Natural Environment Technical Report and Environmental Impact Assessment (EIA)

Proposed Lafarge Pit 3 Extension

Town of Caledon
Region of Peel

April 2024

Submitted to:

Lafarge Canada Inc.

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PROPOSED PIT 3 EXTENSION - LAFARGE CANADA INC.

NATURAL ENVIRONMENT TECHNICAL REPORT AND ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

GOODBAN ECOLOGICAL CONSULTING INC. (GEC)

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1.0 INTRODUCTION

1.1 Background

Lafarge Canada Inc. ("Lafarge") currently operates Pit 3 (licence no. 6525) which is located in the Town of Caledon on Mississauga Road, south of Highway 24 (Charleston Sideroad). Pit 3 has an approved licence area of 37.47 hectares and an approved extraction area of 32.01 hectares. Pit 3 is a Class A operation permitted to extract aggregate below the water table and is licensed to ship unlimited tonnage annually.

Lafarge is applying for an extension to the existing Pit 3. The subject lands are located on Part Lot 13, Concession 5 West Side of Centre Road or Communication Street, Town of Caledon, Region of Peel. The area proposed to be licenced under the Aggregate Resources Act is 25.6 hectares and the proposed extraction area is 20.9 hectares. The majority of the proposed extraction area is currently in agricultural use while a small portion consists of hedgerows and two old field grassland areas. The grassland area on the southeast side of the Elora-Cataract Trailway (Trailway) was historically used as a borrow pit. A small ephemeral wetland exists within the licenced boundary and it is excluded from the proposed extraction area. Both the wetland and grassland area developed following previous aggregate extraction activity on the site. See **Figures 1** and **2**.

The Pit 3 Extension proposes to extract and process aggregate above the established water table, ship a maximum of 1 million tonnes per year and utilize the existing Pit 3 entrance / exit on Mississauga Road for shipping to market. The site is proposed to be restored to existing grades and rehabilitated to agriculture and natural heritage.

Lafarge owns additional land located to the northwest of the Trailway (see **Figures 2** and **3**), and over half of the that property is already zoned in the Town of Caledon Zoning By-law to permit extraction (**Figure 7**). The eastern portion of the northwest property contains fairly mature deciduous and mixed forests, and thicket swamps. The central and western portions of the northwest property contain wetlands, planted conifers and old fields; some of the wetland features were created as a result of aggregate extraction. There is a cultural heritage feature associated with the former farmstead adjacent to Shaws Creek Road. Despite the area being zoned to permit extraction Lafarge is not pursuing an application on these lands and instead they will be used for natural heritage and cultural heritage conservation.

Goodban Ecological Consulting Inc. (GEC) was retained by Lafarge Canada Inc., to prepare a Natural Environment Technical Report and Environmental Impact Statement (EIS) for a Class A Licence application for the proposed Pit 3 Extension. Lafarge proposes to extract to the established water table. The natural environment study area is shown on **Figure 3**.

In addition to the ARA Licence application, Planning Act approvals are also required, including an amendment to the Town of Caledon Official Plan to designate the site to permit aggregate extraction and an amendment to the Town of Caledon Zoning By-law to zone the site to permit aggregate extraction and zone the onsite wetland and buffer Environmental Policy Area. The various land use designations and zoning on and adjacent to the site are shown on **Figures 4** to **7**.

Besides the requirement for a Natural Environment Technical Report under the ARA, there is a requirement to prepare an Environmental Impact Assessment (EIA) under the *Planning Act*. This report serves as both a Natural Environment Technical Report and an EIA.

1.2 Natural Environment Technical Report Requirements under the Aggregate Resources Act (ARA)

Under the *Aggregate Resources Act* there is a requirement to complete a Natural Environment Report to identify any of the following natural heritage features and areas that exist on the site and within 120 metres of the site:

a) significant wetlands;
b) other coastal wetlands in Ecoregions 5E, 6E and 7E;
c) fish habitat;
d) significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
e) habitat of endangered species and threatened species;
f) significant wildlife habitat;
g) significant areas of natural and scientific interest; and,
h) Within the area of one or more provincial plan(s), any key natural heritage features not included in (a) through (g).

The Aggregate Resources of Ontario: Technical Reports and Information Standards issued under O. Reg. 466/20 sets the standards for how the technical reports must be prepared. The standards provide the following guidance in preparing the Natural Environment Report:

> *"Where any of the above features or areas have been identified, the report must identify and evaluate any negative impacts on the natural features or areas, including their ecological functions, and identify any proposed preventative, mitigative or remedial measures. The report must also identify if the site or any of the features, included in (a) through (g), are located within a natural heritage system that has been identified by a municipality in ecoregions 6E and 7E or by the province as part of a provincial plan."*

1.3 Environmental Impact Assessment (EIA) under the *Planning Act*

The Natural Environment Technical Report also serves as an Environmental Impact Assessment (EIA) for the purpose of the Planning Act and it will consider the natural heritage policies and related mapping of features identified in the following:

- Provincial Policy Statement (2020);
- Greenbelt Plan (2017);
- Region of Peel Official Plan (2022); and,
- Town of Caledon Official Plan (Office Consolidation 2018).

The following subsections provide a summary of the key policy considerations from each of the above noted plans.

1.3.1 Provincial Policy Statement (2020)

The Provincial Policy Statement (2020) requires consideration of the following natural heritage policies:

- 2.1.1 Natural features and areas shall be protected for the long term.

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

- 2.1.3 *Natural heritage systems* shall be identified in Ecoregions 6E & 7E1*,* recognizing that *natural heritage systems* will vary in size and form in *settlement areas*, *rural areas*, and *prime agricultural areas*.

- 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*.

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

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

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

1.3.2 Greenbelt Plan (2017)

The subject site is located within the Protected Countryside Natural Heritage System and the application would be considered an expansion of an existing mineral aggregate operation. As a result, the Greenbelt Plan (2017) requires consideration of the following natural heritage policies:

- 4.3.2.3.c *An application requiring a new approval under the Aggregate Resources Act to expand an existing mineral aggregate operation may be permitted in the Natural Heritage System, including in key natural heritage features, key hydrologic features and in any associated vegetation protection zones, only if the related decision is consistent with the PPS and satisfies the rehabilitation requirements of this section.*

- 4.3.2.6 *For rehabilitation of new mineral aggregate operation sites in the Protected Countryside, the following policies apply:*

  a) The disturbed area of a site shall be rehabilitated to a state of equal or greater ecological value and, for the entire site, long-term ecological integrity shall be maintained or enhanced;
  b) If there are key natural heritage features or key hydrologic features on the site, or if such features existed on the site at the time of an application:
    i. The health, diversity and size of these key natural heritage features and key hydrologic features shall be maintained or enhanced; and
    ii. Any permitted extraction of mineral aggregates that occurs in a feature shall be completed, and the area shall be rehabilitated, as early as possible in the life of the operation;
  c) Aquatic areas remaining after extraction are to be rehabilitated to aquatic enhancement, which shall be representative of the natural ecosystem in that particular setting or ecodistrict, and the combined terrestrial and aquatic rehabilitation shall meet the intent of section 4.3.2.6 (b).

- *4.3.2.7 Final rehabilitation for new mineral aggregate operations in the Natural Heritage System shall meet these additional policies* (4.3.2.7)*:*

  a) Where there is no extraction below the water table, an amount of land equal to that under natural vegetated cover prior to extraction, and no less than 35 per cent of the land subject to each license in the Natural Heritage System, is to be rehabilitated to forest cover, which shall be representative of the natural ecosystem in that particular setting or ecodistrict. If the site is also in a prime agricultural area, the remainder of the land subject to the license is to be rehabilitated back to an agricultural condition;

  c) Rehabilitation shall be implemented so that the connectivity of the key natural heritage features and the key hydrologic features on the site and on adjacent lands shall be maintained or enhanced.

1.3.3 Region of Peel Official Plan (2022)

The subject site is located outside of the Core Area of the Region of Peel Greenlands System. The following is a summary of the key policy considerations of the Region of Peel Official Plan (2022) related to natural heritage features and mineral aggregate operations:

- 3.4.7 Prohibit new or expanded mineral aggregate extraction sites and *wayside pits and quarries* or any ancillary or accessory uses thereto, in the following areas:

    a) the Core Areas of the Greenlands System;

- 3.4.10 Require that all extraction and processing and ancillary or accessory use thereto, be located, designed and operated so as to minimize environmental, community and social impacts.

- 3.4.12 Promote progressive *rehabilitation* of licensed mineral aggregate extraction sites in a manner that conforms with the applicable policies in this Plan, the local municipal official plan, the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan, Greenbelt Plan, Provincial Policy Statement, and the Aggregate Resources Act.

In the Region of Peel Official Plan, the subject site is mapped as Provincial Natural Heritage System, consistent with the Greenbelt Plan, Natural Areas and Corridors, and a small portion Potential Enhancement Area. These designations do not restrict aggregate extraction on the subject site.

1.3.4 Town of Caledon Official Plan (Office Consolidation 2018)

The subject site is located outside of the Town of Caledon's Environmental Policy Area. The following is a summary of the key policy considerations of the Town of Caledon Official Plan (2018) related to natural heritage features and mineral aggregate operations:

- Policy 5.11.2.2.5 (d, e, h, and i) of the Town of Caledon Official Plan prohibits aggregate operations in:

    d) The Core Areas of the Greenland System in Peel designations in the Region of Peel Official Plan;
    e) The Environmental Policy Area designations in the Town of Caledon Official Plan except for those Environmental Policy Areas set out in Sections 3.2.5.9.1, 5.11.2.2.6 and as may be considered in accordance with Section 5.11.2.2.8;
    h) Kettle lakes and their catchments with catchments being defined as lands adjacent to kettle lakes that, due to their topography and/or geology, provide surface and/or groundwater contributions to the lake that are necessary to maintain the lake's ecological functions, attributes and features; and,
    i) Natural lakes and their shorelines.

- *Policy 5.11.2.2.6 states that mineral aggregate operations may be permitted within and adjacent to valley and stream corridors, other woodlands, other wetlands, other fisheries, significant wildlife habitat, groundwater recharge and discharge areas and potential*

Environmental Protection Areas subject to policies found in Section 5.11.2.2.6 a) to h) of the Caledon Official Plan.

- 5.11.2.2.8 *Notwithstanding Section 5.11.2.2.5, new or expanding mineral aggregate operations may be permitted within Greenbelt Key Natural Heritage Features and Key Hydrologic Features, and their associated Vegetation Protection Zones, subject to the following:*

    a) the Greenbelt KNHF or KHF does not satisfy the criteria for any other area or feature listed in Section 5.11.2.2.5 a) to d), f) to i) and k); and

    b) the mineral aggregate operation meets all of the applicable provisions contained in Section 5.11.2.2.6.

- *5.11.2.4.2 The Town of Caledon will approve an application for an Official Plan Amendment to designate lands identified as Aggregate Resource Lands on Schedule L for a new extraction operation or expansion to an existing extraction operation when the following criteria have been met:*

    d) The Applicant has completed all environmental investigations and studies as required by this Plan and by all relevant approval agencies and demonstrated that the proposal will not have any unacceptable impacts;

1.4 Organization of this Report

This Natural Environment Technical Report and Environmental Impact Assessment (EIA) is organized under the following headings:

- 2.0 Natural Heritage Screening
- 3.0 Natural Heritage Screening: Conclusions and Recommendations
- 4.0 Study Approach and Methods
- 5.0 Existing Conditions
- 6.0 Habitat of Endangered Species and Threatened Species
- 7.0 Significant Wetlands in Ecoregion 6E
- 8.0 Significant Woodlands in Ecoregion 6E
- 9.0 Significant Wildlife Habitat
- 10.0 Significant Areas of Natural and Scientific Interest (ANSI)
- 11.0 Summary of Significant Natural Heritage Features
- 12.0 Description of the Proposed Extraction, Operational Plan and Rehabilitation Plan
- 13.0 Potential Effects on Significant Natural Heritage Features
- 14.0 Environmental Impact Assessment (EIA) for Peel Core Area and Town of Caledon Environmental Policy Area
- 15.0 Aggregate Resources Act Site Plan Technical Recommendations
- 16.0 Conclusions
- 17.0 Literature Cited

2.0 NATURAL HERITAGE SCREENING

2.1 Natural Heritage Screening Methods

The study area is defined as the proposed licensed area and the surrounding 120 m (adjacent lands), as shown on **Figure 3**. Four separate wetlands were identified within the study area as shown on **Figure 9**: Wetlands U1, U2, U3 and W1.

The Natural Heritage Screening involved a review of available background information and the results of ecological field surveys completed from 2013 to 2022. The details of the field surveys are provided below in **Section 4.1**.

Background information sources included the following:

- Credit Valley Conservation (CVC) and Ministry of Natural Resources (OMNR) Aurora District. 2008. Wetland Evaluation Record (WER) for the Cataract Southwest Wetland Complex.

- Credit Valley Conservation (CVC). 2015. Shaw's Creek – Charleston North Natural Area Site Summary. Credit River Watershed and Region of Peel Natural Areas Inventory. Online site summaries.

- Credit Valley Conservation (CVC). 2016. Shaw's Creek – Charleston South Natural Area Site Summary. Credit River Watershed and Region of Peel Natural Areas Inventory. Online site summaries.

- GWS Ecological & Forestry Services Inc. in association with Stantec Consulting Ltd. 2016. Proposed Erin Pit Extension Level II Natural Environment Technical Report. Prepared for: James Dick Construction Limited. GWS Ecological & Forestry Services Inc., Cambridge, Ontario. 44 pp. + Appendices.

- Kaiser, K. 1994. Biological Inventory and Evaluation of the Dufferin Lake Area of Natural and Scientific Interest.

- Ontario Ministry of Natural Resources (OMNR). 2013. Caledon Meltwater Deposits – Forks of the Credit ANSI. Earth Science Inventory Checklist. Compiled by D.N. Webster, P.S.G. Kor and S. Varga. MNR Aurora District. 6 pp + 3 figures.

- Natural Heritage Information Centre (NHIC) database.

- Ontario Reptile and Amphibian Atlas. Online range maps.

Some of the other technical reports prepared as part of the Pit 3 Extension application were also consulted, including:

- DBH Soil Services Inc. 2023. Soil Survey and Canada Land Inventory Classification for Part Lot 13, Concession 5, West Side of Centre Road (or Communication Street), Town of Caledon, Region of Peel. Prepared for Lafarge Canada Inc.

- WSP. 2024. Proposed Lafarge Pit No. 3 Extension: Level 1 and 2 Hydrogeology and Hydrology Report. Barrie, ON: prepared for Lafarge Canada Inc.

- MacNaughton Hermsen Britton Clarkson Planning Limited (MHBC). 2024. Planning Justification Report & ARA Summary Statement: Pit 3 Extension and Pit 3, Town of Caledon, Region of Peel. MHBC, Barrie, Ontario.

2.2 Habitat of Endangered Species and Threatened Species

The following Endangered species and Threatened Species were identified within the study area during the ecological field surveys:

- Red-headed Woodpecker (Endangered);
- Bank Swallow (Threatened);
- Bobolink (Threatened);
- Eastern Meadowlark (Threatened);
- Least Bittern (Threatened); and,
- Northern Myotis (Endangered).

Endangered and Threatened species and their habitats will be discussed further **Sections 6.0** and **13.1**.

2.3 Significant Wetlands and Significant Coastal Wetlands

A review of Land Information Ontario (LIO) indicates that Wetland W1 (**Figure 2**) is part of the Provincially Significant Cataract Southwest Wetland Complex. Wetland W1 is the only Provincially Significant Wetland (PSW) within the study area.

Wetlands associated with the Provincially Significant Dufferin Lake Wetland Complex are located more than 700 m southeast of the site at the closest point.

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

Significant Wetlands will be discussed further in **Sections 7.0** and **13.2**.

2.4 Significant Woodlands

As shown on **Figure 2** portions of the study area are mapped as part of the Region of Peel's Greenlands System, including the block of forest, wetlands and conifer plantations to the northwest of the site, and an area to the east and southeast of the site that is connected to the larger Dufferin Lake natural area. The area offsite to the east was mainly conifer plantations that were harvested in recent years.

Significant Woodlands will be discussed further as part of the Level 2 Report below, in **Sections 8.0** and **13.3**.

2.5 Significant Valleylands

No Significant Valleylands have been identified within the study area. There are no valley features within the study area.

2.6 Significant Wildlife Habitat (SWH)

Significant habitat was identified for four species listed as Special Concern in Ontario: Barn Swallow, Eastern Wood-Pewee, Grasshopper Sparrow and Snapping Turtle. Barn Swallow was observed foraging over the site and adjacent lands. Eastern Wood-Pewee and Snapping Turtle were observed on the Lafarge property northwest of the Trailway. Grasshopper Sparrow habitat overlaps with a portion of the area identified as habitat for Bobolink (Threatened) and Eastern Meadowlark (Threatened). In addition, significant habitat was identified for six locally significant species: Sprengel's Sedge, Greenish Sedge, Wood's Sedge, Variegated Scouring-Rush, Giant Burreed, and Orchard Oriole.

Wetland U1 was identified as significant amphibian breeding habitat (wetland). Wetlands U2 and W1 were identified as significant amphibian breeding habitat (woodland).

Significant Wildlife Habitat is discussed further in **Sections 9.0** and **13.4**.

2.7 Significant Areas of Natural and Scientific Interest

No Life Science Areas of Natural and Scientific Interest (ANSIs) are located within the study area. The 57.07 ha Provincially Significant Dufferin Lake Life Science ANSI is located more than 400 m southeast of the site at the closest point.

Approximately 11.8 ha of the Provincially Significant Caledon Meltwater Deposits Earth Science ANSI, as currently mapped by Lands Information Ontario (LIO), is located on the site (**Figure 2**). This Earth Science ANSI covers 501.96 ha in total. OMNR (2013) recommended reducing the size of this ANSI to 448.5 ha. The boundary revisions proposed by OMNR (2013) would result in the site being excluded from this ANSI (**Figure 2**).

The Caledon Meltwater Deposits Earth Science ANSI is discussed further in **Sections 10.0** and **13.5**.

2.8 Fish Habitat

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

CVC's online watershed mapping shows a watercourse located approximately 400 m east northeast of the eastern corner of the site.

2.9 Sand Barrens, Savannahs and Tallgrass Prairies

There are no sand barrens, savannahs or tallgrass prairies within the study area.

2.10 Alvars

There are no alvars within the study area.

2.11 Region of Peel Environmental Areas

Core Areas of the Region of Peel Greenlands System are shown on **Figure 5**; no Core Areas occur onsite. The Core Area located northwest of the Trailway overlaps to varying extents with areas identified as Significant Wetlands (in part), Significant Woodlands and Significant Wildlife Habitat (in part).

A second Core Area is located east of the site. Immediately adjacent to the site the conifer plantation was harvested in recent years and only perimeter hedgerows remain.

The Region of Peel Official Plan maps the subject site as Provincial Natural Heritage System, consistent with the Greenbelt Plan, Natural Areas and Corridors and a small portion as Potential Enhancement Areas. These designations do not restrict aggregate extraction on the subject site, but assist in guiding the rehabilitation of the site.

2.12 Town of Caledon Environmental Policy Area

Town of Caledon Environmental Policy Areas are shown on **Figure 6**; no Environmental Policy Areas occur onsite. The Environmental Policy Area located northwest of the site corresponds approximately to Wetland W1. This feature is located approximately 110 m away from the site at the closest point.

A second Environmental Policy Area is located southeast of the easternmost corner of the site; it is approximately 100 m away at the closest point. This feature will be protected by the 15 m property setback and 100 m separation from the site. Connectivity between this feature and the Environmental Policy Area northwest of the Trailway will ultimately be enhanced by the establishment of a 55 m wide linkage as shown on **Figure 15** (Rehabilitation Plan).

3.0 NATURAL HERITAGE SCREENING: CONCLUSIONS AND RECOMMENDATIONS

Of the nine potential natural heritage features that are identified under the PPS (2020) and listed above in **Section 1.2**, five (5) occur on or adjacent to the proposed licensed area. These are as follows:

- Habitats of Endangered Species and Threatened Species;
- Significant Wetlands in Ecoregion 6E;
- Significant Woodlands in Ecoregion 6E;
- Significant Wildlife Habitat; and,
- Significant Areas of Natural and Scientific Interest

In addition, the proposed licensed area is located adjacent to the following natural heritage features:

- Region of Peel Core Area; and,
- Town of Caledon Environmental Policy Area.

It should be noted that the two features listed above are not located onsite.

4.0 STUDY APPROACH AND METHODS

This section describes the methods used to conduct the detailed surveys of vegetation, flora and wildlife and outlines the resulting natural environment input provided to the proposed extraction footprint, operational plan, and rehabilitation plan.

4.1 Vegetation and Flora

Surveys of vegetation and flora were completed on a total of 19 different dates, listed as follows:

- 2013: October 10
- 2014: May 7, June 17, August 9 and September 28
- 2015: September 7
- 2016: April 17 and 18, May 19, June 22 and August 29
- 2017: April 23, June 25
- 2018: May 5 and 17, July 9, September 23
- 2020: October 14
- 2022: July 15

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 Credit River Watershed/Region of Peel (CVC 2002).

4.2 Wildlife

The wildlife inventories were conducted between 2013 and 2022, with most field work being completed in 2014, 2016-2018, and 2022. The 2013 work consisted of a single reconnaissance level visit to help determine the scope of the field program for the site and adjacent lands.

For each species observed on each field visit, it was documented where it was observed in relation to the proposed extraction. Each species was identified as occurring in the extraction area, the setbacks and/or adjacent lands. Many species occurred in more than one of these areas.

Table 1 provides a list of the 16 dates and the times that wildlife inventories were undertaken. **Table 2** summarizes the weather conditions on days that fieldwork was completed.

In addition to the results of the fieldwork, a search of the Natural Heritage Information Centre (NHIC) database was made to determine if any significant species or features had been reported from the site or adjacent areas.

4.2.1 Invertebrates

The invertebrate groups that were inventoried consisted of odonates (dragonflies and damselflies), butterflies, and bumble bees. No specialized surveys were undertaken for these invertebrates, but all species that were observed were identified on each visit.

4.2.2 Amphibians

All amphibians observed on each trip were documented. In addition, surveys were undertaken for salamander egg masses and for calling amphibians.

Salamander egg masses were searched for in Wetland W1, which is part of the Provincially Significant Cataract Southwest Wetland Complex. This wetland was considered the only wetland within the study area that had the potential to support breeding populations of mole salamanders (*Ambystoma* spp.). Because this wetland has an organic substrate, egg mass searches were limited to the shoreline of the wetland.

In 2014, amphibian call count surveys were completed on April 21, May 29, and June 14 using a modified version of the Bird Studies Canada protocol (BSC 2009). Instead of conducting a 3-minute survey, a minimum of 10 minutes was spent at each station and longer if it was uncertain if all species had been heard calling at their maximum intensity. In addition, any amphibians heard calling while approaching or leaving the station were also documented. The BSC protocol recommends that all amphibians heard be documented, but that it be noted whether each species is within or outside of a 100-m radius half-circle. For this study, only those species that were calling from the pond that was being sampled was recorded so that it was known which species were breeding in each of the ponds.

Song Meters were deployed as listed below by wetland and year:

- 2016: Wetlands U1, U2 and U3
- 2017: Wetlands U1, U2 and U3
- 2018: Wetlands U1, U2, U3 and W1

Song Meter SM2 units were used in 2016. Song Meter SM4 units were used in 2017 and 2018. The Song Meters were deployed from late March-early April until mid-June each year. They were set to record 10-minute blocks of time at 30 minutes, 90 minutes and 150 minutes after sunset.

4.2.3 Reptiles

Snakes were inventoried predominantly by visual searches and turning over existing debris. Turtles were searched for in each pond on each visit to the site.

In addition, the Blanding's turtle survey protocol (OMNR 2015a) was implemented to determine if this species was present. This involved searching for turtles early in the season to determine which ponds were probably used for overwintering, and later surveys to look for basking turtles. The visual encounter survey was employed rather than hoop net surveys, nest surveys, or road surveys. The wetlands that have the potential to support turtles within the study area are relatively open, so the survey technique for open-water wetlands was used. Wetland U1 is more heavily vegetated with aquatic emergent plants, but is quite small so that it was not considered necessary to wade through it along transects. The protocol requires five surveys to be completed between 0900 and 1700 hours on sunny warm days with minimal wind.

The survey consisted of scanning each wetland carefully for turtles using 10x42 binoculars. At U1, an initial vantage point was used to survey the pond from the laneway into the site northwest of the Trailway. Then a very slow transect was made along the eastern side of the wetland to search for turtles. After U1 was surveyed, the ponds within U2 were visited. A vantage point was taken on the berm at the west side of the ponds, then a very slow transect was made along the southern edge of the ponds. After surveying W1, another slow transect was completed along the northern edge of U2. For W1, a vantage point was surveyed along the western shoreline from the hill near the northwestern property boundary. Then a very slow transect was walked along the western and southern shorelines.

The Blanding's turtle survey was conducted on 10 dates: April 24 (two surveys, one in the late morning and one mid-afternoon), May 20 and June 5, 10, and 28, 2014; May 19 and June 9 and 23, 2016; and May 17 and June 6, 2018.

4.2.4 Birds

Typical Breeding Bird Surveys

Breeding bird surveys were conducted on 10 different days, including 3 in 2014, 2 in 2016, 1 each in 2017 and 2018, and 3 in 2022. This does not include the targeted surveys for marsh birds that occurred earlier in the season. The earlier visits allowed documentation of earlier breeding bird such as waterfowl and shorebirds. During the breeding bird surveys, all habitats were visited using a wandering transect method, stopping frequently to listen for singing birds. All birds observed in suitable habitat during their typical breeding period were considered breeding species. Species were considered to be nonbreeders only if there was conclusive evidence that they were not breeding.

The codes that are used to denote breeding evidence in the Ontario Breeding Bird Atlas were not used as these are designed for a different purpose than surveying an individual property. Application of these codes frequently leads to errors in interpretation. For example, the Bank Swallow was observed on several occasions and application of the atlas codes would result in it being considered a probable breeder. There is no potential breeding habitat for this species on site, however, and it was simply foraging over the wetlands.

Breeding bird surveys were initiated early in the morning and were completed by 0930 h at the latest, except on June 25, 2022. Site visits were often extended after the breeding bird work was completed so that insects and other wildlife groups could be inventoried. **Table 1** summarizes the dates that breeding bird surveys were completed and **Table 2** provides the weather conditions.

Least Bittern Surveys

Least Bittern surveys were conducted using the national protocol (Jobin et al. 2010). The survey consists of 5 minutes of passive listening, 5 minutes of broadcast calls, and an additional 3 minutes of passive listening. The survey consists of 3 different visits between mid-May and early July. In 2014, only two surveys were conducted because the species was confirmed and it was desirable to not disturb the birds further by playing broadcasts of their calls. On the date that it was confirmed, the broadcast calls were terminated immediately so that the birds would not be further disturbed.

In 2014, the Least Bittern survey was conducted in U1, U2, and W1, the wetland within the deciduous forest northwest of the Trailway. In later years, only the ponds within U2 were surveyed for this species. The other two wetlands were considered to have no to low potential to support this species. Wetland U1 had virtually no standing water in it in the years subsequent to 2014 and was therefore completely unsuitable for this species. Wetland W1 was considered marginal habitat because it is situated within a forest and it has few emergent plants.

In 2016, 2017, and 2018, only single surveys were conducted in U2. This was due to the facts that the area had already been confirmed as habitat for the Least Bittern and that water levels were so low that it was highly unlikely that the species would be present at that time.

Marsh Bird Surveys

Marsh bird surveys were completed on the same dates and at the same wetlands as the Least Bittern surveys. The marsh bird surveys were initiated immediately after the Least Bittern survey and the last 3 minutes of silent listening for the bittern were considered part of the passive listening survey for the marsh bird survey.

The survey followed the protocol developed by Bird Studies Canada. It consists of 5 minutes of passive listening, followed by 5 minutes of broadcast calls for the 5 target species, followed by another 5 minutes of passive listening. The target species include the Least Bittern, Sora, Virginia Rail, a mix of Common Gallinule (*Gallinula galeata*) and American Coot (*Fulica americana*) calls, and the Pied-billed Grebe. For each species, the one minute devoted to it on the CD consists of 30 seconds of its calls and 30 seconds of silence. This is occasionally too short of a period to elicit a response. Consequently, the calls of the Sora and Virginia Rail were played three times each. Once a species responded, the call for it was terminated to avoid excessive disturbance to the birds.

Owl Surveys

Owl surveys were conducted on the evenings of May 29 and June 14, 2014. The survey consisted of playing broadcast calls of the owl species that have the potential to breed in this general area. These included the Northern Saw-whet Owl (*Aegolius acadicus*), Eastern Screech-Owl (*Megascops asio*), Long-eared Owl (*Asio otus*), Barred Owl (*Strix varia*), and Great Horned Owl (*Bubo virginianus*). Approximately 5 minutes of calls were played for each species. The calls were played in the order that they are listed here, with the smallest owl being surveyed first and the largest last. This is because the larger owls may prey upon smaller owls, and playing a larger owl's calls may inhibit a smaller species from responding.

Nightjar Survey

The two nightjar species that were surveyed for include the Common Nighthawk (*Chordeiles minor*) and Eastern Whip-poor-will (*Antrostomus vociferus*). The nighthawk is crepuscular and is most detectable shortly before dawn and sunset. At these times, it may be seen flying and capturing aerial insects. After dark, it is difficult to detect, although it may make a booming sound while foraging. The whip-poor-will is more nocturnal. It also calls at dusk and dawn, but continues to call all night, especially during periods near the full moon.

Three surveys were conducted for the two species of nightjars, on May 7 and 29 and June 14, 2014. The full moon occurred on June 13, so the following evening was the ideal time to survey for the whip-poor-will according to the Bird Studies Canada (2012) protocol.

During all visits, inventories for these species began before sunset so that the dusk period was covered. Surveys extended as long as 2 hours after official sunset. The Bird Studies Canada protocol states that only a single 3-minute point count is required to adequately survey for the whip-poor-will. The duration of the surveys for the two nightjar species greatly exceeded that recommended in the protocol. In addition, three evenings were spent surveying for these species as opposed to a single night.

Bobolink and Eastern Meadowlark Surveys

The protocol for surveying for the Bobolink and Eastern Meadowlark recommends three surveys to be conducted at least a week apart during June and the first week of July (OMNR 2010a). The survey consists of transects spaced 250 m apart and 10-minute point counts every 250 m along the transect.

The most suitable site for these two grassland species was the cultural meadow immediately south of the Trailway. Because of its small size, only a single transect and point count could be accommodated in this habitat patch. The transect extended from near Shaws Creek Road to the east side of the site along the southern edge of the grassland. The point count was completed about 150 m from the eastern end of the transect. The location of the point count was elevated and provided a good vantage point where the entire habitat patch could be observed.

In most years, presence of one or both species was confirmed on the first survey, negating the need for further surveys.

The standardized protocol was not used to survey for these species within the cultural meadow northwest of the Trailway between Shaws Creek Road and U2, or in the cultural meadow in the southwest portion of the study area. The first meadow was observed during all site visits, and was small enough that it was unnecessary to conduct specific surveys for Bobolinks and Eastern Meadowlarks. Similarly, the southwestern cultural meadow was surveyed during every breeding bird survey. It is quite small, so these species would have been easily detected had they been present. In addition, this meadow is too small to support either of the species, being smaller than their minimum territory sizes.

4.2.5 Mammals

With the exception of bats, no targeted surveys for mammals were undertaken. Presence of mammal species was determined through direct observations and signs such as burrows, scats, and tracks.

Acoustical surveys were conducted for bats on four nights in 2014: April 21, May 7 and 29, and June 14. These surveys were completed before any standardized protocols for bat monitoring had been prepared.

On each evening, four stations were sampled using a handheld EM3+ Wildlife Acoustics bat detector. The first station was midway between the onsite house and the old barn that was present at the time. Observations were begun prior to dusk at this station and both buildings were watched to see if any bats exited them at dusk. The purpose of this station was to determine if bats were roosting in either of the buildings. The bat detector was employed while the buildings were being observed and was kept running for about 20 minutes after dark.

The second station was at the shoreline of the Wetland U2 northwest of the Trailway. The purpose of this station was to determine if the little brown myotis (*Myotis lucifugus*) occurred in the area. This bat preferentially forages over open water, so any bats of this species that roosted within the area would probably forage in this area.

The third station was in the deciduous woodland northwest of the Trailway at the southwestern edge of Wetland W1. The purpose of this station was to determine if the little brown myotis was using this pond for foraging and also to confirm whether the northern myotis was foraging within the woodlot. Although the northern myotis frequently forages in the open, it prefers to forage under the canopy of forests.

The fourth station was on the Trailway south of the woodlot. The purpose of this station was to detect bats that may have been foraging in the open and at the edge of the woodlot. This type of habitat is frequently used by the little brown myotis and big brown bat.

The amount of time spent surveying was less than is currently recommended, but by sampling at dusk to after dark, bats that were potentially roosting on site would have been detected. Bats that are detected later in the evening may simply represent those that are foraging in the area and not those that have been roosting during the day.

The bat calls were saved in WAV format on the bat detector and converted to Analook files on the computer. This provides a visual representation of the calls. Calls were identified manually based on factors such as minimum and maximum frequencies and slopes of the pulse. Automated programs are available that identify bat calls, but these tend to make numerous errors; consequently, they were not used. They consistently misidentify calls of species within the genus *Myotis*, and big brown bat calls as those of silver-haired bats (*Lasionycteris noctivagans*).

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

GEC provided a series of recommendations with respect to woodland buffers, silt fence layouts, planting areas, enhancement measures for Wetland U3, tree-planting prescriptions, etc. that were incorporated in to the Site Plans.

5.0 EXISTING CONDITIONS

Section 5.0 describes existing conditions under the following headings:

- 5.1 Terrain Setting
- 5.2 Aquatic Habitat
- 5.3 Terrestrial Habitat
- 5.4 Wildlife

The site characterization integrates available sources of background information and GEC's detailed ecological field surveys, as well as relevant information from other disciplines, including the hydrogeological and hydrological investigations by WSP (2024) and the soil surveys completed by DBH Soil Services Inc. (2023).

5.1 Terrain Setting

Section 5.1 describes the terrain setting under the following headings:

- 5.1.1 Physiography and Climate
- 5.1.2 Geology and Hydrogeology
- 5.1.3 Drainage
- 5.1.4 Soils
- 5.1.5 Landscape Setting

5.1.1 Physiography and Climate

The site is located within the Guelph Drumlin Field physiographic region (Chapman and Putnam 1984). The Guelph Drumlin Field is centred on the City of Guelph, extending into the City of Hamilton, Region of Waterloo, Region of Halton, Region of Peel and Wellington County. Approximately 300 drumlins of varying size occur within this region. The drumlins are generally broad and oval shaped, with slopes less steep than those of the Peterborough drumlins. The till material is loamy and calcareous, with numerous stones.

The site is located within the zone of 2900-3100 average accumulated Crop Heat Units in Ontario (Weather Innovations Inc. [WIN]). The Crop Heat Units (CHU) index was originally developed for field corn and it has been used in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost-free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

5.1.2 Geology and Hydrogeology

WSP (2024, page 4) provide the following characterization of geology and hydrostratigraphy:

> *"The Site is located within an area of glaciofluvial outwash deposits which form the aggregate resource… These deposits are part of a larger complex of outwash deposits which stretch from north of Orangeville to south of Erin (Cowan, 1976). The complex was deposited by glacier derived melt water during the Port Huron stadial approximately 13,000 years ago. The deposit consists mainly of stratified sand and gravel sized materials with occasional cobbles and thin, discontinuous lenses of finer sand and silt materials. An unconfined aquifer … also resides within this deposit."*
>
> *"In the area of the Site the glaciofluvial outwash deposit ranges in thickness within 7 m to 15 m based on Site borehole logs and local Ministry of Environment, Conservation and Parks (MECP) water well records. Underlying the glaciofluvial outwash deposit is a relatively thick (~30 m) sequence of silt and clay-based material down to the bedrock. The Goat Island-Gasport (Amabel) Formation dolostone bedrock, a regionally extensive aquifer and source of groundwater for both domestic and municipal water well supplies, is mapped as being present beneath the Site (AquaResource, 2009), although several water well records in the area indicate the upper bedrock may consist of shale."*
>
> *"Based on the geologic characterization, the major hydrostratigraphic units include, from top down:*

1. *A sand and gravel unconfined aquifer;*
2. *A silt and clay aquitard; and*
3. *A bedrock aquifer.*

In some localized instances a confined granular subunit may be present within the silt and clay aquitard or at the bedrock contact."

Golder commenced a field investigation program at the site in 2016 with the objectives of characterizing hydrologic and hydrogeologic conditions, including: geological units, water levels, groundwater temperature, groundwater chemistry and hydraulic conductivity. The monitoring network included the following:

- Seven monitoring wells (3 installed in 2007, 3 installed in 2016 and an inactive domestic well north of the site converted to a monitoring well);
- An onsite wetland piezometer (Wetland U3); and,
- Four off-site surface water monitors equipped with staff gauges (Wetlands U1, U2A, U2B and W1).

WSP's borehole logs support the conceptual hydrostratigraphy listed above. Their descriptions of the three units provided on page 6 of their report (WSP 2024):

- **Unconfined Sand and Gravel Aquifer:** *"The unconfined aquifer consists largely of brown fine to coarse sand, often silty, with varying proportions of gravel and cobbles. The observed thickness of this unit ranges from 7.62 m to 14.33 m."*

- **Silt and Clay Aquitard:** *"The transition from the unconfined aquifer to the underlying aquitard varies from abrupt to gradual. Typically, the transition to aquitard is denoted by the predominance of grey brown to grey silt. The presence of clay appears more common at greater depths. Well record 4908398, just off-Site, suggests that the aquitard is present down to top of bedrock with a thickness of approximately 26 m."*

- **Bedrock Aquifer: "***Well record 4908398 indicates that bedrock near the Site is approximately 39 m below ground surface. The log reports grey shale underlain by grey dolostone underlain by grey sandstone. The dolostone reported in the log is likely the Goat Island-Gasport (Amabel) Formation."*

WSP provided the following a summary of trends based on their water level measurements on pages 6 and 7 of their report (WSP 2024):

- *"The unconfined aquifer groundwater levels vary between +/- 1 m or less annually… The hydrographs indicate that the highest groundwater elevations typically occur during late spring/early summer and the lowest groundwater elevation typically occur during the late fall/early winter. These patterns are consistent with a fairly deep unconfined system that receives the bulk of its recharge after the freshet. That being said, the highest groundwater elevations were recorded during May 2019 after a particularly wet spring/early summer. Although the water level measurement at UW3 was also relatively high in March 2020, the conditions recorded in May 2019 represent the most comprehensive estimate of the highest groundwater elevation across the entire Site."*

- *"Depending on the well and time of year, depth to water at wells within the Site can vary from 4.4 m to 13.5 m below ground surface."*

- *"The wetlands north of the Site, when ponded, exhibit water level patterns similar to, but greater in elevation, than those of on-Site wells. Well 07-DH-154, which lies north of UW1, further confirms that water levels are greater north of the site. As such, the wetlands are considered upgradient of the Site. The wetlands exhibit a typical hydroperiod response: water levels rise during the spring freshet and slowly decline into late summer; thereafter the wetlands are largely dry for the remainder of the year. 2017 shares a somewhat similar pattern although the extent of the wet hydroperiod is dominated by an unusually wet June."*

- *"UW3 water level measurements are limited to wet periods during 2019. Access to the wetland during summer was prevented as a result of wild (poison) parsnip overgrowth surrounding the feature. When measured, the groundwater level was consistently below ground surface (within 0.13 to 0.54 m) but raised relative to the groundwater elevation at surrounding wells. This would suggest the UW3 area, which is in effect a drainage "bowl", may be an area of increased infiltration resulting in slightly localized water table mounding."*

- *"The difference in water level between unconfined sand and gravel aquifer (MW16-1A) and the underlying silt aquitard (MW16-1B) varies within 0.5 m... Vertical gradient direction is most frequently observed as downwards; however, upward gradients are observed during late summer and into early winter."*

- *"Relatedly, bedrock water levels are at least 3 m lower than those in the overburden… Furthermore, the bedrock hydrograph is subdued relative to the seasonal behaviour observed in the overburden system."*

- *"An inferred high-water table map was developed using the May 31, 2019 monitoring event… Consistent with other monitoring events, the on-Site flow pattern during this period is roughly from northwest to southeast. On-Site, the high-water table ranges from approximately 390.4 masl in the northwest to 389 masl in the eastern corner."*

WSP provided the following characterization of groundwater temperature on pages 7 and 8 of their report (WSP 2024):

> *"Collectively, groundwater temperatures range from 4.6 to 16.1°C with an average temperature of 9.1°C. For a given well, measurements typically indicate cooler water at greater depth during the summer and warmer water at greater depth during the winter; these patterns are the result of both seasonal climate patterns and the associated temperature of the infiltrating water (rain versus snow melt) but are also tempered by the high specific heat capacity of water and the insulating effect of the soil."*
>
> *"Relatedly, the range of temperature fluctuation at a given well over the course of the year is inversely proportional to water table depth. For example, well 07-DH-169 typically has the greatest water table depth and displays the narrowest temperature range (7 to 10°C). Conversely, well 07-DH-154 has the shallowest water table depth and displays a much broader temperature range (5 to 13°C). These observations are attributed to the buffering effect of the unsaturated zone soil thickness."*

"The temperature observations at monitoring well MW16-1A are worthy of additional comment. Water table temperatures at this well are often warmer or cooler than wells with similar water table depths further downgradient (for example 07-DH-160). For example, this occurrence is prominent during the period of October 2017 to January 2018, when MW16-1A water table temperatures were observed to be 4 to 8^{o}C greater than those at 07-DH-160. This behaviour is likely attributable to the close proximity of MW16-1A to the wetlands north of the Site; in other words, MW16-1A is in the path of a thermal plume emanating from pond water."

5.1.3 Drainage

On the site, no waterbodies or flowing streams were observed except for portions of the small Wetland U3 situated in the bottom of a former historic borrow pit beside the Trailway. There are ponds and wetlands on Lafarge's property located northwest of the Trailway.

WSP provided the following characterization of site drainage on page 3 of their report (WSP 2024):

"*The Site is internally drained and there are no permanent surface water features. Surface water drains to depressions within the Site and undergoes either evapotranspiration or infiltration. There are two main depressions within the Site: the meadow along the north-central portion of the Site, which contains wetland UW3, and another depression within the south portion of the Site."*

Figure 7 of WSP's (2024) report provides mapping of the catchment areas onsite.

CVC's online watershed mapping shows a watercourse located approximately 400 m east northeast of the eastern corner of the site.

The site is located within the Credit River watershed (CVC Subwatershed #18) and the West Credit River branch is located approximately 1.3 km southeast of the site.

5.1.4 Soils

The onsite soil survey completed by DHB Soil Services Inc. (2018) identified one soil series and one miscellaneous landscape unit. The one soil series was identified as Caledon Loam. The miscellaneous landscape unit was identified as Disturbed Soils. The Caledon Loam soil series is the well-drained member of the Caledon soil catena. The Caledon Loam soils developed on well sorted gravelly materials that were deposited in slowly moving water typical of outwash plains. The soil parent materials contain large amounts of shale in addition to the calcareous materials. These soils have good internal and external drainage. The Caledon soils are often low in natural fertility. The Caledon soils occur on smooth moderately sloping topography and are prone to erosion (Hoffman and Richards 1955).

The Disturbed Soils unit was associated with the areas of the old aggregate pit including the entrance, roadway and former excavation areas, as well as Wetland U3 which has developed on the old pit floor.

5.1.5 Landscape Setting

The site is primarily in active agricultural use (crop rotation). There is a former gravel pit located onsite next to the Trailway. There are several discontinuous hedgerows along some of the property boundaries and along field compartment boundaries. See **Figures 2** and **3**.

Northwest of the site there is a block of deciduous and mixed forest, with some wetlands and associated conifer plantations. On the Lafarge-owned parcel, there are three wetlands (U1, U2 and W1). Wetland U2 formed as a result of previous aggregate extraction.

North of the site, on the west side of the Trailway, is the former Pinchin Pit property that is now owned by CVC. This property includes large rehabilitated areas that are now old field meadows. There are also former pastures and hay fields on this site. Several dugout wetlands with permanent standing water occur on the former Pinchin Pit property.

Northeast of the site is the existing Lafarge Pit 3. East and south of the site are agricultural fields in crop rotation, horse paddocks, agricultural buildings and residences. Southwest of the site, on the south side of Shaws Creek Road, are residences and agricultural fields.

West of the site is the recently-licenced James Dick Erin Pit Extension ARA site and some conifer plantations were cleared in that area in recent years.

Most of the wetlands located northwest of the Trailway are part of the provincially significant Cataract Southwest Wetland Complex. These wetlands form a chain of 10 kettle wetlands situated within the Credit River watershed. Wetland W1 is the only Provincially Significant Wetland within the Pit 3 Extension study area. Some of the wetlands that form the Cataract Southwest Wetland Complex are located within a large block of deciduous and mixed forest that is part of the Regional Greenlands System (see **Figure 2**).

CVC included the wetlands and forests within their *Shaw's Creek – Charleston North* natural area, which also includes rehabilitated fields and former pastures on the former Pinchin Pit and covers 103 ha (CVC 2015).

At the closest point, the Dufferin Lake Life Science Area of Natural and Scientific Interest (ANSI) is approximately 470 m southeast of the Pit 3 Extension site. CVC included the Dufferin Lake ANSI and associated features within their *Shaw's Creek – Charleston South* natural area, which covers almost 147 ha (CVC 2016).

5.2 Aquatic Habitat

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

Wetland U2 is located on the Lafarge-owned parcel on the northwest side of the Trailway. This wetland was created by previous aggregate extraction and a portion of the wetland has permanent standing water. There is no inlet or outlet to/from Wetland U2; it is hydrologically isolated.

CVC's online watershed mapping shows a watercourse located approximately 400 m east northeast of the eastern corner of the site.

5.3 Terrestrial Habitat

5.3.1 Vegetation Communities

Vegetation Overview

Vegetation communities (ELC units) are shown on **Figure 9**, with summary descriptions provided in **Table 3** and briefly described below. Representative photographs are provided in **Attachment B** and referenced in the descriptions below. Non-native and introduced plant species are denoted in the text below with a plus sign in parentheses (+).

Most of the proposed licensed area is presently in active agricultural use, rotating between corn, soybeans and winter wheat (**Photos 1** to **4**). There are some discontinuous hedgerows on some property boundaries and between field compartments (**Photos 5** and **6**). There is a former gravel pit onsite, beside the Trailway. The former pit is now an old field meadow (CUM1-1a) with scattered woody regeneration (**Photos 7** and **8**). Wetland U3 is a small 0.28 ha feature that has formed in the bottom of the old pit; standing water is very limited in the spring period and the hydroperiod is very short. The former gravel pit entrance at Shaws Creek Road is disturbed and there are old spoil piles still evident (**Photos 9** and **10**). A second, smaller old field meadow (CUM1-1b) occurs behind a row of residential lots fronting onto Shaws Creek Road (**Photos 11** and **12**).

Northwest of the site there is a block of deciduous and mixed forest associated with CVC's *Shaw's Creek – Charleston North* natural area. The forest just encroaches onto the site by a few metres in the north corner. Here, along the Trailway the railway cut has developed into a young deciduous forest of Sugar Maple (*Acer saccharum* ssp. *saccharum*), Basswood (*Tilia americana*) and Black Cherry (*Prunus serotina*) (FOD5-6). The canopy is almost continuous, even across the Trailway (**Photos 13** to **15**).

The Lafarge-owned parcel on the west side of the Trailway includes deciduous forest dominated by Sugar Maple and Red Maple (*Acer rubrum*) (FOD5-9) and mixed forest dominated by Sugar Maple and Eastern Hemlock (*Tsuga canadensis*) (FOM6-1) (**Photos 16** to **18**). Wetland W1 is a 1.25 ha kettle wetland located within the forest block. The portion of W1 within the study area is a Bur-reed Organic Shallow Marsh (MAS3-7) (**Photo 19**). Wetland W1 forms part of the provincially significant Cataract Southwest Wetland Complex.

Wetland U1 is a 0.29 ha organic cattail marsh (MAS3-1a) located beside Shaws Creek Road (**Photo 20**). This wetland appears to be a natural feature and not associated with past aggregate extraction.

Wetland U2 is a 2.6 ha patchwork of submergent aquatic (SAS1-3), Willow thicket swamp (SWT2-2) and Reed Canary Grass meadow marsh (MAM2-2) that have formed as a result of past aggregate extraction that involved shallow excavations below the water table. See **Photos 21** to **30**.

Vegetation Community Descriptions

Wetland

Wetland U1 (0.29 ha)

Wetland U1 is a 0.29 ha organic cattail marsh (MAS3-1a) that appears to be a natural feature and not associated with past aggregate extraction (**Photo 20**). The deeper water sections are dominated by Narrow-leaved Cattail (*Typha angustifolia*) and sedges (*Carex hystericina, C. lacustris*). The margins tend to be dominated by Reed Canary Grass (*Typha angustifolia*).

Wetland U2 (2.6 ha)

Wetland U2 is a 2.6 ha feature that has developed as a result of previous aggregate extraction that involved shallow excavations below the water table (see **Photos 21** to **30**).

The deeper water sections contain open water with mats of submergent aquatics such as Stonewort (*Chara* sp.) (SAS1-3) (**Photos 21**, **23** and **26**).

A low bar extends across most of Wetland U2 that supports a Willow thicket swamp (SWT2-2) dominated by Sandbar Willow (*Salix interior* [*S. exigua*]) and other shrub willow species (**Photo 30**).

The north end of Wetland U2 contains a seasonally flooded Reed Canary Grass meadow marsh (MAM2-2) (**Photo 30**).

Wetland U2 contains a patchwork of deeper open water, shallow bars with willow thicket swamp, emergent marsh dominated by cattails and meadow marsh dominated by Reed Canary Grass. Water levels can vary year over year and seasonally by up to 1.0 m. The variations in water levels result in some gravelly areas being exposed seasonally as water levels drop (**Photos 28** and **29**). Species considered rare in Peel Region and the Credit River watershed (CVC 2002), such as Variegated Scouring-rush (*Equisetum variegatum*) and Greenish Sedge (*Carex viridula* ssp. *viridula*), grow along gravelly shorelines and in seasonally flooded areas with gravel substrates.

Wetland U3 (0.28 ha)

Wetland U3 has formed in the bottom of a former gravel pit beside the Trailway, relatively close to Shaws Creek Road. U3 is a small marginal wetland feature that has limited standing water in the spring for a short duration. Standing water in U3 is typically limited to wheel ruts created by vehicles driving through the area previously.

This small feature has undergone considerable successional change in just a few years. **Photos 31** and **32** show U1 in spring 2016, when the woody vegetation was primarily low growth of Sandbar Willow (*Salix interior* [*S. exigua*]). By fall 2020, **Photos 33** and **34** show that much of the Sandbar Willow was being overgrown by Trembling Aspen (*Populus tremuloides*) and the vegetation can be classified as Poplar Mineral Deciduous Swamp (SWD4-3).

Other common species include Reed Canary Grass, Panicled Aster (*Symphyotrichum lanceolatum*), Purple Loosestrife (*Lythrum salicaria* +), Tall Ryegrass (*Lolium arundinaceum* +), Wild Parsnip (*Pastinaca sativa* +), Fox Sedge (*Carex vulpinoidea*), Dudley's Rush (*Juncus dudleyi*) and Canada Goldenrod (*Solidago canadensis*).

Wetland W1 (1.25 ha)

The portion of Wetland W1 within the study area is a Bur-reed Organic Marsh (MAS3-7) (**Photo 19**). The dominant species is Giant Burreed (*Sparganium eurycarpum*), with Reed Canary Grass, Canada Blue-joint (*Calamagrostis canadensis*) and Cyperus-like Sedge (*Carex pseudo-cyperus*) as common associates. Giant Burreed is considered rare in Peel Region and the Credit River watershed (CVC 2002).

Terrestrial

Deciduous Forest (FOD5-6, FOD5-9, FOD4)

Unit FOD5-6 is a fairly-even aged stand of Sugar Maple and Red Maple, with less frequent associates such as declining White Ash (*Fraxinus americana*), Beech (*Fagus grandifolia*), Basswood (*Tilia americana*), Black Cherry (*Prunus serotina*) and Ironwood (*Ostrya virginiana*) (**Photos 13** to **15**). The trees within Unit FOD5-9 are mainly at the lower end of the 25 to 50 cm dbh size range (**Photos 16** and **17**). The shrub/sapling layer in this forest block is quite sparse; this is likely the result of deer browsing and/or former livestock grazing. There are old barbed wire fences in the woodlot. Common Buckthorn (*Rhamnus cathartica* +) is becoming established in a few areas.

Groundcovers in Unit FOD5-6 are variable, but include patches of ferns such as Lady Fern (*Athyrium filix-femina*), Spinulose Wood Fern (*Dryopteris carthusiana*) and Rattlesnake Fern (*Botrychium virginianum*), and several sedge species (e.g., *Carex arctata, C. blanda, C. gracillima, C. peckii, C. pedunculata* and *C. pensylvanica*). The invasive Garlic Mustard (*Alliaria petiolata* +) is well established in parts of this woodlot.

Closer to the Trailway in Unit FOD5-6 there are patches of Sprengel's Sedge (*Carex sprengelii*) which is considered rare in Peel Region and the Credit River watershed (CVC 2002).

Along a 180 m section of the Trailway, the railway cut has developed into a young deciduous forest of Sugar Maple, Basswood and Black Cherry (FOD5-6). This unit includes mature fenceline trees and younger pole-sized trees and saplings. The canopy is more or less continuous across the Trailway in this area (**Photos 13** to **15**).

Unit FOD4 is a small disturbed patch of Manitoba Maple (*Acer negundo*) located in the former gravel pit on the west side of the Trailway.

Mixed Forest (FOM6-1)

Closer to Wetland W1, the forest transitions to a mixed stand of mainly Sugar Maple and Eastern Hemlock (FOM6-1) (**Photo 18**). Other trees include Yellow Birch (*Betula alleghaniensis*), White Birch (*Betula papyrifera*), Beech, White Pine (*Pinus strobus*) and White Cedar (*Thuja occidentalis*). The slopes down to Wetland W1 are relatively steep and there is more regeneration of White Cedar, Eastern Hemlock, Yellow Birch and White Birch. The trees within are mainly in the 25 to 50 cm dbh size range, although there are some larger Eastern Hemlock and White Pine.

Terrestrial - Cultural

Cultural vegetation features include old field meadows (CUM1-1), shrub thickets (CUT1), hedgerows (CUH) and conifer plantations (CUP3), as described below.

Old Field Meadow

There are several patches of old field meadow (CUM1-1) onsite and on adjacent lands.

Unit CUM1-1a covers most of the former onsite gravel pit beside the Trailway (**Photos 7** and **8**). The dominant plant species are Smooth Brome (*Bromus inermis* +), Red Fescue (*Festuca rubra* ssp. *rubra* +), Kentucky Bluegrass (*Poa pratensis* ssp. *pratensis* +), Canada Bluegrass (*Poa compressa* +), Wild Carrot (*Daucus carota* +), Tall Goldenrod (*Solidago altissima*) and Canada Goldenrod (*Solidago canadensis*). Tall Ryegrass (+) and Wild Parsnip (+) occur commonly on sections of the pit bottom.

Unit CUM1-1b is a smaller patch of old field meadow that also contains some scattered trees (**Photos 11** and **12**).

Other patches of old field meadow occur on the Lafarge-owned parcel northwest of the Trailway, on the existing Pit 3 site, to the northeast in former conifer plantations that were harvested and southwest of Shaws Creek Road near the Trailway.

Shrub Thicket

Unit CUT1 is a shrub thicket feature that has formed along the former rail right-of-way on either side of the Trailway. Typical shrubs include Staghorn Sumac (*Rhus typhina*), Common Buckthorn (+), Dotted Hawthorn (*Crataegus punctata*), Chokecherry (*Prunus virginiana*), Russian Olive (*Elaeagnus angustifolia* +) and Gray Dogwood (*Cornus racemosa*). Scattered clusters of trees include Manitoba Maple, White Elm (*Ulmus americana*), Trembling Aspen, White Cedar, Sugar Maple and declining White Ash.

Hedgerows

Partially treed hedgerows occur on the common boundary with existing Pit 3 (Units CUHa, CUHb and CUHc) and on the east property boundary (Units CUHd, CUHf and CUHh). There are other hedgerow features that are along old fencelines between field compartments (CUHe, CUHg, CUHi and CUHj). The trees in these hedgerows are a mix of Sugar Maple, Basswood, Black Cherry, White Elm, Red Oak, Trembling Aspen, Manitoba Maple, Apple (*Malus pumila* +), etc. A few Rock Elm (*Ulmus thomasii*) trees occur in some of the hedgerows, many of which are in decline. See **Photos 1**-**2** and **4**-**6**. Most of the hedgerows contain piles of field stones placed by farmers over a period of decades.

The most mature and continuous hedgerows are CUHa and CUHc on the common boundary between existing Pit 3 and the proposed Pit 3 Extension. The other hedgerows are generally less mature and discontinuous, with many gaps in the tree cover.

Hedgerows CUHk and CUHl have formed on spoil piles associated with the former gravel pit (**Photo 10**).

Conifer Plantations

A Red Pine conifer plantation (CUP3-1) is located mainly on the adjacent former Pinchin Pit property, although it straddles the property line for the Lafarge-owned parcel northwest of the Trailway.

Some European Larch (*Larix decidua*) were planted in the former gravel pit on Lafarge-owned land northwest of the Trailway. Unit CUP3-6 is a narrow strip growing on the slope between Wetland U2 and the adjacent forest block to the north.

Unit CUP3-9 is a narrow Norway Spruce plantation close to Shaws Creek Road. This unit may have been planted as a wind break.

5.3.2 Plant Species

A vascular plant checklist is provided in **Attachment C**.

A total of 428 vascular plant taxa have been recorded from the study area to date. One-hundred and twenty-three (123) taxa, 28.7% of the recorded flora, are considered non-native and introduced to southern Ontario.

A total of 209 vascular plant taxa have been recorded from the proposed licence area to date. One-hundred and seven (107) taxa, 51.2% of the recorded flora, are considered non-native and introduced to southern Ontario. The much higher proportion of non-native species in the proposed licence area is a reflection of its disturbance history, with most of the site in agricultural use. In contrast, relatively intact natural communities occur in some areas to the northwest of the Trailway.

No plant species listed as Endangered, Threatened or Special Concern were observed within the study area. No plant species ranked S1, S2 or S3 by the Natural Heritage Information Centre (NHIC) (Oldham and Brinker 2009) were observed within the study area.

Six (6) plant species considered rare in Peel Region and/or the Credit River watershed (CVC 2002) were observed within the study area. Each species is discussed below:

- Sprengel's Sedge (*Carex sprengelii*)

Sprengel's Sedge grows in several patches within the deciduous forest (Unit FOD5-9) on the Lafarge-owned parcel on the northwest side of the Trailway. It also grows in several patches along the Trailway.

- Greenish Sedge (*Carex viridula* ssp. *viridula*)

Several patches of Greenish Sedge were observed growing in Wetland U2, on gravelly shores and seasonally flooded areas.

- Wood's Sedge (*Carex woodii*)

Wood's Sedge grows in several patches within the deciduous forest (Unit FOD5-9) on the Lafarge-owned parcel on the northwest side of the Trailway.

- Variegated Scouring-rush (*Equisetum variegatum*)

Mats of Variegated Scouring-rush were observed in Wetland U2 on the Lafarge-owned parcel on the northwest side of the Trailway, growing along the shorelines and seasonally flooded areas.

- Giant Burreed (*Sparganium eurycarpum*)

Giant Burreed is one of the dominant emergents in Wetland W1 (**Photo 19**).

- Rock Elm (*Ulmus thomasii*)

Rock Elm was observed growing in several of the perimeter hedgerows, including CUHa, CUHb, CUHd and CUHh (**Photo 35**). Most of the trees appeared to be declining due to Dutch Elm Disease.

5.4 Wildlife

The list of wildlife species that were observed is presented in **Attachment D**. A total of 148 species were observed, including 19 odonates, 19 butterflies, 4 bumble bees, 8 amphibians, 4 reptiles, 83 birds and 11 mammals. The list includes both common and scientific names for the species that were observed. Scientific names are provided in the text of the report only for those species that are not listed in the attachment.

Species diversity was greatest in the adjacent lands and considerably lower in the proposed licensed and extraction areas. The higher diversity in the adjacent lands was a result of the presence of the ponds that developed as a result of previous extraction, natural wetlands, and the deciduous forest. Areas of cultural meadow also added to the diversity of communities in this area. The presence of grassland species in the proposed extraction area also contributed to the overall diversity of the site. The proposed licensed area consists of a very small area that includes the setbacks between the extraction area and adjacent lands as well as the area around Wetland U3 that will be retained. Consequently, it supported the lowest diversity of species.

5.4.1 Invertebrates

The invertebrate groups that were documented on site included odonates, butterflies, and bumble bees. Other invertebrate species were observed but not recorded as they are not typically included in inventories and the Natural Heritage Information Centre does not have status designations for most of them.

A total of 42 invertebrate species were observed. Four (4) were in the proposed licensed area, 10 in the extraction area, and 30 were on the adjacent lands.

Odonates

Nineteen species of odonates were observed within the study area. Most of these (17) were observed on adjacent lands and were associated predominantly with the human-made ponds (Wetland U2) and the pond within the deciduous forest (Wetland W1). Five species were observed within the proposed extraction area and 1 was seen within the licensed lands. The extraction area and licensed lands provide no breeding habitat for odonates. The extraction and licensed areas provide only foraging habitat for odonates.

All but one of the odonates observed have an S-rank of S5, indicating that they are very common and secure in Ontario. The other species has an S-rank of S4, indicating that it is common and apparently secure in the province. Consequently, no significant species of odonates were documented within the study area.

Butterflies

Nineteen species of butterflies were observed within the study area. Three of these were seen within the proposed licensed area, 10 within the extraction area, and 13 on adjacent lands.

Two of the butterflies that were observed are not native to North America: the European skipper and cabbage white. Thirteen of the 17 native species have an S-rank of S5, indicating that they are very common and secure in Ontario. The additional 4 species have an S-rank of S4, indicating that they are common and apparently secure in the province.

Although the monarch has a breeding season S-rank of S4, its nonbreeding season S-rank is S2, indicating that it is imperilled at that time in the province. Federally, it is considered endangered whereas it has been designated a special concern species in Ontario. The Provincial Policy Statement and its associated support documents recognize solely Ontario status designations. Consequently, for the purpose of planning for the proposed pit extension, the monarch should be considered a special concern species. Habitat for special concern species may qualify as Significant Wildlife Habitat, so the monarch is discussed in more detail in **Section 9.3** that deals with the species of conservation concern component of Significant Wildlife Habitat.

Bumble Bees

All four of the bumble bee species that were detected occurred on adjacent lands, 1 was seen within the proposed extraction area, and 2 were seen on the proposed licensed lands.

The status of bumble bees is not currently listed on the NHIC website, but was previously. Consequently, the older status designations are used in this study. Bumble bees appear to continue to decline, so it is possible that the status of some of them will be changed in future. At present, the tri-coloured bumble bee has an S-rank of S5 indicating that it is very common and secure in the province. The two-spotted and yellow bumble bees both have an S-rank of S4, indicating that they are common and apparently secure in Ontario. The common eastern bumble bee has an S-rank of S4S5 indicating that its status ranges from apparently secure to secure. This latter species appears to now be the most common species in the general region of the study area and it was the most common species on site.

No significant bumble bee species were observed.

5.4.2 Amphibians

Eight species of amphibians were observed. All of these were observed on adjacent lands that support both human-made and natural ponds. No amphibians were observed within the proposed extraction area or licensed area.

The red-spotted newt was observed in the ponds within U2 and it is probable that it also occurs in W1, the pond within the deciduous woodlot. Egg mass surveys for mole salamanders were negative, but this does not necessarily mean that they are absent. The pond within the woodlot

in particular has some potential to support mole salamanders. The upland habitat is suitable and the pond is also suitable breeding habitat. Only a small portion of this pond could be examined for egg masses from the shoreline, and not all of the shoreline could be checked due to some of it being on private property. Therefore, the amphibian egg-mass survey was inconclusive.

The eastern red-backed salamander occurred in the deciduous forest. This was the only suitable habitat for this species within the study area.

Manual Call Count Surveys

Table 4 summarizes the results of the 2014 amphibian call-count surveys. Five species of calling anurans were detected during these surveys; the Northern Leopard Frog was observed on site during other surveys but was not heard calling during the targeted call surveys in 2014.

Wetland U1 supported breeding populations of the American Toad, Gray Treefrog, Spring Peeper, and Wood Frog. The lack of Green Frogs may be because this pond may dry up. This species requires permanent water bodies because the tadpoles take 2 or more years to transform into juveniles. It was the only pond in which toads were heard calling. This species is often associated with small water bodies with short hydroperiods. Full choruses were heard for all species that occurred at this pond except for the toad; only a single toad was heard.

The usually separate ponds within Wetland U2 were a single pond in 2014 because high water levels joined them all. Full choruses of Gray Treefrogs, Spring Peepers and Wood Frogs occurred in this pond, and small numbers of Green Frogs were heard.

No amphibians were heard at U3 in 2014. There was essentially no water in this wetland during the surveys, the wettest year of the study.

The permanent pond in the deciduous forest (W1) had results that were essentially identical to the ponds within Wetland U2.

Song Meter Call Count Surveys

Song Meters were deployed as listed below by wetland and year:

- 2016: Wetlands U1, U2 and U3
- 2017: Wetlands U1, U2 and U3
- 2018: Wetlands U1, U2, U3 and W1

The Song Meters were deployed from late March-early April until mid-June each year. They were set to record 10-minute blocks of time at 30 minutes, 90 minutes and 150 minutes after sunset.

Table 5 provides a summary of peak calling activity for each wetland in each of the years of Song Meter deployment.

Calls recorded from Wetland U1 between 2016 and 2018 were American Toad, Gray Treefrog, Spring Peeper and Wood Frog. Full choruses (Level 3) were heard each year for Gray Treefrog, Spring Peeper and Wood Frog. A full chorus of American Toads was heard on May 17, 2017, but lower numbers were recorded in 2016 and 2018.

Calls recorded from Wetland U2 between 2016 and 2018 were American Toad, Gray Treefrog, Green Frog, Northern Leopard Frog, Spring Peeper and Wood Frog. Full choruses (Level 3) were heard each year for Gray Treefrog and Spring Peeper. Full chorus (Level 3) were recorded for Wood Frog in 2016 and 2017.

No calls were recorded in Wetland U3 from 2016 to 2018. Wetland U1 does not support amphibian breeding functions.

Calls recorded from Wetland W1 in 2018 were American Toad, Gray Treefrog, Green Frog, Northern Leopard Frog, Spring Peeper and Wood Frog. Full choruses (Level 3) were heard each year for Gray Treefrog, Spring Peeper and Wood Frog.

5.4.3 Reptiles

The four reptile species that were observed included two turtles (the Snapping Turtle and Midland Painted Turtle) and two snakes (Eastern Gartersnake and DeKay's Brownsnake). All species were observed on adjacent lands; none were seen within the proposed extraction or licensed areas.

The Snapping Turtle was observed in Wetland U2, in the ponds that formed as a result of previous extraction. It is probable that it also occurs within the pond in the deciduous forest (W1). This latter pond is better habitat for the Snapping Turtle than Wetland U2. It prefers water bodies and slow-flowing watercourses that have a soft substrate that it can burrow in. Wetland W1 contains much organic matter and provides ideal snapping turtle habitat. Although this species was not observed within this wetland, it is probably present. The Snapping Turtle is highly aquatic and is easily overlooked as it stays below the water surface most of the time.

The Midland Painted Turtle was not very common within the study area, with small numbers observed in Wetland U2 and within Wetland W1. No turtles were ever seen within the natural Wetland U1, nor within Wetland U3 south of that is also an artifact of previous aggregate extraction. The maximum numbers of Midland Painted Turtles observed on a single date included 6 in Wetland U2 and 4 in Wetland W1 within the woodlot northwest of the Trailway.

The early season turtle surveys on April 24, 2014 suggested that only a single Midland Painted Turtle overwintered within Wetland U2. There were snow drifts in places on the ground at that time, but it is still possible that this turtle had already moved from a different winter hibernaculum. No turtles were observed in Wetland W1 on this date, although it seems to be a more likely turtle wintering area due to its soft substrate, compared to the gravel/cobble substrate in Wetland U2 which formed as a result of past aggregate extraction.

No Blanding's Turtles were observed during the specific surveys for it or at any other time. The Ontario Reptile and Amphibian Atlas mapping (Ontario Nature 2022) indicates that the Blanding's turtle has never been recorded in the general vicinity of the study area, and it is also not reported as occurring in the general area within the NHIC database or on iNaturalist (2022). It is concluded that the Blanding's turtle is absent and it is not discussed further in the report.

The Eastern Gartersnake was common within the study area where it occurred mostly around the old barn foundation and out-buildings and around Wetland U2, northwest of the site. It was seen in these areas on most visits to this area.

A single DeKay's Brownsnake was observed in between the ponds within Wetland U2 in 2016. It probably occurs throughout grassy areas and within the deciduous forest.

The Snapping Turtle has an S-rank of S3, indicating that it is vulnerable in Ontario, and it is also designated as a special concern species both nationally and provincially. Its habitat may be considered Significant Wildlife Habitat, so it is discussed in more detail in **Section 9.3** that deals with the species of conservation concern component of Significant Wildlife Habitat.

The Midland Painted Turtle is designated special concern nationally but has no formal designations in Ontario. It has an S-rank of S4 indicating that it is common and apparently secure in the province.

Both of the snake species that were observed are very common in the province and have an S-rank of S5.

Wetland U2 appeared to be suitable habitat for the Eastern Ribbonsnake, a special concern species. This is a marsh-dwelling snake that is relatively easy to detect. Given the amount of time that was spent looking for snakes around the ponds within Wetland U2 and the lack of observations, it is concluded that it is absent.

The potential for reptile hibernacula to occur within the study area is discussed in more detail in **Section 9.1** that deals with the *seasonal concentrations of animals* component of Significant Wildlife Habitat.

5.4.4 Birds

A total of 83 bird species was observed and 70 of these were considered to be breeding. This included 37 within the proposed licensed area, 48 within the proposed extraction area, and 79 in adjacent lands.

The number of breeding species by area included 32 within the proposed licensed area, 42 within the proposed extraction area, and 65 in adjacent lands.

In the following subsections, discussions are provided on non-breeding species, results of the specialized surveys, species observed within the proposed extraction area, and the significance of the species observed.

Non-Breeding Bird Species

A total of 13 species were considered to be non-breeders within the study area. These can generally be put into two categories: those that used the area only for foraging and those that were migrants that were not observed during their normal breeding season.

The species that foraged on (or over) the study area with no evidence of breeding included the Great Blue Heron, Green Heron, Turkey Vulture, Sharp-shinned Hawk, Belted Kingfisher, Bank Swallow, and Cliff Swallow. The migrants included the Ruby-crowned Kinglet, Nashville Warbler, American Redstart, American Tree Sparrow, White-throated Sparrow, and White-crowned Sparrow.

The ponds within Wetland U2 were the main feature attracting foraging birds. Species that foraged in or above the ponds included the two heron species, the Belted Kingfisher, and the two swallow species. The Turkey Vulture was seen flying over the site only and was never seen perched within the subject lands. This species nests in hollow logs and stumps in woodlots and

also in anthropogenic features such as barns and silos. There was no indication of its nesting on site.

A single Sharp-shinned Hawk was observed on June 5, 2014. It chased an American Robin around the ponds within Wetland U2 and flew into the deciduous forest after failing to capture it. This species was not observed again within the study area. It was concluded that it was a non-breeder because it was seen on only one occasion. This hawk typically nests in conifers and there is some suitable habitat for it in the small plantation on the northwest side of the Trailway. There was no evidence of a nest within the plantation, nor was this species ever observed displaying early in the season. The observation was made during its breeding season, but this hawk has a very large home range that may vary from 200 to 2,700 ha (Sandilands 2005). It is likely that the study area was within this bird's home range but that it did not nest in the general area.

Owl Survey Results

The owl surveys were negative, with no owl species detected. All five species that were surveyed for were apparently absent. It is surprising that the Eastern Screech-Owl was absent because the deciduous forest appeared to provide suitable habitat for this common nocturnal raptor.

The Northern Saw-whet Owl is near the southern extent of its range in the vicinity of the study area, although there are scattered records south of the Canadian Shield (Badzinski 2007). It is strongly associated with conifers and particularly white cedar swamps in the south. It is concluded that it was absent from the study area due to the general lack of suitable habitat for it and its spotty distribution south of the Shield.

The Eastern Screech-Owl is the most abundant nocturnal raptor in southern Ontario and it is more abundant than any of the diurnal raptors (hawks). It was rather surprising that it was not detected in the deciduous woodland, as it occurs in a high proportion of deciduous and mixed forests in southern Ontario. It readily responds to broadcasts of its calls, so the lack of response is an excellent indication that it was absent from the site.

The Long-eared Owl nests at the edges of coniferous woods and plantations where it typically nests in old American Crow nests. Potential habitat for this species is uncommon on site and is restricted predominantly to the small coniferous plantation and scattered conifers within the deciduous woodlot. The Long-eared Owl seldom responds to broadcasts of its calls, so the lack of response is not surprising. Given the scarcity of onsite conifers and the fact that no old crow nests were observed, it is concluded that this species was absent in the study area.

The Barred Owl nests in upland and lowland deciduous and mixed forests (Peck and James 1983), and the study area is on the extreme southwest corner of its breeding range in the province (Allair 2007). It is typically associated with old-growth forest with trees of at least 50 cm diameter at breast height required to provide suitable nesting cavities. The entire forest need not be old-growth however, as it may nest in younger forests provided that there are a few very large trees (A. Sandilands, personal observation). The Barred Owl is an area-sensitive species that appears to require forests 100-400 ha to support a pair (Bushman and Terres 1988), but it may nest in smaller woodlands in landscapes that are predominantly forested. The onsite forested area is too small to support the Barred Owl in a predominantly agricultural landscape with scattered wooded areas. This species readily responds to broadcasts of its calls, so the lack of response can be interpreted to confirm its absence.

The Great Horned Owl is the second-most abundant owl in southern Ontario. It occurs mostly in deciduous and mixed forests and prefers small fragmented forests rather than extensive forested areas. It does not build its own nest and typically nests in old Red-tailed hawk nests. This owl frequently calls on its own but seldom responds to broadcasts of its own calls. It does respond to screech-owl calls, as the smaller owl is common prey for it. The onsite deciduous forest is suitable habitat for the Great Horned Owl, but it appeared to be absent.

It is concluded that the site supported no breeding owl species in 2014 when the surveys were conducted. It is possible that either of the Eastern Screech-Owl and Great Horned Owl nested in one of the other years when owl surveys were not conducted. In the event that they were present in another year, the proposed pit would have no impact upon them. Both are common species and would probably nest in the deciduous woodland northwest of the Trailway if they were present. This woodland will be protected.

Nightjar Survey Results

The nightjar surveys were negative for both the Common Nighthawk and Eastern Whip-poor-will.

The nighthawk nests in both urban and rural areas of southern Ontario. In rural areas, it nests in grasslands, pastures, agricultural fields, pits, quarries, prairies and alvars, and at airports. In urban areas, it typically nests on flat gravelled rooftops, but occasionally on paths and railways and has previously been documented nesting in coal piles (Peck and James 1983). In southern off-Shield Ontario, the nighthawk appears to have almost abandoned nesting in natural forest clearings and in rural areas. Most nesting occurs in developed areas with flat, gravelled roofs, although it still nests in some areas of extensive forest cover such as the Bruce Peninsula (Sandilands 2007a). The nighthawk has a very spotty distribution in the vicinity of the study area. The fact that it was not detected is a good indication that it is absent as a breeding species.

The whip-poor-will calls persistently during the breeding season, even during periods that are not near the full moon, and may continue calling into September. Its call is very loud and can be heard from a distance of 500 m or more. The fact that this species was not detected during the targeted surveys is an excellent indication that it is absent.

Bobolink and Eastern Meadowlark Surveys

The grassland bird survey was positive for both the Bobolink and Eastern Meadowlark. One or both of the species were seen in each year of surveying, except for 2017. In each year, positive results were obtained on the first survey so there was no need to do the second and third surveys for these species.

All sightings on the subject lands were in the cultural meadow that is south of the Trailway. These two species were never seen in the cultural meadow north of the Trailway immediately west of Shaws Creek Road, or in the very small cultural meadow in the southwestern portion of the site. Both species were seen on adjacent lands south of the site and on the rehabilitated Pinchin Pit northeast of the site.

On May 20, 2014, a single male Bobolink and Eastern Meadowlark were observed in the cultural meadow south of the Trailway. Both species are polygynous (Jaster et al. 2020; Renfrew et al. 2020), so it is likely that each of them had two mates and two nests. The male Bobolink was observed again on June 5 and 10, 2014, and presence of the Bobolink was

confirmed in the hayfields south of the property on June 10, 2014. On June 28, 2014, both the Bobolink and Eastern Meadowlark were observed south of the property.

On June 9, 2016, a single Eastern Meadowlark was present in the cultural meadow south of the Trailway. A Bobolink was heard in the distance somewhere to the northwest, well off site, but its location could not be positively confirmed.

The visit in 2017 was conducted on July 8, rather late for detecting the Bobolink and Eastern Meadowlark. This was only 1 day outside the window recommended by OMNRF for surveying for these species. Both of them are typically single-brooded and may be finished nesting by the end of June. In 2017, it was noted that the grasslands south of the subject lands had been converted to row-crop fields.

In 2018, a single male Bobolink was observed in the cultural meadow south of the Trailway on both visits on May 17 and June 6.

In 2022, a single Eastern Meadowlark was observed on the first and third surveys, but this species was absent on the second survey. On both dates that it was present, it sang only a few times, flew around the cultural meadow and eventually flew northward out of the area. It is most likely that this was an unmated male.

Habitat for the Bobolink and Eastern Meadowlark is marginal within the cultural meadow in which they both occurred. It is a relatively small patch of land (4.9 ha) and contains the Wetland U3. Both species prefer relatively large grasslands of 10 ha or larger, but are known to occasionally breed in patches as small as 2 ha. In the case of the Bobolink, fields 30 ha in size support nearly twice the density of birds as fields 10 ha or smaller (Bollinger and Gavin 1992). It has been estimated that a minimum of 5 ha area is required to support the Eastern Meadowlark in some areas (Savignac 2011; Wiens 1969).

When inventories were first begun, Wetland U3 was a small shrubby wetland that was not a constraint to usage by these two species. By 2017, it was a small (0.28 ha) wooded patch that was treed with Trembling Aspen (*Populus tremuloides*) taller than 3 m in height. In addition, on the slope up to the Trailway, there was a clump of Manitoba Maple (*Acer negundo*) that reaches 6 m in height. Both the Bobolink and meadowlark avoid treed areas, and the regeneration of Wetland U3 has further diminished habitat quality for them.

Both species are also influenced by the amount of suitable habitat within the general landscape. Where grasslands are abundant, they will nest in smaller habitat patches; where other grasslands are scarce, they tend to be restricted to larger habitat patches. The conversion of the grasslands south of the site to row-crop fields is likely to be another limiting factor to continued usage of the site by the Bobolink and Eastern Meadowlark. Over the long-term, this site may not continue to support these two species due to its small size, natural succession, and local losses of other suitable habitats.

Although the cultural meadow south of the Trailway may not be viable long-term habitat for the Bobolink and Eastern Meadowlark, it currently supports these two species and should be considered habitat for them.

Species Seen in the Extraction Area

A total of 47 bird species were observed in the proposed extraction area. Six of these were non-breeders: Turkey Vulture, Red-tailed Hawk, Eastern Phoebe, Tree Swallow, Bank Swallow,

and Barn Swallow. As previously discussed, the Turkey Vulture and Bank Swallow did not nest anywhere within the study area. The Eastern Phoebe and Barn Swallow nested only in the barn that was previously northwest of the Trailway, but these two species foraged within the proposed extraction area. The Red-tailed Hawk was seen soaring above the extraction area, but there was no evidence of its nesting.

Table 6 summarizes where each of the 42 breeding species occurred within the proposed extraction area.

The hedgerows supported the highest diversity of breeding birds with 32 species. Because the precautionary principle was used and all birds in potentially suitable habitat were considered breeders, this may be an overestimate of the number of species that actually bred within the hedgerows. Some of these species may have simply been foraging in hedgerows. These include some species that typically nest in wooded areas such as the Downy Woodpecker, Hairy Woodpecker, Red-eyed Vireo, and Rose-breasted Grosbeak. The Red-winged Blackbird may also have simply perched within hedgerows between feeding bouts in the agricultural fields. The hedgerows did not support any species that were not found elsewhere within the study area or on the subject lands.

The larger cultural meadow south of the Trailway supported the second highest species diversity with 28 species. Unlike the hedgerows, all of these species probably nested within the meadow. The Grasshopper Sparrow occurred within the proposed extraction area and was not found breeding anywhere else within the study area. This species was a recent arrival to the cultural meadow south of the Trailway, having been absent in all years of inventorying except 2018 and 2022.

The Bobolink and Eastern Meadowlark were observed within the proposed extraction area and on adjacent lands.

The small cultural meadow in the southwest corner of the site had the third highest species diversity with 17 species. No species unique to the study area or the subject lands were found within this meadow.

As expected, the active agricultural lands supported the lowest diversity of breeding birds within the proposed licensed area. Only the Killdeer, Vesper Sparrow, Savannah Sparrow, and Song Sparrow were considered breeders in this habitat.

The licensed area supported 1 species that was not found anywhere else within the study area: the Orchard Oriole. Until 2018, there was no suitable habitat for the Orchard Oriole within the cultural meadow south of the Trailway. It nested in the small Wetland U3 that resulted from previous extraction activities. This wetland has since grown up with shrubs and Trembling Aspen saplings, providing habitat for this species that was not previously present. The Orchard Oriole is locally rare within the Credit Valley watershed and its habitat may qualify as Significant Wildlife Habitat. It is discussed further in **Section 9.3.1**.

Four of the species found within the extraction area are considered significant at some level. The Bobolink and Eastern Meadowlark are designated threatened and are discussed further in **Section 6.1** that deals with the habitat of confirmed endangered and threatened species. The Eastern Wood-Pewee and Grasshopper Sparrow have been designated special concern. They are discussed further in **Section 9.3.1** that deals with the species of conservation concern component of Significant Wildlife Habitat.

Summary of Significance of Bird Species Observed

Of the 82 species of birds observed, 2 are non-native, the European Starling and House Sparrow. These species are of no conservation concern in Ontario.

All of the other species except one have an S-rank of either S5 (secure in Ontario) or S4 (apparently secure in Ontario). The Red-headed Woodpecker has an S-rank of S3 (vulnerable) and is therefore provincially significant.

Although most of the bird species observed are fairly common in the province, several of them have special designations due to limiting factors that may be affecting their populations. Four threatened species were detected during the surveys. These include the Least Bittern, Bank Swallow, Bobolink and Eastern Meadowlark. The Red-headed Woodpecker is listed as endangered in Ontario. These five species and their habitats are protected by the *Endangered Species Act, 2007* (ESA). These species are discussed further in **Section 6.1**, which deals with habitat of confirmed endangered and threatened species.

Four additional species are considered to be of special concern, including the Barn Swallow, Eastern Wood-Pewee, Wood Thrush, and Grasshopper Sparrow. Habitat for these species may be considered Significant Wildlife Habitat. These species are discussed in more detail in **Section 9.3.1**, which deals with the species of conservation concern component of Significant Wildlife Habitat.

Four of the forest-breeding birds detected during the study are considered area sensitive. These include the Cooper's Hawk, Hairy Woodpecker, Blue-headed Vireo, and Scarlet Tanager.

The Cooper's Hawk was observed foraging over and east of the deciduous woodland northwest of the Trailway. It was presumed to be breeding in this area, but it is also quite possible that it was nesting elsewhere. This species was not observed displaying in defence of a territory, so it may have been simply foraging. It defends a territory of 6 to 50 ha, but may have a home range as large as 525 ha (Sandilands 2005). This raptor is becoming less area sensitive and now nests routinely within suburban areas.

The Significant Wildlife Habitat Technical Guide (SWHTG) states that the Hairy Woodpecker requires a minimum of 10 ha of woodland. It has been documented breeding in woodlots as small as 2 ha, but it is usually restricted to larger tracts and larger forests are required to sustain viable populations. It may include two smaller woodlots within its territory. Different studies have estimated minimum forest size requirements of 4, 10, 12, and 16 ha (Bushman and Therres 1988; Hayden et al. 1985; Robbins 1979; Robbins et al. 1989). Thus, the Hairy Woodpecker is only mildly area sensitive, or possibly not area sensitive at all.

It is uncertain if the Blue-headed Vireo is area sensitive, or if it is, how large of forest patches it requires. The SWHTG states that it requires a minimum of 100 ha of forest, but this vireo has nested in much smaller woodlots, and is now nesting in many southern Ontario coniferous plantations. In Ontario, it has nested in open areas, including a dry rocky ridge and an overgrown pasture (Peck and James 1987). It is possible that the Blue-headed Vireo is not area sensitive at all, or its sensitivity to patch size may vary depending on the regional amount of forest cover. The Blue-headed Vireo occurred in the deciduous woodlot northwest of the Trailway in one year of the surveys. This species is frequently associated with hemlock and was considered a hemlock-obligate by Benzinger (1994). There are scattered large hemlocks within this woodlot which provide suitable habitat for it. The fact that it was apparently nesting in this woodlot demonstrates that it does not require 100 ha of forest.

Of these four species of forest birds that may be area sensitive, three of them may not be truly area sensitive. The Significant Wildlife Habitat Ecoregion Criteria Schedules (SWHCS) identify only the Blue-headed Vireo and the Scarlet Tanager as being area-sensitive, but there are significant problems with this component of the SWHCS.

Habitat for area-sensitive species may be considered Significant Wildlife Habitat. This is discussed further in **Section 9.2.2** that deals with the specialized habitats component of Significant Wildlife Habitat.

5.4.5 Mammals

Eleven species of mammals were observed during the study. All of these species were seen within the adjacent lands, 4 were seen within the proposed extraction area, and 3 were seen in the licensed lands.

The bat surveys resulted in two species of bats being detected: the northern myotis and the big brown bat.

The northern myotis was detected on April 21, May 7, and June 14 but not on May 29, 2014. On April 21, one was seen exiting the former old barn and it flew directly over the observer and bat detector. This was the only recording of it that evening. On May 7, no bats were observed leaving either of the buildings, but two recordings of the northern myotis were obtained in this area. On June 14, seven calls of the northern myotis were obtained and they were all at the station within the woodlot northwest of the Trailway. For the first two surveys, the northern myotis was present at the former old barn and apparently roosting within it. On June 14, this species was not detected at the barn, but was present within the woodlot.

A single big brown bat was detected on April 21 in the vicinity of the buildings. On May 29, five calls of it were obtained, four near the buildings and one on the Trailway south of the woodlot.

There was no evidence that the onsite house was being used as a roost. The former barn was functioning as a roost for the northern myotis. It appeared as though one or two northern myotis roosted within the barn early in the year, but that this species switched to possibly roosting in the woodlot later on. The northern myotis seldom uses buildings as maternal roosts, but may use them as temporary roosts during migration and also as resting roosts between nocturnal foraging bouts.

The barn was subsequently removed in early April 2018 for safety reasons.

The big brown bat was detected near the buildings but was not confirmed roosting in the former barn and it was absent on two of the four survey dates. This suggests that the big brown bat was not roosting in the general area. When roosts are present, it is common to get a hundred or more recordings of calls within a short period.

Had the bat detector been deployed for extensive periods in the evening, it is likely that additional species would have been encountered. Bats wander extensively in search of prey while foraging. At the Cambridge roost, little brown myotis routinely travelled a minimum of 2 km to forage and also to use other roosts (Morningstar 2017). GWS Ecological and Forestry Services (2016) recorded a single little brown myotis on the west side of Shaws Creek Road. Male hoary bats (*Lasiurus cinereus*) may travel in excess of 250 km in a single evening (Morningstar and Sandilands, 2019), so both of these species would be expected if bat

detectors were deployed for a longer period. Other common species that would likely occur occasionally include the red bat (*Lasiurus borealis*) and the silver-haired bat. The most important period to sample for bats is at dusk and shortly thereafter as this is when all bats leave their roosts to forage. Although more bat species undoubtedly occur in the area on occasion, it appeared as though the northern myotis was the only species that roosted within the study area.

With the exception of the northern myotis, all of the mammal species observed are very common and secure in Ontario, with S-ranks of S5. The northern myotis has been designated endangered due to its perceived vulnerability to white-nose syndrome (*Pseudogymnoascus detructans*). It is discussed in more detail in **Section 6.1** that deals with confirmed habitat of endangered and threatened species.

6.0 HABITAT OF ENDANGERED SPECIES AND THREATENED SPECIES

This section of the report deals with species that are designated endangered or threatened in Ontario and protected under the ESA. Species that are designated endangered or threatened in Canada and protected under the *Species at Risk Act* (SARA), but not protected under the ESA, are discussed under Significant Wildlife Habitat. In some cases, such species are protected under the SARA, such as birds that are also protected under the *Migratory Birds Convention Act*. This is acknowledged when discussing these species.

In addition to discussing endangered and threatened species that were detected during the inventories, some other species that were not observed are also discussed. These are species that have been identified by the NHIC as having been confirmed within the general vicinity of the site. The potential for them to occur and for regulated habitat for any species to extend onto the subject lands is discussed.

6.1 Confirmed Endangered and Threatened Species

Six endangered or threatened species were observed during the study. They include the Least Bittern, Red-headed Woodpecker, Bank Swallow, Bobolink, Eastern Meadowlark, and northern myotis. The Red-headed Woodpecker and northern myotis are endangered and the remaining species are threatened. The approximate extent of the habitat of the endangered and threatened species is depicted on **Figure 10**.

The six endangered and threatened species are discussed in more detail below.

- **Least Bittern (*Ixobrychus exilis*) – S4B (apparently secure), Threatened**

The Least Bittern was confirmed in the ponds within Wetland U2, northwest of the Trailway, on June 5, 2014. It was not detected there on the earlier survey on May 20, 2014. This species was not detected at U1 or W1 on any of the 2014 surveys. A third survey was not completed as per the Least Bittern protocol in 2014 because the species had already been confirmed in Wetland U2 and it was determined that U1 and W1 were generally unsuitable habitat for the species.

In 2016 and 2017, a single survey was completed for the Least Bittern in Wetland U2, but two stations were surveyed in these years as opposed to a single station in 2014.

Within Wetland U2 there are separate ponds with emergent vegetation and shrub willows in between them. Water levels were abnormally high in 2014 and the area was much deeper and larger, with the dug ponds amalgamated into one. The result was that the combined ponds provided suitable breeding habitat for the Least Bittern.

The Least Bittern is a marsh bird that nests in emergent vegetation of tall cattails, bulrushes, or sedges. The nest is typically in dense vegetation but usually less than 10 m from open water. It prefers hemi-marsh conditions, with dense emergents for nesting cover and escape from predators and open water where it can forage at the edge of the vegetation. The nest is placed over water that may be as deep as 1 m. It prefers water that is approximately 50 cm deep at the nest site, otherwise the nest may be readily accessible to predators such as raccoons (Gray Owl Environmental Inc. 2009; Meyer and Friis 2008). In 2014, all of these habitat requirements were present in the large pond that formed within Wetland U2 that year.

During the surveys in 2016 and 2017, water levels were much lower in all the ponds. In the ponds within Wetland U2, it appeared as though the water was 40 to 50 cm shallower than in 2014. The ponds were separated in these years due to the naturally low water levels and the eastern ponds were essentially dry. There was very little water under the emergent cattails. Habitat was generally unsuitable for the Least Bittern in these years.

Wetland U1 was unsuitable for the Least Bittern in all years. In 2014, it contained small amounts of water, but the water depth was only in the order of 30 cm, much lower than required by the Least Bittern. In 2016 and 2017, there was very little standing water in it.

Wetland W1, in the deciduous woodlot, was also considered unsuitable for the Least Bittern in all years. This was because there was very limited emergent vegetation in it, and the emergents that were present were fairly sparse and not particularly good nesting substrate. The wetland is also embedded within forested habitat and the Least Bittern appears to prefer wetlands within more open habitats.

It is concluded that U1 and W1 are not habitat for the Least Bittern. The ponds within Wetland U2 provide habitat for it during years of high-water levels. Due to natural fluctuations in the water table and precipitation, these ponds may be attractive to the Least Bittern in some years but not in others.

It is concluded that the ponds within Wetland U2 provide habitat for the threatened Least Bittern as shown on **Figure 10**. Potential impacts of the proposed pit on the Least Bittern are discussed in **Section 13.1**.

- **Red-headed Woodpecker (*Melanerpes erythrocephalus*) – S3 (vulnerable), Endangered**

The Red-headed Woodpecker was present only during the 2022 breeding season. It was observed foraging in the trees along the Trailway, including within the setback from the trail within the license area. Most foraging occurred in the deciduous forest northwest of the Trailway. The nest with unfledged young was found in a snag within the forest northwest of the Trailway on July 8, 2022.

The study area supported a nest and therefore habitat for the Red-headed Woodpecker. Potential impacts of the proposed pit on it are discussed in **Section 13.1**.

- **Bank Swallow (*Riparia riparia*) – S4B (apparently secure), Threatened**

Small numbers of Bank Swallows were occasionally observed flying over the ponds within Wetland U2. This species nests in vertical earthen banks, so there is no breeding habitat available for it within the study area.

The Ontario government website for Species at Risk does not provide a general habitat description for the Bank Swallow. Nonetheless, OMNRF (2016) described the areas that should be considered habitat for the Bank Swallow under the ESA. Areas that are considered habitat include the nesting colony, including substrate between nest sites; 50 m from the face of the bank that is used for nesting to allow swallows to exit and enter the nest burrows; and a radius of 500 m around the nesting colony in suitable foraging habitat.

The first two habitat components are lacking within the study area. There is no nesting colony or area within 50 m of a nest. Bank Swallows are nesting within the existing Lafarge pit east of the site approximately 175 m from the proposed extension. Consequently, much of the eastern portion of the site falls within the 500 m that should be considered Bank Swallow habitat. Further discussion on this species is provided in **Section 13.1**.

- **Bobolink (*Dolichonynx oryzivorus*) – S4B (apparently secure), Threatened**

The cultural meadow south of the Trailway provides habitat for the Bobolink. All three categories of habitat are present. Category 1 habitat consists of the nest site and the area within 10 m of it. Category 2 habitat includes the area 10 to 60 m from the nest or the approximate centre of the territory, and Category 3 habitat extends 60 to 300 m from the nest or approximate centre of the territory. In the case of Category 3 habitat, only those areas that are suitable habitat for the Bobolink are included (OMECP 2018a).

In both years when the Bobolink was confirmed as being present, its activity was concentrated in the eastern portion of the cultural meadow, but with some sightings in the central portion of the meadow. In 2014, however, the male also occasionally visited the western portion of the meadow close to Shaws Creek Road.

Figure 10 shows the approximate extent of habitat when the general description of habitat is applied. The probability of the Bobolink occurring in a given site decreases with decreasing field size. The existing cultural meadow is near the minimum size that is typically inhabited by this species. The mapping indicates that the entire cultural meadow should be considered habitat for the Bobolink when the general habitat description is applied. Wetland U3 is not suitable nesting habitat for the Bobolink; according to its general habitat description, this area is not considered habitat. The potential impacts of the proposed extraction on Bobolink habitat are discussed in **Section 13.1**.

- **Eastern Meadowlark (*Sturnella magna*) – S4B (apparently secure), Threatened**

Similar to the Bobolink, the cultural meadow south of the Trailway provides all three types of habitat for the Eastern Meadowlark. Category 1 habitat consists of the nest and an area of 10 m around it, Category 2 consists of the area 10 to 100 m around the nest or the approximate centre of the territory, and Category 3 extends from 100 to 300 m from the nest or approximate centre of the territory. Again, only habitat that is suitable for the meadowlark is included as Category 3 habitat (MECP 2018b).

In years when the meadowlark was present, it occurred only in the eastern portion of the cultural meadow at its widest point. **Figure 10** indicates the approximate extent of habitat when the general description of habitat is applied. Wetland U3 is not suitable breeding habitat for the Eastern Meadowlark, so it is excluded as habitat. Application of the general habitat description shows that almost the entire meadow qualifies as meadowlark habitat except for a small portion of the narrow portion near Shaws Creek Road. The potential impacts of the proposed extraction on Eastern Meadowlark habitat are discussed in **Section 13.1**.

- **Northern Myotis (*Myotis septentrionalis*) – S3? (vulnerable?), Endangered**

The northern myotis was confirmed roosting in the old barn that was formerly northwest of the Trailway, and calls of it were confirmed within the deciduous woodlot northwest of the trail. Numbers were low. It appeared as though only a single northern myotis roosted in the barn north of the proposed pit, but there appeared to be a few more flying in the woodlot later on in the season. It is also possible that the northern myotis roosted within the woodlot. This species typically roosts in trees and forages most frequently under the canopy of forests. The onsite woodlot is an ideal foraging location for this species because there is very little understorey that would inhibit free flight under the canopy.

The general habitat of the northern myotis for the purposes of protection under the ESA has not been described to date. A recovery strategy was completed in 2018 (Environment and Climate Change Canada 2018), but the only critical habitat identified for this species is for winter hibernacula. No critical habitat has been identified for roosts or other habitats due to lack of information.

The barn that was previously adjacent to the site supported at least one roosting northern myotis. This may have been a migrant bat as opposed to a local resident, but there is no way to confirm this. It is uncertain if migratory roost sites will eventually be considered essential habitat for this species. At any rate, the barn was removed for safety reasons and there was no indication that the adjacent house was being used as a roost.

Consequently, the deciduous woodland northwest of the Trailway is the only potential habitat for this species within the study area. This assumes that open air above agricultural lands and the ponds are not considered habitat, as it is possible that the species occasionally forages above these habitats.

In the absence of general or critical descriptions for habitats other than hibernacula for the northern myotis, it is GEC's opinion that the woodlot northwest of the Trailway should be considered habitat. It was clearly being used for foraging and it is possible that it also provided roost sites. GEC does not consider other areas where it potentially foraged to be important habitat for this species.

Our interpretation of the habitat of the endangered northern myotis is shown on **Figure 10**. The potential impacts of the proposed extraction on northern myotis and its habitat is discussed in **Section 13.1**.

6.2 Unconfirmed Endangered and Threatened Species

In addition to the endangered and threatened species that were confirmed within the study area, the NHIC database indicated that the Henslow's Sparrow had previously been documented within the general area of the site. It was not observed during the inventories. Its potential to occur on the site is discussed below.

- **Henslow's Sparrow (*Centronyx henslowii*) – S1B (critically imperilled), Endangered**

According to the NHIC database, the Henslow's Sparrow was last recorded in this area in 1984. It has declined significantly in the province. Until recently, it was considered a hypothetical breeder in Ontario, but a few breeding records have been obtained during the third Ontario Breeding Bird Atlas.

The Henslow's Sparrow is a specialized grassland species that has several habitat requirements that are essential for an area to be suitable for it. Optimal Ontario habitat includes a high percentage of grasses, moderate to high density of grasses, a thick mat of ground cover from previous years' vegetation, a height of dense vegetation at least 0.5 m tall, no current disturbance due to grazing, and low coverage by shrubs. If any of these habitat features are lacking, it is highly unlikely that the Henslow's Sparrow will be present (Austen et al. 1995; Heagy 2011; Knapton 1984; Kraus 2015; Pearce et al. 2010). In addition to these habitat requirements, the Henslow's Sparrow is an area-sensitive species. It rarely nests in grasslands smaller than 30 ha and grassland patches as large as 100 ha may be required to support a pair, particularly in Ontario where it is a rare species and grasslands are not important components of the landscape.

The only potential habitat on site for the Henslow's Sparrow includes the cultural meadows north of the Trailway and immediately south of the trail. Both of these habitat patches are too small to support it, even when their combined areas are considered. The meadow south of the trail is further unsuitable because of the rather sparse vegetation. The thick ground cover that it requires is absent and the grasses are relatively sparse. This area supported the Grasshopper Sparrow in one year, and it requires patches of bare soil and sparse vegetation, essentially the opposite of the Henslow's Sparrow's habitat requirements. This area was previously extracted, so there is limited topsoil, thus inhibiting the growth of dense grasses that the Henslow's Sparrow requires.

It is concluded that the Henslow's Sparrow is absent for the following reasons:

- It was not detected during the inventories. Although this species is most easily detected at dusk or even after dark, it does sing during the day and would have been detected during the normal breeding bird surveys had it been present;
- It was last observed within the general area approximately 38 years ago;
- The cultural meadows are too small to support this species; and
- The onsite habitat does not provide all the microhabitat features that it requires, so the general vegetation structure is unsuitable for it.

6.3 Summary of Habitat of Endangered and Threatened Species

The inventories determined that there was habitat within the study area for two endangered species and four threatened species. These include the Red-headed Woodpecker and northern myotis (endangered) and the Least Bittern, Bank Swallow, Bobolink, and Eastern Meadowlark (threatened).

Habitat for the northern myotis and Least Bittern occurs only northwest of the Trailway outside of the proposed extraction area. Habitat for the Red-headed Woodpecker occurs predominantly northwest of the trail, but areas within the setback to the trail may occasionally be used for foraging. Habitat for the other three threatened species occurs within the proposed extraction area. For one of these, the Bank Swallow, only Category 3 habitat is present. This represents foraging habitat distant from the nest. Category 3 habitat consists of areas where habitat alterations are least likely to have impacts upon the species and its overall habitat.

Figure 10 shows the habitat of endangered and threatened species within the study area.

7.0 SIGNIFICANT WETLANDS IN ECOREGION 6E

A review of Land Information Ontario (LIO) indicates that Wetland W1 (**Figure 2**) is part of the Provincially Significant Cataract Southwest Wetland Complex. Wetland W1 is the only Provincially Significant Wetland (PSW) within the study area.

The potential impacts of the proposed extraction on Significant Wetlands will be discussed further in **Section 13.2**.

8.0 SIGNIFICANT WOODLANDS IN ECOREGION 6E

As shown on **Figure 2** portions of the study area are mapped as part of the Region of Peel's Greenlands System.

To the west and northwest of the site there is a block of forest, wetlands and conifer plantations. This area was mapped in the Region's Greenlands System, with the boundary more or less following the west side of the Trailway right-of-way (see **Figures 2** and **5**). During the field surveys GEC observed that the woodland boundary is along the east side of the Trailway, encroaching by a few metres onto the site (see **Figure 11**).

There is another area mapped within the Region's Greenlands System that is offsite to the east and southeast, and that is connected to the larger Dufferin Lake natural area (see **Figure 2**). As shown on **Figure 3**, the area offsite to the east was mainly conifer plantations that were harvested in recent years. It appears that the remnant hedgerows and minor strips of remaining conifers would not ordinarily be mapped as Significant Woodland based on current conditions. It is possible that this area was identified within the Greenlands System for some other reason.

The potential impacts of the proposed extraction on Significant Woodlands will be discussed further in **Section 13.3**.

9.0 SIGNIFICANT WILDLIFE HABITAT

The primary resource for determining what qualifies as Significant Wildlife Habitat is the Significant Wildlife Habitat Technical Guide (SWHTG) prepared by OMNR (2000). OMNRF (2015b) has also prepared Significant Wildlife Habitat Ecoregion Criteria Schedules (SWHECS) that may be used to assist in determining what constitutes Significant Wildlife Habitat. The Natural Heritage Reference Manual (NHRM) (OMNR 2010b) states that the SWHECS are a resource that may be used to determine which features qualify as Significant Wildlife Habitat, but that the SWHTG "is still the authoritative source for the identification and evaluation of Significant Wildlife Habitat".

For the purposes of this study, GEC has relied upon the SWHTG to determine what constitutes Significant Wildlife Habitat. As stated above, this is consistent with the recommendations in the NHRM. There are also several significant problems with the SWHECS that provide additional rationale for not using it. It is inconsistent with some of the key planning policy and support documents, including the Provincial Policy Statement, the NHRM, and the SWHTG. In addition, the scientific credibility of the SWHECS is questionable. It is not defensible to identify a single threshold for significance for a feature over an area as large and diverse as an ecoregion; in some cases, the same threshold has been used for the entire province. Some of the information within the SWHECS is simply incorrect, with the section on area-sensitive breeding birds being particularly inaccurate. In addition, the SWHECS are designed to be used at a larger scale than the SWHTG and are therefore less relevant. The SWHECS are used at the scale of ecoregions whereas the SWHTG is used at the scale of individual municipalities. This is important because the mandate for Significant Wildlife Habitat rests with planning authorities and not the MNRF.

The NHRM and the SWHTG identify four main types of Significant Wildlife Habitat: 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 Region of Peel and the Town of Caledon (North-South Environmental Inc. et al. 2009) have completed their own Significant Wildlife Habitat study. This document incorporated information from the SWHTG and the Technical Paper on Significant Wildlife Habitat from the Oak Ridges Moraine Conservation Plan (Queen's Printer 2007). They also communicated with the team preparing the SWHECS. GEC examined the study completed by the Region of Peel and Town of Caledon. Our analysis is consistent with this document and no other Significant Wildlife Habitat other than what we have identified is warranted.

Although GEC has used the SWHTG to identify most types of Significant Wildlife Habitat, the SWHECS identify some additional types of Significant Wildlife Habitat not included in the SWHTG. An analysis of each of these additional components of Significant Wildlife Habitat is presented below.

9.1 Seasonal Concentrations of Animals

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

- 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.

Each of these is discussed further below.

Winter Deer Yards

The MNRF has not identified any winter deer yards as occurring in this general area. Deer typically yard in dense coniferous forests that are adjacent to rich food supplies such as corn fields in the agricultural south, or areas with abundant deciduous shrubs in more northern areas. In the south, deer often do not yard because weather conditions such as deep snow are not limiting to them. There is no suitable habitat for a deer yard within the study area.

Moose Late Winter Habitat

The study area is well south of the range of the moose.

Colonial Bird Nesting Areas

Colonial nesting birds include certain species of herons, gulls, terns, and swallows. No herons, gulls, or terns nested within the study area. Colonial swallows are limited to those species that nest in natural situations and are predominantly Bank Swallows and Cliff Swallows. Barn Swallows nest colonially, but rarely in natural habitats such as cliffs. No colonial nesting birds occurred at the site.

Waterfowl Stopover and Staging Areas

In spring and autumn, large numbers of waterfowl may stop and stage at wetlands or even flooded agricultural fields to replenish their reserves prior to resuming migration. There was no evidence of waterfowl staging at the site. The ponds within Wetland U2 are the best potential habitat, but few waterfowl were observed using them. Five species of waterfowl were observed, all in low numbers and mostly during the breeding season.

It is concluded that the site does not provide significant habitat as a waterfowl stopover and staging area.

Waterfowl Nesting Areas

According to the SWHTG, most significant waterfowl nesting areas are relatively large undisturbed upland areas adjacent to abundant ponds and wetlands. The ponds within Wetland U2 and other natural wetlands and associated upland areas are the only potential nesting habitat.

Five species of waterfowl bred in the general area, but all at very low density. A pair of Canada Geese nested on U1 in one year and a pair usually nested on the ponds within Wetland U2. Mallards occurred occasionally within Wetland U2, with no more than one pair observed at once. These may not have been actually breeding. Single pairs of the Wood Duck and Hooded Merganser nested in some years in W1 or in the surrounding upland deciduous forest. A single pair of Trumpeter Swans nested in a wetland east of the site.

Because of the low numbers of breeding waterfowl and their sporadic occurrence in the case of some species, it is concluded that there are no significant waterfowl nesting areas within the study area.

Shorebird Migratory Stopover Areas

Shorebirds also stop over at key areas to refuel during migration. These sites typically have soft, wet substrates that support an abundance of invertebrates. For certain species, wet agricultural fields may be important stopover areas.

No migratory shorebirds were observed at the site. The Killdeer and Spotted Sandpiper were the only shorebird species that were observed, and these were breeding species. There is generally no good habitat for staging shorebirds present. The ponds within Wetland U2 are the best potential habitat, but they have gravelly shores that are not good foraging habitat for shorebirds.

Landbird Migratory Stopover Areas

The most important landbird migratory stopover areas occur within 5 km of the shorelines of a Great Lake. The study area is much more distant from a Great Lake than 5 km. Fieldwork was conducted at times during the spring migration period and very few migrants were observed within the study area. It is concluded that the area is not a significant landbird migratory stopover site.

Raptor Winter Feeding and Roosting Areas

Raptor winter foraging areas include meadows, pastures, hayfields, and open fields that support abundant populations of small mammals such as mice and voles. Scattered trees for perching are also required for most species. The site is generally unsuitable for a significant winter foraging area for raptors due to the scarcity of small mammals. There was no evidence of the presence of meadow voles, one of the most important prey items for most raptors, with certain species feeding almost exclusively on voles. When voles are present, their nest sites and tunnel systems are usually evident. The lack or scarcity of small mammals is due to the small amount of grassy and open herbaceous habitat and the gravel substrate which is difficult for these small mammals to dig their tunnels.

The Northern Harrier and Short-eared Owl roost in large grassy fields in winter. The site is generally unsuitable for them in winter because there is limited open grassy habitat. In addition, both species rely heavily on voles as a source of food.

Wild Turkey Winter Range

In winter, Wild Turkeys typically remain close to dense coniferous cover and select tall conifers for roosting in at night. High-quality Wild Turkey winter habitat typically includes seeps or springs. These provide a source of food and water.

The site does not provide significant winter habitat for the Wild Turkey. At this latitude, the Wild Turkey may not restrict its movement to small areas because snow cover may not be limiting. The site supports only scattered conifers and there are no seeps and springs within the study area.

Turkey Vulture Summer Roosting Areas

Vultures prefer to roost on cliffs or tall dead trees where they can easily take flight. Suitable roosting areas may support dozens or even hundreds of vultures.

No vultures were ever observed landed within the study area, so it does not function as a summer roosting area.

Reptile Hibernacula

Wintering areas for both turtles and snakes may qualify as Significant Wildlife Habitat.

Turtles were not very common at the site, with a single snapping turtle being observed as well as a maximum of six painted turtles being found in the ponds within Wetland U2 and four in the pond in Wetland W1 within the deciduous woodlot. Early spring surveys suggested that a maximum of one painted turtle may have overwintered within the Wetland U2 ponds. They are marginal overwintering habitat for turtles because the substrate is predominantly gravel rather than the soft substrate that turtles need to burrow into over the winter. Wetland W1 within the deciduous forest is more suitable for overwintering turtles, although none were seen there during early spring surveys. The fact that much of this pond is shaded may make it less desirable for overwintering because turtles prefer locations where they can bask in the sun early in spring to warm up. It is concluded that there is no significant turtle overwintering site within the study area. If any of the ponds do function as turtle overwintering sites, they will not be affected by the proposed extraction activities.

Eastern gartersnakes were abundant around the old barn and outbuildings that were removed for safety reasons, and also around the margins of the Wetland U2 ponds. They were apparent early in spring suggesting that they either overwintered within this general area or nearby. No snakes were observed south of the Trailway where extraction activity will occur. If there was a snake hibernaculum in this area, its location could not be identified with certainty.

Consequently, no Significant Wildlife Habitat is being identified for snake hibernacula. In the event that one is present, it clearly occurs northwest of the Trailway and will not be affected by the proposed extraction.

Bat Hibernacula

Most bat species hibernate in caves or abandoned mines. The exception is the big brown bat that may hibernate in buildings, but buildings are not typically considered Significant Wildlife Habitat for overwintering bats.

There is no habitat present for hibernating bats, with the possible exception of the adjacent house which has the potential to support wintering big brown bats. The bat acoustic surveys demonstrated that the big brown bat was scarce in the general area and that there was no evidence of a summertime roost. Hibernacula for this species in buildings typically occur where it also roosts at other times of the year.

Bullfrog Concentration Areas

The bullfrog is absent from the study area.

Migratory Butterfly Stopover Areas

Migratory butterfly stopover areas are restricted to areas within 5 km of the shoreline of a Great Lake. The site is farther than this from a Great Lake.

9.2 Rare or Specialized Habitat

9.2.1 Rare Habitat

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.

All of the vegetation communities within the study area are either common in Ontario or cultural in nature. There are no rare habitats present.

9.2.2 Specialized Habitat

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

- 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.

Each of these specialized habitats is discussed further below.

Habitat for Area-Sensitive Species

The inventories revealed the presence of four woodland species that have been considered area sensitive by various authors: Cooper's Hawk, Hairy Woodpecker, Blue-headed Vireo, and Scarlet Tanager. As discussed in **Section 5.4.4** it is unlikely that either the Cooper's Hawk or Hairy Woodpecker are area sensitive and they are not identified as such in the SWHECS.

There is insufficient information on the habitat requirements of the Blue-headed Vireo to determine whether or not it is actually area sensitive. The only document that states that it is area sensitive is the SWHTG, which states that it requires 100 ha of habitat. Given that it apparently nested in the woodlot northwest of the Trailway, it clearly does not require 100 ha of forest. This species is increasing significantly in Ontario and increased by almost 300% in Ecoregion 6 between the two breeding bird atlases (James 2007). As it becomes more common, it is less likely to be area sensitive, if indeed it currently is. The Birds of the World account for the Blue-headed Vireo (Morton and James 2020) makes no mention of it being area sensitive. It states that it occurs in areas with extensive forest cover, but once that criterion is satisfied, it may occur almost anywhere that has intermediate-aged to mature forest.

It appears as though the Scarlet Tanager is the only truly area-sensitive species that is present within the study area. GEC concludes that the site does not provide significant habitat for area-sensitive forest breeding birds. The SWHTG recommends that only the best examples of a wildlife habitat be considered significant. The presence of a single pair (or two pairs if the Blue-headed Vireo is included) is not significant within the context of the planning authority's jurisdiction.

The SWHECS require that a woodland support three species of area-sensitive breeding birds to qualify as Significant Wildlife Habitat. Both that document and the SWHTG consider the Red-breasted Nuthatch to be area sensitive, but only requiring 10 ha of forest. More recent data indicates that this species is not particularly area sensitive in Ontario, often nesting in small wooded areas. In Richmond Hill, it was confirmed nesting in a woodlot that was less than 1 ha in area (A. Sandilands, personal observation). It has even nested in a suburban backyard in Waterloo (Cheskey 1990).

The study area therefore supported a maximum of two area-sensitive species with one pair of each being present. In the case of the Blue-headed Vireo, it may not be area sensitive and it occurred in only one of the four years in which breeding bird surveys were undertaken.

Three of the grassland species that are present may exhibit some area sensitivity. These include the Grasshopper Sparrow, Bobolink, and Eastern Meadowlark. The Grasshopper Sparrow is a species of conservation concern and is discussed in **Section 9.3.1** that deals with that component of Significant Wildlife Habitat rather than as an area-sensitive species. The Bobolink and Eastern Meadowlark are both threatened species that are discussed in more detail in **Section 6.1** that deals with confirmed endangered and threatened species.

It is concluded that the site does not provide significant habitat for area-sensitive breeding birds. Even if significant habitat were present for these species, it is confined to the woodlot northwest of the Trailway where it would be unaffected by the proposed pit.

Forests Providing a High Diversity of Habitats

Forests that are generally considered to provide a high diversity of habitats are those with a wide variety of vegetation communities and dominant tree cover. According to the SWHTG,

these contain older forest stands with cavities for wildlife, very tall supercanopy trees, important habitat for birds of prey, have numerous vertical layers of vegetation, and have fallen logs.

This is a rather subjective category of Significant Wildlife Habitat that is not recognized as Significant Wildlife Habitat by the SWHECS.

The woodlot northwest of the Trailway is the only area that has the potential to qualify for this component of Significant Wildlife Habitat. It lacks many of the features that are considered characteristic of highly diverse forests. It is relatively monotypic, is intermediate in age, does not have very tall supercanopy trees, does not provide important habitat for birds of prey, and lacks numerous vertical layers of vegetation. There is very little in the way of regenerating saplings or shrubs and no distinct subcanopy layers.

It is concluded that the site does not support forests providing a high diversity of habitats.

Old-Growth or Mature Forest Stands

The woodland northwest of the Trailway is not an old-growth or mature forest stand. Consequently, it does not qualify for this category of Significant Wildlife Habitat.

Foraging Areas with Abundant Mast

This is another category of Significant Wildlife Habitat that is not recognized by the SWHECS. It was intended mostly for large mammals such as black bears (*Ursus americanus*) and white-tailed deer, with less of an emphasis on other species.

Important trees that produce hard mast include large Beech and oak trees. These are important to bears and deer, as well as Wild Turkeys, Blue Jays, and squirrels. The woodlot northwest of the Trailway is dominated by Sugar Maple, with limited representation by Beech and oaks. Consequently, there is limited hard mast available for wildlife.

Important soft-mast producing trees include Black Cherry, mountain-ash, and Apple; all of these species are relatively uncommon within the study area. Some shrubs may be important in providing fruit for wildlife, such as blueberries (*Vaccinium* spp.) and raspberries. No blueberries occur on the site. Raspberries are present but there are no large concentrations of these.

It is concluded that the site does not provide significant habitat for species that forage on mast.

Amphibian Woodland Breeding Ponds

Wetlands U1, U2, and W1 (the wetland within the deciduous woodlot) are all considered Significant Wildlife Habitat for amphibian breeding. All three of these wetlands supported full choruses of three species of frogs, as described above in **Section 5.4.2**.

Turtle Nesting Habitat

No evidence of turtle nesting was found during the study. The site supports very low populations of turtles, so some nesting must occur. The gravelly margins of the Wetland U2 ponds plus along the Trailway are potential turtle nesting sites. Because of the scarcity of turtles in the area and the fact that no evidence of turtle nesting was found, no Significant Wildlife Habitat for turtle nesting has been identified. If turtle nesting does occur, it will be in areas that are unaffected by the proposed extraction activities.

Specialized Raptor Nesting Habitat

Specialized raptors include those that nest and forage within forest habitats or require open bodies of water, or large grasslands. These include the Red-shouldered Hawk (*Buteo lineatus*), Barred Owl (*Strix varia*), Osprey (*Pandion haliaetus*), and Short-eared Owl (*Asio otus*). None of these species occurred within the study area.

Moose Calving Areas

The study area is well south of the range of the moose, so there are no calving areas present.

Moose Aquatic Feeding Areas

There are no moose in this general area and consequently no aquatic feeding areas for them.

Mineral Licks

There are no mineral licks within the study area.

Mink, Otter, Marten, and Fisher Denning Areas

There are no known mink, otter, marten, or fisher denning areas within the study area. It is outside of the range of the marten and peripheral to the range of the otter and fisher.

Highly Diverse Areas

This is another category of Significant Wildlife Habitat that is identified in the SWHTG but not recognized in the SWHECS, possibly because of the subjectivity in deciding which areas qualify for this criterion.

Even the evaluation criteria in Appendix Q of the SWHTG are rather vague as to what constitutes a highly diverse area. For this reason, GEC does not identify the site or portions of it as Significant Wildlife Habitat as a highly diverse area. Generally, the study area is not particularly diverse in the habitats that are present. The proposed extraction area is dominated by agricultural fields. Many of the other habitats are cultural in nature, including cultural meadows, hedgerows, small plantations, the Wetland U2 ponds, and Wetland U3.

Cliffs

There are no cliffs within the study area.

Seeps and Springs

There are no seeps or springs within the study area.

9.3 Species of Conservation Concern

Three groups of wildlife may be considered species of conservation concern:

- species that have a significant proportion of their population in Ontario and that are rare in the planning area;
- species that are exhibiting a statistically significant decline in Ontario; and
- species that are rare or designated significant at some level.

Species with a Significant Proportion of their Global Population in Ontario

There are numerous species in Ontario that have limited representation outside of the province. Habitat for these species may be considered Significant Wildlife Habitat if the species is also rare or significantly declining within the planning area.

None of the species observed within the study area have a significant proportion of their global population in Ontario.

Species Declining Significantly in Ontario

With a few exceptions, good data on population trends are currently available only for birds. The NHIC has taken into account some of these declines in recent revisions to the S-ranks that it has ascribed various species. Some of the declining species have recently had their S-ranks changed from S5 (secure) to S4 (apparently secure) to reflect these declines.

The only species observed within the study area that appear to be declining significantly are the Red-headed Woodpecker and northern myotis. Because these species are endangered, their habitat is considered to be habitat of endangered or threatened species rather than Significant Wildlife Habitat. The Bank Swallow, Bobolink, and Eastern Meadowlark are also declining, but these are all threatened species that are discussed under habitat of endangered and threatened species.

Rare or Significant Species

Significance is defined at six levels in the SWHTG:

- globally significant (with a G-rank of G1 to G3);
- nationally significant (designated Endangered, Threatened or Special Concern by the Committee on the Status of Endangered Wildlife in Canada). It is noted that the most recent version of the NHRM does not recognize national designations and only those species with provincial designations are considered candidate Significant Wildlife Habitat;
- provincially significant (with an S-rank of S1 to S3 and S3?, if the latter type of species is being tracked by the OMNRF; species designated Special Concern by the OMNRF);
- regionally significant (within an Ecoregion, or within one of the old OMNR administrative regions);
- locally significant (within an Ecodistrict); and,
- within a planning authority's jurisdiction.

The above is the order of priority that should be given to protection of species of conservation concern. The most recent version of the NHRM does not consider globally or nationally significant species Significant Wildlife Habitat.

Of note is the fact that the SWHECS does not consider species that are rare at the global, national, regional, or local levels to qualify as Significant Wildlife Habitat. Only provincially significant species can qualify as Significant Wildlife Habitat when it is used. GEC concurs that globally and nationally significant species that are not provincially significant should not be considered Significant Wildlife Habitat and this is consistent with the NHRM. Consistent with the SWHTG, GEC concurs that regionally and locally significant species may qualify as Significant Wildlife Habitat. The mandate for designating Significant Wildlife Habitat lies with local planning authorities and not the MNRF. Consequently, municipalities should be able to identify species that are significant within their jurisdiction as Significant Wildlife Habitat. For this reason, GEC has considered most locally significant species to constitute Significant Wildlife Habitat unless there are reasons to suggest that it or its habitat may not actually be significant.

9.3.1 Confirmed Rare or Significant Species

Nationally and Provincially Rare or Significant Species

Monarch (*Danaus plexippus*) – S4BS2N (apparently secure during the breeding season, imperilled during the nonbreeding season), Special Concern

The monarch was observed only in the cultural meadow south of the Trailway, which is within the proposed extraction area. Only one or two were observed on the occasions when it was detected.

The S-rank for the monarch indicates that it is not of particular concern during the breeding season, but that it is imperilled during its migration period. At this time, large numbers concentrate at staging areas prior to their flight across the Great Lakes. The site is not a significant stopover site for the monarch; significant areas are located within 5 km of the Great Lakes (OMNR 2000). Significant staging areas support 100 to 500 monarchs per day (OMNRF 2015b).

It is concluded that the site does not support significant habitat for the monarch.

Snapping Turtle (*Chelydra serpentina*), S3 (vulnerable), Special Concern

Presence of the snapping turtle was confirmed in the Wetland U2 ponds and this area is considered significant habitat for it. It was not observed in Wetland W1 within the deciduous woodlot. Because this wetland extends off the property, not all of it could be examined. The pond appears to be ideal habitat for the snapping turtle and this is a difficult species to detect because of its highly aquatic nature. It seems probable that the snapping turtle also inhabits this pond, so it is also considered Significant Wildlife Habitat for it.

Barn Swallow (*Hirundo rustica*) – S4B (apparently secure), Special Concern

The Barn Swallow was recently downlisted in Ontario from threatened to special concern.

Barn Swallows were observed at the site in all years except 2013, when the single visit was late in autumn after this species had migrated south.

Most observations were of it foraging above the ponds within Wetland U2, but it also foraged over other open habitats including adjacent lands. From 2014 to 2017, a single pair nested in a derelict barn on the site northwest of the Trailway. The barn contained several nest cups, but only one pair nested each year except in 2016. In that year, there was one active nest and another nest with a dead adult hanging by binder twine, indicating that two pairs had attempted nesting.

The barn was removed in early April 2018 for human safety reasons.

There is currently no nesting habitat for this species on site. The Barn Swallow typically nests in or on anthropogenic features such as buildings and bridges. This swallow may rarely nest in natural habitats. Peck and James (1987) reported 1 nest (out of a total of 4,279 nests) on a rocky cliff and it has been reported nesting on rock faces and cliffs at 10 locations in Algonquin Park (Tozer 2012). None of these types of features are currently present within the site.

OMNRF (2013a) provided a summary of the general habitat of the Barn Swallow that was formerly protected under the ESA and the three categories of habitat:

> **Category 1** habitat consists of an active nest.
>
> **Category 2** habitat consists of a 5-m radius around the nest. This is approximately the size of the territory that males defend around the nest.
>
> **Category 3** habitat consists of the area between 5 and 200 m from the nest. Most foraging occurs within this radius of the nest. Adults may occasionally forage farther than this from the nest, but foraging areas outside of the 200-m radius around the nest are not considered habitat under the ESA.

The site is completely devoid of features that could support a Barn Swallow nest, so there is no Category 1 or 2 habitat present.

There are other buildings within 200 m that have the potential to support nesting Barn Swallows. No Barn Swallows were observed entering or exiting these buildings but no extensive study of this was undertaken. James Dick Construction Limited submitted an application for a pit west of Shaws Creek Road, immediately adjacent to the site, that was subsequently approved and licenced. The Level II Environmental Report (GWS Ecological and Forestry Services 2016) reported observations of Barn Swallows in three locations within their study area. The report stated at all three locations were near the perimeter of their site, including one barn near their western boundary.

To err on the conservative side, it is assumed that all buildings within 200 m of the site are supporting breeding Barn Swallows. **Figure 12.0** indicates the potential extent of Category 3 habitat for the Barn Swallow on the subject lands using this assumption. Potential impacts of the proposed pit on Barn Swallow habitat are discussed in **Section 13.4**.

<u>Eastern Wood-Pewee (*Contopus virens*), S4B (apparently secure), Special Concern</u>

The Eastern Wood-Pewee occurred in the deciduous woodlot northwest of the Trailway in every breeding season in which surveys were completed. There were typically about three breeding pairs within this woodlot each year. Because the woodlot regularly supports a small breeding population, it is considered Significant Wildlife Habitat for the Eastern Wood-Pewee.

A single Eastern Wood-Pewee was heard singing in the hedgerow that is just south of the meadow south of the Trailway at the junction with the first hedgerow east of Shaws Creek Road. It was heard there on June 9, 2016. This location was specifically checked for the Eastern Wood-Pewee again on June 16, 2016 and there was no evidence of it being present. It was also not detected in this location in any of the other four years in which breeding bird surveys were undertaken. It was present there on one day out of ten when breeding bird surveys were completed. The hedgerow is atypical nesting habitat for the Eastern Wood-Pewee, consisting of a double row of trees with a small cluster of trees where the two hedgerows join. Although it occasionally nests in hedgerows (Peck and James 1987), those that it uses tend to consist of tall mature deciduous trees as opposed to the smaller sized trees that are present where it was detected. Birds that are unable to establish territories where other males are already present may sing repeatedly in suboptimal habitat in an attempt to attract a mate. If they are unsuccessful, they often abandon the area within a few days and try to establish a territory in another location. It is most likely that this observation was of an unmated male in marginal habitat that subsequently abandoned the area within the same breeding season; this bird may have been simply foraging here. GEC concludes that this hedgerow does not constitute Significant Wildlife Habitat for the Eastern Wood-Pewee because it was used in only one of four years, the bird apparently abandoned the site without breeding, and it is marginal habitat for this species and unlikely to attract it in future.

Wood Thrush (*Hylocichla mustelina*), S4B (apparently secure), Special Concern

The Wood Thrush was detected on two dates: May 20, 2014 and June 9, 2016. On both occasions, it was heard within the deciduous woodlot northwest of the Trailway at a considerable distance off the property.

Both of these detections are considered to constitute breeding records. Although it was not heard on any of the other breeding bird surveys, this is not unusual for the Wood Thrush. This species may show relatively low site fidelity to breeding areas. In the Ottawa area, the number of breeding pairs remained constant within the landscape, but the woodlots that it nested in varied annually (Villard et al. 1992). Thus, it may be present in a woodlot in one year, absent another, then return in a subsequent year. When only a single pair is present, the Wood Thrush may not sing very often because there is no need for it to defend its territory. Therefore, it may be present as a breeding species but not be detected by its vocalizations (McShea and Rappole 1997).

Although the area where the Wood Thrush nested may constitute Significant Wildlife Habitat, it is well outside the 120 m and will not be impacted by extraction activities.

The onsite portion of the woodlot is considered unsuitable habitat for the Wood Thrush. The woodlot in this area is essentially devoid of saplings and shrubs in the understorey. Presence of woody plants in the understorey is an essential habitat feature for breeding Wood Thrushes. They nest within the understorey and select pockets of dense shrubs or saplings for nesting cover (Bertin 1977; Dellinger et al. 2007).

Grasshopper Sparrow (*Ammodramus savannarum*) – S4B (apparently secure), Special Concern

A single Grasshopper Sparrow was observed and heard singing in the cultural meadow south of the Trailway on June 6, 2018, the only visit that was made to the site in that year during the breeding bird season. Two birds were seen on two of the three breeding bird surveys conducted in 2022. These appeared to be a pair, with one singing and the other silent. On the

last visit, one was observed carrying food, an indication that it may have been feeding young. The Grasshopper Sparrow was not detected in the three earlier years in which breeding bird surveys were conducted.

Because the Grasshopper Sparrow was present in the last two years that surveys were undertaken and it appeared to have a nest, a 1.9 ha portion of the cultural meadow south of the Trailway is considered habitat for it.

There is no general habitat description for the Grasshopper Sparrow because its habitat is not protected under the ESA. It has territory sizes that have been reported to range from 0.16 to 4.8 ha (Vickery 2020; Wiens 1969). Mean territory sizes range from 0.37 to 1.38 ha (Jones 2011; Smith 1963). For the purposes of mapping its habitat at the site, a radius around its activity centre of 70 m has been identified as its habitat. This equates to slightly over 1.5 ha, larger than the highest mean territory size that has been reported for the species. In 2018, the bird's activity centre was on the extreme southern edge of the cultural meadow, so the mapped habitat for it is about 0.75 ha, around the median territory size. The boundaries of the territory were mapped in 2022. This territory was northeast of the previous sighting. The combined areas are considered Significant Wildlife Habitat for the Grasshopper Sparrow as shown on **Figure 12**, covering approximately 1.9 ha.

Regionally Rare or Significant Species

Two bird species were observed within the study area that are considered rare in Ecoregion 6. They were the Blue-headed Vireo and Ruby-crowned Kinglet. The source for the regionally significant bird species is an appendix in the Ontario Wetland Evaluation System, Southern Manual (OMNR 2013b). The list of regionally rare bird species was last updated in 1999, prior to the second Ontario Breeding Bird Atlas, so may be somewhat dated.

The Blue-headed Vireo apparently nested within the deciduous woodland northwest of the Trailway. This species has increased significantly since 1999 and it is unlikely that it is still rare within Ecoregion 6E. Results of the second atlas indicate that its probability of occurrence within this ecoregion increased significantly from 4.9% during the first atlas to 19.1% during the second atlas (James 2007). Consequently, GEC does not believe that this species is still regionally significant and have not identified its breeding habitat as Significant Wildlife Habitat. Its habitat is northwest of the Trailway where it will be unaffected by aggregate extraction activities.

The Ruby-crowned Kinglet was observed only as a migrant during this study. Only its breeding habitat is considered significant, so the area northwest of the Trailway where it was observed has not been identified as Significant Wildlife Habitat.

Species Considered Rare or Significant Within a Planning Authority's Jurisdiction

Six plant species considered rare in Peel Region and/or the Credit River watershed (CVC 2002a), as described above in **Section 5.3.2** and listed as follows:

- Sprengel's Sedge (*Carex sprengelii*)
- Greenish Sedge (*Carex viridula* ssp. *viridula*)
- Wood's Sedge (*Carex woodii*)

- Variegated Scouring-rush (*Equisetum variegatum*)
- Giant Burreed (*Sparganium eurycarpum*)
- Rock Elm (*Ulmus thomasii*)

Greenish Sedge and Variegated Scouring-rush occur in Wetland U2, which will not be affected by the proposed Pit 3 Extension. Giant Burreed occurs in Wetland W1, which is a Significant Wetland that will not be affected. Sprengel's Sedge and Wood's Sedge grows in several patches within the deciduous forest (Unit FOD5-9). Sprengel's Sedge also grows in several patches along the Trailway. Sprengel's Sedge and Wood's Sedge will not be affected by the proposed Pit 3 Extension. The habitats associated with these species have already been identified as Habitat for Endangered and Threatened Species, Significant Woodland, Significant Wildlife Habitat, etc., but they can also be considered Significant Wildlife Habitat for species considered rare or significant within a planning authority's jurisdiction.

Rock Elm was observed growing in several of the perimeter hedgerows onsite, including CUHa, CUHb, CUHd and CUHh. Most of the trees appeared to be declining due to Dutch Elm Disease. This occurrence is not considered to be Significant Wildlife Habitat because the Rock Elm are growing in hedgerows which are not natural vegetation communities and the trees are declining due to Dutch Elm Disease. The trees in hedgerows CUHa and CUHb will be removed as part of the proposed aggregate extraction, while the trees growing along the fenceline in hedgerows CUHd and CUHh will be retained and there will be a 15 m extraction setback from the property line.

Credit Valley Conservation (2002b) lists 110 Species of Conservation Concern in its watershed. These include a mix of endangered, threatened, and rare species, habitat specialists, and species that are research priorities. The species include those that are representative of certain habitats or that are identified as specialists. Area-sensitive breeding birds and those listed as being typically of grasslands, shrublands, and other key habitats considered Species of Conservation Concern.

Excluding endangered, threatened, and special concern species already dealt with under Habitat of Endangered and Threatened Species and Significant Wildlife Habitat, 16 Credit Valley Conservation Species of Conservation Concern were documented breeding within the study area. These are discussed below.

<u>Hooded Merganser</u>

It is uncertain why this species is considered significant as it is well represented in the local area. Within the main study area, it was observed foraging only. Breeding probably occurred in wetlands to the northeast of the site, well outside of the core study area. Consequently, no Significant Wildlife Habitat is identified for it.

<u>Cooper's Hawk</u>

This species was likely identified as significant because it is a woodland raptor species that is occasionally considered area sensitive. Although it was identified as possibly breeding northwest of the Trailway, it was acknowledged that it has a very large home range and could have bred elsewhere. No Significant Wildlife Habitat is identified for this species, but its habitat will not be affected by the proposed pit.

Killdeer

The Killdeer is a common to abundant breeder, mostly in open agricultural lands. It is uncertain why it was identified as a Species of Conservation Concern, but it may be because it is characteristic of open habitat. The Horned Lark has similar breeding habitat requirements and also was identified as a Species of Conservation Concern. The Killdeer nested around the perimeter of U2 and in the agricultural lands within the license and extraction areas. GEC is of the opinion that its requirement for open habitat is not sufficient reason to warrant its habitat being identified as Significant Wildlife Habitat.

Yellow-billed Cuckoo

The Yellow-billed Cuckoo has very low site fidelity and may be abundant in an area in one year and absent for many years. It may even be common in part of a breeding season and then move to another location within the same year. This is because of its dependence upon outbreaks of caterpillars for its main source of food (Sandilands 2007b). Because of its nomadic habits, it may appear to be uncommon, but it is a regular breeding species in most of southern Ontario. At the study area, it nested only northwest of the Trailway. No Significant Wildlife Habitat is identified for the Yellow-billed Cuckoo, but its habitat will not be affected by the proposed pit.

Least Flycatcher

It is also uncertain why the Least Flycatcher was identified as a Species of Conservation Concern. It nests in virtually all atlas squares in the Credit River watershed, including developed areas. It nested predominantly in the woodlot northwest of the Trailway in the study area, but a pair occasionally nested in the hedgerow at the western edge of the large cultural meadow south of the trail. This species does not appear to be significant and no Significant Wildlife Habitat is identified for it.

Eastern Kingbird

This kingbird was likely considered a Species of Conservation Concern because it is listed as a characteristic species of shrublands and early successional habitats. It is common and nests in every atlas square within the Credit River watershed. It nested northwest of the Trailway, in hedgerows, and in the cultural meadows within the study area. This species does not appear to be significant and no Significant Wildlife Habitat is identified for it.

Blue-headed Vireo

This species was likely identified as a Species of Conservation Concern because some publications identify it as an area-sensitive species and because it was originally rare within this general area. Its population is now increasing and it is becoming less area-sensitive as a result. Within the study area, it nested only within the woodland northwest of the Trailway. No Significant Wildlife Habitat is identified for it, but its habitat will not be affected by the proposed pit.

Red-breasted Nuthatch

This species was likely considered a Species of Conservation Concern because some documents identify it as being area sensitive, enough though it is not. It nests in most of the Credit Valley watershed. It nested within the woodland northwest of the Trailway and in a

hedgerow within the extraction area. No Significant Wildlife Habitat is identified for it because it is not rare or area sensitive.

Eastern Bluebird

The rationale for considering the Eastern Bluebird a Species of Conservation Concern is uncertain. It has been increasing in numbers for many years and it nests throughout the Credit River watershed. It nested throughout the study area. No Significant Wildlife Habitat is identified for it as there appears to be no reason to consider it or its habitat significant.

Gray Catbird

The Gray Catbird is an abundant species that nests in every atlas square within the Credit River watershed. There appears to be no reason to consider it a Species of Conservation Concern, so no Significant Wildlife Habitat is identified for it.

Brown Thrasher

The Brown Thrasher is probably considered a Species of Conservation Concern because it is identified as being characteristic of shrublands and early successional habitats. It also commonly nests in shrubby and treed roadsides. It nests in every atlas square within the Credit River watershed. No Significant Wildlife Habitat is identified for it because it does not appear to be a significant species.

Chestnut-sided Warbler

The rationale for considering the Chestnut-sided Warbler a Species of Conservation Concern is uncertain. It is widespread in the Credit River watershed and is a habitat generalist. It nests in shrubby meadows and hedgerows, and deciduous and mixed forests with considerable deciduous undergrowth. At the site, it nested predominantly in the woodland northwest of the Trailway, although a single pair may have nested in a hedgerow in the proposed extraction area in 2022. No Significant Wildlife Habitat is identified for it, but its primary habitat will not be affected by the proposed pit.

Vesper Sparrow

This species is probably considered a Species of Conservation Concern because it is identified as an open-country breeding bird. It commonly nests in agricultural lands with treed hedgerows and this is the habitat that it occurred in within the study area, including the area north of the Trailway. It is a common species that is widespread in the Credit Valley watershed. No Significant Wildlife Habitat is identified for the Vesper Sparrow.

Savannah Sparrow

Similar to the Vesper Sparrow, the Savannah Sparrow is considered an open-country breeding bird and this is probably why it was considered a Species of Conservation Concern. It is one of the most abundant grassland species in the province, occurring in hayfields, cultural meadows, and a variety of other habitats. At the site, it occurred in the meadows within the extraction area and north of the Trailway. It is also abundant within the Credit River watershed and has been confirmed in every atlas square. No Significant Wildlife Habitat is identified for the Savannah Sparrow.

Common Grackle

It is uncertain why the Common Grackle is considered a Species of Conservation Concern. It is one of the more abundant species in the province and the Credit River watershed. It is more abundant in anthropogenic habitats (agricultural lands, plantations, villages, and suburban and urban lands) than in natural habitats such as wetlands and forests. As would be expected for a common generalist species, it was found throughout the study area. No Significant Wildlife Habitat is identified for the Common Grackle.

Orchard Oriole

At the time that the Credit Valley Conservation report was completed, the Orchard Oriole was probably rare within the watershed. The second Ontario Breeding Bird Atlas indicated that it had increased and extended its breeding range and this increase still appears to be continuing. Nonetheless, it may still be a rare to uncommon breeding bird within the Credit River watershed and also within the Regional Municipality of Peel. The Orchard Oriole is a notorious vagrant that seldom returns to the same site to breed in subsequent years. It may even nest in the northern portion of its range early in the season and move several hundred kilometers south to raise a second brood (Scharf and Kren 2020). For several years, the Natural Heritage Information Centre did not ascribe it an S-rank because it seldom occurred at the same site more than once. Now that it is becoming more common, its site fidelity may increase somewhat. Within the study area, the Orchard Oriole was present only in 2018 when it nested in the treed area of U3. This area is being maintained with a buffer to protect the wetland and its features and functions. The area that provided nesting habitat for the Orchard Oriole is identified as Significant Wildlife Habitat.

9.3.2 Unconfirmed Rare or Significant Species

The search of the NHIC database revealed that two provincially significant species have been previously documented in the general vicinity of the study area. They are discussed further below.

Hill's Pondweed (*Potamogeton hillii*) – S2 (imperilled), Special Concern

Hill's Pondweed is an aquatic plant species. COSEWIC (2005) described its habitat as:

> *"Hill's pondweed is found in cold, clear, slow-moving, calcareous streams, ditches, and ponds with a muddy substrate. Rarely is it in turbid or polluted waters, in open lakes ... or fast-moving streams. It is often found on the upstream side of road culverts, among stumps and fallen trees, or in shallow water among rushes and sedges."*

COSEWIC (2005) documented Green Lake as supporting a population of Hill's Pondweed. In August 2003 a "small amount [was] found in the north end of lake," estimated at 100 plants. After an October 2, 2005 field visit, MNR staff reported "plants in fruit spread throughout the eastern portion of lake (an area of about 500m x 150m)."

The only potential habitat for Hill's Pondweed within the study area is in Wetland U2. This species was not observed during the field surveys.

River Bluet (*Enallagma anna*) – S2 (imperilled)

The river bluet was not one of the 19 species of odonates that were observed within the study area. As its name suggests, this damselfly occurs only in flowing water, particularly nutrient-rich streams or rivers with slow to moderate flows. There is no suitable habitat for it within the study area.

9.4 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.

The site is relatively isolated from an east to west corridor perspective. The existing Lafarge Pit lies immediately to the east of the site and a below-water pit application for land west of Shaws Creek Road was recently approved. There is no evidence that the existing agricultural land is a critical link between habitats that are regularly used by wildlife. Movement through the site undoubtedly occurs by common species such as white-tailed deer, coyotes, and a number of other common mammal species. It is not important for movement of amphibians.

It is concluded that there are no significant animal movement corridors within the study area. Extraction of the pit will be above the established water table, so that the existing movement patterns will be maintained.

9.5 Additional Types of Significant Wildlife Habitat Identified in the SWHECS

In addition to the habitat types that may qualify as Significant Wildlife Habitat that are identified in the SWHTG, the SWHECS identify four other types of habitats that should be considered significant. Each of these is discussed below.

Marsh Bird Breeding Habitat

To qualify for this category of Significant Wildlife Habitat, a site must support five or more nesting pairs of Marsh Wrens or Sedge Wrens, or 1 pair of breeding Sandhill Cranes, or five or more of the listed species. The listed species are American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, and Trumpeter Swan. Any wetland with a single breeding pair of the last two listed species qualifies as Significant Wildlife Habitat.

Wetland U2 northwest of the Trailway had the highest potential to qualify for this category of Significant Wildlife Habitat. Nonetheless, it supported only three of the required five listed species (Virginia Rail, Sora, and Pied-billed Grebe) and none of the more significant species. Consequently, it does not qualify as Significant Wildlife Habitat.

None of the other wetlands within the study area supported significant marsh bird breeding habitat. A wetland east of Mississauga Road had breeding Trumpeter Swans, but this is outside of the study area.

Open Country Bird Breeding Habitat

To qualify for this type of Significant Wildlife Habitat, the grassland must be a minimum of 30 ha in size. There are no grasslands or meadows this large within the study area.

Shrub/Early Successional Bird Breeding Habitat

To qualify for this type of Significant Wildlife Habitat, the cultural thicket or cultural meadow must be larger than 10 ha. There are no suitable habitat patches this large within the study area.

Terrestrial Crayfish

There was no evidence of terrestrial crayfish within the study area (burrows or chimneys). The soils in the area are generally unsuitable for terrestrial crayfish because they are dry and gravelly. These crustaceans require moist soils that are easy to dig in (predominantly clays and moderately to poorly drained loams) and a high water table. GEC concludes that there is no habitat present for terrestrial crayfish.

9.6 Summary of Significant Wildlife Habitat

Figure 12 shows the extent of Significant Wildlife Habitat within the study area.

No significant seasonal animal concentration areas or animal movement corridors were identified within the study area.

Amphibian breeding ponds were identified as Significant Wildlife Habitat. These included Wetland U1, the Wetland U2 ponds, and Wetland W1 in the deciduous woodlot northwest of the Trailway.

Significant Wildlife Habitat was identified for three species of provincial conservation concern, including the snapping turtle, Eastern Wood-Pewee, and Grasshopper Sparrow.

Significant Wildlife Habitat was identified for five plant species that are considered rare in Peel Region and/or the Credit River watershed. All five species occur to the west of the site. In addition, Significant Wildlife Habitat was identified for the Orchard Oriole which is considered rare in Peel Region and/or the Credit River watershed. It occurred only in U3 within the setback to the proposed extraction area.

Potential impacts of the proposed pit on the Significant Wildlife Habitat are discussed in **Section 13.4**.

10.0 SIGNIFICANT AREAS OF NATURAL AND SCIENTIFIC INTEREST (ANSI)

Approximately 11.8 ha of the Provincially Significant Caledon Meltwater Deposits Earth Science ANSI, as currently mapped by Lands Information Ontario (LIO), is located on the site (**Figures 2** and **13a**). This Earth Science ANSI covers 501.96 ha in total. OMNR (2013) recommended reducing the size of this ANSI to 448.5 ha. The boundary revisions proposed by OMNR (2013) would result in the site being excluded from this ANSI (**Figures 2** and **13b**).

The *Earth Science Inventory Checklist* for the Caledon Meltwater Deposits – Forks of the Credit ANSI (OMNR 2013) provides a summary of earth science features, an assessment of their

significance and recommendations for boundary revisions and management of publicly-owned portions of the ANSI, as follows:

Earth Science Features

"The Caledon Meltwater Deposits - Forks of the Credit ANSI contains Late Wisconsinan, Port Huron Stadial, Violet Hill meltwater channel deposits. The Violet Hill or Caledon meltwater system developed in the Orangeville-Caledon area between the Lake Simcoe and Ontario ice lobes. The ANSI also provides representation of subsequent meltwaters which cut deep valleys through the centre of the ANSI. These valleys expose underlying ice-contact stratified drift deposits and Niagara Escarpment bedrock around a waterfall and railway cut. The ANSI is noted for its numerous kettles including Dufferin Lake."

Significance

"The ANSI supports excellent representation of kettled meltwater deposits that grade into more subtle outwash deposits to the southwest. The ANSI is one of three sites where the "best morphological expression" of the Caledon Meltwater Channel complex is represented (Cowell and Woerns 1976). The other two sites (representing slightly different features) are (i) Caledon Meltwater Deposits - North of Orangeville and (ii) Mono Mills - Caledon Meltwater Channels."

Recommendations

"It is recommended that the southern part of the ANSI be cut back to Shaw's Creek Road and, in the southwest, by a height of land, and the northeast part of the ANSI be expanded to the Forks of the Credit River Provincial Park boundary and some adjacent private lands. There is also a refinement in the southeast to make the ANSI boundary coincide with a forest edge that is also the eastern boundary for the Dufferin Lake life science ANSI. A road and parking lots/picnic areas should not be built in the ANSI as proposed in the park management plan."

Potential impacts of the proposed pit on the Caledon Meltwater Deposits Earth Science ANSI are discussed further in **Section 13.5**.

11.0 SUMMARY OF SIGNIFICANT NATURAL HERITAGE FEATURES

Based on the review of available background information and mapping, and on the results of the detailed ecological field surveys completed for the study area, the following significant natural heritage features have been identified:

- Habitat for Endangered and Threatened Species:
    - Red-headed Woodpecker (Endangered)
    - Bank Swallow (Threatened)
    - Bobolink (Threatened)
    - Eastern Meadowlark (Threatened)
    - Least Bittern (Threatened)
    - Northern myotis (Endangered)

- Significant Wetlands
    - Wetland W1
- Significant Woodlands
- Significant Wildlife Habitat
    - Amphibian Breeding Ponds (Wetlands U1, U2 and W1)
    - Habitat for Special Concern species: snapping turtle, Barn Swallow, Eastern Wood-Pewee and Grasshopper Sparrow
    - Habitat for plant species identified as rare or significant within a planning authority's jurisdiction: Giant Burreed, Greenish Sedge, Sprengel's Sedge, Variegated Scouring-rush and Wood's Sedge
    - Habitat for Orchard Oriole identified as rare or significant within a planning authority's jurisdiction
- Significant Areas of Natural and Scientific Interest (ANSI)
    - Caledon Meltwater Deposits – Forks of the Credit Earth Science ANSI

The potential effects on significant natural heritage features are discussed in **Section 13.0**.

12.0 DESCRIPTION OF THE PROPOSED EXTRACTION, OPERATIONAL PLAN AND REHABILITATION PLAN

12.1 Description of Proposed Extraction and Operational Plan

Figure 14 provides highlights from the Operation Plan, including phasing, tree screens, silt fence layout, etc.

Section 3.0 of MHBC's *Planning Justification Report & ARA Summary Statement* (MHBC 2024) provides the following description of the Pit 3 Extension and the Operational Plan:

> *"Lafarge owns and operates the existing Pit 3 located on the East Half of Lot 13, Concession 5 W.H.S, Town of Caledon, Region of Peel. The pit is located approximately 6.5 kilometres southwest of Caledon Village and approximately 3 kilometres northeast of the Town of Erin. The pit is located on the west side of Mississauga Road. Pit 3 (Licence No. 6525) has an approved licence area of 37.47 hectares and an approved extraction area of 32.01 hectares."*
>
> *"Pit 3 is an existing Class A mineral aggregate operation permitted for below water table extraction and is licenced to ship unlimited tonnage annually. The existing Pit 3 processing areas are maintained on the pit floor at approximately 395 masl and are located near the extraction areas. Pit 3 is permitted to extract below the water table to an elevation of 373.4 masl."*
>
> *"Once the aggregate is processed in the existing Pit 3, it is shipped via the existing Pit 3 entrance/exit on Mississauga Road. The existing haul route is north on Mississauga Road and predominately east on Highway 24 (Charleston Sideroad)."*

“The approved rehabilitation plan for Pit 3 includes a lake and vegetated shorelines. The final lake elevation will be +/- 389 masl with final slopes being a minimum of 3:1.”

“Lafarge owns lands located immediately west of the existing Pit 3 and proposes to extend the existing pit onto these lands. The extension lands are legally described as Part Lot 13, Concession 5 West Site of Centre Road or Communication Street, Town of Caledon, Region of Peel and municipally known at 17823 Shaws Creek Road.”

“The area proposed to be licenced under the Aggregate Resources Act is 25.6 hectares and the proposed extraction area is 20.8 hectares. The remaining 4.7 hectares are included within the licenced area but are not proposed to be extracted and will be used for regulatory setbacks, environmental buffers, vegetated acoustic and visual berms, tree screens and monitoring wells.”

“The Pit 3 Extension proposes to extract sand and gravel above the established water table. Extraction, processing and shipping within the extension is proposed to occur within the maximum permitted hours of 7am to 7pm, Monday to Saturday and shipping is being permitted to commence at 6am Monday to Saturday subject to limitations on equipment and the amount of trucks.”

“The site contains approximately 3 million tonnes of aggregate and the maximum proposed tonnage that can be extracted from the site in any given calendar year is 1 million tonnes.”

“Aggregate from the Pit 3 Extension will be processed, stockpiled and loaded in highway trucks entirely within the proposed Pit 3 Extension. Highway trucks will enter / exit the proposed extension using the Pit 3 entrance / exit and inter-pit roads to access the extension. Within Pit 3 there will not be any activity related to production of aggregate from the Extension lands. Pit 3 will only be used by highway trucks to access the Pit 3 Extension to avoid establishing a new entrance / exit and haul route on Shaws Creek Road.”

“An existing agricultural entrance/exit to the extension lands on Shaws Creek Road will be maintained and utilized throughout the life of the operation for access for monitoring and for agricultural purposes. Aggregate trucks will not be permitted to use this entrance / exit.”

“The Pit 3 Extension is proposed as an extension to the existing Pit 3 with extraction proposed to commence in the northeast portion along the eastern boundary of the site adjacent to the existing Pit 3. Extraction of the extension is proposed to be operated in one lift across the site and has been divided into four phases.”

“The first stage of the pit development involves stripping a sufficient area of topsoil and overburden to be used in site mitigation measures such as landscaped visual and acoustic berms. Future stripping will be phased and only the required area for extraction will be stripped to minimize site disturbance and maximize on-going agricultural operations.”

“Phase 1 will start in the northeastern portion of the site, along the eastern boundary and proceed from east to west. Phase 2 will begin along the southern edge of the Phase 1 limits and proceed south along the remaining portion of the eastern boundary. Phase 2 will then proceed from east to west through the middle section of the site. Phase 3 will proceed in a westerly direction from the edge of Phase 2 limits towards the western boundary. Phase 4 is the final phase to be extracted…”

“The maximum depth of extraction for the proposed extension is to the established water table, which ranges from approximately 389 masl at the southeastern boundary to approximately 390.4 masl at the northern boundary.”

“Extraction equipment on site typically includes three to four loaders (2-3 loaders for production and 1 for shipping), and pit trucks or conveyors to transfer the extracted aggregate from the active pit face to the processing area.”

“The processing plant typically consists of one portable screening plant and one portable crushing plant. However, to ensure Lafarge can meet periods of peak demand, the site has been designed to permit a total of three plants, consisting of either two portable screening plants and one portable crushing plant, or one portable screening plant and two portable crushing plants.”

“Throughout the life of the operation, the processing plant will operate within Phase 1 and aggregate stockpiles will be located within a portion of Phase 2. Aggregate from the active pit face will be extracted with loader machinery and equipment, and transported to the processing plant by a conveyor and/or haul trucks. Unprocessed material is permitted to be stockpiled within Phase 2, along the border of Phase 1 and processed material may be stockpiled and shipped from within Phase 1 or 2. The processing areas will be maintained on the pit floor with the exception of the start of Phase 1 when the processing area will be set at the current grade, with mitigation measures until enough of a footprint is extracted to relocate the processing plant on the pit floor.”

“Operational controls such as setbacks, restrictions on the type and location of equipment, and requirements for berms have been incorporated into the Aggregate Resources Act Site Plans based on recommendations of the various technical reports. These mitigation measures will ensure the proposed Pit 3 Extension does not result in unacceptable impacts on surrounding land uses…”

“The maximum disturbed area of the proposed Pit 3 Extension will not exceed 21 hectares. Maximum disturbed area as defined by the Ministry of Natural Resources and Forestry includes lands that have been stripped for future extraction, the active extraction area, inter pit haul routes, berms (even when vegetated) and areas of progressive rehabilitation where final rehabilitation has not been achieved.”

“See the Aggregate Resources Act Site Plans for additional details regarding the operational and rehabilitation design.”

The phases for the proposed Pit 3 Extension vary in size, as listed below:

- Phase 1A: 3.3 ha
- Phase 1B: 1.4 ha
- Phase 2A: 3.5 ha
- Phase 2B: 3.0 ha
- Phase 2C: 4.2 ha
- Phase 3: 3.8 ha
- Phase 4: 1.6 ha

- Total Extraction Area: 20.8 ha

12.2 Natural Environment Notes and Details for the Operational Plan and Rehabilitation Plan

GEC provided the following natural environment notes and details for inclusion on the Site Plans for the Pit 3 Extension. Refer to **Figures 14** (Operational Plan) and **15** (Rehabilitation Plan).

12.2.1 General Approach

The proposed Pit 3 Extension will require some relatively minor tree removals from internal hedgerows and along the common boundary with existing Pit 3, and some small tree clusters of early successional species such as Manitoba Maple and Trembling Aspen. The rehabilitation of the Pit 3 Extension will result in the reforestation of 10.0 ha which will be contiguous with the Significant Woodland to the northwest and provide a linkage between Core Areas to the northwest and east.

Wetland U3 will be enhanced by constructing two small amphibian breeding pools adjacent to it, reforesting approximately 4.3 ha around it and placing habitat features such as rock piles and woody debris throughout these areas.

An enhanced northwest – southeast 55 m wide linkage will also be created as part of the final rehabilitation for the site. The linkage will be created by providing new habitat structures (e.g., rock piles, logs, woody debris, etc.) and reforestation.

Table 7 provides a summary of the proposed Rehabilitation Plan units.

12.2.2 Silt Fencing Layout

As shown on **Figure 14**, silt fencing shall be implemented to protect Wetland U3 (wetland protection and adjacent to the Significant Woodland in the north corner of the site (woodland protection).

12.2.3 Timing of Tree-clearing and Stripping Operations

Tree-clearing operations shall take place outside of the breeding bird season and bat activity period, i.e., cutting shall take place between December 1 and March 14.

In the area identified as habitat for Bobolink and Eastern Meadowlark on **Figure 10**, stripping shall take place outside of the breeding bird season to avoid contravening Section 9 (Species

Protection) of the Endangered Species Act, i.e., stripping shall not occur in Bobolink and Eastern Meadowlark habitat between April 5 and August 27. These dates are taken from Environment and Climate Change Canada's *Nesting Periods* webpage for open country bird species nesting in Zone C2, where the Pit 3 Extension is located.

12.2.4 Habitat Features

Rock Piles

During clearing and stripping operations, piles of weathered field stones along old fence lines shall be salvaged and repurposed as rock piles in selected reforestation areas. Oversize material from Pit 3 operations may also be used for this purpose.

Rock piles shall have a minimum footprint of 2 m x 2m and a minimum height of 1 m, to provide habitat for snakes, small mammals and other wildlife. As a general guideline, rock piles shall be established in reforestation areas at a minimum density of 10 rock piles per hectare.

Woody Debris Piles (logs, stumps, root wads, brush piles)

Non-merchantable timber and root wads shall be salvaged and used for restoration and rehabilitation purposes. Upper limbs and branches may be cut up for use in brush piles. Logs and root wads shall be integrated into selected reforestation areas. As a general guideline, root wads and/or large logs shall be installed at a minimum density of 15 root wads and/or large logs per hectare. Each "woody debris pile" shall include at least one of the following:

- 1 large stump/root wad partially keyed into the ground; or,
- 5 or 6 logs (0.9 m to 1.2 m length [3' to 4'] or larger; at least 0.3 m [1'] in diameter) in a pile; or,
- Brush pile 2m x 2m x 1m high, with 1 or 2 logs in centre.

Some upper limbs and branches may be chipped for use as mulch for tree-planting.

12.2.5 Amphibian Breeding Pools

Two small amphibian breeding pools shall be created within Area 1A, immediately adjacent to Wetland U3. The pools shall be excavated into the seasonally high water table such that they contain standing water at least until around mid-July in an average year.

At least 3 rock piles and 5 stumps/logs shall be installed around each amphibian breeding pool that is constructed.

Wetland plant species shall be seeded and/or planted as plugs and/or rootstock, as selected from the following list:

- Common Arrowhead (*Sagittaria latifolia*)
- Water-plantain (*Alisma plantago-aquatica*)
- Softstem Bulrush (*Schoenoplectus tabernaemontani* [*Scirpus validus*])
- Dark Green Bulrush (*Scirpus atrovirens*)
- Cyperus-like Sedge (*Carex pseudo-cyperus*)
- Porcupine Sedge (*Carex hystericina*)
- Swamp Milkweed (*Asclepias incarnata*)

- Spotted Joe-pye-weed (*Eutrochium maculatum* [*Eupatorium maculatum*])
- Boneset (*Eupatorium perfoliatum*)
- Blue Flag Iris (*Iris versicolor*)
- Blue Vervain (*Verbena hastata*)

Depending on availability of the wetland plant species listed above, other suitable native, non-invasive wetland plant species may be substituted if necessary.

The two amphibian breeding pools shall be excavated later in the year (September-November window) and this shall occur prior to the commencement of site preparation activities in Phase 2. Input from a qualified hydrogeologist is required in order to determine the correct depth of excavation, in order to create a suitable hydroperiod for each of the two pools based on the monitoring data available prior to construction. Input from a qualified ecologist is required to direct the shaping and grading of each pool, the placement of rocks and woody debris, and the establishment of wetland plants.

12.2.6 Reforestation Areas

Tree-planting – General Planting Scheme

- Tree plugs and/or 1-gallon container stock should be planted with 2.5m x 2.5m spacing (1,600 seedlings per hectare). Shrubs shall not account for more than 5% of the 1,600 seedlings per hectare. During the first year of establishment, plantings shall be watered and fresh mulch shall be added on an as needed basis.

- The long-term survivorship target is 1,000 trees/shrubs per hectare (62.5% survivorship). Following the second year after an initial planting, any dead seedlings within a reforestation area should be replaced in the next spring or fall planting season. The species selections for replacement plantings may vary depending on which species are performing better within a particular unit.

- The reforestation areas are identified as Areas 1 and 2 on the Rehabilitation Plan. Areas 1 and 2 are divided into smaller units (1A, 1B, 1C & 1D, 2A, 2B, 2C & 2D). See **Figure 15**. Planting details are provided below for each unit.

Tree-planting – Nodal Planting Scheme (Area 2D)

- Each node shall be approximately 300 m^2 in size (typically 10m x 30 m). The nodal plantings are intended to establish patches of successional woodland that will contribute to the seed bank and also spread clonally, which will encourage natural regeneration to a woodland condition.

- 30 planting nodes shall be established in Area 2D.

- Trees shall be planted as 1-gallon container stock with 3.0 m x 3.0 m spacing.

- One (1) shrub (plug or 1-gallon container stock) shall be planted for every 2 trees that are planted.

- Each node shall contain at least 42 trees and 21 shrubs.

- During the first year of establishment, plantings shall be watered and fresh mulch shall be added on an as needed basis.

Area 1A (1.3 ha)

- Two small amphibian pools shall be constructed adjacent to Wetland U3 (see above for details).

- Silt fencing shall be installed around Area 1A prior to the construction of the acoustic berm adjacent to the Trailway and/or prior to any Phase 1 site preparation activities within 120 m of Wetland U3, whichever occurs first. Silt fencing shall be removed once Area 1B has been rehabilitated and it has stabilized.

- Prior to the commencement of tree-planting, 13 rock piles and 20 woody debris piles shall be placed within this unit.

- Tree-planting in this unit shall occur in the spring and/or fall planting windows prior to the commencement of site preparation activities in Phase 2.

- Trees and shrubs to be planted at 1,600/ha in Area 1A shall be selected from the following species list:

    - Balsam Poplar (*Populus balsamifera*)
    - Bur Oak (*Quercus macrocarpa*)
    - Freeman's Maple (*Acer* X *freemanii*)
    - Silver Maple (*Acer saccharinum*)
    - Trembling Aspen (*Populus tremuloides*)
    - White Cedar (*Thuja occidentalis*)
    - Highbush Cranberry (*Viburnum trilobum*)
    - Nannyberry (*Viburnum lentago*)
    - Red-osier Dogwood (*Cornus sericea*)
    - Other suitable species native to the Credit River Watershed

Area 1B (2.2 ha)

- Fine grading in this unit shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

- Prior to the commencement of tree-planting, 22 rock piles and 33 large pieces of woody debris shall be placed within this unit.

- Trees and shrubs to be planted at 1,600/ha in Area 1B will be selected from the following species list:

    - Balsam Poplar (*Populus balsamifera*)
    - Basswood (*Tilia americana*)
    - Bur Oak (*Quercus macrocarpa*)
    - Red Maple (*Acer rubrum*)
    - Trembling Aspen (*Populus tremuloides*)
    - White Cedar (*Thuja occidentalis*)
    - White Pine (*Pinus strobus*)

- Highbush Cranberry (*Viburnum trilobum*)
- Nannyberry (*Viburnum lentago*)
- Other suitable species native to the Credit River Watershed

- An upland native seed mix should be applied in this area (see below). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Area 1C (0.8 ha)

- Area 1C is located within the 15 m property setback adjacent to the Trailway. An acoustic berm will be constructed in this area. As part of the final rehabilitation, the berm will be removed and the area shall be reforested.

- Trees to be planted in Area 1C shall be selected from the following species list:

  - Black Cherry (*Prunus serotina*)
  - Bur Oak (*Quercus macrocarpa*)
  - Red Maple (*Acer rubrum*)
  - Red Oak (*Quercus rubra*)
  - Sugar Maple (*Acer saccharum* ssp. *saccharum*)
  - Trembling Aspen (*Populus tremuloides*)
  - White Cedar (*Thuja occidentalis*)
  - White Pine (*Pinus strobus*)
  - Alternate-leaved Dogwood (*Cornus alternifolia*)
  - Chokecherry (*Prunus virginiana*)
  - Other suitable species native to the Credit River Watershed

- An upland native seed mix shall be applied in these areas (see below). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Area 1D (0.3 ha)

- Area 1D is the buffer to the Significant Woodland in the north corner of the site. It shall be planted within 18 months of commencement of site preparation in Phase 1A.

- Trees to be planted in Area 1D shall be selected from the following species list:

  - Black Cherry (*Prunus serotina*)
  - Bur Oak (*Quercus macrocarpa*)
  - Red Maple (*Acer rubrum*)
  - Red Oak (*Quercus rubra*)
  - Sugar Maple (*Acer saccharum* ssp. *saccharum*)
  - Trembling Aspen (*Populus tremuloides*)
  - White Cedar (*Thuja occidentalis*)
  - White Pine (*Pinus strobus*)
  - Alternate-leaved Dogwood (*Cornus alternifolia*)
  - Chokecherry (*Prunus virginiana*)
  - Other suitable species native to the Credit River Watershed

- An upland native seed mix shall be applied in these areas (see below). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Area 2A (1.6 ha)

- Fine grading in this unit shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

- Prior to the commencement of tree-planting, 16 rock piles and 24 large pieces of woody debris shall be placed within this unit.

- Trees to be planted in Area 2A shall be selected from the following species list:

    - Bur Oak (*Quercus macrocarpa*)
    - Red Maple (*Acer rubrum*)
    - Red Oak (*Quercus rubra*)
    - Sugar Maple (*Acer saccharum* ssp. *saccharum*)
    - White Cedar (*Thuja occidentalis*)
    - White Pine (*Pinus strobus*)
    - Alternate-leaved Dogwood (*Cornus alternifolia*)
    - Chokecherry (*Prunus virginiana*)
    - Other suitable species native to the Credit River Watershed

- An upland native seed mix shall be applied in this area (see below). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Area 2B (1.1 ha)

- Fine grading in this unit shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

- Prior to the commencement of tree-planting, 11 rock piles and 17 large pieces of woody debris shall be placed within this unit.

- Trees to be planted in Area 2B shall be selected from the following species list:

    - Bigtooth Aspen (*Populus grandidentata*)
    - Black Cherry (*Prunus serotina*)
    - Bur Oak (*Quercus macrocarpa*)
    - Red Maple (*Acer rubrum*)
    - Red Oak (*Quercus rubra*)
    - Sugar Maple (*Acer saccharum* ssp. *saccharum*)
    - Trembling Aspen (*Populus tremuloides*)
    - White Birch (*Betula papyrifera*)
    - White Cedar (*Thuja occidentalis*)
    - White Pine (*Pinus strobus*)
    - Alternate-leaved Dogwood (*Cornus alternifolia*)
    - Chokecherry (*Prunus virginiana*)
    - Other suitable species native to the Credit River Watershed

- An upland native seed mix shall be applied in this area (see below). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Area 2C (0.2 ha)

- Fine grading in this unit shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

- Trees to be planted in Area 2C shall be selected from the following species list:

    - Black Cherry (*Prunus serotina*)
    - Red Maple (*Acer rubrum*)
    - Sugar Maple (*Acer saccharum* ssp. *saccharum*)
    - White Cedar (*Thuja occidentalis*)
    - White Pine (*Pinus strobus*)
    - Alternate-leaved Dogwood (*Cornus alternifolia*)
    - Chokecherry (*Prunus virginiana*)
    - Other suitable species native to the Credit River Watershed

- An upland native seed mix shall be applied in this area (see below). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Area 2D – Nodal Planting Area (2.5 ha)

- Fine grading in this unit shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

- Planting scheme follows nodal planting approach (see above). Each node shall be approximately 300 m^2 in size (typically 10m x 30 m). 30 planting nodes shall be established in Area 2D.

- Trees to be planted in Area 2D shall be selected from the following species list:

    - Bigtooth Aspen (*Populus grandidentata*)
    - Trembling Aspen (*Populus tremuloides*)
    - White Birch (*Betula papyrifera*)
    - White Cedar (*Thuja occidentalis*)
    - White Pine (*Pinus strobus*)
    - Alternate-leaved Dogwood (*Cornus alternifolia*)
    - Chokecherry (*Prunus virginiana*)
    - Gray Dogwood (*Cornus racemosa*)
    - Staghorn Sumac (*Rhus typhina*)
    - Other suitable species native to the Credit River Watershed

- An upland native seed mix shall be applied in this area (see below). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Monitoring – General Planting Scheme

The reforestation areas shall be monitored for at least two (2) growing seasons after planting. Any dead seedlings within a general reforestation area shall be replaced in the subsequent spring or fall planting season following the second season of monitoring. The long-term survivorship target is 1,000 trees per hectare (62.5% survivorship). The species selections for

replacement plantings may vary depending on which species are performing better within a particular unit.

Monitoring – Nodal Planting Scheme

The nodal planting reforestation areas shall be monitored for at least two (2) growing seasons after planting. Any dead seedlings within a nodal reforestation area shall be replaced in the subsequent spring or fall planting season following the second season of monitoring. The long-term survivorship target is 26 trees per node (62.5% survivorship) and 13 shrubs per node (62.5% survivorship). The species selections for replacement plantings may vary depending on which species are performing better within a particular unit.

12.2.7 Seed Mixes

Upland Native Seed Mix

- An upland native seed mix shall be applied in Areas 1B, 1C, 1D, 2A, 2B, 2C and 2D to establish groundcovers in the reforestation areas.

- The upland native seed mix shall comprise 40% Canada Wild-rye (*Elymus canadensis*) and 40% Virginia Wild-rye (*Elymus virginicus*). The remaining 20% of the seed mix will be selected from the following species list:

    - Canada Anemone (*Anemone canadensis*)
    - Common Milkweed (*Asclepias syriaca*)
    - Grass-leaved Goldenrod (*Euthamia graminifolia*)
    - Wild Bergamot (*Monarda fistulosa*)
    - Foxglove Beardtongue (*Penstemon digitalis*)
    - Black-eyed Susan (*Rudbeckia hirta*)
    - Early Goldenrod (*Solidago juncea*)
    - Gray Goldenrod (*Solidago nemoralis*)
    - New England Aster (*Symphyotrichum novae-angliae* [*Aster novae-angliae*])
    - Arrow-leaved Aster (*Symphyotrichum urophyllum* [*Aster urophyllus*])
    - White Vervain (*Verbena urticifolia*)
    - Other suitable species native to the Credit River Watershed

Other suitable native plant species may also be seeded or planted as appropriate, subject to availability.

A nurse crop such as Winter Rye or Oats may be required, depending on the timing of seeding activities.

12.3 Rehabilitation Plan

The proposed rehabilitated landform is shown on **Figure 15**. Refer to the Site Plans for the detailed Rehabilitation Plan. The notes and details provided in **Section 12.2** above were incorporated in the Site Plans, including the Operational Plan and Rehabilitation Plan.

Section 3.0 of MHBC's *Planning Justification Report & ARA Summary Statement* (MHBC 2024) provides the following description of the Pit 3 Extension Rehabilitation Plan:

"The site is located within the Greenbelt Natural Heritage System, which requires rehabilitation of the site to be progressive, and restored to agricultural and natural heritage end uses. As required by the Greenbelt Plan, a minimum of 35% of the site will be forested, while other areas of the site will be rehabilitated to an agricultural condition... Overall, the rehabilitation plan results in a final landform for the proposed Pit 3 Extension licence area that consists of 15.1 hectares of agricultural land and 10.5 hectares of natural heritage features."

"The rehabilitation plan of the proposed extension includes the importation of excess soils to restore the site to agricultural and to grade the site to enhance the catchment area for the retained wetland area… Areas 1A, 1B, 1C, 1D, 2A, 2B, 2C and 2D will be rehabilitated to a woodland condition that will expand and improve connectivity of adjacent key natural heritage features. As part of the rehabilitation of Area 1A, the existing wetland will be enhanced and two amphibian pools will be created to enhance amphibian habitat. The remainder of the site will be rehabilitated back to an agricultural condition. The final landform for the Pit 3 Extension will include the following the landforms:

- *Agricultural land – 15.1 hectares*
- *New Woodland - 10.0 hectares*
- *Existing Significant Woodland – 0.1 hectares*
- *Existing wetland 0.3 hectares*
- *New amphibian breeding pools - 0.1 hectares"*

13.0 POTENTIAL EFFECTS ON SIGNIFICANT NATURAL HERITAGE FEATURES

13.1 Potential Effects on Habitat of Endangered and Threatened Species

Least Bittern

Habitat for the Least Bittern is confined to the Wetland U2 ponds. This is an obligate marsh species that would not be expected to occur elsewhere within the study area. The Wetland U2 ponds are distant from the proposed extraction area, so there will be no direct effects on the Least Bittern or its habitat.

As described previously, the Wetland U2 ponds are rather marginal breeding habitat for the Least Bittern. They appear to be suitable only in years with exceptionally high rates of spring precipitation that keeps pond levels high. In years of normal or lower than normal precipitation, these ponds are unsuitable habitat due to the lack of water under most of the emergent vegetation.

WSP Associates Ltd. (2024) conducted the Level 1 and 2 Hydrogeology and Hydrology Report for the site. During operations, no dewatering or pumping will occur. The Wetland U2 ponds and other wetlands northwest of the Trailway are upgradient of the proposed extraction area from a hydrogeological perspective. No drawdown of these wetlands is anticipated under either operation or rehabilitation scenarios (WSP 2024).

It is concluded that there will be no direct or indirect effects on the Least Bittern or its habitat as a result of the proposed extraction activities. The Wetland U2 ponds will have the potential to continue to support this species in years when water levels are high. Because the Least Bittern is a rare species with a spotty distribution, it is possible that it may be absent even in years when conditions are suitable for it.

Red-headed Woodpecker

The Red-headed Woodpecker nested within the study area in one of the five years in which breeding bird surveys were undertaken. Nesting was confirmed in the woodland northwest of the Trailway. Most of its activity was confined to this area, but it occasionally foraged in trees along the trail.

It is concluded that extraction activities will have no effect on the Red-headed Woodpecker or its habitat. The nest was distant from the extraction area within the forest. Where it occasionally foraged in trees along the trail was within the setback to the extraction area. The setback is quite wide at most of this location because of the presence of Wetland U3, so no extraction is proposed immediately adjacent to the foraging area. The critical habitat for the woodpecker is the nest site and the surrounding forest. Areas that are casually used for foraging are not mapped as habitat. Woodpeckers foraging along the trail are more likely to be disturbed by humans using the trail than by extraction activities.

Bank Swallow

The Bank Swallow nests at the existing Pit 3 are about 175 m from the eastern boundary of the proposed extension. Consequently, portions of the site are within the 500 m that have been identified as foraging habitat for this species under the ESA. This is Category 3 habitat where there it is expected to have high tolerance to site alterations. The habitat is used for aerial foraging, so the habitat is above ground. Although this swallow was occasionally observed foraging over the extraction area, it occurred predominantly over U2 and other open habitats northwest of the Trailway. Wetlands and water bodies are a much richer source of invertebrates for foraging than terrestrial habitat. Agricultural lands typically support low populations of invertebrates because of the monotypic vegetation that is treated to reduce insect numbers.

It is concluded that the proposed extraction will have no effects on foraging habitat for the Bank Swallow. The area above the extraction area will still support aerially flying insects so there will be no effect on potential prey for it.

Bobolink and Eastern Meadowlark

The existing Bobolink and Eastern Meadowlark habitat will largely be removed as a result of the proposed extraction. According to the Greenbelt Plan:

> "*An application requiring a new approval under the* Aggregate Resources Act *to expand an existing mineral aggregate operation may be permitted in the Natural Heritage System, including in key natural heritage features, key hydrologic features and in any associated vegetation protection zones, only if the related decision is consistent with the PPS and satisfies the rehabilitation requirements of this section.*"

Part IV of Ontario Regulation 830/21 permits development within Bobolink and Eastern Meadowlark habitat provided that the site is registered under the ESA and appropriate alternate

habitat is created for the Bobolink and Eastern Meadowlark. The habitat that is created may be anywhere within the same Ecoregion, which is Ecoregion 6E in this case.

Prior to any site alteration from occurring within the habitat area, the proponent may wish to undertake further surveys for Bobolink and Eastern Meadowlark. Depending on how much time passes, natural succession in the habitat area may render it unsuitable for these grassland bird species. Three (3) consecutive years of negative survey results are required in order to conclude that Bobolink and Eastern Meadowlark are absent from an area.

Otherwise, for the Bobolink and Eastern Meadowlark, it is recommended that the site/activity be registered and at least 1.5 times the amount of suitable habitat be created elsewhere for these threatened species. All the requirements within Part IV of Ontario Regulation 830/21 must be satisfied including submitting a notice of activity prior to commencing any work, preparing a management plan, creating habitat of suitable composition and size, conducting the required maintenance after habitat construction, and keeping all records as stipulated.

Provided the requirements of Part IV of Ontario Regulation 830/21 (see **Attachment F**), as amended from time to time, are followed, there will be no negative impact on Bobolink and Eastern Meadowlark or their habitat. Alternatively, the proponent may choose to pay a "species conservation charge" to the Species at Risk Conservation Fund, per Ontario Regulation 829/21 (Species Conservation Charges).

Northern Myotis

The habitat that was identified for the northern myotis consists of the deciduous forest northwest of the Trailway. This species was detected acoustically within the woodlot. At the very least, the species forages under the canopy of the forest and there is the potential that it also roosts there.

The northern myotis also undoubtedly also forages in open areas within the study area.

The proposed extraction will have no effect on habitat of the northern myotis. The woodlot will be left intact with no disturbance occurring within it. The northern myotis may potentially forage over lands that will be extracted, but this will not affect its foraging habitat. In this event, its foraging habitat would essentially be above the extraction activities.

To ensure that no effects occur to roosting northern myotis and other bat species, tree cutting shall be restricted to the period from December 1 to March 14. This will also protect breeding bird species and ensure compliance with the requirements of the *Migratory Birds Convention Act* and/or the *Fish and Wildlife Conservation Act*.

13.2 Potential Effects on Significant Wetlands

Wetland W1 is located 110 m away from the site at the closest point. It is upgradient of the site in terms of the groundwater contour mapping included in WSP's (2024) *Proposed Lafarge Pit No. 3 Extension: Level 1 and 2 Hydrogeology and Hydrology Report.*

As noted in the WSP report, the proposed pit is above the established water table; no permanent pit pond will be formed, and no dewatering will be required. As such, no groundwater drawdown or water level decline is expected and off-Site wetlands will not be adversely impacted.

It should be noted that although Wetlands U1 and U2 are not presently identified as Provincially Significant Wetlands, they will not be adversely affected by the proposed extraction.

13.3 Potential Effects on Significant Woodlands

As shown on **Figure 10**, a very small portion of Significant Woodland encroaches onto the site by a few metres in the northwest corner of the site. This woodland shall be protected by a minimum 10 m buffer with a silt fence installed within 1.0 m of the limit of extraction, on the buffer side of the limit. The buffer will be retired from its current agricultural use and planted with native trees and shrubs.

A second area is mapped within the Region's Greenlands System that is to the east and southeast (see **Figure 2**), touching the property line only in the east corner of the site. As shown on **Figure 3**, the area offsite to the east was mainly conifer plantations that were harvested in recent years. It appears that the remnant hedgerows and minor strips of remaining conifers would not ordinarily be mapped as Significant Woodland based on current conditions. Nevertheless, the remaining trees will be protected by the 15 m property setback required on the Site Plans.

The Rehabilitation Plan for the Pit 3 Extension will result in the reforestation of 10.0 ha, all of which is contiguous with the two areas included within the Region's Greenlands System (see **Figure 15**). Reforestation will ultimately cover approximately 39.1% of a site that presently contains only a few hedgerows.

There will be no negative effects on Significant Woodlands as a result of the proposed Pit 3 Extension. Forest cover will increase with the implementation of the Pit 3 Extension Rehabilitation Plan.

13.4 Potential Effects on Significant Wildlife Habitat

This section provides a discussion of the potential effects on significant amphibian breeding ponds and species of conservation concern.

13.4.1 Significant Amphibian Breeding Ponds

The three significant amphibian breeding ponds are all northwest of the Trailway. There will be no direct effects on these ponds and the hydrogeological and hydrology studies completed by WSP (2024) indicate that they will not be affected by drawdown.

The proposed extraction will not interrupt any amphibian movement corridors. There is no other amphibian breeding habitat south of the Trailway where amphibians might move among wetlands during different life stages. No amphibians were detected within the proposed extraction area.

13.4.2 Species of Conservation Concern

Snapping Turtle

The snapping turtle is confined to Wetlands U2 and W1 northwest of the Trailway. There will be no direct or indirect effects on these wetlands as a result of the proposed extraction.

The nesting locations for the snapping turtle (and Midland turtle) in the area are uncertain. It is possible that the exposed soils created due to extraction may attract nesting turtles. Therefore, silt fencing shall be installed until the northern portion of the pit is rehabilitated.

Barn Swallow

It is uncertain if there is actually any Barn Swallow habitat on the subject lands. To err on the conservative side, it has been concluded that any building within 200 m of the site has the potential to support nesting Barn Swallows. There is no nesting habitat on site or immediately (within 5 m) adjacent to it, so any potential habitat would be Category 3 habitat using the habitat categorization from the Barn Swallow General Habitat Description that formerly applied when the species was listed as Threatened in Ontario and protected under the *Endangered Species Act*. The Barn Swallow is expected to have high tolerance to site alterations within Category 3 habitat.

The Category 3 swallow habitat is used for aerial foraging, so the habitat is above ground. Even if there is habitat on the subject lands, the proposed extraction area is beneath the habitat. The area above the extraction area will still support aerially flying insects so there will be no effect on potential prey for the Barn Swallow. It is concluded that there will be no effect of extraction activities on Barn Swallow habitat in the event that there actually is habitat over the extraction area.

Eastern Wood-Pewee

Significant populations of the Eastern Wood-Pewee occurred only in the deciduous woodland northwest of the Trailway. This area will not be disturbed during the extraction activities. There will be no effect on the Eastern Wood-Pewee as a result of the proposed pit extension.

Grasshopper Sparrow

The existing habitat for the Grasshopper Sparrow will be removed as a result of the extraction. Because the application is for an extension of an existing pit, Policy 4.3.2, subsection 3.c of the Greenbelt applies. This allows development within the natural heritage system as well as in significant natural heritage features.

In order to satisfy this policy, equivalent or better habitat shall be provided for the Grasshopper Sparrow elsewhere. Based on habitat requirements, the same area where habitat is created for the Bobolink and Eastern Meadowlark will provide suitable habitat for the Grasshopper Sparrow. In order to accommodate the Grasshopper Sparrow's requirement for bare soil, small patches (~10 m^2) where there will be limited vegetation cover should be provided. It is recommended that these be placed near edges of the field in areas that may be avoided by the Bobolink under normal circumstances so that it does not affect the overall habitat suitability of the area for this species.

As a result, there will be no negative impact on the overall Grasshopper Sparrow population.

Species Considered Rare or Significant Within a Planning Authority's Jurisdiction

The habitats of five vascular plant species considered rare in Peel Region and/or the Credit River watershed (CVC 2002a) were identified as Significant Wildlife Habitat for species considered rare or significant within a planning authority's jurisdiction.

Greenish Sedge and Variegated Scouring-rush occur in Wetland U2, which will not be affected by the proposed Pit 3 Extension, as described in **Section 13.2**. Giant Burreed occurs in Wetland W1, which is a Significant Wetland that will not be affected, as described in **Section 13.2**. Sprengel's Sedge and Wood's Sedge grows in several patches within the deciduous forest (Unit FOD5-9). Sprengel's Sedge also grows in several patches along the Trailway. Sprengel's Sedge and Wood's Sedge will not be affected by the proposed Pit 3 Extension, as described in **Section 13.3**.

Habitat for the Orchard Oriole was identified as Significant Wildlife Habitat because it is considered rare in Peel Region and/or the Credit River watershed (CVC 2002b). This species nested only in 2018 in U3, which will be protected with a buffer from the extraction area. The Orchard Oriole exhibits very low site fidelity and rarely returns to the same nesting area in subsequent years. The proposed Pit 3 Extension will have no effect on the Orchard Oriole's habitat in the event that it returns to the site.

13.5 Potential Effects on Significant Areas of Natural and Scientific Interest

Provincially Significant Earth Science ANSIs are identified as *Natural Areas and Corridors* within Peel Region's Greenlands System and all Earth Science ANSIs are identified as *Supportive Natural Systems* and/or *Natural Linkages* within the Town of Caledon's Ecosystem Framework.

Approximately 11.8 ha of the Provincially Significant Caledon Meltwater Deposits Earth Science ANSI, as currently mapped by Lands Information Ontario (LIO), is located on the site (**Figures 2** and **13a**). However, OMNR (2013) recommended reducing the size of this ANSI to 448.5 ha. The boundary revisions proposed by OMNR (2013) would result in the site being excluded from this ANSI (**Figures 2** and **13b**). It is assumed that this is now an administrative matter within MNRF and that the LIO mapping will eventually be updated to reflect the recommendations of their own staff. The OMNR (2013) ANSI report is provided in **Attachment E**.

If this is not the case and the site is found to be partially within the ANSI boundary, the following should be considered:

- Extraction will only occur down to the established water table so a large fraction of the meltwater deposits will remain in place below the water table;
- Through progressive and final rehabilitation, the finished grades will be generally similar to the existing ones; and,
- The reforestation proposed as part of the Rehabilitation Plan will result in an enhanced northwest – southeast forested linkage that is 55 m wide (see **Figure 15**).

There will be no negative effects on Areas of Natural and Scientific Interest as a result of the proposed Pit 3 Extension.

14.0 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR PEEL CORE AREA AND TOWN OF CALEDON ENVIRONMENTAL POLICY AREA

14.1 Core Areas of the Region of Peel Greenlands System

Section 13.0 provided discussion on potential effects on significant natural heritage features, including Habitats of Endangered and Threatened Species, Significant Wetlands, Significant Woodlands and Significant Wildlife Habitat, etc. It was concluded that there will be no negative effects on significant natural heritage features if certain mitigative measures are implemented.

Core Areas of the Region of Peel Greenlands System are shown on **Figure 5**. The Core Area located northwest of the Trailway overlaps to varying extents with areas identified as Significant Wetlands (in part), Significant Woodlands and Significant Wildlife Habitat (in part). There will be no negative effects on these features and areas, as described in **Section 13.0**.

The Core Area located east of the site includes some conifer plantations. Immediately adjacent to the site the conifer plantation was harvested in recent years and only perimeter hedgerows remain. This Core Area will initially be protected by the 15 m property setback and ultimately be enhanced through the establishment of a 55 m wide linkage with the Core Area northwest of the Trailway. The Rehabilitation Plan on **Figure 15** shows that the 10.0 ha of reforestation that is proposed will be contiguous with the two Core Areas shown on **Figure 5**.

14.2 Town of Caledon Environmental Policy Areas

Town of Caledon Environmental Policy Areas are shown on **Figure 6**. The Environmental Policy Area located northwest of the site corresponds approximately to Wetland W1. This feature is located approximately 110 m away from the site at the closest point. **Section 13.2** considered potential effects on Significant Wetlands and it was concluded that there will be no negative impacts or effects as a result of the proposed Pit 3 Extension.

A second Environmental Policy Area is located southeast of the easternmost corner of the site; it is approximately 100 m away at the closest point. This feature will be protected by the 15 m property setback and 100 m separation from the site. Connectivity between this feature and the Environmental Policy Area northwest of the Trailway will ultimately be enhanced by the establishment of a 55 m wide linkage as shown on **Figure 15** (Rehabilitation Plan).

14.3 Wetland U3

Wetland U3 is an unevaluated wetland and, as such, may be identified under the Potential Natural Areas and Corridors of the Greenlands System in Peel.

Wetland U3 is a small (0.28 ha), highly disturbed feature, with limited spring inundation and very short hydroperiod, and it is relatively isolated from the other wetlands nearby. Wetland U3 is an artifact of past aggregate extraction and water generally pools in wheel ruts. See **Attachment B: Photos 31** to **34**.

Wetland U3 shall be protected during extraction with a minimum 15 m buffer and silt fencing (see **Figure 15**).

WSP (2024) mapped catchment areas for the site. Their Basin 101 includes the former borrow pit with relatively steep sideslopes, with Wetland U3 at the bottom, as well as portions of the adjacent active agricultural fields that are on higher ground with some flatter areas. The plough lines around the edges of the fields likely discourage overland flow into the old pit area and down to Wetland U3. **Figure 8** shows the topographic contours for the site. GEC's field observations indicate that the main catchment area for Wetland U3 primarily includes Phases 1B and 4. Phase 1B is relatively small (1.4 ha), while Phase 4 (1.7 ha) will remain in place until the final stages of extraction, when it can be promptly rehabilitated. The design of the pit rehabilitation is intended to restore and further enhance drainage to Wetland U3.

The temporary reduction in runoff to Wetland U3 is not a significant factor because the wetland does not support any sensitive ecological functions dependent on the maintenance of a certain

hydroperiod (e.g., amphibian breeding functions) and the dominant plant species are facultative species that can tolerate a wide range of moisture regimes (e.g., Sandbar Willow, Trembling Aspen, Reed Canary Grass, etc.). Following rehabilitation wetland function should improve due to the increased surface water contribution and the proposed enhancement and rehabilitation measures described in **Section 12.2.6**.

Following rehabilitation, the ecological function of Wetland U3 will be greatly enhanced over existing conditions due to the following:

- Enhanced wetland hydrology due to increase in surface water contribution to this wetland;
- The construction of deeper pools adjacent to the existing wetland which will contain standing water into the mid-summer at least, providing a hydroperiod suitable for early-breeding amphibians (e.g., Spring Peeper, American Toad, Gray Treefrog, etc.);
- Fine-grading of rehabilitation areas to create minor topographic variations;
- The placement of habitat features such as rock piles and stumps/woody debris which will provide microhabitats for a variety of small wildlife, including amphibians; and,
- Reforestation of approximately 4.3 ha around Wetland U3 using suitable native tree species.

As part of the Pit 3 Extension application, it is proposed to zone the area around Wetland U3 "Environmental Protection" to ensure its long-term protection.

14.4 Earth Science Areas of Natural and Scientific Interest (ANSI)

Provincially Significant Earth Science ANSIs are identified as *Natural Areas and Corridors* within Peel Region's Greenlands System and all Earth Science ANSIs are identified as *Supportive Natural Systems* and/or *Natural Linkages* within the Town of Caledon's Ecosystem Framework.

Please refer to **Section 13.5** for discussion on the provincially significant Caledon Meltwater Deposits – Forks of the Credit Earth Science ANSI. There will be no negative impact on this ANSI.

14.5 Cumulative Impact

WSP (2024) noted the following in Section 7.4 of their report with respect to cumulative impact:

> *"There are several aggregates operations in the vicinity of the Site; the most notable Lafarge Pit No. 3 to the immediate northeast. However, because the only significant hydrogeological / hydrological Site impacts are a result of catchment area changes with, and restricted to, the Site itself, no cumulative impacts are expected to occur."*

From an ecological perspective, there will be no negative impacts on significant natural heritage features and functions as described above in **Section 13.0** and ecological conditions overall will be enhanced, including:

- Overall reforestation of 10.0 ha, amounting to 39.1% of a site that currently only contains a few hedgerows, and the reforestation will be contiguous with the Core Areas to the northwest and east, as shown on **Figure 15**;

- Enhancements to Wetland U3 (improved wetland hydrology, creation of deeper pools suitable for amphibian breeding, placement of habitat features, adjacent reforestation of 4.3 ha, etc.);

- Creation of an enhanced northwest – southeast 55 m wide linkage as part of the final rehabilitation for the site. The linkage will be enhanced with new habitat structures (e.g., rock piles, logs, woody debris, etc.);

- Integration of the shoreline rehabilitation area on the existing Pit 3 Site Plans with the adjacent ecological linkage that will be created on the Pit 3 Extension (see Areas 2A, 2B, 2C and 2D on **Figure 15**); and,

- Improved landscape connectivity between the *Shaw's Creek Charleston North* and *Shaw's Creek Charleston South* (Dufferin Lake) natural areas.

15.0 AGGREGATE RESOURCES ACT SITE PLAN TECHNICAL RECOMMENDATIONS

Sections 12, 13 and **14** of this report include natural heritage recommendations for the Pit 3 Extension. The following is a complete list of site plan notes to be included on the Aggregate Resources Act (ARA) Site Plans Operational and Rehabilitation sheets. The references to Drawings in the notes below refer to the Aggregate Resources Act Drawings prepared by MHBC (2024).

OPERATIONAL PAGE

Natural Heritage Technical Recommendations

1. Wetland U3 shall be protected during extraction by a minimum 15 m buffer and silt fencing shall installed in the location shown on the plan view of this Drawing. See Area 1A rehabilitation notes on Drawing 3 of 4 for additional details.

2. The Significant Woodland in the northwest corner of the site shall protected by a minimum 10 m buffer with a silt fence installed within 1.0 m of the limit of extraction, on the buffer side of the limit. The location is shown on the plan view of this Drawing. The buffer will be retired from its current agricultural use and planted with native trees and shrubs. See Area 1D rehabilitation notes on Drawing 3 of 4 for additional details.

3. Silt fencing shall be installed as part of the north perimeter fencing and maintained until the northern portion of the pit is rehabilitated.

4. Prior to any site alteration within the area identified as habitat for Bobolink and Eastern Meadowlark identified on Drawing 1 of 4, the proponent may wish to undertake further surveys for Bobolink and Eastern Meadowlark. Depending on how much time passes, natural succession in the habitat area may render it unsuitable for these grassland bird species. Three (3) consecutive years of negative survey results are required in order to conclude that Bobolink and Eastern Meadowlark are absent from an area.

5. Prior to any site alteration within the area identified as habitat for Bobolink and Eastern Meadowlark identified on Drawing 1 of 4, as may be modified based on Note 4 above, at least 1.5 times the amount of suitable habitat be created elsewhere for these threatened

species. All of the requirements within Part IV of Ontario Regulation 830/21 must be satisfied including submitting a notice of activity prior to commencing any work, preparing a management plan, creating habitat of suitable composition and size, conducting the required maintenance after habitat construction, and keeping all records as stipulated. Alternatively, the proponent may choose to pay a "species conservation charge" to the Species at Risk Conservation Fund, per Ontario Regulation 829/21 (Species Conservation Charges).

6. In the area identified as habitat for Bobolink and Eastern Meadowlark on Drawing 1 of 4, as may be modified based on Note 4 above, stripping shall not occur between April 5 and August 27.

7. On-site tree-clearing shall take place outside of the breeding bird season and bat activity period. Tree-clearing shall only take place between December 1 and March 14.

8. During site clearing and stripping operations, piles of weathered field stones along old fence lines shall be salvaged and repurposed as rock piles in selected reforestation areas. See Drawing 3 of 4 for location and details. Oversized material from Licence 6525 may also be used for this purpose.

9. During site clearing non-merchantable timber and root wads shall be salvaged and used for restoration and rehabilitation purposes. Upper limbs and branches may be cut up for use in brush piles. These woody debris piles shall be integrated into selected reforestation areas. See Drawing 3 of 4 for location and details.

10. The licensee shall implement the natural heritage technical recommendations on Drawing 3 of 4.

REHABILITATION PAGE

Natural Heritage Technical Recommendations

Amphibian Breeding Pools

1. Two small amphibian breeding pools shall be created within Area 1A, immediately adjacent to Wetland U3. The pools shall be excavated into the seasonally high water table such that they contain standing water at least until around mid-July in an average year.

2. The two amphibian breeding pools shall be excavated later in the year (September-November window) and this shall occur prior to the commencement of site preparation activities in Phase 2. Input from a qualified hydrogeologist is required in order to determine the correct depth of excavation, in order to create a suitable hydroperiod for each of the two pools based on the monitoring data available prior to construction. Input from a qualified ecologist is required to direct the shaping and grading of each pool, the placement of rocks and woody debris features and the establishment of wetland plants.

3. At least 3 rock piles and 5 woody debris features shall be installed around each amphibian breeding pool that is constructed.

4. Wetland plant species shall be seeded and/or planted as plugs and/or rootstock, as selected from the following list:

- Common Arrowhead (Sagittaria latifolia)
- Water-plantain (Alisma plantago-aquatica)
- Softstem Bulrush (Schoenoplectus tabernaemontani [Scirpus validus])
- Dark Green Bulrush (Scirpus atrovirens)
- Cyperus-like Sedge (Carex pseudo-cyperus)
- Porcupine Sedge (Carex hystericina)
- Swamp Milkweed (Asclepias incarnata)
- Spotted Joe-pye-weed (Eutrochium maculatum [Eupatorium maculatum])
- Boneset (Eupatorium perfoliatum)
- Blue Flag Iris (Iris versicolor)
- Blue Vervain (Verbena hastata)

Depending on availability of the wetland plant species listed above, other suitable native, non-invasive wetland plant species may be substituted if necessary.

Tree-planting – General Planting Scheme and Monitoring

1. The following general planting scheme applies to 1A, 1B, 1C & 1D, 2A, 2B, 2C. Additional planting details are provided in the Area specific rehabilitation notes on this Drawing.

2. Tree plugs and/or 1-gallon container stock shall be planted with 2.5m x 2.5m spacing (1,600 seedlings per hectare). Shrubs shall not account for more than 5% of the 1,600 seedlings per hectare. During the first year of establishment, plantings shall be watered and fresh mulch shall be added on an as needed basis.

3. The long-term survivorship target is 1,000 trees/shrubs per hectare (62.5% survivorship). Following the second year after an initial planting, any dead seedlings within a reforestation area shall be replaced in the next spring or fall planting season. The species selections for replacement plantings may vary depending on which species are performing better within a particular unit.

4. The reforestation areas shall be monitored for at least two (2) growing seasons after planting. Any dead seedlings within a general reforestation area shall be replaced in the subsequent spring or fall planting season following the second season of monitoring. The long-term survivorship target is 1,000 trees per hectare (62.5% survivorship). The species selections for replacement plantings may vary depending on which species are performing better within a particular unit.

Tree-planting – Nodal Planting Scheme and Monitoring

1. The following nodal planting scheme applies to Area 2D and additional planting details are provided in the Area specific rehabilitation notes on this Drawing.

2. 30 planting nodes shall be established in Area 2D. Each node shall be approximately 300 m2 in size (typically 10m x 30 m). The nodal plantings are intended to establish patches of successional woodland that will contribute to the seed bank and also spread clonally, which will encourage natural regeneration to a woodland condition.

3. Trees shall be planted as 1-gallon container stock with 3.0 m x 3.0 m spacing. One (1) shrub (plug or 1-gallon container stock) shall be planted for every 2 trees that are planted. Each node shall contain at least 42 trees and 21 shrubs. During the first year of establishment, plantings shall be watered and fresh mulch shall be added on an as needed basis.

4. The nodal planting reforestation areas shall be monitored for at least two (2) growing seasons after planting. Any dead seedlings within a nodal reforestation area shall be replaced in the subsequent spring or fall planting season following the second season of monitoring. The long-term survivorship target is 26 trees per node (62.5% survivorship) and 13 shrubs per node (62.5% survivorship). The species selections for replacement plantings may vary depending on which species are performing better within a particular unit.

Seed Mixes

1. An upland native seed mix shall be applied in Areas 1B, 1C, 1D, 2A, 2B, 2C and 2D to establish groundcovers in the reforestation areas.

2. The upland native seed mix shall comprise 40% Canada Wild-rye (Elymus canadensis) and 40% Virginia Wild-rye (Elymus virginicus). The remaining 20% of the seed mix will be selected from the following species list:

    - Canada Anemone (Anemone canadensis)
    - Common Milkweed (Asclepias syriaca)
    - Grass-leaved Goldenrod (Euthamia graminifolia)
    - Wild Bergamot (Monarda fistulosa)
    - Foxglove Beardtongue (Penstemon digitalis)
    - Black-eyed Susan (Rudbeckia hirta)
    - Early Goldenrod (Solidago juncea)
    - Gray Goldenrod (Solidago nemoralis)
    - New England Aster (Symphyotrichum novae-angliae [Aster novae-angliae])
    - Arrow-leaved Aster (Symphyotrichum urophyllum [Aster urophyllus])
    - White Vervain (Verbena urticifolia)
    - Other suitable species native to the Credit River Watershed
    - Other suitable native plant species may also be seeded or planted as appropriate, subject to availability.

3. A nurse crop such as Winter Rye or Oats may be required, depending on the timing of seeding activities.

Rock Piles and Woody Debris Piles

1. Rock piles and woody debris piles shall be established in Areas 1A, 1B, 2A and 2B. See Area specific rehabilitation notes on this Drawing for the amount of piles to be established in each area.

2. Rock piles shall have a minimum footprint of 2 m x 2m and a minimum height of 1 m, to provide habitat for snakes, small mammals and other wildlife.

3. Woody debris piles shall include at least one of the following:

    - 1 large stump/root wad partially keyed into the ground; or,
    - 5 or 6 logs (0.9 m to 1.2 m length or larger; at least 0.3 m in diameter) in a pile; or,
    - Brush pile 2m x 2m x 1m high, with 1 or 2 logs in centre.

Area 1A

1. Two small amphibian pools shall be constructed adjacent to Wetland U3 in accordance with the Amphibian Breeding Pools notes on this Drawing.

2. Silt fencing shall be installed around Area 1A prior to the construction of the acoustic berm adjacent to the Trailway and/or prior to any Phase 1 site preparation activities within 120 m of Wetland U3, whichever occurs first. Silt fencing shall be removed once Area 1B has been rehabilitated and it has stabilized.

3. Prior to the commencement of tree-planting, 13 rock piles and 20 woody debris piles shall be placed within this area.

4. Tree-planting in this area shall occur in the spring and/or fall planting windows prior to the commencement of site preparation activities in Phase 2.

5. Trees and shrubs to be planted shall be selected from the following species list:

    - Balsam Poplar (Populus balsamifera)
    - Bur Oak (Quercus macrocarpa)
    - Freeman's Maple (Acer X freemanii)
    - Silver Maple (Acer saccharinum)
    - Trembling Aspen (Populus tremuloides)
    - White Cedar (Thuja occidentalis)
    - Highbush Cranberry (Viburnum trilobum)
    - Nannyberry (Viburnum lentago)
    - Red-osier Dogwood (Cornus sericea)
    - Other suitable species native to the Credit River Watershed

Area 1B

1. Fine grading in this area shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

2. Prior to the commencement of tree-planting, 22 rock piles and 33 large pieces of woody debris shall be placed within this area.

3. Trees and shrubs to be planted shall be selected from the following species list:

    - Balsam Poplar (Populus balsamifera)
    - Basswood (Tilia americana)
    - Bur Oak (Quercus macrocarpa)
    - Red Maple (Acer rubrum)
    - Trembling Aspen (Populus tremuloides)

- White Cedar (Thuja occidentalis)
- White Pine (Pinus strobus)
- Highbush Cranberry (Viburnum trilobum)
- Nannyberry (Viburnum lentago)
- Other suitable species native to the Credit River Watershed

Area 1C

1. As part of the final rehabilitation of the site the berm shall be removed and this area shall be reforested.

2. Trees to be planted in Area 1C shall be selected from the following species list:

    - Black Cherry (Prunus serotina)
    - Bur Oak (Quercus macrocarpa)
    - Red Maple (Acer rubrum)
    - Red Oak (Quercus rubra)
    - Sugar Maple (Acer saccharum ssp. saccharum)
    - Trembling Aspen (Populus tremuloides)
    - White Cedar (Thuja occidentalis)
    - White Pine (Pinus strobus)
    - Alternate-leaved Dogwood (Cornus alternifolia)
    - Chokecherry (Prunus virginiana)
    - Other suitable species native to the Credit River Watershed

Area 1D

1. Within 18 months of site preparation commencing in Phase 1A this area shall be planted.

2. Trees to be planted shall be selected from the following species list:

    - Black Cherry (Prunus serotina)
    - Bur Oak (Quercus macrocarpa)
    - Red Maple (Acer rubrum)
    - Red Oak (Quercus rubra)
    - Sugar Maple (Acer saccharum ssp. saccharum)
    - Trembling Aspen (Populus tremuloides)
    - White Cedar (Thuja occidentalis)
    - White Pine (Pinus strobus)
    - Alternate-leaved Dogwood (Cornus alternifolia)
    - Chokecherry (Prunus virginiana)
    - Other suitable species native to the Credit River Watershed

Area 2A

1. Fine grading in this area shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

2. Prior to the commencement of tree-planting, 16 rock piles and 24 large pieces of woody debris shall be placed within this area.

3. Trees to be planted shall be selected from the following species list:

    - Bur Oak (Quercus macrocarpa)
    - Red Maple (Acer rubrum)
    - Red Oak (Quercus rubra)
    - Sugar Maple (Acer saccharum ssp. saccharum)
    - White Cedar (Thuja occidentalis)
    - White Pine (Pinus strobus)
    - Alternate-leaved Dogwood (Cornus alternifolia)
    - Chokecherry (Prunus virginiana)
    - Other suitable species native to the Credit River Watershed

Area 2B

1. Fine grading in this area shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

2. Prior to the commencement of tree-planting, 11 rock piles and 17 large pieces of woody debris shall be placed within this area.

3. Trees to be planted shall be selected from the following species list:

    - Bigtooth Aspen (Populus grandidentata)
    - Black Cherry (Prunus serotina)
    - Bur Oak (Quercus macrocarpa)
    - Red Maple (Acer rubrum)
    - Red Oak (Quercus rubra)
    - Sugar Maple (Acer saccharum ssp. saccharum)
    - Trembling Aspen (Populus tremuloides)
    - White Birch (Betula papyrifera)
    - White Cedar (Thuja occidentalis)
    - White Pine (Pinus strobus)
    - Alternate-leaved Dogwood (Cornus alternifolia)
    - Chokecherry (Prunus virginiana)
    - Other suitable species native to the Credit River Watershed

Area 2C

1. Fine grading in this area shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

2. Trees to be planted shall be selected from the following species list:

    - Black Cherry (Prunus serotina)
    - Red Maple (Acer rubrum)
    - Sugar Maple (Acer saccharum ssp. saccharum)
    - White Cedar (Thuja occidentalis)

- White Pine (Pinus strobus)
- Alternate-leaved Dogwood (Cornus alternifolia)
- Chokecherry (Prunus virginiana)
- Other suitable species native to the Credit River Watershed

Area 2D

1. Fine grading in this area shall create minor topographic variations, to enhance site diversity. Topsoil shall be applied to a minimum depth of 30 cm.

2. Trees to be planted shall be selected from the following species list:

    - Bigtooth Aspen (Populus grandidentata)
    - Trembling Aspen (Populus tremuloides)
    - White Birch (Betula papyrifera)
    - White Cedar (Thuja occidentalis)
    - White Pine (Pinus strobus)
    - Alternate-leaved Dogwood (Cornus alternifolia)
    - Chokecherry (Prunus virginiana)
    - Gray Dogwood (Cornus racemosa)
    - Staghorn Sumac (Rhus typhina)
    - Other suitable species native to the Credit River Watershed

16.0 CONCLUSIONS

A Natural Environment Technical Report (NETR) was prepared under the *Aggregate Resources Act* for the proposed Lafarge Pit 3 Extension in the Town of Caledon, Region of Peel. This report also serves as an Environmental Impact Assessment (EIA) that addresses the Region of Peel's and Town of Caledon's Official Plan policies and requirements.

If the recommendations made in this report with respect to the extraction footprint, Operational Plan and Rehabilitation Plan are implemented as described in the Site Plans, it is concluded that the proposed Pit 3 Extension will have no negative effects on Habitats of Endangered and Threatened, Significant Wetlands, Significant Woodlands, Significant Wildlife Habitat, Significant Areas of Natural and Scientific Interest, Region of Peel Core Areas, Town of Caledon Environmental Policy Areas and Wetland U3. As shown on **Figure 15**, over time 10.0 ha or 39.1% of the site will be reforested, unevaluated Wetland U3 will be greatly enhanced and a northwest – southeast linkage between Core Areas will be created. The proposed ecological enhancements and pit rehabilitation will result in a considerable ecological enhancement over current conditions on the site.

Respectfully submitted,

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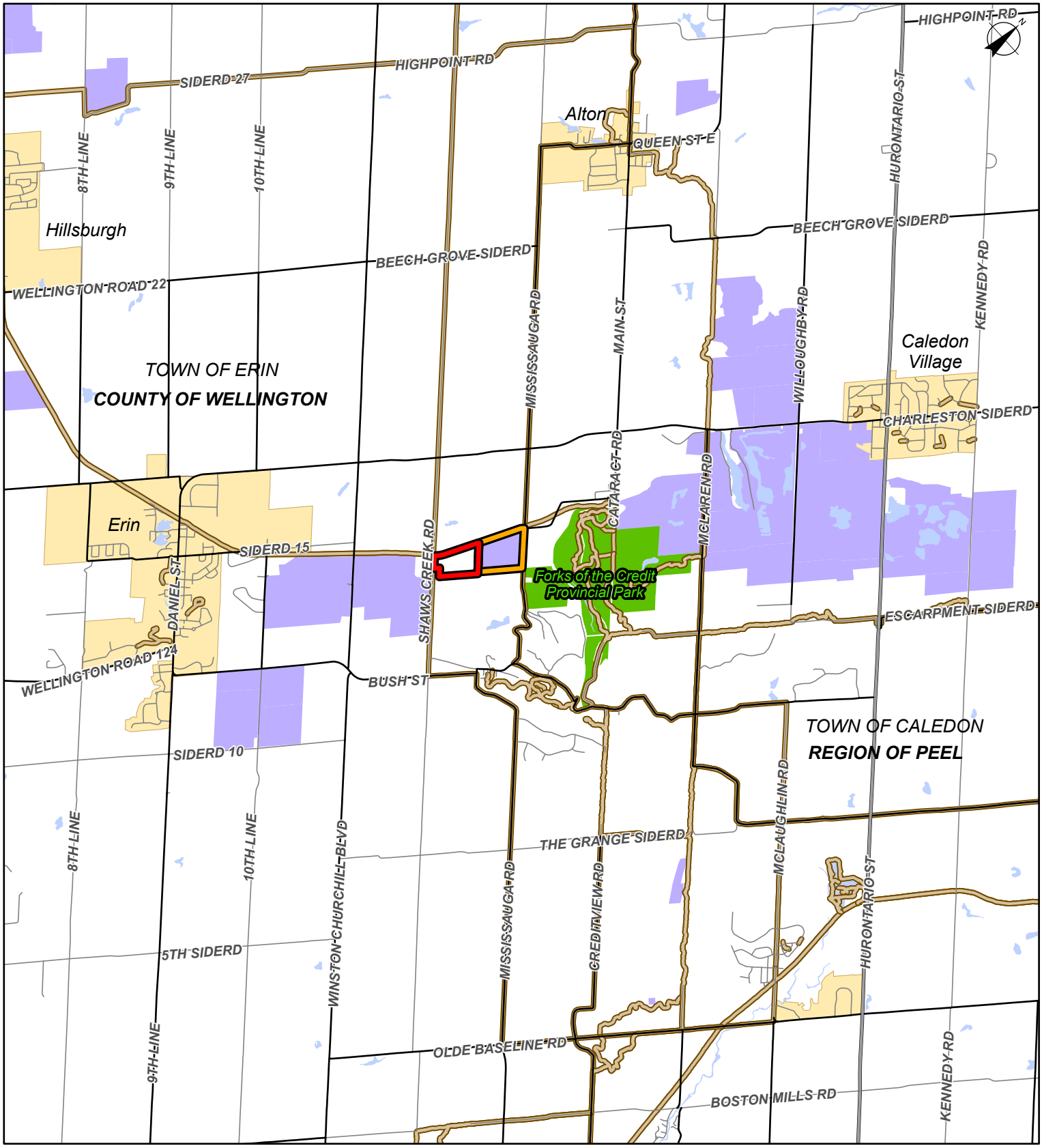

Figure # 1

Location Map

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Existing Licence Boundary
- Public Trail
- Provincial Park
- Existing ARA Licenced Site
- Settlement Area
- Municipal Boundary
- Waterbody

DATE: April 2024

SOURCES

0 500 1,000 1,500 2,000 2,500 3,000
Metres

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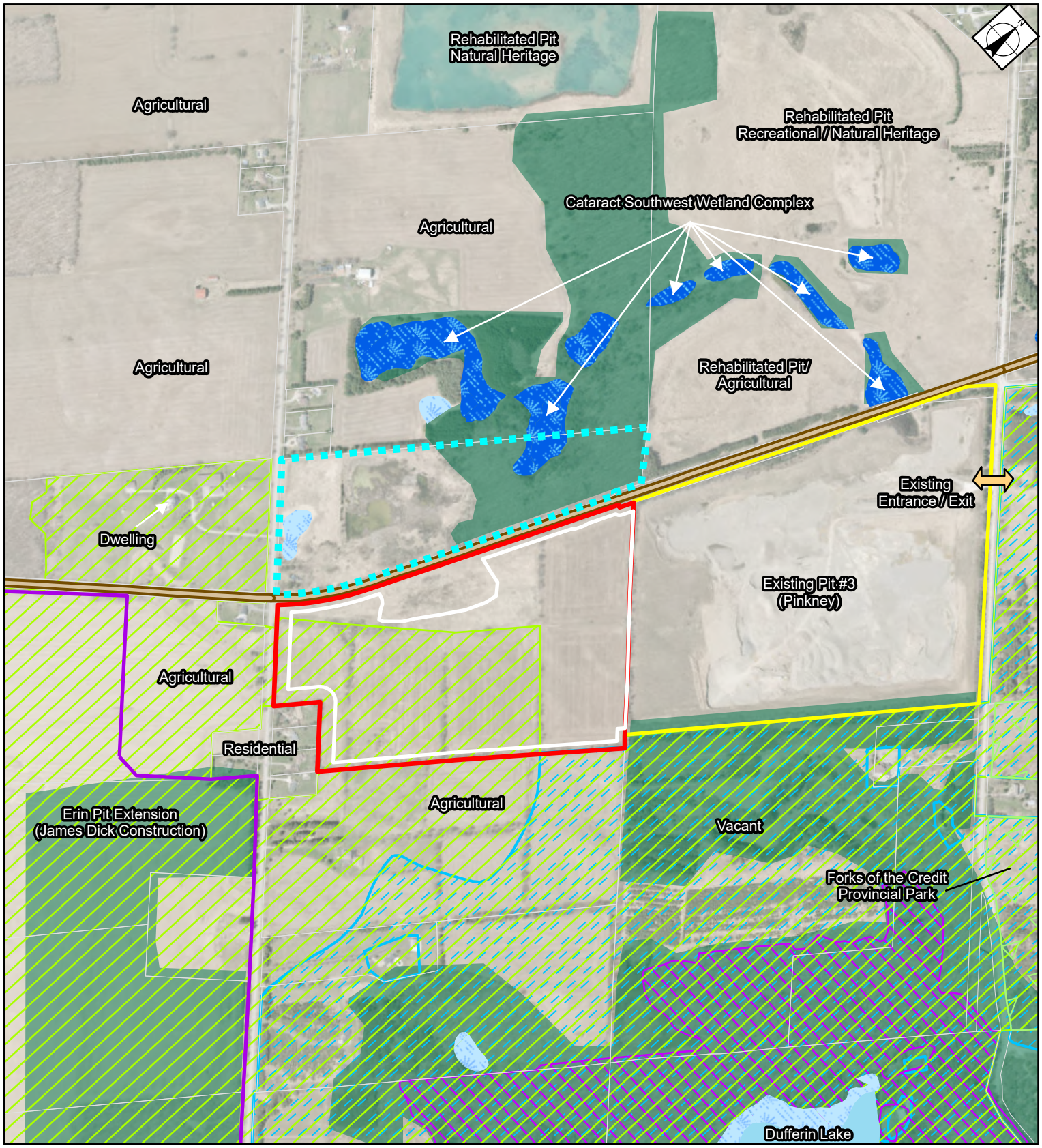

Figure 2
Local Landscape

Pit #3 Extension
Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Proposed Extraction Limit (white)
- Additional Lands owned by Applicant
- Existing Pit #3 Licenced Boundary
- Existing ARA Licenced Site
- Provincial Park
- Public Trail
- Evaluated Wetland (LIO)
- Unevaluated Wetland (LIO)
- ANSI - Life
- ANSI - Earth - LIO
- ANSI - Earth - MNR 2013 Report
- Core Areas of the Greenland System Based on 2022 Region of Peel Official Plan

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0 100 200 300 400
Metres

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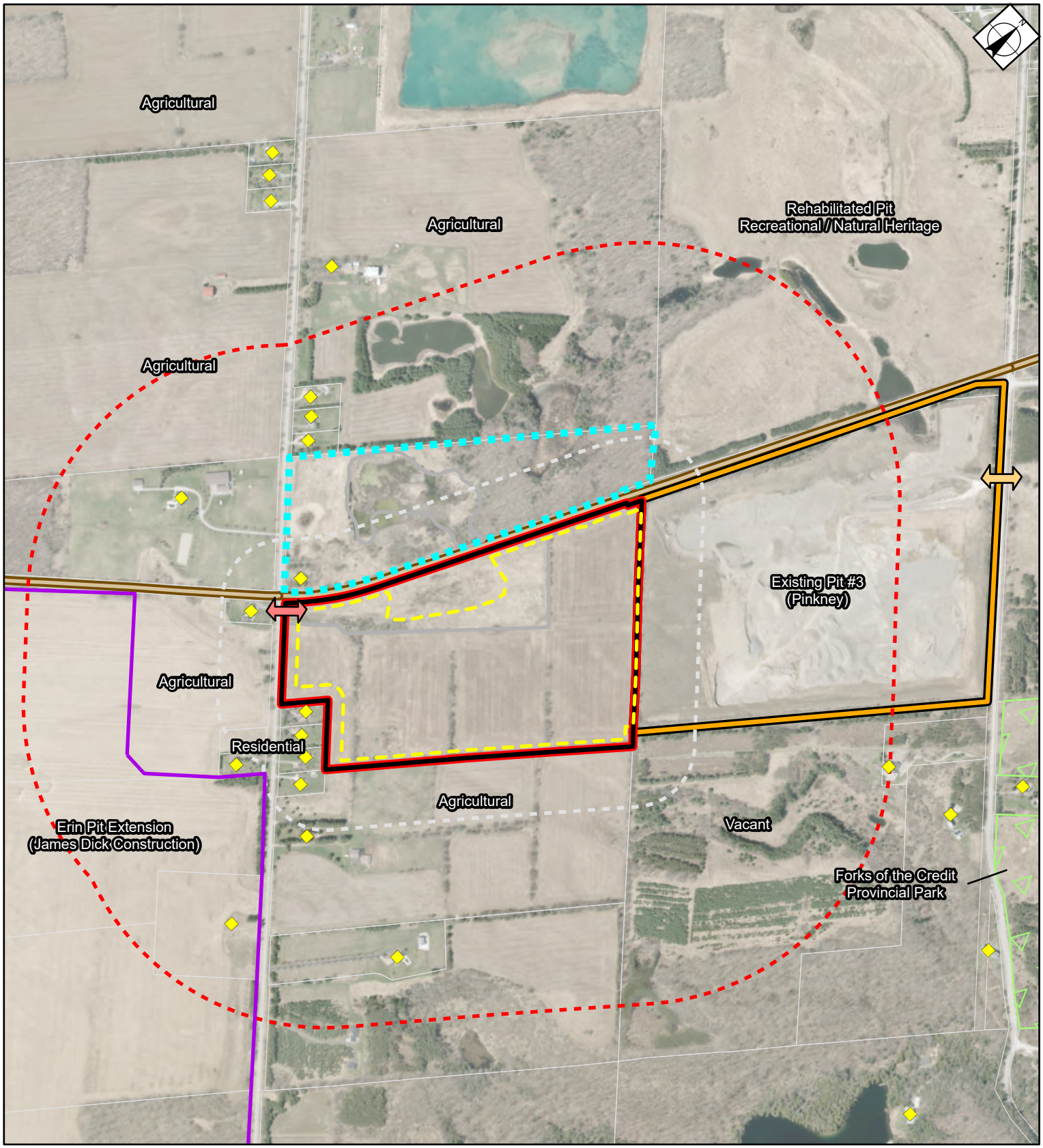

Figure # 3

Surrounding Lands

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Study Area
- 500m Offset from Licence Boundary
- Proposed Extraction Limit
- Additional Lands owned by Applicant
- Existing Licenced Boundary
- Provincial Park
- Existing ARA Licenced Site
- Former Extraction Area
- Dwelling
- Public Trail
- Existing Entrance/Exit (Approved Haul Route)
- Existing Field Access

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0 100 200 300 400
Metres

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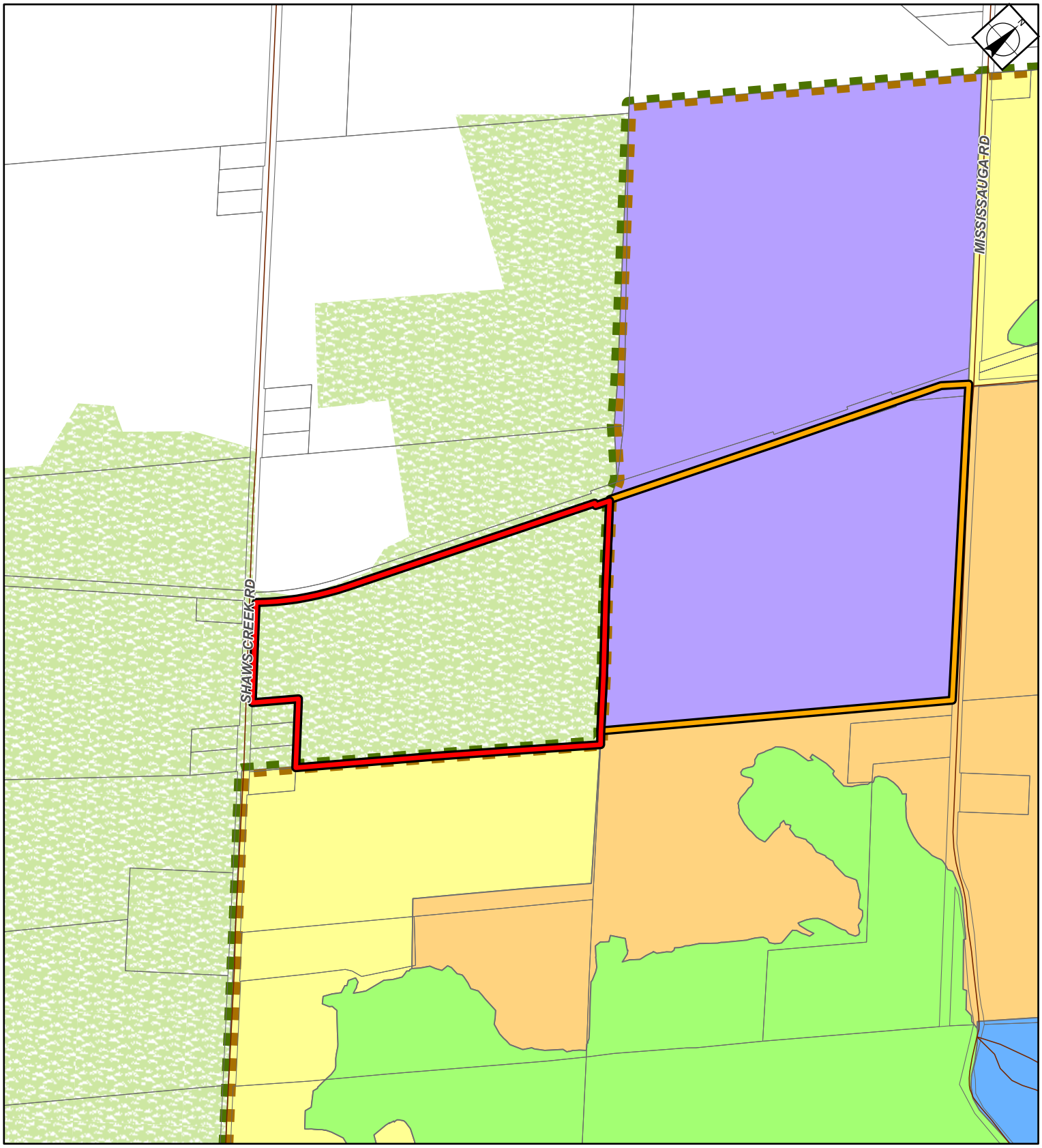

Figure # 4

Greenbelt Plan, Niagara Escarpment Plan (2017)

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Existing Licenced Boundary
- Niagara Escarpment Plan (NEP)
- Greenbelt Plan - Protected Countryside
- Natural Heritage System within Protected Countryside

NEP Land Use Designation

- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area

DATE
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Metres

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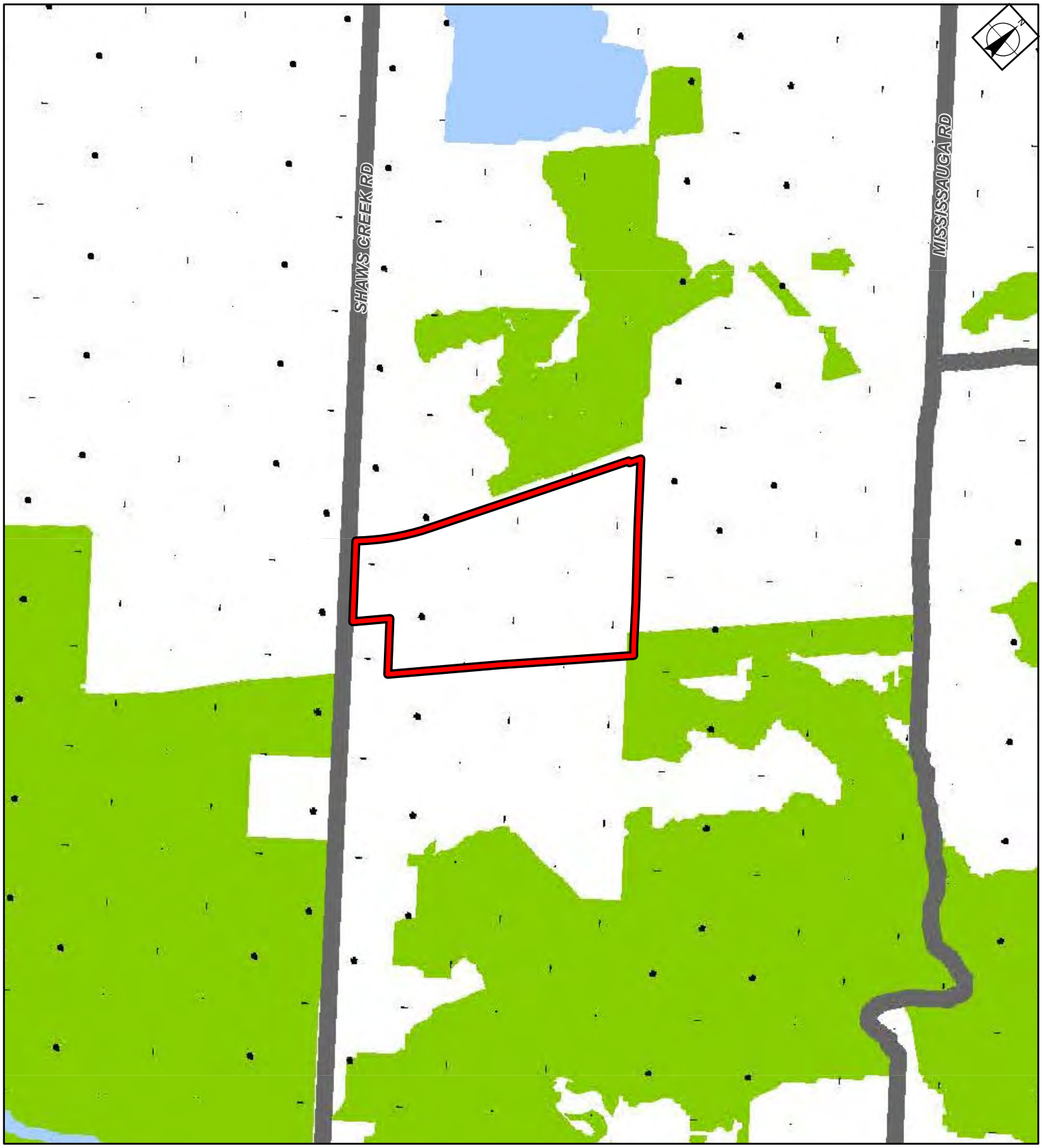

Figure # 5

Region of Peel Official Plan Schedule C-2

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Core Areas of the Greenlands System
- Area with Special Policies

DATE April 2024

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Metres

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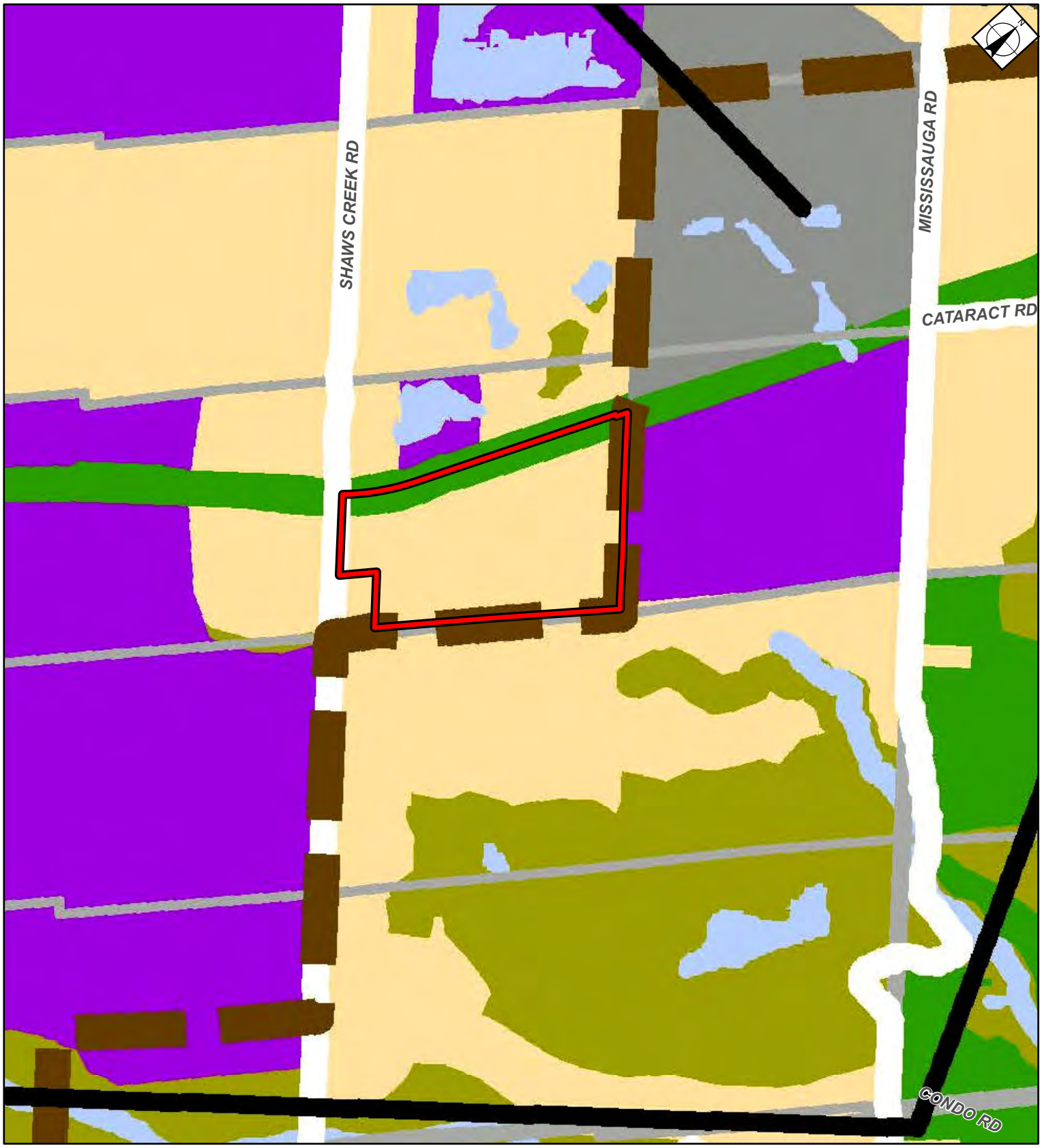

Figure # 6

Town of Caledon Official Plan Schedule A

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- General Agricultural Area
- Environmental Policy Area
- Extractive Industrial Area
- Open Space Policy Area
- Refer to OPA #122
- Niagara Escarpment Plan Area

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Metres

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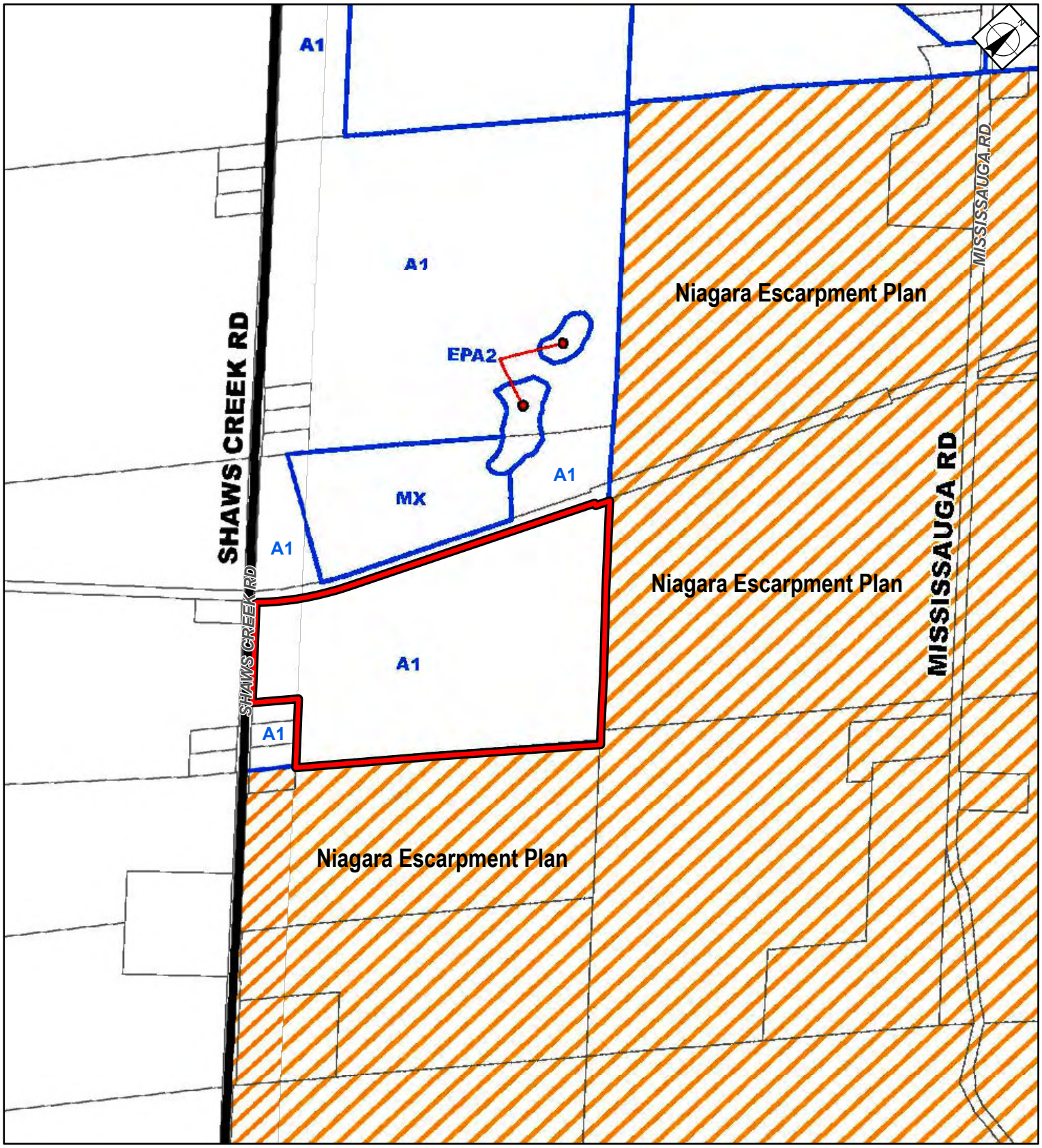

Figure # 7

Town of Caledon Zoning By-law 2006-50

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

Proposed Licence Boundary

DATE April 2024

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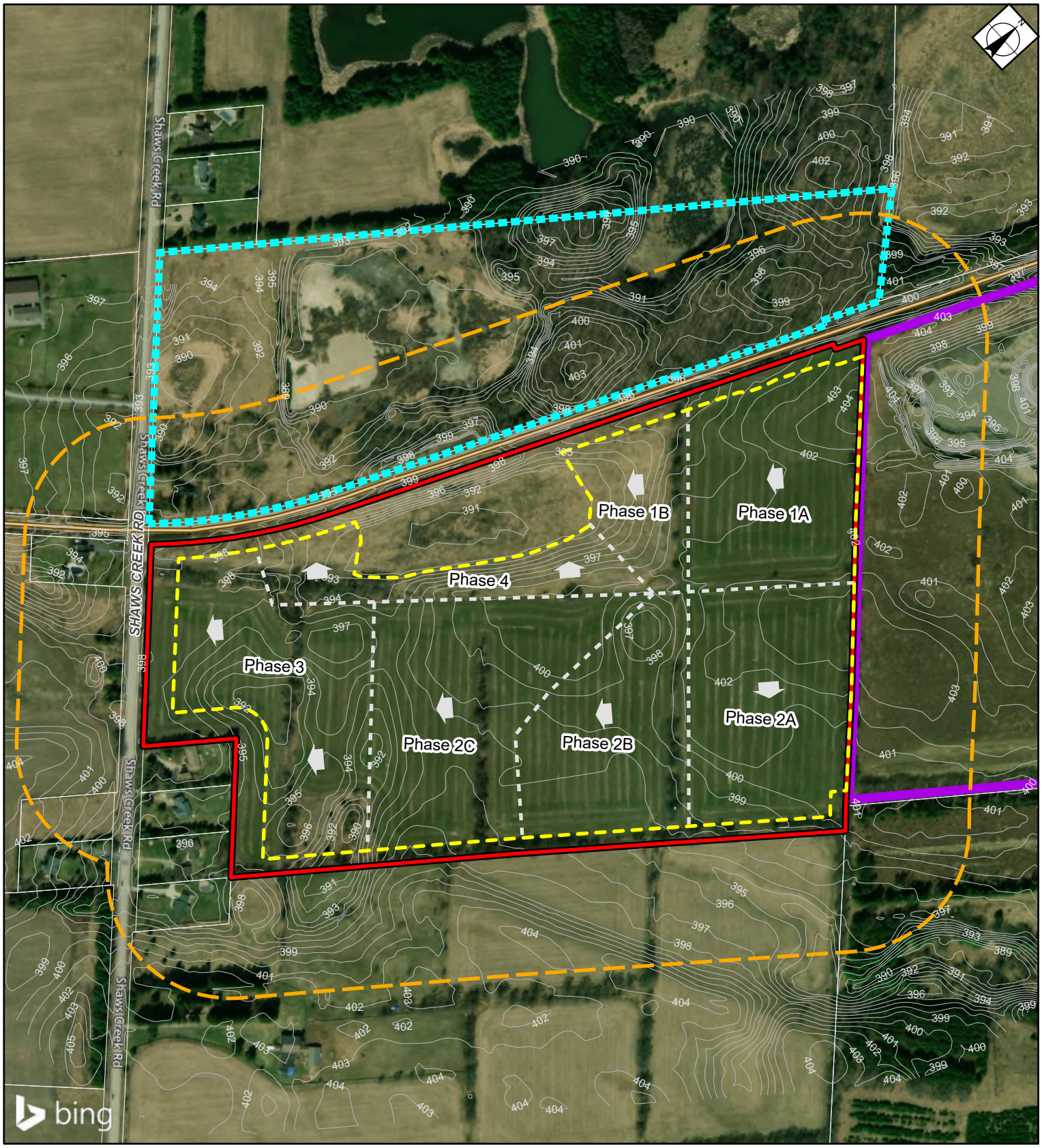

Figure # 8

Site View

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Proposed Extraction Limit
- Additional Unlicenced Lands owned by Applicant
- Existing Pit #3 Licenced Boundary
- 120m Buffer from Proposed Licenced Boundary
- Public Trail
- Existing Contours

DATE: April 2024

SOURCES

0 100 200
Metres

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Figure # 9

Vegetation Communities (ELC Units)

Pit #3 Extension

Part Lot 13, Concession 5 WHS
Town of Caledon
Region of Peel

Legend

Proposed Licenced Boundary

ELC Communities

VEGETATION COMMUNITIES (ELC UNITS) PIT 3 EXTENSION	
ELC Code	**Community Type**
Terrestrial	
FOD	Deciduous Forest
FOD4	Dry-Fresh Deciduous Forest Ecosite (Manitoba Maple)
FOD5-6	Dry-Fresh Sugar Maple – Basswood Deciduous Forest Type
FOD5-9	Dry-Fresh Sugar Maple – Red Maple Deciduous Forest Type
FOM6-1	Fresh-Moist Sugar Maple – Hemlock Mixed Forest Type
Terrestrial – Cultural	
CUP3-1	Red Pine Coniferous Plantation Type
CUP3-6	European Larch Coniferous Plantation Type
CUP3-9	Norway Spruce Coniferous Plantation Type
CUT1	Mineral Cultural Thicket Ecosite
CUM1-1	Dry-Moist Old Field Meadow Type
CUH*	Hedgerow
Wetland	
SWD4-3	Poplar Mineral Deciduous Swamp Type
SWT2-2	Willow Mineral Thicket Swamp Type
MAM2-2	Reed Canary Grass Mineral Meadow Marsh Type
MAS3-1	Cattail Organic Shallow Marsh Type
MAS3-7	Bur-reed Organic Shallow Marsh Type
SAS1-3	Stonewort Submerged Shallow Aquatic Type
Other	
AGC	Agriculture/Cropland – Crop Rotation
RES	Rural Residence with Lawns
DL	Recently Disturbed Land

Date

April 2024

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0 25 50 100 150 200
Meters

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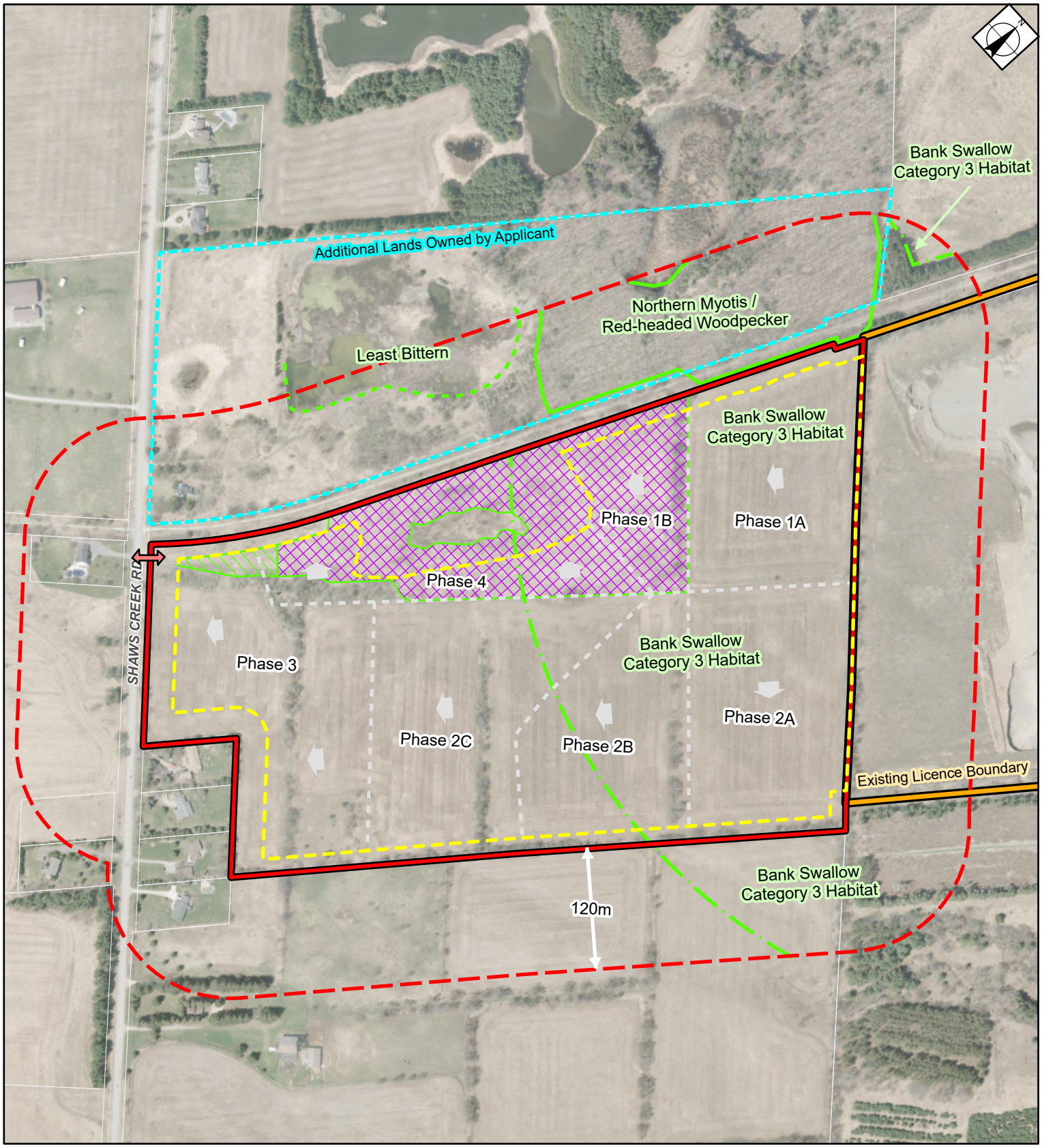

Figure # 10

Endangered and Threatened Species

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Proposed Extraction Limit
- Bobolink
- Bobolink and Eastern Meadowlark
- Northern Myotis / Red-headed Woodpecker
- Least Bittern
- Bank Swallow Category 3 Habitat

DATE April 2024

SOURCES

0 100 200
Metres

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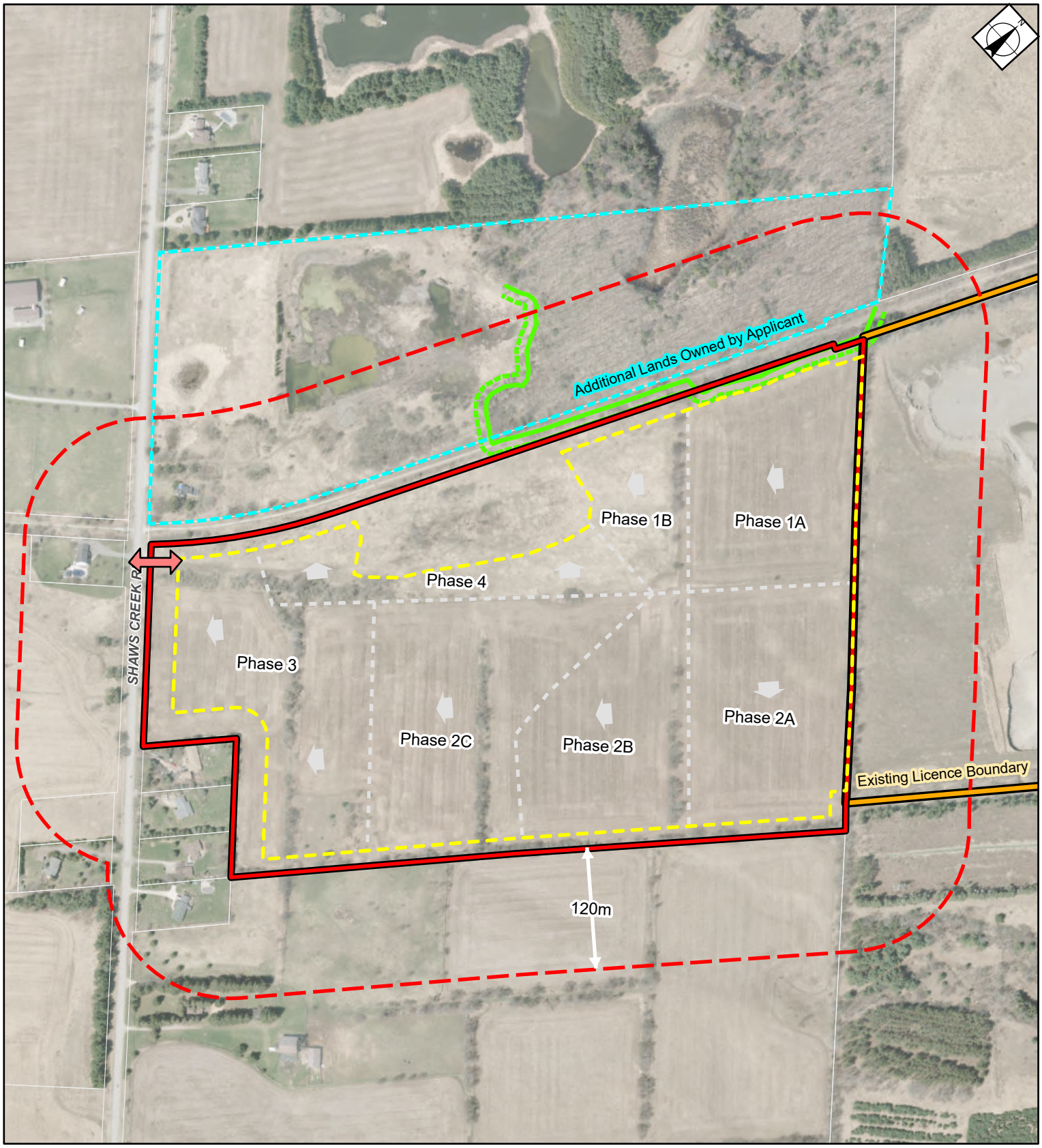

Figure # 11

Significant Woodlands

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Proposed Extraction Limit
- Public Trail
- Significant Woodland Boundary Staked by Goodban on October 14, 2020
- 10m Offset from Significant Woodland Boundary Staked by Goodban on October 14, 2020

DATE April 2024

SOURCES

0 100 200
Metres

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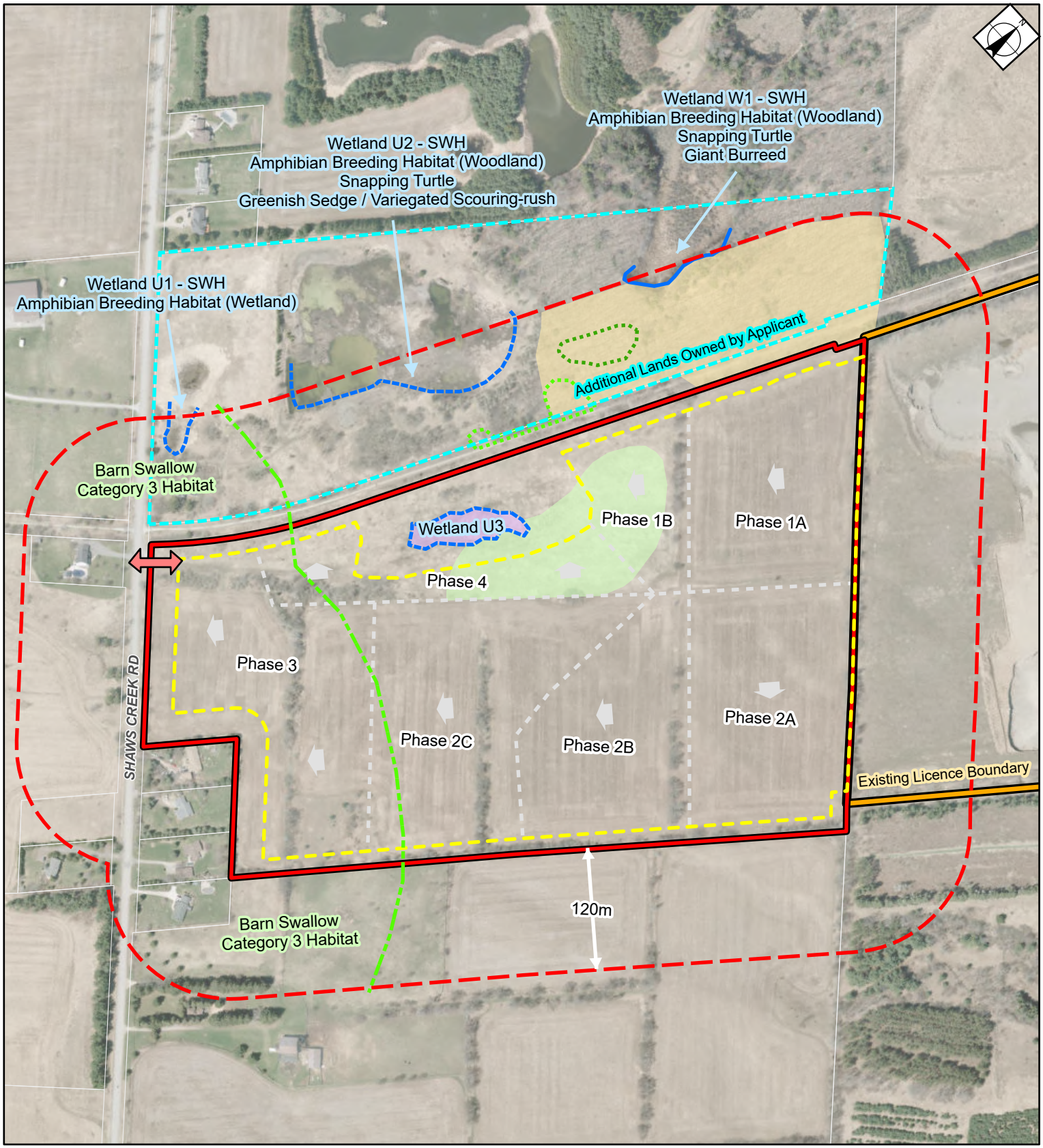

Figure # 12

Significant Wildlife Habitat (SWH)

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Proposed Extraction Limit
- Provincially Significant Wetland
- Unevaluated Wetland
- Barn Swallow Category 3 Habitat
- Sprengel's Sedge Habitat
- Wood's Sedge Habitat
- Grasshopper Sparrow Habitat
- Eastern Wood-Pewee Habitat
- Orchard Oriole Habitat

DATE April 2024

SOURCES

0 100 200
Metres

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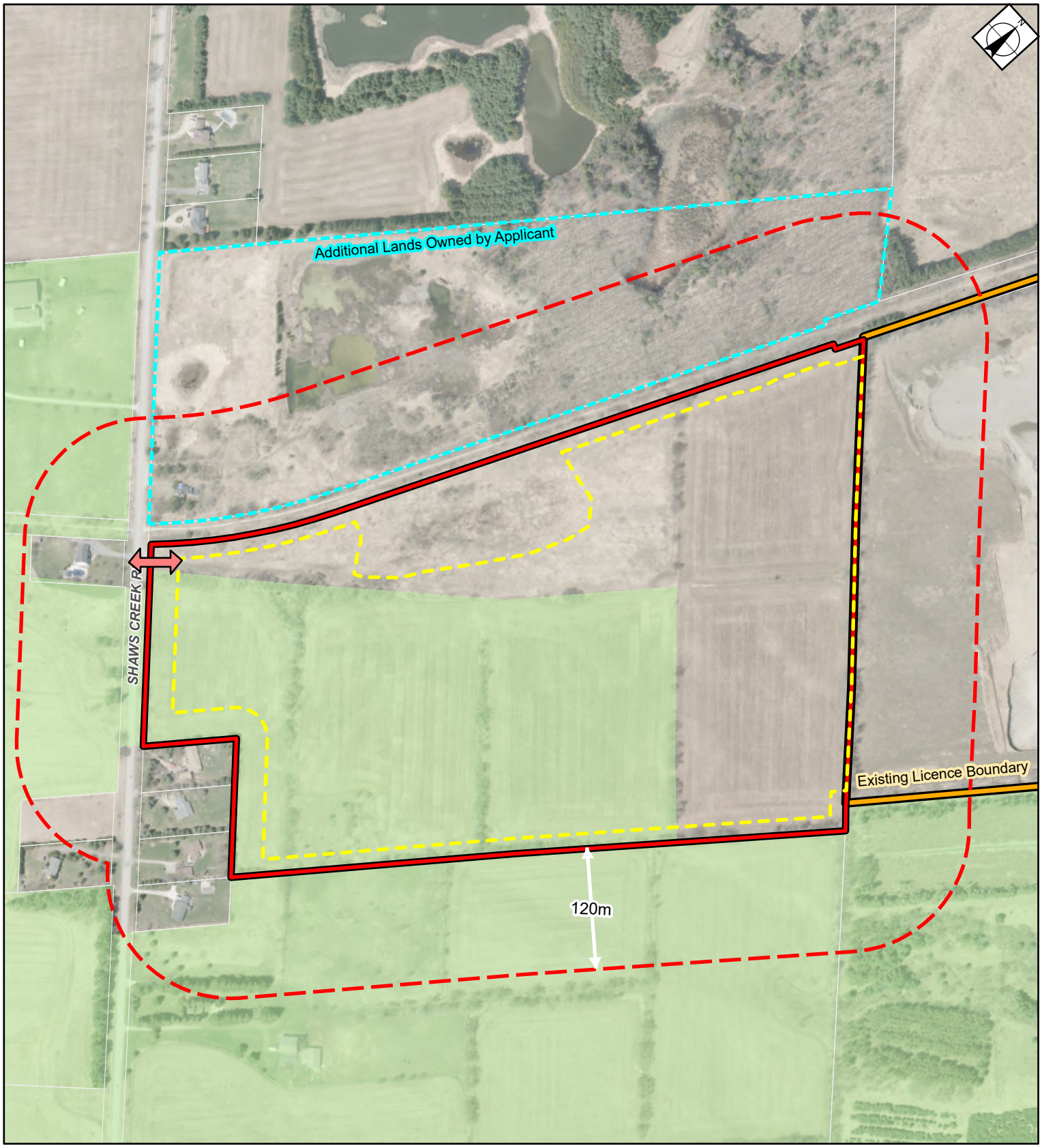

Figure # 13A

Significant Areas of Natural & Scientific Interest (ANSI)

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Proposed Extraction Limit
- ANSI - Earth (Caledon Meltwater Deposits) - LIO Mapping

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0 100 200
Metres

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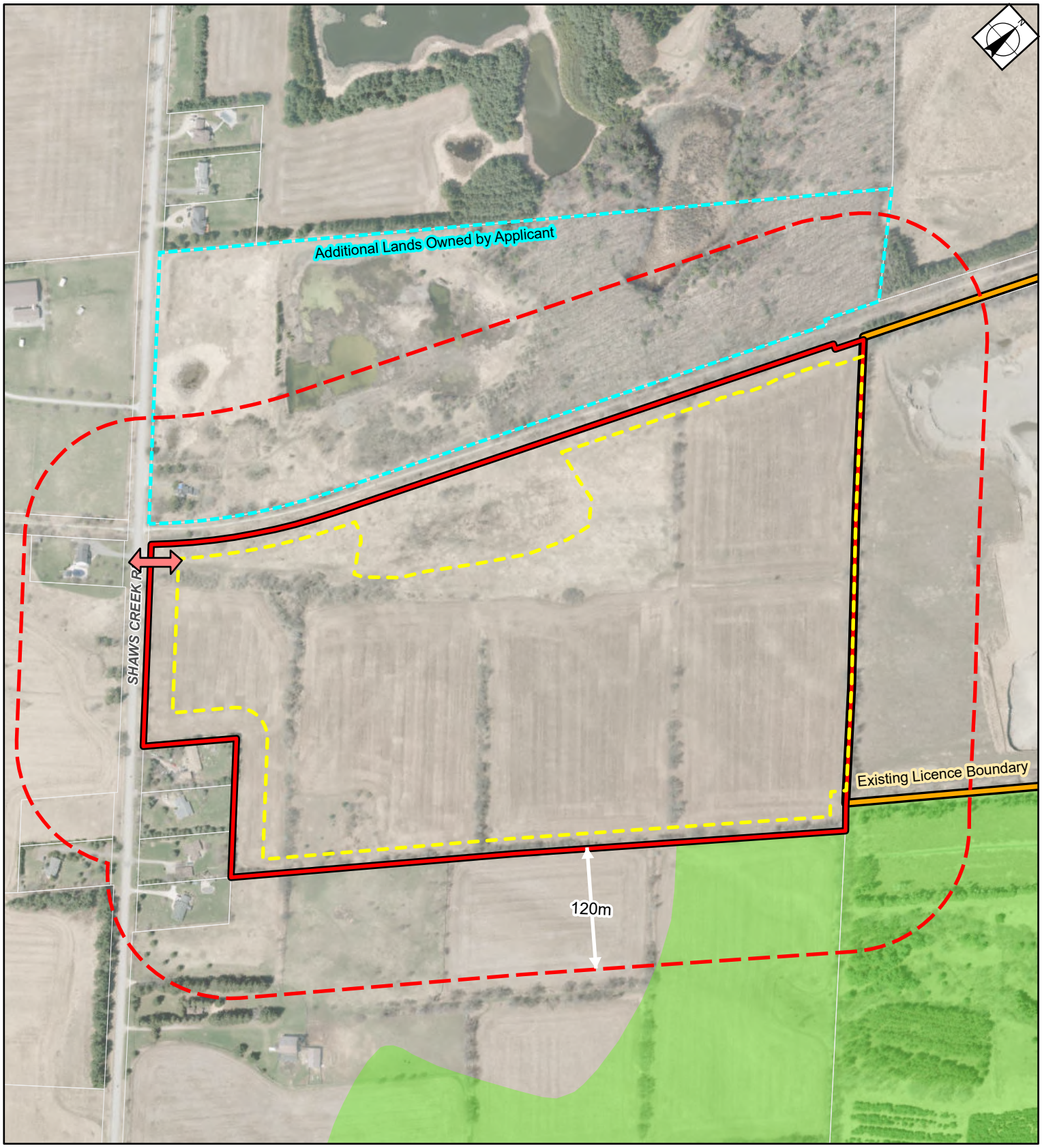

Figure # 13B

Significant Areas of Natural & Scientific Interest (ANSI)

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Proposed Extraction Limit
- ANSI - Earth (Caledon Meltwater Deposits) - 2013 MNR Report

DATE April 2024

SOURCES

0 100 200
Metres

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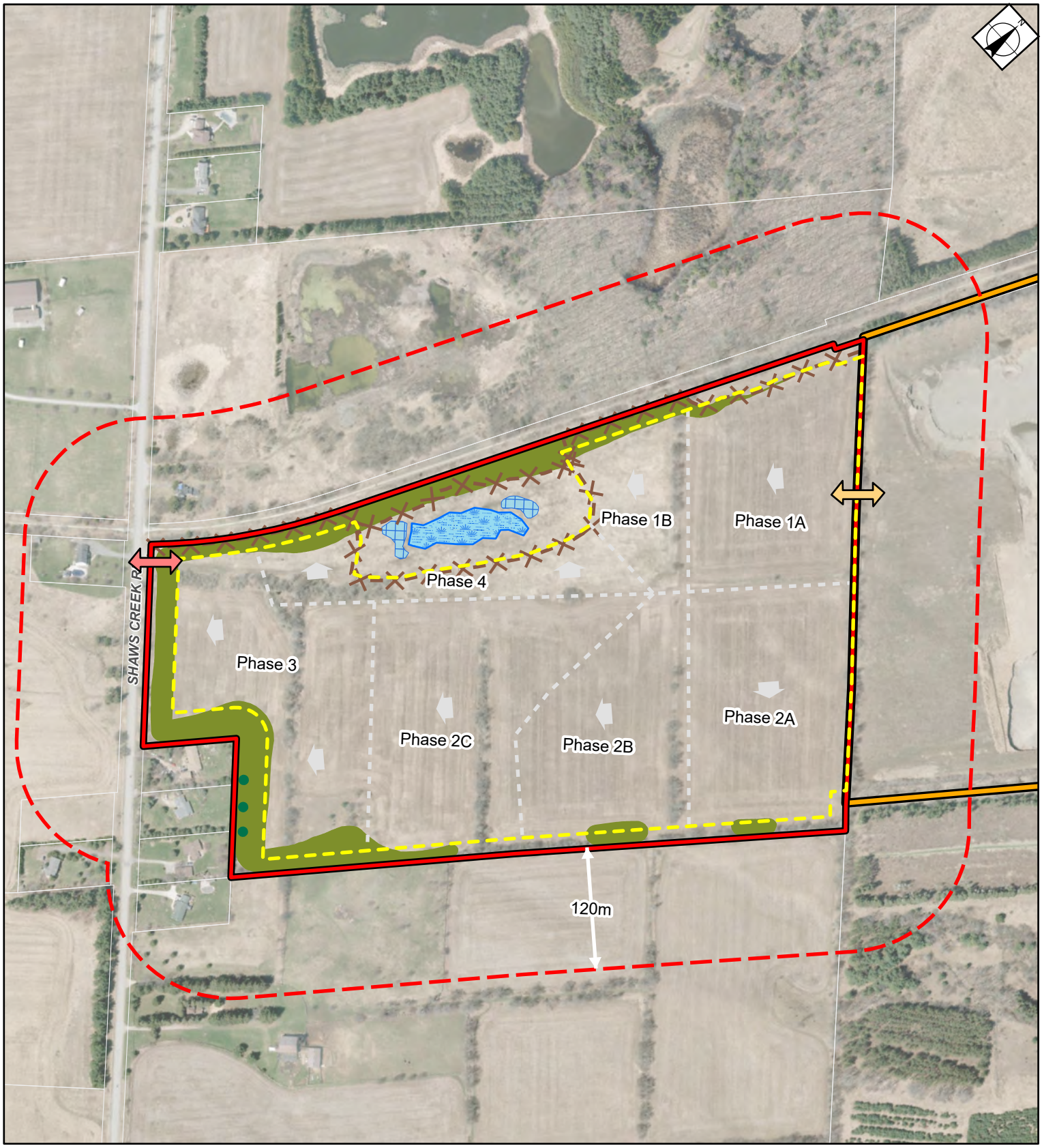

Figure # 14

Operational Plan

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Existing Licence Boundary
- Proposed Extraction Limit
- Operational Entrance/Exit (Location Will Vary)
- Existing Field Access
- Silt Fence
- Acoustic / Visual Berms
- Tree Plantings
- Amphibian Breeding Pool
- Wetland

DATE April 2024

SOURCES

0 100 200
Metres

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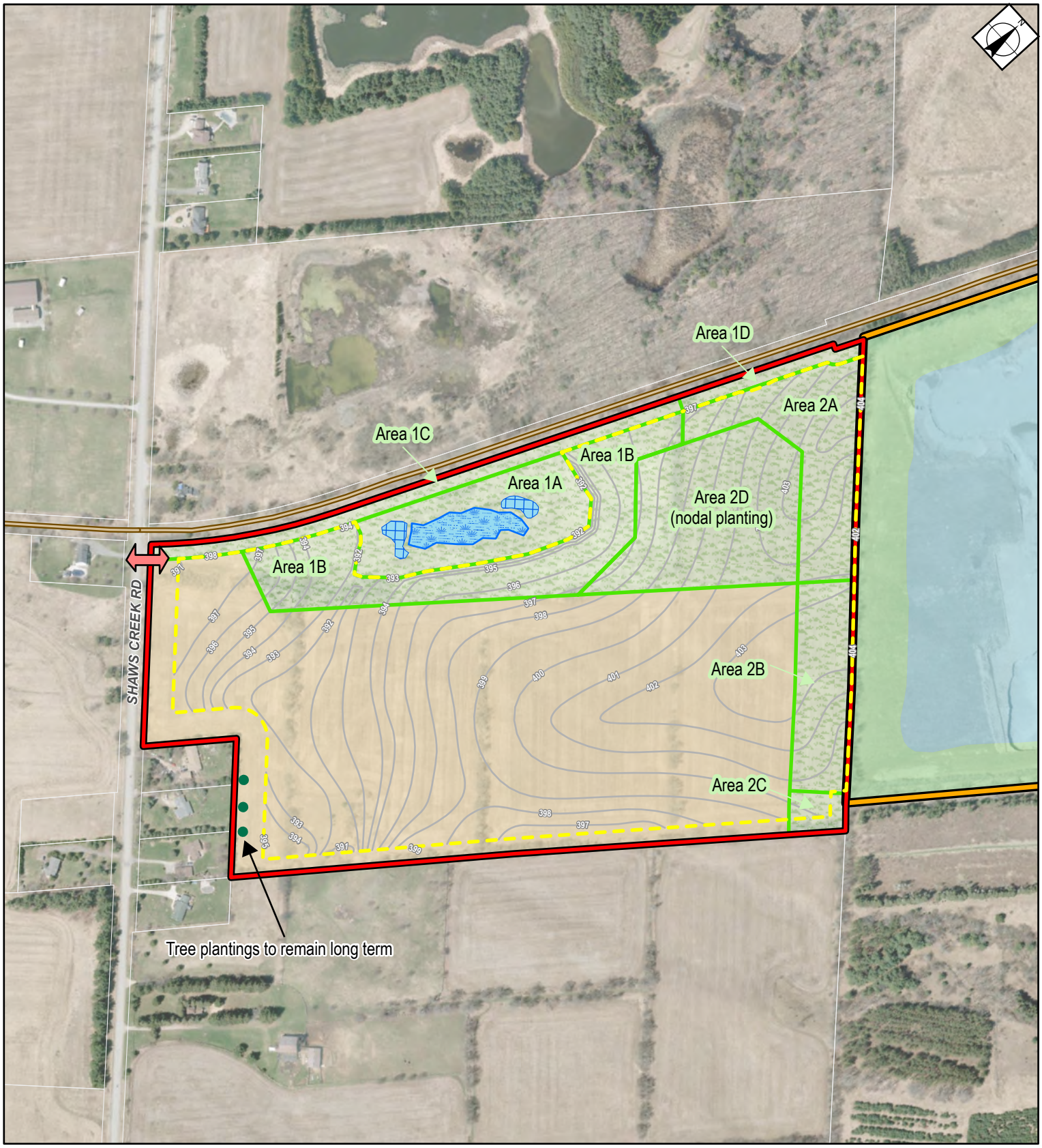

Figure # 15

Rehabilitation Plan

Pit #3 Extension

Pt Lt 13, Con 5 WHS
Town of Caledon
Region of Peel

Legend

- Proposed Licence Boundary
- Existing Licence Boundary
- Proposed Extraction Limit
- Public Trail
- Reforestation Areas
- Agricultural Land
- Amphibian Breeding Pool
- Wetland
- Lake
- Woodland
- Vegetated Shoreline

DATE April 2024

SOURCES

0 100 200
Metres

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Goodban Ecological Consulting Inc.

Table 1 - Wildlife Field Surveys Conducted at the Proposed Lafarge Pit 3 Extension and Adjacent Lands		
Date (yyyy-mm-dd)	**Time**	**Surveys Completed**
2013-10-10	1215-1545	general wildlife survey
2014-04-21	2010-2252	amphibian call, bat acoustical, and owl broadcast call surveys
2014-04-24	1015-1326	amphibian egg mass, turtle, and general wildlife surveys
2014-05-07	2015-2118	bat and nightjar surveys
2014-05-20	0745-1218	turtle, Least Bittern, marsh bird, and general wildlife surveys
2014-05-29	2042-2322	amphibian call, nightjar, owl, and bat acoustical surveys
2014-06-05	0750-1222	turtle, Least Bittern, marsh bird, and breeding bird surveys
2014-06-10	0645-1124	turtle, breeding bird, and general wildlife surveys
2014-06-14	2102-2309	nightjar, bat, and owl surveys
2014-06-28	0645-1135	turtle, breeding bird, and general wildlife surveys
2016-05-19	0755-1105	turtle, Least Bittern, marsh bird, and general wildlife surveys
2016-06-09	0748-1103	turtle, breeding bird, and general wildlife surveys
2016-06-23	0742-1135	turtle, Least Bittern, breeding bird, and general wildlife surveys
2017-07-08	0747-0930	breeding bird and general wildlife surveys
2018-05-17	0643-0918	turtle, Least Bittern, marsh bird, and general wildlife surveys
2018-06-06	0652-1028	turtle, breeding bird, and general wildlife surveys
2022-06-08	0630-0745	breeding bird survey
2022-06-29	0920-1035	breeding bird survey
2022-07-08	0700-0800	breeding bird survey
2022-07-15	1000-1040	Pit 3 Bank Swallow colony survey

Table 2 Weather During Wildlife Fieldwork at the Proposed Pinkney Farms Pit			
Date	**Temperature (°C)**	**Cloud Cover**	**Wind (Beaufort)[1]**
October 10, 2013	18-20	sunny	0
April 21, 2014	16-15	cloudy	0
April 24, 2014	7-11	sunny	0, gusting to 2
May 7, 2014	11-9	cloudy	0
May 20, 2014	11-14	sunny, becoming cloudy	0-1
May 29, 2014	16-12	clear	0
June 5, 2014	11-16	mix of sun and cloud	1-2, gusting to 3-4
June 10, 2014	13-24	mostly sunny	1-2
June 14, 2014	13-10	clear	0-1
June 21, 2014	14-11	clear	0-1
June 28, 2014	18-27	sunny	0-1
May 19, 2016	7-16	mix of sun and cloud	0-1
June 9, 2016	9-15	sunny	0 initially, 1-2 later
June 23, 2016	13-21	mix of sun and cloud	1-2
July 8, 2017	17-18	sunny	3
May 17, 2018	14-18	sunny	0
June 6, 2018	9-11	cloudy	2
June 8, 2022	12	sunny	1
June 25, 2022	24	sunny	1
July 8, 2022	18	mix of sun and cloud	1
July 15, 2022	22	sunny	1

[1]**Beaufort Wind Scale**	**km/h**	**Description**
0 Calm	0-2	Smoke rises vertically
1 Light air	3-5	Smoke drifts, but wind vanes do not move
2 Slight breeze	6-11	Wind felt on face, leaves rustle
3 Gentle breeze	12-19	Leaves & small twigs in constant motion; light flags extended
4 Moderate breeze	20-30	Wind raises dust and loose paper; small branches move
5 Fresh breeze	31-39	Small trees in leaf begin to sway
6 Strong breeze	40-50	Large branches in motion; inconvenience felt when walking against wind

TABLE 3
VEGETATION COMMUNITIES (ELC UNITS) - PROPOSED PIT 3 EXTENSION AND ADJACENT LANDS

ELC Code	Community Type	Dominant Species	Size Class (dbh)	Canopy Closure	Soils / Moisture Regime	Photo Ref.**	Notes
Terrestrial							
FOD4	Dry-Fresh Deciduous Forest Ecosite (Manitoba Maple)	Manitoba Maple	10-24 cm	>60%	Caledon loam. Well drained.	-	Unit FOD4 is a small disturbed patch of Manitoba Maple located in the former gravel pit on the west side of the Trailway.
FOD5-6	Dry-Fresh Sugar Maple – Basswood Deciduous Forest Type	Sugar Maple > Basswood – Black Cherry	10-24 cm Some larger trees along fenceline	>60%	Caledon loam. Well drained. Disturbed soil on slope down to Trailway, which is an old railway cut.	13-15	Along a 180 m section of the Trailway, the railway cut has developed into a young deciduous forest of Sugar Maple, Basswood and Black Cherry. This unit includes mature fenceline trees and younger pole-sized trees and saplings. The canopy is more or less continuous across the Trailway in this area
FOD5-9	Dry-Fresh Sugar Maple – Red Maple Deciduous Forest Type	Sugar Maple – Red Maple >> White Ash – Beech – Basswood – Black Cherry - Ironwood	25-50 cm	>60%	Caledon loam. Well drained.	16-17	This unit is a fairly-even aged stand of Sugar Maple and Red Maple, with less frequently-occurring associates. The shrub/sapling layer in this forest block is quite sparse; this is likely the result of deer browsing and/or former livestock grazing. There are old barbed wire fences in the woodlot. Common Buckthorn (+) is becoming established in a few areas. Groundcovers in this unit are variable, but include patches of ferns such as Lady Fern, Spinulose Wood Fern and Rattlesnake Fern, and several sedge species (e.g., *Carex arctata, C. blanda, C. gracillima, C. peckii, C. pedunculata* and *C. pensylvanica*). The invasive Garlic Mustard (*Alliaria petiolata* +) is well established in parts of this woodlot.
FOM6-1	Fresh-Moist Sugar Maple – Hemlock Mixed Forest Type	Sugar Maple – Eastern Hemlock > Yellow Birch – White Birch – Beech – White Pine – White Cedar	25-50 cm	>60%	Caledon loam. Well drained.	18	Closer to Wetland W1, the forest transitions from deciduous forest to a mixed forest of mainly Sugar Maple and Eastern Hemlock. The slopes down to Wetland W1 are relatively steep and there is more regeneration of White Cedar, Eastern Hemlock, Yellow Birch and White Birch. The trees within are mainly in the 25 to 50 cm dbh size range, although there are some larger Eastern Hemlock and White Pine.

TABLE 3
VEGETATION COMMUNITIES (ELC UNITS) - PROPOSED PIT 3 EXTENSION AND ADJACENT LANDS

ELC Code	Community Type	Dominant Species	Size Class (dbh)	Canopy Closure	Soils / Moisture Regime	Photo Ref.**	Notes
Terrestrial – Cultural							
CUP3-1	Red Pine Coniferous Plantation Type	Red Pine	25-50 cm	>60%	Caledon loam. Well drained.	-	A Red Pine conifer plantation (CUP3-1) is located mainly on the adjacent Pinchin Pit property, although it straddles the property line for the Lafarge-owned parcel west of the Trailway.
CUP3-6	European Larch Coniferous Plantation Type	European Larch (+)	10-24 cm	>25%	Disturbed.	22, 24, 28	Some European Larch were planted in the former gravel pit on Lafarge-owned land west of the Trailway. Unit CUP3-6 is a narrow strip growing on the slope between Wetland U2 and the adjacent forest block to the north.
CUP3-9	Norway Spruce Coniferous Plantation Type	Norway Spruce (+)	25-50 cm	>60%	Caledon loam. Well drained.	-	Unit CUP3-9 is a narrow Norway Spruce plantation close to Shaws Creek Road. This unit may have been planted as a wind break.
CUT1	Mineral Cultural Thicket Ecosite	*Shrubs* Staghorn Sumac – Common Buckthorn (+) – Dotted Hawthorn – Chokecherry – Russian Olive (+) – Gray Dogwood *Trees* Manitoba Maple – White Elm – Trembling Aspen – White Cedar – Sugar Maple – White Ash	n/a	>25%	Caledon loam. Well drained. Disturbed soil on shoulders of former rail bed (now a trail) and, on cuts and embankments.	-	Unit CUT1 is a narrow linear that has formed along the shoulders of the former rail line (now the Elora-Cataract Rail Trail). Variable shrub composition, but mainly dominated by patches of Staghorn Sumac and Common Buckthorn (+). Some dense patches of Gray Dogwood. Scattered trees and tree clusters. Small patches of old field vegetation.
CUM1-1	Dry-Moist Old Field Meadow Type	Smooth Brome (+) > Red Fescue (+) – Kentucky Bluegrass (+) – Canada Bluegrass (+) – Tall Goldenrod – Canada Goldenrod – Tall Fescue (+) – Wild Parsnip (+)	n/a	10%	Caledon loam. Well drained. Disturbed soil in former gravel pit and shoulders of former rail bed.	7-8 11-12	Unit CUM1-1a covers most of the former onsite gravel pit beside the Trailway. Unit CUM1-1b is a smaller patch of old field meadow that also contains some scattered trees. Other patches of old field meadow occur on the Lafarge-owned parcel west of the Trailway, on the existing Pit 3 site, to the northeast in former conifer plantations that were harvested and south of Shaws Creek Road near the Trailway.

TABLE 3 VEGETATION COMMUNITIES (ELC UNITS) - PROPOSED PIT 3 EXTENSION AND ADJACENT LANDS							
ELC Code	**Community Type**	**Dominant Species**	**Size Class (dbh)**	**Canopy Closure**	**Soils / Moisture Regime**	**Photo Ref.****	**Notes**
CUH	Hedgerow	Mix of Sugar Maple, Basswood, Black Cherry, White Elm, Red Oak, Trembling Aspen, Manitoba Maple, Apple (+), Common Buckthorn (+).	variable	-	Caledon loam. Well drained. Disturbed soil, spoil piles.	1-2 4-6	Partially treed hedgerows occur on the common boundary with existing Pit 3 (Units CUHa, CUHb and CUHc) and on the east property boundary (Units CUHd, CUHf and CUHh). There are other hedgerow features that are along old fencelines between field compartments (CUHe, CUHg, CUHi and CUHj). The trees in these hedgerows are a mix of Sugar Maple, Basswood, Black Cherry, White Elm, Red Oak, Trembling Aspen, Manitoba Maple, Apple (+), etc. There are a few Rock Elm in some of the hedgerows, many of which are in decline. Most of the hedgerows contain piles of field stones placed by farmers over a period of decades.
Wetland							
SWD4-3	Poplar Mineral Deciduous Swamp Type	Trembling Aspen – Sandbar Willow / Reed Canary Grass	<10 cm	>25%	Disturbed gravels and cobbles. Poorly drained.	31-34	Wetland U3 is a small (0.28 ha), marginally wet feature dominated by young Trembling Aspen and Sandbar Willow. The Trembling Aspen is gradually overtopping the Sandbar Willow. This feature has formed in the bottom of a former gravel pit beside the rail trail. Standing water in U3 is typically limited to wheel ruts created by vehicles driving through the area previously.
SWT2-2	Willow Mineral Thicket Swamp Type	Sandbar Willow – Peach-leaved Willow	<10 cm	>25%	Disturbed gravels and cobbles. Poorly drained.	30	This unit is part of Wetland U2, which has formed in the bottom of a former gravel pit. A low bar extends across most of Wetland U2 oriented northwest to southeast, dominated mainly by shrub willows.
MAM2-2	Reed Canary Grass Mineral Meadow Marsh Type	Reed Canary Grass	n/a	n/a	Disturbed gravels and cobbles. Poorly drained.	30	The north end of Wetland U2 contains a seasonally flooded Reed Canary Grass meadow marsh
MAS3-1	Cattail Organic Shallow Marsh Type	Narrow-leaved Cattail > Reed Canary Grass > Sedges (*Carex hystericina, C. lacustris*)	n/a	n/a	Organic. Poorly drained.	20	Wetland U1 is a 0.29 ha organic cattail marsh (MAS3-1a) that appears to be a natural feature and not associated with past aggregate extraction. The deeper section is dominated by Narrow-leaved Cattail and sedges, while the margins are dominated by Reed Canary Grass.

TABLE 3
VEGETATION COMMUNITIES (ELC UNITS) - PROPOSED PIT 3 EXTENSION AND ADJACENT LANDS

ELC Code	Community Type	Dominant Species	Size Class (dbh)	Canopy Closure	Soils / Moisture Regime	Photo Ref.**	Notes
MAS3-7	Burreed Organic Shallow Marsh Type		n/a	n/a	Organic. Poorly drained.	19	Part of Wetland W1, which occurs within the large forest block west of the Trailway. The dominant species is Giant Burreed, with Reed Canary Grass, Canada Blue-joint and Cyperus-like Sedge as common associates.
SAS1-3	Stonewort Submerged Shallow Aquatic Type	Stonewort (*Chara* sp.)	n/a	n/a	Disturbed gravels and cobbles. Poorly drained.	21-23	The deeper water sections of Wetland U2 contain open water with mats of submergent aquatics such as Stonewort (*Chara* sp.) (SAS1-3).

Notes:

Photo Ref. – See **Attachment B for representative site photographs.

Table 4
Amphibians Heard During the 2014 Call-Count Surveys
Proposed Pit 3 Extension and Adjacent Lands

Station	Date	American Toad	Gray Treefrog	Spring Peeper	Green Frog	Wood Frog
U1	April 21	-	-	3	-	3
	May 29	1-1	3	1-1	-	-
	June 14	-	-	-	-	-
U2	April 21	-	-	3	-	2-3
	May 29	-	3	1-2	1-2	-
	June 14	-	2-4	1-1	1-1	-
U3	April 21	-	-	-	-	-
	May 29	-	-	-	-	-
	June 14	-	-	-	-	-
W1	April 21	-	-	3	-	3
	May 29	-	3	3	1-1	-
	June 14	-	-	-	-	-

Call Code 1: Individuals can be counted; calls do not overlap. The second number indicates the number of individuals heard.

Call Code 2: Calls distinguishable; some simultaneous calling. The second number indicates the number of individuals heard.

Call Code 3: Full chorus; calls continuous and overlapping.

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Table 5
Amphibians Heard During the 2016-2018 Song Meter Surveys
Proposed Pit 3 Extension and Adjacent Lands

Station	Year	Date (mm-dd)	American Toad	Gray Treefrog	Green Frog	Northern Leopard Frog	Spring Peeper	Wood Frog
U1	2016	04-21 05-20 06-05	- 1-3 -	- 3 3	- - -	- - -	3 3 -	3 - -
	2017	04-10 05-17 06-05	- 3 -	- 3 2-6	- - -	- - -	3 3 -	3 - -
	2018	04-26 05-16 06-14	- 2-5 -	- 3 2-5	- - -	- - -	3 3 -	3 - -
U2	2016	04-21 05-20 06-05	- 1-4 -	- 3 3	- - 1-2	1-3 - -	3 3 1-4	3 - -
	2017	04-10 05-17 06-05	- 2-6 -	- 3 3	- - 1-3	1-2 - -	3 3 1-3	3 - -
	2018	04-26 05-16 06-14	- 1-3 -	- 3 2-5	- - 1-2	1-3 - -	3 3 -	2-5 - -
U3	2016		No calls	No calls	No calls	No calls	No calls	No calls
	2017		No calls	No calls	No calls	No calls	No calls	No calls
	2018		No calls	No calls	No calls	No calls	No calls	No calls
W1	2018	04-26 05-16 06-14	- 2-4 -	- 3 2-4	- - 1-1	1-3 1-2 -	3 3 -	3 - -

Call Code 1: Individuals can be counted; calls do not overlap. The second number indicates the number of individuals heard.

Call Code 2: Calls distinguishable; some simultaneous calling. The second number indicates the number of individuals heard.

Call Code 3: Full chorus; calls continuous and overlapping.

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Table 6
Distribution of Breeding Birds within the Proposed Extraction Area
Proposed Pit 3 Extension

Species	CUM1-1a	CUM1-1b	CUH	AG
Mourning Dove	B	B	B	
Black-billed Cuckoo		B		
Killdeer				B
Red-bellied Woodpecker			B	
Hairy Woodpecker			B	
Northern Flicker			B	F
Willow Flycatcher	B			
Least Flycatcher			B	
Eastern Kingbird	B	B	B	
Warbling Vireo	B		B	
Red-eyed Vireo			B	
Blue Jay			B	F
American Crow		B	B	F
Black-capped Chickadee	B		B	
Cedar Waxwing	B		B	
Red-breasted Nuthatch			B	
White-breasted Nuthatch			B	
House Wren	B	B	B	
Gray Catbird	B	B	B	F
Brown Thrasher	B	B	B	
European Starling	B		B	F
Eastern Bluebird	B	B	B	F
American Robin	B	B	B	F
American Goldfinch	B	B	B	
Grasshopper Sparrow	B			
Chipping Sparrow		B		
Field Sparrow	B	B	B	F
Vesper Sparrow	B		B	B
Savannah Sparrow	B			B
Song Sparrow	B	B	B	B
Bobolink	B			
Eastern Meadowlark	B			
Baltimore Oriole	B	B	B	
Red-winged Blackbird	B	B	B	F
Brown-headed Cowbird	B		B	
Common Grackle	B	B	B	F
Common Yellowthroat	B	B		
Yellow Warbler	B	B	B	
Chestnut-sided Warbler	B			
Northern Cardinal			B	
Rose-breasted Grosbeak	B		B	
Indigo Bunting			B	F
BREEDING SPECIES	**28**	**18**	**32**	**4**
FORAGING ONLY SPECIES	**0**	**0**	**0**	**11**
TOTAL NUMBER OF SPECIES	**28**	**18**	**32**	**15**

Table Codes:

CUM1-1 = Old Field Meadow (see Figure 9 for locations of CUM1-1a and CUM1-1b)
CUH = Hedgerow
AG = Agricultural land

B = Breeding
F = Foraging only

Table 7: Rehabilitation Summary Pit 3 Extension – Lafarge Canada Inc.						
Unit	**Size (ha)**	**Planting List**	**Rock Piles**	**Woody Debris Piles**	**Planting Scheme[1]**	**Reforestation Notes**
1A	1.3	Balsam Poplar Bur Oak Freeman's Maple Silver Maple Trembling Aspen White Cedar Highbush Cranberry Nannyberry Red-osier Dogwood Other native species	13	20	A	• Wetland U3 is located within this unit. Two small amphibian pools will be constructed adjacent to the wetland. • Silt fencing should be installed around Area 1A prior to the construction of the acoustic berm adjacent to the Trailway and/or prior to any Phase 1 site preparation activities within 120 m of Wetland U3, whichever occurs first. Silt fencing should be removed once Area 1B has been rehabilitated and it has stabilized. • Prior to the commencement of tree-planting, 13 rock piles and 20 woody debris piles should be placed within this unit. • Tree-planting in this unit shall occur in the spring and/or fall planting windows prior to the commencement of site preparation activities in Phase 2.
1B	2.2	Balsam Poplar Basswood Bur Oak Red Maple Trembling Aspen White Cedar White Pine Highbush Cranberry Nannyberry Other native species	22	33	A	• This unit is within the proposed extraction area (part of Phase 1B, Phase 4) and it will be rehabilitated once extraction is completed. • Fine grading in this unit should create minor topographic variations, to enhance site diversity. Topsoil should be applied to a minimum depth of 30 cm. • Prior to the commencement of tree-planting, 22 rock piles and 33 woody debris piles should be placed within this unit. • An upland native seed mix should be applied in this area (see **Section 12.2.7**). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Table 7: Rehabilitation Summary Pit 3 Extension – Lafarge Canada Inc.						
Unit	**Size (ha)**	**Planting List**	**Rock Piles**	**Woody Debris Piles**	**Planting Scheme[1]**	**Reforestation Notes**
1C	0.8	Black Cherry Bur Oak Red Maple Red Oak Sugar Maple Trembling Aspen White Cedar White Pine Alternate-leaved Dogwood Chokecherry Other native species	-	-	A	• Unit 1C is located within the 15 m property setback adjacent to the Trailway. An acoustic berm will be constructed with a height of 400 masl. As part of the final rehabilitation, the berm will be removed and the area will be reforested. • An upland native seed mix should be applied in these areas (see **Section 12.2.7**). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.
1D	0.3	Black Cherry Bur Oak Red Maple Red Oak Sugar Maple Trembling Aspen White Cedar White Pine Alternate-leaved Dogwood Chokecherry Other native species	-	-	A	• Unit 1D is mainly located within the 15 m property setback adjacent to the Trailway and Significant Woodland, forming a 10 m buffer to the Significant Woodland. • Unit 1D shall be planted with trees and shrubs within 18 months of commencement of site preparation in Phase 1A. • An upland native seed mix should be applied in these areas (see **Section 12.2.7**). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.
2A	1.6	Bur Oak Red Maple Red Oak Sugar Maple White Cedar White Pine Alternate-leaved Dogwood Chokecherry Other native species	16	24	A	• This unit is within the proposed extraction area (Phase 1A) and it will be rehabilitated once extraction is completed. • Fine grading in this unit should create minor topographic variations, to enhance site diversity. Topsoil should be applied to a minimum depth of 30 cm. • Prior to the commencement of tree-planting, 16 rock piles and 24 woody debris piles should be placed within this unit.

Table 7: Rehabilitation Summary Pit 3 Extension – Lafarge Canada Inc.						
Unit	**Size (ha)**	**Planting List**	**Rock Piles**	**Woody Debris Piles**	**Planting Scheme[1]**	**Reforestation Notes**
						• An upland native seed mix should be applied in this area (see **Section 12.2.7**). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.
2B	1.1	Bigtooth Aspen Black Cherry Bur Oak Red Maple Red Oak Sugar Maple Trembling Aspen White Birch White Cedar White Pine Alternate-leaved Dogwood Chokecherry Other native species	11	17	A	• This unit is within the proposed extraction area (Phase 2A) and it will be rehabilitated once extraction is completed. • Fine grading in this unit should create minor topographic variations, to enhance site diversity. Topsoil should be applied to a minimum depth of 30 cm. • Prior to the commencement of tree-planting, 11 rock piles and 17 large pieces of woody debris should be placed within this unit. • An upland native seed mix should be applied in this area (see **Section 12.2.7**). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.
2C	0.2	Black Cherry Red Maple Sugar Maple White Cedar White Pine Alternate-leaved Dogwood Chokecherry Other native species	-	-	A	• This unit is within the proposed extraction area (Phase 2A) and it will be rehabilitated once extraction is completed. • Fine grading in this unit should create minor topographic variations, to enhance site diversity. Topsoil should be applied to a minimum depth of 30 cm. • An upland native seed mix should be applied in this area (see **Section 12.2.7**). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.

Table 7: Rehabilitation Summary Pit 3 Extension – Lafarge Canada Inc.						
Unit	**Size (ha)**	**Planting List**	**Rock Piles**	**Woody Debris Piles**	**Planting Scheme[1]**	**Reforestation Notes**
2D	2.5	Bigtooth Aspen Trembling Aspen White Birch White Cedar White Pine Chokecherry Gray Dogwood Staghorn Sumac Other native species	-	-	B	• This unit is within the proposed extraction area (part of Phases 1A, 1B and 4) and it will be rehabilitated once extraction is completed. • Fine grading in this unit should create minor topographic variations, to enhance site diversity. Topsoil should be applied to a minimum depth of 30 cm. • See **Section 12.2.6** for nodal planting details. Each node shall be 10 m x 30 m in size. 30 planting nodes will be established in Unit 2D. • An upland native seed mix should be applied in this area (see **Section 12.2.7**). A nurse crop (e.g., oats) may also be required, depending on the timing of seeding.
Pools	0.1	See **Section 12.2.5** for wetland species list.	6	10	-	• Two small amphibian breeding pools are proposed within Area 2A, immediately adjacent to Wetland U3. The pools will be excavated into the seasonally high water table such that they contain standing water at least until around mid-July in an average year. • At least 3 rock piles and 5 stumps/logs will be installed around each amphibian breeding pool that is constructed.
Totals	10.0 ha reforestation		68	104		

Table 7 Notes:

- **[1]Planting Scheme**:

A – Standard Planting Approach 1,600 trees/ha (see **Section 12.2.6**)
B – Nodal Planting Approach (see **Section 12.2.6**)

- For details on habitat features (e.g., rock piles, woody debris piles), see **Section 12.2.4**.
- For details on amphibian breeding pools, see **Section 12.2.5**.
- For tree/shrub planting specifications, refer to **Section 12.2.6**.
- For seed mix details, refer to **Section 12.2.7**.

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Attachment A: Curriculum vitae of Mr. Anthony Goodban

ANTHONY G. GOODBAN, B.Sc., M.E.S.(Pl.), MCIP, RPP

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 33 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, institutions, 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 (SAR)

- 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 Gartersnake, Eastern Foxsnake, Gray Ratsnake, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark, SAR bats and Mottled Duskywing. Projects dealing with plant species include American Chestnut, American Columbo, American Ginseng, Butternut and Flowering Dogwood.

- 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 and O.Reg 830/21.

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.

- 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 Dufferin Aggregates Cedar Creek, Alps and Chudyk Pits, and Cambridge Aggregates Ayr Pit, in North Dumfries. 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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Attachment B:

2013-2020 Representative Site Photographs
Proposed Lafarge Pit 3 Extension and Adjacent Lands

Goodban Ecological Consulting Inc. (GEC)

March 2021

Photo 1 – Most of the site is in active agricultural use.
GEC 2013-10-10

Photo 2 – The onsite agricultural fields are under crop rotation (corn, soybeans, winter wheat). GEC 2013-10-10

Photo 3 – The largest individual field compartments are over 4 ha in size.
GEC 2020-10-14

Photo 4 – Approximately 17 ha of the site are in active agricultural use.
GEC 2020-10-14

Photo 5 – There are several hedgerow features along some of the property boundaries and along old fence lines between individual field compartments.
GEC 2020-10-14

Photo 6 – Some of the hedgerows are dominated by lower quality specimens of Manitoba Maple (*Acer negundo*).
GEC 2020-10-14

Photo 7 – Onsite there is a former gravel pit that is approximately 5 ha in size. GEC 2020-10-14

Photo 8 – The vegetation within the former gravel pit is mainly old field meadow (CUM1-1a). GEC 2020-10-14

Photo 9 – The area surrounding the access onto the site was disturbed during the previous aggregate extraction activities.
GEC 2020-10-14

Photo 10 – Near the entrance to the site there are old spoil piles that now have young trees and shrubs growing on them.
GEC 2020-10-14

Photo 11 – There is also a second old field meadow onsite (CUM1-1b).
GEC 2020-10-14

Photo 12 – There are some scattered trees and tree clusters within Unit CUM1-1b, but tree cover is quite low. This old field patch is approximately 0.49 ha in size.
GEC 2020-10-14

Photo 13 – Northwest of the site there is a block of deciduous and mixed forest associated with CVC's Shaw's Creek – Charleston North natural area. The forest just encroaches onto the site by a few metres in the north corner (FOD5-6).
GEC 2020-10-14

Photo 14 - Along a 180 m section of the Trailway, the railway cut has developed into a young deciduous forest of Sugar Maple (*Acer saccharum* ssp. *saccharum*), Basswood (*Tilia americana*) and Black Cherry (*Prunus serotina*) (FOD5-6).
GEC 2020-10-14

Photo 15 - The canopy is almost continuous, even across the Trailway (FOD5-6). GEC 2020-10-14

Photo 16 – The Lafarge-owned parcel on the west side of the Trailway includes deciduous forest dominated by Sugar Maple and Red Maple (*Acer rubrum*) (FOD5-9) and mixed forest dominated by Sugar Maple and Eastern Hemlock (*Tsuga canadensis*) (FOM6-1). GEC 2018-09-23

Photo 17 – The trees within Unit FOD5-9 are mainly at the lower end of the 25 to 50 cm dbh size range. GEC 2018-09-23

Photo 18 – Closer to Wetland W1, the forest transitions to a mixed stand of mainly Sugar Maple and Eastern Hemlock (FOM6-1). The shrub/sapling layer in this forest block is quite sparse; this is likely the result of deer browsing and/or former livestock grazing. There are old barbed wire fences in the woodlot. GEC 2013-10-10

Photo 19 – Wetland W1 is part of the provincially significant Cataract Southwest Wetland Complex. The portion of this wetland that falls within the study area is a Bur-reed Organic Marsh (MAS3-7).
GEC 2018-09-23

Photo 20 – Wetland U1 is a 0.29 ha organic cattail marsh (MAS3-1a) located beside Shaws Creek Road .
GEC 2013-10-10

Photo 21 – Wetland U2 is a fairly diverse 2.6 ha wetland that has formed as a result of past aggregate extraction.
GEC 2013-10-10

Photo 22 – View of Wetland U2 showing open water and cattail patches. In the background are Carolina Poplar (*Populus* X *canadensis* +) and European Larch (*Larix decidua* +) that were planted in the former gravel pit.
GEC 2013-10-10

Photo 23 – The deeper water section of Wetland U2 has a fringe of Narrow-leaved Cattail (*Typha angustifolia*) and mats of submergent aquatic macrophytes such as Stonewort (*Chara* sp.). This section of the wetland contains permanent standing water. Compare with Photo 26.
GEC 2018-05-05

Photo 24 – View of Wetland U2 showing a patchwork of open water, submergent aquatic macrophytes and emergents such as Reed Canary Grass (*Phalaris arundinacea*) and Narrow-leaved Cattail. This photo was taken during the spring high water period. Compare with Photo 28.
GEC 2018-05-17

Photo 25 – Wetland U2. View looking north towards the large woodlot that forms part of the Shaw's Creek – Charleston North natural area.
GEC 2018-05-17

Photo 26 – View of Wetland U2 showing the open water section during the low water period later in the season.
Compare with Photo 23.
GEC 2018-09-23

Photo 27 – View showing Wetland U2 during the low water period later in the season.
GEC 2018-09-23

Photo 28 – View showing Wetland U2 during the low water period later in the season. Compare with Photo 24.
GEC 2018-09-23

Photo 29 – The northern portion of Wetland U2 contains some gravelly areas that are flooded in the spring, drying out later in the season.
GEC 2018-09-23

Photo 30 – View of Wetland U2 taken from close to the Trailway. This view shows dense swards of Reed Canary Grass (MAM2-2) in the foreground and Willow thicket swamp (SWT2-2) in the background.
GEC 2013-10-10

Photo 31 – Wetland U3 is a small 0.28 ha feature that has formed on the former pit floor onsite. Note the general absence of standing water at the time the photo was taken. GEC 2016-04-17

Photo 32 – In 2016, Wetland U3 was dominated by low growth of Sandbar Willow (*Salix interior* [*S. exigua*]). Standing water was limited to some ruts created by vehicles driving through the area previously.
GEC 2016-04-17

Photo 33 – By late 2020 the Sandbar Willow growing in Wetland U3 was being crowded out by fast-growing Trembling Aspen (*Populus tremuloides*).
GEC 2020-10-14

Photo 34 – View showing Trembling Aspen becoming dominant in Wetland U3. The slope behind the aspen trees is the rehabilitated pit side slope.
GEC 2020-10-14

Photo 35: GEC 2020-10-14

Rock Elm (*Ulmus thomasii*) growing along the southeast property line. This species is considered rare in Peel Region and the Credit River watershed (CVC 2002).

Rock Elm has one of the most distinctive silhouettes of any native tree in southern Ontario. The crown is narrow, with most of the lower branches short, strongly downturned, and with corky wings on the branches.

Rock Elm was observed growing in several of the perimeter hedgerows and the internal hedgerows. Most of the trees appeared to be declining due to Dutch Elm Disease.

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Abies balsamea	Balsam Fir	S5		5	-3					X
Acalypha rhomboidea	Common Three-seeded Mercury	S5		0	3	X		X		X
Acer negundo	Manitoba Maple	S5		0	0	X	X			X
Acer rubrum	Red Maple	S5		4	0		X			X
Acer saccharinum	Silver Maple	S5		5	-3					X
Acer saccharum	Sugar Maple	S5		4	3		X			X
Acer spicatum	Mountain Maple	S5		6	3					X
Acer x freemanii	(Acer rubrum X Acer saccharinum)	SNA		6	-5					X
Achillea borealis	Woolly Yarrow	S5		0	3	X	X			X
Actaea pachypoda	White Baneberry	S5		6	5					X
Actaea rubra	Red Baneberry	S5		6	3					X
Adiantum pedatum	Northern Maidenhair Fern	S5		7	3					X
Agrimonia gryposepala	Hooked Agrimony	S5		2	3	X	X			X
Agrostis gigantea	Redtop	SNA	SE5		-3	X		X		X
Agrostis stolonifera	Creeping Bentgrass	SNA	SE5		-3			X		X
Alisma triviale	Northern Water-plantain	S5		1	-5					X
Alliaria petiolata	Garlic Mustard	SNA	SE5		0		X			X
Allium tricoccum	Wild Leek	S4		7	3					X
Alnus incana ssp. rugosa	Speckled Alder	S5		6	-3					X
Ambrosia artemisiifolia	Common Ragweed	S5		0	3	X	X		X	X
Amelanchier arborea	Downy Serviceberry	S5		5	3					X
Amelanchier laevis	Smooth Serviceberry	S5		5	5					X
Amphicarpaea bracteata	American Hog-peanut	S5		4	0					X
Anemonastrum canadense	Canada Anemone	S5		3	-3	X		X		X
Anemone quinquefolia	Wood Anemone	S5		7	0					X
Anemone virginiana	Tall Anemone	S5		4	3					X
Apocynum androsaemifolium	Spreading Dogbane	S5		3	5	X	X			X
Aquilegia canadensis	Red Columbine	S5		5	3					X
Aralia nudicaulis	Wild Sarsaparilla	S5		4	3					X
Arctium lappa	Great Burdock	SNA	SE5		3	X	X		X	X
Arctium minus	Common Burdock	SNA	SE5		3	X				X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Arisaema triphyllum	Jack-in-the-pulpit	S5		5	-3					X
Asarum canadense	Canada Wild-ginger	S5		6	5					X
Asclepias incarnata	Swamp Milkweed	S5		6	-5			X		X
Asclepias syriaca	Common Milkweed	S5		0	5	X				X
Asparagus officinalis	Garden Asparagus	SNA	SE5		3	X				X
Athyrium filix-femina var. angustum	Northeastern Lady Fern	S5		4	0					X
Barbarea vulgaris	Bitter Wintercress	SNA	SE5		0	X			X	X
Berberis thunbergii	Japanese Barberry	SNA	SE5		3					X
Berberis vulgaris	Common Barberry	SNA	SE5		3		X			X
Betula alleghaniensis	Yellow Birch	S5		6	0					X
Betula papyrifera	Paper Birch	S5		2	3		X			X
Bidens cernua	Nodding Beggarticks	S5		2	-5					X
Bidens frondosa	Devil's Beggarticks	S5		3	-3			X		X
Boehmeria cylindrica	Small-spike False Nettle	S5		4	-5					X
Botrypus virginianus	Rattlesnake Fern	S5		5	3					X
Bromus ciliatus	Fringed Brome	S5		6	-3					X
Bromus inermis	Smooth Brome	SNA	SE5		5	X	X	X	X	X
Bromus tectorum	Downy Brome	SNA	SE5		5	X			X	
Calamagrostis canadensis	Bluejoint Reedgrass	S5		4	-5					X
Calla palustris	Wild Calla	S5		8	-5					X
Caltha palustris	Yellow Marsh Marigold	S5		5	-5					X
Campanula rapunculoides	Creeping Bellflower	SNA	SE5		5		X			X
Capsella bursa-pastoris	Common Shepherd's Purse	SNA	SE5		3	X	X			X
Cardamine diphylla	Two-leaved Toothwort	S5		7	3					X
Cardamine pensylvanica	Pennsylvania Bittercress	S5		6	-3					X
Carex arctata	Drooping Woodland Sedge	S5		5	5					X
Carex bebbii	Bebb's Sedge	S5		3	-5			X		X
Carex blanda	Woodland Sedge	S5		3	0					X
Carex communis	Fibrous-root Sedge	S5		6	5					X
Carex crinita	Fringed Sedge	S5		6	-5					X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Carex cristatella	Crested Sedge	S5		3	-3					X
Carex deweyana	Dewey's Sedge	S5		6	3					X
Carex disperma	Two-seeded Sedge	S5		8	-5					X
Carex gracillima	Graceful Sedge	S5		4	3		X			X
Carex granularis	Limestone Meadow Sedge	S5		3	-3					X
Carex hystericina	Porcupine Sedge	S5		5	-5			X		X
Carex interior	Inland Sedge	S5		6	-5					X
Carex intumescens	Bladder Sedge	S5		6	-3					X
Carex lacustris	Lake Sedge	S5		5	-5					X
Carex leptalea	Bristle-stalked Sedge	S5		8	-5					X
Carex lupulina	Hop Sedge	S5		6	-5					X
Carex peckii	Peck's Sedge	S5		6	5					X
Carex pedunculata	Long-stalked Sedge	S5		5	3					X
Carex pensylvanica	Pennsylvania Sedge	S5		5	5		X			X
Carex plantaginea	Plantain-leaved Sedge	S5		7	5					X
Carex platyphylla	Broad-leaved Sedge	S4S5		7	5					X
Carex pseudocyperus	Cyperus-like Sedge	S5		6	-5					X
Carex radiata	Eastern Star Sedge	S5		4	0					X
Carex retrorsa	Retrorse Sedge	S5		5	-5			X		X
Carex rosea	Rosy Sedge	S5		2	5					X
Carex sparganioides	Burreed Sedge	S4S5		5	3					X
Carex spicata	Spiked Sedge	SNA	SE5		3	X				X
Carex sprengelii	Sprengel's Sedge	S5		6	0					X
Carex stipata	Awl-fruited Sedge	S5		3	-5					X
Carex stricta	Tussock Sedge	S5		4	-5					X
Carex tenera	Tender Sedge	S5		4	0					X
Carex viridula ssp. viridula	Greenish Sedge	S5		5	-5					X
Carex vulpinoidea	Fox Sedge	S5		3	-5			X		X
Carex woodii	Wood's Sedge	S4		6	3					X
Carpinus caroliniana	Blue-beech	S5		6	0					X
Carya ovata	Shagbark Hickory	S5		6	3					X

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Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Caulophyllum thalictroides	Blue Cohosh	S5		5	5					X
Celastrus scandens	Climbing Bittersweet	S5		3	3		X			X
Centaurea stoebe	Spotted Knapweed	SNA	SE5		5	X			X	X
Cerastium fontanum ssp. vulgare	Common Mouse-ear Chickweed	SNA	SE5		3	X	X		X	X
Chelone glabra	White Turtlehead	S5		7	-5					X
Chenopodium album	Common Lamb's-quarters	SNA	SE5		3	X	X		X	X
Cicuta bulbifera	Bulbous Water-hemlock	S5		5	-5					X
Cicuta maculata	Spotted Water-hemlock	S5		6	-5					X
Circaea canadensis	Broad-leaved Enchanter's Nightshade	S5		2	3					X
Cirsium arvense	Canada Thistle	SNA	SE5		3	X	X		X	X
Cirsium vulgare	Bull Thistle	SNA	SE5		3	X				X
Claytonia virginica	Eastern Spring Beauty	S5		5	3					X
Clematis virginiana	Virginia Clematis	S5		3	0		X			X
Clinopodium acinos	Basil Thyme	SNA	SE5		5	X				X
Clinopodium vulgare	Wild Basil	S5		4	5	X				X
Clintonia borealis	Yellow Clintonia	S5		7	0					X
Convallaria majalis	European Lily-of-the-valley	SNA	SE5		5					X
Convolvulus arvensis	Field Bindweed	SNA	SE5		5	X	X		X	X
Coptis trifolia	Goldthread	S5		7	-3					X
Cornus alternifolia	Alternate-leaved Dogwood	S5		6	3		X			X
Cornus obliqua	Silky Dogwood	S5		2	-3					X
Cornus racemosa	Grey Dogwood	S5		2	0	X	X	X		X
Cornus sericea	Red-osier Dogwood	S5		2	-3	X	X	X		X
Crataegus macracantha	Large-thorned Hawthorn	S5		4	5					X
Crataegus monogyna	English Hawthorn	SNA	SE4		3		X			X
Crataegus punctata	Dotted Hawthorn	S5		4	5		X			X
Crepis tectorum	Narrow-leaved Hawksbeard	SNA	SE5		5	X				X
Cyperus esculentus	Perennial Yellow Flatsedge	S5		1	-3	X		X	X	
Cystopteris bulbifera	Bulblet Bladder Fern	S5		5	-3					X
Dactylis glomerata	Orchard Grass	SNA	SE5		3	X	X			X
Danthonia spicata	Poverty Oatgrass	S5		5	5	X				X

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Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Daucus carota	Wild Carrot	SNA	SE5		5	X	X		X	X
Dianthus armeria	Deptford Pink	SNA	SE5		5	X	X			X
Dicentra canadensis	Squirrel-corn	S5		7	5					X
Dichanthelium implicatum	Slender-stemmed Panicgrass	S5		3	0	X				X
Diervilla lonicera	Northern Bush-honeysuckle	S5		5	5					X
Dipsacus fullonum	Common Teasel	SNA	SE5		3	X	X		X	X
Dryopteris carthusiana	Spinulose Wood Fern	S5		5	-3					X
Dryopteris cristata	Crested Wood Fern	S5		7	-5					X
Dryopteris intermedia	Evergreen Wood Fern	S5		5	0					X
Dryopteris marginalis	Marginal Wood Fern	S5		5	3					X
Echinochloa crus-galli	Large Barnyard Grass	SNA	SE5		-3	X		X	X	X
Echinocystis lobata	Wild Cucumber	S5		3	-3		X			X
Echium vulgare	Common Viper's Bugloss	SNA	SE5		5	X				X
Elaeagnus angustifolia	Russian Olive	SNA	SE3		3	X	X			X
Eleocharis erythropoda	Red-stemmed Spikerush	S5		4	-5					X
Eleocharis obtusa	Blunt Spikerush	S5		5	-5			X		X
Elymus hystrix	Bottlebrush Grass	S5		5	5					X
Elymus repens	Quackgrass	SNA	SE5		3	X	X		X	X
Elymus virginicus	Virginia Wildrye	S5		5	-3			X		X
Epifagus virginiana	Beechdrops	S5		6	5					X
Epilobium ciliatum ssp. ciliatum	Northern Willowherb	S5		3	-3			X		X
Epilobium hirsutum	Hairy Willowherb	SNA	SE5		-3			X		X
Epilobium parviflorum	Small-flowered Hairy Willowherb	SNA	SE4		3					X
Epipactis helleborine	Broad-leaved Helleborine	SNA	SE5		3		X			X
Equisetum arvense	Field Horsetail	S5		0	0	X	X	X	X	X
Equisetum hyemale	Common Scouring-rush	S5		2	0	X				X
Equisetum variegatum	Variegated Scouring-rush	S5		5	-3					X
Erigeron annuus	Annual Fleabane	S5		0	3	X	X		X	X
Erigeron canadensis	Canada Horseweed	S5		0	3	X			X	X
Erigeron philadelphicus	Philadelphia Fleabane	S5		1	-3	X			X	X
Erysimum cheiranthoides	Wormseed Wallflower	S5?			3	X				X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Erythronium americanum	Yellow Trout-lily	S5		5	5					X
Euonymus obovatus	Running Strawberry-bush	S4		6	5					X
Eupatorium perfoliatum	Common Boneset	S5		2	-3					X
Euphorbia cyparissias	Cypress Spurge	SNA	SE5		5	X			X	X
Eurybia macrophylla	Large-leaved Aster	S5		5	5					X
Euthamia graminifolia	Grass-leaved Goldenrod	S5		2	0	X		X		X
Eutrochium maculatum	Spotted Joe Pye Weed	S5		3	-5			X		X
Fagus grandifolia	American Beech	S4		6	3					X
Festuca rubra ssp. rubra	Red Fescue	SNA	SE5			X				X
Festuca subverticillata	Nodding Fescue	S4		6	3					X
Fragaria vesca	Woodland Strawberry	S5		4	3					X
Fragaria virginiana	Wild Strawberry	S5		2	3	X	X	X		X
Fraxinus americana	White Ash	S4		4	3	X	X			X
Fraxinus pennsylvanica	Red Ash	S4		3	-3					X
Galium asprellum	Rough Bedstraw	S5		6	-5					X
Galium mollugo	Smooth Bedstraw	SNA	SE5		5	X				X
Galium palustre	Common Marsh Bedstraw	S5		5	-5			X		X
Galium triflorum	Three-flowered Bedstraw	S5		4	3					X
Galium verum	Yellow Bedstraw	SNA	SE4		5	X				X
Geranium maculatum	Spotted Geranium	S5		6	3					X
Geranium robertianum	Herb-Robert	S5		2	3		X			X
Geum aleppicum	Yellow Avens	S5		2	0					X
Geum canadense	Canada Avens	S5		3	0					X
Geum urbanum	Wood Avens	SNA	SE3		5		X			X
Glechoma hederacea	Ground-ivy	SNA	SE5		3		X			
Gleditsia triacanthos	Honey Locust	S2?		8	0		X			X
Glyceria grandis	Tall Mannagrass	S5		5	-5					X
Glyceria striata	Fowl Mannagrass	S5		3	-5					X
Gymnocarpium dryopteris	Common Oak Fern	S5		7	3					X
Hackelia virginiana	Virginia Stickseed	S5		5	3					X
Hamamelis virginiana	American Witch-hazel	S4S5		6	3					X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Helianthus tuberosus	Jerusalem Artichoke	SU		1	0	X				X
Hemerocallis fulva	Orange Daylily	SNA	SE5		5					X
Hepatica acutiloba	Sharp-lobed Hepatica	S5		8	5					X
Hesperis matronalis	Dame's Rocket	SNA	SE5		3		X			X
Hordeum jubatum	Foxtail Barley	S5?		0	0	X			X	X
Huperzia lucidula	Shining Firmoss	S5		5	0					X
Hydrophyllum virginianum	Virginia Waterleaf	S5		6	0					X
Hylodesmum glutinosum	Large Tick-trefoil	S4		6	5					X
Hypericum perforatum	Common St. John's-wort	SNA	SE5		5	X	X			X
Ilex verticillata	Common Winterberry	S5		5	-3					X
Impatiens capensis	Spotted Jewelweed	S5		4	-3					X
Inula helenium	Elecampane	SNA	SE5		3	X		X		X
Iris versicolor	Harlequin Blue Flag	S5		5	-5					X
Juglans nigra	Black Walnut	S4?		5	3		X			X
Juncus articulatus	Jointed Rush	S5		5	-5					X
Juncus dudleyi	Dudley's Rush	S5		1	-3	X		X		X
Juncus effusus ssp. solutus	Soft Rush	S5?		4	-5					X
Juncus nodosus	Knotted Rush	S5		5	-5					X
Juncus tenuis	Path Rush	S5		0	0					X
Juncus torreyi	Torrey's Rush	S5		3	-3			X		X
Juniperus virginiana	Eastern Red Cedar	S5		4	3	X	X			X
Lactuca canadensis	Canada Lettuce	S5		3	3					X
Lactuca serriola	Prickly Lettuce	SNA	SE5		3	X	X		X	X
Laportea canadensis	Canada Wood Nettle	S5		6	-3					X
Lapsana communis	Common Nipplewort	SNA	SE5		3		X			X
Larix decidua	European Larch	SNA	SE2		5					X
Larix laricina	Tamarack	S5		7	-3					X
Leersia oryzoides	Rice Cutgrass	S5		3	-5					X
Lemna minor	Small Duckweed	S5		5	-5					X
Leonurus cardiaca ssp. cardiaca	Common Motherwort	SNA	SE5		5		X			X
Lepidium campestre	Field Peppergrass	SNA	SE5		5	X			X	X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Lepidium densiflorum	Common Peppergrass	SNA	SE5		3	X			X	X
Leucanthemum vulgare	Oxeye Daisy	SNA	SE5		5	X				X
Ligustrum vulgare	European Privet	SNA	SE5		3		X			X
Linaria vulgaris	Butter-and-eggs	SNA	SE5		5	X			X	X
Lithospermum officinale	European Gromwell	SNA	SE5		5	X				X
Lobelia inflata	Indian-tobacco	S5		3	3					X
Lobelia siphilitica	Great Blue Lobelia	S5		6	-3					X
Lolium arundinaceum	Tall Ryegrass	SNA	SE5		3	X		X		X
Lolium perenne	Perennial Ryegrass	SNA	SE4		3	X				X
Lonicera canadensis	Canada Fly Honeysuckle	S5		6	3					X
Lonicera dioica	Limber Honeysuckle	S5		5	3					X
Lonicera morrowii	Morrow's Honeysuckle	SNA	SE3		3		X			X
Lonicera tatarica	Tatarian Honeysuckle	SNA	SE5		3	X	X			X
Luzula acuminata	Hairy Woodrush	S5		6	3					X
Lycopus americanus	American Water-horehound	S5		4	-5					X
Lycopus uniflorus	Northern Water-horehound	S5		5	-5					X
Lysimachia ciliata	Fringed Yellow Loosestrife	S5		4	-3					X
Lysimachia nummularia	Creeping Yellow Loosestrife	SNA	SE5		-3			X		X
Lythrum salicaria	Purple Loosestrife	SNA	SE5		-5	X		X		X
Maianthemum canadense	Wild Lily-of-the-valley	S5		5	3					X
Maianthemum racemosum	Large False Solomon's Seal	S5		4	3					X
Maianthemum stellatum	Star-flowered False Solomon's Seal	S5		6	0					X
Malus pumila	Common Apple	SNA	SE4		5		X			X
Matteuccia struthiopteris	Ostrich Fern	S5		5	0					X
Medicago lupulina	Black Medick	SNA	SE5		3	X			X	X
Medicago sativa ssp. sativa	Alfalfa	SNA	SE5		5	X			X	X
Melilotus albus	White Sweet-clover	SNA	SE5		3	X				X
Melilotus altissimus	Tall Yellow Sweet-clover	SNA	SE1		5	X			X	X
Mentha canadensis	Canada Mint	S5		3	-3					X
Mimulus ringens	Square-stemmed Monkeyflower	S5		6	-5					X
Mitchella repens	Partridgeberry	S5		6	3					X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Monarda fistulosa	Wild Bergamot	S5		6	3	X	X			X
Morus alba	White Mulberry	SNA	SE5		0		X			X
Muhlenbergia mexicana var. mexicana	Mexican Muhly	S5		1	-3			X		X
Myosotis laxa	Small Forget-me-not	S5		6	-5					X
Nepeta cataria	Catnip	SNA	SE5		3	X	X		X	X
Oenothera parviflora	Small-flowered Evening-primrose	S5		1	3	X				X
Onoclea sensibilis	Sensitive Fern	S5		4	-3					X
Oryzopsis asperifolia	Rough-leaved Mountain Rice	S5		6	5					X
Osmorhiza claytonii	Hairy Sweet Cicely	S5		5	0					X
Osmundastrum cinnamomeum	Cinnamon Fern	S5		7	-3					X
Ostrya virginiana	Eastern Hop-hornbeam	S5		4	3		X			X
Oxalis stricta	Upright Yellow Wood-sorrel	SNA	SE5		3	X			X	X
Panicum capillare	Common Panicgrass	S5		0	0	X			X	X
Parthenocissus vitacea	Thicket Creeper	S5		4	3		X			X
Pastinaca sativa	Wild Parsnip	SNA	SE5		5	X		X		X
Persicaria amphibia	Water Smartweed	S5		5	-5					X
Persicaria hydropiper	Marshpepper Smartweed	SNA	SE5		-5					X
Persicaria lapathifolia	Pale Smartweed	S5		2	-3					X
Phalaris arundinacea	Reed Canary Grass	S5		0	-3	X		X		X
Phleum pratense	Common Timothy	SNA	SE5		3	X				X
Phragmites australis ssp. australis	European Reed	SNA	SE5		-3			X		X
Phryma leptostachya	Lopseed	S4S5		6	3					X
Picea abies	Norway Spruce	SNA	SE3		5					X
Picea glauca	White Spruce	S5		6	3					X
Pilea pumila	Dwarf Clearweed	S5		5	-3					X
Pilosella aurantiaca	Orange Hawkweed	SNA	SE5		5	X				X
Pilosella caespitosa	Meadow Hawkweed	SNA	SE5		5	X				X
Pilosella piloselloides	Tall Hawkweed	SNA	SE5		5	X				X
Pinus resinosa	Red Pine	S5		8	3					X
Pinus strobus	Eastern White Pine	S5		4	3		X			X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Pinus sylvestris	Scots Pine	SNA	SE5		3		X			X
Plantago lanceolata	English Plantain	SNA	SE5		3	X				X
Plantago major	Common Plantain	SNA	SE5		3	X	X			X
Poa annua	Annual Bluegrass	SNA	SE5		3					X
Poa compressa	Canada Bluegrass	SNA	SE5		3	X				X
Poa palustris	Fowl Bluegrass	S5		5	-3			X		X
Poa pratensis	Kentucky Bluegrass	S5		0	3	X				X
Podophyllum peltatum	May-apple	S5		5	3					X
Polygonatum pubescens	Hairy Solomon's Seal	S5		5	5					X
Polystichum acrostichoides	Christmas Fern	S5		5	3					X
Populus alba	White Poplar	SNA	SE5		5		X			X
Populus balsamifera	Balsam Poplar	S5		4	-3		X			X
Populus grandidentata	Large-toothed Aspen	S5		5	5					X
Populus tremuloides	Trembling Aspen	S5		2	0	X	X	X		X
Populus x canadensis	(Populus deltoides X Populus nigra)	SNA			5					X
Potamogeton natans	Floating-leaved Pondweed	S5		5	-5					X
Potentilla argentea	Silvery Cinquefoil	SNA	SE5		3					X
Potentilla norvegica	Rough Cinquefoil	S5		0	0	X				X
Potentilla recta	Sulphur Cinquefoil	SNA	SE5		5	X				X
Potentilla simplex	Old-field Cinquefoil	S5		3	3					X
Prunella vulgaris ssp. lanceolata	Lance-leaved Self-heal	S5		0	0			X		X
Prunus nigra	Canada Plum	S4		4	3	X				
Prunus pensylvanica	Pin Cherry	S5		3	3	X				X
Prunus serotina	Black Cherry	S5		3	3		X			X
Prunus virginiana	Chokecherry	S5		2	3	X	X			X
Pteridium aquilinum	Bracken Fern	S5		2	3					X
Pyrola elliptica	Shinleaf	S5		5	5					X
Quercus macrocarpa	Bur Oak	S5		5	3					X
Quercus rubra	Northern Red Oak	S5		6	3		X			X
Ranunculus abortivus	Kidney-leaved Buttercup	S5		2	0					X
Ranunculus acris	Common Buttercup	SNA	SE5		0	X	X	X		X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Ranunculus recurvatus var. recurvatus	Hooked Buttercup	S5		4	-3					X
Ranunculus sceleratus	Cursed Buttercup	S5		2	-5			X		X
Rhamnus cathartica	European Buckthorn	SNA	SE5		0	X	X	X		X
Rhus typhina	Staghorn Sumac	S5		1	3	X	X			X
Ribes americanum	American Black Currant	S5		4	-3					X
Ribes cynosbati	Eastern Prickly Gooseberry	S5		4	3					X
Ribes rubrum	European Red Currant	SNA	SE5		5					X
Ribes triste	Swamp Red Currant	S5		6	-5					X
Robinia pseudoacacia	Black Locust	SNA	SE5		3		X			X
Rorippa palustris ssp. hispida	Hispid Marsh Yellowcress	S5		3	-5					X
Rosa blanda	Smooth Rose	S5		3	3	X				X
Rosa multiflora	Multiflora Rose	SNA	SE5		3	X	X			X
Rubus allegheniensis	Allegheny Blackberry	S5		2	3		X			X
Rubus idaeus ssp. strigosus	North American Red Raspberry	S5		2	3		X	X		X
Rubus occidentalis	Black Raspberry	S5		2	5					X
Rubus odoratus	Purple-flowering Raspberry	S5		3	5					X
Rudbeckia hirta	Black-eyed Susan	S5		0	3	X				X
Rumex acetosella	Sheep Sorrel	SNA	SE5		3	X				X
Rumex crispus	Curled Dock	SNA	SE5		0	X		X		X
Rumex triangulivalvis	Triangular-valve Dock	S5		0	0					X
Sagittaria latifolia	Broad-leaved Arrowhead	S5		4	-5					X
Salix amygdaloides	Peach-leaved Willow	S5		6	-3					X
Salix bebbiana	Bebb's Willow	S5		4	-3					X
Salix discolor	Pussy Willow	S5		3	-3					X
Salix eriocephala	Cottony Willow	S5		4	-3					X
Salix interior	Sandbar Willow	S5		1	-3			X		X
Salix petiolaris	Meadow Willow	S5		3	-3			X		X
Salix x fragilis	(Salix alba X Salix euxina)	SNA	SE5		-3					X
Sambucus canadensis	Common Elderberry	S5		5	-3					X
Sambucus racemosa	Red Elderberry	S5		5	3					X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Sanicula marilandica	Maryland Sanicle	S5		5	3					X
Saponaria officinalis	Bouncing-bet	SNA	SE5		3	X	X			X
Schizachne purpurascens	Purple False Melic	S5		6	3					X
Schoenoplectus tabernaemontani	Soft-stemmed Bulrush	S5		5	-5					X
Scirpus atrovirens	Dark-green Bulrush	S5		3	-5	X		X		X
Scirpus cyperinus	Common Woolly Bulrush	S5		4	-5					X
Scutellaria galericulata	Marsh Skullcap	S5		6	-5					X
Scutellaria lateriflora	Mad-dog Skullcap	S5		5	-5					X
Senecio vulgaris	Common Ragwort	SNA	SE5		5	X				X
Setaria pumila	Yellow Foxtail	SNA	SE5		0	X			X	X
Setaria viridis	Green Foxtail	SNA	SE5		5	X			X	X
Silene latifolia	White Campion	SNA	SE5		5	X				
Silene vulgaris	Bladder Campion	SNA	SE5		5	X				X
Sinapis arvensis	Corn Mustard	SNA	SE5		5	X			X	X
Sisymbrium officinale	Common Tumble Mustard	SNA	SE5		5	X			X	X
Sium suave	Common Water-parsnip	S5		4	-5					X
Smilax herbacea	Herbaceous Carrionflower	S4?		5	0		X			X
Smilax tamnoides	Bristly Greenbriar	S5		6	0		X			X
Solanum dulcamara	Bittersweet Nightshade	SNA	SE5		0		X	X		X
Solidago altissima	Tall Goldenrod	S5		1	3	X				X
Solidago caesia	Blue-stemmed Goldenrod	S5		5	3					X
Solidago canadensis	Canada Goldenrod	S5		1	3	X		X		X
Solidago flexicaulis	Zigzag Goldenrod	S5		6	3					X
Solidago gigantea	Giant Goldenrod	S5		4	-3					X
Solidago juncea	Early Goldenrod	S5		3	5	X				X
Solidago nemoralis	Grey-stemmed Goldenrod	S5		2	5	X				X
Solidago rugosa	Rough-stemmed Goldenrod	S5		4	0			X		X
Sonchus arvensis	Field Sow-thistle	SNA	SE5		3	X				
Sorbaria sorbifolia	False Spiraea	SNA	SE4		5					X
Sorbus aucuparia	European Mountain-ash	SNA	SE4		5					X
Sparganium eurycarpum	Broad-fruited Burreed	S5		3	-5					X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Sphenopholis intermedia	Slender Wedgegrass	S4S5		6	0					X
Spiraea alba	White Meadowsweet	S5		3	-3			X		X
Spirodela polyrhiza	Great Duckweed	S5		4	-5					X
Sporobolus neglectus	Small Dropseed	S4		1	3				X	X
Stellaria borealis	Boreal Starwort	S5		10	-3					X
Streptopus lanceolatus	Rose Twisted-stalk	S5		7	3					X
Stuckenia pectinata	Sago Pondweed	S5		4	-5					X
Symphyotrichum cordifolium	Heart-leaved Aster	S5		5	5	X	X			X
Symphyotrichum ericoides	White Heath Aster	S5		4	3	X				X
Symphyotrichum lanceolatum	Panicled Aster	S5		3	-3	X		X		X
Symphyotrichum lateriflorum	Calico Aster	S5		3	0					X
Symphyotrichum novae-angliae	New England Aster	S5		2	-3	X	X	X		X
Symphyotrichum puniceum	Purple-stemmed Aster	S5		6	-5					X
Symphyotrichum urophyllum	Arrow-leaved Aster	S4		6	5		X			X
Syringa vulgaris	Common Lilac	SNA	SE5		5		X			X
Tanacetum vulgare	Common Tansy	SNA	SE5		5	X			X	X
Taraxacum officinale	Common Dandelion	SNA	SE5		3	X	X	X	X	X
Taraxacum palustre	Marsh Dandelion	SNA	SE5		-3			X		X
Taxus canadensis	Canada Yew	S4		7	3					X
Thalictrum dioicum	Early Meadow-rue	S5		6	3					X
Thalictrum pubescens	Tall Meadow-rue	S5		5	-3					X
Thelypteris palustris	Marsh Fern	S5		5	-3					X
Thlaspi arvense	Field Pennycress	SNA	SE5		5	X			X	X
Thuja occidentalis	Eastern White Cedar	S5		4	-3		X			X
Tiarella cordifolia	Heart-leaved Foamflower	S5		6	3					X
Tilia americana	Basswood	S5		4	3		X			X
Toxicodendron radicans var. rydbergii	Western Poison Ivy	S5		2	0	X		X		X
Tragopogon dubius	Yellow Goatsbeard	SNA	SE5		5	X				X
Tragopogon pratensis	Meadow Goatsbeard	SNA	SE5		5	X				
Trifolium hybridum	Alsike Clover	SNA	SE5		3	X				X

ATTACHMENT C: VASCULAR PLANT CHECKLIST – PROPOSED PIT 3 EXTENSION (CALEDON) & ADJACENT LANDS										
Scientific Name	**Common Name**	**S-Rank**	**SE-Rank**	**CC**	**CW**	**Licence Area**				**ADJ**
						CUM	**CUH**	**SWD**	**AGR**	
Trifolium pratense	Red Clover	SNA	SE5		3	X				X
Trifolium repens	White Clover	SNA	SE5		3	X			X	X
Trillium erectum	Red Trillium	S5		6	3					X
Trillium grandiflorum	White Trillium	S5		5	3					X
Tsuga canadensis	Eastern Hemlock	S5		7	3					X
Typha angustifolia	Narrow-leaved Cattail	SNA	SE5		-5					X
Typha latifolia	Broad-leaved Cattail	S5		1	-5					X
Ulmus americana	White Elm	S5		3	-3		X			X
Ulmus pumila	Siberian Elm	SNA	SE3		3		X			
Ulmus thomasii	Rock Elm	S4		6	0		X			
Urtica gracilis ssp. gracilis	Slender Stinging Nettle	S5		2	0					X
Verbascum thapsus	Common Mullein	SNA	SE5		5	X				X
Verbena hastata	Blue Vervain	S5		4	-3			X		X
Verbena urticifolia	White Vervain	S5		4	0	X				X
Veronica officinalis	Common Speedwell	SNA	SE5		5					X
Veronica serpyllifolia	Thyme-leaved Speedwell	SU			0					X
Viburnum acerifolium	Maple-leaved Viburnum	S5		6	5					X
Viburnum lentago	Nannyberry	S5		4	0					X
Vicia cracca	Tufted Vetch	SNA	SE5		5	X				X
Vicia sativa	Common Vetch	SNA	SE5		3	X				X
Vinca minor	Lesser Periwinkle	SNA	SE5		5					X
Vincetoxicum rossicum	European Swallowwort	SNA	SE5		5	X				X
Viola canadensis	Canada Violet	S5		6	3					X
Viola cucullata	Marsh Blue Violet	S5		5	-5					X
Viola pubescens	Yellow Violet	S5		5	3					X
Viola rostrata	Long-spurred Violet	S5		6	3					X
Vitis riparia	Riverbank Grape	S5		0	0	X	X	X		X

PLANT LIST NOTES:

Taxonomy and Nomenclature

The taxonomy and nomenclature used in this list generally follows that used by the Ontario Natural Heritage Information Centre (NHIC).

Table Column Information

S-Rank	Provincial (subnational) conservation status rank assigned by NHIC; S1 to S5 based on decreasing level of conservation concern.
SE-Rank	Provincial (provincial) exotic status rank assigned by NHIC, SE1 to SE5 based on increasing abundance.
SNA	S-Rank not available/applicable.
CC	Coefficient of Conservatism (Oldham et al. 1995 and NHIC database).
CW	Coefficient of Wetness (Oldham et al. 1995 and NHIC database).
Licence Area:	CUM Old Field Meadow (CUM1-1) CUH Hedgerow (CUH) SWD Poplar Mineral Deciduous Swamp (SWD4-3) AGR Agricultural Field
ADJ	Adjacent Land

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Attachment D - Wildlife Species Recorded from the Proposed Lafarge Pit No. 3 Extension

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
ODONATES	**ODONATA**							
DAMSELFLIES	**ZYGOPTERA**							
Northern Spreadwing	*Lestes disjuncta*	S5	G5					A
Emerald Spreadwing	*Lestes dryas*	S5	G5					E
Powdered Dancer	*Argia moesta*	S5	G5					A
Boreal Bluet	*Enallagma boreale*	S5	G5					A
Familiar Bluet	*Enallagma civile*	S5	G5					A, E
Marsh Bluet	*Enallagma ebrium*	S5	G5					A
Skimming Bluet	*Enallagma geminatum*	S4	G5					E
Eastern Forktail	*Ischnura verticalis*	S5	G5					A
DRAGONFLIES	**ANISOPTERA**							
Common Green Darner	*Anax junius*	S5	G5					A
Dusky Clubtail	*Gomphus spicatus*	S5	G5					A
Common Baskettail	*Epitheca cynosura*	S5	G5					A
Calico Pennant	*Celithemis elisa*	S5	G5					A
Chalk-fronted Corporal	*Ladona julia*	S5	G5					A
Dot-tailed Whiteface	*Leucorrhinia intacta*	S5	G5					A, E, L
Widow Skimmer	*Libellula luctuosa*	S5	G5					A
Twelve-spotted Skimmer	*Libellula pulchella*	S5	G5					A, E,
Four-spotted Skimmer	*Libellula quadrimaculata*	S5	G5					A
White-faced Meadowhawk	*Sympetrum obtruscum*	S5	G5					A
Autumn Meadowhawk	*Sympetrum vinium*	S5	G5					A
BUTTERFLIES	**PHOPALOCERA**							
Northern Cloudy Wing	*Thorybes pylades*	S5	G5					E
Arctic Skipper	*Carterocephalus palaemon*	S5	G5			7		A
Least Skipper	*Ancyloxypha numitor*	S5	G5					E
European Skipper	*Thymelicus lineola*	SNA	G5					A, E
Delaware Skipper	*Anatrytone logan*	S4	G5					L
Cabbage White	*Pieris rapae*	SNA	G5					A, E, L
Clouded Sulphur	*Colias philodice*	S5	G5					A, E
Northern Azure	*Celastrina lucius*	S5	G5					A, L
Summer Azure	*Celastrina neglecta*	S5	G5					E
Pearl Crescent	*Phyciodes tharos*	S4	G5					A
Northern Crescent	*Phycoides pascoensis*	S5	G5					A

Attachment D - Wildlife Species Recorded from the Proposed Lafarge Pit No. 3 Extension

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
Mourning Cloak	*Nymphalis antiopa*	S5	G5					A
Painted Lady	*Vanessa cardui*	S5	G5					A
Viceroy	*Limenitis archippus*	S5	G5					A
Appalachian Brown	*Satyrodes appalachia*	S4	G4					E
Little Wood-Satyr	*Megisto cymela*	S5	G5					A
Common Ringlet	*Coenonympha tullia*	S5	G5					A, E
Common Wood-Nymph	*Cercyonis pegala*	S5	G5					A, E, L
Monarch	*Danaus plexippus*	S4B, S2N	G4	SC	END			E
BUMBLE BEES	**APIDAE**							
Two-spotted Bumble Bee	*Bombus bimaculatus*	S4	GNR					A
Yellow Bumble Bee	*Bombus fervidus*	S4	GNR					A, L
Common Eastern Bumble Bee	*Bombus impatiens*	S4S5	G5					A, E, L
Tri-coloured Bumble Bee	*Bombus ternarius*	S5	GNR					A
AMPHIBIANS	**AMPHIBIA**							
Red-spotted Newt	*Notophthalmus viridescens*	S5	G5T5					A
Northern Redback Salamander	*Plethodon cinereus*	S5	G5					A
American Toad	*Anaxyrus americanus*	S5	G5					A
Tetraploid Gray Treefrog	*Hyla versicolor*	S5	G5					A
Spring Peeper	*Pseudacris crucifer*	S5	G5					A
Northern Green Frog	*Lithobates clamitans*	S5	G5					A
Wood Frog	*Lithobates sylvatica*	S5	G5					A
Northern Leopard Frog	*Lithobates pipiens*	S5	G5	NAR	NAR			A
REPTILES	**REPTILIA**							
Snapping Turtle	*Chelydra serpentina*	S3	G5	SC	SC			A
Midland Painted Turtle	*Chrysemys picta marginata*	S4	G5T5		SC			A
Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5					A
DeKay's Brown Snake	*Storeria dekayi*	S5	G5	NAR	NAR			A
BIRDS	**AVES**							
Canada Goose	*Branta canadensis*	S5	G5					A: breeding
Trumpeter Swan	*Cygnus buccinator*	S4	G5	NAR	NAR			A: breeding
Wood Duck	*Aix sponsa*	S5	G5					A: breeding
Mallard	*Anas platyrhynchos*	S5	G5					A: breeding

Attachment D - Wildlife Species Recorded from the Proposed Lafarge Pit No. 3 Extension

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
Hooded Merganser	*Lophodytes cucullatus*	S5B, S5N	G5			7		A: breeding
Pied-billed Grebe	*Podilymbus podiceps*	S4B, S4N	G5					A: breeding
Mourning Dove	*Zenaida macroura*	S5	G5					A: breeding; E: breeding; L: breeding
Yellow-billed Cuckoo	*Coccyzus americanus*	S4B	G5					A: breeding
Black-billed Cuckoo	*Coccyzus erythropthalmus*	S5B	G5					A: breeding; E: breeding
Virginia Rail	*Rallus limicola*	S5B	G5					A: breeding
Sora	*Porzana carolina*	S4B	G5					A: breeding
Killdeer	*Charadrius vociferus*	S5B, S5N	G5					A: breeding; E: breeding; L: breeding
Spotted Sandpiper	*Actitis macularia*	S5	G5					A: breeding
Least Bittern	*Ixobrychus exilis*	S4B	G5	THR	THR			A: breeding
Great Blue Heron	*Ardea herodias*	S5	G5					A: foraging
Green Heron	*Butorides virescens*	S4B	G5					A: foraging
Turkey Vulture	*Cathartes aura*	S5B	G5					A: overhead; E: overhead; L: overhead
Sharp-shinned Hawk	*Accipiter striatus*	S5	G5	NAR	NAR		20-30	A: foraging
Cooper's Hawk	*Accipiter cooperii*	S4	G5	NAR	NAR		4-50+	A: breeding
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5					A: breeding; E: foraging
Belted Kingfisher	*Megaceryle alcyon*	S4B	G5					A: foraging
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3B	G5	END	END			A: nesting; L: foraging
Red-bellied Woodpecker	*Melanerpes carolinus*	S4	G5					A: breeding; E: breeding; L: breeding
Downy Woodpecker	*Picoides pubescens*	S5	G5					A: breeding; L: breeding
Hairy Woodpecker	*Picoides villosus*	S5	G5				10	A: breeding; E: breeding; L: breeding
Northern Flicker	*Colaptes auratus*	S4B	G5					A: breeding; E: breeding L: breeding
American Kestrel	*Falco sparverius*	S5B	G5					A: breeding
Eastern Wood-Pewee	*Contopus virens*	S4B	G5	SC	SC			A: breeding; E: foraging
Willow Flycatcher	*Empidonax traillii*	S5B	G5			5		A: breeding; E: breeding
Least Flycatcher	*Empidonax minimus*	S4B	G5					A: breeding; E: breeding
Eastern Phoebe	*Sayornis phoebe*	S5B	G5					A: foraging; E: foraging; L: breeding
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5					A: breeding
Eastern Kingbird	*Tyrannus tyrannus*	S4B	G5					A: breeding; E: breeding; L: breeding
Blue-headed Vireo	*Vireo solitarius*	S5B	G5			6, 7	100?	A: breeding
Warbling Vireo	*Vireo gilvus*	S5B	G5					A: breeding; E: breeding; L: breeding
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5					A: breeding; E: breeding; L: breeding
Blue Jay	*Cyanocitta cristata*	S5	G5					A: breeding E: breeding; L: breeding
American Crow	*Corvus brachyrhynchos*	S5B	G5					A: breeding; E: breeding; L: breeding
Black-capped Chickadee	*Poecile atricapillus*	S5	G5					A: breeding; E: breeding; L: breeding
Bank Swallow	*Riparia riparia*	S4B	G5	THR	THR			A: foraging E: foraging; L: foraging

Attachment D - Wildlife Species Recorded from the Proposed Lafarge Pit No. 3 Extension

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
Tree Swallow	*Tachycineta bicolor*	S4B	G5					A: breeding; E: foraging; L: foraging
Cliff Swallow	*Petrochelidon pyrrhonota*	S4B	G5					A: foraging
Barn Swallow	*Hirundo rustica*	S4B	G5	THR	THR			A: breeding; E: foraging: L: foraging
Ruby-crowned Kinglet	*Regulus calendula*	S4B	G5			6, 7		A: migrant
Cedar Waxwing	*Bombycilla cedrorum*	S5B	G5					A: breeding; E: breeding; L: breeding
Red-breasted Nuthatch	*Sitta canadensis*	S5	G5					A: breeding; E: breeding
White-breasted Nuthatch	*Sitta carolinensis*	S5	G5					E: breeding
House Wren	*Troglodytes aedon*	S5B	G5					A: breeding; E: breeding; L: breeding
Gray Catbird	*Dumetella carolinensis*	S4B	G5					A: breeding; E: breeding; L: breeding
Brown Thrasher	*Toxostoma rufum*	S4B	G5					A: breeding; E: breeding; L: breeding
European Starling	*Sturnus vulgaris*	SNA	G5					E: breeding; L: breeding
Eastern Bluebird	*Sialia sialis*	S5B	G5	NAR	NAR			A: breeding; E: breeding; L: breeding
Wood Thrush	*Hylocichla mustelina*	S4B	G5	SC	THR			A: breeding
American Robin	*Turdus migratorius*	S5B	G5					A: breeding; E: breeding L: breeding
House Sparrow	*Passer domesticus*	SNA	G5					A: breeding
American Goldfinch	*Spinus tristis*	S5B	G5					A: breeding; E: breeding; L: breeding
Grasshopper Sparrow	*Ammodramus savannarum*	S4B	G5	SC	SC	5		E: breeding
Chipping Sparrow	*Spizella passerina*	S5B	G5					A: breeding; E: breeding; L: breeding
Field Sparrow	*Spizella pusilla*	S4B	G5					A: breeding; E: breeding
American Tree Sparrow	*Spizella arborea*	S4B	G5					A: migrant
Vesper Sparrow	*Pooecetes gramineus*	S4B	G5					A: breeding; E: breeding; L: breeding
Savannah Sparrow	*Passerculus sandwichensis*	S4B	G5					A: breeding; E: breeding
Song Sparrow	*Melospiza melodia*	S5B	G5					A: breeding; E: breeding; L: breeding
Swamp Sparrow	*Melospiza georgiana*	S5B	G5					A: breeding
White-throated Sparrow	*Zonotrichia albicollis*	S5B	G5					A: migrant
White-crowned Sparrow	*Zonotrichia leucophrys*	S4B	G5					A: migrant
Eastern Towhee	*Pipilo erythrophthalmus*	S4B	G5					A: breeding
Bobolink	*Dolichonyx oryzivorus*	S4B	G5	THR	THR		10	A: breeding; E: breeding
Eastern Meadowlark	*Sturnella magna*	S4B	G5	THR	THR			A: breeding; E: breeding
Orchard Oriole	*Icterus spurius*	S4B	G5					L: breeding
Baltimore Oriole	*Icterus galbula*	S4B	G5					A: breeding; E: breeding; L: breeding
Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5					A: breeding; E: breeding; L: breeding
Brown-headed Cowbird	*Molothrus ater*	S4B	G5					A: breeding; E: breeding; L: breeding
Common Grackle	*Quiscalus quiscula*	S5B	G5					A: breeding; E: breeding; L: breeding
Nashville Warbler	*Oreothylpis ruficapilla*	S5B	G5					A: migrant
Common Yellowthroat	*Geothlypis trichas*	S5B	G5					A: breeding; E: breeding; L: breeding

Attachment D - Wildlife Species Recorded from the Proposed Lafarge Pit No. 3 Extension

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
American Redstart	*Setophaga ruticilla*	S5B	G5				20-30	A: migrant
Yellow Warbler	*Setophaga petechia*	S5B	G5					A: breeding; E: breeding; L: breeding
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B	G5					A: breeding; E: breeding
Scarlet Tanager	*Piranga olivacea*	S4B	G5				20	A: breeding
Northern Cardinal	*Cardinalis cardinalis*	S5	G5			5		A: breeding; E: breeding; L: breeding
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B	G5					A: breeding; E: breeding; L: breeding
Indigo Bunting	*Passerina cyanea*	S4B	G5					A: breeding; E: breeding
MAMMALS	**MAMMALIA**							
Northern Myotis	*Myotis septentrionalis*	S3?	G4	END	END			A
Big Brown Bat	*Eptesicus fuscus*	S5	G5					A
Eastern Cottontail	*Sylvilagus floridanus*	S5	G5					A, E
Eastern Chipmunk	*Tamias striatus*	S5	G5					A, E, L
Gray Squirrel	*Sciurus carolinensis*	S5	G5					A
Red Squirrel	*Tamiasciurus hudsonicus*	S5	G5					A
Muskrat	*Ondatra zibethicus*	S5	G5					A
Coyote	*Canis latrans*	S5	G5					A, E, L
Raccoon	*Procyon lotor*	S5	G5					A
Striped Skunk	*Mephitis mephitis*	S5	G5					A
White-tailed Deer	*Odocoileus virginianus*	S5	G5					A, E, L
SUMMARY								
Total Odonates: 19	A: 17; E: 5; L: 1							
Total Butterflies: 19	A: 13; E: 10; L: 3							
Total Bumble Bees: 4	A: 4; E: 1; L: 2							
Total Amphibians: 8	A: 8; E: 0; L: 0							
Total Reptiles: 4	A: 4; E: 0; L: 0							
Total Birds: 83	A: 79; E: 48; L: 37							
Total Breeding Birds: 70	A: 65; E: 42; L: 32							
Total Mammals: 11	A: 11; E: 4; L: 3							
Total Species: 148	A: 136 E: 64; L: 46							
SIGNIFICANT SPECIES								
Global: 0	A: 0; E: 0; L: 0							
National: 13	A: 11; E: 7; L: 3							
Provincial: 12	A: 11; E: 7; L: 3							

Attachment D - Wildlife Species Recorded from the Proposed Lafarge Pit No. 3 Extension

COMMON NAME	*SCIENTIFIC NAME*	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
Regional: 2	A: 2; E: 0; L: 0							
Local: 1	A: 0; E: 0; L: 1							
Explanation of Status and Acronymns								
OMNR: Designations by the Ontario Ministry of Natural Resources								
COSEWIC: Committee on the Status of Endangered Wildlife in Canada								
REGION: Rare in an Ecoregion								
S2: Imperiled in Ontario								
S3: Vulnerable in Ontario								
S4: Apparently secure in Ontario								
S5: Secure in Ontario								
SB: Status during the breeding season								
SN: Status during the nonbreeding season								
S#S#: Range rank used to indicate any range of uncertainty about status								
SNA: Not Applicable, not a suitable	target for conservation efforts							
G4: Common globally								
G5: Very common globally								
GNR: Not ranked								
T: Denotes that the rank applies to a subspecies or variety								
END: Endangered								
THR: Threatened								
SC: Special Concern								
NAR: Not At Risk								
5: Rare in Site Region 5								
6: Rare in Site Region 6								
7: Rare in Site Region 7								
Area: Minimum patch size for area-sensitive species (ha)								
A: Adjacent Lands								
E: Extraction Area								
L: Licence Area excluding the Extraction Area								

Attachment E

EARTH SCIENCE INVENTORY CHECKLIST

Part One: Summary

NAME	**Caledon Meltwater Deposits - Forks of the Credit ANSI**		
NTS MAP 40P/16	MAP NAME Orangeville	UTM REFERENCE 578500E 485000N	OBM NUMBER 1017 5750 48500

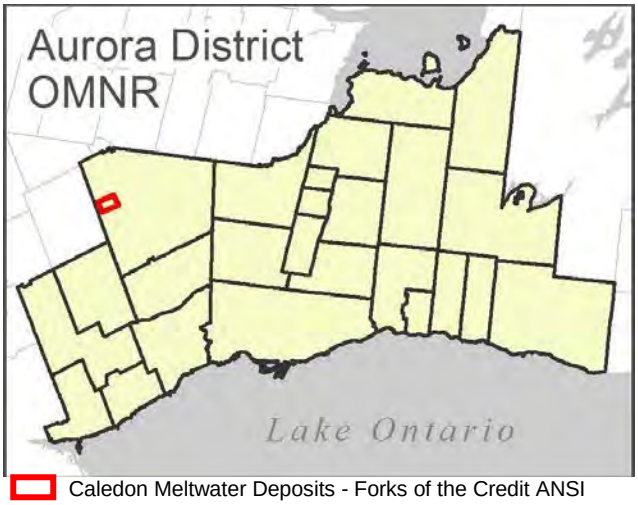
REGIONAL MUNICIPALITY	LOCAL MUNICIPALITY	MNR REGION	MNR DISTRICT	LATITUDE	LONGITUDE
Peel	Town of Caledon	Southern	Aurora	43° 48´N	80° 01´ 30´´W

GEOGRAPHIC TOWNSHIP	LOT	CONCESSION
Caledon	11-13 11-14 11-12	3 4 5

AREA (ha)	OWNERSHIP
448.5	55% Forks of the Credit Provincial Park, 45% private

AERIAL PHOTOGRAPHS

YEAR	ROLL	NUMBERS
1978	64-4357	94-96
1978	65-4356	98-100
1999	IR 5007, 5008	
2003, 2011	Digital Ortho-rectified Imagery	



Caledon Meltwater Deposits - Forks of the Credit ANSI

EARTH SCIENCE FEATURES The Caledon Meltwater Deposits - Forks of the Credit ANSI contains Late Wisconsinan, Port Huron Stadial, Violet Hill meltwater channel deposits. The Violet Hill or Caledon meltwater system developed in the Orangeville-Caledon area between the Lake Simcoe and Ontario ice lobes. The ANSI also provides representation of subsequent meltwaters which cut deep valleys through the centre of the ANSI. These valleys expose underlying ice-contact stratified drift deposits and Niagara Escarpment bedrock around a waterfall and railway cut. The ANSI is noted for its numerous kettles including Dufferin Lake.

SIGNIFICANCE The ANSI supports excellent representation of kettled meltwater deposits that grade into more subtle outwash deposits to the southwest. The ANSI is one of three sites where the “best morphological expression” of the Caledon Meltwater Channel complex is represented (Cowell and Woerns 1976). The other two sites (representing slightly different features) are (i) Caledon Meltwater Deposits - North of Orangeville and (ii) Mono Mills - Caledon Meltwater Channels.

SENSITIVITY The kettled areas and the steep valley slopes are susceptible to erosion; however, the low topographical relief in the southwest is likely not sensitive to erosion. The most significant threat comes from aggregate extraction.

RECOMMENDATIONS It is recommended that the southern part of the ANSI be cut back to Shaw’s Creek Road and, in the southwest, by a height of land, and the northeast part of the ANSI be expanded to the Forks of the Credit River Provincial Park boundary and some adjacent private lands. There is also a refinement in the southeast to make the ANSI boundary coincide with a forest edge that is also the eastern boundary for the Dufferin Lake life science ANSI. A road and parking lots/picnic areas should not be built in the ANSI as proposed in the park management plan.

MAJOR REFERENCES Cowan 1976, Cowell & Woerns 1976, Kor 1993, Telford et al 1976, Woerns 1977

DATE COMPILED November 2013 | COMPILERS David N. Webster, P.S.G. Kor & Steve Varga

Ontario

Ontario Ministry of Natural Resources,
Parks and Protected Areas Policy Section,
300 Water Street, Peterborough, Ontario K9J 8M5

Attachment E

CALEDON MELTWATER DEPOSITS - FORKS OF THE CREDIT PROVINCIALLY SIGNIFICANT EARTH SCIENCE AREA OF NATURAL AND SCIENCTIFIC INTEREST

Part Two: Detailed Information

Protection History

The Caledon Meltwater Deposits - Forks of the Credit ANSI (formerly Caledon Meltwater Deposits 1) was first identified for protection by Cowell and Woerns (1976) during a thematic inventory of earth science features and values of the Niagara Escarpment Planning Area. The site was noted as a large rectangular, candidate Nature Reserve which required further analysis to identify core value features. In 1977, Woerns identified significant kettle depressions and bedrock features associated with this site in what is now the Forks of the Credit Provincial Park. In 1983, this site was included in the District Land Use Guidelines (DLUGS) and confirmed as a provincially significant ANSI. In 1985, the Forks of the Credit Provincial Park was regulated and the ANSI was one of its protection objectives (OMNR 1990). In 1988, the ANSI boundary was refined from a 1:50 000 to a 1:10 000 scale, and in 1992, it was put into a digital format. In 1994, the western boundary of the ANSI was cut back to exclude a pre-existing, licensed aggregate operation, and an isolated block proposed for aggregate extraction.

The present checksheet was prepared to re-assess feature values and to refine ANSI boundaries that better reflect the selected values. The ANSI lies within the Provincial Niagara Escarpment Plan and specifically within the Escarpment Natural Area, Escarpment Protection Area and Escarpment Rural Area overlays of that plan. As well, the existing provincially significant life science Dufferin Lake ANSI is included within the boundaries of this earth science ANSI.

Setting

The 448 hectare ANSI is located between the hamlets of Belfountain and Cataract and is centred on the Forks of the Credit Provincial Park in the Town of Caledon (see airphoto map). The ANSI is bisected in the middle by a major valley of the Credit River, and extends north to encompass most of the Provincial Park and, south of the valley, to Cataract Road, Mississauga Road, Shaw's Creek Road, the slopes around Dufferin Lake, Garage Road and Main Lodge Road. The ANSI is situated in an agricultural setting with scattered rural residences, a ski hill to the east, and several aggregate pits to the west.

Earth Science Features

Bedrock Geology:

This site has exposures of bedrock units of Lower Silurian and Upper Ordovician age, about 430 million years old (Woerns 1977, Telford et al. 1976). They form part of the Niagara Escarpment, southern Ontario's most prominent bedrock feature, which stretches in the province for about 850 kilometres from Queenston, through the Bruce Peninsula, to the western tip of Manitoulin Island. The Escarpment is an erosional feature, created by the removal of underlying

softer shales from under the more resistant overlying layers of sandstone, limestone and dolostone. The oldest shales at the base of the Escarpment are part of the Queenston Formation, with the top and youngest dolostone layer, the Gasport Formation (formerly Amabel/Lockport Formation; see Brunton and Brintell 2011) forming the main escarpment face. There are a variety of intermediate formations such as the Whirlpool Formation that form secondary scarps.

The Escarpment's layers formed in an extensive sea in the middle of the North American continent which covered southern Ontario. The province was then closer to the equator, so this tropical marine environment supported reefs and an abundance of ancient marine animals. The sea varied in depth and distance from sediment sources, resulting in changes to the nature of the sediments being deposited in the sea. With time, the seas retreated, and under pressure from overlying deposits that have since eroded away, these sediments became rocks. The reefs and shell deposits became limestones and, if magnesium-enriched, dolostones, clays laid down in deeper waters became shales, and sands deposited in more shallow waters became sandstones.

The ANSI's rock exposures occur at and around Cataract Falls in the Credit River valley near the hamlet of Cataract, and along a railway that cuts into the south side of the valley slope (see surficial geology map).

The exposures around the waterfall, based on Woerns (1977), include, from top (younger) to bottom (older):

Manitoulin Formation - thin-bedded, flaggy dolomite that appears as tiny steps in the riverbed above the main waterfall

Whirlpool Formation - massive 3 metre high sandstone unit which forms the main ledge or harder cap rock of the waterfall.

Queenston Formation – 1.5 to 2.5 metres of softer red and green shales below the waterfall ledge and on the surrounding valley slopes.

Above and south of the falls, a railway cut has exposed 5 to 6.5 metres of the younger Cabot Head Formation which consists primarily of greyish green and red shale beds with alternating carbonate interbeds (Woerns 1977). Woerns notes that this exposure is probably the best example of the Cabot Head Formation south of Owen Sound. The exposure, however, is situated in a hazardous area next to a railway track.

Surficial Geology:

The province has experienced repeated periods of glaciation with intervening warmer interglacials such as we have today. The last period of glaciation is known as the Wisconsinan Glaciation and it is divided into Early, Middle and Late

that represent pulses in the glaciation. During a period of glaciation, there are pulses of even colder climate, called stadials, when the ice front expands, along with warmer pulses called interstadials when the ice front ablates (melts back). The resulting glacial terrain supports, among other things, moraines, which are linear mounds of deposits laid down along an ice front, and erosional channels which have been eroded by glacial meltwaters. The meltwater features are very well displayed within this ANSI, and a morainal feature, the Paris Moraine, occurs just southeast of the ANSI.

The ANSI's meltwater deposits were laid down during the Late Wisconsinan between two ice lobes, one centred on the Lake Simcoe basin to the north and one in the Lake Ontario basin to the south. During the Port Huron Stadial environment, about 12 000 to 13 000 years before present (BP), the Violet Hill meltwater channel (Caledon meltwater deposits) fed water from the Lake Simcoe lobe south to the Orangeville-Caledon area where it was joined by meltwater from the Lake Ontario lobe. These meltwater flows were particularly significant during and following the building up of the Paris Moraine. The glacial meltwater then flowed southwest into glacial lakes in the Erie and Huron basins. Thus, an extensive network of meltwater channels became established in the Orangeville-Caledon area (Chapman and Putnam, 1984).

These meltwater channels are well marked by steeper sides from Lavender through Violet Hill and around Mono Mills. They are part of the Caledon Meltwater Deposits - North of Orangeville ANSI and the Mono Mills - Caledon Meltwater Channels ANSI (Kor 1993). However, at the subject site, the channel is less well-marked and is composed of thick deposits of well-sorted sand and gravel. Site inspection has concluded that the deposits here are also rich in well-rounded cobbles and boulders. The ANSI is particularly noted for its numerous kettles which are very pronounced at the north end of the site within the Forks of the Credit Provincial Park portion as well as around Dufferin Lake in the southeast (see surficial geology map). These features are created when buried blocks of ice gradually melt away to form depressions or kettles. There are about 20 kettles at the north end; the largest one supports a kettle lake. In the south, there are several shallow kettles, as well as a large, steep-sided kettle (Dufferin Lake).

Following the decay of the ice lobes, post-glacial meltwaters no longer flowed to the southwest, but instead, flowed to the east into post-glacial ponds below the Niagara Escarpment (Kor 1993). These meltwaters eroded the large valley of the Credit River through the centre of the ANSI, and three major tributaries on the southeast side. That these flows occurred later than the southwest trending kettled meltwater deposits, that cover most of the ANSI, is evidenced by kettles that have been cut by the main valley (see surficial geology map). This steep-sided valley is up to 80 metres deep. High terraces are evident along the valley walls suggesting varied flows. The meltwaters cut into and exposed underlying sands of ice-contact stratified drift deposits. These layered deposits were laid

down at the edge of, and in contact with, the ice sheet. The meltwaters may have eroded a glacial or pre-glacial, re-entrant valley on the edge of the Niagara Escarpment that was subsequently filled in by glacial sediments. This is supported by the lack of bedrock exposures, except for those at the narrower, west end of the main valley (see bedrock geology section). On the floor of the valley, there are terraces of sand and gravel deposited by the meltwaters, and along the recent, narrower floodplain of the Credit River there are deposits of alluvial sands and silts.

Sensitivity

The kettled areas and the steep slopes in the ANSI are susceptible to erosion; however, the low topographical relief in the southwest is likely not sensitive to erosional forces.

Use in the northern provincial park portion is generally restricted to low impact walking trails; however, there is a proposal in the management plan for an access road and three small parking lots and associated picnic areas in the ANSI (OMNR 1990). Such a use would negatively impact on ANSI features including several kettles. The current agricultural uses in the southwest are compatible with the maintenance of the outwash deposits.

Irreversible destruction of the deposits will occur if the contours of the feature are disturbed or covered by non-conforming activities (for example, through housing development), or removed (such as through aggregate extraction). The northern part of the ANSI is within a provincial park and, therefore, should be secure from this type of development. The southern part should be kept in its current use of agriculture and forests.

Significance

The deposits within these meltwater channels provide excellent educational and interpretive opportunities. They form part of the record of the Port Huron Stadial. The meltwater complex covers a large area and three ANSIs (including this one) represent the best morphological expression of this feature.

This site has excellent examples of kettles at the north end and transitions toward the southwest into a low-relief outwash plain deposit. This site, along with two others (Mono Mills - Caledon Meltwater Channels (Kor 1993) and Caledon Meltwater Deposits - North of Orangeville) represent a significant part of the late glacial history of this part of Ontario and, therefore, are provincially significant.

The site is also noted for its subsequent post-glacial meltwaters that eroded the Credit River valley, a Niagara Escarpment re-entrant valley, and exposed Niagara Escarpment bedrock features, including the best exposure of the Cabot Head Formation south of the Bruce Peninsula.

The high-relief kettles in the Park portion of the ANSI, because they were cleared of trees for pasture, provide exceptional educational and interpretive opportunities. There are trails in and around the kettles that add to its value. The Park's deeply cut Credit River Valley, with its lookouts and trails also provides excellent educational and interpretive opportunities to highlight post-glacial meltwater and bedrock features.

Recommendations

It is recommended that the southern boundary of the ANSI be modified to follow Shaw's Creek Road and, in the southwest, a height of land. The area removed from the ANSI, south of Shaw's Road, and the height of land, represent a more subtle outwash deposit which is well represented north of Shaw's Creek Road. This low-relief feature still requires representation in the ANSI in order to demonstrate the transition from the kettled areas in the north and east, to the outwash plain in the south, and to keep the kettle features in topographical perspective. Any further reduction of the subtle outwash deposit would be a loss of educational and interpretive opportunities related to this important geological feature.

It is also recommended that the northeast boundary of the ANSI be expanded to encompass more of the Forks of the Credit Provincial Park and some adjacent private lands along the west side of Garage Road and Main Lodge Road. This captures more of the kettles in the north, and an area of Port Stanley Till in the northeast corner. It also includes more of the Park's Credit River valley, including a secondary post-glacial meltwater channel slope and, to the south, the slopes and a kettle feature along Garage and Main Lodge Roads.

A refinement was also made to the southeast boundary to make it coincide with a height of land east of Dufferin Lake, and to encompass two kames and a kettle feature. The boundary in this area now largely follows a forest edge, which is also the eastern boundary for the Dufferin Lake life science ANSI.

The proposed access road, parking lots and picnic areas noted in the 1990 park management plan should no longer be considered in future management plans due to its negative impacts on the ANSI.

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Attachment E

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Compilers: David N. Webster, P.S.G. Kor and Steve Varga

Date: November 2013

Attachment E

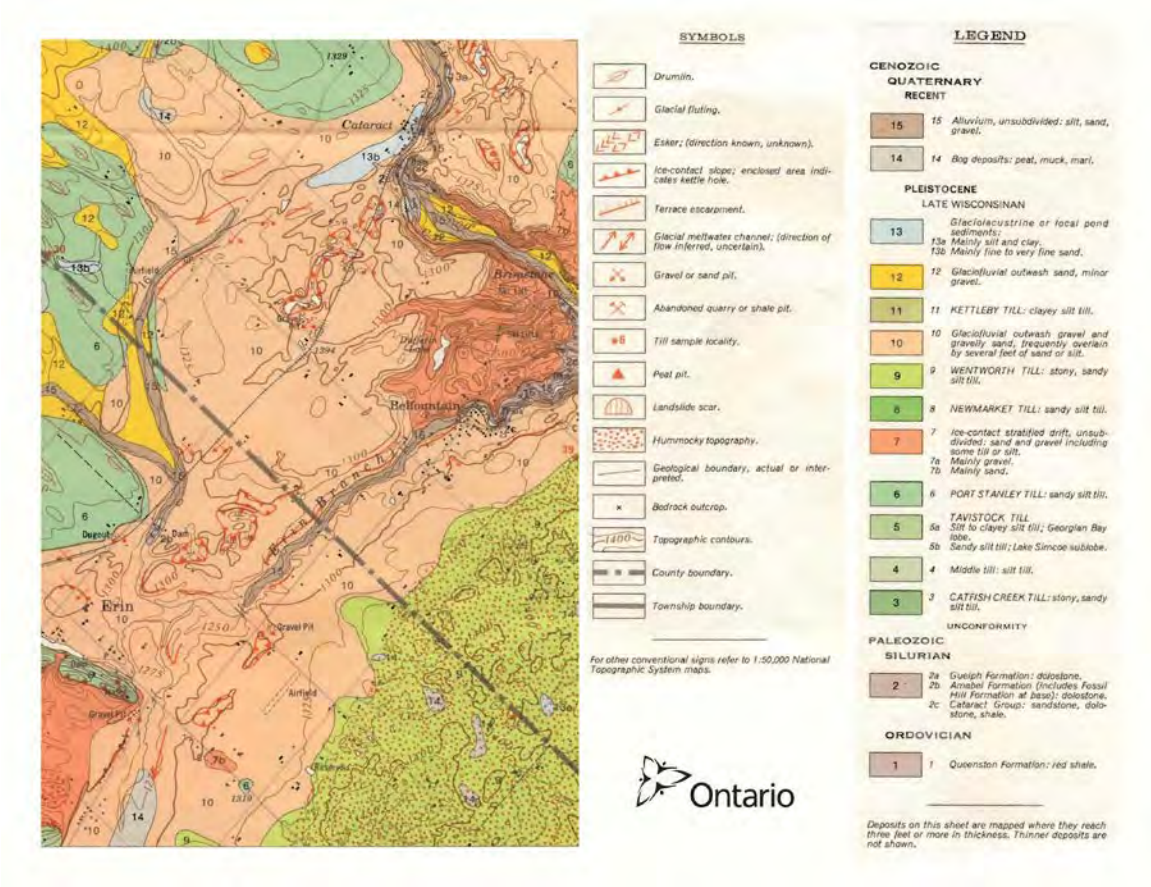

Figure 1. Surficial Geology in and Around the Caledon Meltwater Deposits - Forks of the Credit ANSI (after Cowan 1976)

Caledon Meltwater Deposits - Forks of the Credit

Provincially Significant
Earth Science Area of Natural and Scientific Interest

Town of Caledon, Region of Peel
November 2013

Cataract
CATARACT ROAD
MISSISSAUGA ROAD
Credit River
Forks of the Credit Provincial Park
Park Entrance
SHAWS CREEK ROAD
Dufferin Lake
MAIN LODGE ROAD
LOWER CHALET ROAD
GARAGE ROAD
PUCKERING LANE
RIVER ROAD
FORKS OF THE CREDIT ROAD
KING STREET SOUTH
BUSH STREET
Belfountain
SCOTT STREET
CONDO ROAD
SKI HILL ROAD

Aurora District
OMNR

Lake Ontario

Scale 1 : 10,000

0 150 300 450 600 m

Earth Science ANSI

Parcel

Caledon Meltwater Deposits - Forks of the Credit

Provincially Significant
Earth Science Area of Natural and Scientific Interest

Town of Caledon, Region of Peel
December 2013

N

Cataract

CATARACT ROAD

MISSISSAUGA ROAD

Forks of the Credit Provincial Park

Park Entrance

SHAWS CREEK ROAD

MAIN LODGE ROAD

LOWER CHALET ROAD

GARAGE ROAD

DOMINION STREET

KING STREET SOUTH

RIVER ROAD

FORKS OF THE CREDIT ROAD

CONDO ROAD

SKI HILL ROAD

SCOTT STREET

BUSH STREET

Belfountain

Earth Science ANSI

Road

Internal Features

Cataract Falls Exposure of Manitoulin, Whirlpool and Queenston Formations

Meltwater Channel

Kettle/Ice-contact Slope

Kame

Paleozoic Bedrock (Cabot Head Formation)

Paleozoic Bedrock (Queenston Formation)

Port Stanley Till

Ice-contact Stratified Drift Deposit

Glacial River Deposit

Modern River Deposit

Organic Deposit

Scale 1 : 10,000

0 150 300 450 600 m

1. An indication of the number and location of nest cups installed on buildings or structures in accordance with section 8.
2. A description of each building and structure constructed or modified in accordance with section 9, including the location of the building or structure and the area of nesting habitat created in accordance with subsection 9 (3).

(2) For each year a person is required to monitor the use of habitat by barn swallows under paragraph 9 of section 5, the person shall, within three months of having completed the annual monitoring, update the record of habitat creation and monitoring to include the following monitoring information:

1. The number, description and location of new nests created by barn swallows.
2. An estimate of the number of barn swallows using the building or structure.

Transition

12. Despite the revocation, on December 1, 2021, of section 23.5 of Ontario Regulation 242/08 (General) made under the Act, a person who, before December 1, 2021, had submitted a notice of activity form to the Minister under section 23.5 of Ontario Regulation 242/08 with respect to an activity described in subsection 4 (2) of this Regulation and was, immediately before December 1, 2021, exempt under subsection 23.5 (2) of Ontario Regulation 242/08 from clause 9 (1) (a) and subsection 10 (1) of the Act with respect to the activity,

(a) is not required to register a new notice of activity form under this Regulation in order to continue being exempt from clause 9 (1) (a) and subsection 10 (1) of the Act with respect to the activity; and

(b) shall continue, after December 1, 2021, to be exempt under section 23.5 (2) of Ontario Regulation 242/08 from clause 9 (1) (a) and subsection 10 (1) of the Act with respect to the activity, so long as the person continues to satisfy all the conditions to the exemption set out in subsections 23.5 (3) to (12) of Ontario Regulation 242/08, as those subsections read immediately before December 1, 2021.

PART IV
BOBOLINK, EASTERN MEADOWLARK

EXEMPTIONS

Exemptions

13. (1) Clause 9 (1) (a) and subsection 10 (1) of the Act do not apply to a person who, while carrying out an activity described in subsection (3), kills, harms, harasses, captures or takes a bobolink or an eastern meadowlark, or damages or destroys its habitat, if the size of the area of habitat of bobolinks or eastern meadowlarks that is damaged or destroyed by the activity is equal to or less than 30 hectares and the person satisfies all of the conditions set out in section 14.

(2) Subclauses 9 (1) (b) (i) and (ii) of the Act do not apply to the possession or transport of a bobolink or an eastern meadowlark that was killed, harmed, harassed, captured or taken by a person carrying out an activity described in subsection (3), if, pursuant to subsection (1), the person was exempt from clause 9 (1) (a) of the Act with respect to that activity.

(3) The activities referred to in subsection (1) are land development activities that take place in an area that is the habitat of bobolinks or eastern meadowlarks and include,

(a) the construction of buildings, structures, roads or other infrastructure; and

(b) the excavation and landscaping of land.

CONDITIONS

Conditions

14. The following are the conditions that a person must satisfy for the purpose of the exemption under subsection 13 (1):

1. Before commencing an activity referred to in subsection 13 (3), the person must give the Minister notice of the activity by submitting a notice of activity form available on the Registry to the Minister through the Registry, and must ensure that the notice includes the following:
    i. A statement identifying which of the activities listed in subsection 13 (3) will be carried out and a description of the activity.
    ii. The area of habitat, measured in hectares, that will be impacted by the activity.
    iii. The proposed start and end dates of the activity and the area in which it will be carried out.
    iv. An indication as to whether the activity will be carried out on land that is habitat for bobolinks, for eastern meadowlarks, or for both, as the case may be.
2. Before, during and after carrying out the activity, the person must follow the steps set out in section 15 to minimize the adverse effects of the activity on the bobolink or eastern meadowlark and their habitat.

3. Before carrying out the activity, the person must prepare a bobolink and eastern meadowlark management plan in accordance with section 16 and, once the activity has commenced, the person must update the bobolink and eastern meadowlark management plan in accordance with section 16.
4. The person must,
   i. retain a copy of the bobolink and eastern meadowlark management plan for at least five years after the activity is complete, and
   ii. provide a copy of the bobolink and eastern meadowlark management plan to the Ministry within 14 days of receiving a request for it.
5. Within 12 months after the day the activity is commenced, the person must, in accordance with section 17,
   i. create new habitat for bobolinks or eastern meadowlarks, or
   ii. enhance an existing habitat for bobolinks or eastern meadowlarks.
6. The person must manage, in accordance with section 18, the created or enhanced habitat under paragraph 5 for a period of five years after the habitat is created or enhanced.
7. Before commencing the activity, the person must give the Minister a written undertaking to continue, after the end of the five-year period referred to in paragraph 6, to manage any habitat created or enhanced under paragraph 5 in accordance with section 18 until the earlier of,
   i. the end of the 20-year period that follows the creation or enhancement of the habitat under paragraph 5, or
   ii. if the area of habitat that was destroyed by the activity is eventually returned to a suitable state to be used by bobolinks or eastern meadowlarks, the day on which the area reaches that state.
8. After the person has created or enhanced habitat under paragraph 5, the person must prepare a record of created or enhanced habitat in accordance with subsection 19 (1) and must update the record in accordance with subsection 19 (2).
9. For a period of five years after the habitat is created or enhanced under paragraph 5, the person must monitor the area in which the habitat was created or enhanced by conducting at least three surveys every year at a time when bobolinks or eastern meadowlarks are likely to be present, to determine if the species are in fact present and, if so, to assess fledgling success.
10. The person must,
    i. retain the record until December 31 of the final year of the five-year period during which the person must manage and monitor the new or enhanced habitat, and
    ii. provide a copy of the record to the Ministry within 14 days of receiving a request for it.

Mitigation measures

15. The following are the steps referred to in paragraph 2 of section 14 to minimize the adverse effects of the activity on the bobolink or eastern meadowlark and their habitat:

1. The person shall ensure that no part of the activity that is likely to damage or destroy the habitat of bobolinks or eastern meadowlarks or kill, harm or harass bobolinks or eastern meadowlarks is performed between May 1 and July 31 of any year.
2. The person shall take reasonable steps to minimize adverse effects of the activity on the bobolink and eastern meadowlark, including, if applicable, routing access roads along existing fencerows or hedgerows if possible.

Bobolink and eastern meadowlark management plan

16. (1) A bobolink and eastern meadowlark management plan referred to in paragraph 3 of section 14 shall be prepared by one or more persons with expertise in relation to bobolinks or eastern meadowlarks, or both, as the case may be, using the best available information on steps that may help minimize or avoid adverse effects on the species to which the plan relates, which includes consideration of information obtained from the Ministry, aboriginal traditional knowledge and community knowledge, if it is reasonably available.

(2) A bobolink and eastern meadowlark management plan shall, when first prepared, include the following information:

1. The name and contact information of the person on whose behalf the activity described in subsection 13 (3) is being carried out.
2. A description of the activity.
3. The proposed start date of the activity.

4. An indication as to whether the activity will be carried out on land that is habitat for bobolinks, for eastern meadowlarks, or for both, as the case may be.
5. With respect to the area of bobolink or eastern meadowlark habitat that is likely to be damaged or destroyed by the activity,
    i. a description of the area's location, including a detailed map,
    ii. the ecoregion in which the area is located, and
    iii. the size of the area in hectares.

(3) The bobolink and eastern meadowlark management plan shall be updated from time to time to include the following information:

1. A description of the steps followed by the person in accordance with section 15 to minimize the adverse effects of the activity on the bobolink or eastern meadowlark and their habitat, including details of any encounters with the species.
2. Any change to the information required under subsection (1).

New or enhanced habitat requirements

17. The habitat required to be created or enhanced under paragraph 5 of section 14 shall meet the following requirements:

1. The habitat shall be created or enhanced in an area that meets the following criteria:
    i. The area shall be located outside of the area where the activity is carried out but within the same ecoregion as that area or in an ecoregion that is adjacent to that area.
    ii. The area shall be at least 1.5 times larger than the area of the habitat for bobolinks or eastern meadowlarks that is damaged or destroyed by the activity.
    iii. The area may be made up of separate parcels of land, but the minimum size of any individual parcel shall be no less than four hectares.
    iv. No portion of the area shall be less than 200 metres in width.
2. A minimum of 60 to 80 per cent of the habitat shall be covered with at least three different grass species and any remaining part of the habitat that is not covered with grass species shall be covered with forbs or legumes.
3. Among the grass species referred to in paragraph 2, at least one shall grow greater than 50 centimetres high under normal growing conditions.

New or enhanced habitat management

18. The habitat required to be created or enhanced under paragraph 5 of section 14 shall be managed in accordance with the following rules:

1. The area in which the habitat is located shall not be harvested, mowed or cut between April 1 and July 31 of any year.
2. If the habitat is used for pasture, grazing farm animals shall be excluded from at least 50 per cent of the habitat from April 1 until July 31 of each year.
3. In each of the five years following the creation or enhancement of the habitat,
    i. woody vegetation and invasive species shall be removed from the habitat, and
    ii. actions shall be taken to ensure that the grass species, forbs and legumes in the habitat are maintained in the proportions described in paragraph 2 of section 17.

New or enhanced habitat record and monitoring

19. (1) A record of new or enhanced habitat referred to in paragraph 8 of section 14 shall, when first prepared, include the following information with respect to the habitat created or enhanced under paragraph 5 of section 14:

1. A description of the area's location, including a detailed map.
2. The ecoregion in which the area is located.
3. The size of the area in hectares.
4. The composition of the soils covering the area.
5. The percentage of the area covered by grass species at the time the record is prepared.
6. A summary of the steps taken to create or enhance the habitat, and to manage that habitat, including:
    i. A description of the areas that have been seeded, and of the composition of the seed mixture such as the species and their relative percentage within the seed mixture.

ii. An overview of phasing and times of the year for site preparation, planting, seeding, tending and maintenance.

iii. A description of the practices undertaken for site preparation, planting, seeding, tending and maintenance.

7. Photographs of the area created or enhanced as habitat that show the area prior to and after the habitat is created or enhanced.

(2) Each year, within three months of completing the monitoring of new or enhanced habitat as required under paragraph 9 of section 14, the record of new or enhanced habitat shall be updated to include the following monitoring information:

1. For each survey taken, the number of bobolinks or eastern meadowlarks surveyed in the area.

2. Details of any encounters with bobolinks or eastern meadowlarks.

Transition

20. Despite the revocation on December 1, 2021 of section 23.6 of Ontario Regulation 242/08 (General) made under the Act, a person who, before December 1, 2021, had submitted a notice of activity form to the Minister under section 23.6 of Ontario Regulation 242/08 with respect to an activity described in subsection 13 (3) of this Regulation and was, immediately before December 1, 2021, exempt under subsections 23.6 (2) and (3) of Ontario Regulation 242/08 from clause 9 (1) (a), subclauses 9 (1) (b) (i) and (ii) and subsection 10 (1) of the Act with respect to the activity,

(a) is not required to register a new notice of activity form under this Regulation in order to continue being exempt from clause 9 (1) (a), subclauses 9 (1) (b) (i) and (ii) and subsection 10 (1) of the Act with respect to the activity; and

(b) shall continue, after December 1, 2021, to be exempt under subsections 23.6 (2) and (3) of Ontario Regulation 242/08 from clause 9 (1) (a), subclauses 9 (1) (b) (i) and (ii) and subsection 10 (1) of the Act with respect to the activity, so long as the person continues to satisfy all the conditions to the exemption set out in subsections 23.6 (4) to (10) of Ontario Regulation 242/08, as those subsections read immediately before December 1, 2021.

PART V
BUTTERNUT

DEFINITIONS AND APPLICATION

Definitions

21. In this Part,

"Butternut Assessment Guidelines" means the document entitled "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007*" (Version 3), published by the Government of Ontario, dated December 2021, as amended from time to time, and available to the public on a website maintained by the Government of Ontario; ("Ligne directrice pour l'évaluation du noyer cendré")

"butternut health expert" means an arborist, professional forester, forest technician, dendrologist, horticulturist, botanist, mycologist or plant pathologist or any other qualified professional who,

(a) has expertise in relation to butternut, and

(b) has the expertise, education, training and experience necessary to assess the health of butternut trees and to carry out the other responsibilities imposed on the expert under this Part; ("expert sur la santé des noyers cendrés")

"butternut health expert's report" means the butternut health expert's report prepared and submitted under paragraph 2 of subsection 24 (1); ("rapport de l'expert sur la santé des noyers cendrés")

"impactful actions" means any actions that a person undertakes with respect to a butternut tree or in the vicinity of a butternut tree that may directly impact the butternut tree by killing, harming or taking it and includes removing the tree, digging in the vicinity of the tree or any other action directed at the tree or undertaken in the vicinity of the tree that may directly result in the killing, harming or taking of the butternut tree; ("actions à incidence importante")

"mitigation plan" means a mitigation plan that is required to be prepared by a butternut health expert under paragraph 3 of section 26; ("plan de mesures d'atténuation")

"root harm prevention zone" means the area surrounding the stem of a butternut tree determined in accordance with subsection 31 (2); ("zone de prévention des nuisances aux racines")

"scion" means a small portion of a butternut tree containing buds that is used for grafting; ("griffon")

"seed zone" means a seed zone identified in the document entitled "Southern Ontario Tree Seed Zone Atlas" published by the Government of Ontario, dated 2011, as amended from time to time, and available to the public on a website maintained by the Government of Ontario. ("zone de semences")

Application

22. This Part applies with respect to impactful actions undertaken with respect to butternut trees whether,