there is the potential for habitat for area-sensitive species to occur within the study area.

Habitat for Woodland Area-Sensitive Breeding Birds

Large, natural blocks of mature woodland habitat are important habitats for area-sensitive woodland songbirds. These habitats are typically large (>30 ha) and mature (>60 years old) forest stands or woodlots (MNRF 2015).

The 2018 breeding bird surveys revealed the presence of breeding bird species that are considered area sensitive by certain authorities. The area mapped on **Figure 8** as candidate SWH for woodland area-sensitive bird species is habitat for the following 7 area sensitive bird species listed in the Ecoregion Criteria Schedules (MNRF 2015):

- Cerulean Warbler
- Black-throated Blue Warbler
- Black-throated Green Warbler
- Ovenbird
- Scarlet Tanager
- Veery
- Yellow-bellied Sapsucker

The woodlands located northwest and west of the proposed license area are mature and form part of a much larger forest patch. MNRF recommends identifying SWH for woodland area-sensitive breeding bird habitat when the presence of nesting or breeding pairs of 3 or more of the listed bird species is confirmed. In this case, 7 of the listed area sensitive bird species were identified during the breeding season.

8.3 Species of Conservation Concern

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include Endangered or Threatened species as identified by the Ontario *Endangered Species Act (2007)*.

There are no marsh communities within the study area so there is no Marsh Breeding Bird Habitat to consider.

Open Country Bird Breeding Habitat refers to large grassland areas greater than 30 ha in size. Cultural grassland within the study area is limited to a very small patch (Unit MEGM3a = 0.85 ha) and it does not qualify as SWH for Open Country Bird Breeding Habitat.

Shrub/Early Successional Bird Breeding Habitat refers to large field areas that are succeeding to shrub thicket habitats greater than 10 ha in size. The areas mapped on **Figure 5** as regeneration thickets or shrub thickets comprise two separate patches that together cover around 3.43 ha, which is too small to qualify at SWH for Shrub/Early Successional Bird Breeding Habitat.

Two bird species that are listed as Special Concern in Ontario were recorded during the 2018 breeding bird surveys, Eastern Wood-pewee and Wood Thrush. The majority of the occurrences were associated with the mature forests located northwest and west of the proposed licensed area. The area mapped on **Figure 8** as candidate SWH for Special Concern breeding bird species is coincident with the area mapped as candidate SWH for Woodland Area-sensitive Breeding Birds.

The site is located within 1 km square 17NK9044. The NHIC database lists the following historic records of S2 and S3 plant species from this 1 km square:

- Beaked Spike-rush (Eleocharis rostellata) - S3 - 1978-07-15
- American Lotus (Nelumbo lutea) - S2 - 1969-09-23
- Northern Long Sedge (Carex folliculata) - S3 - 1977-07-09

All three species occur in wetland habitats and they do not occur in the small wetland at the east end of the study area.

8.4 Animal Movement Corridors

The SWHTG defines animal movement corridors as elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another. To qualify as Significant Wildlife Habitat, these corridors should be a critical link between habitats that are regularly used by wildlife.

There was no evidence of significant animal movement corridors within the study area.

8.5 Summary of Significant Wildlife Habitat

The analysis of Significant Wildlife Habitat concluded that there are two types of candidate significant habitat present. These are:

- Habitat for Woodland Area-sensitive Breeding Birds; and,
- Habitat for Special Concern breeding bird species (Eastern Wood-pewee and Wood Thrush).

Figure 8 shows the distribution of candidate Significant Wildlife Habitat within the study area.

9.0 SUMMARY OF SIGNIFICANT NATURAL HERITAGE FEATURES

9.1 Habitat of Endangered Species and Threatened Species

During the 2018 field surveys no Endangered or Threatened species were observed on the proposed Teedon Pit Extension license area.

Approximately 100 Forked Three-awned Grass (*Aristida basiramea*) plants were found by GEC in a disturbed area at the edge of the active pit, south of the proposed license area. This species is Endangered in Ontario. It is a late-flowering annual grass species. This population was growing in a sandy area that had been stripped of topsoil decades ago.

A Cerulean Warbler (*Dendroica cerulea*) was observed singing on adjacent property more than 100 m north of point count station 5 (see **Figure 6**) during the first breeding bird survey on June 6, 2018. It was not recorded during the second survey on June 28, 2018. Cerulean Warbler was considered a breeding species on the adjacent property but a non-breeder on the proposed license area.

Potential effects on Endangered and Threatened species are discussed below in **Section 11.1**.

9.2 Significant Woodlands

The County of Simcoe identified a section of Greenlands within the study area identified as Tiny-Tay Peninsula (TTP4), Wye River Valley (large area of woodlands). Most of the proposed licensed property is part of a 353.7 ha woodland (part of TTP4). **Figures 5** and **8** show the Significant Woodland boundary recommended by GEC, based on the 2018 field surveys and aerial photo interpretation. The portion of the proposed license area that is identified as Significant Woodland in this report was formerly in agricultural use and this area was essentially treeless in 1954, except for a few hedgerow trees and scattered shade trees (see **Figure 7**).

Potential effects on Significant Woodlands are discussed below in **Section 11.2**.

9.3 Significant Wildlife Habitat

There are two types of candidate Significant Wildlife Habitat present within the study area, beyond the proposed license area. These are:

- Habitat for Woodland Area-sensitive Breeding Birds; and,
- Habitat for Special Concern breeding bird species (Eastern Wood-pewee and Wood Thrush).

Figure 8 shows the distribution of candidate Significant Wildlife Habitat within the study area.

Potential effects on Significant Wildlife Habitat are discussed below in **Section 11.3**.

10.0 DESCRIPTION OF THE PROPOSED EXTRACTION, OPERATIONAL PLAN, FOREST EDGE MANAGEMENT PLAN AND REHABILITATION PLAN

The *Aggregate Resources Act* Site Plans for the Teedon Pit Extension comprise four sheets, as follows:

- Sheet 1 of 4 - Existing Features
- Sheet 2 of 4 - Operational Plan
- Sheet 3 of 4 - Rehabilitation Plan
- Sheet 4 of 4 - Cross-Sections

GEC provided a series of recommendations to CRH Canada Group Inc. that were incorporated into the Site Plans prepared for the Teedon Pit Extension. The recommendations related to the proposed extraction footprint, licence boundary, fencing, tree-clearing, forest edge management and progressive and final rehabilitation.

10.1 Description of Proposed Extraction

The proposed Teedon Pit Extension licenced area covers 15.3 ha and the proposed extraction area covers 13.5 ha, as shown on **Figures 9** and **10**. The maximum depth of extraction is 239 mASL in the eastern portion of the extraction area and 238 mASL in the western portion of the extraction area.

The extraction area has been carefully designed to avoid significant and sensitive features and to provide ecological buffers to sensitive natural features on adjacent lands.

The extraction will occur as one phase, moving from the existing Teedon Pit northwards to the north extraction limit. Annual tonnage will a maximum of 600,000 tonnes in combination with the existing Teedon Pit (Licence #3670).

The proposed hours are: Shipping 0500 to 1900 (Monday to Friday) and 0500 to 1600 on Saturdays. Site preparation, extraction, processing and rehabilitation 0700 to 1900 (Monday to Friday). Extraction and processing on Saturdays limited to 0900 to 1600. No pit operations will occur on Sundays or statutory holidays. Servicing of equipment may take place at any time with no restricted hours.

Extraction will proceed in a south to north direction from the adjacent Teedon Pit (LICENSE # 3670).

10.2 Operational Plan

Key excerpts from the Operational Plan dealing with the natural environment are provided on **Figures 10** and **11** and outlined below.

Timing of Tree Clearing

- Tree cutting in Tree Clearing Zone '1' shall occur between November 1st and March 31st inclusive. This window for tree cutting avoids the active period for bats and the breeding bird season, except for very early breeders (e.g. Great Horned Owl). Zone '1', as shown on the Tree Clearing Schematic on **Figure 11**, encompasses the younger conifer plantations, young deciduous forest and shrub thickets, which are unlikely to provide nesting habitat for Great Horned Owls.

- Tree cutting in Tree Clearing zone '2' shall occur between November 1st and January 31st inclusive. This window for tree cutting avoids the active period for bats and the breeding bird season, including very early breeders (e.g. Great Horned Owl). Zone '1', as shown on the Tree Clearing Schematic on **Figure 11**, encompasses the more mature trees within the extraction footprint.

Licensed Area Boundary - Fencing

- Prior to the installation of fencing, tree clearing shall occur along the boundary of the site in accordance with the tree removal notes on the Operational Plan (see **Figure 11**).

- After tree clearing along the boundary of the site and prior to stripping of topsoil/subsoil a 1.2m fence shall be installed along the east and west licensed boundary and 5m north of the northern extraction limit. Fencing will not be required for the southern common boundary with the existing Teedon Pit. Marker posts shall be placed along unfenced boundaries at 30m +/- intervals to identify the licence boundary limits. See **Figure 10** for fencing details.

Tree Removal

- Refer to the Tree Clearing Schematic on **Figure 11**.

- Within three (3) years of licence issuance and prior to extraction commencing the following 20m wide strip of trees shall be removed to pre-stress the new forest edge that will be created:

  A) Trees 5m beyond the extraction area (e.g. within setback area) shall be cleared of trees (but not grubbed). Prior to tree clearing in the north setback area, a qualified ecologist or forester shall walk the alignment of the proposed fence located 5m north of the extraction limit and mark trees that should be removed to accommodate the installation of the fence. Trees to be cut shall be marked with yellow or orange marking paint. Trees along the fence alignment should be felled towards the extraction area.

  B) Within the extraction area a 15m wide area of trees along the west, north and east limits of extraction shall be removed.

- The requirement to clear trees within the 5 m setback, as shown on **Figures 9** and **11** will ensure no mature trees are within 5 m of the future extraction face, per ARA requirements. This 5 m wide strip of land around the proposed extraction area covers 0.5 ha and it will be

replanted per the Rehabilitation Plan requirements. The 20 m wide strip of land (5m + 15 m) to be cleared of trees within three years of licence issuance is intended to pre-stress the new forest edge that will be created. This will promote the development of a forest edge that is adapted to an edge environment, with increased exposure to sunlight and wind.

- All remaining trees within the extraction area will be gradually cut/cleared ahead of extractive operations. Tree clearing shall occur as required to advance extraction and minimize the disturbed area.

- Suitable trees will be harvested for saw logs and or fuel wood. Stumps and other wood refuse (waste wood, limbs & brush) may be used for pit rehabilitation purposes, removed from the site or piled on the site to be chipped or buried in the side slope.

10.3 Forest Edge Management Plan

- Refer to the Forest Edge Management Schematic on **Figure 11**.

- Following tree cutting along the boundary of the site, a qualified ecologist or forester will walk the new forest edge and mark defective trees for removal. Trees to be cut shall be marked with yellow or orange marking paint.

Forest Edge Management Zone 'A'

- Within 10 m of the new forest edge mark defective trees for cutting. Cut up stems/trunks into 1 to 2 m lengths and place on forest floor. Cut up tops into brush piles for wildlife. Zone 'A' on the west side of the Extension mainly comprises young Sugar Maple and Scots Pine. Zone 'A' on the east side mainly comprises Red Pine plantation with some hardwood regeneration. Cutting defective trees will release healthier trees and promote regeneration.

- In the 5m area between the fence and the extraction limit the new forest edge will be augmented by planting Red Oak (67%) and White Pine (33%) in gaps. Spacing will vary according to edge conditions at the time of planting, but shall be at least 3m apart. Planting Red Oak and White Pine in this area is intended to augment the new forest edge and to provide a potential native tree seed source for the adjacent future rehabilitation side slopes (see Rehabilitation Plan).

- Tree planting within Forest Edge Management Area shall be 1 or 2 gallon container stock.

- Tree planting should occur during the spring period, i.e. April or early May, depending on seasonal conditions. If necessary, fall planting may occur after September 20th.

Forest Edge Management Zone 'B'

- Retain the existing 4.5m wide private trail within the former road allowance.

- Between the existing private trail and the fence mark defective trees for cutting. Cut up stems/trunks into 1 to 2 metre lengths and place on forest floor. Cut up tops into brush piles for wildlife or, alternatively, chipped and placed on the 4.5m wide trail.

- Along the south side of the trail, where feasible the forested area will be augmented by planting one or two rows of White Cedar and White Spruce on 2m spacing or greater. Planting one or two rows of conifers is intended to augment the buffer function of the

northern strip of conifer plantation that is to be retained. This will help to buffer the mature hardwood forest located offsite to the north.

- In the 5m area between the fence and the extraction limit the new forest edge will be augmented by planting Red Oak (67%) and White Pine (33%) in gaps. Spacing will vary according to edge conditions at the time of planting, but shall be at least 3m apart. Planting Red Oak and White Pine in this area is intended to augment the new forest edge and to provide a potential native tree seed source for the adjacent future rehabilitation side slopes (see Rehabilitation Plan).

- Tree planting within Forest Edge Management Area shall be 1 or 2 gallon container stock.

- Tree planting should occur during the spring period, i.e. April or early May, depending on seasonal conditions. If necessary, fall planting may occur after September 20th.

Reporting

- Following completion of the Edge Management Plan a qualified ecologist or forester shall prepare a report documenting the implementation of the Forest Edge Management Plan. The report shall be submitted to the Ministry of Natural Resources and Forestry (MNRF).

10.4 Rehabilitation Plan

General Notes

- Refer to the Rehabilitation Plan shown on **Figure 12**.

- Area to be rehabilitated: 14.0 ha (13.5 ha extraction area and 5 m extraction setback which covers 0.5 ha).

- The elevation of the established water table ranges on site from ±236.5 mASL to ±237.5 mASL.

- Progressive and final rehabilitation of the disturbed area will be completed as extraction reaches final limits and depths.

- Final pit faces will be sloped at 3:1 or greater. Final slopes will be created using a combination of cut & fill and/or backfilling. Available overburden and topsoil from onsite will be applied on the slopes and final pit floor. See Site Plan Sheet 4 of 4 for cross-sections. Clean inert fill may also be imported for the purposes of establishing final slopes in accordance with the requirements on Sheet 2 of 4 (Operational Plan).

- The objective of the Rehabilitation Plan is to reforest the setback areas (0.5 ha) and the side slopes (11.4 ha) and the pit floor shall be rehabilitated to agricultural land (2.1 ha).

- The pit floor shall be graded and contoured as shown on this page and topsoil reapplied and planted with seed conducive to form cropland thereafter.

- The side slope planting areas shall be monitored for survival in the first and second years after planting. Replacement planting should be undertaken if survival is less than 60%. if herbaceous competition is preventing tree growth / tree survival, a tending treatment may be necessary (e.g. herbicide application by a licensed pesticide applicator).

- Prior to surrender of the licence a qualified ecologist or forester shall prepare a report documenting:

  A) the implementation of the reforestation plan;

  B) to assess the need for any stand thinning to promote further native hardwood regeneration; and

  C) to identify other management opportunities if appropriate. If required any further work shall be completed prior to the surrender of the licence. The report shall be submitted to the Ministry of Natural Resources and Forestry (MNRF).

Tree Planting Schematic - Reforestation of 5 m Setback

- A few years prior to tree planting commencing on the rehabilitated side slopes, a qualified ecologist will walk the 5m setback and assess existing tree regeneration established through the Forest Edge Management Plan.

- Existing tree regeneration will be augmented by planting Red Oak (67%) and White Pine (33%) in gaps approximately 2m from the fence.

- Tree planting in the 5 m setback shall use 1 or 2 gallon container stock.

- Tree planting should occur during the spring period, i.e. April or early May, depending on seasonal conditions. If necessary, fall planting may occur after September 20.

- Spacing of trees will vary according to the amount and quality of existing regeneration, but plantings shall be at least 3 m apart.

Tree Planting Schematic - Reforestation of Side Slopes

- The tree planting prescription outlined below was adapted from the tree planting prescription prepared by Mr. Peter Hynard, RPF, which was dated August 10, 2011 and included as Section 12 (pages 110 to 113) in the LESG (2015) report.

- Tree planting of side slopes shall not occur until the slopes have been successfully stabilized and re-vegetated with herbaceous cover (grass and legume mixture).

- Some stumps, logs and rock piles shall be incorporated into side slopes, to provide some habitat structure and variability.

- Since the soil conditions on the rehabilitation slopes will be variable, a qualified ecologist or forester should examine the soil conditions prior to tree planting and the soil will be amended as recommended by a qualified ecologist or forester.

- Conifers are recommended as the initial plantings on the side slopes due to their ability to grow in exposed, hot, dry and nutrient-poor environments. Red Pine and Jack Pine are the preferred conifers for the initial planting at the site. Red Oak and White Pine are secondary species that will also be planted. After the secondary species are planted the side slopes should contain approximately the following proportions of trees: Red Pine 45%, Jack Pine 35%, Red Oak 10% and White Pine 10%.

- Wider-than-normal tree spacing is recommended. A target spacing of 2.4m between rows and 2.1 to 2.4m within rows is suitable, which totals approximately 1,600 to 1,900 trees per hectare.

- Tree planting shall occur during the spring period, i.e. April or early May depending on seasonal conditions. If necessary, fall planting may occur after September 20.

- Large bareroot stock shall be used and planting shall be deep. For Red Pine and Jack Pine 3-0 bareroot stock is suitable. Trees shall be planted deeper than the natural root collar but with the first whorl of branches showing above ground. The planting may be done by hand or machine, depending on the size of the area to be planted and the stone content in the soil.

11.0 POTENTIAL EFFECTS ON SIGNIFICANT NATURAL HERITAGE FEATURES

11.1 Potential Effects on Habitat of Endangered Species and Threatened Species

During the 2018 field surveys no Endangered or Threatened species were observed on the proposed Teedon Pit Extension license area. One Endangered and one Threatened species were observed on adjacent lands.

Forked Three-awned Grass (*Aristida basiramea*) **- Endangered**

Approximately 100 Forked Three-awned Grass (*Aristida basiramea*) plants were found in 2018 in a disturbed area at the edge of the active pit, south of the proposed license area. This species is Endangered in Ontario. It is a late-flowering annual grass species. This population was growing in a sandy area that had been stripped of topsoil decades ago.

CRH Canada Group Inc. has registered the existing Teedon Pit under Ontario Regulation 242/08, Section 23.14 (Pits and Quarries), for the Endangered Forked Three-awned Grass. A Mitigation Plan for Forked Three-awned Grass is in preparation and implementation will commence in time for the 2019 mining season. In the interim, CRH staff and GEC visited the site on November 1, 2018 and the disturbed area containing the Forked Three-awned Grass was marked with wooden stakes and pink flagging tape. Pit operations staff were instructed to avoid this area in order to prevent any inadvertent disturbance. Mitigation for Forked Three-awned Grass will be implemented by following the rules in regulation.

Cerulean Warbler (*Dendroica cerulea*) **- Threatened**

As described above a Cerulean Warbler (*Dendroica cerulea*) was observed singing on adjacent property more than 100 m north of point count station 5 (see **Figure 6**) during the first breeding bird survey on June 6, 2018. It was not recorded during the second survey on June 28, 2018. Cerulean Warbler was considered a breeding species on the adjacent property but a non-breeder on the proposed license area.

The Cerulean Warbler was singing in an area that is approximately 130 m from the proposed extraction area. Within the proposed license boundary, approximately 20 m of Red Pine plantation will be retained and managed as an ecological buffer, consistent with the Forest Edge Management Plan on the Operational Plan (Sheet 2 of 4). Management activities within the

buffer will include planting one or two rows of White Cedar and White Spruce on the south side of the east-west private trail, planting Red Oak and White Pine along the new forest edge to be created within the plantation, and cutting defective trees to promote hardwood regeneration within the plantation. This will result in an enduring ecological buffer to the mature deciduous forest to the north (FODM5-3c).

Tree-clearing to create the new forest edge and install perimeter fencing, and to cut the 20 m strip for pre-stressing the new edge, will all occur during the winter months when the Cerulean Warbler would be on its wintering grounds in the Andes Mountains in South America. The new forest edge would have been in place for more than 10 years before further tree-clearing within the extraction area approaches the north limit.

The mature forest located west of the proposed license area (FODM5-3b) has been excluded from the license area and it is well buffered by 20 to 30 m of much younger Sugar Maple forest (FODM5-1a). Beyond the base of the west slope, mature Sugar Maple forest on the proponent's land extends approximately 600 m west to Marshall Road. This 14 ha of potentially suitable habitat for the Cerulean Warbler was purposefully excluded from the proposed extraction footprint, and the forest extending westward to Marshall Road will not be used for tree harvesting. Over time additional canopy gaps should form as mature trees fall down due to windfall, insect pests (e.g. White Ash and Emerald Ash Borer) and senescence. Allowing natural gap dynamics to redevelop should gradually improve habitat quality for the Cerulean Warbler in this mature deciduous forest habitat. Approximately 15 ha of forested habitat will also be retained to the east of the proposed license area.

It is concluded that there will be no negative effects on the habitat of the Threatened Cerulean Warbler as a result of the proposed Teedon Pit Extension and the application conforms to the Provincial Policy Statement (PPS) policy with respect to the habitat of endangered and threatened species and also to the Endangered Species Act. Protecting the mature forest to the west of the proposed license area and allowing natural forest gap dynamics to redevelop should provide more suitable habitat for Cerulean Warbler over time.

11.2 Potential Effects on Significant Woodlands

Most of the proposed licensed property is part of a 353.7 ha woodland (part of TTP4). LSEG (2015) reported that the size of the Wye River watershed is 21343.5 ha and forest cover in 2011 was 7205.7 ha, or 33.8% of the total watershed area. The woodland is far greater in size than the 50 ha size threshold for significance when local forest cover is 31-60% of the land cover.

Mature and higher quality Sugar Maple - Red Oak forest stands occur to the northwest (FODM5-3c) and west (FODM5-3b) of the proposed extraction area. In these areas there are a number of trees more than 100 years old and the ground flora is species rich, relative to the rest of the study area. There are some signs of past cutting but none appear recent. Units FODM5-3b and FODM5-3c are considered by GEC to be examples of *primary woodland*, which is defined here as a woodland occupying a site which has been continuously wooded even though it may have been clear-cut, provided that the clear-cutting does not break the woodland continuity (i.e. the woodland regenerated). In contrast, a *secondary woodland* is defined as a woodland growing on a previously unwooded site, for example if the site had been cleared at some former time for agriculture then abandoned. **Figure 7** is a 1954 aerial photograph that clearly shows that Units FODM5-3b and FODM5-3c contained mostly mature deciduous forest at that time. **Figure 8** shows the *primary woodland* boundary interpreted by GEC from the 1954 aerial photography and 2018 field observations. **Figures 5** and **8** show the Significant

Woodland boundary recommended by GEC, based on the 2018 field surveys and aerial photo interpretation.

The Significant Woodlands that surround the proposed extraction area include conifer plantations and younger deciduous forests that serve to buffer the more mature *primary woodlands*. The Forest Edge Management Plan described above in **Section 10.3** will result in the formation of a stable new forest edge and enhanced buffer areas adjacent to the extraction area. Approximately 30 ha of Significant Woodland on the proponent's property will be retained to the west, north and east of the proposed extraction area.

The portion of the proposed license area that is identified as Significant Woodland in this report was formerly in agricultural use and this area was essentially treeless in 1954, except for a few hedgerow trees and scattered shade trees (see **Figure 7**). The woodland communities comprise lower quality stands including conifer plantations (TAGM1-1) and very young Sugar Maple (FODM5-1) and Sugar Maple - Red Oak (FODM5-3a) stands.

As shown on **Figure 13**, 9.2 ha of Significant Woodland will be extracted, including approximately 5.84 ha of conifer plantations and 3.36 ha of very young deciduous forest stands (FODM5-1, FODM5-3a). None of the habitats of Endangered and Threatened species or Significant Wildlife Habitats are associated with the proposed extraction footprint. Considering the cultural origin of these woodland features, their lack of ecological complexity, and their lack of significant features and functions, it is feasible to replace these woodlands via progressive and final rehabilitation of the Teedon Pit Extension. As shown on **Figure 13**, the 9.2 ha of Significant Woodland to be extracted will ultimately be rehabilitated back to a woodland condition over time. An additional 2.7 ha will also be reforested on the pit rehabilitation side slopes, resulting in an overall net gain in the size of the Significant Woodland in the future.

The temporary removal of 9.2 ha of Significant Woodland amounts to 2.6% of the larger 353.7 ha woodland patch. Reforestation as part of the Rehabilitation Plan will create 12 ha of new woodland, resulting in a net increase of 2.7 ha of Significant Woodland (see **Figure 13**). The size of the Significant Woodland (TTP4) will increase by 0.76%. **Figure 14** shows the future landforms and natural features that will be the result of Rehabilitation Plan implementation.

It is concluded that there will be no negative effects on Significant Woodlands as a result of the proposed Teedon Pit Extension and the application conforms to the Provincial Policy Statement (PPS) with respect to Significant Woodlands.

11.3 Potential Effects on Significant Wildlife Habitat

The analysis of Significant Wildlife Habitat (SWH) in **Section 8** above concluded that two types of candidate significant habitat are present. These are:

- Habitat for Woodland Area-sensitive Breeding Birds; and,
- Habitat for Special Concern breeding bird species (Eastern Wood-pewee and Wood Thrush).

Figure 8 shows the distribution of candidate SWH within the study area. **Figure 13** shows the areas mapped as candidate SWH in relation to the proposed extraction area. The habitats for Woodland Area-sensitive Breeding Birds and Special Concern breeding bird species are associated with the *primary woodlands* located northwest and west of the proposed license area. These habitats are buffered by 25 to 30 m of younger deciduous forest stands (FODM5-1a, FODMa) and conifer plantations (TAGM1-1a).

The Forest Edge Management Plan described above in **Section 10.3** will result in the formation of a stable new forest edge and enhanced buffer areas adjacent to the extraction area. On other land owned by the proponent, 14 ha of mature deciduous forest suitable as area-sensitive breeding bird habitat will be retained. Tree cutting within the proposed license area will occur outside of the breeding bird season.

It is concluded that there will be no negative effects on Significant Wildlife Habitat as a result of the proposed Teedon Pit Extension and the application conforms to the Provincial Policy Statement (PPS) with respect to Significant Wildlife Habitat.

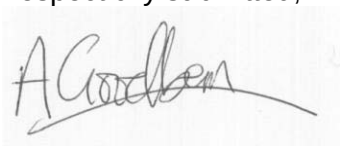
12.0 SUMMARY AND RECOMMENDATIONS

A Natural Environment Level 1 and Level 2 Report was prepared under the *Aggregate Resources Act* for the proposed Teedon Pit Extension.

The application is for a Class A Category 3 pit to permit an extension to the existing Teedon Pit. The subject site is located on the North Part of Lot 80, Concession 1 W.P.R. and Part of the original road allowance between Lots 80 and 81, Concession 1 W.P.R., Geographic Township of Tiny, County of Simcoe. The property proposed to be licensed under the ARA is 15.3 ha and 13.5 ha are proposed for extraction.

If the recommendations made in this report with respect to the extraction footprint, Operational Plan, Forest Edge Management Plan and Rehabilitation Plan are implemented as described in the Site Plans, it is concluded that the proposed Teedon Pit Extension will have no negative effects on Endangered and Threatened species, Significant Woodlands and Significant Wildlife Habitat. Over time the Significant Woodlands will increase in size by 2.7 ha and the adjacent mature deciduous forests and plantations will be managed by the proponent for conservation purposes, which will maintain or enhance habitat conditions for the Threatened Cerulean Warbler, Woodland Area-sensitive Breeding Birds and Special Concern breeding bird species.

Respectfully submitted,



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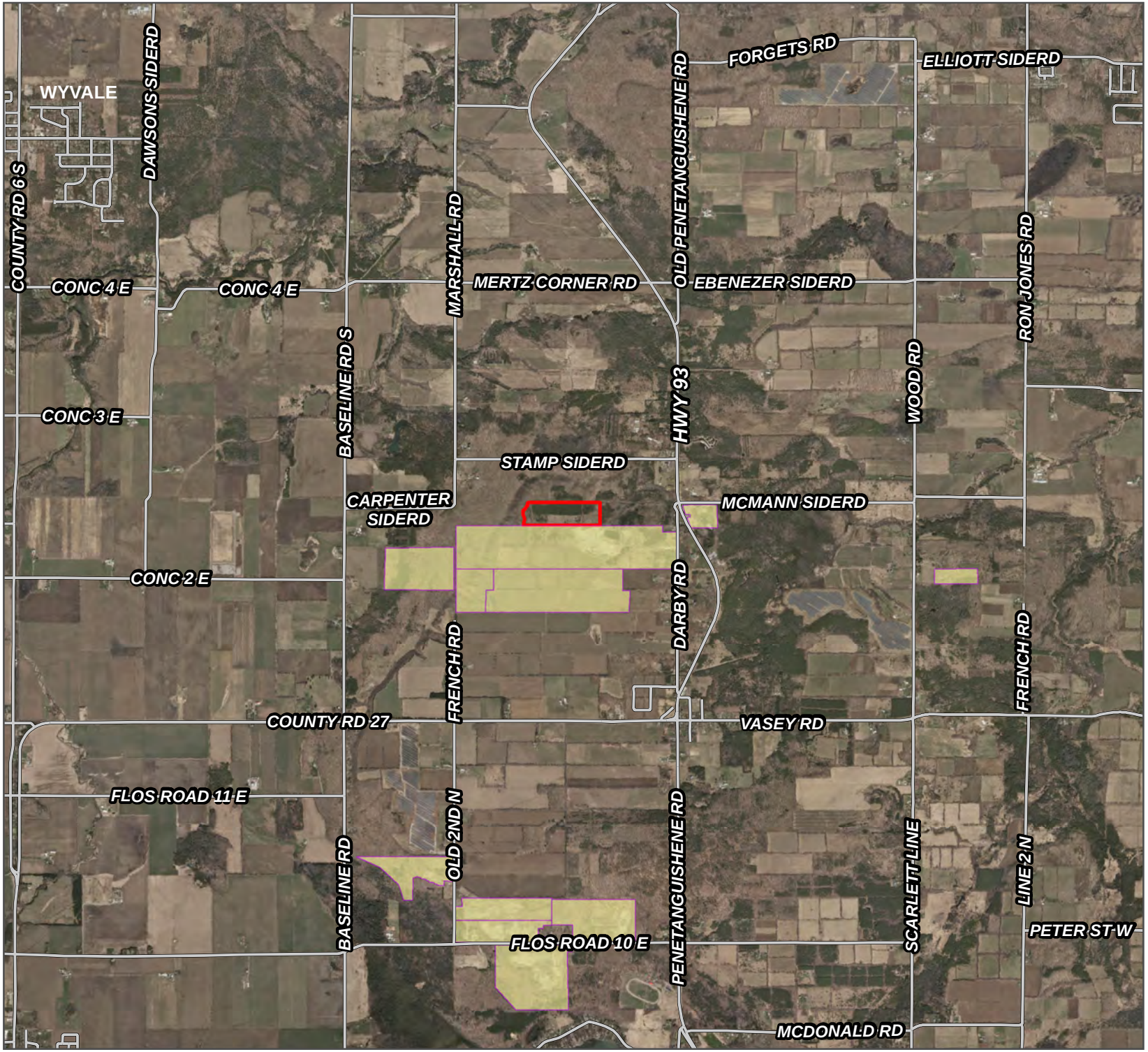

FIGURE 1

LOCATION MAP

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- Existing ARA Licensed Site

Goodban Ecological Consulting Inc.

DATE
December 2018

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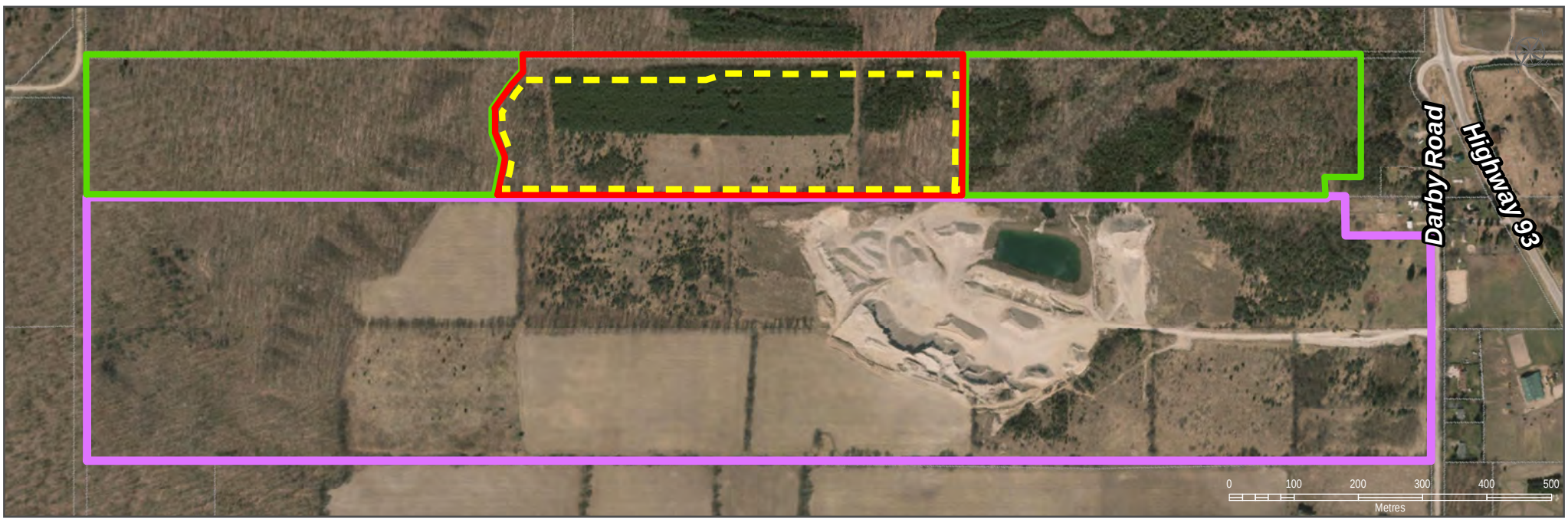
FIGURE 2

CRH TEEDON PIT EXTENSION

2018 CURRENT PROPOSAL



2013 REVISED PROPOSAL

2012 ORIGINAL PROPOSAL

Legend

- EXISTING TEEDON PIT
- PROPOSED TEEDON PIT EXTENSION LICENSED BOUNDARY
- PROPOSED TEEDON PIT EXTENSION EXTRACTION AREA
- ADDITIONAL LANDS OWNED BY CRH - ENVIRONMENTAL BUFFER (NO EXTRACTION)

SINCE 2012 APPLICATION:

64% REDUCTION IN LICENSED AREA
65% REDUCTION IN EXTRACTION AREA

	LICENSED AREA	EXTRACTION AREA
2012	42.6 ha	39.0 ha
2013	42.6 ha	30.0 ha
2018	15.3 ha	13.5 ha

December 2018

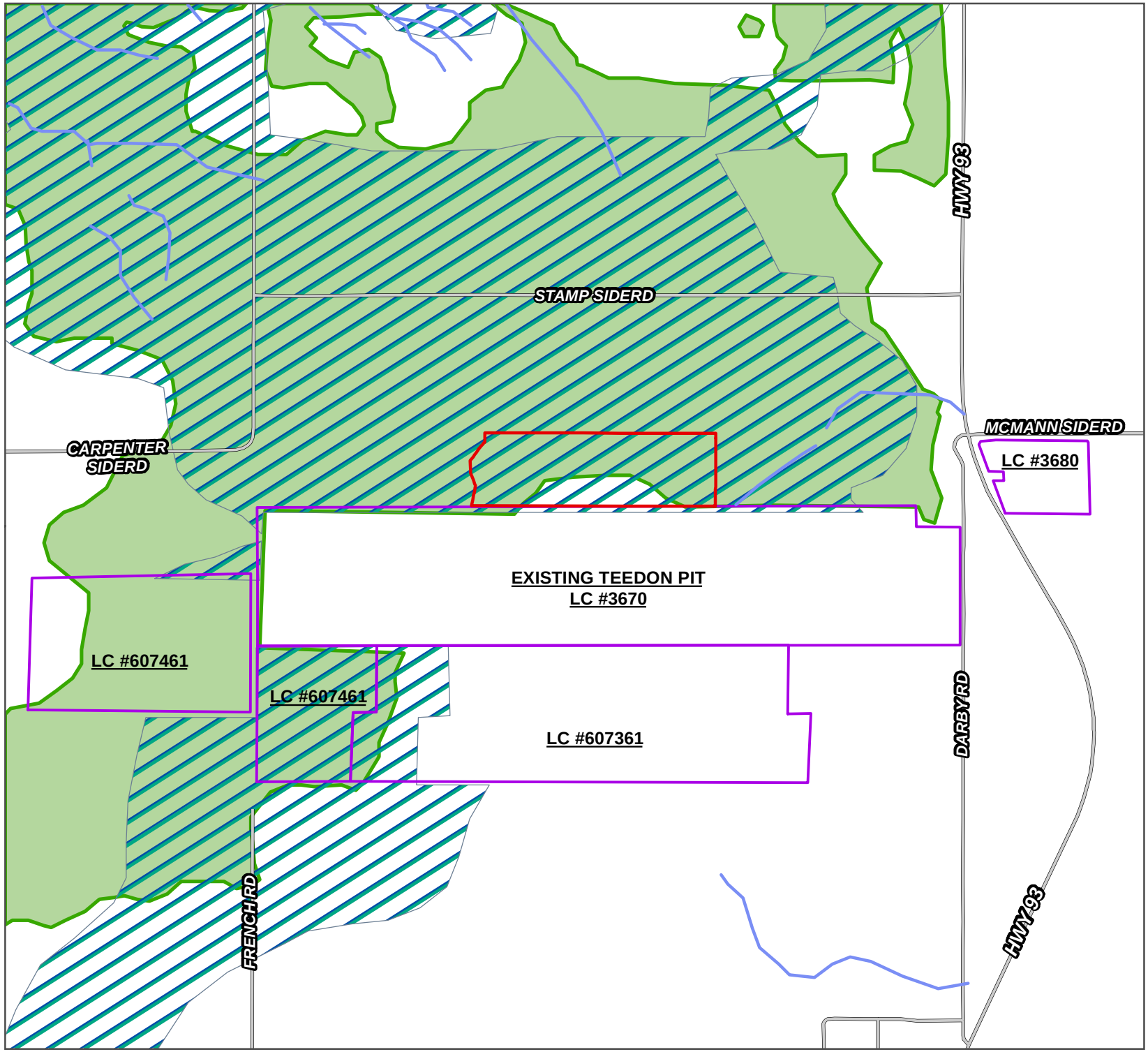


FIGURE 3

LOCAL LANDSCAPE

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- Existing ARA Licensed Site

Township of Tiny Official Plan
Schedule A - Land Use

- Environmental Protection II
- Watercourses

County of Simcoe Official Plan
Schedule 5.1 - Land Use

- Greenlands

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FIGURE 4

STUDY AREA

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- 120m Buffer from Licensed Boundary

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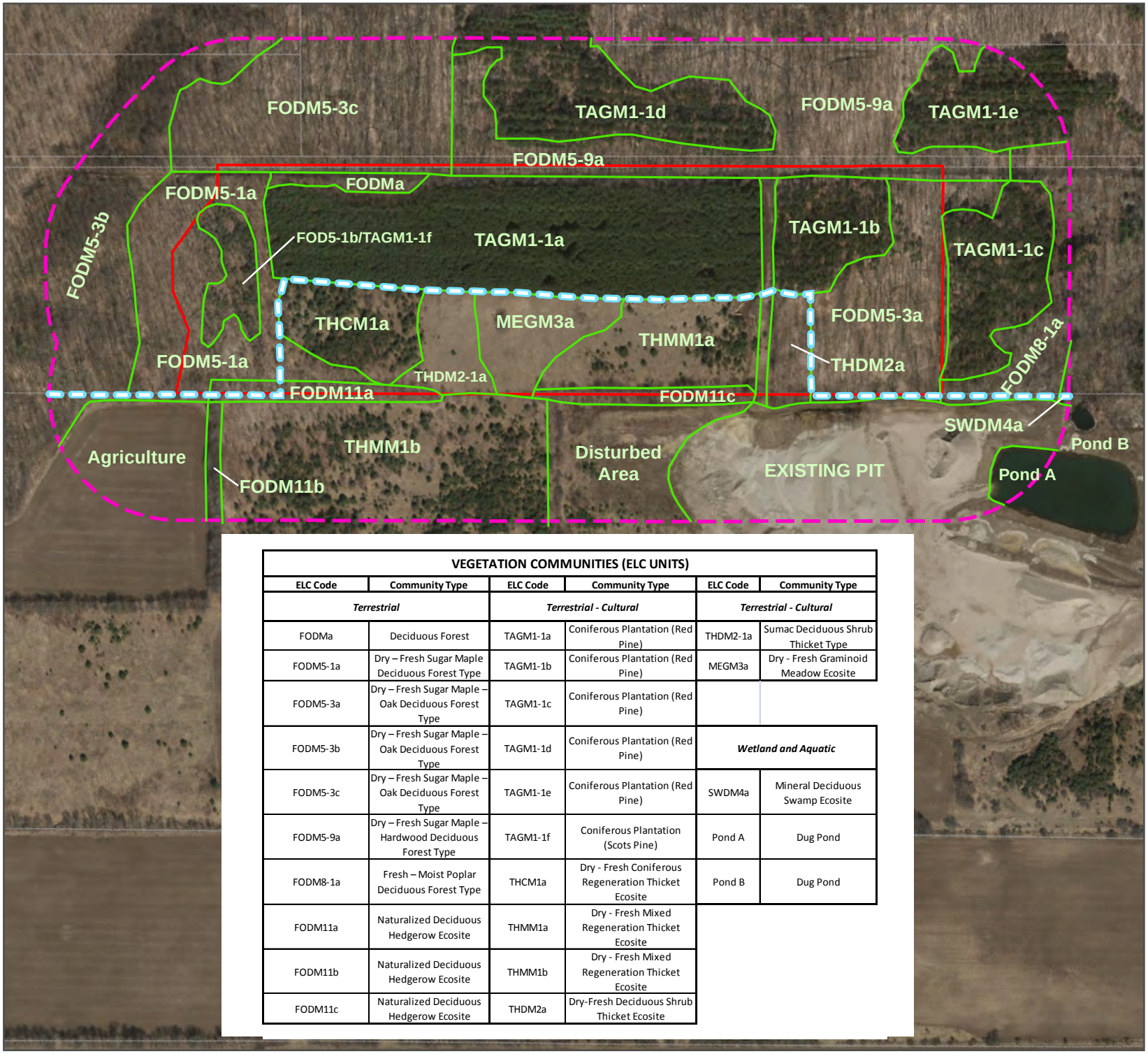

VEGETATION COMMUNITIES (ELC UNITS)

ELC Code	Community Type	ELC Code	Community Type	ELC Code	Community Type
Terrestrial		*Terrestrial - Cultural*		*Terrestrial - Cultural*	
FODMa	Deciduous Forest	TAGM1-1a	Coniferous Plantation (Red Pine)	THDM2-1a	Sumac Deciduous Shrub Thicket Type
FODM5-1a	Dry – Fresh Sugar Maple Deciduous Forest Type	TAGM1-1b	Coniferous Plantation (Red Pine)	MEGM3a	Dry - Fresh Graminoid Meadow Ecosite
FODM5-3a	Dry – Fresh Sugar Maple – Oak Deciduous Forest Type	TAGM1-1c	Coniferous Plantation (Red Pine)		
FODM5-3b	Dry – Fresh Sugar Maple – Oak Deciduous Forest Type	TAGM1-1d	Coniferous Plantation (Red Pine)	*Wetland and Aquatic*	
FODM5-3c	Dry – Fresh Sugar Maple – Oak Deciduous Forest Type	TAGM1-1e	Coniferous Plantation (Red Pine)	SWDM4a	Mineral Deciduous Swamp Ecosite
FODM5-9a	Dry – Fresh Sugar Maple – Hardwood Deciduous Forest Type	TAGM1-1f	Coniferous Plantation (Scots Pine)	Pond A	Dug Pond
FODM8-1a	Fresh – Moist Poplar Deciduous Forest Type	THCM1a	Dry - Fresh Coniferous Regeneration Thicket Ecosite	Pond B	Dug Pond
FODM11a	Naturalized Deciduous Hedgerow Ecosite	THMM1a	Dry - Fresh Mixed Regeneration Thicket Ecosite		
FODM11b	Naturalized Deciduous Hedgerow Ecosite	THMM1b	Dry - Fresh Mixed Regeneration Thicket Ecosite		
FODM11c	Naturalized Deciduous Hedgerow Ecosite	THDM2a	Dry-Fresh Deciduous Shrub Thicket Ecosite		

FIGURE 5

VEGETATION COMMUNITIES (ELC Units)

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- 120m Buffer from Licensed Boundary
- Recommended Significant Woodland Boundary (GEC)

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6a - BREEDING BIRD SURVEY POINT COUNT STATIONS

6b - EASTERN WHIP-POOR-WILL SURVEY ROUTE & POINT COUNT STATIONS

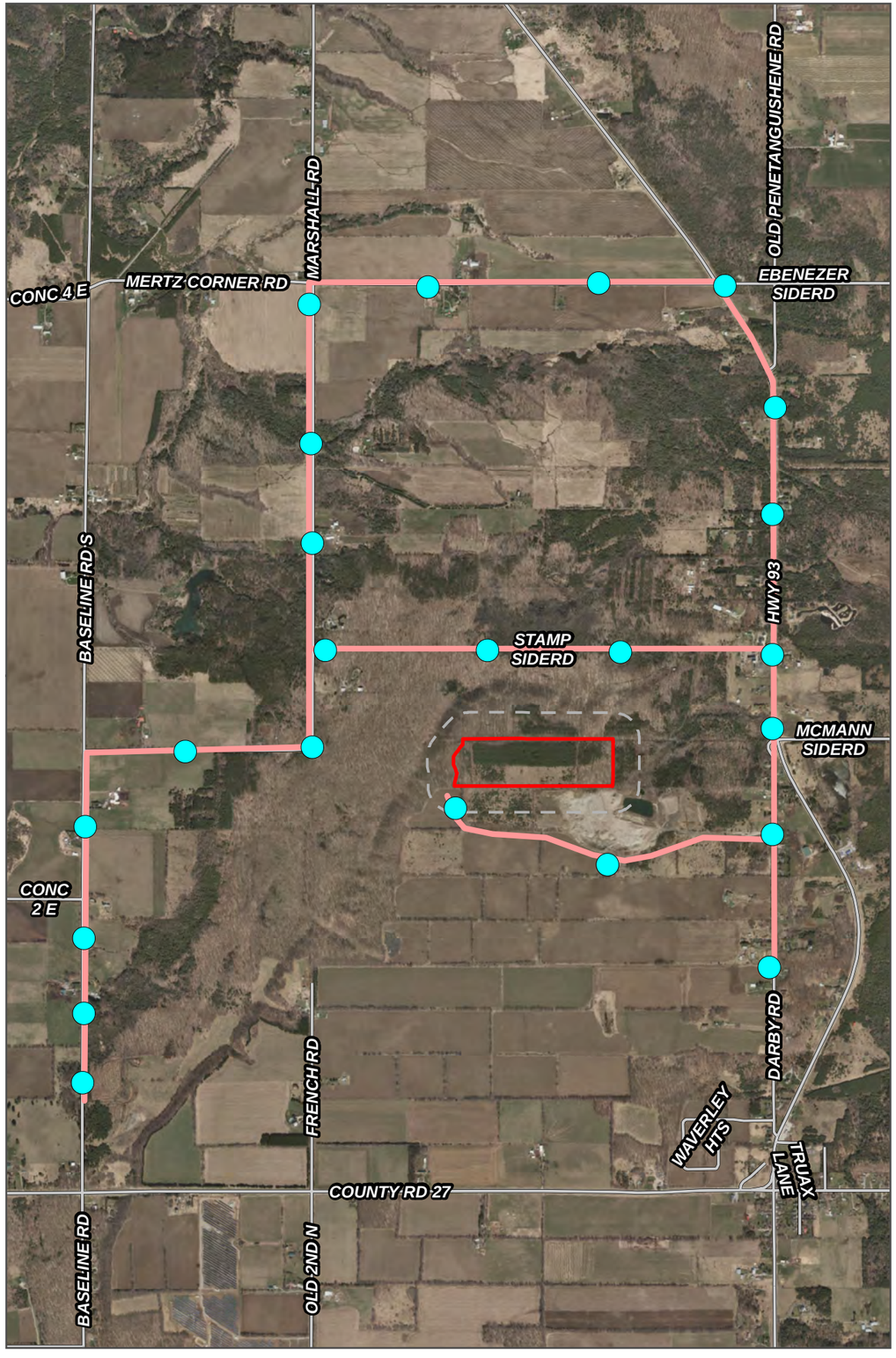

FIGURE 6

2018 - BREEDING BIRD SURVEYS

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- 120m Buffer from Licensed Boundary
- Whip-poor-will Point Count Station
- Whip-poor-will Survey Route
- Breeding Bird Point Count Station
- Breeding Bird Point Count Location 100m Buffer

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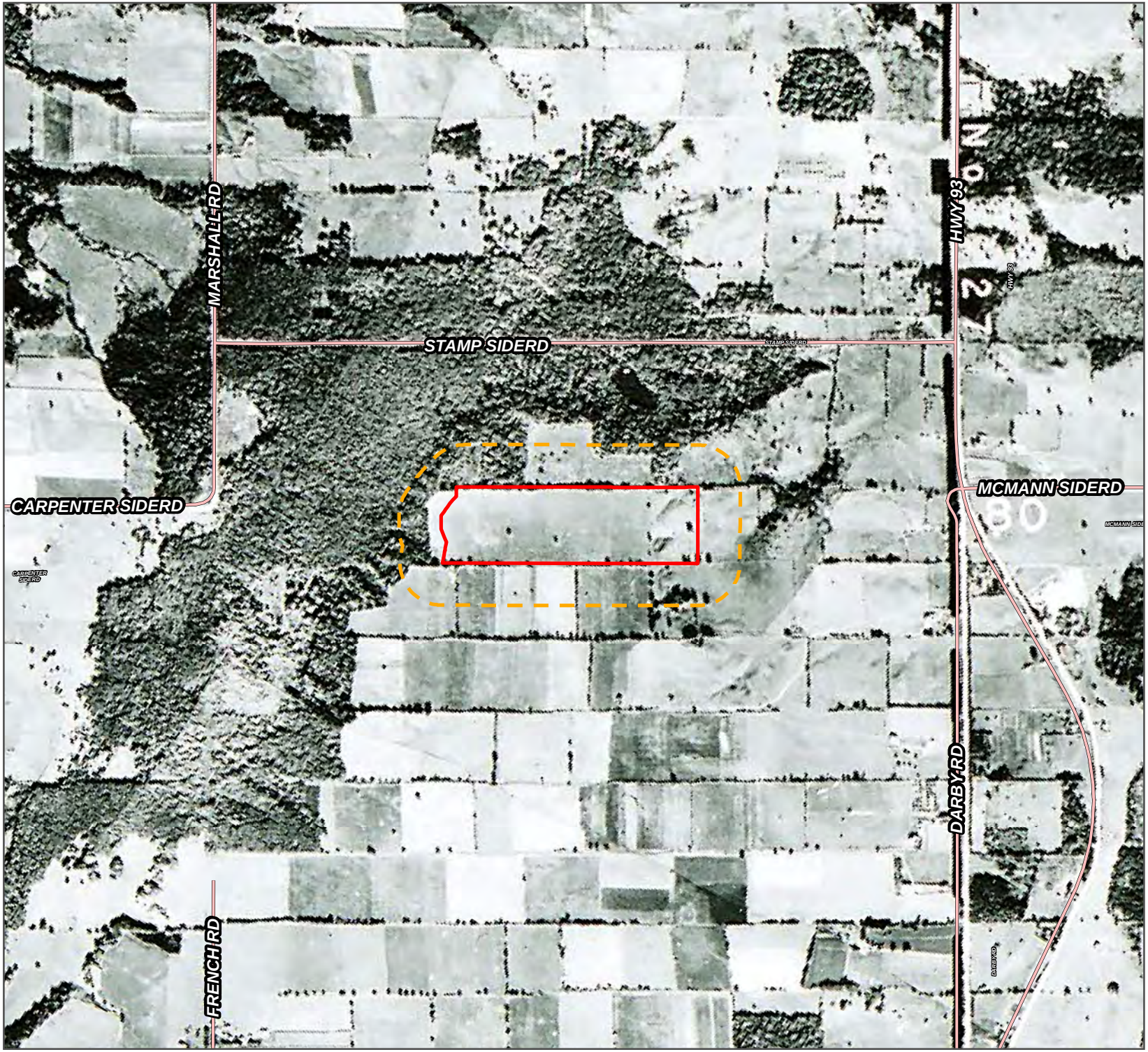

FIGURE 7

1954 AERIAL PHOTOGRAPH

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- 120m Buffer from Licensed Boundary

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DATE
December 2018

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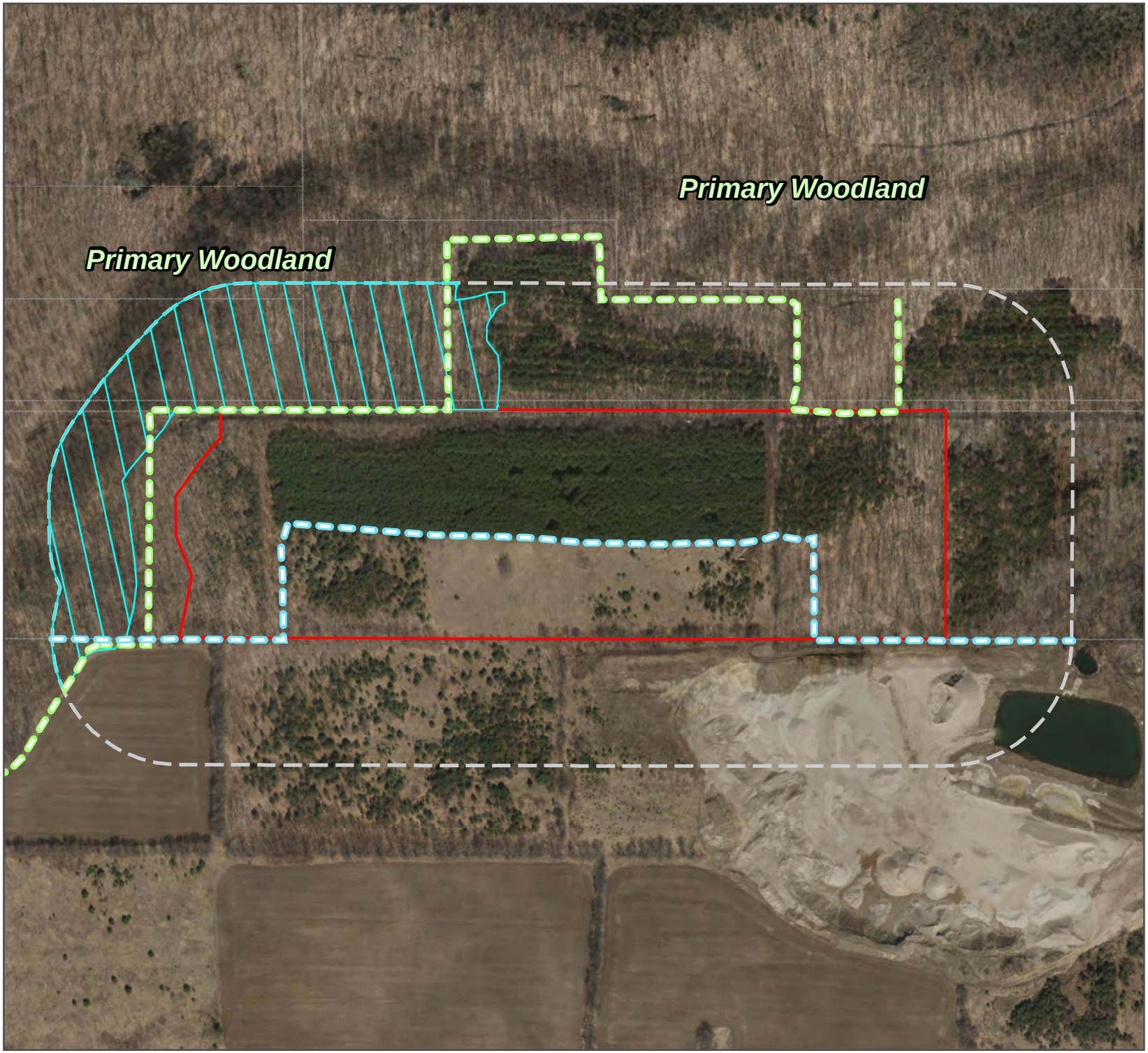

FIGURE 8

SIGNIFICANT FEATURES

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- 120m Buffer from Licensed Boundary
- Primary Woodland Boundary
- Significant Wildlife Habitat for Woodland Area Sensitive Bird Species and Special Concern Bird Species
- Recommended Significant Woodland Boundary (GEC)

Goodban Ecological Consulting Inc.

DATE
December 2018

SOURCES

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Metres

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ARCHITECTURE

FIGURE 9

EXTRACTION FOOTPRINT

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- Extraction Limit
- Property Boundary
- 1m Contour Line

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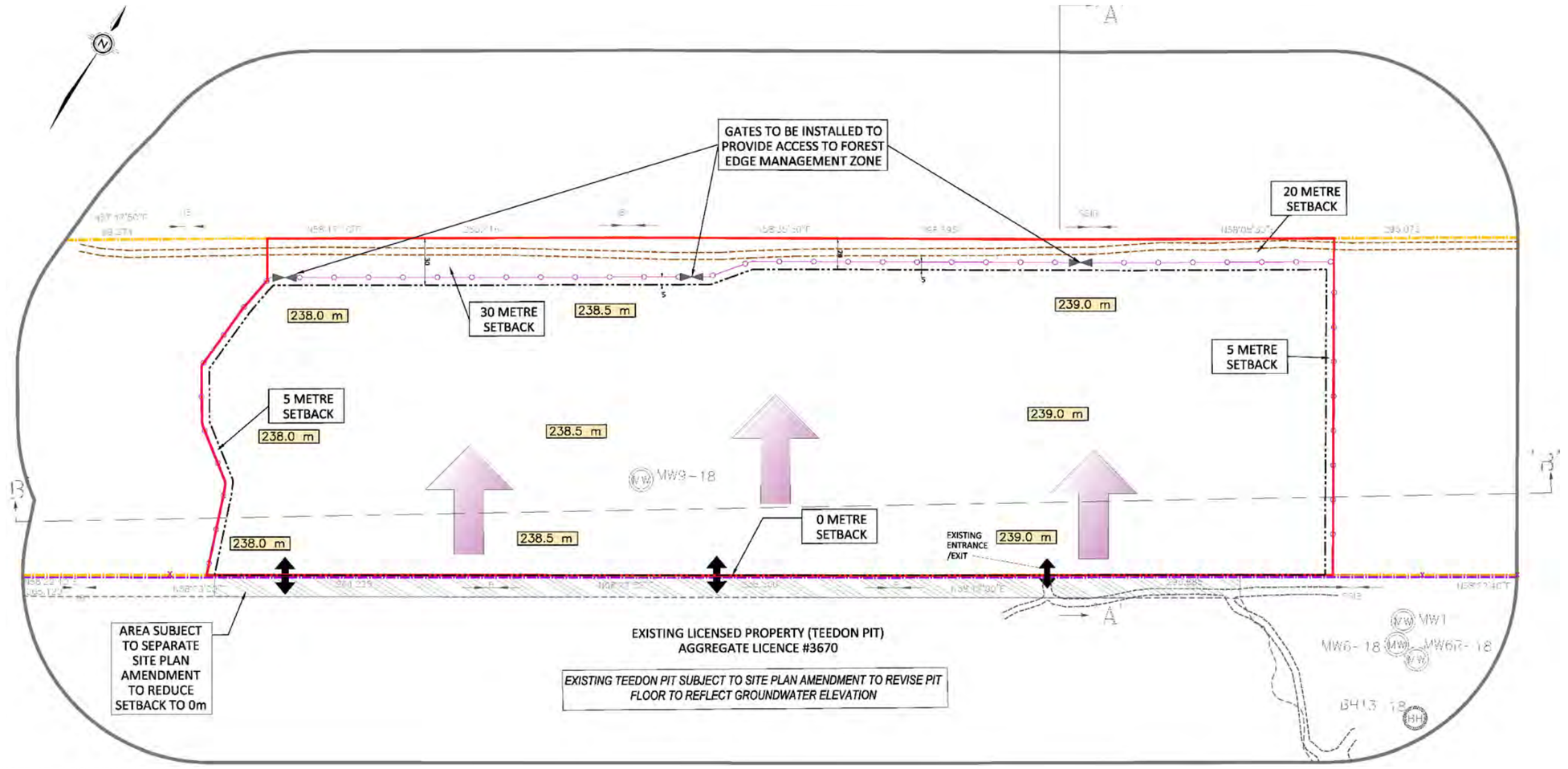

LICENSED AREA BOUNDARY - FENCING

PRIOR TO THE INSTALLATION OF FENCING TREE CLEARING SHALL OCCUR ALONG THE BOUNDARY OF THE SITE IN ACCORDANCE WITH THE TREE REMOVAL NOTES ON THIS PAGE.

AFTER TREE CLEARING ALONG THE BOUNDARY OF THE SITE AND PRIOR TO STRIPPING OF TOPSOIL/SUBSOIL A 1.2m FENCE SHALL BE INSTALLED ALONG THE EAST AND WEST LICENSED BOUNDARY AND 5m NORTH OF THE NORTHERN EXTRACTION LIMIT. FENCING WILL NOT BE REQUIRED FOR THE SOUTHERN COMMON BOUNDARY WITH THE EXISTING TEEDON PIT (LICENSE # 3670). MARKER POSTS SHALL BE PLACED ALONG UNFENCED BOUNDARIES AT 30m +/- INTERVALS TO IDENTIFY THE LICENCE BOUNDARY LIMITS. SEE OPERATIONS SCHEMATIC FOR FENCING DETAILS AND SITE PLAN OVERRIDE 5.1.

TREE REMOVAL

WITHIN THREE (3) YEARS OF LICENCE ISSUANCE AND PRIOR TO EXTRACTION COMMENCING THE FOLLOWING 20m WIDE STRIP OF TREES SHALL BE REMOVED TO PRE-STRESS THE NEW FOREST EDGE THAT WILL BE CREATED:

A) TREES 5m BEYOND THE EXTRACTION AREA (E.G. WITHIN SETBACK AREA) SHALL BE CLEARED OF TREES (BUT NOT GRUBBED). PRIOR TO TREE CLEARING IN THE NORTH SETBACK AREA A QUALIFIED ECOLOGIST OR FORESTER SHALL WALK THE ALIGNMENT OF THE PROPOSED FENCE LOCATED 5m NORTH OF THE EXTRACTION LIMIT AND MARK TREES THAT SHOULD BE REMOVED TO ACCOMMODATE THE INSTALLATION OF THE FENCE. TREES TO BE CUT SHALL BE MARKED WITH YELLOW OR ORANGE MARKING PAINT. TREES ALONG THE FENCE ALIGNMENT SHOULD BE FELLED TOWARDS THE EXTRACTION AREA. ALSO SEE NOTE 41, THIS PAGE, FOR EROSION/SEDIMENT CONTROL.

B) WITHIN THE EXTRACTION AREA A 15m WIDE AREA OF TREES ALONG THE WEST, NORTH AND EAST LIMITS OF EXTRACTION SHALL BE REMOVED.

ALL REMAINING TREES WITHIN THE EXTRACTION AREA WILL BE GRADUALLY CUT / CLEARED AHEAD OF EXTRACTIVE OPERATIONS. TREE CLEARING SHALL OCCUR AS REQUIRED TO ADVANCE EXTRACTION AND MINIMIZE THE DISTURBED AREA.

TREE CUTTING IN TREE CLEARING ZONE '1' SHALL OCCUR BETWEEN NOVEMBER 1ST AND MARCH 31ST INCLUSIVE.

TREE CUTTING IN TREE CLEARING ZONE '2' SHALL OCCUR BETWEEN NOVEMBER 1ST AND JANUARY 31ST INCLUSIVE.

SUITABLE TREES WILL BE HARVESTED FOR SAW LOGS AND OR FUEL WOOD. STUMPS AND OTHER WOOD REFUSE (WASTE WOOD, LIMBS & BRUSH) MAY BE USED FOR PIT REHABILITATION PURPOSES, REMOVED FROM THE SITE OR PILED ON THE SITE TO BE CHIPPED OR BURIED IN THE SIDE SLOPE.

FOREST EDGE MANAGEMENT

FOLLOWING TREE CUTTING ALONG THE BOUNDARY OF THE SITE, A QUALIFIED ECOLOGIST OR FORESTER WILL WALK THE NEW FOREST EDGE AND MARK DEFECTIVE TREES FOR REMOVAL. TREES TO BE CUT SHALL BE MARKED WITH YELLOW OR ORANGE MARKING PAINT.

FOLLOWING TREE CUTTING ALONG THE BOUNDARY OF THE SITE A FOREST EDGE MANAGEMENT PLAN SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE FOREST EDGE MANAGEMENT SCHEMATIC THIS PAGE.

FOLLOWING COMPLETION OF THE EDGE MANAGEMENT PLAN A QUALIFIED ECOLOGIST OR FORESTER SHALL PREPARE A REPORT DOCUMENTING THE IMPLEMENTATION OF THE FOREST EDGE MANAGEMENT PLAN. THE REPORT SHALL BE SUBMITTED TO THE MINISTRY OF NATURAL RESOURCES AND FORESTRY (MNRF).

FIGURE 10

PIT OPERATIONS

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
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Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

LEGEND

- LICENSED AREA BOUNDARY
- LIMIT OF EXTRACTION
- LICENSED AREA BOUNDARY (LICENCE # 3670 - TEEDON PIT)
- LIMIT OF EXTRACTION (LICENCE #3670 - TEEDON PIT)
- INTERNAL ROAD
- CROSS-SECTION
- ADDITIONAL LANDS OWNED BY CRH CANADA GROUP INC.
- LIMIT OF 120m INFORMATION ZONE
- EXISTING FENCE
- PROPOSED 1.2m FENCE
- EXISTING TRAIL
- ENTRANCE/EXIT *(Location may vary along common boundary)*
- 238.0 m FINAL PIT FLOOR ELEVATION
- GENERAL DIRECTION OF EXTRACTION
- BOREHOLE
- MONITORING WELL
- GATE

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SCALE
0 50 100 150
Metres

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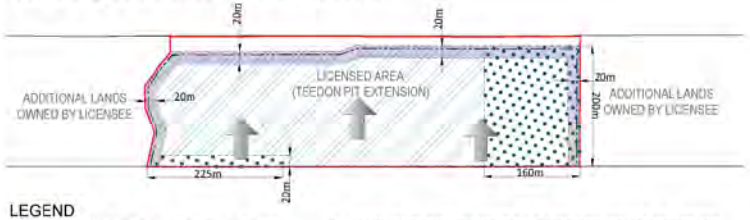
TREE CLEARING SCHEMATIC

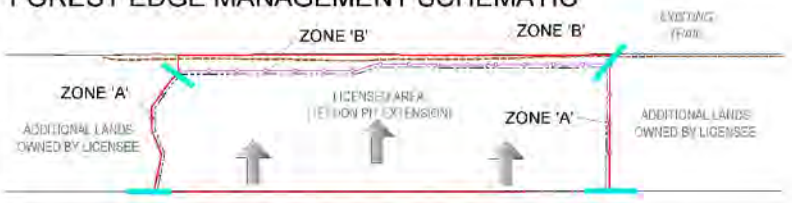


LEGEND

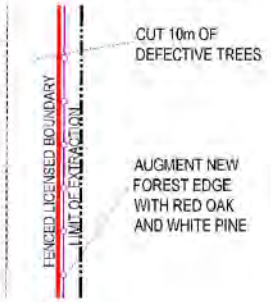
- TREE CLEARING WITHIN 3 YEARS OF LICENCE ISSUANCE - 20m (INCLUDES 5m OF SETBACK BEYOND EXTRACTION AREA AND 15m OF EXTRACTION AREA) SEE SCHEMATIC FOR LOCATION
- TREE CLEARING ZONE '1' (NOV 1ST - JAN 31ST)
- TREE CLEARING ZONE '2' (NOV 1ST - MAR 31ST)

1. WITHIN THREE (3) YEARS OF LICENCE ISSUANCE, TREES 5m BEYOND THE EXTRACTION AREA SHALL BE CLEARED (BUT NOT GRUBBED).
2. WITHIN THREE (3) YEARS OF LICENCE ISSUANCE, AN ADDITIONAL 15m WIDE AREA SHALL BE CLEARED OF TREES ALONG THE WEST, NORTH AND EAST EDGES OF THE EXTRACTION AREA.
3. AS EXTRACTION PROGRESSES NORTH TREE CLEARING SHALL OCCUR AS REQUIRED TO ADVANCE EXTRACTION AND MINIMIZE THE DISTURBED AREA.

FOREST EDGE MANAGEMENT SCHEMATIC

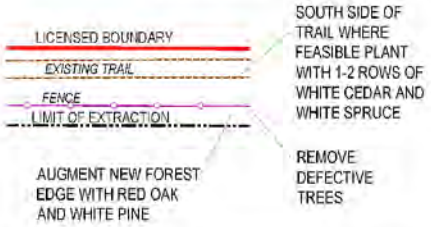


FOREST EDGE MANAGEMENT ZONE 'A' *(EAST AND WEST SIDE)*



1. WITHIN 10m OF THE NEW FOREST EDGE MARK DEFECTIVE TREES FOR CUTTING. CUT UP STEMS/TRUNKS INTO 1 TO 2 METRE LENGTHS AND PLACE ON FOREST FLOOR. CUT UP TOPS INTO BRUSH PILES FOR WILDLIFE.
2. IN THE 5m AREA BETWEEN THE FENCE AND THE EXTRACTION LIMIT THE NEW FOREST EDGE WILL BE AUGMENTED BY PLANTING RED OAK (67%) AND WHITE PINE (33%) IN GAPS. SPACING WILL VARY ACCORDING TO EDGE CONDITIONS AT THE TIME OF PLANTING, BUT SHALL BE AT LEAST 3m APART.
3. TREE PLANTING WITHIN FOREST EDGE MANAGEMENT AREA SHALL BE 1 OR 2 GALLON CONTAINER STOCK.
4. TREE PLANTING SHOULD OCCUR DURING THE SPRING PERIOD, I.E. APRIL OR EARLY MAY, DEPENDING ON SEASONAL CONDITIONS. IF NECESSARY, FALL PLANTING MAY OCCUR AFTER SEPTEMBER 20TH.

FOREST EDGE MANAGEMENT ZONE 'B' *(NORTH SIDE)*



1. RETAIN THE EXISTING 4.5m WIDE TRAIL WITHIN THE FORMER ROAD ALLOWANCE AS A PRIVATE ACCESS FOR THE OPERATOR TO IMPLEMENT FOREST EDGE MANAGEMENT.
2. BETWEEN THE EXISTING TRAIL AND THE FENCE MARK DEFECTIVE TREES FOR CUTTING. CUT UP STEMS/TRUNKS INTO 1 TO 2 METRE LENGTHS AND PLACE ON FOREST FLOOR. CUT UP TOPS INTO BRUSH PILES FOR WILDLIFE OR, ALTERNATIVELY, CHIPPED AND PLACED ON THE 4.5m WIDE TRAIL.
3. ALONG THE SOUTH SIDE OF TRAIL, WHERE FEASIBLE THE FORESTED AREA WILL BE AUGMENTED BY PLANTING ONE (1) OR TWO (2) ROWS OF WHITE CEDAR AND WHITE SPRUCE ON 2m SPACING OR GREATER.
4. IN THE 5m AREA BETWEEN THE FENCE AND THE EXTRACTION LIMIT THE NEW FOREST EDGE WILL BE AUGMENTED BY PLANTING RED OAK (67%) AND WHITE PINE (33%) IN GAPS. SPACING WILL VARY ACCORDING TO EDGE CONDITIONS AT THE TIME OF PLANTING, BUT SHALL BE AT LEAST 3m APART.
5. TREE PLANTING WITHIN FOREST EDGE MANAGEMENT AREA SHALL BE 1 OR 2 GALLON CONTAINER STOCK.
6. TREE PLANTING SHOULD OCCUR DURING THE SPRING PERIOD, I.E. APRIL OR EARLY MAY, DEPENDING ON SEASONAL CONDITIONS. IF NECESSARY, FALL PLANTING MAY OCCUR AFTER SEPTEMBER 20TH.

FIGURE 11

TREE CLEARING & FOREST EDGE MANAGEMENT ZONES

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Goodban Ecological Consulting Inc.

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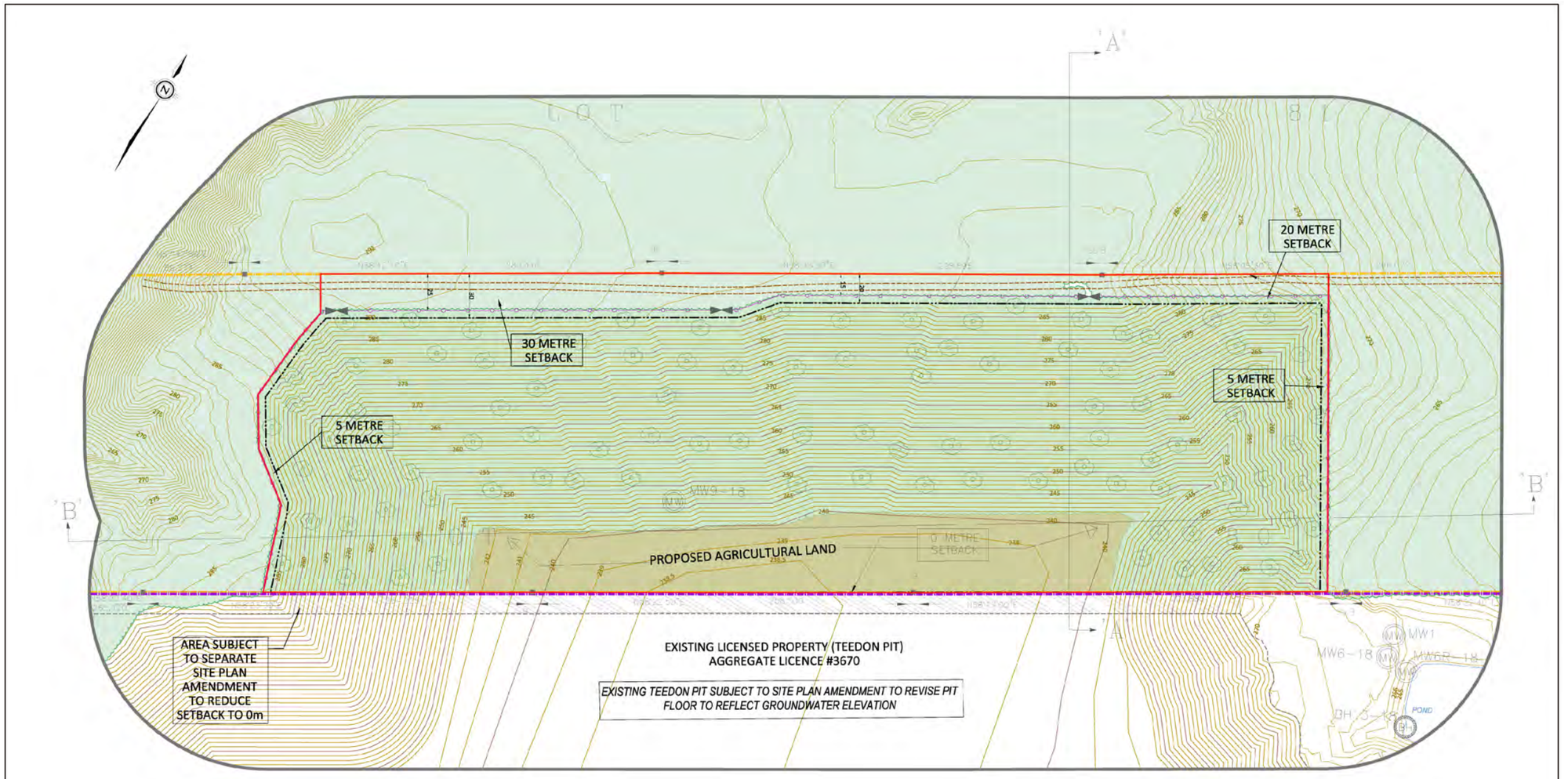
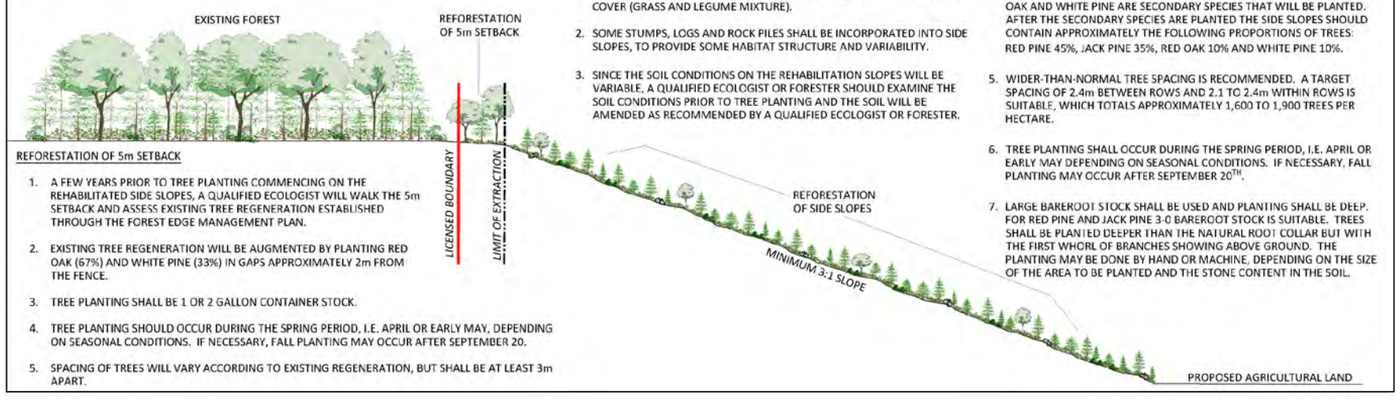


1. AREA TO BE REHABILITATED: 14.0 HA (EXTRACTION AREA AND 5m OF EXTRACTION SETBACK).
2. THE ELEVATION OF THE ESTABLISHED WATER TABLE RANGES ON SITE FROM ±236.5mASL TO ± 237.5mASL.
3. PROGRESSIVE AND FINAL REHABILITATION OF THE DISTURBED AREA WILL BE COMPLETED AS EXTRACTION REACHES FINAL LIMITS AND DEPTHS.
4. FINAL PIT FACES WILL BE SLOPED AT 3:1 TO 5:1. FINAL SLOPES WILL BE CREATED USING A COMBINATION OF CUT & FILL AND/ OR BACKFILLING. AVAILABLE OVERBURDEN AND TOPSOIL FROM ON SITE WILL BE APPLIED ON THE SLOPES AND FINAL PIT FLOOR. SEE PAGE 4 OF 4. CLEAN INERT FILL MAY ALSO BE IMPORTED FOR THE PURPOSES OF ESTABLISHING FINAL SLOPES IN ACCORDANCE WITH THE REQUIREMENTS ON PAGE 2 OF 4.
5. THE OBJECTIVE OF THE REHABILITATION PLAN IS TO REFOREST THE SETBACK AREAS AND THE SIDE SLOPES AND THE PIT FLOOR SHALL BE REHABILITATED TO AGRICULTURAL. SEE TREE PLANTING SCHEMATIC THIS PAGE FOR TREE PLANTING DETAILS.
6. THE PIT FLOOR SHALL BE GRADED AND CONTOURED AS SHOWN ON THIS PAGE AND TOPSOIL REAPPLIED AND PLANTED WITH SEED CONDUCIVE TO FORM CROPLAND THEREAFTER.
7. THE SIDE SLOPE PLANTING AREAS SHALL BE MONITORED FOR SURVIVAL IN THE FIRST AND SECOND YEARS AFTER PLANTING. REPLACEMENT PLANTING SHOULD BE UNDERTAKEN IF SURVIVAL IS LESS THAN 60%. IF HERBACEOUS COMPETITION IS PREVENTING TREE GROWTH / TREE SURVIVAL, A TENDING TREATMENT MAY BE NECESSARY (E.G. HERBICIDE APPLICATION BY A LICENSED PESTICIDE APPLICATOR).
8. PRIOR TO SURRENDER OF THE LICENCE A QUALIFIED ECOLOGIST OR FORESTER SHALL PREPARE A REPORT DOCUMENTING:
   - A) THE IMPLEMENTATION OF THE REFORESTATION PLAN;
   - B) TO ASSESS THE NEED FOR ANY STAND THINNING TO PROMOTE FURTHER NATIVE HARDWOOD REGENERATION; AND
   - C) TO IDENTIFY OTHER MANAGEMENT OPPORTUNITIES IF APPROPRIATE.

   IF REQUIRED ANY FURTHER WORK SHALL BE COMPLETED PRIOR TO THE SURRENDER OF THE LICENCE. THE REPORT SHALL BE SUBMITTED TO THE MINISTRY OF NATURAL RESOURCES AND FORESTRY (MNRF).

TREE PLANTING SCHEMATIC



REFORESTATION OF 5m SETBACK

1. A FEW YEARS PRIOR TO TREE PLANTING COMMENCING ON THE REHABILITATED SIDE SLOPES, A QUALIFIED ECOLOGIST WILL WALK THE 5m SETBACK AND ASSESS EXISTING TREE REGENERATION ESTABLISHED THROUGH THE FOREST EDGE MANAGEMENT PLAN.
2. EXISTING TREE REGENERATION WILL BE AUGMENTED BY PLANTING RED OAK (67%) AND WHITE PINE (33%) IN GAPS APPROXIMATELY 2m FROM THE FENCE.
3. TREE PLANTING SHALL BE 1 OR 2 GALLON CONTAINER STOCK.
4. TREE PLANTING SHOULD OCCUR DURING THE SPRING PERIOD, I.E. APRIL OR EARLY MAY, DEPENDING ON SEASONAL CONDITIONS. IF NECESSARY, FALL PLANTING MAY OCCUR AFTER SEPTEMBER 20.
5. SPACING OF TREES WILL VARY ACCORDING TO EXISTING REGENERATION, BUT SHALL BE AT LEAST 3m APART.

REFORESTATION OF SIDE SLOPES

1. TREE PLANTING OF SIDE SLOPES SHALL NOT OCCUR UNTIL THE SLOPES HAVE BEEN SUCCESSFULLY STABILIZED AND RE-VEGETATED WITH HERBACEOUS COVER (GRASS AND LEGUME MIXTURE).
2. SOME STUMPS, LOGS AND ROCK PILES SHALL BE INCORPORATED INTO SIDE SLOPES, TO PROVIDE SOME HABITAT STRUCTURE AND VARIABILITY.
3. SINCE THE SOIL CONDITIONS ON THE REHABILITATION SLOPES WILL BE VARIABLE, A QUALIFIED ECOLOGIST OR FORESTER SHOULD EXAMINE THE SOIL CONDITIONS PRIOR TO TREE PLANTING AND THE SOIL WILL BE AMENDED AS RECOMMENDED BY A QUALIFIED ECOLOGIST OR FORESTER.
4. CONIFERS ARE RECOMMENDED AS THE INITIAL PLANTINGS ON THE SIDE SLOPES DUE TO THEIR ABILITY TO GROW IN EXPOSED, HOT, DRY AND NUTRIENT-POOR ENVIRONMENTS. RED PINE AND JACK PINE ARE THE PREFERRED CONIFERS FOR THE INITIAL TREE PLANTING AT THE SITE. RED OAK AND WHITE PINE ARE SECONDARY SPECIES THAT WILL BE PLANTED. AFTER THE SECONDARY SPECIES ARE PLANTED THE SIDE SLOPES SHOULD CONTAIN APPROXIMATELY THE FOLLOWING PROPORTIONS OF TREES: RED PINE 45%, JACK PINE 35%, RED OAK 10% AND WHITE PINE 10%.
5. WIDER-THAN-NORMAL TREE SPACING IS RECOMMENDED. A TARGET SPACING OF 2.4m BETWEEN ROWS AND 2.1 TO 2.4m WITHIN ROWS IS SUITABLE, WHICH TOTALS APPROXIMATELY 1,600 TO 1,900 TREES PER HECTARE.
6. TREE PLANTING SHALL OCCUR DURING THE SPRING PERIOD, I.E. APRIL OR EARLY MAY DEPENDING ON SEASONAL CONDITIONS. IF NECESSARY, FALL PLANTING MAY OCCUR AFTER SEPTEMBER 20TH.
7. LARGE BAREROOT STOCK SHALL BE USED AND PLANTING SHALL BE DEEP. FOR RED PINE AND JACK PINE 3-0 BAREROOT STOCK IS SUITABLE. TREES SHALL BE PLANTED DEEPER THAN THE NATURAL ROOT COLLAR BUT WITH THE FIRST WHORL OF BRANCHES SHOWING ABOVE GROUND. THE PLANTING MAY BE DONE BY HAND OR MACHINE, DEPENDING ON THE SIZE OF THE AREA TO BE PLANTED AND THE STONE CONTENT IN THE SOIL.

FIGURE 12

REHABILITATION PLAN

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
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Geographic Township of Tiny
County of Simcoe

LEGEND

- LICENSED AREA BOUNDARY
- LIMIT OF EXTRACTION
- LICENSED AREA BOUNDARY (LICENCE # 3670 - TEEDON PIT)
- LIMIT OF EXTRACTION (LICENCE #3670 - TEEDON PIT)
- A A' CROSS-SECTION
- ADDITIONAL LANDS OWNED BY LICENSEE
- LIMIT OF 120m INFORMATION ZONE
- EXISTING TRAIL
- CONTOUR LINE
- EXISTING FENCE
- 1.2m FENCE
- BOREHOLE
- MONITORING WELL
- GATE
- EXISTING VEGETATION
- PROPOSED FORESTED AREA *(SEE TREE PLANTING SCHEMATIC ON THIS PAGE)*
- PROPOSED AGRICULTURAL LAND

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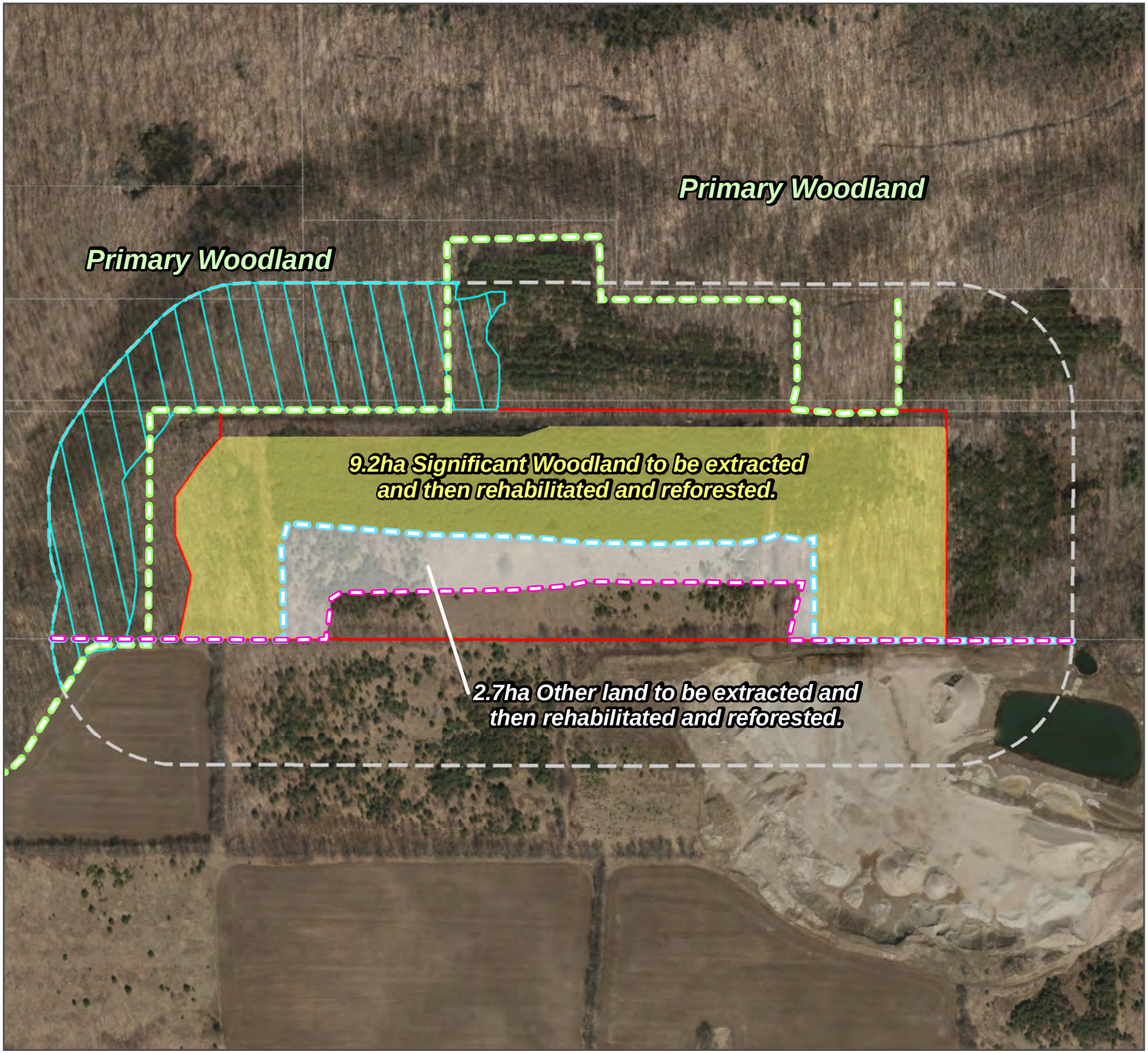

FIGURE 13

REFORESTATION AREAS

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
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Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- 120m Buffer from Licensed Boundary
- Primary Woodland Boundary
- Significant Wildlife Habitat for Woodland Area Sensitive Bird Species and Special Concern Bird Species
- Recommended Significant Woodland Boundary (GEC)
- Future Significant Woodland Boundary

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FIGURE 14

FUTURE LANDFORMS & NATURAL FEATURES

Natural Environment Report

TEEDON PIT EXTENSION
2 Darby Road,
Part of Lot 80, Concession 1 W.P.R. &
Part of original road allowance between lots 80 & 81, Concession 1, W.P.R.
Geographic Township of Tiny
County of Simcoe

Legend

- Licensed Boundary
- 120m Buffer from Licensed Boundary
- Reforestation Area - 3:1 Side Slopes and 5m Setback Area (11.9ha)
- Proposed Agricultural Area (2.1ha)
- Future Significant Woodland Boundary

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TABLE 1: VEGETATION COMMUNITY SUMMARY
Teedon Pit Extension

ELC Code[1]	Community Type[1]	Dominant Species	Tree Size Class[2] (cm dbh)	Cover Code[3]	Soils / Drainage	Area (ha) within Extraction Area	Photo Numbers[4]	General Description
Terrestrial								
FODMa	Deciduous Forest	Sugar Maple - White Birch - Trembling Aspen	10-24 cm	4	Well drained sandy loam.	0	1, 2	This small, successional unit is located within the 30 m setback from the north property boundary. This successional stand will be retained as a buffer to the mature forest to the north.
FODM5-1a	Dry – Fresh Sugar Maple Deciduous Forest Type	Sugar Maple >>> Red Maple = White Ash = White Birch = Scots Pine	10-24 cm	4	Well drained sandy loam.	1.13	3	This young forest has developed on former agricultural land. Most of this unit will be retained as a buffer to the mature forest to the west.
FODM5-1b / TAGM1-1f	Dry – Fresh Sugar Maple Deciduous Forest Type / Coniferous Plantation (Scots Pine)	Sugar Maple > Scots Pine > Black Cherry = Ironwood = Basswood > Red Maple = White Birch	10-24 cm	4	Well drained sandy loam.	0.5	4,5	Mosaic of young Sugar Maple forest (FODM5-1b) and declining Scots Pine plantation (TAGM1-1f) on former agricultural land. The Scots Pine are approximately 30 years old; many are dead/dying. Numerous downs Scots Pine. This unit is located within the proposed extraction area.
FODM5-3a	Dry – Fresh Sugar Maple – Oak Deciduous Forest Type	Sugar Maple > Red Oak > Black Cherry = White Ash = Trembling Aspen = Basswood	10-24 cm >50 cm	4	Well drained sandy loam. Some steeper slopes.	1.76	6-9	This stand is mainly young Sugar Maple with some larger Red Oaks. Former agricultural land. A few trees (oaks?) are visible on the 1954 air photo; these trees were probably left as shade trees for livestock.
FODM5-3b	Dry – Fresh Sugar Maple – Oak Deciduous Forest Type	Sugar Maple > Red Oak > Basswood = Beech = Black Cherry = Ironwood = White Birch	25-50 cm	4	Well drained sandy loam. Steeper slopes and complex topography.	0	10-14	Mature deciduous forest on steep slopes and complex topography (old shoreline feature. Unit FODM5-3b is habitat for woodland area-sensitive breeding birds. This is a 'primary woodland', meaning that it has never been converted to other land uses. This unit will be protected and it is well buffered from the proposed extraction area by the younger Sugar Maple stand (FODM5-1a). This unit contains some clusters of larger Red Oak and Sugar Maple that are over 100 years old. Woodland ground flora is more intact than most other vegetation communities within the study area.

TABLE 1: VEGETATION COMMUNITY SUMMARY
Teedon Pit Extension

ELC Code[1]	Community Type[1]	Dominant Species	Tree Size Class[2] (cm dbh)	Cover Code[3]	Soils / Drainage	Area (ha) within Extraction Area	Photo Numbers[4]	General Description
FODM5-3c	Dry – Fresh Sugar Maple – Oak Deciduous Forest Type	Sugar Maple > Red Oak > Basswood = Beech = Black Cherry = Ironwood = Red Maple	25-50 cm	4	Well drained sandy loam.	0	15-17	This stand is located north of the subject property. It supports area-sensitive woodland breeding birds, including the Threatened Cerulean Warbler. This is an example of a 'primary woodland', having never been converted to other uses. The stand is uneven aged, with various age classes. Some trees are well over 100 years old. This stand contains canopy gaps where large trees have fallen down. Hardwood regeneration typically forms beneath the canopy gaps. This unit will be well buffered from the proposed extraction area by successional deciduous forest (FODMa) and Red Pine plantation (TAGM1-1a). Woodland ground flora is more intact than most other vegetation communities within the study area.
FODM5-9a	Dry – Fresh Sugar Maple – Hardwood Deciduous Forest Type	Sugar Maple >> Red Oak = Basswood = Beech = Black Cherry = Ironwood = Red Maple	10-24 cm 25-50 cm	4	Well drained sandy loam.	0	18	Most of this unit was previously in agricultural use and the stand is relatively young. More mature trees (mainly Red Oak) occur in the east portion that is a 'primary woodland' (see Figure 7). This unit will be protected and it is well buffered from the proposed extraction area.
FODM8-1a	Fresh – Moist Poplar Deciduous Forest Type	Trembling Aspen > Green Ash = Green Ash = White Elm = Red Maple > Freeman's Maple	10-24 cm	4	Imperfectly drained silty sand.	0	19	This unit was previously in agricultural use; it is outside of the proposed extraction area.
Terrestrial - Cultural								
FODM11a	Naturalized Deciduous Hedgerow Ecosite	Sugar Maple > Basswood = Black Cherry = Red Oak	25 - 50 cm >50 cm	-	Well drained sandy loam.	0.22		Mature deciduous hedgerow along southern limit of proposed license area. The west section of this hedgerow will be retained.
FODM11b	Naturalized Deciduous Hedgerow Ecosite	Sugar Maple > Basswood = Black Cherry = Red Oak	25 - 50 cm >50 cm	-	Well drained sandy loam.	0		Mature deciduous hedgerow on the adjacent Teedon Pit property.
FODM11c	Naturalized Deciduous Hedgerow Ecosite	Sugar Maple = White Ash	25 - 50 cm	-	Well drained sandy loam.	0.13		Discontinuous treed hedgerow. White Ash are declining/dead. Located within the proposed extraction area.
TAGM1-1a	Coniferous Plantation (Red Pine)	Red Pine >>> White Pine > Scots Pine	10-24 cm	4	Well drained sandy loam.	4.41	20-23	This is the largest vegetation community within the proposed extraction area, covering 4.41 ha. There are a few rows of other conifers such as White Pine and Scot Pine. This plantation is approximately 20-25 years old. Hardwood regeneration and native groundcover plants are virtually absent from this unit. A portion of this conifer plantation will be retained north of the proposed extraction area, as a buffer to mature deciduous forest further north.

TABLE 1: VEGETATION COMMUNITY SUMMARY
Teedon Pit Extension

ELC Code[1]	Community Type[1]	Dominant Species	Tree Size Class[2] (cm dbh)	Cover Code[3]	Soils / Drainage	Area (ha) within Extraction Area	Photo Numbers[4]	General Description
TAGM1-1b	Coniferous Plantation (Red Pine)	Red Pine	25 - 50 cm	4	Well drained sandy loam.	0.93	24	This stand is 35+ years old. There had been some thinning in the past and there is more hardwood regeneration as a result. This unit is located within the proposed extraction area.
TAGM1-1c	Coniferous Plantation (Red Pine)	Red Pine	25 - 50 cm	4	Well drained sandy loam.	0	25-26	This plantation is approximately 40-45 years old. This unit will be protected; it will function as a buffer to more natural forest communities located to the north and east.
TAGM1-1d	Coniferous Plantation (Red Pine)	Red Pine	25 - 50 cm	4	Well drained sandy loam.	0	18	This Red Pine plantation is located north of the proposed extraction area, on former agricultural land.
TAGM1-1e	Coniferous Plantation (Red Pine)	Red Pine	25 - 50 cm	4	Well drained sandy loam.	0		This Red Pine plantation is located north of the proposed extraction area, on former agricultural land.
THCM1a	Dry - Fresh Coniferous Regeneration Thicket Ecosite	Red Pine = Scots Pine > Staghorn Sumac > Sugar Maple = White Ash	<10 cm 10-24 cm	3	Well drained sandy loam.	1.02	27	The old field is being taken over by young Red Pine and Scots Pine which are seeding in from the nearby plantations. Staghorn Sumac, Sugar Maple and White Ash are also invading the field. This 1.02 ha unit is situated within the proposed extraction area. It is a former agricultural field (hay/pasture).
THMM1a	Dry - Fresh Mixed Regeneration Thicket Ecosite	Red Pine = Scots Pine > White Ash = Sugar Maple = Staghorn Sumac	<10 cm 10-24 cm	3	Well drained sandy loam.	1.43	28-29	This old field is immediately south of Unit TAGM1-1a, which is a large Red Pine plantation. Unit THMM1a covers 1.43 ha within the proposed extraction area. Red Pine, Scots Pine, White Ash, Sugar Maple and Staghorn Sumac are the main woody species invading this field.
THMM1b	Dry - Fresh Mixed Regeneration Thicket Ecosite	Red Pine = Scots Pine > White Ash = Sugar Maple = Staghorn Sumac	<10 cm 10-24 cm	3	Well drained sandy loam.	0		This unit is located on the existing Teedon Pit site. Conifers and hardwoods are invading the former agricultural field (hay/pasture).
THDM2a	Dry-Fresh Deciduous Shrub Thicket Ecosite	Staghorn Sumac > Sugar Maple > White Ash	<10 cm 10-24 cm	3	Well drained sandy loam.	0.38		Scrubby patch of regeneration with a few larger trees. Former agricultural land (hay/pasture). Located within the proposed extraction area.
THDM2-1a	Sumac Deciduous Shrub Thicket Type	Staghorn Sumac >> Red Pine = Scots Pine	< 10 cm	3	Well drained sandy loam.	0.60	30-31	Former agricultural field (hay/pasture) with low, spreading growth of Staghorn Sumac. Located within the proposed extraction area.
MEGM3a	Dry - Fresh Graminoid Meadow Ecosite	Cool season forage grasses	-	1	Well drained sandy loam.	0.85	31	This is an old field formerly used for hay and/or pasture. Typical mix of old field grasses.

TABLE 1: VEGETATION COMMUNITY SUMMARY
Teedon Pit Extension

ELC Code[1]	Community Type[1]	Dominant Species	Tree Size Class[2] (cm dbh)	Cover Code[3]	Soils / Drainage	Area (ha) within Extraction Area	Photo Numbers[4]	General Description
Wetland and Aquatic								
SWDM4a	Mineral Deciduous Swamp Ecosite	Trembling Aspen > White Elm = Green Ash > Freeman's Maple = Red Maple	10-24 cm	4	Poorly drained sandy silt.	0	32	The main trees are Trembling Aspen, White Elm and Green Ash. Note the limited extent of standing water on May 8, 2018. Only a tiny fraction of this unit is within the study area, just within the 120 m adjacent lands.
Pond A	Dug Pond (Sump Pond)	Stonewort (*Chara* sp.) - Narrow-leaved Cattail	-	-	-	0	19	Dug pond that is part of the Teedon Pit operations. Sparsely vegetated.
Pond B	Dug Pond	Narrow-leaved Cattail	-	-	-	0	33	Small dug pond downgradient of Pond A (Sump Pond). Located just outside 120 m adjacent lands.

Notes:

[1]ELC codes and community types are based on Lee (2008): Lee, H.T. 2008. Southern Ontario Ecological Land Classification. Vegetation Type List. Ontario Ministry of Natural Resources, London, Ontario. 35 pp.

[2]Tree Size Class: <10 cm dbh, 10-24 cm dbh, 25-50 cm dbh, >50 cm

[3]Cover Code: 0 = none, 1 = 0-10%, 2 = 11-25%, 3 = 26-60%, 4 = >60%

[4]See **Attachment B** for representative site photographs.

Table 2: Species at Risk in Ontario with Ranges Overlapping with the Teedon Pit Extension Study Area					
Scientific Name	**Common Name**	**MNRF Status**	**Habitat**	**Suitable Habitat Within Study Area?**	**Notes**
Aristida basiramea	Forked Three-awned Grass	END	Open, bare ground or in sparsely-covered grassy areas, often in bare spots between patches of other species of grasses. The maintenance of this type of habitat requires periodic disturbances, such as fire or drought, to prevent other plants from dominating the area.	Yes.	No element occurrence in NHIC database. Forked Three-awned Grass was recorded from a disturbed area in the existing pit during the 2018 field surveys.
Asio flammeus	Short-eared Owl	SC	Grasslands, marshes and tundra.	Marginal. Only 0.85 ha of old field onsite.	No element occurrence in the NHIC database. Species not listed in OBBA square 17NK94. Not observed within study area.
Caprimlugus vociferus	Eastern Whip-poor-will	THR	Mix of open and forested areas such as savannahs, open woodlands or openings in more mature deciduous, coniferous and mix forests.	Yes.	No element occurrence in the NHIC database. Species listed in ABBO square 17NK94 as possibly breeding. Not observed onsite or surrounding area during nocturnal survey completed on July 4, 2018.
Chordeiles minor	Common Nighthawk	SC	Open areas with little or no ground cover.	Yes, marginal.	No element occurrence in the NHIC database. Species listed in ABBO square 17NK94 as possibly breeding. Not observed onsite or surrounding area during nocturnal survey completed on July 4, 2018.
Clemmys guttata	Spotted Turtle	END	Ponds, marshes and bogs with abundant vegetation.	Yes, marginal.	No element occurrence in NHIC database. Not observed within study area. Ponds provide little if any habitat.
Contopus virens	Eastern Wood-pewee	SC	Typically found in mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation.	Yes.	Species listed in ABBO square 17NK94 as probably breeding. Recorded on adjacent lands during the 2018 breeding bird surveys.

Table 2: Species at Risk in Ontario with Ranges Overlapping with the Teedon Pit Extension Study Area					
Scientific Name	**Common Name**	**MNRF Status**	**Habitat**	**Suitable Habitat Within Study Area?**	**Notes**
Danaus plexippus	Monarch	SC	Meadows and open areas with milkweed.	Yes, marginal. Common Milkweed is very sparse in old field habitat.	No element occurrence in NHIC database. Habitat not significant because not within 5 km of Lake Ontario (SWHTG).
Dendroica cerulea	Cerulean Warbler	THR	Large tracts of relatively undisturbed mature semi-open deciduous forest.	Yes. Mature forest occurs north and west of proposed licence area.	No element occurrence in NHIC database. Species not listed in this square (17NK94) in ABBO. Cerulean Warbler was recorded by GEC on June 6, 2018 in mature deciduous forest approximately 100 m north of proposed licence area.
Dolichonyx oryzivorus	Bobolink	THR	Open grassy fields, especially hay fields.	Yes, marginal.	No element occurrence in NHIC database. Species listed in this square (17NK94) in ABBO as confirmed breeding. Not observed within study area during 2018 breeding bird surveys.
Emydoidea blandingii	Blanding's Turtle	THR	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. They can travel hundreds of metres from the nearest water body when searching for a mate or travelling to/from nesting sites.	Yes, marginal.	Reported as element occurrence in NHIC database. Not observed within study area. Ponds provide little if any habitat.
Heterodon platirhinos	Eastern Hog-nosed Snake	THR	Open woodlands, brushland, forest edge and disturbed sites.	Yes.	No element occurrence in NHIC database. Not observed during the 2010-2011 and 2018 field surveys.

Table 2: Species at Risk in Ontario with Ranges Overlapping with the Teedon Pit Extension Study Area					
Scientific Name	**Common Name**	**MNRF Status**	**Habitat**	**Suitable Habitat Within Study Area?**	**Notes**
Hylocichla mustelina	Wood Thrush	SC	Mature deciduous and mixed (conifer-deciduous) forests. Prefer moist stands of trees with well-developed undergrowth and tall trees for singing perches. They nest in living saplings, trees or shrubs, usually in sugar maple or American beech.	Yes.	Species listed in ABBO square 17NK94 as confirmed breeding. Recorded on adjacent lands during the 2018 breeding bird surveys.
Juglans cinerea	Butternut	END	Deciduous forests on rich, moist and well-drained soil. Deciduous forest on shallow soils over limestone/dolostone bedrock.	Yes.	No element occurrence in NHIC database. One tree was found by LEG in 2010/11 closer to Darby Road. This area is no longer within the study area. Detailed searches were made for Butternut in 2018 and none were observed within the reduced study area.
Panax quinquefolius	American Ginseng	END	Rich, moist, undisturbed and relatively mature deciduous forests.	Yes.	No element occurrence in NHIC database. Detailed searches for American Ginseng were made in 2018 and none were observed within the study area.
Pieris virginiensis	West Virginia White	SC	Rich deciduous forests with populations of toothwort (*Cardamine* spp.).	Yes, marginal.	No element occurrence in NHIC database. Not observed during field surveys. Toothwort (*Cardamine diphylla*) occurs only as a few scattered plants.
Plestiodon fasciatus	Common Five-lined Skink	SC	Rocky outcrops in deciduous or mixed forest.	Yes, marginal. No rocky outcrops occur within the study area.	Reported as an element occurrence in NHIC database. Not observed during 2010-2011 and 2018 field surveys. No rocky outcrops occur in the study area.
Thamnophis sauritus	Eastern Ribbon Snake	SC	Usually close to water, especially in marshes.	Yes, marginal.	No element occurrence in NHIC database. Suitable habitat is extremely limited. Not observed during field surveys in 2010-2011 and 2018.

Table 2: Species at Risk in Ontario with Ranges Overlapping with the Teedon Pit Extension Study Area

Scientific Name	Common Name	MNRF Status	Habitat	Suitable Habitat Within Study Area?	Notes
Vermivora chrysoptera	Golden-winged Warbler	SC	Prefers to nest in areas with young shrubs surrounded by mature forest – locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas.	Yes.	No element occurrence in NHIC database. Species listed in this square (17NK94) in ABBO as possibly breeding. Not observed within study area during detailed breeding bird surveys in 2018.
Wilsonia canadensis	Canada Warbler	SC	Breeds in a range of deciduous and coniferous, usually wet forest types, all with a well- developed, dense shrub layer	Yes, marginal.	No element occurrence in NHIC database. Species listed in this square (17NK94) in ABBO as probably breeding. Not observed within study area during detailed breeding bird surveys in 2018.

Notes:

END = Endangered in Ontario
THR = Threatened in Ontario
SC = Special Concern in Ontario

This table was adapted from Table 4 by Lindsay Environmental Services Group (2015). The current table reflects changes in species status in Ontario and includes relevant observations from GEC's 2018 field surveys.

PROPOSED TEEDON PIT EXTENSION
NATURAL ENVIRONMENT LEVEL 1 AND 2 TECHNICAL REPORT

GOODBAN ECOLOGICAL CONSULTING INC.

January 2019

ATTACHMENT A:

SEVERN SOUND ENVIRONMENTAL ASSOCIATION (SSEA) CORRESPONDENCE FROM 2012 TO 2014

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June 25, 2012

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
Corporation of the Township of Tiny
RR 1
Perkinsfield ON L0L 2J0

Dear Shawn,

RE: REVIEW OF PROPOSED CEDARHURST QUARRIES & CRUSHING LTD (SIBTHORPE PIT), BEAMISH LTD., TOWNSHIP OF TINY, COUNTY OF SIMCOE

The following documents relating to the subject property have been reviewed.

1. License Site Plan from C.T. Strongman Surveying Ltd. dated January 31, 2012, 4 Sheets
2. Environmental Impact Statement and Natural Environment Level 1 and 2 Technical Report by The Lindsay Environmental Services Group, dated September 30, 2011
3. OP Excerpts: Schedule A – Land Use and Schedule B – Natural Features of the Township of Tiny Official Plan as they relate to the subject lands; Section B2 Environmental Protection Two of the Township of Tiny OP; Section B14 Mineral Aggregate Resources Two of the Township of Tiny OP; Part C Environmental and Groundwater Management Policies of the Township of Tiny OP
4. Planning Report PD-020-12 dated March 16 12
5. Summary Statement Report, dated Nov 28 2011 by Dennis C. Simmons Development and Land Management Consulting Services;
6. Hydrogeological Assessment, dated Apr 12 2011 by Alpha Environmental Services Inc. (to be peer reviewed by R.J. Burnside & Associates;
7. Planning Report, dated Feb 2012, prepared by Les C. Selby Consulting Services (to be peer reviewed by Township Planning Staff)

Comments on the EIS Natural Environment Level 1 & 2 Technical Report

In general, the forest cover analysis in the report started with the 2002 SOLRIS forest cover layer. The comparison with "How much habitat is enough" document should use the entire forest layer and not remove plantations that are part of the contiguous forest patch, as was done in their analysis. Our comparative analysis (copy attached) shows that there are larger interior forest patches in the existing condition of the area than were shown by the EIS document. Their analysis (Figure 16) shows interior forest patches that are not merged, artificially reducing the interior forest patch size. The 15m setback to the property boundary was not used in the forest cover analysis.

The report states that "only forest on the proposed licensed property that meets the [Significant Woodland] criteria is ELC01…" [p.27, section 4.13 Significant Woodlands] and "Most of the remaining forest, approximately 26 ha, on the proposed licensed property is small plantations of various species and ages and stands of young secondary growth. These stands do not have the attributes to be considered significant." [p.31, section 5.5 Significant Woodlands] however, the significant woodland criteria are not meant to be applied to individual stands within a forest, but rather to the contiguous forest patch.

The report implies that there will be minimal impact on Significant Woodlands and interior forest: "…with the additional loss of forest cover as a result of the proposed Cedarhurst Sibthorpe Pit, the Wye River watershed would continue to have more than the minimum forest habitats…" [p.33-35, section 5.7.2 Vegetation Functions]. However, How Much Habitat is Enough guidelines are not minimums, i.e., we should not be allowing loss of habitat or managing down to 'only' 30% forest cover in a watershed; consideration should be given to maintaining as much existing habitat as possible. The loss of forest cover and interior forest on the property would impact the Significant Woodland patch, as well as the watershed.

Although linkages/corridors were not identified in either the County or Township Official Plans, the forest habitat itself is a linkage, so "no linkage values will be impacted by this proposal" is inaccurate.[p.9, section 4.6.4 Linkages]. An important objective of Section B2 (ENVIRONMENTAL PROTECTION TWO) of the Official Plan for the Township is "To minimize the loss or fragmentation of significant woodland features and the habitats and ecological functions they provide". Also an objective in Section B14 (MINERAL AGGREGATE RESOURCES TWO) is "to ensure that new extractive activities are carried out with minimal environmental and social costs."

If the Phase 3 area is excluded and kept as a wooded corridor as it presently is, then the pit plan could be seen as having minimal impact on significant woodland and interior forest habitat on the property and in context with surrounding land. If acceptable, the silvicultural prescription and the operational plan should be

amended to reflect this change. It is also recommended that the forest cover along the north side of the property be maintained as part of the 15-m buffer (Page 2 of License Site Plan).

A concern with the retention of existing tree cover, and cutting trees no more than 90 m ahead of extraction operations (p.4), is that this timing could be bad for breeding birds. Any required tree cutting should be conducted outside the breeding season for bird species and other woodland wildlife.

The report indicates that whip-poor-will, bobolink, hog-nosed snake, cerulean warbler, golden-winged warbler, hooded warbler were all possible Species at Risk for the site [p.21-26, sections 4.8 – 4.10]. Site visit timing (March 22, June 11, and October 6, 2010, and May 20, 2011) would not have been appropriate to determine if these species were present on site.

Groundwater quality

It was noted that the water table analysis relied on three wells for the operational plan of the pit (the fourth well was reported to be dry?). The status of the surrounding private wells has not been investigated with respect to existing well construction issues, quality and quantity problems as a "pre-survey". It is recommended that a pre-survey of private wells in the vicinity be completed prior to commencement of Phase 1. This should be helpful in dealing with any well interference complaints in future.

Please contact us with any questions.

Yours truly,

Keith Sherman, Executive Director

Michelle Hudolin, Wetland and Habitat Biologist

CC: Sandra Mattson

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October 31, 2012

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
Corporation of the Township of Tiny
130 Balm Beach Road West
Tiny ON L0L 2J0

Dear Shawn,

RE: Comments concerning *Response to the Peer Review of the EIS and Natural Environment Level 1 & 2 Technical Report for the Sibthorpe Pit, Township of Tiny, County of Simcoe*

Severn Sound Environmental Association (SSEA) offers the following comments in response to Mr. David Bell's letter dated October 10, 2012.

Forest Cover & *How Much Habitat Is Enough*

As indicated in our letter dated June 25, 2012, the *How Much Habitat is Enough* guidelines are not minimums in the sense that loss of habitat to 'only' 30% forest cover in a watershed should be permitted or be seen as having no impact. In fact, *How Much Habitat is Enough* (2004) states that "...municipalities or other land units that contain higher amounts of habitat than outlined here (e.g., 35 percent forest cover, 15 percent wetlands) should maintain or improve that habitat." Thus, the loss of forest cover and interior forest on the property would impact the Significant Woodland patch, as well as the watershed, despite the fact that it would continue to have more than 30 percent forest cover.

The SSEA did not participate in the review of Sarjeant's Waverley Pits 1 & 2, and cannot comment on the review/approval process. The analysis of forest cover that SSEA conducted for our June 2012 comments included the Sarjeant's pits, and the same approach was used to provide Craig with background forest cover information for

his report. The SSEA was not responsible for, or involved in, the conclusions Craig reported.

Phase 3 & North Buffer

In SSEA's June 25, 2012 letter, we recommended excluding Phase 3 from extraction as an approach for minimizing impacts to Significant Woodland and interior forest habitat while allowing the pit to proceed. Mr. Bell's response to this suggestion was that "The proponent is not prepared to exclude the Phase 3 as this will significantly reduce the amount of material available for extraction." No alternative mitigation approaches are suggested that would satisfy the objectives of the Township of Tiny Official Plan to "minimize the loss or fragmentation of significant woodland features and the habitats and ecological functions they provide" (Section B2, Environmental Protection Two) or to "ensure that new extractive activities are carried out with minimal environmental and social costs" (Section B14, Mineral Aggregate Resources Two). As per the Official Plan, part of the purpose of an EIS is to make an informed decision as to whether or not a proposed use will have a negative impact on the critical natural features and ecological functions of the Township (Section C6.1, Purpose of an EIS).

SSEA also recommended in our June 25, 2012 letter that forest cover should be maintained on the north boundary as part of the 15 m buffer. Mr. Bell's response was that "... maintaining the 15 m buffer along the north boundary will have a major impact on the functioning of the pit as this area is required for a noise mitigation berm to be constructed with top soil along most of the northern boundary. Part of the 15 m buffer is presently a forest access road and not forested." Buffers do not necessarily need to be forested, but if this forest access road is no longer being used, then planting it with native trees would enhance the 15 m buffer. Buffers should be treated as no-touch zones and must be determined and rationalized on the basis of their ability to protect natural features and their associated functions.

Breeding season for birds

Mr. Bell's response indicates that a note will be added to the site plan that tree cutting will not occur from the beginning of April to the end of July. However, some birds nest earlier or later than these time frames. Ideally, clearing activities should be undertaken between September and February, and if any clearing is to occur between January 1 and April 1, screening for active nests of early breeding species (e.g., owls) should be conducted first.

Timing of site visits

Mr. Bell maintains that site visit dates were appropriate for Species At Risk (SAR), however the EIS/Natural Environment Report did not provide detailed information on the

conditions during visits. Please provide the following information to assist the SSEA in confirming that the typical requirements for SAR surveys (e.g., whip-poor-will) were met:

- time of day (or night) surveys were conducted, and the duration of surveys
- temperature and weather conditions (wind, precipitation)
- phase of moon (relevant for whip-poor-will surveys only)
- locations of point counts.

Please contact us with any questions.

Yours truly,

Keith Sherman,
Executive Director

Michelle Hudolin,
Wetlands and Habitat Biologist

CC: Sandra Mattson

November 26, 2012

Mr. Shawn Persaud
Director of Planning & Development
Corporation of the Township of Tiny
RR 1
Perkinsfield, ON L0L 2J0

Subject: Second Response to the Peer Review of the EIS and Natural Environment Level 1 & 2 Technical Report for the Sibthorpe Pit, Township of Tiny, County of Simcoe.

Dear Mr. Persaud,

The following is in response to the letter dated October 31, 2012 from the Severn Sound Environmental Association (SSEA) to your office providing SSEA's comments concerning our response to the peer review of the EIS and Natural Environment Level 1 & 2 Technical Report for the Sibthorpe Pit, Township of Tiny, County of Simcoe, dated, September 30, 2011.

Forest Cover & How Much Habitat Is Enough

As we stated in our original response, with the additional loss of forest cover and interior forest habitat associated with the Sibthorpe Pit, the Wye River watershed would continue to have more than the minimum forest habitat as suggested in the ``How much Habitat is Enough`` guidelines.

Although there will be loss of forest cover and interior forest habitat in the short term, the loss will be gradual over many years. This woodland area is proposed to be managed in accordance with a Silvicultural Prescription (prepared by Peter Hynard, Registered Professional Forester) until removed for extraction of aggregate. The Silvicultural Prescription is included in the Environmental Impact Statement and Natural Environment Level 1 and 2 Technical Report prepared by The Lindsay Environmental Services Group, dated September 30, 2011.

Rehabilitation of the site will be progressive with topsoil applied, seeding undertaken and trees planted as directed in a Tree Planting Prescription. Also, rehabilitation including tree planting will be progressive and start immediately after the aggregate is exhausted in a given phase. To increase the forested area in the total aggregate operation, the applicant is prepared to plant trees on an additional 10 ha of the Teeton site adjacent to the proposed licensed property. Another consideration to increase forest growth area is to look at the agricultural lands to be rehabilitated on the Teeton pit, home aggregate operation site. A trade off to weigh is the value of these lands to agricultural production vs. forest growth. This is an area of discussion with the Township & others.

The proposed aggregate extraction will occur over a very lengthy period of time, **60** plus years. Phase 3, which is proposed in the 13 ha significant woodland, will be the second last phase. **The site will be extracted in conjunction with the Teeton Pit (Aggregate License # 3670). The licenses would be combined as one pit operation with the 13 ha woodlot area (Phase 3) in all probability not being disturbed for 80-100 yrs.** This

woodland would continue to be managed under sustainable forestry practices and benefit bird & wildlife values during this extended period of time. Rehabilitation and tree planting is proposed after extraction completion of each phase before entering into another phase. Thus, initiation of tree planting and secondary succession growth occurs through and after all phases of extraction.

The approach and conclusions for the Sibthorpe Pit application are the same as those followed and approved for the Sarjeant`s Waverley Pits / 1 and 2 (Craig, 2006) regarding the potential removal of the significant woodland. Numerous agencies were involved with this approval process for Sarjeant`s.

Under the professional guidance of The Silvicultural Prescription and the Tree Planting Prescription and the Natural Environment Report, the applicant seeks similar agency support with this application in dealing with this significant woodland.

North Buffer

SSEA has suggested that the north 15 meter setback or buffer area "should be treated as a no - touch zones" and that the forest cover be maintained on the north boundary as part of the 15 m buffer. Under the Aggregate Resources Act, A.R. 2.00.03 Guiding Principles, every licensee is required to operate the licenced site in accordance with all licence conditions, and provisions of the site plan. There are mandatory conditions described by the Aggregate Resources of Ontario Provincial Standards as "Prescribed Conditions".

The Aggregate Resources of Ontario: Provincial Standards Version 1.0 contains a set of Operational Standards for licenced areas. These Operational Standards identify day-to-day operational requirements that apply to all pits and quarries.

Key operational standards for all proposed licenses include:

.the requirement to strip all topsoil before extraction and keep all topsoil that was stripped on the site for future rehabilitation.

.the minimum extraction setback distances, areas where extraction is not permitted from the boundary of the site (this is 15 m's along the north boundary).

Ensuring that topsoil and overburden are stripped and stored separately is of great importance to the eventual success of the rehabilitation program.

It is common practice and approved by the Ministry of Natural Resources that topsoil and overburden be stored in setbacks while operations are ongoing on any particular site until these materials are used in the site rehabilitation.

On the site plans for this proposal, Sheet 2 of 4, Operational Plan, the site plan notes indicate that topsoil & overburden will be stripped in advance of extraction and placed in berm locations along the north boundary. These stock pile areas will also be used as noise attenuation barriers as outlined in the Acoustic Report for the site

As stated by SSEA, part of the 15m buffer is presently a forest access road and not forested. Portions of the north boundary are open areas, old **allowance roadways** with no trees, areas of plantation growth, new tree growth, etc. The proposal is to plant this setback area once the pit is rehabilitated.

We do not agree with the ESSA statement to not place topsoil in the north boundary 15 meter setback, as operational and legislative requirements cannot be met for topsoil storage in the setback area nor the noise attenuation benefits of the berms realized.

Breeding Season for Birds

A note will be added to the site plan that tree cutting will be conducted outside the breeding season for bird species. Tree cutting will only occur between September and February to protect any nesting birds on site.

Timing of Site Visits

The timing of site visits was appropriate for most of the Species of Risk (SAR) potentially on site. The site visits were multipurpose and not targeted specifically on individual species. This approach has been acceptable to MNR on other similar projects in other areas. With regards to Whip-poor-will and after reviewing the direction provided in the Whip-poor-will Roadside Survey Participant's Guide, 2012, the site visits to the proposed licensed area, although conducted at the time of the year when male Whip-poor-will would be actively calling, were not conducted during the primary survey window as identified in the guide.

Yours truly,

David Bell, The Lindsay Environmental Group

Les C. Selby Consulting Services

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April 16, 2013

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
Corporation of the Township of Tiny
130 Balm Beach Road West
Tiny ON L0L 2J0

Dear Mr. Persaud,

RE: Comments concerning the proposed Sibthorpe Pit, Township of Tiny, County of Simcoe

In addition to the documents reviewed for Severn Sound Environmental Association's previous comments, the following information relating to the subject property has been reviewed.

1. Response to the Peer Review of the EIS and Natural Environment Level 1 & 2 Technical Report for the Sibthorpe Pit, Township of Tiny, County of Simcoe, dated October 10, 2012, prepared by David Bell.
2. Second Response to the Peer Review of the EIS and Natural Environment Level 1 & 2 Technical Report for the Sibthorpe Pit, Township of Tiny, County of Simcoe, dated November 26, 2012, prepared by David Bell and Les Selby.
3. Supplemental information on site visits, including timing, weather conditions, and purpose, provided at the February 15, 2013 meeting and via summary report, dated February 26, 2013 (received March 7), prepared by David Bell.

Severn Sound Environmental Association (SSEA) offers the following comments.

Fieldwork

With regards to completeness of fieldwork, the work conducted to date is adequate. However, if additional field work or studies are required, a pre-consultation meeting must be held to approve a detailed Terms of Reference, including appropriate survey methodologies and other expectations.

Natural Heritage Policies/Guidelines

The November letter states that the approach and conclusions for Sibthorpe Pit are the same as those for Sarjeant's Waverley Pits 1 & 2. Rules and standards have changed since the Sarjeant's and Teeton pits were approved, including direction from the Ministry of Natural Resources (MNR):

- Second Edition Natural Heritage Reference Manual (MNR 2010)
- 2012 Draft Ecoregion Schedules to support the Significant Wildlife Habitat Technical Guide (MNR)
- Lists of provincial and federal Species At Risk.

It is important to recognize that Natural Heritage information, policies and guidelines are periodically amended and updated, and development proposals must be assessed based on the best information available at the time of the application.

Woodland and Interior Forest Habitat

SSEA conducted an analysis of forest cover for the MacDonald Creek watershed, and modeled the impacts of several extraction scenarios for the Sibthorpe pit (see attached).

The Second Response letter indicated that the applicant is prepared to plant trees on an additional 10 ha of the Cedarhurst Teeton site adjacent to the proposed licensed property. SSEA agrees with this concept in principle, but would like to be provided with a map or digital shapefile that shows the location of this additional planting.

The consultant confirmed in the November letter that tree cutting will only occur between September and February. This will help protect any forest nesting birds on site.

The consultant acknowledges that there will be loss of forest cover and interior forest habitat as a result of this proposal. Based on information from the consultants and the forest cover analysis conducted by SSEA, at a minimum, Phase 3 should be excluded from the proposed extraction area. This phase is within the significant woodland patch on the property, and includes interior forest more than 100 m from an edge. In addition, the EIS identified this area as containing old growth/mature stands, with most trees 110 years old. Excluding Phase 3 will reduce the loss and fragmentation of woodland habitat, features and functions, and help minimize impacts to Significant Woodland and interior forest habitat while allowing the pit to proceed. The consultants have not suggested any alternative mitigation approaches that would satisfy the objectives of the Township of Tiny Official Plan to "minimize the loss or fragmentation of significant woodland features and the habitats and ecological functions they provide" (Section B2, Environmental Protection Two) or to "ensure that new extractive activities are carried

out with minimal environmental and social costs" (Section B14, Mineral Aggregate Resources Two).

If Phase 3 is excluded from the extraction area, an operational setback from the top of the slope would be required to maintain stability; this should be a minimum of 10 m in width, and should be a no-touch zone (i.e., no berms or stockpiles permitted). SSEA recognizes that excluding Phase 3 will reduce the amount of material available for extraction, however Section B14.6 of the Township's Official Plan indicates that the preservation of Significant Woodlands is deemed to be more important than the extraction of aggregate.

To further mitigate long-term impacts to forest cover, rehabilitation of extracted areas must include native tree species and maximize interior forest habitat.

North Buffer

At the February 15, 2013 meeting, the proponent indicated that berms will not be required in all locations on the north side of the property. Where berms are required, they should be seeded with an appropriate mix, and natural succession should be allowed to occur (i.e., no regular cutting of tree/shrub growth on the berms). SSEA will provide suggestions for a seed mix at a later date.

Please contact us with any questions.

Yours truly,

Keith Sherman,
Executive Director

Michelle Hudolin,
Wetlands and Habitat Biologist

CC: Sandra Mattson

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June 11, 2013

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
Corporation of the Township of Tiny
130 Balm Beach Road West
Tiny ON L0L 2J0

Dear Mr. Persaud,

RE: Comments concerning the proposed Sibthorpe Pit, Township of Tiny, County of Simcoe

The Severn Sound Environmental Association (SSEA) has reviewed the email response from Les Selby and David Bell, dated May 14, 2013, and offers the following comments.

Fieldwork

The SSEA indicated in our April 16, 2013 letter that the field work conducted to date is adequate. The SSEA contacted staff at the Midhurst MNR to discuss requirements of field work generally, in terms of natural heritage. The SSEA has not provided Midhurst MNR with detailed information on the Sibthorpe proposal for review or comment, and our discussions with them should not be presumed to be approval from MNR with regards to the field work on this site.

Natural Heritage Policies / Guidelines

The email briefly described the timing of the field study as being a two-year process; a response from the SSEA to this comment in the email is not required.

Tree Cutting

The SSEA has no further comment, provided that the stated tree cutting timing, agreed to by Beamish, is incorporated into the Site Plan/Silvicultural Prescription for this application.

North Buffer

The SSEA has no further comment, provided that the retention of secondary growth on the berms is incorporated into the Site Plan for this application.

Teedon Pit- Additional Tree Plant

In the May 14, 2013 email, the consultants state that the additional 10 ha of the Teedon Pit to be planted would be to "*compensate for the potential loss of trees on the slope area of the Sibthorpe proposal*". The November 26, 2012 letter from the consultants indicated that planting an additional 10 ha of the Teedon site was to "*increase the forested area in the total aggregate operation*", and did not indicate it would be specifically as compensation for the loss of trees on the slope of the proposed Sibthorpe Pit.

Beamish has agreed to provide further mapping details on additional tree planting on the Teedon Pit site. This information, and approximate time-frames of when the planting would occur, should be provided in order to consider if/how compensation planting would offset the proposed loss of interior forest habitat on the slope of the Sibthorpe site.

Woodland and Interior Forest Habitat

As stated previously, the SSEA cannot comment on approvals granted for the Sarjeant Pit applications, since our agency was not involved in their review or approval. As we understand it, the Sarjeant's Waverley Pits were submitted to the Township in 2006, which was prior to the release of the second edition Natural Heritage Reference Manual, which provides fairly detailed recommended criteria for features such as significant woodlands. The SSEA's comments to date on the Sibthorpe Pit reflect the current proposal as it pertains to existing policy and supporting documents such as the second edition Natural Heritage Reference Manual.

The consultants continue to refer to the significant woodland size as 13 ha: "*Beamish's initial proposal was to potentially extract 13 ha. of significant woodland on their property*". In fact, the majority of the property is currently within the Significant Woodlands designation of the municipal Official Plan; though only the Phase 3 area has mature stands and 200 m interior forest habitat.

It is true that the SSEA's analysis of forest cover used the smaller land unit of MacDonald Creek subwatershed, rather than the larger Wye River watershed. The Severn Sound Habitat Strategy (2002) summarized the amount of forest habitat by watershed (e.g., Wye River, Sturgeon River), but for larger watersheds like Wye River,

the amount of forest habitat was also calculated by subwatershed (i.e., Upper Wye, Lower Wye, and MacDonald Creek), to provide a more detailed picture of forest cover as it applies to ecosystem health at the local scale, rather than just at the larger watershed scale.

At a site level, the proposed forest loss is considerable. Even if the forest cover for the larger Wye River watershed is used and the Wye River watershed would continue to have what the consultants refer to as "*the minimum forest habitat*" with reference to How Much Habitat is Enough, there would still be impacts from the loss of forest cover. As stated in the SSEA's letter of October 31, 2012, How Much Habitat is Enough (2004) maintains that "...municipalities or other land units that contain higher amounts of habitat [than the guidelines] **should maintain or improve that habitat**."

The Township must be consistent with the Provincial Policy Statement, which states that: "development shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions". In addition, "development and site alteration shall not be permitted on adjacent lands [to significant woodlands] unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions". Given that the functions of the significant woodland in Phase 3 include diverse tree species, mature stands and the provision of 200 m interior forest habitat -functions not present elsewhere on the subject land- it has not yet been satisfactorily demonstrated that the proposal will have 'no negative impacts' on these functions of the significant woodland.

The SSEA's forest cover analysis modeled several scenarios including the impact of the Sarjeant's and Teedon Pits alone (see Map 4 from SSEA's April 15, 2013 analysis) and in combination with forest cover loss on the Sibthorpe site. The SSEA disagrees with the consultants that our analysis of forest cover is an 'elevated figure of lost woodlands'. While it is probable that the loss of woodland habitat from the Sarjeant and Beamish Pits may not all occur at the same time, the length of time required for a rehabilitated site to become functional interior woodland habitat similar in species composition and tree size to what currently exists means there will be a cumulative effect of lost forest cover and habitat functions for some time.

The consultants state that "*Much of the woodland area that SSEA shows as interior, other than Phase 3, is secondary growth, few trees over 60 years and with many openings. Although it is interior because it is 100 or 200 m from the edge, it does not meet the criteria for Area-Sensitive Bird Habitat because the trees are not old enough and there are too many openings and plantations*". The second edition Natural Heritage

Reference Manual does not require that a woodland meets the criteria for Area-Sensitive Bird Habitat in order to be considered Significant Woodland; the recommended criteria for Significant Woodland include size and ecological functions such as woodland interior habitat and mature trees. Area-Sensitive Bird Habitat is considered Significant Wildlife Habitat, a separate designation from Significant Woodland; it appears that the western portion of phase 3 (proposed to be excluded from extraction) may also meet this designation.

The consultants presume that the SSEA's preferred scenario is #3 (i.e., phase 3 untouched with a 10 m buffer). As the Township is aware, the SSEA's preferred scenario is #2 (i.e., extraction only to the western edge of ELC04), since ELC03 provides 100 m edge habitat to ELC02. Scenario #3 was proposed as a compromise that reduces the loss and fragmentation of woodland habitat, features and functions, and helps minimize impacts to Significant Woodland, particularly interior habitat and mature stands, while allowing the pit to proceed.

Points of consideration

Mr. Selby states that the "*EIS and Natural Environment Report Level 1 & 2... appears to be initially satisfactory to MNR*". The SSEA requests additional details about the MNR staff who reviewed the information; ideally, a copy of the MNR comments should be provided for reference.

The consultants state "*The professional forester indicates that the significant woodlands within phase 3, approximately 13 ha's, was probably clear cut around 1900- thus the site had a total removal of existing trees over 100 years ago*". This is not a particularly relevant consideration, since the issue is the current condition and designation of the woodland on site.

The email indicates that "*not all areas within the proposed licensed property may be extracted due to aggregate availability or quality as aggregate operations progress- in those situations existing secondary tree growth would be retained to compliment adjacent areas*". The SSEA agrees that retention of existing trees under these circumstances is appropriate and will enhance adjoining areas; a decision of whether or not to extract an area would presumably be made prior to tree clearing in that location.

Top of Bank Extraction Restriction

Of Phase 3, Mr. Selby indicates "*There does not appear to be the same quality of trees on the slope compared to the western flat area.*" The EIS describes the vegetation on the slope and up on top of the hill as containing "*mature red oak and younger sugar maples*", and lists quite a diverse number of tree and shrub species for ELC

communities 01 and 02: 13 tree and 9 shrub species listed for community 01 (all native species), and 14 tree and 4 shrub species listed for community 02 (with all but apple tree being native species). The species listed in the EIS for these communities have habitat value as well as contributing to a 200 m buffer to the forest edge.

The SSEA recognizes that Beamish has protected a portion of significant woodlands on the Teedon Pit. What is being proposed by Beamish for the Sibthorpe Pit is attractive on paper because it appears to be a relatively small loss of interior forest in exchange for a potential gain in forest cover over the long term. The Township ultimately must decide if the proposal is consistent with the natural heritage policies of the Provincial Policy Statement, the Township Official Plan, and represents a sustainable solution to the loss of forest cover. As part of these deliberations, the Township must also consider if eliminating the requirement for agricultural rehabilitation in favour of reforestation is an acceptable trade-off in terms of the eventual land use of the site.

Before considering whether or not to accept the proposed compensation planting in exchange for extraction to the bottom of the slope, mapping of the proposed area to be planted as compensation should be provided for review. In addition, commitments should be made to amend the Site Plan for the Teedon Pit application, and to modify: the Site Plan, Silvicultural Prescription and Tree Planting Prescription for both the Teedon and Sibthorpe Pits. Tree Planting Prescription modifications for the Sibthorpe Pit that should be required before compensation planting would be considered include:

1. SPECIES PLANTED - The list of species to be planted should be revised, to include a larger diversity of species and be more representative of the tree species composition currently on site in the Phase 3 area. The current planting plan only prescribes Red Pine and 10% Red Oak, with the addition of Jack Pine and/or White Pine depending on the post-extraction soil conditions. The Silvicultural Prescription lists existing tree species along the bluff as including: hard [sugar] maple, white ash, red oak, largetooth aspen, beech, basswood, white pine and white birch, while the EIS also found: red ash, ironwood, black cherry, hemlock, red maple, and quaking aspen in the Phase 3 area (i.e., ELC map communities 01 and 02).
2. SURVIVAL REQUIREMENTS & REFILL PLANTING - The 60% survival suggested in the prescription should be modified to clarify that at least 60% survival <u>of each species</u> is required, in order to ensure good post-planting species diversity. The prescription presently indicates that "*refill planting should be* ***considered*** *if survival at that time is less than 60%*". This should be modified to: "refill planting is **required** if survival at the time of assessment is less than 60%".
3. SURVIVAL ASSESSMENTS - Survival assessments should be done at years one, two and five (free-to-grow assessment), as is currently the practice of agencies like

Trees Ontario, rather than just in the first and second year after planting as indicated in the current prescription. The prescription states that "*there is little point in refilling after age two, as the refilled trees are unlikely to catch up with the original plantings from that point on*", however, it also indicates that the "*goal of tree planting following pit rehabilitation is to establish a natural self-sustaining forest*". With this goal in mind, trees of uneven age (i.e., from any required infill planting after year two) are unlikely to be a large issue, and in fact would contribute to a more natural woodland structure.

The additional information and a commitment to the modifications outlined above would allow for a more thorough consideration of how the proposed compensation planting would offset the loss of interior forest habitat on the slope of the Sibthorpe site.

Please contact us with any questions.

Yours truly,

Keith Sherman,
Executive Director

Michelle Hudolin,
Wetlands and Habitat Biologist

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February 27, 2014

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
Corporation of the Township of Tiny
130 Balm Beach Road West
Tiny ON L0L 2J0

Dear Mr. Persaud,

RE: Proposed Sibthorpe Pit, Darby Road, Township of Tiny

K.J. Beamish Construction Limited (Beamish) has submitted an application for an aggregate license for the Sibthorpe Pit (Darby Road). Beamish is proposing to extract aggregate from the eastern end of the property to the base of the ridge (i.e., 257 metres above sea level in elevation). This proposal would result in the removal of some of the Significant Woodland on the subject lands, including woodland with interior forest habitat. The remainder of the Significant Woodland, from the base of the ridge to the western property boundary, is not part of the proposed extraction area, and would be retained as woodland.

To mitigate impacts from the loss of the extent of Significant Woodland, Beamish has proposed compensation tree planting on the Teedon Pit that abuts the subject lands to the south, and tree planting as part of the rehabilitation plan for the Sibthorpe site. The tree planting being proposed would result in parts of Teedon being forested that are currently not treed, and contribute to interior forest habitat once the trees mature.

Given Sections 2.5.2.2 and 2.5.3.1 of the current (2005) Provincial Policy Statement, the Severn Sound Environmental Association (SSEA) agrees in principle to extraction to the base of the slope with compensation tree planting, pending the submission of an acceptable tree planting plan.

For land use planning purposes, the Township could consider retaining the Significant Woodlands designation (i.e., Environmental Protection Two in the Official Plan) on areas of the property with that designation currently, in order to reflect the ultimate use of the land.

Please contact me with any questions.

Yours truly,

Keith Sherman,
Executive Director

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July 22, 2014

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
Corporation of the Township of Tiny
130 Balm Beach Road West
Tiny ON L0L 2J0

Dear Mr. Persaud,

RE: Proposed Sibthorpe Pit, Darby Road, Township of Tiny – Site Plans

The SSEA has reviewed the revised site plans submitted in support of the proposed Sibthorpe Pit (received electronically at the SSEA office on July 14, 2014). We offer the following comments.

Operational Plan

SITE AREA CALCULATIONS

1. The Area to be extracted was originally 39.0 hectares; the revised plan shows the Area to be extracted as 30.0 hectares, a reduction of 9 hectares. However, correspondence from Mr. Selby (January 30, 2014) indicates that Beamish proposes "*to protect 10.65 ha of significant woodlands, if permitted to extract to the bottom of the slope*". Based on this, our assumption was that the revised area to be extracted would be reduced by 10.65 ha; the reason(s) for this discrepancy are unclear. Please clarify how far to the west the extraction is proposed [also see comment #5 below].

TREE REMOVAL / FOREST MANAGEMENT

2. The note indicates that "*All trees within the extractive area will be gradually cut/cleared no more than 90 meters ahead of extractive operations (pit faces) and no less than 5 meters at any given time.*" In our letter of June 25, 2012, the SSEA raised the issue of timing of tree cutting, indicating that this timing could impact breeding birds. The issue was to be addressed, as per the following correspondence from Mr. Bell and Mr. Selby:

- "*A note will be added to the site plan that tree cutting will be conducted outside the breeding season for bird species. Tree cutting will only occur between September and February to protect any nesting birds on site.*" (November 26, 2012)
- "*Beamish has agreed that tree cutting is only to occur between September and February to protect any forest nesting birds on site. This will be appropriately placed on the site plan notes as agreed to earlier.*" (November 29, 2013)

The appropriate note concerning tree cutting timing has not been incorporated into the revised site plans.

3. The tree planting that would occur on portions of the Teedon Pit as compensation if the Sibthorpe Pit is approved has been satisfactorily addressed by the note "*Prior to pit operations commencing, a tree planting agreement shall be finalized with the Township of Tiny. This agreement shall apply to the planting of trees on blocks 1 - 5, to be identified on the site plans of the Teedon pit, Aggregate license # 3670. Establishment of the planting blocks will be subject to a site plan amendment on the Teedon pit site plans. No pit operations are to take place on this licensed property (Sibthorpe pit) until such time that the site plan amendment for the Teedon pit is approved.*"

STRIPPING OF TOPSOIL / OVERBURDEN

4. Berms are described, and it is noted that they will be seeded with grass seed. The SSEA's letter of April 16, 2013 stated that, for the North Buffer area, "*Where berms are required, they should be seeded with an appropriate mix, and natural succession should be allowed to occur (i.e., no regular cutting of tree/shrub growth on the berms).*" In his letter from November 16, 2013, Mr. Selby confirmed that the retention of secondary growth on the berms would be incorporated into the site plan: "*The secondary growth can be maintained on the berms and shown on the site plan notes with the qualifier that this will occur until the berm materials are required for progressive and final site rehabilitation. At that time, any secondary growth would, along with the rehabilitation materials in the berms, be removed. Eventually, any disturbed areas will be reseeded & reforested.*"

The appropriate note concerning retention of secondary growth on the berms has not been incorporated into the revised site plans.

EXTRACTION / MAXIMUM NUMBER OF LIFTS AND MAXIMUM HEIGHT

5. As outlined in our letter of February 27, 2014, the SSEA had understood that the extraction in the west to the base of the ridge would be to 257 m a.s.l. A draft version of this letter, which included reference to 257 m a.s.l, was circulated to the Township and Mr. Selby to ensure that the letter captured the intent of what was agreed upon in the meeting. Email correspondence (March 2, 2014) from Mr. Selby stated that "*Dennis & I have…reviewed the draft letter and it reflects our agreement and meeting outcome.*"

The note in the Operational Plan indicates that "*...the maximum depth of extraction will vary across the site with an final pit floor elevation varying from 240.5 meters in the west portion...*" This is considerably deeper than the 257 m a.s.l expected, and requires clarification [this comment may be related to #1 above].

MINING / EXTRACTION SEQUENCE

6. The notes indicate that "*...Phases 1 and 2 may be operated on concurrently and Phases 1 and 3 may be operated on concurrently.*" A further note (under Phase 3) indicates that "*Prior to extraction proceeding into Phase 3, all of the Phase 2 area...shall be rehabilitated.*" If Phases 1 and 3 were to be operated on concurrently, presumably Phase 2 would be left untouched and thus would not be ready for rehabilitation; if this is the case, technically the pit would be in contravention of the second note.
7. The notes indicate that "*Slopes will be graded, topsoil applied, seeded and planted with tree species as identified in the Tree Planting Agreement made with the Township of Tiny.*" The SSEA is in agreement with this note, since it provides a mechanism to ensure that the Township will be satisfied with tree planting to occur on the site.

Rehabilitation Plan

8. The Total area to be planted with trees was 23.7 ha in the original plan; the revised plan shows the Total area to be planted with trees as 23.0 hectares. The area to be rehabilitated to agriculture was discussed and agreed to in general terms at the meeting on February 26, 2014. From this discussion, the SSEA understood that the western limit of the agricultural rehabilitation would essentially remain the same as in the original Rehabilitation Plan, and the eastern portion of the area to be extracted would be planted in trees rather than rehabilitated to agriculture, i.e., that the area to be rehabilitated to agriculture would generally correspond with the area depicted in the site plan drawing as 'Open Field'. On the revised Rehabilitation Plan, the eastern area to be planted corresponds with the SSEA's expectation; however, the proposed agricultural land has been expanded to the west when compared with the original Plan. Since this area is currently well treed, it should ideally be part of the area to be planted during rehabilitation.

Please contact us with any questions.

Yours truly,

Keith Sherman,
Executive Director

Michelle Hudolin,
Wetlands and Habitat Biologist

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October 15, 2014

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
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130 Balm Beach Road West
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Dear Mr. Persaud,

RE: Proposed Sibthorpe Pit, Darby Road, Township of Tiny – Site Plans

The SSEA has reviewed Mr. Les Selby's email, dated September 9, 2014, which was in response to the SSEA's July 22, 2014 letter, as well as the subsequent emails from October 7 and 12, 2014. We offer the following comments.

Item #1 - Operational Plan - Site Area Calculations
The September 9 email provides clarification on the calculation of the extraction area. The SSEA has no further comment on this item.

Item #2 - Tree Removal / Forest Management
Beamish had previously agreed (in November 2012) that "tree cutting is only to occur between September and February to protect any forest nesting birds on site". A note was to be added to the site plan, which would have satisfied the SSEA on this issue.

A less restrictive timing window has been proposed. The Operational Plan [*file: 7700 JUNE 2014 OPERATIONAL PLAN.pdf*] states "Tree cutting will only occur between August 1st and April 30th", and the October 7 email provides a slightly reduced tree cutting window: "We propose to not cut between April 15 to September 1st".

The September 9 email indicates that the rationale is that "Dennis has been in touch with the Bancroft MNR Species at Risk staff who confirmed that the bird breeding season is from May 1st to August 15th annually." This timing is true of most migratory bird species, however, forest habitat can also be used by non-migratory birds, with some species nesting earlier or later than the migratory bird time frame.

The September 1st start date for tree cutting is acceptable, however allowing cutting until April 15th is not ideal, since some non-migratory birds such as owls begin breeding as early as the start of February.

The intent of the SSEA's originally recommended tree cutting timing restriction is to protect a wide variety of forest-breeding birds, not just migratory species protected through the Migratory Birds Convention Act (MBCA). The Ontario Fish and Wildlife Conservation Act provides protection to many wildlife species, including the nests and eggs of most birds not protected by the federal MBCA, such as owls. Numerous existing publications, such as the following OMNR publication, recommend timing tree cutting outside the breeding season to minimize disruption to forest birds or give guidance on the critical breeding period for many species, including early nesting species such as owls and hawks.

Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (OMNR, 2010)
https://www.ontario.ca/environment-and-energy/forest-management-guide-conserving-biodiversity-stand-and-site-scales-stand-and-site-guide

- Section 4.2 lists critical breeding periods (for OMNR Southern Region) for a variety of species, including hawks and owls.
    - February 1 and February 15 are the earliest critical breeding periods given (for Great Horned Owl and Bald Eagle, respectively), with many other owl species with dates as early as March 15.
    - The latest critical breeding period dates provided are August 15 (for Bald Eagle and Osprey), and August 31 (Turkey Vulture).

Based on the guidance in this OMNR document, the SSEA maintains the position that tree cutting activities should be undertaken between September and February, as was previously agreed to for the Sibthorpe proposal, to protect breeding forest birds. As the Township is aware, the SSEA has provided this same tree removal timing recommendation for several other development proposals in the Township in recent years.

The SSEA has considered Mr. Selby's October 7 proposal to allow tree cutting up until April 15. This could be permitted, if Beamish commits to retaining a qualified biologist to first conduct site visits to screen for active nests of early nesting bird species in every year that tree cutting is to occur between February 1 and April 15.

The SSEA recommends that one of the following notes be added to the site plan:

- Tree cutting will only occur between September 1st and February 1st.

OR

- Tree cutting will only occur between September 1st and April 15th. In any year that cutting is to occur between February 1st and April 15th, a qualified biologist will first conduct site visits to screen for active nests of early nesting bird species. For any nests found, the standards, guidelines and best management practices in 'Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales' (OMNR, 2010), or its successors, will be followed.

Item #3 – Compensation Tree Planting Site Note
No additional comment from the SSEA is required.

Item #4 – Stripping of Topsoil / Overburden
The Operational Plan [*file: 7700 JUNE 2014 OPERATIONAL PLAN.pdf*] has been modified to add the site plan note indicated in the email. The SSEA is now satisfied on this issue.

Item #5 - Extraction / Maximum Number of Lifts and Maximum Height
The September 9 email provides clarification that the base of slope contour used corresponds with the Teedon Pit. We have no further comment on this item.

Item #6 - Mining / Extraction Sequence
The September 9 email provides clarification on the extraction sequence. The SSEA has no further comment on this item.

Item #7 – Tree Planting Agreement Site Note
No additional comment from the SSEA is required.

Item #8 – Rehabilitation Plan
The SSEA understands that the reforestation comments in our letter of July 22, 2014 are being incorporated into revised site plans, and we will review the plans when they are resubmitted.

Please contact us with any questions.

Yours truly,

Keith Sherman,
Executive Director

Michelle Hudolin,
Wetlands and Habitat Biologist

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November 19, 2014

Mr. Shawn Persaud, BA, MCIP, RPP
Manager of Planning & Development
Corporation of the Township of Tiny
130 Balm Beach Road West
Tiny ON L0L 2J0

Dear Mr. Persaud,

RE: Proposed Sibthorpe Pit, Darby Road, Township of Tiny – Revised Site Plans

The Severn Sound Environmental Association (SSEA) has reviewed the following revised Site Plans for the proposed Sibthorpe Pit:

- Operational Plan [electronic file: 7700 NOV. 2014-2.pdf, dated November-04-14, received via email on November 11, 2014]
- Rehabilitation Plan [electronic file: 7700 NOV. 2014 REHAB.pdf, dated November-18-14, received via email on November 19, 2014].

Operational Plan

The SSEA's concern regarding timing of tree cutting has been addressed by the addition of the following Tree Removal/Forest Management site note:

> "Tree cutting will only occur between September 1st and April 15th. In any year that cutting is to occur between February 1st and April 15th, a qualified biologist will first conduct site visits to screen for active nests of early nesting bird species. For any nests found, the standards, guidelines and best management practices in 'Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales' (OMNR, 2010), or its successors, will be followed."

Rehabilitation Plan

The revised drawing depicts the proposed agricultural land in the central portion of the extraction area, which corresponds with the existing open field area; the remainder of the rehabilitated area is shown as being planted in trees. Site Plan note #7 indicates that the area to be planted in trees will be 26.6 ha.

With these revisions, the outstanding issues with the Operational Plan and Rehabilitation Plan have been addressed.

Please contact us with any questions.

Yours truly,

Keith Sherman,
Executive Director

Michelle Hudolin,
Wetlands and Habitat Biologist

Attachment B:

2018 Representative Site Photographs

Teedon Pit Extension

Goodban Ecological Consulting Inc. (GEC)

January 2019

Photo 1 – Deciduous Forest (FODMa). This unit is located within the 30 m setback from the north property boundary. November 1, 2018.

Photo 2 – Deciduous Forest (FODMa). This successional stand will be retained as a buffer to the mature forest to the north. November 1, 2018.

Photo 3 – Dry-Fresh Sugar Maple Deciduous Forest Type (FODM5-1a). This young forest has developed on former agricultural land. Most of this unit will be retained as a buffer to the mature forest to the west. View 1.
October 16, 2018.

Photo 4 – Mosaic of young Sugar Maple forest (FODM5-1b) and declining Scots Pine plantation (TAGM1-1f) on former agricultural land. View 1.
October 16, 2018.

Photo 5 - Mosaic of young Sugar Maple forest (FODM5-1b) and declining Scots Pine plantation (TAGM1-1f) on former agricultural land. View 2.
October 16, 2018.

Photo 6 – Dry- Fresh Sugar Maple – Red Oak Deciduous Forest (FODM5-3a). This stand is mainly young Sugar Maple with some larger Red Oaks. View 1.
November 1, 2018.

Photo 7 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3a). This section is dominated by young Sugar Maple. Unit FODM5-3a has developed on former agricultural land. View 2. October 16, 2018.

Photo 8 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest (FODM5-3a). Young Sugar Maple with a larger Red Oak in this frame. View 3.
October 16, 2018.

Photo 9 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3a). Young Sugar Maple and Red Maple. View 4. October 16, 2018.

Photo 10 – Dry-Fresh Sugar Maple – Red Oak (FODM5-3b). Mature deciduous forest on steep slopes and complex topography. View 1. August 31, 2018.

Photo 11 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3b). This forest unit is habitat for woodland area-sensitive breeding birds. View 2. August 31, 2018.

Photo 12 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3b). This is a 'primary woodland', meaning that it has never been converted to other land uses. View 3. August 31, 2018.

Photo 13 – Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3b). This unit will be protected and it is well buffered from the proposed extraction area by the younger Sugar Maple stand (FODM5-1a). View 4.
October 16, 2018.

Photo 14 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3b). This unit contains some clusters of larger Red Oak and Sugar Maple that are over 100 years old. View 5.
October 16, 2018.

Photo 15 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3c). View 1.
October 16, 2018.

Photo 16 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3c). This stand is located north of the subject property. It supports area-sensitive woodland breeding birds, including the Threatened Cerulean Warbler. This is an example of a 'primary woodland', having never been converted to other uses. Note the uneven aged character of this stand. Some trees are well over 100 years old. This unit will be well buffered from the proposed extraction area by successional deciduous forest (FODMa) and Red Pine plantation (TAGM1-1a). View 2.
October 16, 2018.

Photo 17 – Dry-Fresh Sugar Maple – Red Oak Deciduous Forest Type (FODM5-3c). This stand contains canopy gaps where large trees have fallen down. Note the patch of hardwood regeneration n the canopy gap (upper left).
November 1, 2018.

Photo 18 – Dry-Fresh Sugar Maple – Hardwood Deciduous Forest Type (FODM5-9a). Most of this unit was previously in agricultural use and the stand is relatively young. The larger trees in the foreground were hedgerow trees between field compartments. Note the Red Pine Conifer Plantation (TAGM1-1d) in the distance to the north. This unit will be protected and it is well buffered from the proposed extraction area.
November 1, 2018.

Photo 19 – View looking northwest across the existing pit, showing the north half of the Sump Pond (Pond A) and Fresh-Moist Poplar Deciduous Forest Type (FODM8-1).
November 1, 2018.

Photo 20 – Red Pine Coniferous Plantation (TAGM1-1a). This is the largest vegetation community within the proposed extraction area, covering 4.41 ha. View 1.
October 16, 2018.

Photo 21 – Red Pine Coniferous Plantation (TAGM1-1a). There are a few rows of other conifers such as White Pine (seen here) and Scot Pine. This plantation is approximately 20-25 years old. View 2.
November 1, 2018.

Photo 22 – Red Pine Coniferous Plantation (TAGM1-1a). Note the complete absence of hardwood regeneration and native groundcover plants. View 3.
November 1, 2018.

Photo 23 – Red Pine Coniferous Plantation (TAGM1-1a). A portion of this unit will be retained north of the proposed extraction area, as a buffer to mature deciduous forest further north. View 4.
October 16, 2018.

Photo 24 – Red Pine Coniferous Plantation (TAGM1-1b). This stand is 35+ years old. There had been some thinning in the past. Note the hardwood regeneration.
View 1. October 16, 2018.

Photo 25 – Red Pine Coniferous Plantation (TAGM1-1c). This plantation is approximately 40-45 years old.
View 1. May 8, 2018.

Photo 26 – Red Pine Coniferous Plantation (TAGM1-1c). This unit will be protected; it will function as a buffer to more natural forest communities located to the north and east.
View 2. May 8, 2018.

Photo 27 - Dry - Fresh Coniferous Regeneration Thicket Ecosite (THCM1a). The old field is being taken over by young Red Pine and Scots Pine which are seeding in from the nearby plantations. Staghorn Sumac, Sugar Maple and White Ash are also invading the field. This 1.02 ha unit is situated within the proposed extraction area. It is a former agricultural field (hay/pasture).
October 16, 2018.

Photo 28 - Dry - Fresh Mixed Regeneration Thicket Ecosite (THMM1a). This old field is immediately south of Unit TAGM1-1a, which is a large Red Pine plantation. Unit THMM1a covers 1.43 ha within the proposed extraction area. View 1.
October 16, 2018.

Photo 29 - Dry - Fresh Mixed Regeneration Thicket Ecosite (THMM1a). Red Pine, Scots Pine, White Ash, Sugar Maple and Staghorn Sumac are the main woody species invading this field. View 2. October 16, 2018.

Photo 30 - Sumac Deciduous Shrub Thicket Type (THDM2-1a). This former agricultural field (hay/pasture). It covers 0.6 ha in the proposed extraction area.
November 1, 2018.

Photo 31 - View looking across the Sumac thicket (THDM2-1a) towards a more open patch of old field. The Dry - Fresh Graminoid Meadow Ecosite (MEGM3a) unit covers 0.85 ha in the proposed extraction area.
November 1, 2018.

Photo 32 - Mineral Deciduous Swamp Ecosite (SWDM4a). The main trees are Trembling Aspen, White Elm and Green Ash. Note the limited extent of standing water on May 8, 2018. Only a tiny fraction of this unit is within the study area, just within the 120 m adjacent lands.

Photo 33 - October 16, 2018.

Photo 34 – The Endangered Forked Three-awned Grass *(Aristida basiramea*) grows in a disturbed area on the existing Teedon Pit. November 1, 2018.

Photo 35 - The habitat of the Forked Three-awned Grass on the existing Teedon Pit is a disturbed area that had topsoil scraped off years ago. Disturbed Area - View 1. November 1, 2018.

Photo 36 - The spoil pile in the background likely contains the topsoil that was scraped off. Note the trees and shrubs growing on the spoil pile. Disturbed Area - View 2. November 1, 2018.

Photo 37 - The habitat of Forked Three-awned Grass has been marked in the field with wooden stakes. Teedon Pit site staff have been advised about the presence of this species at the pit. November 1, 2018.

Photo 38 – View looking west along the proposed licence limit (which is to the right in the photo). This area will function as a buffer for the mature forest (FODM5-3c) to the north (right). The buffer includes 20 m of younger deciduous forest (FOD5-1a). November 1, 2018.

Photo 39 – View looking east along the proposed licence limit (on the left side of the photo). This area will form part of the buffer to the mature forest (FODM5-3c). A 4.5 m wide trail will be retained, under the dripline of mature trees growing along the former field edge.
October 16, 2018

Photo 40 – View looking east. Approximately 20 m of young deciduous forest (FODMa) will be retained and managed as an ecological buffer for the mature forest located to the north (left). November 1, 2018.

Photo 41 – View looking west. Approximately 20 m of young deciduous forest (FODMa) will be retained and managed as an ecological buffer to the mature forest to north (right). October 16, 2018.

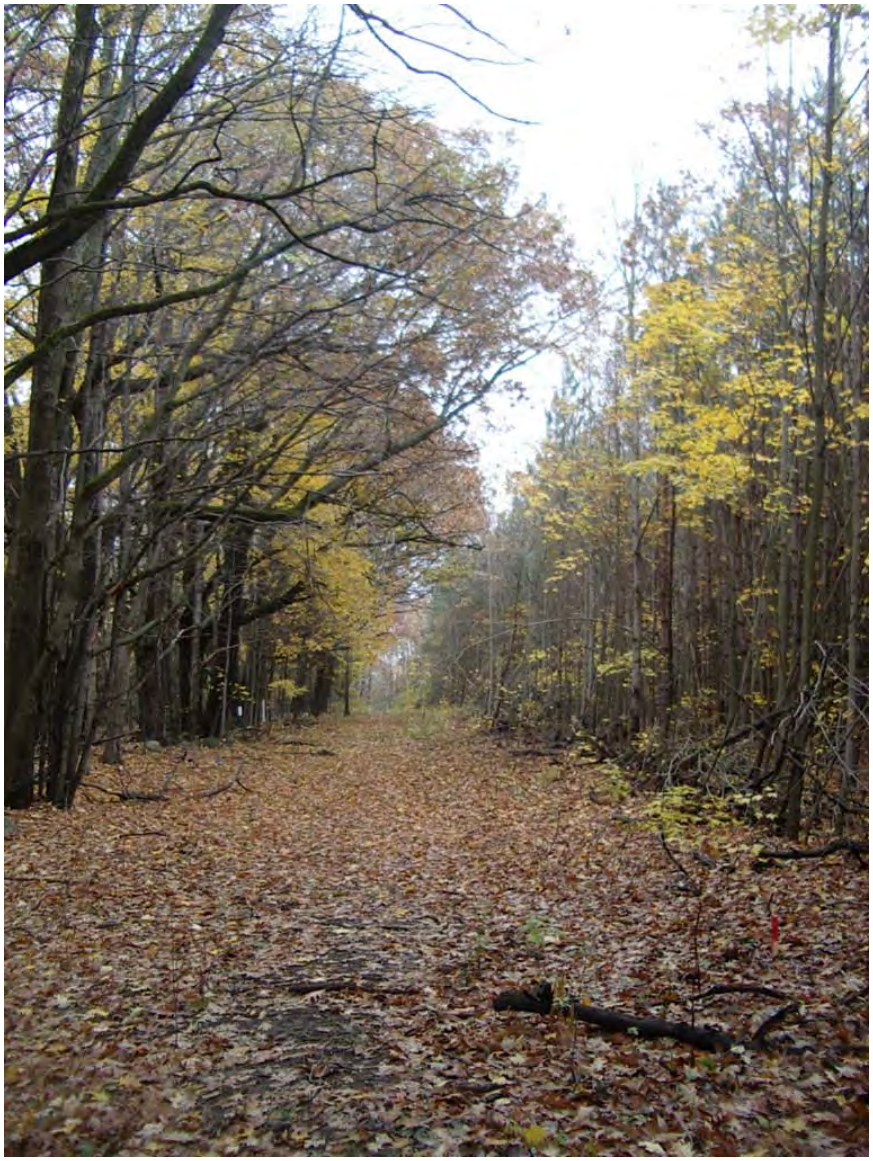

Photo 42 – View looking east. The proposed licence limit follows the row of mature trees on the left. A 30 m setback is proposed, which will include a 4.5 m wide trail and more than 20 m of Red Pine plantation (TAGM1-1a) will be retained as a buffer. November 1, 2018.

Photo 43 – View looking west. Where there is sufficient room, one or two rows of White Cedar and White Spruce will be planted along the north edge of the conifer plantation (i.e. left side of photo), to augment the buffer.
November 1, 2018.

Photo 44 – View looking east. Where there is sufficient room, one or two rows of White Cedar and White Spruce will be planted along the north edge of the conifer plantation (i.e. right side of photo), to augment the buffer. November 1, 2018.

Photo 45 – View looking east (downhill), towards the proposed east licence limit. Approximately 10 m of young forest on the right will be retained as part of the 20 m setback.
October 16, 2018.

Photo 46 - View looking west (uphill), away from the proposed east licence limit. Approximately 10 m of young forest on the left will be retained as part of the 20 m setback.
October 16, 2018.

PROPOSED TEEDON PIT EXTENSION
NATURAL ENVIRONMENT LEVEL 1 AND 2 TECHNICAL REPORT

GOODBAN ECOLOGICAL CONSULTING INC.

January 2019

ATTACHMENT C:

VASCULAR PLANT CHECKLIST

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ATTACHMENT C: VASCULAR PLANT CHECKLIST
TEEDON PIT EXTENSION

Lindsay Environmental Services Group (LESG) listed 163 vascular plant taxa from their 2010-2011 field surveys (LESG 2015). Goodban Ecological Consulting Inc. (GEC) recorded 232 vascular plant taxa during their 2018 field surveys. When combined, the overall plant checklist presented below includes a total 237 vascular plant taxa. Fifty (50) taxa, 21.1% of the total vascular plant flora, are considered non-native and introduced to southern Ontario.

Forked Three-awned Grass (*Aristida basiramea*) was found by GEC in 2018 in a disturbed area on the existing Teedon Pit. This species is Endangered in Ontario and it is ranked S2 by the Natural Heritage Information Centre (NHIC).

Checklist Columns

Int. = Introduced. Taxa considered non-native and introduced to southern Ontario are denoted with the letter "I" in this column.

S-Rank = Subnational (provincial) rank (NHIC).

CC = Coefficient of Conservatism (Oldham et al. 1995).

CW = Coefficient of Wetness (Oldham et al. 1995).

LESG = Observations made by the Lindsay Environmental Services Group (LESG) in 2010-2011.

GEC = Observations made by Goodban Ecological Consulting Inc. (GEC) during 2018.

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Abies balsamea	Balsam Fir		S5	5	-3	X	X
Acer rubrum	Red Maple		S5	4	0	X	X
Acer saccharinum	Silver Maple		S5	5	-3	X	X
Acer saccharum ssp. *saccharum*	Sugar Maple		S5	4	3	X	X
Acer X freemanii	Freeman's Maple		S5	5	-3		X
Achillea millefolium	Yarrow	I	SE5	*	3		X
Actaea pachypoda	White Baneberry		S5	6	5	X	X
Adiantum pedatum ssp. *pedatum*	Northern Maidenhair Fern		S5	7	1	X	X
Agrimonia gryposepala	Yellow Agrimony		S5	2	2	X	X
Allium tricoccum	Wild Leek		S5	7	2	X	X
Ambrosia artemisiifolia	Common Ragweed		S5	0	3	X	X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Anaphalis margaritacea	Pearly Everlasting		S5	3	5		X
Anemone virginiana	Thimbleweed		S5	4	5	X	X
Apocynum androsaemifolium ssp. *androsaemifolium*	Spreading Dogbane		S5	3	5	X	X
Aquilegia canadensis	Wild Columbine		S5	5	1		X
Aralia nudicaulis	Wild Sarsaparilla		S5	4	3	X	X
Aristida basiramea	Forked Three-awned Grass		S2	10	5		X
Asclepias syriaca	Common Milkweed		S5	0	5	X	X
Asparagus officinalis	Garden Asparagus	I	SE5	*	3		X
Asplenium platyneuron	Ebony Spleenwort		S4	6	3		X
Athyrium filix-femina ssp. *angustum*	Northeastern Lady Fern		S5	4	0	X	X
Betula alleghaniensis	Yellow Birch		S5	6	0	X	X
Betula papyrifera	White Birch		S5	2	2	X	X
Bidens frondosa	Devil's Beggar-ticks		S5	3	-3		X
Bromus inermis ssp. *inermis*	Smooth Brome Grass	I	SE5	*	5	X	X
Carex arctata	Compressed Sedge		S5	5	5	X	X
Carex bebbii	Bebb's Sedge		S5	3	-5	X	X
Carex blanda	Smooth Sedge		S5	3	0		X
Carex communis	Common Sedge		S5	6	5		X
Carex deweyana	Dewey's Sedge		S5	6	4		X
Carex flava	Yellow Sedge		S5	5	-5		X
Carex gracillima	Filiform Sedge		S5	4	3	X	X
Carex granularis	Granular Sedge		S5	3	-4		X
Carex hitchcockiana	Hitchcock's Sedge		S5	6	5		X
Carex hystericina	Porcupine Sedge		S5	5	-5	X	X
Carex laxiflora	Distant-flowered Sedge		S5	5	0		X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Carex pedunculata	Peduncled Sedge		S5	5	5		X
Carex pensylvanica	Pennsylvania Sedge		S5	5	5		X
Carex rosea	Sedge		S5	5	5	X	X
Carex tonsa var. *rugosperma* (*Carex rugosperma*)	Wrinkled-seeded Sedge		S5	7	5		X
Carex vulpinoidea	Fox Sedge		S5	3	-5	X	X
Caulophyllum thalictroides	Blue Cohosh		S5	6	5	X	X
Centaurea jacea	Brown Knapweed	I	SE5	*	5		X
Centaurea stoebe ssp. *micranthos* (*Centaurea maculosa*)	Spotted Knapweed	I	SE5	*	5		X
Cerastium fontanum ssp. *vulgare* (*Cerastium fontanum* ssp. *triviale*)	Mouse-eared Chickweed	I	SE5	*	3	X	X
Chenopodium album	Lamb's-quarters	I	SE5	*	1	X	X
Cichorium intybus	Chicory	I	SE5	*	5		X
Circaea canadensis ssp. *canadensis* (*Circaea lutetiana* ssp. *canadensis*)	Enchanter's Nightshade		S5	3	3	X	X
Cirsium arvense	Canada Thistle	I	SE5	*	3	X	X
Cirsium vulgare	Bull Thistle	I	SE5	*	4	X	X
Clematis virginiana	Virgin's-bower		S5	3	0	X	X
Clinopodium vulgare	Wild Basil		S5	4	5	X	X
Conopholis americana	Squawroot		S4	9	5	X	X
Conyza canadensis	Horseweed		S5	0	1		X
Cornus alternifolia	Alternate-leaved Dogwood		S5	6	5	X	X
Cornus stolonifera	Red-osier Dogwood		S5	2	-3	X	X
Corylus cornuta	Beaked Hazel		S5	5	5	X	
Crataegus macrosperma (*Crataegus flabellata*)	Fan-shaped Hawthorn		S4	4	5	X	
Crataegus punctata	Dotted Hawthorn		S5	4	5		X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Dactylis glomerata	Orchard Grass	I	SE5	*	3	X	X
Danthonia spicata	Poverty Oat Grass		S5	5	5	X	X
Daucus carota	Queen Anne's Lace	I	SE5	*	5	X	X
Desmodium canadense	Showy Tick-trefoil		S4	5	1	X	X
Desmodium glutinosum	Pointed-leaved Tick-trefoil		S4	6	5		X
Dianthus armeria	Deptford Pink	I	SE5	*	5		X
Diervilla lonicera	Bush-honeysuckle		S5	5	5		X
Doellingeria umbellata var. *umbellata* (*Aster umbellatus*)	Flat-topped White Aster		S5	6	-3	X	X
Dryopteris carthusiana	Spinulose Wood Fern		S5	5	-2	X	X
Dryopteris cristata	Crested Wood Fern		S5	7	-5	X	X
Dryopteris intermedia	Glandular Wood Fern		S5	5	0	X	X
Dryopteris marginalis	Marginal Wood Fern		S5	5	3	X	X
Echinocystis lobata	Wild Cucumber		S5	3	-2		X
Echium vulgare	Blueweed	I	SE5	*	5	X	X
Epipactis helleborine	Helleborine	I	SE5	*	5	X	X
Equisetum arvense	Field Horsetail		S5	0	0	X	X
Equisetum hyemale ssp. *affine*	Scouring-rush		S5	2	-2		X
Equisetum pratense	Meadow Horsetail		S5	8	-3	X	
Equisetum sylvaticum	Woodland Horsetail		S5	7	-3	X	X
Erigeron annuus	Annual Fleabane		S5	0	1		X
Erigeron philadelphicus ssp. *philadelphicus*	Philadelphia Fleabane		S5	1	-3		X
Erigeron strigosus	Rough Fleabane		S5	0	1	X	X
Eurybia macrophylla (*Aster macrophyllus*)	Large-leaved Aster		S5	5	5	X	X
Euthamia graminifolia	Grass-leaved Goldenrod		S5	2	-2	X	X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Fagus grandifolia	American Beech		S5	6	3	X	X
Fragaria vesca ssp. *americana*	Woodland Strawberry		S5	4	4		X
Fragaria virginiana	Field Strawberry		S5	2	1	X	X
Fraxinus americana	White Ash		S5	4	3	X	X
Fraxinus nigra	Black Ash		S5	7	-4	X	X
Fraxinus pennsylvanica	Red Ash, Green Ash		S5	3	-3	X	X
Galium palustre	Marsh Bedstraw		S5	5	-5	X	X
Galium triflorum	Sweet-scented Bedstraw		S5	4	2	X	X
Geranium bicknellii	Cranesbill		S4	5	5	X	X
Geranium robertianum	Herb Robert	I	SE5	*	5	X	X
Gymnocarpium dryopteris ssp. *dryopteris*	Oak Fern		S5	7	0	X	X
Hepatica acutiloba	Sharped-lobed Hepatica		S5	6	5	X	X
Hieracium aurantiacum	Orange Hawkweed	I	SE5	*	5	X	X
Hieracium caespitosum ssp. *caespitosum*	Yellow Hawkweed	I	SE5	*	5	X	X
Hydrophyllum virginianum	Virginia Waterleaf		S5	6	-2	X	X
Hypericum perforatum	Common St. John's-wort	I	SE5	*	5	X	X
Impatiens capensis	Spotted Touch-me-not		S5	4	-3	X	X
Juncus dudleyi	Dudley's Rush		S5	1	0		X
Juncus effusus ssp. *solutus*	Common Rush		S5	4	-5		X
Juncus nodosus	Rush		S5	5	-5	X	X
Juncus tenuis	Path Rush		S5	0	0		X
Juniperus communis	Common Juniper		S5	4	3	X	X
Lactuca canadensis	Canada Lettuce		S5	3	2		X
Laportea canadensis	Wood Nettle		S5	6	-3	X	X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Lapsana communis	Nipplewort	I	SE5	*	5		X
Lemna minor	Common Duckweed		S5	2	-5	X	X
Leucanthemum vulgare (*Chrysanthemum leucanthemum*)	Ox-eye Daisy	I	SE5	*	5	X	X
Lonicera canadensis	Fly-honeysuckle		S5	6	3	X	
Lonicera dioica	Wild Honeysuckle		S5	5	3	X	X
Lonicera tatarica	Tartarian Honeysuckle	I	SE5	*	3	X	X
Lycopus uniflorus	Water-horehound		S5	5	-5	X	X
Maianthemum canadense	Wild Lily-of-the-valley		S5	5	0	X	X
Maianthemum racemosum ssp. *racemosum*	Tall False Solomon's-seal		S5	4	3	X	X
Malus pumila	Apple	I	SE5	*	5	X	X
Matteuccia struthiopteris	American Ostrich Fern		S5	5	-3	X	X
Medicago lupulina	Black Medick	I	SE5	*	1	X	X
Medicago sativa	Alfalfa	I	SE5	*	5	X	X
Melilotus alba	White Sweet-clover	I	SE5	*	3	X	X
Melilotus officinalis	Yellow Sweet-clover	I	SE5	*	3		X
Mitchella repens	Partridge-berry		S5	6	2	X	X
Mitella nuda	Naked Mitrewort		S5	6	-3	X	
Monarda fistulosa	Wild Bergamot		S5	6	3		X
Monotropa hypopithys	Pinesap		S4	6	5		X
Nepeta cataria	Catnip	I	SE5	*	1	X	X
Oenothera biennis	Hairy Yellow Evening-primrose		S5	0	3	X	X
Onoclea sensibilis	Sensitive Fern		S5	4	-3	X	X
Oryzopsis asperifolia	Rough-leaved Mountain-rice		S5	6	5	X	X
Osmunda regalis	American Royal Fern		S5	7	-5	X	

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Ostrya virginiana	Ironwood		S5	4	4	X	X
Oxalis stricta	Common Wood-sorrel		S5	0	3	X	X
Panicum acuminatum (*P. lanuginosum* var. *implicatum*)	Panic Grass		S5	2	0		X
Panicum capillare	Witch Grass		S5	0	0		X
Parthenocissus inserta	Virginia Creeper		S5	3	3	X	X
Persicaria lapathifolia (*Polygonum lapathifolium*)	Nodding Smartweed		S5	2	-4	X	
Phalaris arundinacea	Reed Canary Grass		S5	0	-4		X
Phleum pratense	Timothy Grass	I	SE5	*	3	X	X
Phragmites australis	Common Reed		S5	0	-4		X
Physalis heterophylla	Clammy Ground-cherry		S4	3	5	X	X
Phytolacca americana	Pokeweed		S4	3	1		X
Picea glauca	White Spruce		S5	6	3	X	X
Pinus resinosa	Red Pine		S5	8	3	X	X
Pinus strobus	White Pine		S5	4	3	X	X
Pinus sylvestris	Scots Pine	I	SE5	*	5	X	X
Plantago lanceolata	English Plantain	I	SE5	*	0	X	X
Plantago major	Broad-leaved Plantain	I	SE5	*	-1	X	X
Poa compressa	Canada Blue Grass		S5	0	2	X	X
Poa pratensis	Kentucky Blue Grass		S5	0	1		X
Podophyllum peltatum	May-apple		S5	5	3		X
Polystichum acrostichoides	Christmas Fern		S5	5	5		X
Populus balsamifera	Balsam Poplar		S5	4	-3	X	X
Populus grandidentata	Large-toothed Aspen		S5	5	3		X
Populus tremuloides	Trembling Aspen		S5	2	0	X	X
Potentilla norvegica	Rough Cinquefoil		S5	0	0	X	X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Potentilla recta	Rough-fruited Cinquefoil	I	SE5	*	5	X	X
Prenanthes alba	White Lettuce		S5	6	3	X	X
Prenanthes altissima	Tall White Lettuce		S5	5	3	X	X
Prunella vulgaris lanceolata	Heal-all		S5	5	5	X	X
Prunus nigra	Canada Plum		S4	4	4		X
Prunus serotina	Wild Black Cherry		S5	3	3	X	X
Prunus virginiana virginiana	Chokecherry		S5	2	1	X	X
Pteridium aquilinum	Eastern Bracken Fern		S5	2	3		X
Quercus rubra	Red Oak		S5	6	3	X	X
Ranunculus abortivus	Small-flowered Buttercup		S5	2	-2		X
Ranunculus acris	Tall Buttercup	I	SE5	*	-2	X	X
Rhamnus cathartica	Common Buckthorn	I	SE5	*	3		X
Rhamnus frangula	Alder Buckthorn	I	SE5	*	-1	X	X
Rhus radicans rydbergii	Rydberg's Poison-ivy		S5	0	0	X	X
Rhus typhina	Staghorn Sumac		S5	1	5	X	X
Ribes americanum	Wild Black Currant		S5	4	-3	X	X
Ribes cynosbati	Prickly Gooseberry		S5	4	5	X	X
Rubus allegheniensis	Common Blackberry		S5	2	2	X	X
Rubus idaeus melanolasius	Wild Red Raspberry		S5	0	-2	X	X
Rubus occidentalis	Black Raspberry		S5	2	5	X	X
Rubus pubescens	Dwarf Raspberry		S5	4	-4	X	X
Rudbeckia hirta	Black-eyed Susan		S5	0	3		X
Rumex acetosella	Sheep Sorrel	I	SE5	*	0	X	X
Rumex crispus	Curly Dock	I	SE5	*	-1		X
Salix discolor	Pussy Willow		S5	3	-3		X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Salix eriocephala	Heart-leaved Willow		S5	4	-3		X
Sambucus canadensis	Common Elder		S5	5	-2		X
Sambucus racemosa pubens	Red-berried Elder		S5	5	2	X	X
Sanguinaria canadensis	Bloodroot		S5	5	4		X
Scirpus atrovirens	Black Bulrush		S5	3	-5		X
Schoenoplectus tabernaemontani (*Scirpus validus*)	Softstem Bulrush		S5	5	-5		X
Setaria verticillata	Bristly Foxtail	I	SE4	*	0		X
Setaria viridis	Green Foxtail	I	SE5	*	5		X
Silene vulgaris	Bladder Campion	I	SE5	*	5	X	X
Sisyrinchium montanum	Little Blue-eyed Grass		S5	4	-1	X	X
Sium suave	Water-parsnip		S5	4	-5	X	
Smilax herbacea	Carrion-flower		S4	5	0		X
Smilax hispida	Bristly Greenbrier		S4	6	0	X	X
Solanum dulcamara	Climbing Nightshade	I	SE5	*	0	X	X
Solanum ptycanthum	Eastern Black Nightshade		S5	3	5	X	X
Solidago altissima	Tall Goldenrod		S5	1	3	X	X
Solidago caesia	Blue-stem Goldenrod		S5	5	3	X	X
Solidago canadensis	Canada Goldenrod		S5	1	3	X	X
Solidago flexicaulis	Zig-zag Goldenrod		S5	6	3	X	X
Solidago gigantea	Late Goldenrod		S5	4	-3	X	X
Solidago juncea	Early Goldenrod		S5	3	5		X
Solidago nemoralis nemoralis	Gray Goldenrod		S5	2	5	X	X
Solidago rugosa rugosa	Rough Goldenrod		S5	4	-1	X	X
Sonchus oleraceus	Annual Sow-thistle	I	SE5	*	3	X	
Sporobolus cryptandrus fuscicolus	Sand Dropseed		S5	2	4		X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Sporobolus neglectus	Overlooked Dropseed		S4	1	5		X
Symphyotrichum ciliolatum (*Aster ciliolatus*)	Lindley's Aster		S5	6	4	X	X
Symphyotrichum cordifolium (*Aster cordifolius*)	Heart-leaved Aster		S5	5	5		X
Symphyotrichum ericoides var. *ericoides* (*Aster ericoides*)	Heath Aster		S5	4	4	X	X
Symphyotrichum lanceolatum var. *lanceolatum* (*Aster lanceolatus*)	Tall White Aster		S5	3	-3	X	X
Symphyotrichum lateriflorum var. *lateriflorum* (*Aster lateriflorus*)	One-sided Aster		S5	3	-2	X	X
Symphyotrichum novae-angliae (*Aster novae-angliae*)	New England Aster		S5	2	-3	X	X
Symphyotrichum puniceum var. *puniceum* (*Aster puniceus*)	Purple-stemmed Aster		S5	6	-5		X
Symphyotrichum urophyllum (*Aster urophyllus*)	Arrow-leaved Aster		S4	6	5		X
Taraxacum officinale	Common Dandelion	I	SE5	*	3	X	X
Thalictrum dioicum	Early Meadow-rue		S5	5	2	X	X
Thuja occidentalis	White Cedar		S5	4	-3	X	X
Tilia americana	American Basswood		S5	4	3	X	X
Tragopogon dubius	Goat's-beard	I	SE5	*	5	X	X
Trientalis borealis borealis	Starflower		S5	6	-1	X	X
Trifolium pratense	Red Clover	I	SE5	*	2	X	X
Trillium grandiflorum	White Trillium		S5	5	5	X	X
Tsuga canadensis	Eastern Hemlock		S5	7	3	X	X
Tussilago farfara	Coltsfoot	I	SE5	*	3	X	X

VASCULAR PLANT CHECKLIST - TEEDON PIT EXTENSION							
Scientific Name	**Common Name**	**Int.**	**S-Rank**	**CC**	**CW**	**LESG**	**GEC**
Ulmus americana	White Elm		S5	3	-2	X	X
Uvularia grandiflora	Large-flowered Bellwort		S5	6	5	X	X
Verbascum thapsus	Common Mullein	I	SE5	*	5	X	X
Veronica officinalis	Common Speedwell	I	SE5	*	5	X	X
Viburnum lentago	Nannyberry		S5	4	-1	X	X
Vicia cracca	Bird Vetch	I	SE5	*	5	X	X
Viola canadensis	Canada Violet		S5	6	5	X	X
Viola conspersa	Dog Violet		S5	4	-2		X
Viola cucullata	Marsh Violet		S5	5	-5		X
Viola pubescens	Downy Yellow Violet		S5	5	4		X
Viola rostrata	Long-spurred Violet		S5	6	3		X
Viola sororia	Common Blue Violet		S5	4	1		X
Vitis riparia	Riverbank Grape		S5	0	-2	X	X

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PROPOSED TEEDON PIT EXTENSION
NATURAL ENVIRONMENT LEVEL 1 AND 2 TECHNICAL REPORT

GOODBAN ECOLOGICAL CONSULTING INC.

January 2019

ATTACHMENT D:

BIRD CHECKLIST

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ATTACHMENT D:

Teedon Pit Extension - Bird Checklist

Lindsay Environmental Services Group (LEG 2010-11) &
Goodban Ecological Consulting Inc. (GEC 2018)

		LESG 2010-11	GEC 2018	Area Sensitive
GALLIFORMES: Phasianidae				
Wild Turkey	*Meleagris gallopavo*	X	X	
Ruffed Grouse	*Bonasa umbellus*	X	X	
COLUMBIFORMES: Columbidae				
Mourning Dove	*Zenaida macroura*	X	X	
CUCULIFORMES: Cuculidae				
Yellow-billed Cuckoo	*Coccyzus americanus*		X	
CHARADRIIFORMES: Charadriidae				
Killdeer	*Charadrius vociferous*		X	
CHARADRIIFORMES: Laridae				
Ring-billed Gull	*Larus delawarensis*		X	
ACCIPITRIFORMES: Accipitridae				
Broad-winged Hawk	*Buteo platypterus*		X	
PICIFORMES: Picidae				
Pileated Woodpecker	*Dryocopus pileatus*	X	X	
Northern Flicker	*Colaptes auratus*	X	X	
Yellow-bellied Sapsucker	*Sphyrapicus varius*	X	X	Yes
Downy Woodpecker	*Picoides pubescen*	X	X	
Hairy Woodpecker	*Picoides villosus*	X		
CORACIIFORMES: Alcedinidae				
Belted Kingfisher	*Megaceryle alcyon*		X	
PASSERIFORMES: Tyrannidae				
Eastern Kingbird	*Tyrannus tyrannus*		X	
Great Crested Flycatcher	*Myiarchus crinitus*	X	X	
Least Flycatcher	*Empidonax minimus*	X	X	
Eastern Wood Pewee	*Contopus virens*	X	X	
PASSERIFORMES: Vireonidae				
Yellow-throated Vireo	*Vireo flavifrons*		X	
Warbling Vireo	*Vireo gilvus*		X	
Red-eyed Vireo	*Vireo olivaceus*	X	X	
PASSERIFORMES: Corvidae				
American Crow	*Corvus brachyrhynchos*	X	X	
Blue Jay	*Cyanocitta cristata*	X	X	
PASSERIFORMES: Fringillidae				
American Goldfinch	*Spinus tristis*	X	X	
PASSERIFORMES: Passerellidae				
Chipping Sparrow	*Spizella passerina*	X	X	
Field Sparrow	*Spizella pusilla*	X	X	
Dark-eyed Junco	*Junco hyemalis*	X		
White-throated Sparrow	*Zonotrichia albicollis*		X	
Vesper Sparrow	*Pooecetes gramineus*		X	
Song Sparrow	*Melospiza melodia*	X	X	
PASSERIFORMES: Parulidae				
Ovenbird	*Seiurus aurocapilla*	X	X	Yes
Mourning Warbler	*Geothlypis philadelphia*		X	
Common Yellowthroat	*Geothlypis trichas*		X	
Hooded Warbler	*Setophaga citrina*		X	
American Redstart	*Setophaga ruticilla*		X	

ATTACHMENT D:

Teedon Pit Extension - Bird Checklist

Lindsay Environmental Services Group (LEG 2010-11) &
Goodban Ecological Consulting Inc. (GEC 2018)

		LESG 2010-11	GEC 2018	Area Sensitive
Cerulean Warbler	*Setophaga cerulea*		X	Yes
Chestnut-sided Warbler	*Setophaga pensylvanica*		X	
Black-throated Blue Warbler	*Setophaga caerulescens*		X	Yes
Black-throated Green Warbler	*Setophaga virens*		X	Yes
PASSERIFORMES: Icteridae				
Red-winged Blackbird	*Agelaius phoeniceus*		X	
Brown-headed Cowbird	*Molothrus ater*	X	X	
Common Grackle	*Quiscalus quiscula*		X	
PASSERIFORMES: Cardinalidae				
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	X	X	
Indigo Bunting	*Passerina cyanea*		X	
Scarlet Tanager	*Piranga olivacea*	X	X	Yes
Northern Cardinal	*Cardinalis cardinalis*		X	
PASSERIFORMES: Paridae				
Black-capped Chickadee	*Poecile atricapillus*	X	X	
PASSERIFORMES: Regulidae				
Ruby-crowned Kinglet	*Regulus calendula*	X		
Golden-crowned Kinglet	*Regulus satrapa*	X		
PASSERIFORMES: Bombycillidae				
Cedar Waxwing	*Bombycilla cedrorum*	X	X	
PASSERIFORMES: Troglodytidae				
House Wren	*Troglodytes aedon*	X	X	
PASSERIFORMES: Turdidae				
Wood Thrush	*Hylocichla mustelina*		X	
Veery	*Catharus fuscescens*		X	Yes
Hermit Thrush	*Catharus guttatus*	X		
American Robin	*Turdus migratorius*	X	X	
	Totals	30	49	7

Notes:

The taxonomic order and nomenclature follows Howard and Moore 4th edition (incl. corrigenda vol.1-2). Avisbase Simcoe county (accessed November 2018).
(https://avibase.bsceoc.org/checklist.jsp?lang=EN&p2=1&list=howardmoore&synlang=&region=CAonsc&version=text&lifelist=&highlight=0)

LESG 2010-11 - Lindsay Environmental Services Group. Site visits were made by David Bell on March 22, June 11 and October 10, 2010 and May 20, 2011. Thirty (30) species were recorded, including some migrants and overwintering species.

GEC 2018 - Goodban Ecological Consulting Inc. All bird observations listed were observed during the breeding season by Tyler Hoar (June 6 and June 28, July 4, 2018). Forty-nine (49) species were recorded. All species listed for 2018 are considered breeders except for Ring-billed Gull.

"Area Sensitive" species were identified using the list in OMNR's *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (January 2015) in the section dealing with *Area Sensitive Breeding Bird Habitat*.

PROPOSED TEEDON PIT EXTENSION
NATURAL ENVIRONMENT LEVEL 1 AND 2 TECHNICAL REPORT

GOODBAN ECOLOGICAL CONSULTING INC.

January 2019

ATTACHMENT E:

Point Count Data Summary for June 6 and 28, 2018 Breeding Bird Surveys

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Attachment E: Point Count Data Summary for June 6 and 28, 2018 Breeding Bird Surveys

June 6 2018 Visit 1

Point Count Station 1

species	<100m	>100m
American Crow	1	1
Eastern Wood Pewee		1
Great Crested Flycatcher		1
House Wren	2	1
Red-eyed Vireo	1	
Red-winged Blackbird	4	1
Song Sparrow		1

June 28 2018 Visit 2

Point Count Station 1

species	<100m	>100m
American Crow	2	1
Cedar Waxwing	3	
Common Yellowthroat	1	
Eastern Wood Pewee		1
House Wren	3	
Killdeer		2
Red-winged Blackbird		1
Song Sparrow	2	1

June 6 2018 Visit 1

Point Count Station 2

species	<100m	>100m
American Crow	1	
American Redstart		2
Belted Kingfisher	1	
Broad-winged Hawk		1
Chestnut-sided Warbler	1	
House Wren	1	
Least Flycatcher	1	
Ovenbird		1
Red-eyed Vireo	2	1

June 28, 2018 Visit 2

Point Count Station 2

species	<100m	>100m
American Crow		1
American Redstart	1	1
Chestnut-sided Warbler	1	1
House Wren		1
Mourning Warbler	1	
Ovenbird		1
Red-eyed Vireo	2	2
Veery		1

Attachment : Point Count Data Summary for June 6 and 28, 2018 Breeding Bird Surveys (page 2)

June 6 2018 Visit 1

Point Count Station 3

species	<100m	>100m
American Redstart	1	
Eastern Wood Pewee		1
Great Crested Flycatcher		1
Ovenbird		1
Red-eyed Vireo		2
Rose-breasted Grosbeak		1
yellow-bellied Sapsucker	1	

June 28, 2018 Visit 2

Point Count Station 3

species	<100m	>100m
American Redstart	1	
American Robin		1
Black-capped Chickadee	1	
Chestnut-sided Warbler	1	
Great Crested Flycatcher		1
Ovenbird		1
Red-eyed Vireo	1	2

June 6 2018 Visit 1

Point Count Station 4

species	<100m	>100m
American Goldfinch	2	
Ovenbird	1	2
Red-eyed Vireo	1	3
Ring-billed Gull		2
White-throated Sparrow		1

June 28 2018 Visit 2

Point Count Station 4

species	<100m	>100m
American Goldfinch	1	
American Redstart	3	
Broad-winged Hawk		1
Common Grackle	1	
Eastern Kingbird	1	
Indigo Bunting		1
Killdeer		1
Mourning Dove		1
Ovenbird	1	
Red-eyed Vireo	2	2
Ring-billed Gull	1	
Rose-breasted Grosbeak		1
Song Sparrow		1
Wood Thrush		1
Yellow-billed Cuckoo		1

Attachment E: Point Count Data Summary for June 6 and 28, 2018 Breeding Bird Surveys (page 3)

June 6 2018 Visit 1

Point Count Station 5

species	<100m	>100m
American Robin	1	
Black-throated Blue Warbler		2
Cerulean Warbler		1
Eastern Wood Pewee	1	2
Ovenbird	1	1
Red-eyed Vireo	1	3

June 28 2018 Visit 2

Point Count Station 5

species	<100m	>100m
Eastern Wood Pewee	1	1
Ovenbird		1
Red-eyed Vireo	1	1
Wood Thrush	1	2
Yellow-throated Vireo	1	

June 6 2018 Visit 1

Point Count Station 6

species	<100m	>100m
Eastern Wood Pewee	1	1
Ovenbird		1
Red-eyed Vireo	2	4
Ring-billed Gull		1
Rose-breasted Grosbeak		1
Scarlet Tanager		1
Wood Thrush		2

June 28 2018 Visit 2

Point Count Station 6

species	<100m	>100m
American Redstart	1	
American Robin	1	
Black-throated Blue Warbler	1	
Ovenbird		1
Red-eyed Vireo		1
Rose-breasted Grosbeak	1	1
Wood Thrush	1	1

June 6 2018 Visit 1

Point Count Station 7

species	<100m	>100m
American Crow		1
American Robin		1
Black-throated Blue Warbler		1
Blue Jay	1	1
Ovenbird	2	1
Red-eyed Vireo	2	3
Rose-breasted Grosbeak	1	
Wood Thrush		2

June 28 2018 Visit 2

Point Count Station 7

species	<100m	>100m
American Robin		1
Downy Woodpecker	1	
Red-eyed Vireo	2	3
Rose-breasted Grosbeak		2
Scarlet Tanager	1	
Wood Thrush		2
yellow-bellied Sapsucker		1

Attachment E: Point Count Data Summary for June 6 and 28, 2018 Breeding Bird Surveys (page 4)

June 6 2018 Visit 1

Point Count Station 8

species	<100m	>100m
Eastern Wood Pewee	2	1
Ovenbird		1
Red-eyed Vireo		1
Veery	1	
Wood Thrush	2	1
yellow-bellied Sapsucker		1

June 28 2018 Visit 2

Point Count Station 8

species	<100m	>100m
American Robin		1
Eastern Wood Pewee	1	
Hooded Warbler	1	
Ovenbird	1	1
Red-eyed Vireo	2	2
Rose-breasted Grosbeak	1	1
Ruffed Grouse		1
Scarlet Tanager	1	
Wood Thrush	1	
yellow-bellied Sapsucker	1	

June 6 2018 Visit 1

Point Count Station 9

species	<100m	>100m
American Robin	3	
Black-capped Chickadee		1
Indigo Bunting	1	
Mourning Warbler		1
Red-eyed Vireo	2	2
Ring-billed Gull	1	
Wood Thrush		2
yellow-bellied Sapsucker	1	

June 28 2018 Visit 2

Point Count Station 9

species	<100m	>100m
American Redstart		1
American Robin	2	2
Blue Jay		1
Ovenbird		1
Red-eyed Vireo	1	2
Song Sparrow		1
Vesper Sparrow	1	

Attachment E: Point Count Data Summary for June 6 and 28, 2018 Breeding Bird Surveys (page 5)

June 6 2018 Visit 1

Point Count Station 10

species	<100m	>100m
American Redstart	1	
Black-throated Green Warbler	1	
Field Sparrow		1
Great Crested Flycatcher		1
Red-eyed Vireo		3

June 28 2018 Visit 2

Point Count Station 10

species	<100m	>100m
Blue Jay		1
Field Sparrow		1
Ovenbird	1	1
Red-eyed Vireo		2
Yellow-billed Cuckoo	1	1

June 6 2018 Visit 1

Point Count Station 11

species	<100m	>100m
American Crow		1
Chipping Sparrow	2	
House Wren	1	1
Mourning Warbler	1	
Northern Flicker		2
Ovenbird	1	1
Red-eyed Vireo		1
Song Sparrow		1

June 28 2018 Visit 2

Point Count Station 11

species	<100m	>100m
American Goldfinch	1	
Chipping Sparrow	2	
Field Sparrow	1	
Ovenbird		1
Ring-billed Gull		2
Ruffed Grouse	2	
Song Sparrow		1
Vesper Sparrow		1
Yellow-billed Cuckoo		1

June 6 2018 Visit 1

Point Count Station 12

species	<100m	>100m
American Redstart	1	
Belted Kingfisher		1
Chipping Sparrow	1	
Indigo Bunting		1
Ovenbird	1	1
Red-eyed Vireo	2	2
Song Sparrow	3	

June 28 2018 Visit 2

Point Count Station 12

species	<100m	>100m
Indigo Bunting	1	1
Northern Cardinal	1	
Red-eyed Vireo	1	1
Song Sparrow	1	
Warbling Vireo	1	

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PROPOSED TEEDON PIT EXTENSION
NATURAL ENVIRONMENT LEVEL 1 AND 2 TECHNICAL REPORT

GOODBAN ECOLOGICAL CONSULTING INC.

January 2019

ATTACHMENT F:

Curriculum vitae of Mr. Anthony Goodban
Goodban Ecological Consulting Inc. (GEC)

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Goodban Ecological Consulting Inc.

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Phone: (905) 693-9064

Consulting Services in Field Botany, Ecology and Natural Heritage Planning

EDUCATION

1995 M.E.S.(Planning), Environmental Planning, York University, North York, Ontario

1992 Honours B.Sc., Ecology, University of Guelph, Guelph, Ontario

PROFESSIONAL ASSOCIATIONS

Ontario Professional Planners Institute - Full Member
Canadian Institute of Planners - Full Member

PROFESSIONAL TRAINING

2017 Completed the 3-day *Ontario Reptile & Amphibian Field Survey Course* presented by Blazing Star Environmental, NRSI, Ontario Ministry of Natural Resources and Forestry (MNRF). The course was held on Beausoleil Island in Georgian Bay.

2014 Completed the 2-day RX-100 *Low Complexity Prescribed Burn (LCPB) Worker Course* provided by Tallgrass Ontario in Bloomingdale, Ontario.

2013 Completed the Trees Ontario 2-day *Ontario Tree Seed Collector Training Course* in Angus, Ontario.

2013 Completed the Ministry of Natural Resources and Forestry (MNRF) Butternut Health Assessment "Refresher" Training at the Royal Botanical Gardens (RBG), Burlington, Ontario.

2009 Completed the MNRF *Butternut Health Assessment Workshop* at the Royal Botanical Gardens, Burlington, Ontario.

2008 Completed the MNRF 5-day training course in the use of the *Ecological Land Classification System for Southern Ontario* (ELC) at Ball's Falls Conservation Area, Jordan, Ontario.

1994 Completed the MNRF 5-day training course in the use of the *Ontario Wetlands Evaluation System: Southern Manual* (Third Edition) in Tweed, Ontario.

PROFESSIONAL EXPERIENCE

1999-Present	Consulting Ecologist and Natural Heritage Planner, Goodban Ecological Consulting Inc.
1992-1998	Ecologist and Natural Heritage Planner, Ecoplans Limited
1991-1992	Botanist and Ecologist, Hamilton-Wentworth Natural Areas Inventory Project
1990	Field Botanist, Hamilton Region Conservation Authority and Hamilton Naturalists' Club

PROFILE

Mr. Anthony Goodban's academic background is in botany, ecology and environmental planning at the undergraduate and graduate level and he has 28 years of field and professional experience. He has expert knowledge of the vegetation and flora of southern Ontario, being especially familiar with the flora of the Hamilton and Halton Region. Mr. Goodban has been the principal of Goodban Ecological Consulting Inc. since 1999 and he works either as an independent consultant or as a subconsultant to other firms. Past and present clients include other consulting firms, aggregate companies, developers, municipalities, conservation authorities, provincial ministries, naturalist clubs and private citizens. Mr. Goodban has worked on a broad variety of projects involving species at risk, including many different plant and wildlife species. He often undertakes detailed field ecological field surveys for a wide range of projects, including Official Plan updates, aggregate applications, land development projects, park planning exercises, natural areas inventories, restoration and monitoring projects. Mr. Goodban has worked on many wetland projects, including wetland evaluations, boundary delineations, impact assessments and monitoring programs. He provides project input relating to planning matters such as the natural heritage components of the Provincial Policy Statement, Greenbelt Plan and the Endangered Species Act, and has prepared numerous environmental impact statements for a wide variety of development proposals. Mr. Goodban prepared and updated the Flora of Hamilton, in association with the Hamilton Conservation Authority. He has expertise dealing with rare vegetation communities, including alvars and prairies, and has written several papers and reports on prairie and savanna vegetation in the Hamilton and Halton areas. He is certified to complete wetland evaluations under the *Ontario Wetland Evaluation System: Southern Manual (3rd Edition)* and to use the *Ecological Land Classification System for Southern Ontario* (ELC). Mr. Goodban has appeared as an expert witness before the Ontario Municipal Board and the Joint Board.

PROJECT EXPERIENCE

Species at Risk

- Mr. Goodban has worked on many projects involving Threatened and Endangered Species in recent years. Projects dealing with wildlife species include Jefferson Salamander, Butler's Garter Snake, Eastern Fox Snake, Gray Rat Snake, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift and Eastern Meadowlark. Projects dealing with plant species include American Chestnut, American Columbo, American Ginseng, Butternut, Flowering Dogwood and Kentucky Coffee-tree.

- Mr. Goodban has completed a series of detailed studies of the Endangered Jefferson Salamander and its habitats. Work has included detailed monitoring of six breeding pools from 2004 to the present (including frog call surveys, egg mass surveys, fixed-point photography, water temperature, vegetation, etc), egg mass surveys of 30+ breeding pools in Halton, Hamilton, Peel, Waterloo and Wellington, spring migration studies with drift fencing and pitfall traps, larval surveys in breeding pools, etc. In 2014, Mr. Goodban began monitoring almost 1 km of drift fence and 60+ pitfall traps set up to capture salamanders migrating to breeding pools in the early spring.

- Mr. Goodban is a certified Ontario Butternut Health Assessor (BHA) who has completed many Butternut Health Assessments in recent years. In 2014 he assessed 27 Butternut trees on the Oro Moraine, of which 6 were retainable (Category 2) trees, and 6 Butternut trees on the Niagara Escarpment in Halton Hills which were all non-retainable (Category 1). Mr. Goodban has also overseen compensatory Butternut planting programs required by *Endangered Species Act* Stewardship Agreements and through the registry process allowed under O.Reg 242/08.

Resource Management - Watersheds and Natural Heritage System Planning

- Responsible for the development of Natural Heritage Systems for the Sixteen Mile Creek watershed, Township of Oro-Medonte and North Oakville.

Resource Management – Wetlands, ANSI's and ESA's

- Responsible for numerous wetland evaluations and impact assessments for a range of development proposals across Ontario, including such wetlands as: Dorchester Swamp, Strasburg Creek Wetland Complex, Forks of the Credit Wetland Complex, Creditview Swamp, Victoria Point Wetland Complex and Halton Escarpment Wetland Complex. Many of these projects required the preparation of environmental impact studies/assessments, often including the detailed review and integration of water resources (hydrogeology, hydrology, stormwater engineering) and ecological (wetlands, fisheries) data.

Resource Management – Wetlands, ANSI's and ESA's (continued)

- Main environmental consultant to the City of Orillia during an OMB hearing that focused on the issue of large-scale development within a Provincially Significant Wetland (Victoria Point Bog).

- Main environmental consultant to local residents in the Town of Essex during a 2002 OMB hearing that examined an 18-hole golf course proposal within a Provincially Significant Wetland (Marshfield Woods).

- Participant in evaluations and impact assessments for development proposals adjacent to Environmentally Sensitive Areas (ESAs) across southern Ontario, including: Sixteen Mile Creek Valley (ESA 16) and Hilton Falls Complex (ESA 25) in Halton Region, Doon Pinnacle Hill (ESPA 35) in Waterloo Region, Major Spink Area (ESA No. 97) in Durham Region and Hayesland Complex (ESA No. 28) in Hamilton.

Transportation Projects

- Participated in the preparation of a number of highway Environmental Assessments, including: the Bradford Bypass, the Leslie Street Extension in Toronto, the Parry Sound and Mactier sections of Highway 69 and Highway 7 from Kitchener to Guelph.

- Participant in Class Environmental Assessments for sensitive river, wetland and valley crossings, including: the northerly and southerly crossings of Twelve Mile Creek in Oakville, the Mountainview Road crossing of Silver Creek in Georgetown and Sixth Line crossing of Sixteen Mile Creek in Milton.

Aggregates

- Participant in multi-disciplinary studies in support of sand and gravel pit license applications, including the Lockyer Brothers pit in Mono Township, Armbro Pinchin Pit in Caledon. Responsible for several MTO wayside permit applications (one quarry and three pits) in eastern Ontario.

- Participant in multi-disciplinary studies in support of limestone/dolostone quarry license applications, including the Tomlinson Brothers quarry in Stittsville, Holmenin quarry near Buckhorn, Dufferin Aggregates' Milton Quarry and Acton Quarry Extensions and James Dick Construction Limited's proposed Rockfort Quarry in Caledon.

- Responsible for the development and implementation of wetland vegetation monitoring programs adjacent to aggregate operations, as components of adaptive management plans (AMP).

- Consulting Botanist/Ecologist to aggregate companies for biodiversity plans, enhancement plans and rehabilitation plans at a number of pits and quarries in southern Ontario.

Vegetation and Flora - Inventory, Management and Monitoring

- Responsible for completing detailed botanical inventories of numerous sites in southern Ontario, including Bronte Creek Provincial Park (Halton), the Red Hill Valley (Hamilton-Wentworth) and the Dundas Valley (Hamilton-Wentworth).

- Consulting botanist and ecologist to Natural Areas Inventory Projects in southern Ontario, including Hamilton (2001-2002; 2010-2014), Halton (2003-2004) and Niagara (2006-2008).

- Developed vegetation management plans and strategies for a number of significant natural areas and communities, including:

    - Ontario Hydro's right-of-way at Bronte Creek Provincial Park (Oakville)
    - prairie and other vegetation at Bronte Creek Provincial Park (Oakville)

- prairie and oak woodland vegetation at Spencer Gorge Wilderness Area (Dundas/Flamborough)
- prairie vegetation at the Ancaster Prairie (Ancaster)
- rare species and significant communities in the Albion Falls - Buttermilk Falls portion of the Red Hill Valley (Hamilton)

RELATED EXPERIENCE AND COMMUNITY INVOLVEMENT

1995 to present

Mr. Goodban is the first author of a research paper on the historical and present extent and floristic composition of prairie and savanna vegetation in the vicinity of Hamilton, Ontario, prepared with the assistance of two other authors (W.D. Bakowsky and B.D. Bricker). This paper was presented at the 23rd Natural Areas, 15th North American Prairie, and Indiana Dunes Ecosystems Conferences held at St. Charles, Illinois, on October 26, 1996. It was published in the Proceedings of the 15th North American Prairie Conference (1999). Mr. Goodban is currently undertaking further research on prairie, savanna and oak woodland vegetation in the western Lake Ontario region of Ontario. He has authored several papers and studies on the prairie and oak woodland vegetation at Bronte Creek Provincial Park.

1995 to 1999

Mr. Goodban was a participant in the **International Alvar Conservation Initiative** or **'Alvar Working Group'**. This was a collaborative project aimed at documenting and protecting alvar sites in the Great Lakes basin. Participants from across eastern North America examined sites in Michigan, New York, Ohio and Ontario. Mr. Goodban's masters level research on alvar vegetation on the Flamborough Plain was integrated into this broader study. He prepared the text for a 24-page full color brochure and poster for the Federation of Ontario Naturalists, as one of the products generated by the Alvar Working Group, entitled *Great Lakes Alvars*. Mr. Goodban has studied alvar vegetation in all of the main alvar regions in Ontario. He has also visited alvar sites in New York and Ohio.

1991 to present

Mr. Goodban has led numerous naturalist and field botanist field trips in southern Ontario on behalf of the Field Botanists of Ontario. He has given presentations on rare vegetation communities (e.g., prairies, alvars) at conferences, meetings and naturalist club events.

1991 to present

Mr. Goodban has worked in collaboration with the Hamilton Region Conservation Authority to document the flora of the City of Hamilton. The first edition of *The Vascular Plant Flora of the Regional Municipality of Hamilton-Wentworth, Ontario,* was produced in 1995. Mr. Goodban prepared a Second Edition of the Flora in 2003 and a Third Edition in 2014, documenting more than 1400 vascular plant taxa in the City of Hamilton.

1995 to 2000

Member of the Regional Municipality of Hamilton-Wentworth's **ENVIRONMENTALLY SIGNIFICANT AREA IMPACT EVALUATION GROUP** (ESAIEG). ESAIEG considers development proposals located within or adjacent to Environmentally Significant Areas (ESAs) and provides advice to planning staff.

1991 to 1995

Member of the Regional Municipality of Halton's **ECOLOGICAL AND ENVIRONMENTAL ADVISORY COMMITTEE** (EEAC). The basic function of EEAC is to provide technical advice, through the Planning and Development Department, to staff and Council on all environmental matters affecting Halton.

SELECTED PUBLICATIONS AND REPORTS

Goodban, A.G. 2014. The Vascular Plants of Hamilton, Ontario. pp. 1 to 91, In: Schwetz, N. (ed.), Hamilton Natural Areas Inventory Project 3rd Edition, Nature Counts 2, Species Checklist Document. Hamilton Conservation Authority, Ancaster, Ontario.

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Goodban, A.G. and A.C. Garofalo. 2010. Rare Vegetation Types of the Niagara Region, Ontario: A Preliminary Checklist. Chapter 7 In: Natural Areas Inventory 2006-2009 – Niagara Peninsula Conservation Authority Watershed, Volume 1. Niagara Peninsula Conservation Authority, Welland, Ontario.

Crins, W.J., W.D. McIlveen, A.G. Goodban and P.G. O'Hara. 2006. The Vascular Plants of Halton Region, Ontario. pp. 1-79 In: Dwyer, J.K. (ed.), Halton Natural Areas Inventory 2006: Volume 2 – Species Checklists. Halton/North Peel Naturalists' Club, South Peel Naturalists' Club, Hamilton Naturalists' Club, Conservation Halton and the Regional Municipality of Halton.

Goodban, A.G. 2003. The Vascular Plants of Hamilton, Ontario. pp. 1-1 to 1-99, In: Dwyer, J.K., Nature Counts Project, Hamilton Natural Areas Inventory 2003, Volume 1 – Species Checklists. Hamilton Naturalists' Club, Hamilton, Ontario.

Goodban, A.G. 2003. The Vegetation Communities of Hamilton, Ontario. pp. 2-1 to 2-22, In: Dwyer, J.K., Nature Counts Project, Hamilton Natural Areas Inventory 2003, Volume 1 – Species Checklists. Hamilton Naturalists' Club, Hamilton, Ontario.

Goodban, A.G. *In prep.* Bronte Creek Provincial Park (North Section): Grasslands Study. Bronte Creek Provincial Park, Burlington, Ontario Parks.

Goodban, A.G. *In prep.* A life science inventory and assessment of Bronte Creek Provincial Park (North Section). Bronte Creek Provincial Park, Burlington, Ontario Parks.

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Goodban, A.G. 1999. An Overview and Assessment of Prairie and Oak Woodland Vegetation at Bronte Creek Provincial Park. pp. 263-274. In: M. Pollock-Ellwand et al., Parks and Protected Areas Research in Ontario, Proceedings of the Parks Research Forum of Ontario (PRFO) Annual General Meeting. Faculty of Environmental Studies, University of Waterloo, Waterloo, Ontario.

Goodban, A.G., W.D. Bakowsky and B.D. Bricker. 1999. The historical and present extent and floristic composition of prairie and savanna vegetation in the vicinity of Hamilton, Ontario. pp. 87-103. In: Proceedings of the 15th North American Prairie Conference. *Edited by* C. Warwick. Natural Areas Association, Bend, Oregon.

Goodban, A.G. 1998. Significant Flora Survey: Ontario Hydro Right-of-Way, Bronte Creek Provincial Park Nature Reserve Zone Area of Natural and Scientific Interest. Prepared for Ontario Hydro. 11 pp + map.

Goodban, A.G. 1997. A survey of the rare vascular plant flora of the Albion Falls - Buttermilk Falls area in the City of Hamilton, Ontario. Hamilton Region Conservation Authority, Ancaster, Ontario. 14 pp. + appendix + map.

Goodban, A.G. 1996. The vegetation and flora of the Red Hill Valley and environs. pp. 17-66. In: Biological Inventory of the Red Hill Valley, Hamilton Naturalists' Club (eds.), Hamilton, Ontario.

Goodban, A.G. 1995. Alvar Vegetation on the Flamborough Plain: Ecological Features, Planning Considerations and Conservation Recommendations. Major Paper. Faculty of Environmental Studies, York University, North York, Ontario. 88 pp. + appendices.

Goodban, A.G. 1994. *Carex virescens* (Cyperaceae) new to the Regional Municipality of Hamilton-Wentworth. Field Botanists of Ontario Newsletter 7(1): 11-12.

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