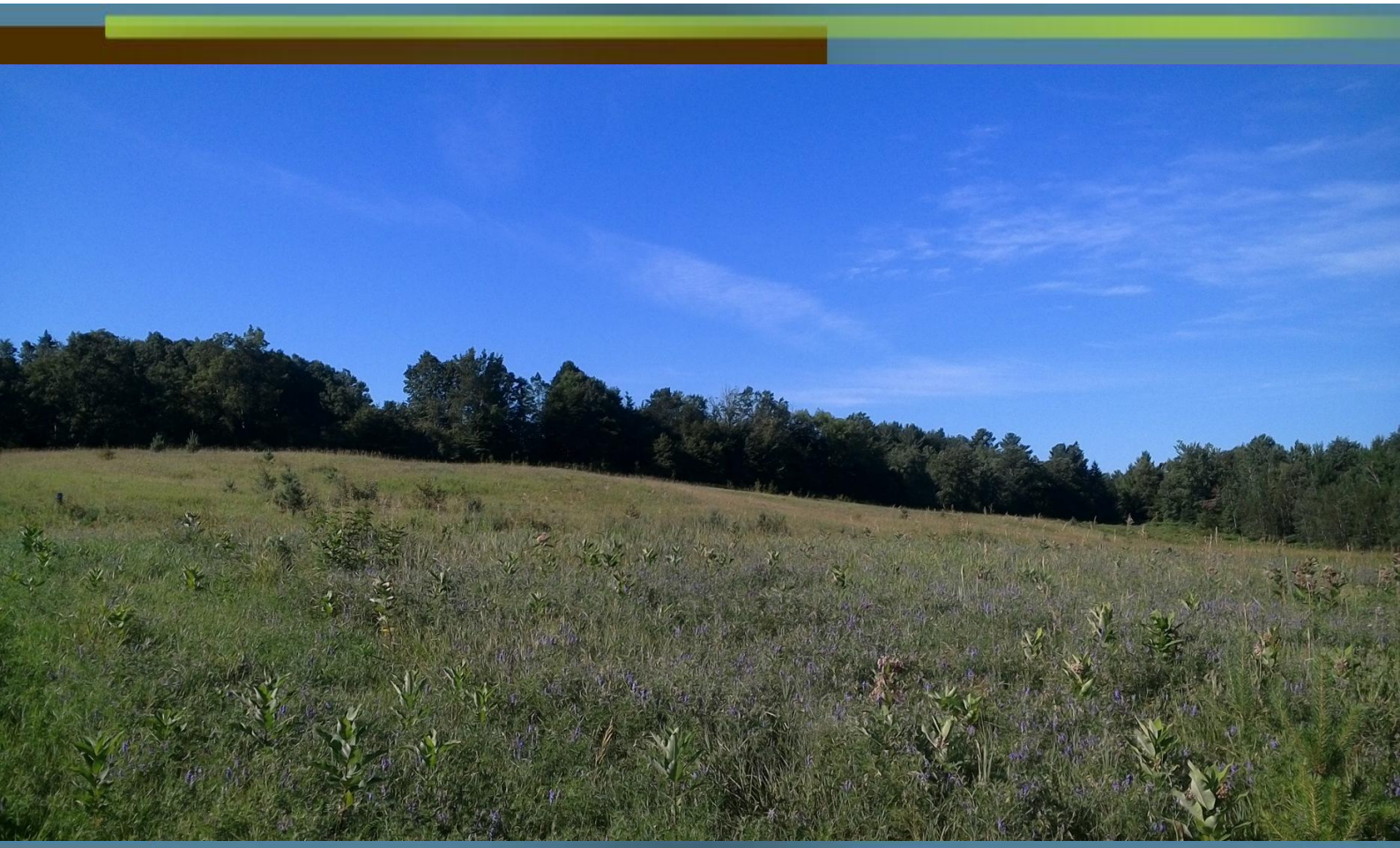
NATURAL ENVIRONMENT REPORT

Highway 7 Application
Township of Asphodel-Norwood
July 2026



RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

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ENVIRONMENTAL SOLUTIONS INC.

July 23, 2026
RS# 2024-034

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SUBJECT: Natural Environment Technical Report
Highway 7 Aggregate Licence Application
Township of Asphodel-Norwood

RiverStone Environmental Solutions Inc. is pleased to provide you with the attached report. A summary of the key results and recommendations are provided at the beginning of the report. Detailed descriptions of the work completed, and the findings are provided in the subsequent sections.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

RiverStone Environmental Solutions Inc.

Bev Wicks, Ph.D.
Senior Ecologist / Principal

REPORT SUMMARY

Type of Study Natural Environment Technical Report	**Date** July 23, 2026
Legal Description Lots 14 and 15, Concession 5 and 6, Geographic Township of Asphodel-Norwood, County of Peterborough.	**Application** -ARA Licence for a Class A, Pit above water table. -ARA site plan amendment for Licence #3399 to remove common setback - Zoning By-law Amendment (ZBA) Township of Asphodel-Norwood and Official Plan Amendment Peterborough County
Approval Authorities Ministry of Natural Resources Township of Asphodel-Norwood County of Peterborough	**Proponent** Drain Bros. Excavating Limited.

Report Summary

This Natural Environment Report has been prepared to support an application under the *Aggregate Resources Act* (ARA) in the Township of Asphodel-Norwood with the property legally described as part of Lot 14, Concession 5 and Part of Lot 15 Concession 6, 3749 Highway 7 and 926 Sand Road, County of Peterborough. The area to be licensed is 35.2 ha, of which 25.0 a would be in the extraction area. This report details a comprehensive approach to confirming the presence and absence of key natural heritage features that are afforded protection under the applicable legislation and policies at the municipal, provincial, and federal levels. During site investigations and field surveys carried out in 2024 and 2025, it was determined that significant natural features and species of conservation interest occurred on or adjacent to the licence area. Features located within the licence boundary and adjacent lands include 1) Non-Provincially significant wetlands, 2) habitat of endangered and threatened species, 3) significant woodlands, 4) significant wildlife habitat and 5) fish habitat. Per the requirements of the ARA, the potential impacts of the proposed licence including operational activities permitted by the ARA application on the identified natural features and species of conservation interest were evaluated.

Based on the findings herein, RiverStone has determined that the proposed ARA licence application addresses the applicable policies and legislation, provided that the recommendations contained in **Section 5** are implemented in full. The requested local and regional planning approvals will allow for the proposed extractive land use without compromising the ecological values of the assessment area.

CONSOLIDATED RECOMMENDATIONS FOR SITE PLANS

The recommendations provided in the text of the NER for each identified natural heritage feature and ecological function have been consolidated for inclusion in the site plan. These consolidated recommendations are provided below.

Wetlands Including Provincially Significant Wetlands

- The limit of extraction and operational activities shall be setback a minimum of 30 m from the boundary of all wetlands features as shown on Figure 6 in the NER. The 30 m setback shall be permanently marked prior to the commencement of pit operations.
- The rehabilitation plan shall include pre-emptive naturalization of all setbacks with a combination of native trees and shrubs adjacent to wetlands, where the current use is agricultural field as shown on Figure 10 in the NER. For the planting details please see the rehabilitation requirements in Section 5.9 of this report.
- The 30 m wetland setbacks shall be undisturbed by pit operations and remain as natural self-sustaining vegetation.

Significant Woodlands

- Woodland feature removal and woodland thinning shall only occur between November 1 and March 15th to avoid active periods for birds and bats.
- Where direct encroachment into a woodland feature will occur, forest thinning up to the setback, shall occur 2 years prior to woodland removals to reduce edge effect.
- Woodland thinning shall occur within the Woodland Thinning Area shown on Figure 10 of the NER.
- Within the Woodland Thinning Area, low to moderate thinning shall occur at least 50 m from proposed new edge with no more than 25% of stand volume removed. Thinning shall favour removal of smaller understory trees, retain dominant trees, and result in a mix of small gaps and denser woodland patches with avoidance of abrupt edges.
- The limit of extraction shall be setback a minimum of 30 m from the boundary of all woodland features not approved for extraction as shown on Figure 8 of the NER. The 30 m setback shall be permanently marked prior to the commencement of pit operations.
- To prevent damage to adjacent woodland habitat located within the licence boundary, tree protection measures (e.g., hoarding, temporary fencing at the dripline) shall be applied.
- The 30 m woodland setback shall be undisturbed by pit operations and remain as natural self-sustaining vegetation.

Black Ash

- The recommendations to protect the wetlands must be implemented in full to protect Black Ash and their habitat.
- It is the proponent's responsibility to confirm any updated requirements for the protection of endangered and threatened species on an annual basis including Black Ash. Black Ash is an endangered species and protection measures afforded by the Species Conservation Act apply within the County of Peterborough. Black Ash protection should be reviewed prior to vegetation clearing on lands adjacent to wetlands to ensure ongoing compliance with the SCA or policy guidance related to the SCA.

Bat Maternity Colonies

- Twenty-one bat boxes shall be installed in clusters of three (3) in locations within the subject property adjacent to the FOD5 community as shown on Figure 10 of the NER.

Snapping Turtle

- Specialized barrier fencing for reptiles that include J hooks, shall be erected along the licence boundary adjacent to wetland features.
- A qualified person shall be retained to certify the adequacy of the specialized barrier fence. The fence shall be inspected to ensure necessary repairs occur on a routine basis (monthly from April through October).

Eastern Wood-pewee, Wood Thrush, and Grasshopper Sparrow

- Removal of natural vegetation (e.g., shrub clearing, fallow fields, etc.) shall be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31).
- The progressive rehabilitation plan shall include the restoration of forest habitat that is continuous with the existing woodland habitat. For rehabilitation recommendations, please see Section 5.9 and for the location please see Figure 10 in the NER.
- The rehabilitation plan shall include the creation of meadow habitat of sufficient size to provide useable habitat for protected grassland birds. For rehabilitation recommendations, please see Section 5.9 and for the location please see Figure 10 in the NER.

Monarch

- Removal of natural vegetation within the cultural meadow communities shall be completed outside of the primary Monarch breeding window (i.e., between Mid-May to October).
- Cultural meadow habitat, using a native wildflower mix that includes milkweed species, shall be included as part of the rehabilitation plan. Native seed mixes that include milkweed species should also be applied on the berms. For rehabilitation recommendations, please see Section 5.9 and for the location please see Figure 10 in the NER.

Fish Habitat and Watercourse

- Permanent sediment and erosion control fencing shall be installed adjacent to the access route in proximity to the watercourse to prevent roadbed materials from entering the tributaries.
- Areas adjacent to Tributary 1 between the access road and the channel shall include pre-emptive naturalization with a combination of native trees and shrubs to improve the riparian buffer. For naturalization recommendations please see Section 5.9 and for the location please see Figure 10 in the NER.

Other Natural Features and Functions

- At pit closure, site rehabilitation will be required utilizing vegetation species native to the local area in the final rehabilitation plan. Areas adjacent forest communities are to utilize native species that blend with the adjoining vegetation communities. For rehabilitation recommendations, please see Section 5.9.

Rehabilitation Requirements

Pre-emptive Plantings Adjacent to Wetlands

The area identified for Pre-emptive Planting on the ARA operational and rehabilitation plan shall be planted within 5 years of the issuance of the ARA licence in the spring (i.e., May) or fall (i.e., mid - September to early-October) with a mixture of the following tree and shrub species:

Trees

- Red Maple (*Acer rubrum)*
- Bigtooth Aspen (*Populus grandidentata*)
- Trembling Aspen (*Populus tremuloides*)
- White Birch (*Betula papyrifera*)
- American Basswood (*Tilia americana*),
- Balsam Fir (*Abies balsmea*)
- Eastern Hemlock (*Tsuga canadensis*)
- Eastern White Pine (*Pinus Strobus*)

Shrubs / Groundcover

- Choke Cherry (*Prunus virginiana*)
- Red Osier-dogwood (*Conus sericea*)
- Staghorn Sumac (*Rhus typhina*)
- Smooth Serviceberry (*Amelanchier laevis*)
- Common Blackberry (*Rubus allegheniensis*)
- Northern Bracken Fern (*Pteridium aquilinum var. latiusculum)*
- White Meadow-sweet (*Spiraea alba)*

Within the Pre-emptive Planting Area, the following planting requirements shall be met:

a) Trees shall be planted at a density of five (5) trees per 100 m².
b) All tree saplings shall be planted 5 m apart to increase rooting and provide stabilization.
c) Trees shall be a minimum of 1.2 m (~4 ft) in height with a sufficiently developed root ball to sustain planting.
d) Shrubs shall be planted at a shrub to tree ratio of 5:1.
e) All shrubs shall be installed 1 m apart.
f) All installed shrubs shall consist of potted material at least 30cm tall in 1-3 gallon pots.
g) Any woody plant root defects (e.g., girdling) shall be corrected prior to installation.
h) All woody plants shall be installed such that the root crown/trunk flare is exposed above the soil surface to ensure proper oxygenation of the rooting zone.

i) All installed woody plants shall be watered (deep soaking) following installation.

Woodland Rehabilitation

The area identified as woodland on the ARA rehabilitation page shall be planted in the spring (i.e., May) or fall (i.e., mid -September to early-October) with a minimum of six (6) of the following tree species:

- Sugar Maple (*Acer saccharum*)
- Northern Red Oak (*Quercus rubra*)
- Eastern White Pine (*Pinus Strobus*)
- Eastern Hemlock (*Tsuga canadensis*)
- Red Maple (*Acer rubrum)*
- Bigtooth Aspen (*Populus grandidentata*)
- Trembling Aspen (*Populus tremuloides*)
- White Birch (*Betula papyrifera*)
- American Basswood (*Tilia americana*),
- Balsam Fir (*Abies balsmea*)

The location and diversity of the tree species within the woodland area shall be field fitted based on the soil conditions, and topography.

A minimum of 15 % of each selected tree species shall be planted overall within the woodland area. Trees shall be a minimum height of 0.45m (1.5 feet) tall when planted and shall be planted at a 2 m spacing to a minimum density of 1800-2000 seedlings / ha.

Prior to planting, the woodland planting area shall be amended with topsoil/organic soil to be at minimum 0.3 m deep.

Competing vegetation shall be removed yearly until the planted trees have reached 2 m in height.

Monitoring shall occur annually for three (3) years to verify a survival rate of greater than 75% in the woodland plantings. If survival is noted to be less than 75% during the annual monitoring, replacements will be planted in order to ensure a minimum density of 1200 trees / ha.

Grassland Habitat Naturalization

The area identified for grassland on the ARA rehabilitation page, shall be planted with a mix of short and mid height native bunchgrass and diverse wildflowers composed of roughly 20% native grass and 80% forbs to provide appropriate habitat for grassland bird species. The grassland area shall be planted with the following species:

- Panic Grass Switch Grass (*Panicum virgatum*)
- Little Bluestem (*Schizachyrium scoparium*)
- Orchard Grass (*Dactylis glomerata*) Not Native
- Indian Grass (*Sorghastrum nutans*)
- Dropseeds (*Sporobolus spp.*)

- Sideoats Grama (*Bouteloua curtipendula*)
- Purple Coneflower (*Echinacea purpurea*) Not Native
- Black-eyed Susan (*Rudbeckia hirta*)
- Wild Bergamot (*Monarda fistulosa*)
- Gray Goldenrod (*Solidago nemoralis*)
- Milkweed species (*Asclepias spp*.)
- Bebb's Sedge (*Carex bebbii*)
-

Monarch Habitat Creation (Cultural Meadow)

The area identified for potential Monarch Habitat Cultural Meadow on the ARA rehabilitation page, shall be planted with a native mix of wildflowers and grasses to stabilize soils and provide appropriate habitat for Monarch Butterfly. These areas are to be maintained as a meadow with mowing and maintenance limited to periodic removal of trees and woody shrubs. The area shall be planted with an Early Succession Mix that includes the following:

- Black Eyed Susan (*Rubeckia hirta*)
- Blue Vervain (*Verbena hastata*)
- Canada Anemone (*Anemone canadensis*),
- Canada Blue-joint (*Calamagrostis canadensis*),
- Canada Goldenrod (*Solidago canadensis*)
- Little Bluestem (*Schizachyrium scoparuim*)
- Common Milkweed (*Asclepias syriaca*)
- Fowl Bluegrass (*Poa palustris*)
- Meadow/Open Field Sedge (*Carex granularis*)
- New England Aster (*Symphyotrichum novae-angliae*)
- Path Rush (*Juncus tenuis*)
- Purple Stemmed Aster (*Symphyotrichum puniceum*)
- Virgins Bower (*Clematis virginiana*)
- Wild Bergamot (*Monarda fistulosa*)

Tributary 1 Naturalization

The area identified as Tributary 1 Planting on the ARA operational and rehabilitation page shall be planted within 5 years of the issuance of the ARA license in the spring (i.e., May) or fall (i.e., mid - September to early-October) with a mixture of the following tree and shrub species:

<u>Trees</u>

- Red Maple (*Acer rubrum)*
- Bigtooth Aspen (*Populus grandidentata*)
- Trembling Aspen (*Populus tremuloides*)
- White Birch (*Betula papyrifera*)
- American Basswood (*Tilia americana*)

- Balsam Fir, (*Abies balsmea*)
- Eastern Hemlock (*Tsuga canadensis*)
- Eastern White Pine (*Pinus Strobus*)

Shrubs / Groundcover

- Choke Cherry (*Prunus virginiana*)
- Red Osier-dogwood (*Conus sericea*)
- Staghorn Sumac (*Rhus typhina*)
- Smooth Serviceberry (*Amelanchier laevis*)
- Common Blackberry (*Rubus allegheniensis*)
- Northern Bracken Fern (*Pteridium aquilinum var. latiusculum*)
- Red Trillium (*Trillium erectum*)
- White Trillium (*Trillium grandiflorum)*
- Zigzag Goldenrod (*Solidago flexicaulis)*
- Wild Sarsaparilla (*Aralia nudicaulis)*
- Blue Cohosh (*Caulophyllum thalictroides)*
- Wild Leek (*Allium tricoccum)*
- Sensitive Fern (*Onoclea sensibilis)*
- White Meadow-sweet (*Spiraea alba)*

Within the Tributary 1 Planting Area, the following planting requirements shall be met:

a. Trees shall be planted at a density of five (5) trees per 100 m².
b. All tree saplings shall be planted 5 m apart to increase rooting and provide stabilization.
c. Trees shall be a minimum of 1.2 m (~4 ft) in height with a sufficiently developed root ball to sustain planting.
d. Shrubs shall be planted at a shrub to tree ratio of 5:1.
e. All shrubs shall be installed 1 m apart.
f. All installed shrubs shall consist of potted material at least 30cm tall in 1-3 gallon pots.
g. Any woody plant root defects (e.g., girdling) shall be corrected prior to installation.
h. All woody plants shall be installed such that the root crown/trunk flare is exposed above the soil surface to ensure proper oxygenation of the rooting zone.
i. All installed woody plants shall be watered (deep soaking) following installation.

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1 BACKGROUND

RiverStone Environmental Solutions Inc. (hereafter, "RiverStone") was retained by Drain Bros. Excavating Limited (hereafter, "Client") to prepare a Natural Environment Report (NER) for submission with an application under the Aggregate Resources Act (ARA) in the Township of Asphodel-Norwood (hereafter, "Township"). The assessment parcels are legally described as Part of Lot 14, Concession 5 and Part of Lot 15 Concession 6, 3749 Highway 7 and 926 Sand Road, Township of Asphodel-Norwood, County of Peterborough (Figure 1).
The applications required to support the proposed pit include the following.

- Peterborough County Official Plan Amendment (1992 Official Plan)
- Township of Asphodel-Norwood Comprehensive Zoning By-law 2009-08
- ARA Licence Application

The proposal is for a Class A, pit above the water table, with a proposed licensed area of 35.2 ha of which 25.0 ha would be extracted. The pit is bounded on the east by the existing Sand Road Pit and agricultural lands, on the south by Sand Road and rural residential properties, on the west by natural vegetated features and agricultural lands, and on the north by Highway 7, natural vegetated features and agricultural lands. The proposed pit will use an existing entrance/exit to Highway 7 with a maximum extraction limit of 350,00 tonnes per annum.

For the purposes of this NER, the following terminology is employed as shown on **Figure 1**.

- subject property -parcels/properties in which the aggregate licence is situated
- site – proposed licence area.
- adjacent lands – areas within120 meters of the site.
- Assessment area – areas that include the site, adjacent lands (120 m), additional lands, and the surrounding landscape to a distance considered necessary to appropriately situate the proposed areas of disturbance within a broader municipal and ecoregional context.

1.1 Study Purpose

This NER has been prepared to address the requirements under the ARA and its associated regulation (O. Reg. 244/97) and policy standards. Per s. 7 of O. Reg. 244/97 pursuant to the ARA, licence applications must be made in accordance with the Provincial Standards (i.e., *Aggregate Resources of Ontario: Provincial Standards*). Per the aggregate resources of Ontario Standards , the application must be supported by an NER, following the Aggregate Resources of Ontario Technical Reports and Information Standards (August 2020). Under the ARA, a "site" is defined as "the land or land under water to which a licence or permit or an application therefore relates", which is the term used for this NER.

Per the Ministry of Natural Resources (MNR) Technical Report Standards, the purpose of an NER is to identify and describe the existing natural environment conditions on and within 120 m of the site, and to determine whether any of the following features are present:

- 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 St. Mary's River)
- e) Habitat of endangered and threatened species
- f) Significant wildlife habitat
- g) Significant areas of natural and scientific interest (ANSIs)
- h) Within the area of one or more of the provincial plan (s) any key natural heritage features not included in a) through g)

When any of the above listed features are identified during the NER an analysis is required to determine the potential for negative impacts on the identified feature(s) or areas of significance and their ecological function. If potential negative impacts are identified, then the assessment should provide recommendations for appropriate preventative, mitigative, and remedial measures. The NER is also required to identify if any of the features listed in a) through g) are located in a natural heritage system identified by the municipality in ecoregions 6E and 7E or by the province in a provincial plan.

In addition to satisfying the requirements for a NER assessments under the ARA, this report is intended to be submitted to the Township of Asphodel-Norwood and Peterborough County as part of a complete application package for a site specific ZBA and OPA to permit mineral aggregate operation within lands designated Rural Area in the County OP, and as Extractive Industrial, Agriculture and Natural Core Area in the Township OP. Currently lands within the subject property are zoned Agriculture (A), Rural (RU) and Environmental Protected (EP). A Township Zoning By-Law Amendment and Aggregate Resources Act Licence Application will be required to permit an expansion of a mineral aggregate operation on any part of the site. Pre -consultation with the Township of Asphodel-Norwood and Peterborough County was completed in October 2023 to confirm application requirements. Therefore, this report includes an assessment, to the extent needed for a planning application, of whether the activities proposed address relevant natural heritage policies contained in the Township's Land Use Schedules, Peterborough County OP, and other applicable legislation and policies including the 2024 Provincial Planning Statement (PPS), federal *Fisheries Act,* and provincial Species Conservation Act (SCA) (see **Section 2.2**).

2 APPROACH AND METHODS

2.1 Personnel and Qualifications

The field investigation work conducted between 2024-2025 was completed by Craig Mann, H.BSc.F. (vegetation, fisheries, species at risk, breeding birds, wetlands), Al Shaw, M.Sc. (fisheries), Becca Howe, M.Sc. (wildlife, breeding birds, wetlands), Terin Robinson M.Sc. (fisheries), and Mike Frances M.Sc. (vegetation, species at risk, wetlands).

The curricula vitae for the primary report author (Bev Wicks senior ecologist/president) and primary field investigators are provided in **Appendix 1**.

2.2 Applicable Environmental Legislation and Policy

As described in **Section 1.1**, the primary policies directing this assessment are the ARA, municipal OP's, and provincial policy. In accordance with the ARA, the application is considered a Class A above water licence. To assess whether the application satisfies other relevant municipal, provincial,

and federal requirements with respect to the natural environment, the following policies (e.g., statutes, regulations, plans, guidance documents, etc.) were considered applicable during both the field investigations and the impact analysis:

- County of Peterborough Official Plan (1994, Consolidated to June 2025) including the Township of Asphodel-Norwood included in Sections 6 and 7 of the County of Peterborough Official Plan.
- Township of Asphodel-Norwood land use schedules.
- Provincial *Aggregate Resources Act* (ARA), R.S.O. 1990, c. A.8, including:
    - Ontario Regulation 244/97: General
    - Aggregate Resources of Ontario Standards: A compilation of the four standards adopted by Ontario Regulation 244/97 under the Aggregate Resources Act
    - Aggregate Resources of Ontario Technical Reports and Information Standards (2020)
- *Provincial Planning Statement*, 2024, pursuant to the *Planning Act*, R.S.O. 1990, c. P.13, including:
    - Significant Wildlife Habitat Technical Guide (OMNR 2000a)
    - Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (OMNR 2010)
    - Significant Wildlife Habitat Technical Guide (OMNR 2000b)
    - Significant Wildlife Habitat Criteria Schedules for Ecoregion 6 (OMNRF 2015b)
    - Significant Wildlife Habitat Mitigation Support Tool (OMNRF 2014).
- Provincial Species Conservation Act (SCA), S.O. 2025, c. 4, Sched. 10,, including:
    - O. Reg. 60/26: Protected Species in Ontario List
    - O. Reg. 61/26: Excepted Activities - No Permit or Registration
    - O. Reg. 62/26: Transitional Matters
    - O. Reg. 74/26: Permit Activities
    - O. Reg. 75/26: Registerable Activities
- *Fish and Wildlife Conservation Act*, S.O. 1997, c. 41.
- Federal *Fisheries Act*, R.S.C. 1985, c. F-14, including:
    - *Applications for Authorization under Paragraph 35(2)(b) of the Fisheries Act Regulations*, S.O.R/2013-191
    - Fish and Fish Habitat Protection Policy Statement (DFO 2019)
- Federal *Species at Risk Act*, S.C. 2002, c. 29.
- Federal *Migratory Birds Convention Act*, S.C. 1994, c. 22, including:
    - Migratory Birds Regulations, C.R.C., c. 1035

2.3 Information Sources Used to Assess Site Conditions

Information pertaining to the natural features and functions of the site and adjacent lands was obtained from the following sources:

- **Peterborough County Official Plan** (Consolidated to June 2025) for natural heritage feature mapping within and adjacent to the site, including:
    - Section 4.1.3.3 – Mineral Aggregate and Non-Aggregate Mineral Resources
    - Section 4.1.3.4 – Natural Heritage Features
    - Section 6.0 Local Plan Policies – Land Use
    - Section 7.0 Local Plan Policies – General Development
    - Let Me Map 2.0 Peterborough County
- **Otonabee Conservation Authority (OCA) Interactive Mapping** to identify potential features of conservation interest within and adjacent to the site (accessed November 5, 2025, at https://camaps.maps.arcgis.com/apps/webappviewer/index.html?id=403c466c459347cfb0c3887d8de85be3
- **Land Information Ontario (LIO)** accessed via MNRF's "Make a Map" web-based platform (last accessed November 2025).
- **Ontario GeoHub Aquatic Resource Area Survey Point** (last accessed September 2025)
- **MNRF Natural Areas Mapping and Natural Heritage Information Centre (NHIC) database** regarding information on occurrences of species at risk (SAR), provincially tracked species, and natural heritage features near the site (squares:17QK3614, 17QK3714, 17QK3615, 17QK3715, 17QK3716, 17KQ3816, and 17QK3815 accessed November 4, 2025, at: http://www.giscoeapp.lrc.gov.on.ca/web/MNR/NHLUPS/NaturalHeritage/Viewer/Viewer.htm
- **iNaturalist Mapping and Online Database** regarding citizen scientist observations documented in the vicinity of the subject lands accessed November 2025 at: https://inaturalist.ca/projects/nhic-rare-species-of-ontario
- **Species at Risk range maps** (accessed at: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/246809.html).
- **Ontario Breeding Bird Atlas (OBBA) database and the Atlas of the Breeding Birds of Ontario, 2001–2005** (Cadman et al. 2007) regarding birds that were documented to be breeding near the site between 2001–2005 (squares: 17TQK31; accessed November 4, 2025 at: http://www.birdsontario.org/atlas/squareinfo.jsp).
- **Ontario Reptile and Amphibian Atlas** database regarding reptile and amphibian records near the site (squares: 17TQK31; accessed November 4, 2025, at: http://www.ontarioinsects.org/herpatlas/herp_online.html).
- **Ontario Butterfly Atlas** database regarding butterflies recorded near the site (square: 17TQK31; accessed February 4, 2025, at: http://www.ontarioinsects.org/atlas_online.htm).
- **Atlas of the Mammals of Ontario** (Dobbyn 1994) regarding mammals recorded near the site.
- **Aquatic Species at Risk Maps** mapping generated by Fisheries and Oceans Canada (accessed November 4, 2025, at: http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm)
- **Aquatic Resources Area Line Segment** database regarding fish data near the site. Accessed November 5, 2025, at https://geohub.lio.gov.on.ca/datasets/lio::aquatic-resource-area-line-segment/explore?location=47.970763%2C-81.379760%2C4.44

- **Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2** (Henson and Brodribb (2005) regarding terrestrial biodiversity within Ecodistrict 6E-5 (Mount Forest).
- **Great Lakes Conservation Blueprint for Aquatic Biodiversity, Volume 2** (Phair et al. (2005) regarding aquatic biodiversity within tertiary watershed 2FE (Maitland).
- **Physiography of Southern Ontario** (Chapman and Putnam 2007) for information pertaining to the physiography and soils within and adjacent to the site.
- **Digital Ontario Base Maps** (OBMs; 1:10,000)
- **Historical and Current Aerial Photographs** of the site and Study Area.
- **Site investigations** by RiverStone staff (see **Section 2.4**)

In addition to the above information sources, RiverStone also reviewed the following technical reports and incorporated their results into this NER as appropriate:

- **Pre-consultation letter sent to Township of Asphodel-Norwood and Peterborough County October 31, 2023**
- **Sand Road Pit Extension Level 1 and Level 2 Hydrogeological Assessment, (2026) Tatham Engineering.**
- **Site Plans (MHBC, 2026)**

2.4 Site Investigations

The background biophysical information gathered as outlined in **Section 2.3** helped direct field data collection activities and species-specific surveys associated with multiple site investigations carried out by Riverstone staff. **Table 1** below indicates the primary assessments/surveys performed during each site visit, weather conditions, and time on-site.

Table 1. Site Visits and Primary Tasks.

Date	Primary Task(s)	RiverStone Staff	Weather Conditions	Time Onsite / person
April 25,2024	Site reconnaissance, preliminary ELC mapping, vegetation inventory, bat snag assessment	C. Mann, M. Francis	Air Temperature 9°C; Beaufort Wind 1-2; Cloud Cover 0%; Precipitation None	6.0 hr
April 26, 2024	Site reconnaissance, preliminary ELC mapping, vegetation inventory, bat snag assessment, turtle survey #1	C. Mann	Air Temperature 10 - 14 °C; Beaufort Wind 0-1; Cloud Cover 0%; Precipitation None	4.0 hr
April 26, 2024	Anuran calling survey #1	C. Mann, T. Robinson	Air Temperature 5-10 C; Beaufort Wind 0-1; Cloud Cover 0%; Precipitation None	2.75 hr
May 16, 2024	Turtle survey #2, spring vegetation inventory	C. Mann	Air Temperature 23 C; Beaufort Wind 1; Cloud Cover 60%; Precipitation None	2 hr

May 16, 2024	Anuran calling survey #2, Eastern Whip-poor-will survey #1	C. Mann, T. Robinson	Air Temperature 14-17 C; Beaufort Wind 0-1; Cloud Cover 2%; Precipitation None	3.75 hr
May 23, 2024	Eastern Whip-poor-will survey #2	C. Mann, T. Robinson	Air Temperature 16 C; Beaufort Wind 0; Cloud Cover 0%; Precipitation None	3.5 hr
June 2, 2024	Breeding bird survey #1, turtle survey #3, vegetation inventory, incidental wildlife	B. Howe	Air Temperature 12-17 C; Beaufort Wind 0-1; Cloud Cover 100%; Precipitation None	5.25 hr
June 4, 2024	Turtle survey #4, vegetation inventory, incidental wildlife	B. Howe	Air Temperature 26-27 C; Beaufort Wind 0-1; Cloud Cover 60-70%; Precipitation None	1 hr
June 12, 2024	Turtle survey #5, deploy bat monitors, vegetation inventory, incidental wildlife	B. Howe	Air Temperature 21 C; Beaufort Wind 2; Cloud Cover 50-60%; Precipitation None	2 hr
June 18, 2024	Breeding bird survey #2, vegetation inventory, incidental wildlife	B. Howe	Air Temperature 19-25 C; Beaufort Wind 0-2; Cloud Cover 15-30%; Precipitation None	4 hr
June 21, 2024	Anuran calling survey #3, Eastern Whip-poor-will survey #3, fish sampling, wetland delineation, vegetation inventory	C. Mann, T. Robinson	Air Temperature 15-19 C; Beaufort Wind 1; Cloud Cover 0%; Precipitation None	6 hr
July 3, 2024	Breeding bird survey #3, retrieve bat monitors, vegetation inventory, incidental wildlife	B. Howe	Air Temperature 19-21 C; Beaufort Wind 0-2; Cloud Cover 0-25%; Precipitation None	4.5 hr
October 10, 2024	Wetland delineation, ELC refinement, vegetation inventory, incidental wildlife	C. Mann	Air Temperature 7-12 C; Beaufort Wind 0-1; Cloud Cover 0-10%; Precipitation None	7.5 hr
October 11, 2024	Watercourse assessment, fish sampling	C. Mann, A. Shaw	Air Temperature 8-10 C; Beaufort Wind 0-2; Cloud Cover 0-15%; Precipitation None	5 hr
February 7, 2025	Winter raptor survey #1, winter conditions	C. Mann	Air Temperature -5 to -7 C; Beaufort Wind 1-2; Cloud Cover 0 to 50 %; Precipitation flurries earlier in day	5 hr
March 12, 2025	Winter raptor survey #2, winter conditions	C. Mann	Air Temperature0 to -3 C; Beaufort Wind 1; Cloud Cover 50% overcast; Precipitation None	4.5

Evidence for the presence of a species (or use of an area by a species) was determined from visual and/or auditory documentation (e.g., song, call) and/or observation of nests, tracks, burrows, browse, skins, and scats (where applicable). Natural heritage features (e.g., SAR habitat, wetlands, etc.) were digitized and delineated in the field with a high accuracy GPS. All land-use, physiographic, and ecological information described for adjacent lands was collected from either current aerial photographs or observations from inside the subject property and/or publicly accessible areas (e.g., rights-of-way, roadsides, etc.). Features of interest were photographed, and all information collected

was catalogued for future reference. Representative photographs detailing on-site conditions are provided in **Appendix 2**.

Overall, the level of effort expended during the site investigations and field surveys was considered adequate to document the natural heritage features and functions with recognized conservation status occurring within and adjacent to the site given the location, extent of the proposed pit extraction activities and disturbances, keeping in mind the habitat-based approach described in **Section 2.4.3**.

2.4.1 Terrain, Drainage, and Soils

The geophysical setting of the site and adjacent lands was determined via a review of topographic mapping, soils mapping for the area (Chapman and Putnam 2007), surficial geological mapping, and aerial photographs. Where required soils were further investigated with a Dutch Auger during vegetation community characterization (see also **Section 2.4.4**). Drainage direction and the presence or absence of surface water features was determined based on a review of background information sources (e.g., Ontario Base Maps, Agricultural Information Atlas, etc.), on-site observations, and review of the hydrogeologic assessment which includes surface catchment analysis (Tatham, 2026).

2.4.2 Surface Water and Groundwater

Surface water and groundwater investigations were principally performed by Tatham Engineering and described in the **Level 1 and Level 2 Hydrogeological and Hydrological Assessment for the Sand Pit** (2026). The results of Tatham's analysis are incorporated where applicable herein.

2.4.3 Habitat-based Approach

RiverStone's primary approach to site assessment is habitat-based. This means that our field investigations first focus on evaluating the potential for features within an area of interest to function as habitat for species considered potentially present, rather than searching for live specimens. An area is considered potential habitat if it satisfies a number of criteria, usually specific to a species, but occasionally characteristic of a broader group (e.g., several turtles of conservation interest use sandy shorelines for nesting, numerous fish species use areas of aquatic vegetation for nursery habitat). Physical attributes of a site that can be used as indicators of its potential to function as habitat for a species include structural characteristics (e.g., physical dimensions of rock fragments or trees, water depth), ecological community (e.g., meadow marsh, rock barren, coldwater stream), and structural connectivity to other habitat features required by the species. Species-specific habitat preferences and/or affinities are determined from status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007), published and unpublished documents, and direct experience.

In instances where habitat features are such that either (i) a species presence cannot be easily determined through an assessment of habitat feature alone, or (ii) habitat features are such that they suggest a species may be present in an area where development is proposed and impacts are likely, RiverStone adds an additional level of rigor to our work by completing further species-specific assessments in accordance with applicable standard methods and protocols.

2.4.4 Vegetation

2.4.4.1 Community Characterization according to Ecological Land Classification

Vegetation communities occurring within the assessment area (i.e., site, adjacent lands, and additional lands) were delineated according to Ecological Land Classification (ELC) community tables (Lee et al. 1998). ELC defines ecological units or communities based on bedrock, climate (temperature, precipitation), physiography (soils, slope, aspect), and corresponding vegetation. Use of the system permits biologists and other land managers to use a common language to describe vegetation communities, which in turn facilitates the identification of communities likely to support features or functions of conservation interest. The ELC system is an organizational framework that can be applied at different scales. The ecological units most useful for site-specific evaluations are ecosites and vegetation types (also known as eco-elements). Vegetation types are the finest level of resolution in the ELC system and are recurring patterns found in the plant species assemblages that are associated with a particular ecosite (Lee et al. 1998). Vegetation communities mapped on adjacent lands were delineated predominantly via aerial photograph interpretation.

The boundaries of wetland communities identified via ELC were delineated in the field in accordance with the "50% wetland vegetation rule" specified by the Ontario Wetland Evaluation System (OWES). The boundaries of all treed communities (i.e., forests, cultural woodlands) where they abut open areas (e.g., agricultural fields, etc.) were delineated in the field based on the dripline. Where a treed community is also a wetland (i.e., treed swamp), the greater of the dripline or OWES wetland boundary is used to define the feature extent.

2.4.4.2 Vascular Plant Survey

A vascular plant survey consisting of a comprehensive area search ("wandering transects") was principally centred within areas of the site and adjacent lands (contingent upon access) with naturally occurring (i.e., non-planted) vegetation. Effort was paid to areas with the greatest potential to support vascular plants that are designated endangered, threatened, provincially rare, or regionally significant species and areas with the greatest potential for impact based on the proposal. Nomenclature and common names for the recorded vascular plant species are generally consistent with the southern Ontario Vascular Plant Species List (Bradley 2013) except where a name change has more recently been adopted by NHIC.

2.4.5 Anuran Calling Surveys

Calling anuran surveys were conducted in accordance with the Marsh Monitoring Program for Surveying Amphibians (Bird Studies Canada 2009). This protocol involves the completion of three (3) surveys; once per month between April and June, from approximately 30 minutes after sunset until midnight. Appropriate weather conditions include no or very light precipitation and wind speed $\leq$3 on the Beaufort wind scale. As the site is located within the southern region, each of the three (3) surveys should occur during the second half of the month (i.e., April 15-30, May 15-31, and June 15-30). A total of five (5) anuran calling stations were established and situated systematically to cover potentially significant anuran breeding habitats, particularly those that could occur adjacent to proposed areas of extraction or disturbance (**Figure 2**). Each station was surveyed for a minimum duration of three (3) minutes. Anurans were also recorded incidentally during other field activities on-site.

2.4.6 Breeding Bird Surveys

Three (3) rounds of breeding bird surveys were conducted in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (Bird Studies Canada et al. 2001) and any species specific surveys as required under the *Species Conservation Act*. Surveys were conducted in the appropriate season (May 24–July 10), time of day (between dawn and 5 hours after dawn), and weather conditions (no rain, wind speed ≤3 on the Beaufort Wind Scale). A total of twelve (12) breeding bird stations were established and situated systematically to cover potentially significant bird habitats, particularly those that could occur adjacent to proposed areas of extraction or disturbance (**Figure 2**). Each station was surveyed for a minimum duration of 5 minutes. Birds were also recorded incidentally in transit between stations during the breeding bird survey, and incidentally during other field activities on-site.

The OBBA provides four breeding categories to accompany each observation:

> ***Observed:*** Species observed during its breeding season (no evidence of breeding).
>
> ***Possible Breeding:*** Includes any of the following observation types: 1) species observed in its breeding season in suitable nesting habitat, and 2) singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat.
>
> ***Probable Breeding:*** Includes any of the following observation types: 1) pair observed in their breeding season in suitable nesting habitat, 2) permanent territory presumed through registration of territorial song on at least 2 days, a week or more apart, at the same place, 3) courtship or display between a male and a female or 2 males, including courtship feeding or copulation, 4) visiting probable nest site, 5) agitated behaviour or anxiety calls of an adult, 6) brood patch on adult female or cloacal protuberance on adult male, and 7) nest-building or excavation of nest hole.
>
> ***Confirmed Breeding:*** Includes any of the following observation types: 1) distraction display or injury feigning, 2) used nest or eggshell found (occupied or laid within the period of the study), 3) recently fledged young or downy young, including young incapable of sustained flight, 4) adults leaving or entering nest site in circumstances indicating occupied nest, 5) adult carrying faecal sac, 6) adult carrying food for young, 7) nest containing eggs, and 8) nest with young seen or heard.

2.4.7 Winter Roosting Raptor Surveys

RiverStone completed visual winter raptor surveys based a combination of methodologies reviewed through online sources. The Significant Wildlife Habitat Mitigation Support Tool, 2014 defines raptor wintering areas as a combination of fields and woodlands that contain roosting, foraging, and resting habitats. Habitat consists of a combination of fields and woodlands larger than 20 ha and/or field/meadow habitat larger than 15 ha with windswept and limited snow accumulation. The amount of potential habitat within the assessment area was limited. Based on the variability of terrain and limited amount of roadway adjacent potential habitats, a combination of survey points and transects were completed within the assessment area using the following parameters. Surveys were completed during winter months with snow on the ground, during periods of good visibility (no heavy snowfall), with a minimum of seven (7) days between surveys. Binoculars or a viewing scope were used to scan potential habitat for between 15-30 min, depending on length of transition area. Two (2) surveys were completed, and if raptors were observed additional surveys to confirm continued roosting were proposed. Location of winter roosting surveys are outlined on (**Figure 2**).

2.4.8 Snakes – Visual Encounter Surveys

An assessment was completed during the initial site reconnaissance review of the subject property to identify potential habitat for overwintering snakes including bedrock areas, stone piles and brush piles etc., that would provide access to hibernaculum below frost line. With the lack of potential hibernation habitat observed within or adjacent to the extraction area, general snake visual surveys were completed while walking transects through the study area to determine presence and absence of snakes in the spring of 2024. Surveys generally followed the Survey Protocol for Ontario's Species at Risk Snakes (OMNRF 2016) with surveys completed when air temperatures were between 8-25^{o}C between 0900-1700h on days with less than 50% cloud cover and low winds (i.e., less than 24 kph) (OMNRF 2016). The goal of these surveys was to identify locations snakes may be using for overwintering (i.e., hibernacula). These surveys are designed to target snakes in the season when vegetative cover is minimal, and thermal conditions result in snakes heading to or congregating at overwintering sites. During this period, surveys focus on observations of snakes coming in and out of overwintering sites to bask and as well as looking for discarded snake sheds. Visual encounter surveys were conducted primarily along transition areas that contained a variety of vegetation communities with good sun exposure.

2.4.9 Bat Maternal Roosting Habitat Surveys and Acoustic Monitoring

Targeted surveys for bats focused on identifying the presence of maternal roosts. Surveys followed the protocols outlined is OMNR (2011). Vegetation mapping using Ecological Land Classification (ELC) was used to identify appropriate ecosites and guide the completion of onsite surveys (Protocol Step 1). Snags/cavity tree surveys were conducted during leaf off conditions within appropriate forest communities using a fixed plot method of sampling. Plots were completed within conifer, deciduous, mixedwood and swamp communities. Location of plots were scoped based on vegetation mapping prepared through photo interpretation and provided on **Figure 2** and results in **Appendix 3** (Protocol Step 2). Acoustic surveys were then completed within the assessment area; however, as snag/cavity tree surveys did not yield any areas with significant numbers of snags, acoustic survey equipment was placed in areas where some snags were documented as well as in proximity to location of the proposed pit (Protocol Step 3) following a precautionary principle. Acoustic equipment was placed at three (3) locations (**Figure 2**). Timing of surveys was selected as it corresponded with the roosting period for maternal colonies as outlined in (COSEWIC 2013) and continued for a period of at least 10 days. Acoustic monitoring was completed between sunset and sunrise each day. Weather conditions were fair throughout the survey period (Protocol Step 4).

2.4.10 Turtle Visual Encounter Surveys

Visual encounter surveys for turtles were conducted in accordance with *Occurrence Survey Protocol for Blanding's Turtle (Emydoidea blandingii) in Ontario* (OMNR 2014). The protocol involves conducting five (5) separate surveys spread out over a minimum three (3) week period between ice-out (i.e., April) and June 15 under appropriate weather conditions (e.g., generally sunny conditions, no rain). All turtle visual encounter surveys were completed when air temperatures were at least 10°C since this is a requirement of the Blanding's Turtle survey protocol. Where possible, surveys were timed to target warm days following cool or inclement weather, which would increase the chances of encountering basking turtles. Vegetation communities and other features with a potential to function as habitat (i.e., overwintering, basking, feeding) for species at risk turtles were surveyed (**Figure 2**).

2.4.11 Eastern Whip-poor-will Calling Surveys

Whip-poor-will was identified in the background review and based on RiverStone's habitat-based assessment this species was identified as having the potential to be present in the open communities on the subject property. Surveys for Whip-poor-will were completed following a slightly modified MNR survey protocol (MNRF 2015). The protocol requires that two site visits be completed, one each during the waxing period of the full moon cycle (i.e., > 50% illumination of the moon) in May and June. Surveys were completed on clear nights (i.e., little to no cloud cover), no precipitation, temperatures above 10^{o}C, and calm winds (i.e., >12 km/h). Surveys involve the completion of point counts that take place at least 30 minutes after sunset, with the moon is above the horizon – given that moon rise changes throughout the survey period, survey start times may be considerably later than sunset. Point count stations must be within 500 m of potential habitat and not be within 400 m of adjacent stations. For stations that were closer than 400 m, point counts were directional as to not include previously counted calls. Point count times at each were a minimum of 3 minutes (protocol recommendation) with the length of time spent within the vicinity of potential habitat gathering incidental observation being much longer. Four (4) survey locations were established within open field habitat in the assessment area.

2.4.12 Fish and Aquatic Habitat

Fish habitat was assessed during the site investigations included direct fish habitat (spawning, rearing, feeding, and cover habitat), and indirect fish habitat, which includes intermittent watercourses and drainage features that contribute food, water, or nutrients for fish, but which fish do not use directly.

Fish and aquatic habitat conditions within all on-site surface water features were assessed in accordance with the Ontario Stream Assessment Protocol (OSAP) (Stanfield 2010). A modified version of the OSAP Section 4, Module 1 (Rapid Assessment Methodology for Channel Structure) was employed to collect the aquatic data. OSAP provides a standard assessment technique for characterizing watercourses and their associated fish and aquatic habitat conditions at specific locations (stations). Information collected includes bankfull and wetted widths, channel structure, evidence of erosion, instream cover, substrate type, stability, and aquatic and riparian vegetation, and other relevant characteristics.

An assessment of the fish community using electrofishing and minnow traps was completed within tributaries associated with wetland present on the subject property and adjacent lands. Electrofishing was undertaken in the watercourse under Permit #PEBA-2024-FWCA-00431 issued by MNRF (**Appendix 4**). The purpose of the assessment was to document the fish community present to assist in determining fish community structure and the thermal regime of the creek. A coldwater fish community (i.e., presence of Brook Trout) would suggest that groundwater is a component of the baseflow, placing additional emphasis on protecting coldwater inputs. The purpose of the sampling of the tributaries was to determine if these features were fish habitat.

2.5 Identification of Significant Natural Features

"Significant natural features" as described herein represent natural features and habitats that have recognized status (and therefore policy significance) within the planning jurisdiction in which an application is proposed. Significant natural features herein include those outlined in the compiled Aggregate Resources of Ontario Standards, namely:

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).

Criteria used to determine the presence or absence of the above significant natural features within the Study Area were considered from a variety of sources including the Natural Heritage Reference Manual (MNR 2010) and (for Significant Wildlife Habitat) the Ecoregion 6E Criteria Schedule (MNRF 2015).

Like significant natural features, "significant species" represent individuals of wild species that have recognized status (and therefore policy significance) within the planning jurisdiction in which an application is proposed. Significant species are defined here to include:

· Species designated endangered, threatened, or special concern under the provincial *Species Conservation Act*, 2025, S.O. 2025, c. 4, Sched. 10, and species afforded protection by this act as listed on O. Red. 60/26: Protected Species in Ontario List..

· Species designated Provincially Rare (i.e., S1, S2, or S3) by NHIC.

The appropriate process for identifying such features is outlined below.

2.5.1 Significant Wetlands

A significant wetland is an area identified as provincially significant by the MNRF using evaluation procedures established by the province, as amended from time to time. The Ontario Wetland Evaluation System (OWES) Southern Manual (4th Edition 2022) is the applicable process for use in the assessment area.

The presence or absence of significant wetlands within the site and adjacent lands was ascertained via the online Ontario Make a Map Natural Heritage website and by reviewing relevant background information sources (per **Section 2.3**). As described in **Section 2.4.4**, RiverStone delineated the boundaries of all wetlands identified within the subject property (whether Significant or not) in accordance with the "50% wetland vegetation rule" per OWES. No Provincially Significant Wetlands (PSW) are mapped on the subject property. An evaluated non-PSW (Asphodel South) is located immediately north of the proposed pit. The closest PSW (Ouse River Middle Complex Wetland) is mapped approximately 200 m southeast of Sand Rd at the closest point. Additional unevaluated wetlands have been identified on the greater landscape proximate to the PSW and the evaluated non-PSW (**Figure 1**). Most of the wetlands within the subject property have been evaluated for significance, and these wetlands are considered not provincially significant.

2.5.2 Coastal and Significant Coastal Wetlands

Coastal wetlands are defined in the PPS. Significance is determined using evaluation criteria and procedures established by the province (MMAH 2024). The subject property is not located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Mary's, St. Clair, Detroit, Niagara and

St. Lawrence Rivers), nor is the subject property on a tributary to any of the above-specified water bodies and lies, wholly or partly, downstream of a line located 2 km upstream of the 1:100 year flood line (plus wave run-up) of the large water body to which the tributary is connected (MMAH 2024).

Therefore, coastal wetlands and significant coastal wetlands are considered absent from the subject lands and the surrounding, local landscape.

2.5.3 Significant Woodlands

Based on review of the County of Peterborough Official Plan, it was determined that no significant woodland features had been mapped in the assessment area, however the County of Peterborough online mapping shows areas of vegetation **Figure 3**. Since the OP does not provide detailed descriptions of significant woodland, RiverStone has relied on the Natural Heritage Reference Manual for assessment of significant woodland.

The Natural Heritage Reference Manual describes a woodland and significance as follows:

- Woodland means…

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

- Significant: means…

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

Section 3.7.4 and **Table 5** below provides a detailed assessment for significant woodland within the assessment area.

2.5.4 Significant Valleylands

Valleylands are defined in the PPS. Significance is determined using criteria provided in provincial guidance, but municipal approaches that achieve or exceed the same objective may also be used (MMAH 2024). The assessment area does not contain valleys or other landform depressions with flowing or standing water. The Ouse River Tributary becomes a defined channel within a wetland in an area of flat topography proximate to HWY 7.

The presence or absence of significant valleylands was ascertained via assembly and review of relevant background information sources (per **Section 2.3**) and the results of targeted and habitat-based assessments on-site (per **Section 3**). No significant valleylands are identified in the County or Township Official Plan in the area that contains the identified watercourse.

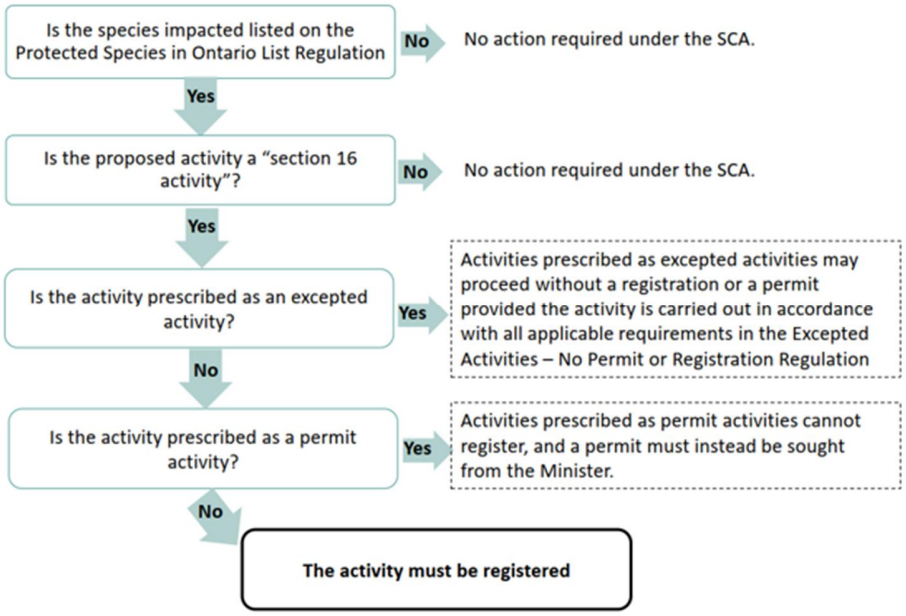
2.5.5 Habitat of Endangered and Threatened Species

Recently (June 5, 2025), through Bill 5, the *Endangered Species Act* (ESA) was amended to immediately bring into force several changes related to the protection endangered species. These changes included a new definition of "habitat", the removal of harassment as a basis for protection, and the creation of new legislation called the *Species Conservation Act* (SCA). On March 30, 2026, the SCA came into force, and the ESA was fully repealed along with all regulations. Along with the SCA, five (5) regulations also came into force, as follows;

1. The Protected Species in Ontario List Regulation
2. Registerable Activities Regulation
3. Permit Activities Regulation
4. Excepted Activities – No Permit or Registration Regulation
5. Transitional Matters Regulation

Several key changes are found within the new SCA, including a registration-first approach, permit requirements for only a limited number of activities, and removal of protections for migratory birds and aquatic species at risk that are already protected under federal legislation (*Species at Risk Act*, *Migratory Birds Convention Act*).

According to this legislation and associated regulatory framework for species at risk, the process to assess a proposed development/activity for consideration through the SCA, is as follows.



- taken from "Ministry of the Environment, Conservation and Parks, *Species Conservation Act* Implementation, Information Session, April 2026"

The presence or absence of endangered and threatened species and their habitat on the site and adjacent lands was ascertained via assembly and review of relevant background information sources (per **Section 2.3**) and the results of targeted surveys and habitat-based assessments on-site (per **Section 3**).

2.5.6 Significant Areas of Natural and Scientific Interest (ANSIs)

Areas of natural and scientific interest (ANSI) are defined in the PPS. The significance is determined using evaluation criteria and procedures established by the province (MMAH 2024).

The presence or absence of Significant ANSI's within the site and adjacent lands was ascertained via the online Ontario Make a Map Natural Heritage website, and by reviewing relevant background information sources (per **Section 2.3**). According to the provincial mapping database and the Peterborough County mapping (Let Me Map 2.0), the Westwood Drumlin Field is located approximately 4 km to the southwest of the assessment area.

2.5.7 Significant Wildlife Habitat

Significant wildlife habitat (SWH) is defined in the PPS as features or areas that are ecologically important in terms of functions, representation or amount, and are contributing to the quality and diversity of an identifiable geographic area or NHS. Criteria for determining significance are provided in provincial guidance (MNRF 2015; MNR 2000), but municipal approaches that achieve or exceed the same objective may also be used. The County of Peterborough relies on the definition provided in the PPS for SWH; therefore, the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015) have been used to identify and assess candidate and confirmed SWH.

As outlined in the SWH Technical Guide (OMNR 2000a) and supporting Ecoregion Criteria Schedules (OMNRF 2015a, 2015b, 2015c), SWH is composed of four principal components:

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

The process for identifying SWH is outlined in s. 9.2.3 of the Natural Heritage Reference Manual (OMNR 2010). Step 1 considers the nature of the development application proposed and involves the assembly of background ecological information for the study area. If the application triggers a need to protect SWH (e.g., change in land-use that requires approval under the *Planning Act*, etc.), a more thorough investigation of potential SWH features within the study area must occur. Any confirmed SWH for the site and/or study area as identified in relevant planning documents or by the MNR should be noted at this stage.

Where a need to protect SWH is triggered, step 2 involves undertaking a more thorough analysis of features, functions, and habitats within the site and adjacent lands via Ecological Land Classification (see **Section 3.5.1**). The list of ELC codes generated for the site, adjacent lands, and additional lands is compared to those codes considered candidate SWH in the relevant Ecoregion Criterion Schedule (i.e., 5E, 6E, or 7E) in step 3. Where a positive match between an ELC Ecosite and candidate SWH exists, the area is considered candidate SWH.

Two options are available for candidate SWH: 1) the area may be protected without further study, or 2) the area may be evaluated to ascertain whether confirmed SWH is present based on the Ecoregion criteria. Evaluation may involve generating more detailed maps of vegetation cover or conducting surveys of the wildlife population within the candidate SWH including reproductive, feeding, and movement patterns. If the area is confirmed SWH, the final step in the process is the completion of an

impact assessment to determine if negative impacts will occur to the confirmed SWH or its function. The impact assessment process and mitigation is assisted by SWH Mitigation Support Tool (OMNRF 2014).

RiverStone employed the approach as outlined above (i.e., steps 1-5) in assessing the potential for SWH to exist within the site and adjacent lands. Where targeted on-site assessments were required to evaluate SWH, survey methods are outlined in **Section 2.4**.

2.5.8 Fish Habitat

The definition of "Fish Habitat" was revised during amendments to the *Fisheries Act* in 2013. The current *Fisheries Act* defines "fish habitat" as

"spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes." Fish, as defined in S.2 of the *Fisheries Act*, c. F-14, includes "parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals."

The presence or absence of fish habitat was ascertained via assembly and review of relevant background information sources (per **Section 2.3**) and the results of fish sampling through minnow trapping, electro fishing, and habitat-based assessments on-site (per **Section 3**).

3 BIOPHYSICAL FEATURES AND FUNCTIONS

3.1 Landscape Setting and Physiography

The site is situated within the Peterborough Drumlin Field with esker and till moraine extending through the assessment area (Chapman and Putnam 2007). The site occurs within Ecodistrict 6E-9 (Lake Simcoe-Rideau), which generally follows the Drumlin Moraines extending from the east side of Lake Simcoe to Kingston. Ecodistrict 6E-9 contains several townships and rural communities including Belmont, Marmora, Modoc, Rawdon and Sheffield. Approximately 69 % of the ecodistrict remains in a natural state, consisting primarily of forest, with 19 % having been developed for agricultural purposes that includes row crop, pasture, or old fields no longer in production.

The landscape including and surrounding the assessment area is consistent with the overall character of surrounding land within Ecodistrict 6E-9, containing mostly agricultural land-uses punctuated by wetlands, deciduous, and coniferous forest. There is a history of aggregate extraction in the area with the existing Sand Rd pit located immediately to the east of the site. An existing access road that connects HWY 7, the existing Pit located to the east with the western assessment lands was in place at the time of the field investigations. This network of internal gravel access roads crosses the Tributary of the Ouse River (**Figure 1**). The nearest community to the assessment area is Norwood, that is located approximately 5.0 km northeast.

3.2 Bedrock and Surficial Geology

The bedrock underlying the site is characterized as upper Silurian aged limestones, mostly from the Bobcaygeon and Gull River formations but also includes some overlying Lindsay and Verulam formations. The surficial geology of the site is mapped as ice-contact stratified drift deposits dominated by sand and gravel (Ontario Geological Survey 2010). Ice-contact materials are generally deposited on

top of or within glacial ice by flowing meltwater; as the ice melts the drift slumps and becomes deposited (reworking or eliminating stratification that may have been present). Throughout the assessment area, these long linear ridges of gravel have formed into eskers. Within the assessment area, the esker formation runs through the central portion of the area with till moraine to the north and south.

3.3 Topography

The general topography (i.e., 5 m contours) of the site is shown on **Figure 4**. The northern section of the site is generally flat with a slight slope south towards the watercourse and wetland, where the lowest topographic point occurs at approximately 199 m above sea level (masl). South of the watercourse the topography becomes more rugged and hilly where the esker formation passes through the site. This terrain occurs throughout most of the southern portion of the property, where slopes are variable, with a topographic high of approximately 225 masl.

3.4 Drainage, Hydrogeologic Conditions

The surface soils of the site are dominated by porous media including gravel and sands so surface drainage from the site is limited to snowmelt and infrequent storm events. The site is located within the Ouse River watershed, with the main branch located to the south. The north half of the Site drains north to the tributary of the Ouse River (Tributary 2) while the south half of the Site drains south to the main branch of the Ouse River (**Figure 1** and **Figure 6**). A second tributary of Ouse River flows south from HWY 7 following the existing access road (Tributary 1) before its confluence with Tributary 2. This feature has a history of channel maintenance. A ditch was identified along the eastern property boundary that may convey spring melt but has little indication of intermittent flows. Soils in this feature remain saturated enough to support wetland vegetation species.

The topographic features on the site consist of elongated eskers that run generally from southwest to northeast. There is a topographic drainage divide running through the site, that splits the surface drainage directing the north half to the Ouse River and the south half to the Ouse River Tributary that flow south under HWY 7 through a culvert.

Tatham (2026) conducted a detailed hydrogeologic analysis for the site. The extraction area is in a significant recharge area, with sheet flow only during snowmelt or infrequent storm events. The highly permeable soils allow for rapid flow of groundwater.

3.4.1 Surface Water

The assessment area is located in the Ouse River subwatershed, that originates in the treed swamps in the Township of Douro Dummer. The main branch of the Ouse River is located to the south and the west branch of the river is located to the west of the subject property. Tributary 2 contributing to the main branch runs through the subject property north of the site and passes under the access road. Tributary 1 consists of an agricultural drainage ditch contributing baseflow to Tributary 2. Tributary 2 is located within the site, adjacent to the access road. A second drainage ditch along the eastern property boundary contributes ephemeral flows to Tributary 2. During the collection of background information, Ontario base mapping provided on the Ontario government site – Make a Map: Natural Heritage Areas was reviewed with a tributary to the Ouse River shown traversing wetlands located to the north of the site. Where accessible the channel locations of this watercourse were walked during site assessments. Wetlands were identified on the site, and numerous wetlands were located in the assessment areas and on adjacent lands. Where a watercourse channel was present in the subject

property it was assessed based on criteria outlined in The Stream Permanency Handbook (MNRF 2005) and the Ontario Stream Assessment Protocol (Stanfield 2010). Information collected during the assessments are outline in **Table 2** below.

Table 2. Channel Morphology and Aquatic Characteristics of the Ouse River Tributary

Station #	Feature	Channel Morphology and Aquatic Habitat Characteristics
WC1	Ouse River Trib 1 - permanent	**Bankfull Width**: 2.80 m **Wetted Width:** 2.80 m **Average Water Depth:** 25.0 cm **Flow:** yes **Bank Stability:** dug ditch with vegetated banks **Substrates:** silt **Observed Aquatic Species**: invertebrates **Aquatic Vegetation:** Common Watercress **Riparian Vegetation:** Reed Canary Grass, Narrow-leaved Cattail, Willow
WC2	Ouse River Trib 1 permanent	**Bankfull Width**: 2.6 m **Wetted Width:** 2.6 m **Average Water Depth:** 15.0 cm **Flow:** minimal **Bank Stability:** 2-3 m incised banks, vegetated banks **Substrates:** 50% silt, 50% gravel **Observed Aquatic Species**: invertebrates **Aquatic Vegetation:** Common Watercress **Riparian Vegetation:** Reed Canary Grass, Coltsfoot
WC3	Ouse River Trib 1 permanent	**Bankfull Width**: 2.80 m **Wetted Width:** 0.20 m **Average Water Depth:** 25.0 cm **Flow:** minimal **Bank Stability:** 40 cm banks, wandering channel **Substrates:** silt **Observed Aquatic Species**: invertebrates **Aquatic Vegetation:** none **Riparian Vegetation**: Reed Canary Grass

Station #	Feature	Channel Morphology and Aquatic Habitat Characteristics
WC4	Ouse River Tributary 2 permanent	**Bankfull Width**: 2.00 m **Wetted Width:** 1.40 m **Average Water Depth:** 30.0 cm **Flow:** minimal **Bank Stability:** 0.20 m banks **Substrates:** silt **Observed Aquatic Species**: invertebrates **Instream Cover:** none **Aquatic Vegetation:** Common Watercress **Riparian Vegetation**: Reed Canary Grass, Spotted Joe-pye-weed, Speckled Alder, Water Smartweed, Common Boneset, Purple Loosestrife
WC5	Ouse River Tributary 2 permanent	**Bankfull Width**: 1.00 m **Wetted Width:** 1.00 m **Average Water Depth:** 20.0 cm **Flow:** flow **Bank Stability:** 0.30 m banks **Substrates:** silt **Observed Aquatic Species**: invertebrates **Instream Cover:** emergent vegetation **Aquatic Vegetation:** Common Watercress, Narrow-leaved Cattail **Riparian Vegetation**: Reed Canary Grass, Bluejoint Reedgrass
WC6	Ouse River Tributary 2 permanent	**Bankfull Width**: 0.90 m **Wetted Width:** 0.70 m **Average Water Depth:** 23.0 cm **Flow:** flow **Bank Stability:** 0.20 m banks **Substrates:** silt **Observed Aquatic Species**: invertebrates **Instream Cover:** none **Aquatic Vegetation:** none **Riparian Vegetation**: Reed Canary Grass, Narrow-leaved Cattail
WC7	Ouse River Tributary 2 permanent	**Bankfull Width**: 1.60 m **Wetted Width:** 1.20 m **Average Water Depth:** 12.0 cm **Flow:** flow **Bank Stability:** 0.10 m banks **Substrates:** silt **Observed Aquatic Species**: invertebrates **Instream Cover:** none **Aquatic Vegetation: none** **Riparian Vegetation**: Reed Canary Grass, Water Smartweed

Station #	Feature	Channel Morphology and Aquatic Habitat Characteristics
WC8	Ouse River Tributary 2 permanent	**Bankfull Width**: 1.10 m **Wetted Width:** 0.80 m **Average Water Depth:** 14.0 cm **Flow:** flow **Bank Stability:** 0.10 m banks **Substrates:** silt, sand **Observed Aquatic Species**: none **Instream Cover:** none **Aquatic Vegetation:** none **Riparian Vegetation**: Reed Canary Grass, Bluejoint Reedgrass, Silver Maple, Black Ash
WC9	Ouse River Tributary 2 permanent	**Bankfull Width**: 1.40 m **Wetted Width:** 0.90 m **Average Water Depth:** 15.0 cm **Flow:** flow **Bank Stability:** 0.20 m banks **Substrates:** 50% silt, 50% sand **Observed Aquatic Species**: none **Instream Cover:** none **Aquatic Vegetation:** none **Riparian Vegetation**: Spotted Joe-pye-weed, Speckled Alder, Black Ash, Climbing Nightshade
WC10	Ouse River Tributary 2 permanent	**Bankfull Width**: 1.30 m **Wetted Width:** 1.00 m **Average Water Depth:** 13.0 cm **Flow:** flow **Bank Stability:** 0.30 m banks **Substrates:** muck **Observed Aquatic Species**: none **Instream Cover:** none **Aquatic Vegetation:** none **Riparian Vegetation**: Reed Canary Grass

3.5 Vegetation

3.5.1 Vegetation Communities and Dominant Flora

Natural vegetation communities within the site, were characterized during several field visits in 2024 using ELC and winter 2025. These communities were delineated in mapping contained herein through a combination of aerial photograph interpretation and detailed field investigations. Vegetation community mapping is provided on **Figure 5**, with a total species list in **Appendix 5**. A general summary of the vegetation communities present within the site, adjacent lands, and additional lands is provided below.

The assessment area is made up of several properties that have historically been used for agricultural and residential purpose. A large portion of the site consists of agricultural fields that are currently or have been used for pasture, hay or crops with the remaining areas consisting of upland forest, and wetland. The following vegetation communities were delineated in the assessment area.

FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite

This vegetation community is located within the eastern end of the site along the southern boundary of the northern parcel and the northeast corner of the southern parcel. Species observed include Sugar Maple (*Acer saccharum*), Trembling Aspen (*Populus tremuloides*), White Ash (*Fraxinus americana*), American Basswood (*Tilia americana*), Bigtooth Aspen (*Populus grandidentata*), Ironwood (*Ostrya virginiana*), Eastern Hemlock (*Tsuga canadensis*), White Birch (*Betula papyrifera*), White Oak (*Quercus alba*), Black Cherry (*Prunus serotina*), Bur Oak (*Quercus macrocarpa*), White Spruce (*Picea glauca*), Balsam Fir (*Abies balsamea*), and Scots Pine (*Pinus sylvestris*). Groundcover includes Wild Strawberry (*Fragaria virginiana*), Wood Sorrel (*Oxalis montana*), Sharp-lobed Hepatica (*Hepatica acutiloba*), Eastern Poison Ivy (*Toxicodendron radicans var. radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), European Swallowwort (*Vincetoxicum rossicum*), Black Raspberry (*Rubus occidentalis*), Cow Vetch (*Vicia cracca*), Bladder Campion (*Silene vulgaris*), Meadow Buttercup (*Ranunculus acris*), Broadleaved Goldenrod (*Solidago flexicaulis*), Spinulose Wood Fern (*Dryopteris carthusiana*), Broad-leaf Enchanter's Nightshade (*Circaea canadensis*), Drooping Woodland Sedge (*Carex arctata*), White Trillium (*Trillium grandiflorum*), American Fly Honeysuckle (*Lonicera canadensis*), Blue Cohosh (*Caulophyllum thalictroides*), May Apple (*Podophyllum peltatum*), Virginia Waterleaf (*Hydrophyllum virginianum*), Herb-Robert (*Geranium robertianum*), Interrupted Fern (*Osmunda claytoniana*), Eastern Prickly Gooseberry (*Ribes cynosbati*), Northern Maidenhair Fern (*Adiantum pedatum*), Northern Lady Fern (*Athyrium filix-femina var. angustum*), Virgins-bower (*Clematis virginiana*), Bluebead Lily (*Clintonia borealis*), Early Meadow-rue (*Thalictrum dioicum*), Red Trillium (*Trillium odoratum*), Solomon's Plume (*Maianthemum racemosum*), Canada Mayflower (*Maianthemum canadense*), Intermediate Wood Fern (*Dryopteris intermedia*), Meadow Anemone (*Anemone canadensis*), Staghorn Sumac (*Rhus typhina*), Riverbank Grape (*Vitis riparia*), Wild Leek (*Allium tricoccum var. tricoccum*), and Yellow Trout Lily (*Erythronium americanum*).

ANTH - Anthropogenic

Portions of the subject property have been heavily altered due to anthropogenic activity and are now best described as an Anthropogenic vegetation community. The farm fields adjacent to HWY 7 were planted with corn during RiverStone's site investigations. Other cleared and altered areas included the species Blue Vervain (*Verbena hastata*), Meadow Buttercup, Wild Chicory (*Cichorium intybus*), White Sweet-clover (*Melilotus albus*), Wild Carrot (*Daucus carota*), Common Viper's Bugloss (*Echium vulgare*), Garden Bird's-foot Trefoil (*Lotus corniculatus*), Cow Vetch, Philadelphia Fleabane (*Erigeron philadelphicus*), Red-seeded Dandelion (*Taraxacum erythrospermum*), Oxeye Daisy (*Leucanthemum vulgare*), Orange Hawkweed (*Pilosella aurantiaca*), Common Mullein (*Verbascum thapsus*), Common Yarrow (*Achillea millefolium*), Bedstraw species (*Galium sp.*), Meadow Hawkweed (*Pilosella caespitosa*), Hairy Beardtongue (*Penstemon digitalis*), and Narrow-leaved Hawksbeard (*Crepis tectorum*).

Hydrophytic species were present within the areas surrounding Tributary 1 and the Drainage Ditch (**Figure 6**). These include Narrow-leaved Cattail (*Typha angustifolia*), Field Horsetail (*Equisetum arvense*), Hairy Willowherb (*Epilobium hirsutum*), Meadow Anemone, Spotted Jewelweed (*Impatiens*

capensis), Awl-fruited Sedge (*Carex stipata*), Common Watercress (*Nasturtium officinale*), Reed Canary Grass (*Phalaris arundinacea var. arundinacea*), Willow species (*Salix sp.*), Phragmites (*Phragmites australis ssp. australis*), Eastern White Cedar (*Thuja occidentalis*), and Purple Loosestrife (*Lythrum salicaria*).

CUM1-1 - Dry – Moist Old Field Meadow Type

This ecosite is found adjacent to HWY 7 and within portions of the site. It is dominated by grass species but contains a high forb content and mixture of native and non-native species, including Common St. John's-wort (*Hypericum perforatum*), Common Milkweed (*Asclepias syriaca*), Bladder Campion, Yellow Goatsbeard (*Tragopogon dubius*), European Swallowwort, Cow Vetch, Common Yarrow, Common Mullein, Sulphur Cinquefoil (*Potentilla recta*), Hairy Beardtongue, Wild Strawberry, Silvery Cinquefoil (*Potentilla argentea*), Yellow Daylily (*Hemerocallis lilioasphodelus*), German Iris (*Iris x germanica*), Garden Bird's-foot Trefoil, Manitoba Maple (*Acer negundo*), Black-eyed Susan (*Rudbeckia hirta*), Oxeye Daisy, Common Juniper (*Juniperus communis*), Eastern Poison Ivy, Deptford Pink (*Dianthus armeria*), Nodding Thistle (*Carduus nutans ssp. nutans*), Red Clover (*Trifolium pratense*), White Sweet-clover, Orange Hawkweed, Hoary Vervain (*Verbena stricta*), Annual Fleabane (*Erigeron annuus*), Wild Carrot, Meadow Buttercup, Common Timothy (*Phleum pratense*), Clammy Ground-cherry (*Physalis heterophylla*), Virgins-bower, Orchard Grass (*Dactylis glomerata*), and Black Medick (*Medicago lupulina*).

SWC1 – White Cedar Mineral Coniferous Swamp Ecosite

A swamp community dominated by Eastern White Cedar is present north of the site in the northern parcel, adjacent to the tributary. Other species within the canopy include Black Ash (*Fraxinus nigra*), White Birch, Silver Maple (*Acer saccharinum*), White Elm (*Ulmus americana*), Balsam Fir, and White Spruce. Groundcover species include Yellow Marsh Marigold (*Caltha palustris*), Narrow-leaved Cattail, Climbing Nightshade (*Solanum dulcamara*), Red-osier Dogwood (*Cornus sericea*), White Meadowsweet (*Spirea alba*), Sensitive Fern (*Onoclea sensibilis*), Sedge species (*Carex sp.*), Bluejoint Reedgrass (*Calamagrostis canadensis var. canadensis*), Spotted Joe-pye-weed (*Eutrochium maculatum*), Speckled Alder (*Alnus incana*), Purple Loosestrife, American Black Currant (*Ribes americanum*), Reed Canary Grass, and Northern Prickly-ash (*Zanthoxylum americanum*). Common Watercress is also present within the tributary.

FOC2-2 – Dry – Fresh White Cedar Coniferous Forest Type

This vegetation community is present surrounding the SWC1 vegetation community and is partially present within the site. It is dominated by planted White Spruce, with a strong Eastern White Cedar component. Other species within this community are found within the adjacent SWC1 and FOM4 communities.

FOM4 – Dry – Fresh White Cedar Mixed Forest Ecosite

This forest ecosite is present throughout the site and adjacent areas. It is dominated by Eastern White Cedar, with associated Balsam Fir, Sugar Maple, American Basswood, Ironwood, Trembling Aspen, White Birch, White Elm, Scots Pine, Eastern White Pine (*Pinus strobus*), Green Ash (*Fraxinus pennsylvanica*), Black Cherry, Red Maple (*Acer rubrum*), and American Beech (*Fagus grandifolia*). Shrubs and groundcover include Common Buckthorn (*Rhamnus cathartica*), Long-leaved Groundcherry (*Physalis longifolia*), Eastern Poison Ivy, and European Swallowwort.

SWT3-1 Alder Organic Thicket Swamp Type

Thicket swamp vegetation is present throughout the wetland north of the site. It is the dominant vegetation in some areas and fringes the cattail marsh in others. The dominant species is Red Osier Dogwood, but other species are present, including Eastern White Cedar, White Birch, Black Ash, Silver Maple, Balsam Fir, Bigtooth Aspen, Red Maple, Green Ash, Black Cherry, Wild Sarsaparilla (*Aralia nudicaulis*), Eastern Poison Ivy, Canada Mayflower, Bluebead Lily, Broad-leaved Helleborine (*Epipactis helleborine*), Bracken Fern (*Pteridium aquilinum*), Yellow Marsh Marigold, and Sensitive Fern.

MAS3-1 – Cattail Organic Shallow Marsh Type

A Cattail Marsh community is present surrounding the watercourse north of the site. It is dominated by Narrow-leaved Cattail, and also includes Willow species, Eastern White Cedar, Black Ash, Green Ash, Red Maple, Reed Canary Grass, Ostrich Fern (*Matteuccia struthiopteris*), Harlequin Blue Flag (*Iris versicolor*), Sensitive Fern, Riverbank Grape, Marsh Fern (*Thelypteris palustris*), Common Marsh Bedstraw (*Galium palustre*), Water Smartweed (*Persicaria amphibia*), Bluejoint Reedgrass, Silver Maple, White Elm, Common Watercress, Spotted Joe-pye-weed, Sedge species (*Carex sp.*), Common Boneset (*Eupatorium perfoliatum*), and Purple Loosestrife.

CUS1 – Mineral Cultural Savannah Ecosite

Fields in the western end of the site have begun to regenerate and contain scattered immature Scots Pine. Groundcover in this area includes Foxglove Beardtongue (*Penstemon digitalis*), Virgins-bower, Virginia Creeper, Annual Fleabane, Black-eyed Susan, Cow Vetch, White Sweet-clover, European Swallowwort, Common Timothy, Common Milkweed, Sulphur Cinquefoil, Red Clover, Oxeye Daisy, Wild Carrot, and Yellow Goatsbeard.

SWM1-1 – White Cedar – Hardwood Mineral Mixed Swamp Type

This vegetation community is present adjacent to the site on the western edge of the subject property. It is dominated by a mixture of species including Trembling Aspen, White Birch, Black Cherry, Sugar Maple, White Ash, Balsam Fir, Bur Oak, and Black Ash. The groundcover community includes Shinleaf (*Pyrola elliptica*), Ghost Pipe (*Monotropa uniflora*), Wild Sarsaparilla, Climbing Nightshade, Canada Mayflower, Northern Starflower (*Trientalis borealis*), Bracken Fern, Eastern Prickly Gooseberry, Bluebead Lily, Bladder Sedge (*Carex intumescens*), Drooping Woodland Sedge, Baneberry species (*Actaea sp.*), Sensitive Fern, Red Trillium, Horsetail species (*Equisetum sp.*), Virginia Creeper, Eastern Poison Ivy, Riverbank Grape, Solomon's Plume, and Intermediate Wood Fern.

3.5.2 Vascular Plants

A total of three-hundred and eighty-one (381) vascular plant species were recorded during the fieldwork. Vascular plants recorded were restricted to areas where permission to enter had been granted except for adjacent lands that would be observed from the roadside or property boundary. Given the abundance of agricultural and cultural meadow communities in the assessment area, field effort was directed towards the portion of the assessment area where extraction is proposed and those lands directly adjacent to the extraction area (given the higher likelihood of impact/disturbance

associated with the proposed pit extraction activities). A list of vascular plant species documented by RiverStone is provided in **Appendix 5**.

Black Ash, a provincially Endangered species, was observed on the subject property. No other vascular plants designated as species at risk (either provincially or federally), or provincially rare species (i.e., S1, S2, S3), were recorded.

3.6 Wildlife

Appendix 6 contains a list of the wildlife species documented by RiverStone within the subject property and adjacent lands during either targeted surveys (e.g., breeding bird surveys, etc.) or incidentally in 2024 and 2025. A total of eight (8) amphibian species, sixty-nine (69) bird species (including migrants), eleven (11) mammal species, two (2) reptile species, two (2) invertebrate, and four (4) fish species were recorded. The results of RiverStone's targeted wildlife surveys are provided below.

3.6.1 Anurans

RiverStone completed anuran calling surveys on April 29, May 15, and June 21, 2024. The established anuran calling survey stations are shown on **Figure 2**. The full results of RiverStone's anuran calling surveys are found in **Appendix 7**. A general summary of the identified anuran communities is provided below.

A total of seven (7) anuran species were recorded during anuran calling surveys. Spring Peeper (*Pseudacris crucifer*), Northern Leopard Frog (*Lithobates pipiens*), and Wood Frog (*Lithobates sylvaticus*), Green Frog (*Lithobates clamitans*), and Bullfrog (*Lithobates catesbeianus*) were observed at stations in the northern parcel. Spring Peeper, Northern Leopard Frog, American Toad (*Anaxyrus americanus*), Gray Tree Frog (*Hyla versicolor*), and Green Frog were observed at stations in the southern parcel. Western Chorus Frog (*Pseudacris triseriata*) were observed incidentally calling to the east of Station 5 on May 16, 2024. No frogs were detected during any surveys at Stations 1 and 5. The number of calling individuals was not sufficient at any location to be confirmed as SWH.

3.6.2 Winter Roosting Raptor Surveys

Winter roosting raptor surveys were completed by RiverStone on February 7 and March 12, 2025, utilising transects, and survey points as outlined in **Section 2.4.7**. The transition areas between woodland and open communities were walked with point surveys completed where good a view of transitions from open area to woodlands could be made (**Figure 2**). No raptors were observed during the survey and therefore no additional surveys were completed.

3.6.3 Snakes – Visual Encounter Surveys

As outlined in **Section 2.4.8**, an assessment for snakes was completed by RiverStone on April 26, June 2, June 4, June 12, June 18, July 3, 2024. During these surveys, habitat was scanned for the presence of snakes with one (1) species being observed; Eastern Gartersnake (*Thamnophis sirtalis*) on April 26, 2024. The Eastern Gartersnake was observed in the area between bat snag stations D1 and D2 (**Figure 2**).

3.6.4 Bats

As outlined in **Section 2.4.9**, targeted surveys for bats focused on identifying the presence of maternal roosts. Surveys followed the protocols outlined in MNR (2011) and MNR (2017). Vegetation mapping using Ecological Land Classification (ELC) was used to guide the completion of onsite surveys with snag/cavity tree surveys being conducted during leaf off conditions within forest communities using a fixed plot method of sampling. Location of plots were scoped based on vegetation mapping prepared through photo interpretation with locations provided on **Figure 2** and results provided in **Appendix 3.** Ten (10) plots were located within conifer communities, twelve (12) plots within mixedwood communities, eleven (11) plots within deciduous communities and ten (10) plots within swamp communities. The results of the snag assessment showed that none of the communities had sufficient snag densities to meet the >10 ha to be SWH (**Appendix 3**).

Even though wooded communities did not meet the requirement for SWH, acoustic monitors were deployed at three (3) locations within the assessment area between June 12 and July 3, 2025. This timeframe was used to ensure that that the survey contained ten (10) nights of suitable conditions to detect bats. The acoustic detectors were deployed in areas that had the potential to capture bat activity on the property and were determined to be suitable locations for roosting habitat based on snag and cavity trees noted during the snag assessment. Locations for the equipment deployed are provided on **Figure 2**. Timing of surveys was selected as it corresponded with the roosting period for maternal colonies as outlined in (COSEWIC 2013).

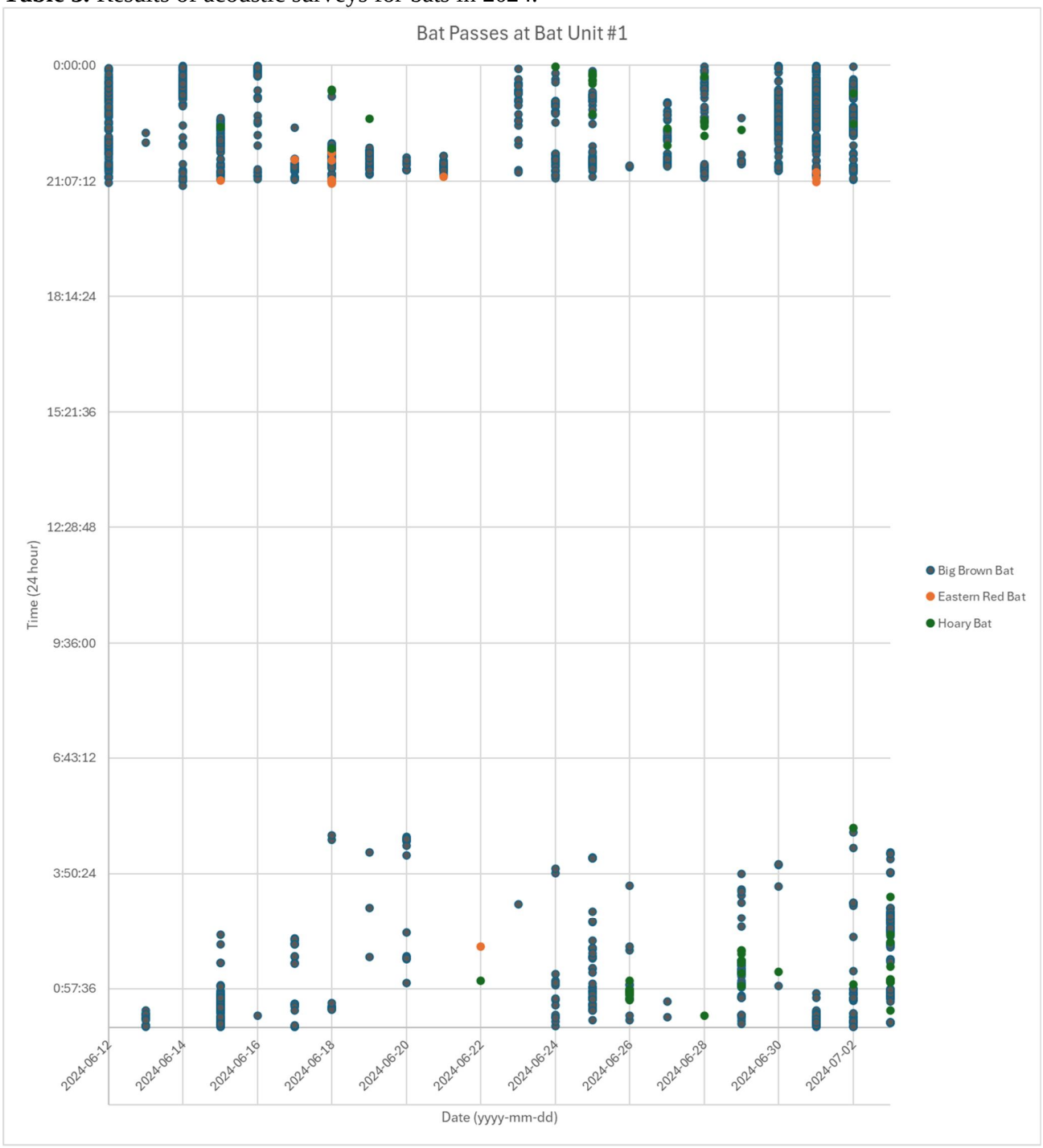
The equipment deployed is from Wildlife Acoustics and is known as the Song Meter SM4BAT FS Ultrasonic Recorder. The unit is programmed to record from sunset to sunrise with an internal clock set for accuracy. A minimum trigger frequency of 14 kHz was chosen to include the full range of all species of bats found in Ontario. When the ultrasonic recorder is triggered by a sound with the appropriate frequency and duration, a recording is saved. Each recording is a series of pulses which represent a bat echolocating while feeding. The pulse series is called a bat pass. The bat passes provide valuable information with respect to which species are present, and the relative abundance present. Acoustic detections of “bat passes” are often used as a measure of relative abundance of bats (Miller 2001).

The recordings were analyzed with Wildlife Acoustics Kaleidoscope Pro software. Results of the data collection determined that the overall abundance of bats using the subject property were found to be average based on the amount of foraging habitat available.

Three (3) species of bats were detected during the survey period with two (2) species being designated endangered. The most abundant species was Big Brown Bat with 1618 passes during the survey period. Hoary Bat (endangered) was recorded with 58 passes and Eastern Red Bat (endangered) was recorded with 16 passes during the same period. All bats were recorded at Station 1. No bats were detected at Station 2, and the monitor at Station 3 was damaged by wildlife and the resulting data was corrupted.

Two (2) species of endangered bats occurring with only a minimal number of passes over the period of monitoring is indicative of foraging and transient behaviour but not roosting. However, the high number of passes by Big Brown Bats is indicative of an active colony. To confirm an area as SWH for bat maternity colonies, more than 10 Big Brown Bats must be observed during the appropriate survey period. Although acoustic monitoring can only detect the number of individual passes, not individual bats, it is RiverStone’s opinion that more than 10 Big Brown Bats are present based on the volume of passes. Results of acoustic monitoring are graphed below and SWH is mapped on **Figure 9**.

Table 3. Results of acoustic surveys for bats in 2024.



3.6.5 Breeding Birds

Breeding bird surveys based on the OBBA were undertaken on multiple occasions between June 3 and July 5, 2025. The full results of these surveys are provided in **Appendix 8**. In addition to the bird species recorded during the breeding surveys, **Appendix 6** provides a list of all bird species recorded

within the site, adjacent lands, and additional lands (i.e., including incidental observations and observations of migrants) in 2024 and 2025.

A total of sixty-nine (69) bird species were recorded during the breeding bird surveys and incidental observations. The assemblage and abundance of birds recorded during the OBBA surveys generally reflects the prevailing structure and composition of on-site vegetation communities (per **Figure 5**). Bird species that breed and forage in deciduous forests and treed swamps were encountered at stations situated within these habitats, including Black-and-white Warbler (*Mniotilta varia*), Eastern Wood-Pewee (*Contopus virens*), Red-eyed Vireo (*Vireo olivaceus*), Veery (*Catharus fuscescens*), American Robin (*Turdus migratorius*), Black-capped Chickadee (*Poecile atricapillus*), Blue Jay (*Cyanocitta cristata*), and Ovenbird (*Seiurus aurocapilla*). Wetland communities including thicket swamp, deciduous swamp and meadow marsh communities and transition areas contained species such as Red-winged Blackbird (*Agelaius phoeniceus*), Great Crested Flycatcher (*Myiarchus crinitus*), Alder Flycatcher (*Empidonax alnorum*), American Goldfinch (*Spinus tristis*), Common Yellowthroat (*Geothlypis trichas*), and Song Sparrow (*Melospiza melodia*). Open vegetation communities that include agricultural, anthropogenic and cultural meadow communities provide habitat for bird species that include Savannah Sparrow (*Passerculus sandwichensis*), Song Sparrow (*Melospiza melodia*), Grasshopper Sparrow (*Ammodramus savannarum*), and Eastern Meadowlark (*Sturnella magna*).

Several significant bird species were recorded during the OBBA surveys and incidental observations including: one (1) threatened bird, four (4) special concern birds, and fourteen (14) ecoregion 6E Area Sensitive Birds. These species and their habitat preferences are discussed further below, with an assessment of potential impacts to their habitat during implementation of the proposed pit extraction activities provided in **Section 5**.

3.6.6 Turtles

Visual encounter surveys targeting basking turtles were completed on five (5) separate dates in 2024: April 26, May 16, June 2, June 4, and June 12. During initial site surveys in the study area, wetlands were assessed for water and muck depth to determine turtle overwintering potential. The visual encounter surveys targeted pond features and portions of wetland communities with water/muck depths greater than 1.0 m that would support turtle hibernation and basking and foraging potential later in the survey window (**Figure 2**). Incidental observations and review of potential nesting areas were also made (i.e., during other field surveys) during most site investigations both before and after the targeted visual encounter surveys. The full results of RiverStone's visual encounter surveys for turtles are found in **Appendix 9**. A general summary is provided below.

No turtles were observed during visual encounter surveys. During site visit travel a predated Snapping Turtle (*Chelydra serpentina*) nest was observed where an access driveway meets Sand Road, south of Station B6 (**Figure 2**). Based on this observation, there is potential for the site to provide breeding habitat for turtles using adjacent aquatic features. Snapping Turtles are discussed further below, with an assessment of potential impacts provided in **Section 5**.

3.6.7 Eastern-whip-poor-will

Three (3) surveys for Whip-poor-will were completed in the study area in May and June 2024. Four (4) locations were surveyed within the open habitat conditions in the assessment area (**Figure 2**) Conditions during all three (3) surveys were within the optimal weather parameters outlined in **Section 2.4.11**. No Whip-poor-will were heard calling during the three (3) targeted surveys for this species.

3.6.8 Fish and Fish Habitat

The potential locations of fish habitat within the assessment area consist of the tributary of the Ouse River running from the west to east through the subject property (Tributary 2), a tributary that enters the property from the north to join this feature (Tributary 1), and a drainage ditch along the eastern property boundary (**Figure 6**). Fish may also be present within the surrounding wetland during high water levels.

Through background information collection it was determined that fish sampling of the main tributary had been completed in 2018 by an organization other than RiverStone. Online fish data shows records of Blacknose Dace (*Rhinichthys atratulus*), Blacknose Shiner (*Notropis heterolepis*), Bluegill (*Lepomis macrochirus*), Bluntnose Minnow (*Pimephales notatus*), Brook Stickleback (*Culaea inconstans*), Burbot (*Lota lota*), Central Mudminnow (*Umbra limi*), Common Shiner (*Luxilus cornutus*), Creek Chub (*Semotilus atromaculatus*), Fallfish (*Semotilus corporalis*), Fathead Minnow (*Pimephales promelas*), Golden Shiner (*Notemigonus crysoleucas*), Largemouth Bass (*Micropterus salmoides*), Longnose Dace (*Rhinichthys cataractae*), Northern Pearl Dace (*Margariscus margarita*), Northern Redbelly Dace (*Chrosomus eos*), Pumpkinseed (*Lepomis gibbosus*), Rock Bass (*Ambloplites rupestris*), Smallmouth Bass (*Micropterus dolomieu*), Spottail Shiner (*Notropis hudsonius*), Striped Shiner (*Luxilus chrysocephalus*), Trout-Perch (*Percopsis omiscomaycus*), White Sucker (*Catostomus commersonii*), and Yellow Perch (*Perca flavescens*).

Sampling was completed in Tributary 2 on October 11, 2024, via electrofishing. Species collected include Blacknose Dace, Central Mudminnow, Brook Stickleback, and White Sucker.

Watercourse 1 had insufficient water to electro fish or to minnow trap during the field season.

3.7 Significant Natural Features

Based on the biophysical information collected during background information gathering (per **Section 2.3**) and the multiple site investigations completed by RiverStone in 2024 and 2025 (per **Section 2.4**), **Table 4** below summarizes the status of natural features of conservation interest within the site, adjacent lands, and additional lands:

Table 4. Assessment of the Significant Natural Features within the Site and Adjacent Lands.

Significant Natural Feature	Status of **Feature within the Site**	Status **of Feature on A**djacent lands
Significant Wetlands	*Absent*. See Section 3.7.1.	*Absent*. See Section 3.7.1.
Habitat of Endangered and Threatened Species	*Present*. See Section 3.7.2.	*Present*. See Section 3.7.2.
Significant Areas of Natural and Scientific Interest (ANSI)	*Absent*. See Section 3.7.3.	*Absent*. See Section 3.7.3
Significant Woodlands	*Present*. See Section 3.7.4.	*Present*. See Section 3.7.4.
Significant Valleylands	*Absent*. See Section 3.7.5.	*Absent.* See Section 3.7.5.
Significant Wildlife Habitat	*Present*. See Section 3.7.6.	*Present*. See Section 3.7.6.
Fish Habitat	*Present*. See Section 3.7.7.	*Present*. See Section 3.7.7.

[1] - Shaded rows denote significant natural features which negative impacts stemming from implementation of the proposed development plan are possible.

3.7.1 Significant Wetlands

Based on mapping reviewed on the Ontario Government Make a Map: Natural Heritage Areas (MAMNH), there are no Provincially Significant Wetlands (PSWs) mapped within the assessment area. MAMNH mapping does show unevaluated wetland and evaluated non-PSW (Asphodel South) within the subject property north of the proposed pit. The boundaries of these wetlands have been delineated in the field by RiverStone and are shown on Figures. This NER has been prepared under the assumption that no PSW designations are on the subject property. Based on MAMNH mapping, the closest PSW to the subject property is the Ouse River Middle Complex Wetland located approximately 200 m southeast of Sand Road at the closest point. Other unevaluated wetlands are also present within the local landscape surrounding the subject property.

All documented wetland communities within the assessment area are located entirely outside of the proposed extraction area as shown on **Figure 6**. Current boundary delineation of the wetlands adjacent to the extraction area were delineated by OWES certified ecologists using the "50% wetland vegetation rule" as stipulated by OWES. Wetland evaluations were not completed for the wetlands identified in the assessment area; however, these were considered for protection and are located outside the extraction area.

3.7.2 Endangered and Threatened Species

Provincially threatened and endangered SAR listed on the Protected Species in Ontario List (PSO) – O. Reg 60/26 are legally protected under the provincial *Species Conservation Act* (SCA, 2025) from harm and their habitats are legally protected from damage or destruction. Protected species that are listed on O. Reg 230/08, *Species at Risk in Ontario List* that are not included on the PSO are protected by either the federal *Species at Risk Act (SARA)* or the federal *Fisheries Act*.

The results of RiverStone's desktop, habitat-based, and targeted assessments for endangered and threatened species and their habitat are provided in **Appendix 10**. A preliminary screening of background and biophysical information for the assessment area resulted in the identification several species with a potential to be present within the site or study area based on existing records and/or range maps. This initial list of endangered and threatened species was refined to those species that have the potential to occur within the assessment area or were confirmed to be present based on the on-site assessments and targeted field surveys.

Per the results of **Appendix 10**, a total of four (4) endangered and threatened species have the potential to be present or were detected to be within the assessment area (**Figure 7**). One (1) species, Black Ash is protected by the SCA. Black Ash (*Fraxinus nigra*) was observed throughout wetlands in the assessment area. As outlined in **Section 3.6.4** very small numbers of Eastern Red Bat (*Lasiurus borealis*) and Hoary Bat (*Lasiurus cinereus*) were detected within woodland habitat located at bat monitor 1. The small number of detections suggests that endangered bats protected under the SCA are not using the woodland habitat for roosting but rather passing through for foraging. With the small number of detections, along with the lack of quality roosting habitat as determined through the snag survey, it is RiverStone's opinion that the woodland features are not providing roosting habitat for endangered bats. Breeding Eastern Meadowlark (*Sturnella magna*), protected by SARA and Migratory Convention Act, were observed within the cultural meadow community in northern portion of the assessment area. Further discussion about species with the potential to be impacted is provided in following sections.

3.7.3 Significant Areas of Natural and Scientific Interest (ANSI)

Based on mapping reviewed on the Ontario Government Make a Map: Natural Heritage Areas (MAMNH), no ANSIs are present within the study area. The closest ANSI is the Westwood Drumlin Field, which is located approximately 4 km to the southwest of the assessment area. No further assessment undertaken.

3.7.4 Significant Woodlands

Based on review of the County of Peterborough Official Plan, it was determined that no significant woodland features had been mapped is the study area. Since the OP does not provide detailed description of significant woodland, to determine whether forest communities on the subject property should be considered significant woodlands, RiverStone has relied on the MNR Natural Heritage Reference Manual for assessment of significant woodland. RiverStone's significant woodland assessment is provided below in **Table 5** and shown on **Figure 8**. Based on this assessment, wooded areas on the subject property meet relevant significant woodland criteria per the PPS and the Natural Heritage Reference Manual. Further assessment provided below.

Table 5. Significant Woodland assessment based on criteria within the Natural Heritage Reference Manual, 2005. Determination of size thresholds is based on 42% forest cover in the Otonabee Region Watershed Report Card, 2023.

Woodland ID	Size (ha)	Meets Size Threshold (> 50 ha)	Meets Interior Habitat Threshold (> 8 ha)	Proximity to other SNHFs or Fish Habitat (≤ 30 m)	Linkage between SNHFs	Water Protection	Woodland Diversity	Uncommon Characteristics Present	Economic and Social Value	Significant (yes/no)
A	93.7	Yes	Yes	No	Yes (Within a natural heritage system)	Yes (Within a Highly Vulnerable Aquifer and meets size threshold)	Yes (combination of several ELCs)	Yes (Black Ash present)	Yes (contains conifer plantation)	Yes
B	166	Yes	Yes	Yes (Within 30 m of Fish Habitat, contains PSW, and meets size threshold)	Yes (Within a natural heritage system)	Yes (Within a Highly Vulnerable Aquifer and meets size threshold)	Yes (combination of several ELCs)	Yes (Black Ash present)	Yes (contains conifer plantation)	Yes
C	14.3	No	No	No	Yes (Within a natural heritage system)	No (Within a Highly Vulnerable Aquifer but does not meet size threshold)	No	No	No	Yes
D	4.3	No	No	No (Within 30 m of Fish Habitat but does not meet	Yes (Within a natural	No (Within a Highly Vulnerable Aquifer but does not	No	Yes (Black Ash present)	No	Yes

size threshold)	heritage system)	meet size threshold)

3.7.5 Significant Valleylands

Significant valleylands represent valleys or other landform depressions with recognized significant attributes, such as supporting natural vegetation cover with associated ecological linkages and corridors. Valleylands are typically associated with a watercourse feature. Designation of significant valleylands is ultimately the responsibility of the relevant planning authority; however, site-specific designation of these features can be undertaken using standardized criteria endorsed by the province and/or the planning authority.

In this case, applicable OP documents or other resources do not designate lands within the assessment area as significant valleylands. RiverStone's on-site investigation identified no landform features that may be representative of significant valleylands. No further assessment undertaken.

3.7.6 Significant Wildlife Habitat

The results of RiverStone's desktop, habitat-based, and targeted assessments of potential features and communities that could function as significant wildlife habitat (SWH) is provided in **Appendix 11** with locations depicted (**Figure 9**). Based on the results of these assessments, a total of seven (7) communities or features with the potential to be designated SWH were identified; these are outlined below.

1) Seasonal Concentration Areas of Wildlife Species
    - Bat Maternity Colonies
2) Habitat of Species of Conservation Concern
    - Special Concern and Rare Wildlife Species

A total of five (5) special concern species has the potential to be impacted by the proposed extraction activities within the site:

1) Snapping Turtle (*Chelydra serpentina*)
2) Monarch (*Danaus plexippus*)
3) Eastern Wood Pewee (*Contopus virens*)
4) Grasshopper Sparrow (*Ammodramus savannarum*)
5) Wood Thrush (*Hylocichla mustelina*)

An impact assessment is provided for each identified SWH feature and special concern species in **Section 5.6**.

3.7.7 Fish Habitat

As described in **Section 3.6.8**, direct fish habitat as defined by the *Fisheries Act* is present within Tributary 2 (**Figure 6**). Potential impacts to fish and fish habitat are discussed further in **Section 5**.

3.8 Summary of Natural Heritage Feature Assessment

Natural features and areas were initially identified through a desktop review and air photo interpretation. A site reconnaissance visit was then completed to verify the initial site conditions, and a

comprehensive field program was completed throughout 2024 and 2025 to identify, delineate and survey the existing natural heritage features and areas within the study area. The field data was then summarized and used to determine significance of features using definitions and criteria provided by the County of Peterborough official plan and / or the PPS (2024).

The following natural features and areas meet relevant definitions of significance and occur within the proposed limit of extraction, within the proposed licensed area, or within the 120 m adjacent lands (**Figure 10**).

- Non-PSW and Unevaluated Wetlands – located within the assessment area. Outside the proposed limit of extraction within 120 m adjacent lands.
- Significant woodlands – located within the assessment area and within 120 m adjacent lands.
- Significant woodlands within the proposed limit of extraction.
- Significant wildlife habitat
    - Bat maternity habitat – located within the assessment area and within 120 m adjacent lands. Habitat within the proposed limit of extraction.
    - Special concern and rare wildlife species – located within the assessment area and within the 120 m adjacent lands. Habitat within the proposed limit of extraction.
- Grasshopper Sparrow - located within the assessment area and within 120 m adjacent lands. Habitat within the proposed limit of extraction.
- Eastern Wood-pewee - located within the assessment area and the 120 m adjacent lands. Habitat within the proposed limit of extraction.
- Fish habitat – direct (Tributary 2) and indirect habitat (Tributary 1) located within assessment area and within 120 m adjacent lands. Habitat within the proposed access route.
- Habitat of endangered and threatened species
    - Black Ash (SCA) – Located within the assessment area outside the proposed limit of extraction.
    - Meadowlark (SARA) – Located with the assessment area outside the proposed limit of extraction.

The proposed application and its potential for negative impacts to these natural features and areas are discussed in the following sections of this NER.

4 PHASING AND OPERATIONS PLANS

Drain Bros is applying for a Class A Above Water Pit to be licensed on 35.2 ha with a proposed extraction area of 25.0 ha as depicted in the Site Plans prepared by MHBC (2026), as shown in **Figure 1**. The pit floor elevation will be maintained at least 1.5 m above the water table as established by Tatham (2026), at elevations of approximately 197.1 and 203.8 m asl. Operations have been divided into two phases of extraction. Phase 1 will be comprised of 5.7 ha of extraction located east of Cooper Line. Phase 2 will be 19.3 ha of extraction located west of Cooper Line. The proposed pit will have a maximum extraction limit of 350,000 tonnes per year.

No onsite pumping is required. The on-site drainage of undisturbed areas will continue as per the existing drainage patterns while drainage within the extracted areas will be contained within the proposed extraction limits to ultimately infiltrate through the pit floor.

An existing access road will be used to connect the two phases, with the main access via an existing driveway to HWY 7. Aggregate materials will be processed on-site.

An accompanying submission by MHBC contains rehabilitation plans developed with ecological input from RiverStone (**Appendix 12**). This plan incorporates reforestation and cultural meadow recreation that will provide a naturalized corridor connecting significant features northwest of the extraction area to the northeast of the extraction area. The plan includes reforestation areas, successional features, and wetland/pond features.

5 IMPACT ASSESSMENT AND RECOMMENDATIONS

The purpose of this NER is to present a biophysical characterization of the study area to identify the potential for negative impacts on the natural environment and natural heritage features as a result of the proposed pit extraction activities. Several significant natural features and species were documented or have the potential to occur within the site as determined through the assessment details found in Section 4. The level 2 assessment is required to determine the potential for impacts to these features and provide avoidance, mitigation, and enhancement measures, and to provide input to the rehabilitation plan.

The following assessment provides an evaluation of the potential for the proposed pit operations to result in negative impacts to significant features and offers recommendations to mitigate impacts where warranted. Some recommendations provided apply to several natural features and/or species simultaneously; as such, all recommendations should be read and considered in their entirety. The baseline or existing conditions against which the application is assessed are treated as the state of the site at the time of the site assessments. The following sections provide an assessment of potential impacts to identified significant natural features and the natural environment overall. Significant natural features with recommended setbacks are shown in **Figure 10**.

5.1 Impact Assessment Approach

The potential ecological impacts of an application can be understood as zones that project outwards from the project footprint and areas of site alteration (grading, etc.). The greatest potential for impact occurs within areas directly subject to disturbance, however, adjacent areas may also be impacted indirectly. Indirect impacts can include light or noise pollution or degradation of water quality within a downstream receptor resulting from sediment runoff during extraction or changes to groundwater quality.

To carry out the assessment of potential impacts associated with the proposed above water pit extraction activities within the site of significant natural features, RiverStone has employed the following approach:

1. *Predict* direct and indirect impacts to significant natural features and species of conservation interest based on the proposed pit extraction plan, including both direct and indirect impacts over all project life stages (i.e., operation to post-rehabilitation).

2. *Evaluate the significance* of the predicted impacts to natural features and species of conservation interest based on their spatial extent, magnitude, timing, frequency (how often), and duration (how long).
3. *Assess the probability or likelihood* that the predicted impacts will occur at the level of significance expected (e.g., high, medium, low probability).
4. Where the potential for negative impacts exists, ecologically meaningful *mitigation measures* are offered to avoid such impacts first, and where impacts cannot be fully avoided to minimize and/or compensate such impacts as appropriate.

Direct impacts are those in which there is a direct cause-effect relationship between a proposed activity within the pit extraction area on a natural feature or species. In the context of the ARA application considered herein, direct impacts largely pertain to the necessary removal of vegetation and habitats within the pit extraction area. Indirect impacts may include disturbance impacts on wildlife communities on lands adjacent to the extraction area or decrease of water abundance or water quality within a downstream receptor (e.g., wetland or watercourse). The major project phases for which impacts must be assessed include the operational phase and a post-rehabilitation phase. The operational phase involves above water pit extraction. The post-rehabilitation phase occurs when all rehabilitation activities are complete.

RiverStone works iteratively with the project team to identify extraction options that avoid negative impacts first. In general, avoidance measures that have already been incorporated into the application or project design are not duplicated as technical recommendations herein. The Site Plans (phasing, operations, and rehabilitation) are described in Section 4 while the impact assessment and recommended mitigation measures are provided in Section 5.

Our determination of whether the risk of potential impacts on a specific feature is acceptable relies upon the relevant policies and legislation considered in **Section 2.2**, as well as our assessment of the significance or quality of the feature.

The significant features identified during this study that occur within or in proximity to the site are listed in **Table 4** in **Section 3.8**, and include 1) non-PSW and other wetlands, 2) habitat of endangered and threatened species, 3) significant woodland, 4) significant wildlife habitat, and 5) fish habitat. As outlined in the impact assessments for each feature that follow, ecologically appropriate setbacks from these significant natural features have been incorporated into the site plan as the primary mitigation tool to avoid impacts.

The following assessment evaluates the potential for negative impacts resulting from the activities proposed as part of the ARA applications, as well as mitigation measures to address the potential for negative impacts.

5.2 Wetlands Including Provincially Significant Wetlands

Wetland communities have been mapped throughout the assessment area as outlined on **Figure 2** and **Figure 6**. While no PSW's are located within the assessment area, the Ouse River Middle Complex Wetland PSW is located approximately 200 m southeast of Sand Road at the closest point. Wetlands in the assessment area generally drain in a northwest to southeast direction. Most of the study area drains into the Asphodel South non-PSW, which drains eastward via Tributary 2 and passes under Sand Road

near Asphodel 7th Line. Lands immediately adjacent to Sand Road drain into roadside ditches that ultimately drain into the Ouse River Middle Complex Wetland PSW or Ouse River tributaries.

The following potential pathways of effects from the proposed pit on wetlands within the assessment area and on adjacent lands were assessed for potential impacts:

- Direct loss of wetland area in locations that conflict with the proposed areas of pit extraction within the site.
- Alteration of the water balance as related to surface water and/or groundwater contributions to wetlands that may result from above water extraction operations, from increased coverage of pervious surfaces, modifications to existing topography or drainage, or from localized water table alterations related to the post-rehabilitation features.
- Increased sediment and nutrient loadings that reach the wetland via runoff from the pit extraction area. This may adversely affect wetland water quality via increased turbidity, nutrient enrichment, contamination, changes in pH, etc.
- Thermal loadings to the groundwater where it is exposed within the pit extraction area, adversely affecting wetland communities which receive groundwater contributions.
- Noise and light pollution that may affect the ability of wetland wildlife to successfully carry out their life processes (e.g., feeding/foraging, nesting, etc.); and
- Potential disruption of wildlife movement or dispersal corridors.

The greatest potential for impact to the wetland within the assessment area would be associated with direct loss of these features due to access and pit extraction activities. To account for this, the proposed extraction area has been situated outside the boundaries of all identified wetlands and a minimum 30 m buffer recommended. Therefore, no direct loss of wetland habitat is anticipated from the proposed extraction area.

Potential water balance implications of the proposal relate to changes in surface water and groundwater flow impacts during active extraction operations, post-rehabilitation changes in localized water table elevations, and changes in surface catchment areas and water balance across the site in the long term. The physical impacts to the wetlands were assessed in detail in the *Hydrogeological Assessment* (Tatham 2026). The adjacent wetlands and associated hydroperiods are supported by groundwater, with surface water contributions important when the groundwater levels drop. The extraction footprint has been adjusted to take into consideration the water balance in the adjacent wetlands.

The proposed operation is to be a minimum of 1.5 m above the local groundwater table with no dewatering of ground or surface water. The site is a recharge area since most precipitation and snowmelt can infiltrate into the ground (Tatham 2026). Water quality conditions are not expected to be impacted by the pit operations.

The proposed pit will intercept surface water discharge due to topographic changes that occur with extraction. With surface runoff primarily originating from major storms and snowmelt when the ground is frozen, such runoff from the proposed pit will be intercepted as the pit floor is lowered. This interception will result in an increase in infiltration on the site. According to the hydrogeologic assessment, any reductions in surface runoff are predicted to be more than replaced by increased groundwater flow and discharge to receiving features.

A monthly feature-based water budget was provided by Tatham (2026) to determine if there are impacts to the hydroperiods in the wetlands due to changes in surface water run-off. The results of Tatham's assessment indicate that the western wetlands are groundwater fed, while the eastern wetlands contribute to the groundwater table in the summer and fall and receive groundwater in the winter. These wetlands are anticipated to continue to fill with water seasonally and their hydroperiod will be maintained during extraction.

There will be an overall reduction in drainage area for the Ouse River Tributaries located on the subject property. This reduction will reduce peak flows after significant rainfall events, however baseflows are driven by groundwater contribution and are therefore not anticipated to be impacted by the minor change in drainage area (Tatham, 2025).

Extraction near wetland communities also has a potential to disrupt the ability of wetland wildlife to carry out their life processes, and could result in impacts from dust, noise, excessive light, and other accidents. Such impacts can largely be addressed by designating an ecologically appropriate setback, restrictions on noise and lighting sources and via a comprehensive system of erosion and sediment control as outlined in the ESC Plan, combined with other measures, such as a Spill Management Plan, contained in the site plan.

To protect the wetland features during implementation of the proposed pit extraction activities, in addition to the proactive adjustment of extraction limits in the final site plans to reflect feature boundaries and setbacks, RiverStone recommends the following measures be included on the Site Plans:

- **The limit of extraction and operational activities shall be setback a minimum of 30 m from the boundary of all wetlands features as shown on Figure 6. The 30 m setback shall be permanently marked prior to the commencement of pit operations.**

- **The rehabilitation plan shall include pre-emptive naturalization of all setbacks with a combination of native trees and shrubs adjacent to wetlands, where the current use is agricultural field. For rehabilitation recommendation, please see Section5.9.**

- **The 30 m wetland setback shall be undisturbed by pit operations and remain as natural self-sustaining vegetation.**

5.3 Significant Woodlands

Significant woodlands have been identified per the methodology in the Natural Heritage Reference Manual. Significant woodlands have been identified in the assessment area and within the proposed limit of extraction. Impacts on woodlands can be either direct (i.e., removal of features in the limit of extraction) or indirect (i.e., dust, soil compaction, edge effects). Potential direct and indirect impacts of the proposed extraction, operation and rehabilitation phases are assessed as follows.

There are four (4) significant woodlands located in the assessment area (**Figure 8**), three of which are located partially within the limit of extraction (B, C, and D). Woodland B is the largest woodland (166 ha) and extends south of the subject property into the Ouse River Middle Complex Wetland PSW. There will be 5.7 ha of Woodland B removed as a result of the proposed license. Woodland C is located within the southern parcel and is 14.3 ha, with 6.89 ha of woodland proposed for removal. Woodland D is a 4.3 ha feature located on the eastern property boundary, with 0.48 ha of woodland

proposed for removal. Woodland A is located outside of the limit of extraction and is not expected to be impacted by the proposal. A total of 13.07 ha of significant woodland will be removed as a result of the proposal. Areas of woodland that require removal will be replaced with additional area to enhance overall form, function and resiliency of the County Natural Heritage Areas. The proposed Rehabilitation Plan (MHBC) will result in a net gain of 10.0 ha of woodland features and functions within the local landscape, ensuring no negative loss.

To mitigate impacts to woodlands the following recommendations should be included on the Site Plans.

- **Woodland feature removals and woodland thinning shall only occur between November 1 and March 15th to avoid a active periods for birds and bats.**
- **Where direct encroachment to a woodland feature will occur, forest thinning up to the setback areas shall occur 2 years prior to woodland removals to reduce edge effect.**
- **Woodland thinning shall occur within the Woodland Thinning Area shown on Figure** 10**.**
- **Within the Woodland Thinning Area, low to moderate woodland thinning shall occur at least 50 m from proposed new edge with no more than 25% of stand volume removed. Thinning shall favour removal of smaller understory trees, retain dominant trees, and result in a mix of small gaps and denser woodland patches with avoidance of abrupt edges.**
- **The limit of extraction shall be setback a minimum of 30 m from the boundary of all woodland features not approved for extraction as shown on Figure 8. The 30 m setback shall be permanently marked prior to the commencement of pit operations.**
- **To prevent damage to adjacent woodland habitat located within the licence boundary, tree protection measures (e.g., hoarding, temporary fencing at the dripline) shall be applied.**
- **The 30 m woodland setback shall be undisturbed by pit operations and remain as natural self-sustaining vegetation.**

5.4 Endangered and Threatened Species

As per Section 15 of the SCA, no person shall engage in an activity that results or is likely to result in a species no longer living in the wild in Ontario. Additionally, Section 16 of the SCA protects individuals of endangered and threatened species, prohibiting individuals from being killed, harmed, captured, or taken and damage or destruction of their habitat without an appropriate registration or permit. In many (but not all) cases, mitigation planning is sufficient to ensure that development can occur in a manner that is consistent with the above provisions.

Under the SCA, the activities proposed by a development are assessed against whether the activities are exempted (no registration or permit required), permitted (requires a permit) or registerable**.** **Appendix 2** presents our assessment of potential impacts on species and ecological communities of conservation interest. As summarized in **Section 3.8**, the only species to have potential habitat or was observed on the subject property that is listed on the PSO is Black Ash. The following section outlines recommended protections for this species.

5.4.1 Black Ash

Black Ash were identified within wetland features throughout the assessment area (**Figure 7**). There is currently protection for Black Ash within the County of Peterborough under the SCA, therefore proponents need to seek appropriate approvals for activities impacting Black Ash or their habitat To avoid impacts to wetland habitat containing Black Ash, the extraction limit has been located outside of these communities, the water balance in the wetlands has been protected, and a minimum 30 m buffer has been recommended for wetlands. All Black Ash trees have been avoided and with the implementation of mitigation measures to protect wetlands, there is no anticipated impacts to Black Ash or their habitat.

- **The recommendations offered herein to protect the wetlands must be implemented in full to protect Black Ash and their habitat.**

- **It is the proponent's responsibility to confirm any updated requirements for the protection of all endangered and threatened species including Black Ash. Black Ash is an endangered species and protection measures afforded by the Species Conservation Act apply within the County of Peterborough. Black Ash protection should be reviewed prior to vegetation clearing on lands adjacent to wetlands to ensure ongoing compliance with the SCA or future policy guidance related to the SCA.**

5.5 Federal Species as Risk Act (SARA)

The federal Species at Risk Act (SARA; 2002) provides regulatory protection to species designated as Endangered or Threatened under the Act through prohibition of killing, harm, or harassment of individual listed species and or their residence. A species' residence is defined under SARA as "a dwelling-place, such as a den, nest or similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their lifecycles, including breeding, rearing, staging, wintering, feeding or hibernating." As outlined in Section 34 of SARA, the Act generally only applies to listed species on federal lands (except in the case of an order by the Minister), with the exception of aquatic species and migratory bird species listed under the federal MBCA. With the Ontario SCA deferring to SARA for species not listed on the PSO list, one (1) species Eastern Meadowlark) was observed on the subject property that has protections that fall under this act. The following section along with recommendations to protect special concern species and migratory birds will also ensure this species is protected according to SARA.

5.5.1 Eastern Meadowlark (SARA)

One (1) breeding pair of Eastern Meadowlark was identified during breeding bird surveys in the northern corner of the assessment area as outlined on **Figure 7**. This area is not within the license boundary and impacts due to habitat loss or direct impacts to nesting birds and young during clearing are not anticipated. Therefore, RiverStone does not provide additional recommendations specific to this species outside of general protections for all breeding birds.

5.6 Significant Wildlife Habitat

RiverStone completed an assessment of SWH features within the assessment area in accordance with the Ecoregion 6E Criterial Schedules (OMNRF 2015a) with a screening provided in **Appendix 11** and

locations depicted on **Figure 9**. The assessment used a combination of habitat-based approach and targeted surveys. The following sections contain the results of the impact assessment and recommendations for avoidance and minimization of potential impacts to the ecological form and function of SWHs identified during RiverStone's SWH assessment. The following SWH were identified within the assessment area and are further discussed below.

- Bat Maternity Colonies
- Special Concern and Rare Wildlife Species

5.6.1.1 Seasonal Concentration Areas of Animals

Bat Maternity Colonies

Acoustic monitoring completed by RiverStone detected more than 10 individual Big Brown Bats within forested communities on the subject property. This habitat is within the FOD5 vegetation community, and part of Significant Woodland B. Woodland B is 166 ha in size and there is approximately 4.5 ha of the FOD5 community containing the maternity colony proposed for removal.

Although bats will not return to specific maternity colony trees annually, they will return to the same general area. The FOD5 polygon containing the maternity colony extends onto adjacent lands outside of the limit of extraction, and the local landscape contains large contiguous woodlands that are suitable for maternity colony roosting. Removal of part of Significant Woodland B is not anticipated to significantly reduce the availability of bat habitat within the local area.

The Restoration Plan proposes the replanting 23.4 ha of woodlands that will result in a net gain of approximately 10 ha of total forest and will provide bat maternity colony habitat when mature. To mitigate impacts to all bat species before and during extraction, RiverStone also recommends:

- **Twenty-one bat boxes shall be installed in clusters of three (3) in locations within the subject property adjacent to the FOD5 community as shown on Figure 10.**

5.6.1.2 Habitat of Species of Conservation Concern -Special Concern and Rare Wildlife Species

Snapping Turtle

While Snapping Turtle was not observed during targeted basking surveys, a predated nest of this species was observed adjacent to Sand Road. This species is likely to occur periodically within the ponds, wetlands, and areas of exposed soil. The proposed licence boundary is located outside of identified wetlands within the assessment area and impacts to potential turtle habitat is not anticipated. Recommendations outlined in **Section 5.2** that protect the wetland will also protect potential Snapping Turtle habitat. There is also potential for the disturbed areas of the pit to attract Snapping Turtle (and Painted Turtles) for nesting. To protect Snapping Turtle and turtles in general from nesting in the pit area, RiverStone recommends the following measures:

- **Specialized barrier fencing for reptiles that include J hooks, shall be erected along the licence boundary adjacent to wetland features as shown on Figure 10.**
- **A qualified person shall be retained to certify the adequacy of the specialized barrier fence. The fence shall be inspected to ensure necessary repairs occur on a routine basis (monthly from April through October).**

Eastern Wood-pewee and Wood Thrush

Singular Eastern Wood-pewee were documented on a number of occasions during breeding bird surveys within upland and lowland deciduous, mixedwood and coniferous forests through the assessment area (**Figure 9**). Wood Thrush was documented in mixedwood habitat on the western property boundary in less abundance with no confirmation of breeding. Eastern Wood-pewee were also recorded within 120 m on adjacent lands. These species prefer the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. The area of SWH for this habitat type and species is the area of the habitat to the finest ELC scale that protects the habitat form and function. Habitat for these species is not limited within the assessment area nor on the greater landscape; it is present in the surrounding woodland and wetland habitats.

The proposed extraction area requires the removal of 6.13 ha of the FOD5 vegetation community in the center of the site. This habitat would be removed outside the breeding season. While some habitat will be removed, there is abundant similar habitat in the assessment areas that will remain, and the rehabilitation plan provides for enhancement and restoration of these habitat types. To protect Eastern Wood-pewee during implementation of the proposed pit extraction activities, and following rehabilitation RiverStone recommends the following measures:

- **Removal of natural vegetation (e.g., shrub clearing, fallow fields, etc.) shall be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31).**

- **The progressive rehabilitation plan must include the restoration of forest habitat that is continuous with the existing habitat. For rehabilitation recommendation, please see Section 5.9.**

Grasshopper Sparrow

Grasshopper Sparrow was documented within the cultural meadow community in the western end of the site (**Figure 9**). Grasshopper Sparrow were consistently observed defending a territory within this ecosite, although no direct evidence of breeding (i.e. food carry) was observed. This community is partially located within the proposed extraction area, and 3.73 ha will require removal. The following are recommended for inclusion on the Site Plan.

- **All removal of natural vegetation (e.g., tree/shrub clearing, fallow fields, etc.) shall to be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31).**

- **The rehabilitation plan must include the creation of meadow habitat of sufficient size to provide useable habitat for protected grassland birds. For rehabilitation recommendations, please see Section 5.9.**

Monarch

Monarch was documented in cultural meadows in the west of the assessment area and based on the vegetation composition of cultural meadow habitat with Common Milkweed, the presence of this species is not unexpected. General habitat of nectar rich plants utilized by Monarch (*Asclepias syriaca*) and other insect species is associated with the meadow habitats on the site.

The extraction area will require removal of 7.04 ha of cultural meadow habitat; however, the local landscape supports an abundance of such suitable habitat. There is no expectation that the proposed pit

would negatively impact the availability or function of local habitat for this species. To ensure that potential habitat is maintained and appropriate species present, RiverStone recommends the following.

- **Removal of natural vegetation within the cultural meadow communities shall be completed outside of the primary Monarch breeding window (i.e., between Mid-May to October).**

- **Cultural meadow habitat, using a native wildflower mix that includes milkweed species, shall be included as part of the rehabilitation plan . Native seed mixes that include milkweed species should also be applied on the berms. For rehabilitation recommendations, please see Section 5.9.**

Rare Wildlife Species

Thirteen (13) rare bird species other than endangered, threatened and special concern species outlined above were recorded during the breeding bird surveys and incidental observations. All species are identified in the Ecoregion 6E Area Sensitive Birds list. These species include Barred Owl, Black-and-white Warbler, Grasshopper Sparrow, Hermit Thrush, Ovenbird, Pileated Woodpecker, Pine Warbler, Red-breasted Nuthatch, Savannah Sparrow, Scarlet Tanager, Veery, and Winter Wren. These species and their habitat are associated with features in or adjacent to the extraction area. With the required removal of cultural meadow and forest habitat to develop the pit there is potential for impacts to habitat for area sensitive birds. To protect rare bird species during implementation of the proposed pit extraction activities and to provide future habitat, RiverStone recommends the following measure:

- Rehabilitation areas outlined on **Figure 10**, and in Section **5.9** will provide future habitat for bird species noted to be present on the subject property. **All removal of natural vegetation (e.g., tree/shrub clearing, fallow fields, etc.) shall be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31).**

5.7 Fish Habitat and Watercourse

In general, development and/or site alteration activities that occur in proximity to fish habitat and watercourses have the potential to cause negative impacts via the following pathways:

- Alterations of surface water and/or groundwater contributions that may result during pit activities (e.g., dewatering, etc.), and/or modifications to existing topography or drainage;
- Increased sediment and/or nutrient loadings to features via runoff exiting the development area from construction to post-completion of the project. This may adversely affect water quality via increased turbidity, nutrient enrichment, contamination by toxic substances, changes in pH, etc.;
- Direct loss of habitat for fish during the development and continued operation of the pit; and,
- Increased human activity/encroachment, that may result in dumping, or other disturbances.

As outlined above in **Section 3.4.1**, two Tributaries of the Ouse River are located within the subject property and pass through or are within 120 m of the site. Tributary 2 is located to the north of the site and flows in an easterly direction onto adjacent lands before entering the Ouse River Middle Complex Wetland PSW. During site assessments it was confirmed that Tributary 2 supported a warm-cool water fish community and is direct fish habitat. Tributary 1, which drains into Tributary 2, did not contain sufficient water during field work to sample. It is possible that in periods of high flow or spring melt that some areas of this feature would support fish habitat. It is best classified as seasonal fish habitat.

The extraction limits have been modified so that there is no encroachment into wetlands, and the hydrogeological assessment (Tatham, 2025) has confirmed that the water balance to the wetlands and watercourses will be maintained. However, Tributary 2 flows through a culvert under the proposed HWY 7 access route, and Tributary 1 flows along the side of the access route. There is potential for increased human activity along this access route to negatively impact these features. RiverStone recommends:

- **Permanent sediment and erosion control fencing shall be installed adjacent to the access route in proximity to the watercourse to prevent roadbed materials from entering the tributaries.**

- **Areas adjacent to Tributary 1 between the access road and the channel shall include pre-emptive naturalization with a combination of native trees and shrubs to improve the riparian buffer. For naturalization recommendations please see Section 5.9.**

5.8 Other Natural Features and Functions

Although a portion of the proposed extraction area is occupied by cultural meadow and historical plantations, that will be the requirement to remove forest and other communities that contain natural vegetation (i.e., mature and young trees and shrub, etc.). As such, the ecological function of these areas will be negatively impacted during site preparation and during the life of the pit until rehabilitation. To mitigate some of the ecological impacts associated with the loss of vegetation cover, and to provide broad recommendations to guide rehabilitation, RiverStone recommends the following measures:

- **All removal of natural vegetation (e.g., tree/shrub clearing, fallow fields, etc.) shall be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31). For rehabilitation recommendations, please see Section 5.9.**

- **At pit closure, site rehabilitation will be required utilizing vegetation species native to the local area in the final rehabilitation plan. Areas adjacent forest communities are to utilize native species that blend with the adjoining vegetation communities. For rehabilitation recommendations, please see Section 5.9.**

5.9 Rehabilitation Requirements

The following recommendations are provided as mitigative measures to protect species and habitat both during extraction and in the long-term. Restoration plantings and areas in the rehabilitation plan will ensure long-term connectivity of the natural heritage system and habitat availability to species identified in the NER.

5.9.1.1 Pre-emptive Plantings Adjacent to Wetlands

The area identified for Pre-emptive Planting on the ARA operational and rehabilitation plan shall be planted within 5 years of the issuance of the ARA licence in the spring (i.e., May) or fall (i.e., mid - September to early-October) with a mixture of the following tree and shrub species:

Trees

- Red Maple (*Acer rubrum)*
- Bigtooth Aspen (*Populus grandidentata*)
- Trembling Aspen (*Populus tremuloides*)
- White Birch (*Betula papyrifera*)

- American Basswood (*Tilia americana*),
- Balsam Fir (*Abies balsmea*)
- Eastern Hemlock (*Tsuga canadensis*)
- Eastern White Pine (*Pinus Strobus*)

Shrubs / Groundcover

- Choke Cherry (*Prunus virginiana*)
- Red Osier-dogwood (*Conus sericea*)
- Staghorn Sumac (*Rhus typhina*)
- Smooth Serviceberry (*Amelanchier laevis*)
- Common Blackberry (*Rubus allegheniensis*)
- Northern Bracken Fern (*Pteridium aquilinum var. latiusculum*)
- White Meadow-sweet (*Spiraea alba)*

Within the Pre-emptive Planting Area, the following planting requirements shall be met:

a) Trees shall be planted at a density of five (5) trees per 100 m².
b) All tree saplings shall be planted 5 m apart to increase rooting and provide stabilization.
c) Trees shall be a minimum of 1.2 m (~4 ft) in height with a sufficiently developed root ball to sustain planting.
d) Shrubs shall be planted at a shrub to tree ratio of 5:1.
e) All shrubs shall be installed 1 m apart.
f) All installed shrubs shall consist of potted material at least 30cm tall in 1-3 gallon pots.
g) Any woody plant root defects (e.g., girdling) shall be corrected prior to installation.
h) All woody plants shall be installed such that the root crown/trunk flare is exposed above the soil surface to ensure proper oxygenation of the rooting zone.
i) All installed woody plants shall be watered (deep soaking) following installation.

5.9.1.2 Woodland Rehabilitation

The area identified as woodland on the ARA rehabilitation page shall be planted in the spring (i.e., May) or fall (i.e., mid -September to early-October) with a minimum of six (6) of the following tree species:

- Sugar Maple (*Acer saccharum*)
- Northern Red Oak (*Quercus rubra*)
- Eastern White Pine (*Pinus Strobus*)
- Eastern Hemlock (*Tsuga canadensis*)
- Red Maple (*Acer rubrum)*
- Bigtooth Aspen (*Populus grandidentata*)
- Trembling Aspen (*Populus tremuloides*)
- White Birch (*Betula papyrifera*)
- American Basswood (*Tilia americana*)
- Balsam Fir (*Abies balsmea*)

The location and diversity of the tree species within the woodland area shall be field fitted based on the soil conditions, and topography.

A minimum of 15 % of each selected tree species shall be planted overall within the woodland area. Trees shall be a minimum height of 0.45m (1.5 feet) tall when planted and shall be planted at a 2 m spacing to a minimum density of 1800-2000 seedlings / ha.

Prior to planting, the woodland planting area shall be amended with topsoil/organic soil to be at minimum 0.3 m deep.

Competing vegetation shall be removed yearly until the planted trees have reached 2 m in height.

Monitoring shall occur annually for three (3) years to verify a survival rate of greater than 75% in the woodland plantings. If survival is noted to be less than 75% during the annual monitoring, replacements will be planted in order to ensure a minimum density of 1200 trees / ha.

5.9.1.3 Grassland Habitat Naturalization

The area identified for grassland on the ARA rehabilitation page, shall be planted with a mix of short and mid height native bunchgrass and diverse wildflowers composed of roughly 20% native grass and 80% forbs to provide appropriate habitat for grassland bird species. The grassland area shall be planted with the following species:

- Panic Grass Switch Grass (*Panicum virgatum*)
- Little Bluestem (*Schizachyrium scoparium*)
- Orchard Grass (*Dactylis glomerata*) Not Native
- Indian Grass (*Sorghastrum nutans*)
- Dropseeds (*Sporobolus spp.*)
- Sideoats Grama (*Bouteloua curtipendula*)
- Purple Coneflower (*Echinacea purpurea*) Not Native
- Black-eyed Susan (*Rudbeckia hirta*)
- Wild Bergamot (*Monarda fistulosa*)
- Gray Goldenrod (*Solidago nemoralis*)
- Milkweed species (*Asclepias spp.*)
- Bebb’s Sedge (*Carex bebbii*)

5.9.1.4 Monarch Habitat Creation (Cultural Meadow)

The area identified for potential Monarch Habitat Cultural Meadow on the ARA rehabilitation page, shall be planted with a native mix of wildflowers and grasses to stabilize soils and provide appropriate habitat for Monarch Butterfly. These areas are to be maintained as a meadow with mowing and maintenance limited to periodic removal of trees and woody shrubs. The area shall be planted with an Early Succession Mix that includes the following:

- Black Eyed Susan (*Rubeckia hirta*)
- Blue Vervain (*Verbena hastata*)
- Canada Anemone (*Anemone canadensis*)
- Canada Blue-joint (*Calamagrostis canadensis*)

- Canada Goldenrod (*Solidago canadensis*)
- Little Bluestem (*Schizachyrium scoparuim*)
- Common Milkweed (*Asclepias syriaca*)
- Fowl Bluegrass (*Poa palustris*)
- Meadow/Open Field Sedge (*Carex granularis*)
- New England Aster (*Symphyotrichum novae-angliae*)
- Path Rush (*Juncus tenuis*)
- Purple Stemmed Aster (*Symphyotrichum puniceum*)
- Virgins Bower (*Clematis virginiana*)
- Wild Bergamot (*Monarda fistulosa*)

5.9.1.5 Tributary 1 Naturalization

The area identified as Tributary 1 Planting on the ARA operational and rehabilitation page shall be planted within 5 years of the issuance of the ARA license in the spring (i.e., May) or fall (i.e., mid - September to early-October) with a mixture of the following tree and shrub species:

Trees

- Red Maple (*Acer rubrum)*
- Bigtooth Aspen (*Populus grandidentata*)
- Trembling Aspen (*Populus tremuloides*)
- White Birch (*Betula papyrifera*)
- American Basswood (*Tilia americana*)
- Balsam Fir, (*Abies balsmea*)
- Eastern Hemlock (*Tsuga canadensis*)
- Eastern White Pine (*Pinus Strobus*)

Shrubs / Groundcover

- Choke Cherry (*Prunus virginiana*)
- Red Osier-dogwood (*Conus sericea*)
- Staghorn Sumac (*Rhus typhina*)
- Smooth Serviceberry (*Amelanchier laevis*)
- Common Blackberry (*Rubus allegheniensis*)
- Northern Bracken Fern (*Pteridium aquilinum var. latiusculum*)
- Red Trillium (*Trillium erectum*)
- White Trillium (*Trillium grandiflorum)*
- Zigzag Goldenrod (*Solidago flexicaulis)*
- Wild Sarsaparilla (*Aralia nudicaulis)*
- Blue Cohosh (*Caulophyllum thalictroides)*
- Wild Leek (*Allium tricoccum)*
- Sensitive Fern (*Onoclea sensibilis)*
- White Meadow-sweet (*Spiraea alba)*

Within the Tributary 1 Planting Area, the following planting requirements shall be met:

j. Trees shall be planted at a density of five (5) trees per 100 m².
k. All tree saplings shall be planted 5 m apart to increase rooting and provide stabilization.
l. Trees shall be a minimum of 1.2 m (~4 ft) in height with a sufficiently developed root ball to sustain planting.
m. Shrubs shall be planted at a shrub to tree ratio of 5:1.
n. All shrubs shall be installed 1 m apart.
o. All installed shrubs shall consist of potted material at least 30cm tall in 1-3 gallon pots.
p. Any woody plant root defects (e.g., girdling) shall be corrected prior to installation.
q. All woody plants shall be installed such that the root crown/trunk flare is exposed above the soil surface to ensure proper oxygenation of the rooting zone.
r. All installed woody plants shall be watered (deep soaking) following installation.

6 APPLICABLE ENVIRONMENTAL LEGISLATION AND POLICIES

The following commentary summarizes the various federal, provincial, and municipal environmental legislation and policies that are applicable to the proposed ARA applications considered herein and describes how the recommendations provided in this report will address these policies. Interpretation of the County of Peterborough Official Plan and Township of Asphodel-Norwood**.**

6.1 County of Peterborough Official Plan (1994 with Consolidation to June 2025)

The County's of Peterborough outlines goals, objectives, and policies pertaining to land use within the planning jurisdiction of the County. As outlined in Section 1.1 of the OP, the County of Peterborough OP also serves as the OP for the Township of Asphodel-Norwood. Local municipal plans for have been incorporated into Sections 6 and 7 along with associated schedules.
Section 2.2 of the OP states:

> When submitting an application to amend the County Official Plan, the applicant shall provide supporting documentation to the satisfaction of County Council which adequately addresses the following:
>
> · the impact of the proposal on the natural environment of the watershed within which it is located
>
> · the degree to which the proposal conforms to the various Provincial policies and guidelines including but not limited to the Provincial Policy Statement, Minimum Distance Separation I and II as prescribed by the Ministry of Agriculture and Food, and the Oak Ridges Moraine Conservation Plan.

Section 2.6 DEVELOPMENT APPLICATIONS

General Policies

> In accordance with Regulations made under The Planning Act for the purpose of deeming a "complete application", the County and/or the Townships may request additional information that it considers it may need when considering development proposals or Planning Act applications. Such information may include, but is not limited to, any of the following:

- Environmental Impact Analysis (see Section 4.1.3.1)

The requirements for Environmental Impact Analysis are found in section 4.1.3.1. This NER report is submitted to address this requirement has been prepared by professional ecologists and includes identification of natural features on the site and within the required adjacent lands distance.

Section 4.1 Natural Environment

> The County recognizes the important contribution that natural systems, natural heritage features and natural resources make to the social, economic, and environmental health of local municipalities. In this regard, the County has identified the following areas to ensure that the appropriate land use and resource management protection policies are applied to them.
>
> Natural Heritage Features include wetlands, flood plains, endangered and threatened species habitat, fish habitat, wildlife habitat, woodlands valleylands, areas of natural and scientific interest, and the Oak Ridges Moraine

This NER has identified and characterized the natural heritage features identified in the County's OP.

The County recognizes the important contribution that natural system, natural heritage features and natural resources play in the community.

Section 4.1.3.1 - General (Policies)

> Development and site alterations within provincially significant wetlands and in significant portions of the habitat of endangered and threatened species is not permitted. However, with the exception of the Oak Ridges Moraine Policy, development or site alteration such as filling, grading and excavating may be permitted within or adjacent to the remaining natural heritage features listed in Section 4.1 of this Plan, provided that it has been demonstrated by an Environmental impact assessment that there will be no negative impacts on the natural features or ecological functions for which the area is identified.

The requirements for the Environmental Impact Assessment are included in this OP section

As per discussion provided herein, the proposed extraction area and 120 m adjacent lands include confirmed habitat for endangered and threatened species (Black Ash) and SWH (Bat maternity colonies and habitat of special concern species).

Section 4.1.3.3 Mineral Aggregate and Non-Aggregate Mineral Resources

This section of the OP specifically addresses aggregate resources in the County. The following points are relevant to the natural heritage features.

> All extraction and processing operations should be located and operated in such a manner as to minimize the impact on the natural, social and built environments. In particular, water resources including both surface and ground, shall be protected from adverse impacts of extraction. Appropriate separation distances for proposed and existing aggregate operations are usually determined on a site specific basis. However, the Ministry of Environment considers the area of influence to be 500 metres for a quarry, 300

> metres for a pit below the groundwater table and 150 metres for a pit above the groundwater table. This area is considered to have the greatest impact on sensitive land uses from the pit or quarry operation. Environmental studies should be required to assess the impact if development occurs within this influence area. This influence area should be applied reciprocally to new sensitive land uses encroaching upon an existing extraction operation or lands committed for future extraction.
>
> Pit and quarry operators will be required to undertake progressive and final rehabilitation to accommodate subsequent land uses, and to promote land use compatibility, and to recognize the interim nature of extraction. Final rehabilitation will take surrounding land use and approved land use designations into consideration.

Water resources including ground and surface water have been addressed in the Hydrogeological Assessment (Tatham, 2025). RiverStone has considered natural heritage features, including wetlands and the Ouse River Tributaries herein. The licence boundary has been adjusted to avoid significant features and fish habitat, and wetlands have been buffered by a minimum of 30 m, more if required to maintain water balance in the feature.

The progressive and final rehabilitation plan has considered the adjacent natural heritage features, land uses, and linkages on the landscape.

Section 4.1.3.4 - Natural Heritage Features

This section specifically addresses natural heritage features and states the following:

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

The Natural Heritage System Area for the County of Peterborough proximate to the assessment area is depicted in **Figure 3**.

Within the Natural Heritage System Area the OP states:

> Local plans shall prohibit development and site alterations within the following types of significant natural heritage features: significant wetlands; significant portions of the habitat of endangered and threatened species but may permit development and site alteration in significant woodlands south and east of the Canadian Shield; significant valleylands south and east of the Canadian Shield; significant wildlife habitat; and; significant areas of natural and scientific interest.
>
> Development and site alteration will not be permitted in fish habitat except in accordance with provincial and federal requirements.
>
> Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas listed above unless the ecological function of the adjacent lands has been evaluated in accordance with an environmental impact assessment as described in Section 4.1.3.1 and it has been determined that there will be no new negative impacts on the natural features or on their ecological functions.

The proposed pit is located fully within one of the areas identified as part of the Natural Heritage System. The site is located in the Natural Heritage area but does not contain significant wetlands or significant portions of habitat of endangered and threatened species. There were no valleys lands identified within the licence boundary or on adjacent lands. In terms of SWH, 6.13 ha of SWH used as Bat Maternity Colony and by Eastern Wood Pewee, 3.73 ha of SWH for Grasshopper Sparrow, and 7.04 ha of SWH for Monarch will be removed. An area of 13.4 ha of significant woodland will be removed, and 23.4 ha will be reforested as part of the rehabilitation plan. The progressive rehabilitation plan will create….23.4 ha of forested habitat, and 5.3 ha of meadow habitat protecting and enhancing the natural heritage area in the long-term.

Fish habitat is present within the Ouse River tributaries located outside of the limit of extraction, but adjacent to the access route. Recommendations provided herein will mitigate impacts to these features that could result from erosion and disturbances due to aggregate hauling adjacent to these features.

This report has been prepared to provide an assessment of the proposed pit impact on natural heritage features, satisfying the requirements of the County's OP. Natural heritage features identified within the assessment areas that will be impacted by the proposed pit include habitat for Eastern Meadowlark, mitigation measures have been discussed and recommended herein to support demonstration of no negative/net negative impacts to natural heritage features.

6.2 Provincial Aggregate Resources Act, R.S.O. 1990, c. A.8

The information and recommendations provided in this report satisfy the requirements restated below for Natural Environmental report as outlined in the Aggregate Resources of Ontario: Technical Reports and Information Standards (August 2020) for a Class A licence:

The report must 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,
h) Within the area of one or more provincial plan(s), any key natural heritage features not included in (a) through (g)

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. For the purposes of this section, "provincial plan" means any one of the following plans:

• Oak Ridges Moraine Conservation Plan

• Greenbelt Plan
• A Place to Grow: Growth Plan for the Greater Golden Horseshoe • Niagara Escarpment Plan
• Lake Simcoe Protection
Plan.

The following natural heritage features per ARA policies were identified within the site and/or Study Area: 1) Non - significant wetlands 2) habitat of endangered and threatened species, 3) fish habitat, 4) significant wildlife habitat and 5) Significant Woodland. Recommendations and measures to ensure the above features are protected and/or potential impacts are appropriately mitigated are provided in **Section 5**.

6.3 Provincial Planning Statement (2024), pursuant to the Planning Act, R.S.O. 1990, c. P. 13

The 2024 Provincial Policy Study (PPS) is promulgated under the *Planning Act, 1990* and provides direction to municipalities on matters of provincial interest related to land-use planning. Municipal OP's must be consistent with the PPS. The PPS instructs (s. 4.1.1) that *natural features and areas shall be protected for the long term* and that (s. 4.1.2):

> *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.*

The PPS prohibits development and site alteration within the following natural heritage features in Ecoregion 6E (s. 4.1.4):

· Significant Wetlands

· Significant Coastal Wetlands

The PPS also prohibits development and site alteration within the following natural heritage features in Ecoregion 6E (s. 4.1.5) *unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions*:

· Significant Woodlands

· Significant Valleylands

· Significant Wildlife Habitat

· Significant Areas of Natural and Scientific Interest

· Non-Significant Coastal Wetlands

The PPS does not permit development and site alteration in fish habitat (s. 4.1.6) or the habitat of endangered and threatened species (s. 4.1.7) except in accordance with federal and provincial requirements, respectively. Finally, with respect to lands adjacent to significant natural heritage features, the PPS requires that (s. 4.1.8):

> *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.*

In considering the aforementioned PPS policies, RiverStone has determined that the proposed extraction activities have addressed the natural heritage provisions of the 2024 PPS for the following reasons:

- RiverStone does not anticipate any negative impacts to Fish Habitat within the assessment area or adjacent lands.
- Per **Section 5.2** of this report, no Provincially Significant wetlands are present within the assessment area and RiverStone does not anticipate any negative impacts to the Provincially Significant Wetlands located beyond the assessment area on adjacent lands to the south of the proposed extraction area, provided that the recommended mitigation measures are implemented in full.
- Per **Section 5.3** of this report there will be 13.44 ha of significant woodlands that require removal. Mitigation measures have been recommended including timing windows for vegetation removals and habitat enhancement and replacement through the progressive and final rehabilitation plan to ensure there are no negative impacts to significant woodlands.
- Per **Section 5.4**of this report, RiverStone notes that habitat for Black Ash occurs on adjacent lands. Mitigation measures have been recommended to avoid negative impacts on this species and their habitat.
- Per **Section 5.6** of this report, RiverStone anticipates the removal of small areas of habitat related to bat maternity colonies and special concern and area sensitive bird species considered SWH. Mitigation measures have been recommended including timing windows for vegetation removals and habitat enhancement and replacement through the progressive and final rehabilitation plan to ensure no negative impacts occur on these species and their habitat.

6.4 Provincial Species Conservation Act, 2025

The SCA (2025) and its regulations, is intended to provide for the “protection and conservation of species at risk in Ontario, while taking into account social and economic considerations, including the need for sustainable economic growth in Ontario”. The SCA follows a “registration first” approach, to characterise activities that are exempted, registerable, or permitted.

In our assessment of the subject properties and development proposal, impact to habitats and individuals of species at risk on the property are being purposefully avoided and therefore the project does not require registration under the SCA. This is contingent on the diligent application of the mitigation measures presented in **Section 5**.

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6.5 Federal Species at Risk Act, S.C. 2002, c. 29

The federal *Species at Risk Act* (SARA) was promulgated in 2002 to protect indigenous species from disappearing, and to recover those identified as extirpated, endangered, or threatened on federal lands. The official list of species at risk under SARA is contained in Schedule 1 of the Act.

The key requirements of SARA – including prohibitions on killing/harming a listed Extirpated, Endangered, or Threatened species (s. 32), destroying its “residence” (s. 32), and destroying its “critical habitat (s. 58) – are largely restricted to federal lands except as it relates to migratory birds and aquatic species. With recent implementation of the Ontario SCA, protection for some endangered and

threatened species in Ontario are afforded protection under SARA. Eastern Meadowlark were identified in the study area, so these provisions are applicable to the proposed pit applications considered herein. Notwithstanding the above, endangered and threatened species listed on Schedule 1 that are either fish or migratory birds are afforded protection from killing/harming and from having their "residence "damaged or destroyed. For birds, a "residence" includes a nest.

With mitigation measure recommended to project nesting birds and watercourses on the subject property outside the extraction area, RiverStone has determined that the proposed extraction activities are consistent with the requirements of SARA (also see RiverStone's recommendations related to protection of migratory bird nests in **Section 5.8**).

6.6 Federal Fisheries Act, R.S.C. 1985, c. F-14 (amended on 2019-08-28)

The *Fisheries Act* includes protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. The *Fisheries Act* provides protection against the "death of fish, other than by fishing", (Section 34.4(1)) and the "harmful alteration, disruption or destruction of fish habitat", (Section 35(1)), otherwise known as HADD. HADD is defined by DFO to include "any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish".

In cases where impacts to fish and fish habitat cannot be avoided, and the project does not fall within waterbodies where Fisheries and Oceans Canada (DFO) review is not required, proponents are asked to submit a request for review to their Fish and Fish Habitat Protection Program regional office to determine approval requirements. All projects are encouraged to avoid causing the death of fish and a HADD of fish habitat, using measures to protect fish and fish habitat that include standards and codes of practice for common works, undertakings and activities

Consistent with the assessment carried out in **Section 5.7**, the Ouse River tributaries were determined to provide fish habitat (as defined within the *Fisheries Act*). Neither of these features are present within the extraction area. Any features located on adjacent lands that may contain fish habitat are not anticipated to be impacted.

6.7 Federal Migratory Birds Convention Act, S.C. 1994, c. 22

Section 6 of the Migratory Birds Regulations under the *Migratory Birds Convention Act, 1994* (MBCA) prohibits the disturbance or destruction of nests, eggs, or nest shelters of a migratory bird. The provincial *Fish and Wildlife Conservation Act, 1997* (FWCA) extends the protection of bird nests and eggs to species that are not listed under the Migratory Birds Regulations (e.g., Corvids).

As recommended in **Section 5.8**, all clearing of vegetation required to implement the proposed development plan should be restricted to times outside of the period April 1 to August 31 inclusive.

7 CONCLUSIONS

In accordance with *Aggregate Resources Act* policies, the preceding Natural Environment Report provides a detailed characterization of the natural environment occurring within and adjacent to an existing and proposed pit licence on Part of Lot 14, Concession 5 and Part of Lot 15 Concession 6, 3749 Highway 7 and 926 Sand Road, Township of Asphodel-Norwood, County of Peterborough. This report details a comprehensive approach to confirming the presence and absence of significant natural heritage features that are afforded protection under the ARA and applicable legislation and policies at

the municipal, provincial and federal levels. Potential negative impacts were assessed with recommendations for preventive, and mitigative measures are provided where appropriate.

Based on the findings herein, RiverStone has determined that the proposed ARA licence application addresses the applicable policies and legislation, provided that the recommendations contained in **Section 5** are implemented in full. The requested local and regional planning approvals will allow for the proposed extractive land use without compromising the ecological values of the assessment area.

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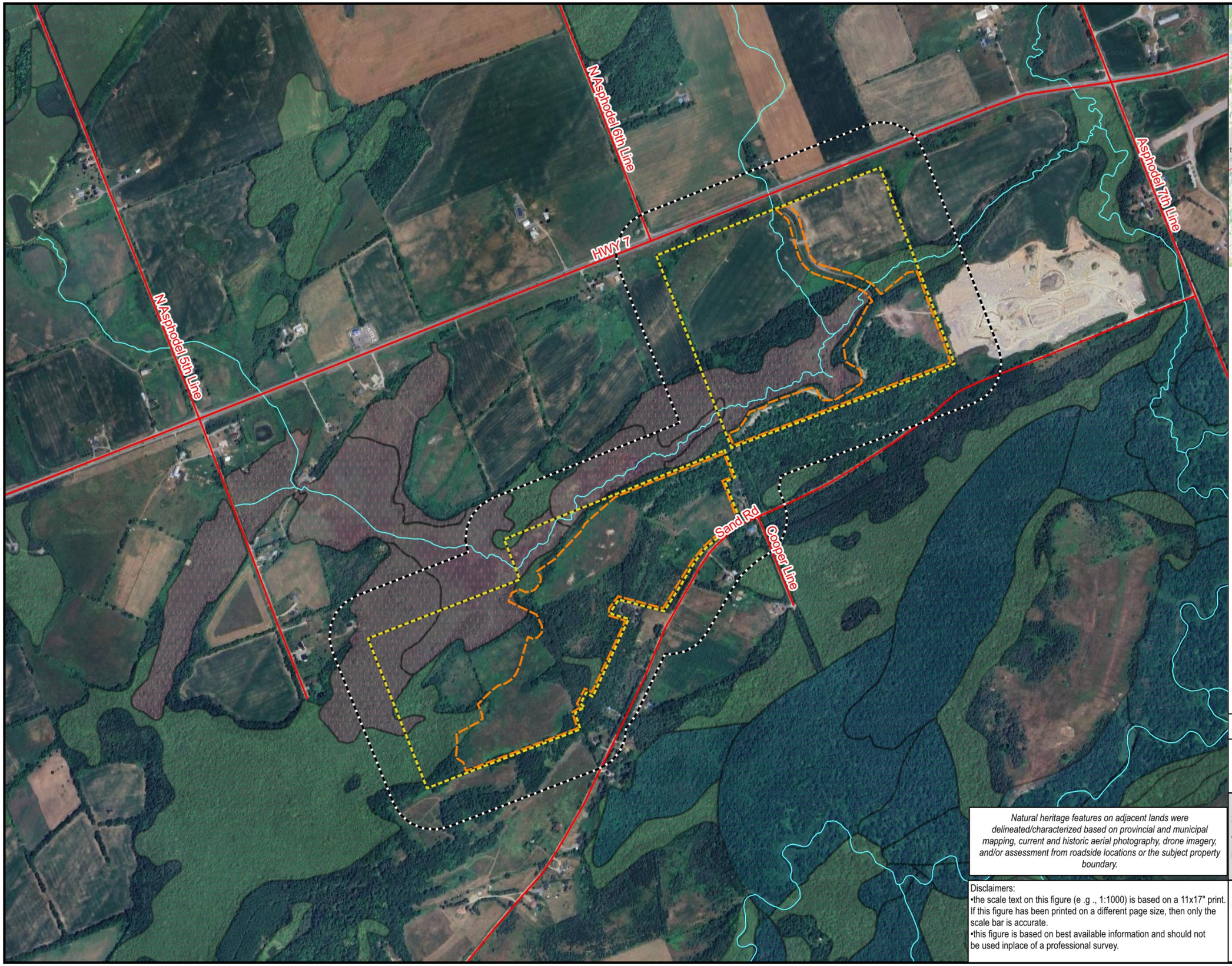
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Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary

Land Information Ontario (Ontario Geohub)

- Roads

Natural Heritage Features - Identified by Province (Geohub)

- Watercourses

Wetlands

- Evaluated-Other
- Evaluated-Provincial
- Unevaluated

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 2, 2026	By: ET

0 150 300 450 600 m

Scale 1:9,800

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

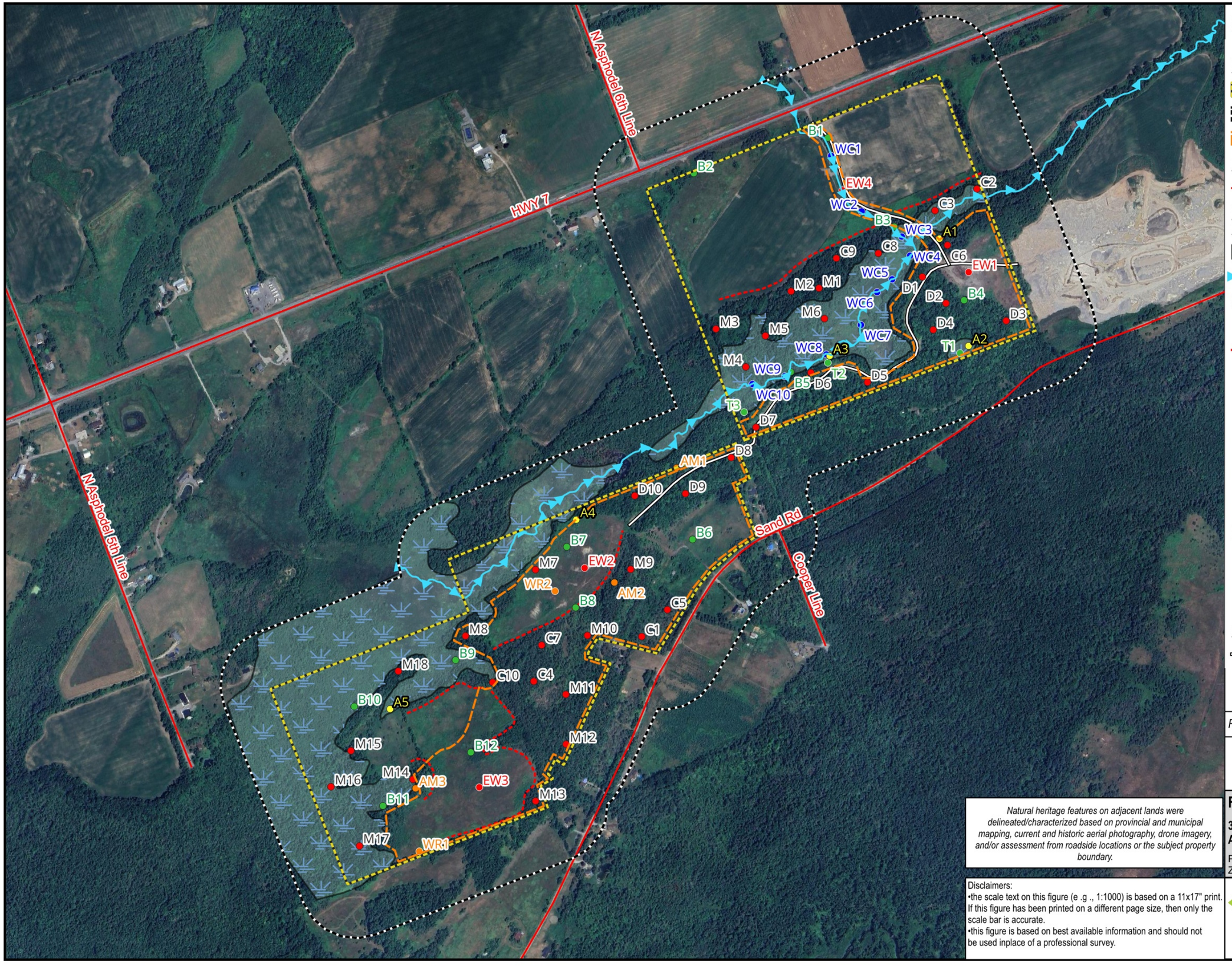
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Figure 1. Location of Subject Property
3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

Inset: Generalized Location of Subject Property

RIVERSTONE ENVIRONMENTAL SOLUTIONS INC.



Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary

Land Information Ontario (Ontario Geohub)

- Roads

Natural Heritage Features - Identified by RiverStone

- Wetlands
- Watercourses

Survey Stations

- Watercourse (WC)
- Winter Raptor Survey Transects
- Acoustic Monitors (AM)
- Anuran Calling (A)
- Breeding Bird (B)
- Eastern Whip-poor-will Calling Stations (EW)
- Turtle Basking (T)
- Winter Raptor (WR)

Roosting Bats

- FOC Bat Snag (C)
- FOM Bat Snag (M)
- FOD Bat Snag (D)

Existing Development

- Access Road

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 8, 2026	By: ET

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Scale: 1:7,500

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

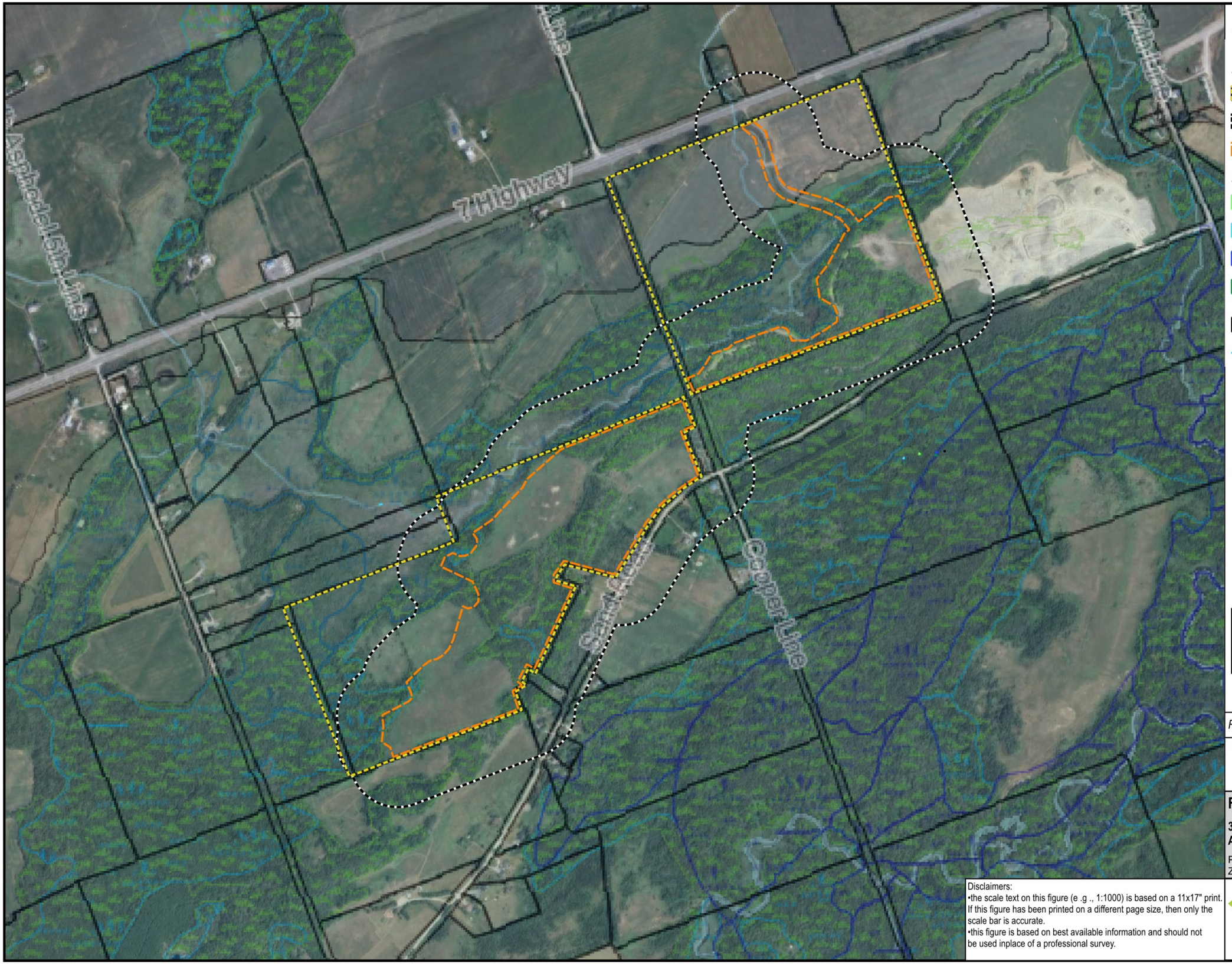
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Figure 2. Survey Locations

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

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Legend

Planning Boundaries

- Subject Property
- Licence Boundary Study Area (120m)
- Site - Licence Boundary

Peterborough County Mapping Portal

- Vegetation
- Non-Evaluated Wetlands
- Evaluated-Provincial Wetlands
- Areas of Natural and Scientific Interest (ANSI) - Regional
- Natural Heritage System Area
- Watercourse

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 8, 2026	By: ET

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Scale: 1:8,700

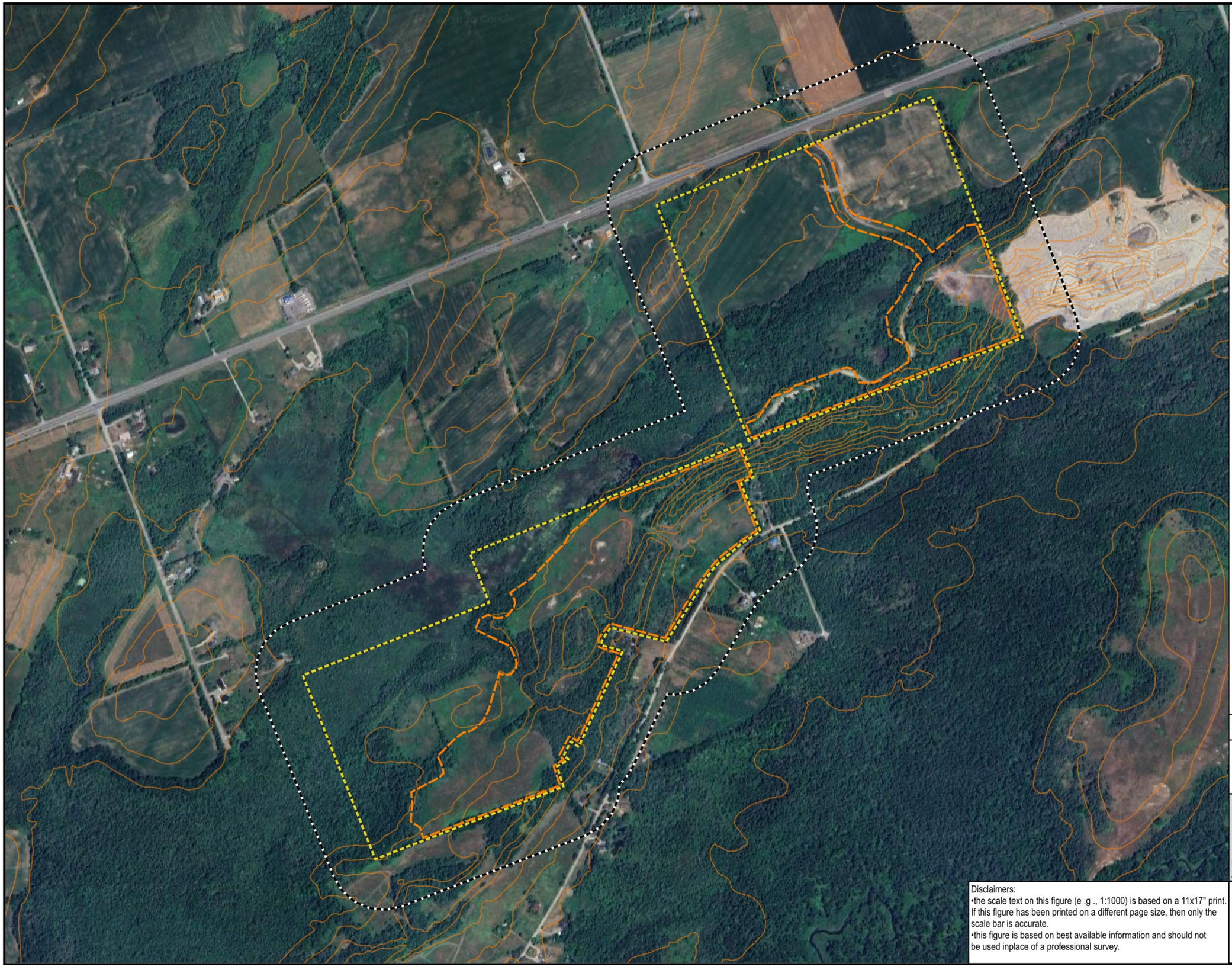
Figure 3. Peterborough County Features

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

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Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary

Land Information Ontario (Ontario Geohub)

- 5m Contours

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 2, 2026	By: ET

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Scale: 1:8,000

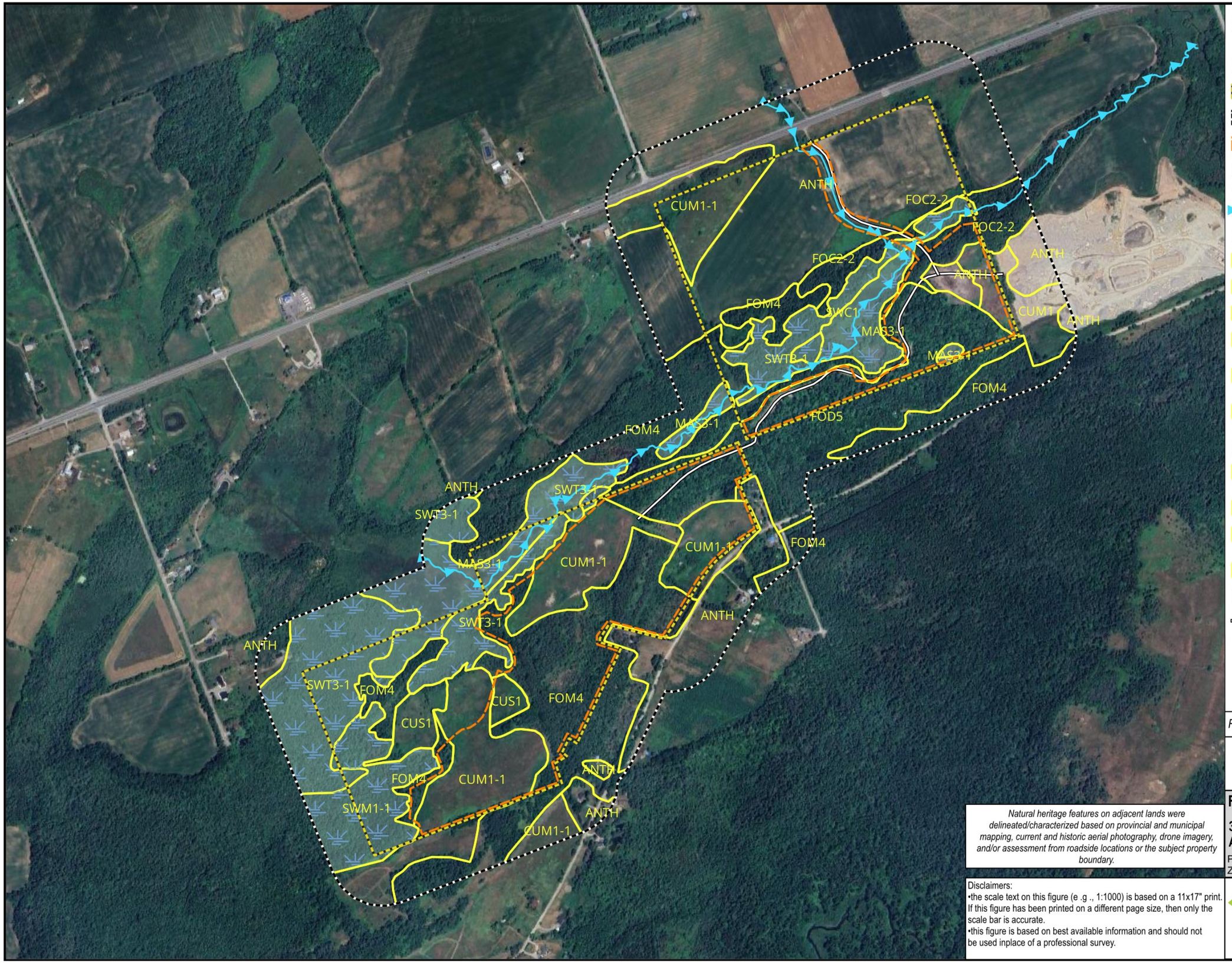
Figure 4. Surficial Geology and Topography

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

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Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary

Natural Heritage Features - Identified by RiverStone

- Watercourses

Ecological Land Classification (ELC)

- ANTH - Anthropogenic
- CUM1-1 - Dry-Moist Old Field Meadow Type
- CUS1 - Mineral Cultural Savannah Ecosite
- FOC2-2 - Dry-Fresh White Cedar Coniferous Forest Type
- FOD5 - Dry-Fresh Sugar Maple Deciduous Forest Ecosite
- FOM4 - Dry-Fresh White Cedar Mixed Forest Ecosite

Wetlands

- SWC1 - White Cedar Mineral Coniferous Swamp Ecosite
- SWT3-1 - Alder Organic Thicket Swamp Type
- SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp Type
- MAS3-1 - Cattail Organic Shallow Marsh Type

Existing Development

- Access Road

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 2, 2026	By: ET

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Scale: 1:8,000

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

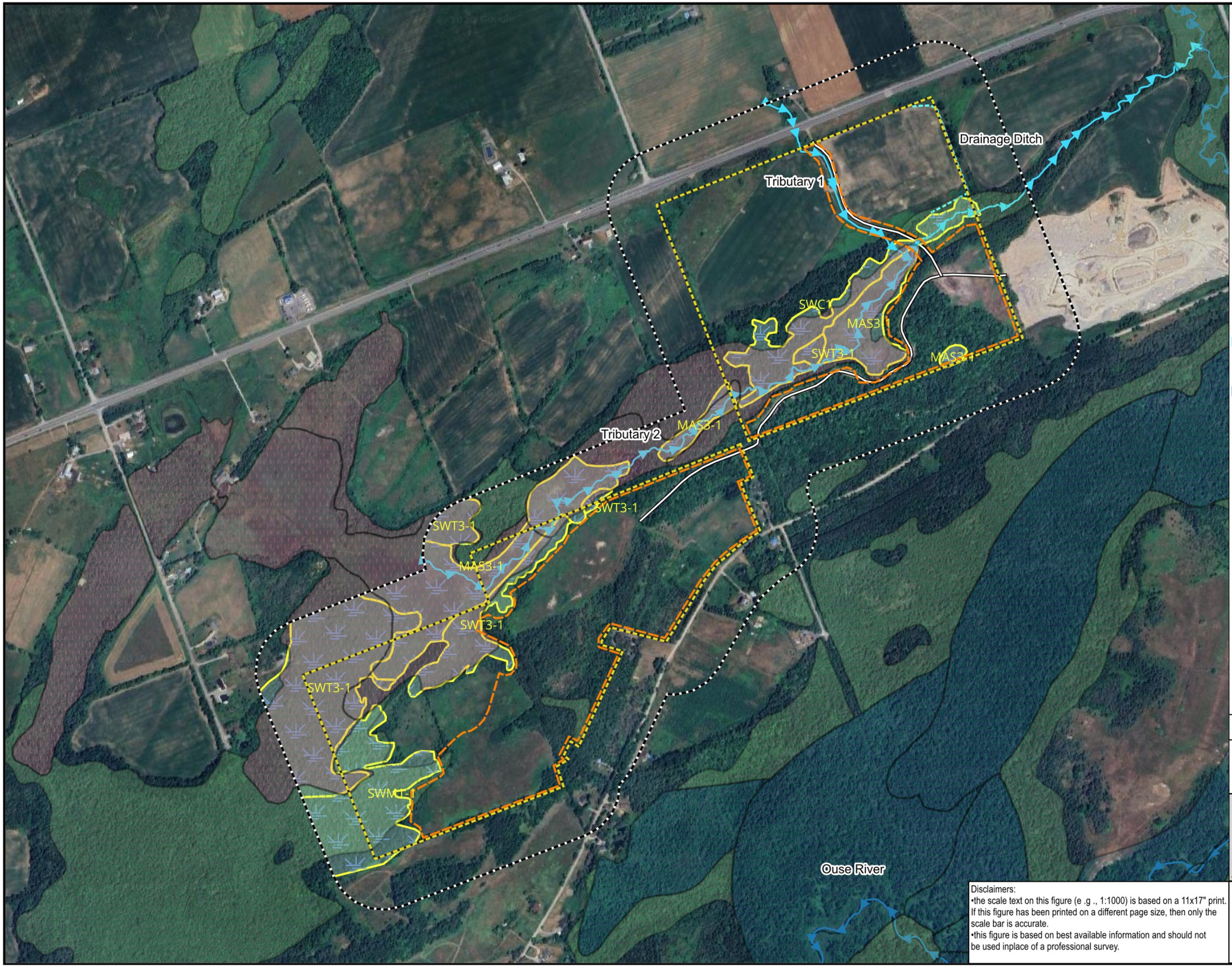
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Figure 5. Vegetation Communities

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

RIVERSTONE ENVIRONMENTAL SOLUTIONS INC.



Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary

Natural Heritage Features - Identified by Province (Geohub)

Wetlands

- Evaluated-Other
- Evaluated-Provincial
- Unevaluated

Natural Heritage Features - Identified by RiverStone

- Watercourses
- Drainage Ditch
- Ouse River

Wetlands

- SWC1 - White Cedar Mineral Coniferous Swamp Ecosite
- SWT3-1 - Alder Organic Thicket Swamp Type
- SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp Type
- MAS3-1 - Cattail Organic Shallow Marsh Type

Existing Development

- Access Road

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 2, 2026	By: ET

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Scale: 1:8,000

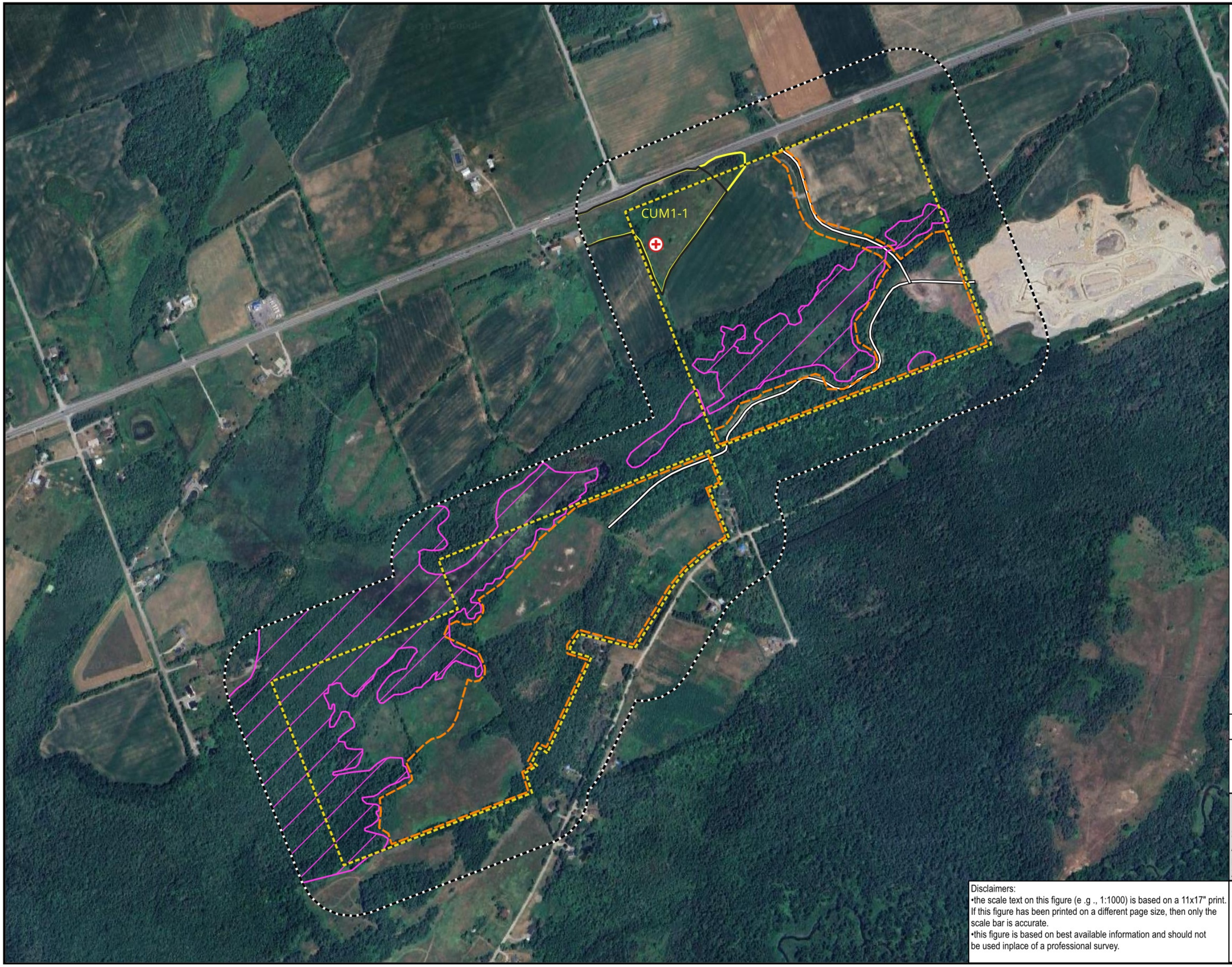
Figure 6. Aquatic Features

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

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RIVERSTONE ENVIRONMENTAL SOLUTIONS INC.



Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary

Natural Heritage Features - Identified by RiverStone

Ecological Land Classification (ELC)

- CUM1-1 - Dry-Moist Old Field Meadow Type

Habitat of Endangered and Threatened Species

- Eastern Meadowlark Nest
- Eastern Meadowlark Habitat (200m radius)
- Black Ash

Existing Development

- Access Road

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 2, 2026	By: ET

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Scale: 1:8,000

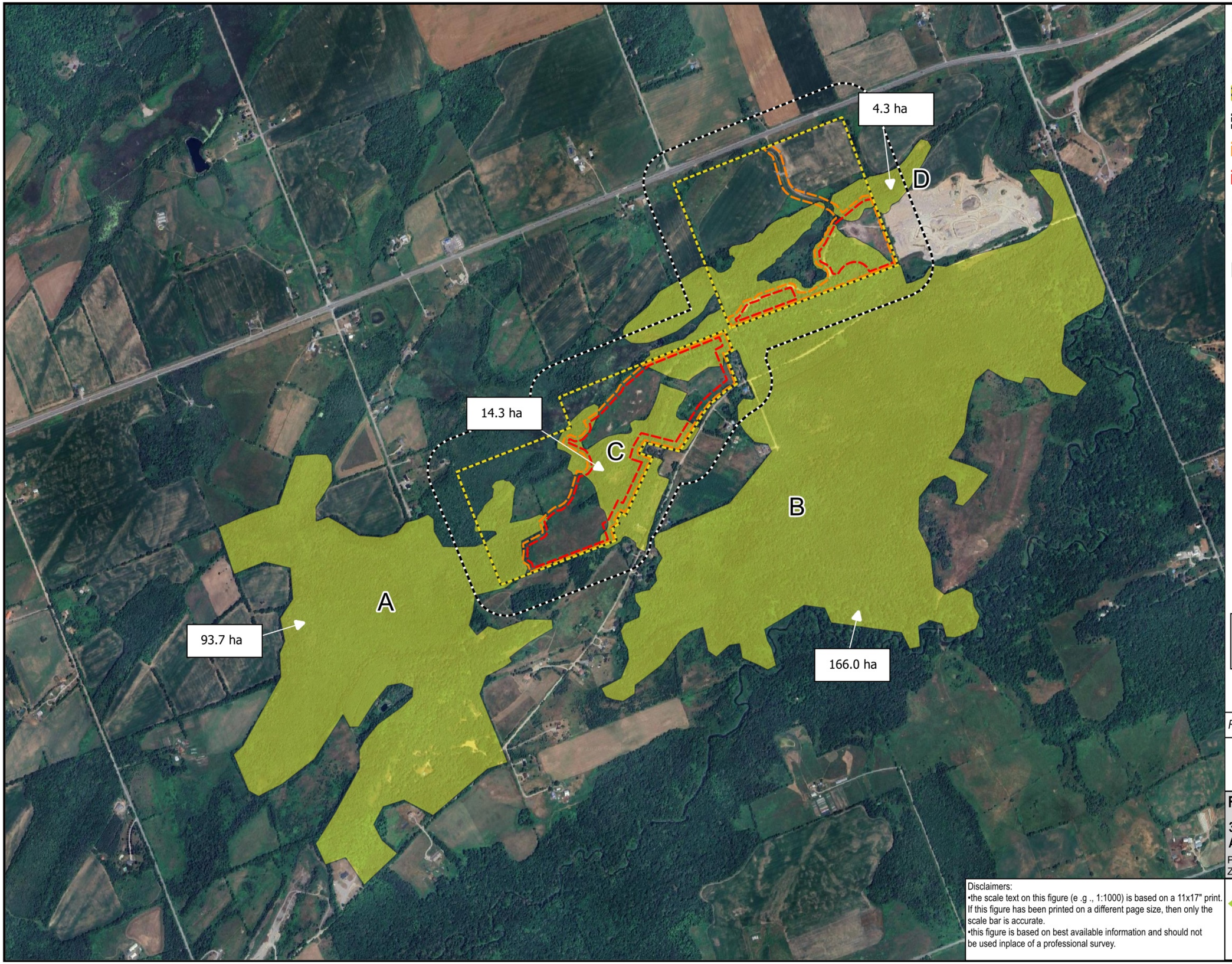
Figure 7. Habitat of Endangered and Threatened Species

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

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RIVERSTONE ENVIRONMENTAL SOLUTIONS INC.



Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary
- Limit of Extraction

Natural Heritage Features - Identified by RiverStone

Wooded Area

- Woodlands

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 2, 2026	By: ET

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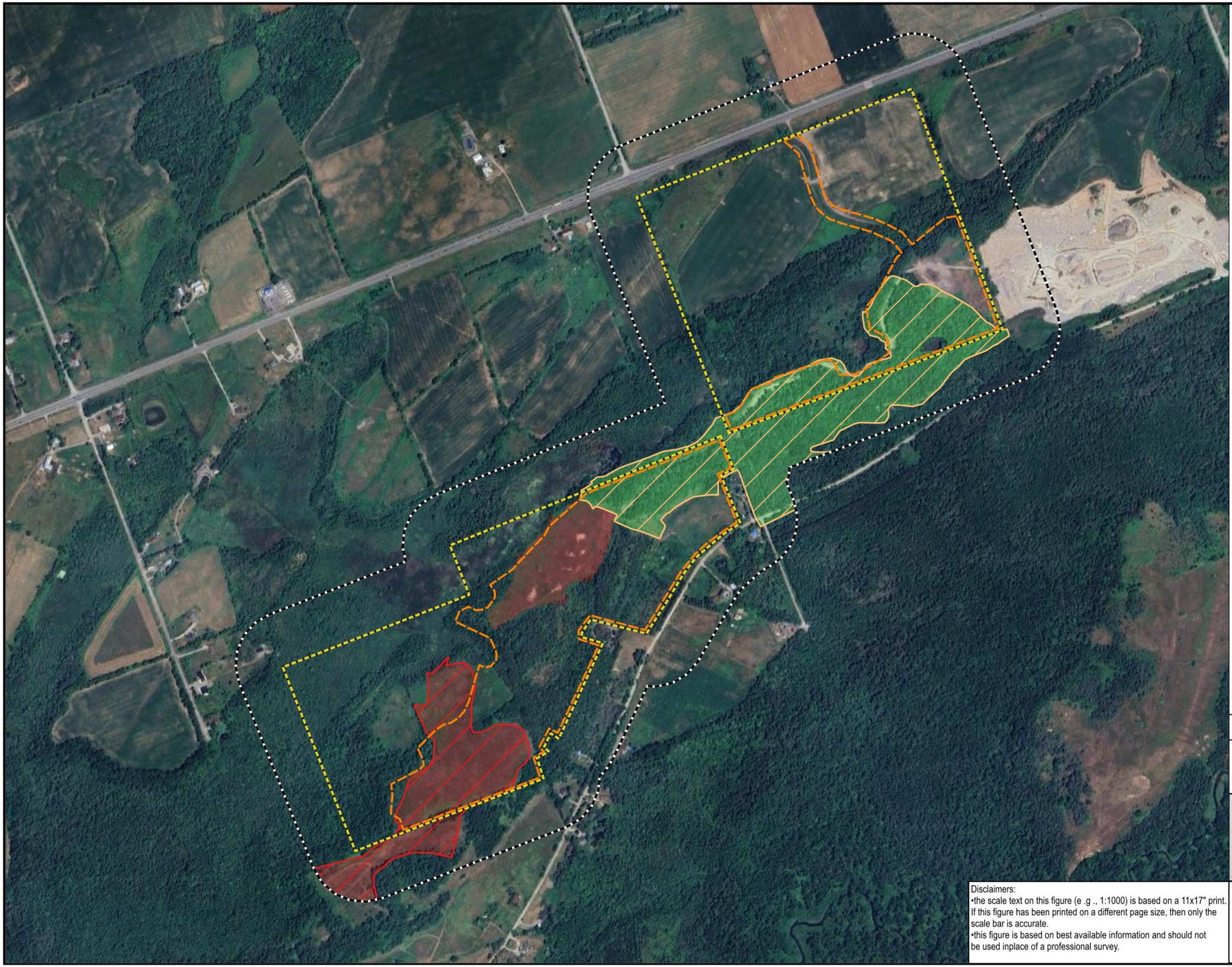
Figure 8. Significant Woodlands

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

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RIVERSTONE ENVIRONMENTAL SOLUTIONS INC.



Legend

Planning Boundaries

- Subject Property
- Assessment Area
- Site - Licence Boundary

Significant Wildlife Habitat - Confirmed

SWH - Bat Maternity Colony

- SWH - Bat Maternity Colony

SWH - Species of Special Concern

- Grasshopper Sparrow
- Eastern Wood-pewee
- Monarch Butterfly

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 2, 2026	By: ET

0 100 200 300 400 m

Scale: 1:8,000

Figure 9. Significant Wildlife Habitat

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

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RIVERSTONE ENVIRONMENTAL SOLUTIONS INC.

N Asphodel 6th Line

HWY 7

Drainage Ditch

Tributary 1

Licence Boundary Area:
10.2 ha

Limit of Extraction Area:
4.9 ha

Reforestation Area:
4.9 ha

Tributary 2

Limit of Extraction Area:
1.0 ha

Reforestation Area:
1 ha

N Asphodel 5th Line

Sand Rd

Cooper

Reforestation Area:
14.1 ha

Limit of Extraction Area:
19.3 ha

Licence Boundary Area:
26.2 ha

Ouse River

Legend

Planning Boundaries
- Subject Property
- Study Area (Licenced Area + 120m)
- Site - Licence Boundary
- Limit of Extraction

Land Information Ontario (Ontario Geohub)
- Roads

Significant NHFs within Licenced Boundary + 120m
- Wetlands

Natural Heritage Features - Identified by RiverStone
- Watercourses
- Ouse River
- Drainage Ditch

Existing Development
- Access Road

Avoidance and Mitigation Measures

Recommended by RiverStone
- Monarch Habitat Cultural Meadow
- Pre-emptive Planting Adjacent to Wetlands
- Tributary 1 Planting Area
- Woodland Thinning Area
- Potential Grassland Compensation Area
- Bat Box Locations
- Reforestation Area
- Permanent Sediment and Erosion Control Fencing
- Turtle Exclusion Fencing

Orthorectified Aerial Photograph 2025

RS Project No. 2024-040	June 3, 2026	By: ET

0 100 200 300 400 m

Scale: 1:8,000

Natural heritage features on adjacent lands were delineated/characterized based on provincial and municipal mapping, current and historic aerial photography, drone imagery, and/or assessment from roadside locations or the subject property boundary.

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Figure 10. Recommended Rehabilitation

3749 Highway 7 & 926 Sand Road, Township of Asphodel-Norwood

Prepared for: Drain Bros. Excavating Limited c/o Brian Zeman

RIVERSTONE ENVIRONMENTAL SOLUTIONS INC.

Appendix 1. Curricula Vitae.

Beverley J. Wicks, Ph.D.
Senior Ecologist, Principal

CAREER AND ACADEMIC HISTORY

2008 – Present	**Senior Ecologist, Principal; RiverStone Environmental Solutions Inc.**
2002 – 2008	Aquatic Biologist; Michalski Nielsen Associates Limited
2001	Research Assistant; Simon Fraser University, Burnaby, BC
1998 – 2001	Ph.D., University of British Columbia, Aquatic/Fisheries Toxicology
1998 – 2001	Research Assistant; University of British Columbia, Vancouver, BC
1997	Fisheries Biologist; Department of Environment, Lands and Parks, Vancouver, BC
1994 – 1996	M.Sc., University of Guelph, Guelph, ON
1993	Fisheries Technician; Trout Unlimited/Ontario Ministry of Natural Resources
1990 – 1992	Fisheries Technician; Ontario Ministry of Natural Resources, Muskoka Lakes Fisheries Assessment Unit
1989 – 1994	Honours B.Sc. (Agr.) University of Guelph, Guelph, ON

Professional Experience

Bev is a senior ecologist and project manager specializing in the characterization and management of fish and aquatic habitat. With 20 years of experience, she has managed many projects involving both terrestrial and aquatic systems including: completing species at risk assessment, fish habitat surveys and mapping, habitat rehabilitation and impact assessment for development and infrastructure, and water quality impact assessment. Bev manages and reviews both terrestrial and aquatic aspects of natural heritage planning exercises with results intended for incorporation into municipal and provincial policy.

The following is a partial list of consulting-based project experience for 2008–2022.

Ecological Site Assessments & Environmental Impact Studies/Statements

- Existing Ecological Conditions Assessment in the **Region of Peel**; *for the Regional Municipality of Peel*; **Key Tasks**: As part of a Municipal Class EA, project management, fish habitat assessment, impact analysis, assessment of policy compliance, and development of mitigation plan, and reporting in support of the rehabilitation of multiple bridge and culverts along Highway 50.
- Existing Ecological Conditions Assessment for three structures in the **Town of Caledon**; *for the Town of Caledon*; **Key Tasks**: As part of three separate Municipal Class EAs, project management, fish habitat assessment, impact analysis, assessment of policy compliance, and development of mitigation plan, and reporting in support of the rehabilitation of multiple structures along municipal roadways.
- Natural Environment Addendum in the **Town of Caledon/City of Brampton**; *for the Regional Municipality of Peel*; **Key Tasks**: project management, fish habitat assessment, impact analysis, assessment of policy compliance, and development of mitigation plan, and reporting in support of the expansion of Mayfield Road.

- Natural Environment Level 1 and Level 2 Technical Report in the **City of the Kawartha Lakes**; *for private client.*; **Key Tasks**: project management, fish habitat assessment, impact analysis, assessment of policy compliance, and development of mitigation plan to facilitate licensing of quarry under *Aggregate Resources Act* and obtaining a permit under *Endangered Species Act, 2007*
- Natural Environment Level 1 and Level 2 Technical Report in the **Township of Lake of Bays**; *for private client*; **Key Tasks**: project management, fish habitat assessment, impact analysis, assessment of policy compliance, development of mitigation plan to facilitate licensing of quarry under *Aggregate Resources Act* and avoidance of habitat protected under *Endangered Species Act, 2007*
- Natural Environment Level 1 and Level 2 Technical Report in the **Town of Bracebridge**; *for private client*; **Key Tasks**: project management, fish habitat and SAR assessment, impact analysis, assessment of policy compliance, development of mitigation plan to facilitate licensing of quarry under *Aggregate Resources Act*, *Fisheries Act review*, and avoidance of habitat protected under *Endangered Species Act, 2007*
- Natural Environment Level 1 and Level 2 Technical Report in the **Township of Ramara**; *for private client*; **Key Tasks**: project management, fish habitat and species at risk assessment, impact analysis, assessment of policy compliance, development of mitigation plan to facilitate licensing of quarry under *Aggregate Resources Act* and avoidance of habitat protected under *Endangered Species Act, 2007*
- Fisheries and Species at Risk for Natural Environment Level 1 and Level 2 Technical Report in the **Township of Faraday**; *for private client*; **Key Tasks**: project management, fish habitat assessment, impact analysis, assessment of policy compliance, development of mitigation plan to facilitate licensing of quarry under *Aggregate Resources Act*, Fisheries Act review, overall benefit permitting work and avoidance of habitat protected under *Endangered Species Act, 2007*
- Fish Habitat Impact Assessment and Water Quality Monitoring in the **Township of Muskoka Lakes**; *for private client;* **Key Tasks**: fish and aquatic habitat and impact assessment, development of water quality monitoring program to establish baseline conditions, and reporting as part of a Level ½ Natural Environment Report in support of a proposed quarry.
- Species at Risk and Fisheries Assessment in the **Township of Guelph/Eramosa**; *for River Valley Developments Inc.;* **Key Tasks**: project management, fisheries assessment, obtaining of permitting and approvals for the renewal of active extraction at an existing licensed quarry.
- Natural Environment Addendum in the **Town of Caledon/City of Brampton**; *for the Regional Municipality of Peel*; **Key Tasks**: project management, agency liaison, fish and aquatic habitat surveys, identification and assessment of significant natural heritage features, mitigation opportunities, reporting, permitting and approvals for the widening and reconstruction of ~7 Km of Mayfield Road (Phases 1 and 2).
- Environmental Impact Statement Addendum in the **Township of Southgate**; *Flato Developments Inc.*; **Key Tasks**: ELC, species at risk habitat assessment, wetland delineation, fisheries and aquatic habitat assessment, botanical inventory in support of a two phase plan of subdivision.
- Environmental Impact Assessment in the **Town of Uxbridge-Durham Region**; *for private client*; **Key Tasks**: project management, impact assessment, environmental conditions report, and analysis of impacts and mitigation measures, tree preservation and edge management plan, and TRCA permits for a 35-lot estate subdivision development.
- Environmental Impact Assessment in the **Town of Mt Albert-York Region**; *for private client*; **Key Tasks**: project management, existing site conditions, opportunities and constraint analysis, report completion, analysis of impacts and mitigation measures and permitting for a 602-lot estate subdivision development.
- Natural Heritage Evaluation in **King Township-York Region**; *for private client*; **Key Tasks**: project management, policy review, mapping of ecological constraints and report preparation for development of an equestrian centre.

- Environmental Impact Study for island property in the **Township of The Georgian Bay**; *for private client*; **Key Tasks**: project management, identification of fish habitat and significant natural heritage features, assessment of policy compliance, analysis of impacts potentially resulting from proposed multiple lot severance.
- Ecological Site and Impact Assessment on Kyle Island in the **Township of The Archipelago**; *for private client*; **Key Tasks**: project management, identification of fish habitat and significant natural heritage features, assessment of policy compliance, analysis of impacts potentially resulting from proposed single-lot severance.
- Site Evaluation Report for property on Drag Lake in the **Township of Dysart et al**; *for private client*; **Key Tasks**: project management, identification of SAR and fish habitat and significant natural heritage features, assessment of policy compliance, analysis of impacts potentially resulting from proposed multi-lot severance.
- Site Evaluation Report for property on Taylor Island in the **Town of Gravenhurst**; *for private client*; **Key Tasks**: project management, identification of fish habitat and significant natural heritage features, assessment of policy compliance, analysis of impacts potentially resulting from proposed rezoning.
- Environmental Screening and Site Plan in the **Township of Seguin**; *for private client*; **Key Tasks**: project management, identification of significant natural heritage features, assessment of policy compliance, analysis of impacts potentially resulting from proposed land use as a result of re-zoning.
- Site Evaluation Report for property on Kawagama Lake in the **Township of Havelock**; *for private client*; **Key Tasks**: project management, identification of fish habitat and significant natural heritage features, aquatic impact assessment, assessment of policy compliance, analysis of impacts potentially resulting from proposed single-lot severance.
- Significant Natural Heritage Feature Assessment for the **Town of Bracebridge** Official Plan Review; *for Town of Bracebridge*; **Key Tasks**: project management, review existing significant natural heritage feature information in urban and near urban area for Town of Bracebridge.

Environmental Policy and Assessment

- Significant Natural Heritage Feature Assessment for the **Town of Bracebridge** Official Plan Review; *for Town of Bracebridge*; **Key Tasks**: project management, review existing significant natural heritage feature information in urban and near urban area for Town of Bracebridge.
- Large Natural Area Review and Policy Recommendations for the **District Municipality of Muskoka**; **Key Tasks**: scientific literature review, identification of data gaps and present recommendations to establish defendable planning benchmarks for the District of Muskoka.
- Background Research and Literature Review for the **Ontario Ministry of Natural Resources;** Impacts of cottage and shoreline development and associated activities on ecosystem features and functions for the purpose of policy development in Provincial Parks; scientific literature review, identification of data gaps and summary of potential and documented impact.
- Class Environmental Assessment Screening Report on the Severn River in the **Township of Severn** ; *for private client*; **Key Tasks**: project management, fish habitat assessment, impact analysis of application to dredge, and assessment of compliance with federal policy to facilitate dredging of marina.

Aquatic Habitat and Fisheries Assessments

- Fish Habitat Impact Assessment and Creek Channel Design Lakeshore Drive and Centennial Park Improvements in the **City of Barrie**; *for IBI Group*; **Key Tasks:** project management, permitting and agency liaison, contract tendering, construction monitoring, stream assessment, identification of fish habitat, data

management, and analysis of impacts and mitigation measures for road reconstruction and park improvements project.

- Fish Habitat and Species at Risk Level 1 Assessment on Cole Lake in the **Township of Carling**; *for private client*; **Key Tasks**: project management, identification of fish habitat and significant natural heritage features, assessment of policy compliance, analysis of impacts potentially resulting from proposed single-lot severance.
- Fish Habitat Assessment on Georgian Bay, in the **Township of Georgian Bay**; *for private client*; **Key Tasks**: project management, fish habitat assessment, assessment of policy compliance.
- Environmental Evaluation Report in the **Town of East Gwillimbury**; *for private client*; **Key Tasks**: identification of fish habitat and significant natural heritage features, assessment of policy compliance, and analysis of impacts potentially resulting from subdivision development.

Fisheries Mitigation and Compensation/ DFO/MNR/CA Permit Applications

- Barrie Essa Road Reconstruction; for **City of Barrie**: **Key Tasks**: project management, fish habitat assessment, natural channel design and permitting, and construction mitigation measures development and monitoring protocol
- Fisheries Assessment for Highway 101 **Foleyete** for **Ministry of Transportation**; **Key Tasks:** project management, stream and fish habitat assessment, analysis of impacts and mitigation measures, agency approvals, construction monitoring.
- Muskoka Wharf Shoreline Assessment/Compensation Project at the Muskoka Wharf on Lake Muskoka in the **Town of Gravenhurst**; *for The Town of Gravenhurst*; **Key Tasks**: project management, fish habitat assessment, design of rehabilitated shoreline, and construction mitigation measures development and monitoring protocol.
- Fish Habitat Compensation, on the Mill Pond in the **Town of Parry Sound**; *for Crofter's Food Ltd*; **Key Tasks**: project management, fish habitat assessment, obtain permits and develop compensation plan.
- Kearney – Un-named Creek Rehabilitation, in the **Township of Perry**; *for private client*; **Key tasks**: project management, fish habitat assessment, obtain permits and develop restoration and compensation plan.
- Culvert Replacement, Mitigation and Compensation, in the **Town Parry Sound**; *for private client*; **Key Tasks**; project management, fish habitat assessment, obtain permits and develop restoration and compensation plan.
- Fisheries permitting and compensation for new Coaster in the **City of Vaughn**; *for Canada's Wonderland*; **Key Tasks**: project management, fish habitat assessment, permitting, compensation plan, construction mitigation measures and monitoring protocol.
- County Road 28 Reconstruction near Minesing Swamp in the **County of Simcoe**; *for R.J. Burnside and Associates*; **Key Tasks**: project management, fish habitat assessment, permitting, compensation plan, construction mitigation and monitoring.

Limnology, Water Quality/Sediment Quality Investigations

- Muskoka Lakes Association Water Quality Initiative Program in various townships of the **District of Muskoka**; *for the Muskoka Lakes Association* **Key Tasks**: project management, science and technical advisor, directed analysis of yearly water quality program and making scientific recommendations, and educational support.

- Aquatic Study in Lake Couchiching in the **County of Simcoe**; *for Totten Sims Hubicki Associates*; **Key Tasks**: project management, aquatic monitoring and benthic invertebrates assessment, impact analysis for Westshore Water and Sewage project.
- Bond Head – Environmental Monitoring, Holland River in the **Township of East Gwillimbury**; *for Geranium Homes;* **Key Tasks**: project management, collection and analysis of water quality data, background conditions report.
- Muskoka River Benthic and Water Quality Analysis in the **District of Muskoka**; *for the Town of Hunstville;* **Key Tasks**: project management, water monitoring and benthic invertebrates assessment, impact analysis.
- Phase 1 and Phase 2 Water Quality Impact Assessment on Lake Joseph in the **Township of Muskoka Lakes**; *for private client*; **Key Tasks**: project management, identification of significant natural heritage features, locate suitable development envelopes, and analysis of impacts and mitigation measures for single lot severance and development on identified over-threshold waterbody.
- Phase 2 Water Quality Impact Assessment on Medora Lake in the **Township of Muskoka Lakes**; *for private client*; **Key Tasks**: project management, identification of significant natural heritage features, locate suitable development envelopes, and analysis of impacts and mitigation measures for single lot severance and development on identified over-threshold waterbody.
- Phase 2 Water Quality Impact Assessment on Three Mile Lake in the **Township of Muskoka Lakes**; *for private client*; **Key Tasks**: project management, identification of significant natural heritage features, locate suitable development envelopes, and analysis of impacts and mitigation measures for single lot severance and development on identified over-threshold waterbody.

Relevant Certification or Training Courses

2021 CISEC Training and Certification

2020 Fisheries Protection Program Fisheries Act Training, Fisheries and Oceans Canada Central and Arctic Region.

2018 Natural Channel Systems Training

2013 Fisheries Assessment and Fisheries Contract Specialist, as per Ministry of Transportation / Department of Fisheries and Oceans / Ontario Ministry of Natural Resources, fisheries protocol training

2012 Water Management and Wetland Restoration MNR

2009 Ontario Benthos Biomonitoring Network participant, Ontario Ministry of the Environment

2003 Ichthyology course, Royal Ontario Museum Centre of Biodiversity and Conservation Biology

Publications

Wicks, B.J. and D.J. Randall. 2002. The effect of sub lethal ammonia exposure on fed and unfed rainbow trout: the role of glutamine in the regulation of ammonia. Comparative Biochemistry and Physiology. Part A: Molecular and Integrative Physiology. 132: 275-285.

Wicks, B.J. and D.J. Randall. 2002. The effect of feeding and fasting on ammonia toxicity in juvenile rainbow trout, *Oncorhynchus mykiss*. Aquatic Toxicology. 59:71-82.

Wicks, B.J., Q. Tang, R. Joensen, D.J. Randall. 2002. Swimming and ammonia toxicity in salmonids: the effect of sub lethal ammonia exposure on the swimming performance of coho salmon and the acute toxicity of ammonia in swimming and resting rainbow trout. Aquatic Toxicology. 59:55-69.

Rosenfeld, J.S., M. Porter, M. Pearson, **B. Wicks**, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth, *Acrocheilus alutaceus* in British Columbia. Env. Biol. Fish. 62: 401-413.

Val, A.L., **B.J. Wicks** and D.J. Randall. 2001. Anaemia and polycythaemia affect levels of ATP and GTP in fish red blood cells. Proceeding of the Sixth International Symposium on Fish Physiology, Toxicology, and Water Quality. Baja, Mexico.

Randall, D.J. and **B.J. Wicks**. 1999. Fish ammonia production, excretion and toxicity. Paper presented in the Fifth International Symposium on Fish Physiology, Toxicology and Water Quality, 9-12 November 1998, City University of Hong Kong.

Wicks, B.J., L.A. Barker, B.J. Morrison and F.W.H. Beamish. 1998. Gonadal variation in Great Lakes sea lamprey larvae. J. Great Lakes Res. 24: 962-968.

Barker, L.A. B.J. Morrison, **B.J. Wicks** and F.W.H. Beamish. 1998. Potential fecundity of landlocked sea lamprey larvae, *Petromyzon marinus*, with typical and atypical gonads. Copeia. 1998: 1070-1075.

Barker, L.A., B.J. Morrison, **B.J. Wicks** and F.W.H. Beamish. 1997. Age discrimination and statolith diversity in sea lamprey from streams with varying alkalinity. Trans. Am. Fish. Soc. 126:1021-1026.

Appendix 2. Representative Photographs.

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Photo 1. CUM1-1 Dry – Moist Old Field Meadow Type with Anuran Calling station 4 in the background (June 18, 2024).



Photo 2. ANTH – Anthropogenic (June 2, 2024).



Photo 3. SWC1 White Cedar Mineral Coniferous Swamp Ecosite (October 10, 2024).



Photo 4. FOC2-2 Dry – Fresh White Cedar Coniferous Forest Type (July 3, 2024).



Photo 5. FOM4 Dry – Fresh White Cedar Mixed Forest Ecosite (July 3, 2024)



Photo 6. SWT3-1 Alder Organic Thicket Swamp Type (October 10, 2024).



Photo 7. MAS3-1 Cattail Organic Shallow Marsh Type (October 10, 2024).



Photo 8. FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite (June 2, 2024).



Photo 9. CUS1 Mineral Cultural Savannah Ecosite (July 3, 2024).



Photo 10. Tributary of the Ouse River and location of Anuran Calling station 1 (October 11, 2024).



Photo 11. Drainage ditch through Anthropogenic field (May 16, 2024).



Photo 12. Existing roadway on the subject property (June 2, 2024).



Photo 13. Active pit on adjacent lands (June 2, 2024).



Photo 14. Drainage ditch on northeastern property boundary (October 10, 2024).



Photo 15. Wetland inclusion at Turtle station 1 and Anuran Calling station 2 (June 12, 2024).



Photo 16. Shallow water at edge of wetland at Turtle station 3 (June 2, 2024).



Photo 17. Wetland shoreline conditions at Turtle station 2 and Anuran Calling station 3 (July 3, 2024).



Photo 13. Conditions adjacent to Anuran Calling station 5 (July 3, 2024).

Appendix 3. Results of Bat Snag Assessment.

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Appendix 3 - Bat Snag Analysis

Plot #	Height	Snag/Cavity	# of Holes	% of Bark	DBH (cm)	Tree Species
C1	No Snags					
C2	medium	cavity	low	0	39	Eastern White Cedar
	medium	cavity	low	0	37	Eastern White Cedar
	tall	cavity	few	0	47	Bur Oak
C3	short	snag	0	25	26	White Spruce
	medium	snag	0	50	28	White Spruce
C4	No Snags					
C5	No Snags					
C6	tall	snag	0	25	27	Eastern White Pine
C7	No Snags					
C8	No Snags					
C9	No Snags					
C10	No Snags					
M1	No Snags					
M2	tall	snag	few	29	22	Poplar Species
	tall	cavity	few	0	29	Trembling Aspen
M3	No Snags					
M4	No Snags					
M5	medium	cavity	few	0	25	Eastern White Cedar
M6	medium	snag	few	0	25	Eastern White Cedar
	medium	snag	few	5	27	Eastern White Cedar
M7	No Snags					
M8	No Snags					
M9	No Snags					
M10	medium	snag	0	15	21.5	Scots Pine
M11	No Snags					
M12	No Snags					
M13	medium	Cavity	lots	0	29	Trembling Aspen
	medium	snag	lots	0	24	Trembling Aspen
	medium	snag	few	5	29	Trembling Aspen

Height Code

Tall ->15 m

Medium = 5-15 m

Small = up to 5 m

# of Hole

Few = 1-4

Lots = 5+

none = 0

	medium	snag	lots	0	27	Trembling Aspen
M14	No Snags					
M15	No Snags					
M16	medium	snag	few	0	35	Trembling Aspen
M17	No Snags					
M18	No Snags					
D1	tall	Cavity	lots	0	36	Eastern White Cedar
	tall	Cavity	lots	0	25	Eastern hemlock
	tall	Cavity	lots	0	25	Eastern hemlock
D2	tall	Cavity	few	0	33	American Basswood
	tall	Cavity	few	0	37	American Basswood
D3	tall	Cavity	lots	5	71	Sugar Maple
D4	tall	Cavity	few	0	35	American Basswood
	short	snag	0	50	17	American Basswood
D5	tall	Cavity	few	0	42	Sugar Maple
D6	tall	Cavity	lots	0	44	Sugar Maple
D7	No Snags					
D8	tall	Cavity	lots	5	45	White Ash
D9	No Snags					
D10	No Snags					

Vegetation Community	Community size m2	Community Size Ha	# of sample plots	Total # of snags in sample plots	Snags/ha
FOD	160141	16	9	8	0.5
FOC	28698	2.9	3	4	1.37931
FOM	95489	9.5	20	8	0.842105
SWC	35251	3.5	4	7	2
SWM	32908	3.3	2	1	0.30303

Appendix 4. License to Collect Fish for Scientific Purposes, Authorization No. PEBA-2024-FWCA-00431

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

Ontario

Licence to Collect Fish for Scientific Purposes
Fish and Wildlife Conservation Act

Authorization No.
PEBA-2024-FWCA-00431

This licence is issued under Part IV of Ontario Regulation 664/98 (Fish Licensing) made under the *Fish and Wildlife Conservation Act, 1997* to collect the species, sizes and quantities of fish from the waters as set out below.

LICENSEE:

This Licence is issued to:	Mailing Address of Licensee:
Al Shaw	**47 Quebec Street** **Bracebridge Ontario** **P1L 2A5**
Phone Number of Licensee:	Email Address of Licensee:
705-641-0640	al@rsenviro.ca

Name of Business/Organization/Affiliation: RiverStone Environmental Solutions Inc.

LICENCE EFFECTIVE DATE:	2024-08-06	**LICENCE EXPIRY DATE:**	2024-12-31

PURPOSE OF COLLECTION: to conduct an Environmental Impact Assessment on properties located at 3749 Highway 7 and 926 Sand Road in the Township of Asphodel-Norwood.

This Licence authorizes the licence holder together with the assistants named in application PEBA-2024-FWCA-000431 (the “Application”) to collect the species, sizes and quantities of fish from the waters and locations identified in the Application.

LICENCE CONDITIONS:

1. This licence and the Application must be carried at all times while activities are being carried out under the authority of the licence.

2. Fish can only be collected by means of the following gear: ***dip nets, baitfish traps and electrofishing gear (backpack).***

3. All gear used to collect fish shall be inspected at least once daily and clearly marked with the name and licence number of the licence holder any time it is left unattended while in the water.

4. Due to potential spawning activity by resident or migratory fish species, visual inspection of all sampling areas must be done prior to sampling. Sampling must not be initiated if spawning activity or redds are observed. Should spawning activity or redds be observed after sampling has commenced, all sampling must be stopped in order to prevent disturbance to the fish and habitats.

5. All gear and equipment used for fish collection shall be decontaminated using the decontamination methods outlined for watercraft and watercraft equipment in the document entitled “*Best Management Practices for Preventing the Spread of Aquatic Invasive Species – Guidance for Watercraft Users”*, dated 2021, available on a website maintained by the Government of Ontario.

6. Unless specified otherwise in these conditions, all live fish collected, other than a species classified as a prohibited or restricted invasive species under the *Invasive Species Act, 2015* or an aquatic invasive species set out under the *Aquatic Invasive Species Regulations* (AISR) made under the *Fisheries Act* (Canada), shall be immediately released, in a manner that causes the least harm to the fish, into the closest suitable habitat outside of the work area.

7. Any person acting under the authority of this licence, shall immediately report the capture of any invasive fish species, as defined in the AISR, (e.g. Ruffe, Tubenose Goby, Round Goby, rusty crayfish, invasive carp, etc.) to the Invading Species Hotline (1-800-563-7711) or www.eddmaps.org/ontario/distribution. Any such specimens shall be euthanized (and eviscerated if required under either the AISR or the *Ontario Fishery Regulations, 2007*).

8. Unless specifically authorized under the *Endangered Species Act, 2007* (ESA) (e.g., regulation or permit) and/or federal *Species at Risk Act* (SARA) permit, sampling must cease when a species at risk is caught. These fish shall be immediately released in a manner that causes the least harm to the fish, into the closest suitable habitat outside of the work area. The appropriate authorities shall be notified to obtain required authorization prior to continuation of sampling. Contact the Ministry of Environment, Conservation and Parks (https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization) and/or Fisheries and Oceans Canada (https://www.dfo-mpo.gc.ca/species-especes/sara-lep/permits-permis/index-eng.html) for information on the relevant authorization.

9. All fish species at risk must also be reported to the Ministry of Natural Resources and Forestry Natural Heritage Information Centre on the appropriate form at: Natural Heritage Information Centre (NHIC) Observation Reporting Form | EngageON (ontario.ca)

10. The holder this licence shall complete a report as required under subsection 34.1(9) of Ontario Regulation 664/98 and submit it to the Minister by January 31 following the licence expiration.

    For a link to the reporting form, please go to the related page on Ontario.ca.

This licence is not valid in Provincial Parks, Conservation Reserves, National Parks, National Historic canals and waterways, National Marine Conservation Areas, or Conservation Authority property without the written permission from the authorized person in charge of the area concerned.

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

Ministry Approval

Issued by: Jesse Van Allen	Signature: Jesse Van Allen box SIGN 427WK5RY-13V8Q5J9	Date Signed: 08/06/2024

Appendix 5. List of Vascular Plant Species Recorded during Targeted Surveys and/or Incidentally.



SCIENTIFIC NAME	COMMON NAME	CC[1]	CW[1]	OWES WETLAND PLANT LIST[2]	G_RANK[3]	S_RANK[4]	COSEWIC[5]	PROTECTED SPECIES IN ONTARIO LIST	COSSARO
Abies balsamea	Balsam Fir	5	-3	X	G5	S5			
Acer negundo	Manitoba Maple	0	-2	X	G5	S5			
Acer rubrum	Red Maple	4	0	X	G5	S5			
Acer saccharinum	Silver Maple	5	-3	X	G5	S5			
Acer saccharum	Sugar Maple	4	3		G5	S5			
Achillea millefolium	Common Yarrow	*	3		G5	SNA			
Actaea sp.	Baneberry sp.								
Adiantum pedatum	Northern Maidenhair Fern	7	1		G5	S5			
Alisma triviale	Northern Water-plantain				G5	S5			
Alliaria petiolata	Garlic Mustard	*	0		GNR	SNA			
Allium tricoccum var. tricoccum	Wild Leek	7	2		G5	S4			
Alnus incana	Speckled Alder	6	-5	X	G5	S5			
Amelanchier arborea	Downy Serviceberry	5	3		G5	S5			
Anemonastrum canadense	Canada Anemone	3	-3	X	G5	S5			
Anemone virginiana var. virginiana	Tall Anemone	4	5		G5T5	S5?			
Antennaria neglecta	Field Pussytoes	3	5		G5	S5			
Aquilegia canadensis	Red Columbine	5	1		G5	S5			
Aralia nudicaulis	Wild Sarsaparilla	4	3		G5	S5			
Arctium minus	Common Burdock	*	5		GNR	SNA			
Asclepias syriaca	Common Milkweed	0	5		G5	S5			
Athyrium filix-femina var. angustum	Northeastern Lady Fern	4	0	X	G5T5	S5			
Betula alleghaniensis	Yellow Birch	6	0	X	G5	S5			
Betula papyrifera	Paper Birch	2	2	X	G5	S5			
Bidens frondosa	Devil's Beggarticks	3	-3	X	G5	S5			
Bromus inermis	Smooth Brome	*	5		G5TNR	SNA			
Calamagrostis canadensis var. canadensis	Bluejoint Reedgrass	4	-5	X	G5T5	S5			
Caltha palustris	Yellow Marsh Marigold	5	-5	X	G5	S5			
Cardamine diphylla	Two-leaved Toothwort	7	5		G5	S5			
Carduus nutans ssp. nutans	Nodding Thistle	*	5		GNRTNR	SNA			
Carex arctata	Drooping Woodland Sedge	5	5		G5	S5			
Carex communis	Fibrous-root Sedge	6	5		G5	S5			
Carex gracillima	Graceful Sedge	4	3	X	G5	S5			
Carex intumescens	Bladder Sedge	6	-4	X	G5	S5			
Carex pedunculata	Long-stalked Sedge	5	5		G5	S5			
Carex pensylvanica	Pennsylvania Sedge	5	5		G5	S5			
Carex platyphylla	Broad-leaved Sedge	7	5		G5	S4S5			
Carex rosea	Rosy Sedge	5	5		G5	S5			
Carex stipata	Awl-fruited Sedge	3	-5	X	G5	S5			
Carpinus caroliniana	Blue-beech	6	0	X	G5	S5			
Carya cordiformis	Bitternut Hickory	6	0		G5	S5			
Caulophyllum thalictroides	Blue Cohosh	6	5		G5	S5			
Chimaphila umbellata	Common Pipsissewa	8	5		G5	S5			
Cichorium intybus	Wild Chicory	*	5		GNR	SNA			
Circaea canadensis	Broad-leaved Enchanter's Nightshade	3	3		G5T5	S5			
Cirsium arvense	Canada Thistle	*	3		GNR	SNA			
Claytonia caroliniana	Carolina Spring Beauty	7	3		G5	S5			
Clematis virginiana	Virginia Clematis	3	0	X	G5	S5			
Clintonia borealis	Yellow Clintonia	7	-1	X	G5	S5			
Coptis trifolia	Goldthread	7	-3	X	G5	S5			
Cornus alternifolia	Alternate-leaved Dogwood	6	5		G5	S5			
Cornus canadensis	Bunchberry	7	0		G5	S5			
Cornus obliqua	Silky Dogwood	5	-4	X	G5T5	S5			
Cornus sericea	Red-osier Dogwood	2	-3	X	G5	S5			
Corylus cornuta	Beaked Hazelnut	5	5		G5	S5			
Crepis tectorum	Narrow-leaved Hawksbeard	*	5		GNR	SNA			
Dactylis glomerata	Orchard Grass	*	3		GNR	SNA			
Daucus carota	Wild Carrot	*	5		GNR	SNA			
Dianthus armeria	Deptford Pink	*	5		GNR	SNA			
Dicentra cucullaria	Dutchman's Breeches	6	5		G5	S5			
Diervilla lonicera	Northern Bush-honeysuckle	5	5		G5	S5			
Dryopteris carthusiana	Spinulose Wood Fern	5	-2	X	G5	S5			
Dryopteris intermedia	Evergreen Wood Fern	5	0		G5	S5			
Dryopteris marginalis	Marginal Wood Fern	5	3		G5	S5			
Echium vulgare	Common Viper's Bugloss	*	5		GNR	SNA			
Epifagus virginiana	Beechdrops	6	5		G5	S5			
Epilobium hirsutum	Hairy Willowherb	*	-4	X	GNR	SNA			
Epipactis helleborine	Broad-leaved Helleborine	*	5		GNR	SNA			
Equisetum arvense	Field Horsetail	0	0	X	G5	S5			
Equisetum hyemale	Common Scouring-rush	2	-2	X	G5	S5			
Equisetum scirpoides	Dwarf Scouring-rush	7	-1	X	G5	S5			
Erigeron annuus	Annual Fleabane	0	1		G5	S5			
Erigeron philadelphicus	Philadelphia Fleabane	1	-3	X	G5	S5			
Erythronium americanum	Yellow Trout Lily	5	5		G5	S5			
Eupatorium perfoliatum	Common Boneset	2	-4	X	G5	S5			
Eurybia macrophylla	Large-leaved Aster	5	5		G5	S5			
Euthamia graminifolia	Grass-leaved Goldenrod	2	-2		G5	S5			
Fagus grandifolia	American Beech	6	3		G5	S4			
Fragaria virginiana ssp. virginiana	Wild Strawberry	2	1		G5T5	SU			
Fraxinus americana	White Ash	4	3		G5	S4			
Fraxinus nigra	Black Ash	7	-4	X	G5	S4	THR	END	END
Fraxinus pennsylvanica	Green Ash	3	-3	X	G5	S4			
Galium palustre	Common Marsh Bedstraw	5	-5	X	G5	S5			
Gaultheria procumbens	Eastern Teaberry	6	3		G5	S5			
Geranium robertianum	Herb-Robert	*	5		G5	S5			
Hemerocallis lilioasphodelus	Yellow Daylily	*	5		GNR	SNA			
Hepatica acutiloba	Sharp-lobed Hepatica	6	5		G5	S5			
Hepatica americana	Round-lobed Hepatica	6	5		G5	S5			
Hydrophyllum virginianum	Virginia Waterleaf	6	-2		G5	S5			
Hypericum perforatum	Common St. John's-wort	*	5		GNR	SNA			
Impatiens capensis	Spotted Jewelweed	4	-3	X	G5	S5			
Iris versicolor	Harlequin Blue Flag	5	-5	X	G5	S5			
Iris x germanica	German Iris	*	5		GNR	SNA			
Juglans nigra	Black Walnut	5	3		G5	S4?			
Juniperus communis	Common Juniper	4	3		G5	S5			
Juniperus virginiana	Eastern Red Cedar	4	3		G5	S5			
Larix laricina	Tamarack	7	-3	X	G5	S5			
Leucanthemum vulgare	Oxeye Daisy	*	5		GNR	SNA			
Lonicera canadensis	Canada Fly-honeysuckle	6	3		G5	S5			

Lonicera tatarica	Tatarian Honeysuckle	*	3		GNR	SNA			
Lotus corniculatus	Garden Bird's-foot Trefoil	*			GNR	SNA			
Lycopus americanus	American Water-horehound	4	-5	X	G5	S5			
Lysimachia borealis	Northern Starflower	6	-1		G5	S5			
Lythrum salicaria	Purple Loosestrife	*	-5	X	G5	SNA			
Maianthemum canadense ssp. canadense	Wild Lily-of-the-valley	5	0		G5T5	S5			
Maianthemum racemosum	Large False Solomon's-seal	4	3		G5	S5			
Matteuccia struthiopteris	Ostrich Fern	5	-3	X	G5	S5			
Medicago lupulina	Black Medick	*	1		GNR	SNA			
Medicago sativa ssp. sativa	Alfalfa	*	5		GNRTNR	SNA			
Melilotus albus	White Sweet-clover	*	3		G5	SNA			
Monotropa uniflora	Indian Pipe	6	3		G5	S5			
Nabalus albus	White Rattlesnakeroot	6	3	X	G5	S5			
Nasturtium officinale	Common Watercress	*	-5		GNR	SNA			
Onoclea sensibilis	Sensitive Fern	4	-3	X	G5	S5			
Oryzopsis asperifolia	Round-leaved Mountain-ricegrass	6	5		G5	S5			
Osmorhiza claytonii	Hairy Sweet Cicely	5	4		G5	S5			
Osmunda claytoniana	Interrupted Fern	7	-1	X	G5	S5			
Osmundastrum cinnamomeum	Cinnamon Fern	7	-3	X	G5	S5			
Ostrya virginiana	Eastern Hop-hornbeam	4	4		G5	S5			
Oxalis montana	White Wood-sorrel	8	3	X	G5	S5			
Parthenocissus quinquefolia	Virginia Creeper	6	1		G5	S4?			
Penstemon digitalis	Foxglove Beardtongue	6	1		G5	S4			
Penstemon hirsutus	Hairy Beardtongue	7	5		G4	S4			
Persicaria amphibia	Water Smartweed								
Phalaris arundinacea var. arundinacea	Reed Canarygrass	0	-4	X	GNR	S5			
Phleum pratense	Common Timothy	*	3		GNR	SNA			
Phragmites australis ssp. australis	European Reed	*	-4	X	G5T5	SNA			
Physalis heterophylla	Clammy Ground-cherry	3	5		G5	S4			
Physalis longifolia	Long-leaved Ground-cherry				G5	S4			
Picea glauca	White Spruce	6	3	X	G5	S5			
Pilosella aurantiaca	Orange Hawkweed	*	5		GNR	SNA			
Pilosella caespitosa	Meadow Hawkweed	*	5		GNR	SNA			
Pinus strobus	Eastern White Pine	4	3	X	G5	S5			
Pinus sylvestris	Scots Pine	*	5		GNR	SNA			
Podophyllum peltatum	May-apple	5	3		G5	S5			
Polypodium virginianum	Rock Polypody	6	5		G5	S5			
Populus alba	White Poplar	*	5		G5	SNA			
Populus balsamifera	Balsam Poplar	4	-3	X	G5	S5			
Populus grandidentata	Large-toothed Aspen	5	3		G5	S5			
Populus tremuloides	Trembling Aspen	2	0		G5	S5			
Potentilla argentea	Silvery Cinquefoil	*	3		GNR	SNA			
Potentilla recta	Sulphur Cinquefoil	*	5		GNR	SNA			
Potentilla simplex	Old Field Cinquefoil	3	4		G5	S5			
Prunus serotina	Black Cherry	3	3		G5	S5			
Prunus virginiana	Chokecherry	2	1		G5	S5			
Pteridium aquilinum	Bracken Fern	2	3		G5	S5			
Pyrola elliptica	Shinleaf	5	5		G5	S5			
Quercus alba	White Oak	6	3		G5	S5			
Quercus macrocarpa	Bur Oak	5	1	X	G5	S5			
Quercus rubra	Northern Red Oak	6	3		G5	S5			
Ranunculus acris	Common Buttercup	*	-2	X	G5	SNA			
Rhamnus cathartica	European Buckthorn	*	3	X	GNR	SNA			
Rhus typhina	Staghorn Sumac	1	5		G5	S5			
Ribes americanum	American Black Currant	4	-3	X	G5	S5			
Ribes cynosbati	Eastern Prickly Gooseberry	4	5		G5	S5			
Ribes triste	Swamp Red Currant	6	-5	X	G5	S5			
Rosa multiflora	Multiflora Rose	*	3		GNR	SNA			
Rubus allegheniensis	Alleghany Blackberry	2	2		G5	S5			
Rubus idaeus ssp. strigosus	North American Red Raspberry	0	-2		G5T5	S5			
Rubus occidentalis	Black Raspberry	2	5		G5	S5			
Rubus pubescens	Dwarf Raspberry	4	-4	X	G5	S5			
Rudbeckia hirta	Black-eyed Susan	0	3		G5	S5			
Salix cordata	Heart-leaved Willow	9	-1		G4	S4			
Salix discolor	Pussy Willow	3	-3	X	G5	S5			
Salix interior	Sandbar Willow	3	-5	X	GNR	S5			
Sambucus racemosa	Red Elderberry	5	2		G5	S5			
Sanguinaria canadensis	Bloodroot	5	4		G5	S5			
Sedum acre	Mossy Stonecrop	*	5		GNR	SNA			
Silene vulgaris	Bladder Campion	*	5		GNR	SNA			
Smilax tamnoides	Hispid Greenbrier	6	0		G5	S5			
Solanum dulcamara	Climbing Nightshade	*	0	X	GNR	SNA			
Solidago caesia	Blue-stemmed Goldenrod	5	3		G5	S5			
Solidago canadensis var. canadensis	Canada Goldenrod	1	3		G5T5	S5			
Solidago flexicaulis	Zigzag Goldenrod	6	3		G5	S5			
Solidago nemoralis ssp. nemoralis	Gray-stemmed Goldenrod	2	5		G5T5	S5			
Solidago rugosa ssp. rugosa	Northern Rough-stemmed Goldenrod	4	-1	X	G5T5	S5			
Spiraea alba var. alba	White Meadowsweet	3	-4	X	G5T5	S5			
Symphyotrichum cordifolium	Heart-leaved Aster	5	5		G5	S5			
Symphyotrichum lanceolatum ssp. lanceolatum var. lanceolatum	White Panicled Aster	3	-3		G5T5	S5			
Symphyotrichum lateriflorum var. lateriflorum	Calico Aster	3	-2	X	G5T5	S5			
Symphyotrichum novae-angliae	New England Aster	2	-3		G5	S5			
Taraxacum erythrospermum	Red-seeded Dandelion	*	5		GNR	SNA			
Taraxacum officinale	Common Dandelion	*	3		G5	SNA			
Taxus canadensis	Canada Yew	7	3		G5	S4			
Thalictrum dioicum	Early Meadow-rue	5	2		G5	S5			
Thelypteris palustris	Marsh Fern	5	-4	X	G5	S5			
Thuja occidentalis	Eastern White Cedar	4	-3	X	G5	S5			
Tilia americana	Basswood	4	3		G5	S5			
Toxicodendron radicans var. radicans	Eastern Poison Ivy	5	-1	X	GNR	S5			
Tragopogon dubius	Yellow Goatsbeard	*	5		GNR	SNA			
Trifolium pratense	Red Clover	*	2		GNR	SNA			
Trifolium repens	White Clover	*	2		GNR	SNA			
Trillium erectum	Red Trillium	6	1		G5	S5			
Trillium grandiflorum	White Trillium	5	5		G5	S5			
Tsuga canadensis	Eastern Hemlock	7	3	X	G5	S5			
Tussilago farfara	Coltsfoot	*	3	X	GNR	SNA			
Typha angustifolia	Narrow-leaved Cattail	3	-5	X	G5	SNA			
Typha latifolia	Broad-leaved Cattail	3	-5	X	G5	S5			
Ulmus americana	White Elm	3	-2	X	G5	S5			
Verbascum thapsus	Common Mullein	*	5		GNR	SNA			
Verbena hastata	Blue Vervain	4	-4	X	G5	S5			
Verbena stricta	Hoary Vervain	7	5		G5	S4			
Viburnum lentago	Nannyberry	4	-1	X	G5	S5			
Vicia cracca	Tufted Vetch	*	5		GNR	SNA			
Vincetoxicum rossicum	European Swallowwort	*	5		GNR	SNA			
Vitis riparia	Riverbank Grape	0	-2		G5	S5			
Zanthoxylum americanum	Northern Prickly-ash	3	5		G5	S5			
Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed	3	-5	X	G5T5	S5			

Appendix 6. List of Wildlife Species recorded during Targeted Surveys and/or Incidentally.



Scientific Name	English Common Name	Family	S-Rank	PSO/ COSSAR	SARA	MNR Area Sensitive
Empidonax alnorum	Alder Flycatcher	Tyrannidae	S5B			
Corvus brachyrhynchos	American Crow	Corvidae	S5B			
Narceus americanus	American Giant Millipede	Spirobolidae	S5			
Spinus tristis	American Goldfinch	Fringillidae	S5			
Turdus migratorius	American Robin	Turdidae	S5			
Anaxyrus americanus	American Toad	Bufonidae	S5			
Icterus galbula	Baltimore Oriole	Icteridae	S4B			
Hirundo rustica	Barn Swallow	Hirundinidae	S4B	SC	THR	
Strix varia	Barred Owl	Strigidae	S5			X
Megaceryle alcyon	Belted Kingfisher	Alcedinidae	S5B, S4N			
Eptesicus fuscus	Big Brown Bat	Vespertilionidae	S4			
Ursus americanus	Black Bear	Ursidae	S5			
Rhinichthys atratulus	Blacknose Dace	Leuciscidae	SNR			
Mniotilta varia	Black-and-white Warbler	Parulidae	S5B			X
Coccyzus erythropthalmus	Black-billed Cuckoo	Cuculidae	S4S5B			
Poecile atricapillus	Black-capped Chickadee	Paridae	S5			
Cyanocitta cristata	Blue Jay	Corvidae	S5			
Buteo platypterus	Broad-winged Hawk	Accipitridae	S5B			
Molothrus ater	Brown-headed Cowbird	Icteridae	S5			
Lithobates catesbeianus	Bullfrog	Ranidae	S4			X
Branta canadensis	Canada Goose	Anatidae	S5			
Bombycilla cedrorum	Cedar Waxing	Bombycillicae	S5			
Umbra limi	Central Mudminnow	Umbridae	S5			
Setophaga pensylvanica	Chestnut-sided Warbler	Parulidae	S5B			
Spizella passerina	Chipping Sparrow	Emberizidae	S5B, S3N			
Quiscalus quiscula	Common Grackle	Icteridae	S5			
Corvus corax	Common Raven	Corvidae	S5			
Geothlypis trichas	Common Yellowthroat	Parulidae	S5B, S3N			
Canis latrans	Coyote	Canidae	S5			

Scientific Name	English Common Name	Family	S-Rank	PSO/ COSSAR	SARA	MNR Area Sensitive
Tamias striatus	Eastern Chipmunk	Sciuridae	S5			
Thamnophis sirtalis	Eastern Gartersnake	Colubridea	S5			
Tyrannus tyrannus	Eastern Kingbird	Tyrannidae	S4B			
Sturnella magna	Eastern Meadowlark	Icteridae	S4B, S3N	THR	THR	
Sayornis phoebe	Eastern Phoebe	Tyrannidae	S5B			
Lasiurus borealis	Eastern Red Bat	Vespertilionidae	S3	END		
Contopus virens	Eastern Wood-pewee	Tyrannidae	S4B	SC	SC	
Sturnus vulgaris	European Starling	Sturnidae	SNA			
Spizella pusilla	Field Sparrow	Emberizidae	S4B, S3N			
Culaea inconstans	Five-spine Stickleback	Gasterosteidae	S5			
Ammodramus savannarum	Grasshopper Sparrow	Passerellidae	S4B	SC		X
Dumetella carolinensis	Gray Catbird	Mimidae	S5B, S3N			
Dryophytes versicolor	Gray Treefrog	Hylidae	S5			
Myiarchus crinitus	Great Crested Flycatcher	Tyrannidae	S5B			
Lithobates clamitans	Green Frog	Ranidae	S5			
Butorides virescens	Green Heron	Ardeidae	S4B			
Sciurus carolinensis	Grey Squirrel	Sciuridae	S5			
Leuconotopicus villosus	Hairy Woodpecker	Picidae	S5			X
Catharus guttatus	Hermit Thrush	Turdidae	S5B, S4N			X
Lasiurus cinereus	Hoary Bat	Vespertilionidae	S3	END		
Troglodytes aedon	House Wren	Troglodytidae	S5B			
Passerina cyanea	Indigo Bunting	Cardinalidae	S5B			
Charadrius vociferus	Killdeer	Charadriidae	S4B			
Empidonax minimus	Least Flycatcher	Tyrannidae	S5B			X
Anas platyrhynchos	Mallard	Anatinae	S5			
Cistothorus palustris	Marsh Wren	Troglodytidae	S4B, S3N			
Danaus plexippus	Monarch	Nymphalidae	S4B, S2N	SC	END	
Zenaida macroura	Mourning Dove	Columbidae	S5			
Leiothlypis ruficapilla	Nashville Warbler	Parulidae	S5B			

Scientific Name	English Common Name	Family	S-Rank	PSO/ COSSAR	SARA	MNR Area Sensitive
Cardinalis cardinalis	Northern Cardinal	Cardinalidae	S5			
Colaptes auratus	Northern Flicker	Picidae	S5			
Lithobates pipiens	Northern Leopard Frog	Ranidae	S5			
Circus hudsonius	Northern Harrier	Circinae	S5B, S4N			X
Parkesia noveboracensis	Northern Waterthrush	Parulidae	S5B			
Seiurus aurocapilla	Ovenbird	Parulidae	S5B			X
Setophaga pinus	Pine Warbler	Parulidae	S5B, S3N			
Dryocopus pileatus	Pileated Woodpecker	Picidae	S5			X
Procyon lotor	Raccoon	Procyonidae	S5			
Vulpes vulpes	Red Fox	Canidae	S5			
Tamiasciurus hudsonicus	Red Squirrel	Sciuridae	S5			
Sitta canadensis	Red-breasted Nuthatch	Sittidae	S5			X
Vireo olivaceus	Red-eyed Vireo	Vireonidae	S5B			
Buteo jamaicensis	Red-tailed Hawk	Accipitridae	S5			
Agelaius phoeniceus	Red-winged Blackbird	Icteridae	S5			
Larus delawarensis	Ring-billed Gull	Laridae	S5			
Pheucticus ludovicianus	Rose-breasted Grosbeak	Cardinalidae	S5B			
Bonasa umbellus	Ruffed Grouse	Phasianidae	S5			
Passerculus sandwichensis	Savannah Sparrow	Fringillidae	S5B, S3N			X
Piranga olivacea	Scarlet Tanager	Thraupidae	S5B			X
Chelydra serpentina	Snapping Turtle	Chelydridae	S4	SC	SC	
Melospiza melodia	Song Sparrow	Fringillidae	S5			
Porzana carolina	Sora	Rallidae	S5B			
Melospiza georgiana	Swamp Sparrow	Fringillidae	S5B, S4N			
Pseudacris crucifer	Spring Peeper	Hylidae	S5			
Cathartes aura	Turkey Vulture	Ardeidae	S5B, S3N			
Catharus fuscescens	Veery	Turdidae	S5B			X
Pseudacris triseriata	Western Chorus Frog	Hylidae	S4		THR	
Catostomus commersonii	White Sucker	Catostomidae	S5			

Scientific Name	English Common Name	Family	S-Rank	PSO/ COSSAR	SARA	MNR Area Sensitive
Odocoileus virginianus	White-tailed Deer	Cervidae	S5			
Zonotrichia albicollis	White-throated Sparrow	Fringillidae	S5			
Meleagris gallopava	Wild Turkey	Meleagrididae	S5			
Troglodytes hiemalis	Winter Wren	Troglodytidae	S5B, S4N			X
Lithobates sylvaticus	Wood Frog	Ranidae	S5			
Hylocichla mustelina	Wood Thrush	Turdidae	S4B	SC	THR	
Sphyrapicus varius	Yellow-bellied Sapsucker	Picidae	S5B, S3N			
Setophaga petechia	Yellow Warbler	Parulidae	S5B			

[1]"S-ranks" represent rarity ranks for native species in Ontario set by the Natural Heritage Information Centre (NHIC)

S1 - Extremely Rare (usually 5 or fewer occurrances in Ontario)

S2 - Very Rare (usually between 5 and 20 occurrences in Ontario)

S3 - Rare to Uncommon (usuablly between 20 and 100 occurrences)

S4 - Common (apparently secure)

S5 - Very Common

Appendix 7. Anuran Survey Results.

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

Table 1: Results of Anuran Calling Surveys

Date	Conditions	Station #	Species, Total Number Observed, and Call Code
April 26, 2024	Air Temperature 7-11ºC, Beaufort Wind 0, Cloud Cover 0%, Precipitation none, Noise 0-1	1	No Calls
		2	Spring Peeper 3(1), Northern Leopard Frog 1 (1)
		3	Spring Peepers 3 (1)
		4	Spring Peepers (3), Northern Leopard Frog 3 (1)
		5	No Calls
May 16, 2024	Air Temperature 16-17ºC, Beaufort Wind 0, Cloud Cover 2%, Precipitation none, Noise 1-2	1	No Calls
		2	Spring Peeper 3(2), Wood Frog 2(1)
		3	Spring Peeper 3(2), Wood Frog 5(2)
		4	American Toad 1 (1), Gray Treefrog 2 (1), Spring Peeper (3), Green Frog 1 (1)
		5	No Calls
June 21, 2024	Air Temperature 21ºC, Beaufort Wind 0, Cloud Cover 80-90%, Precipitation none, Noise 1	1	No Calls
		2	Green Frog 2(1), Bull Frog 1(1)
		3	Green Frog 1(1)
		4	Grey Treefrog 2 (1)
		5	No Calls

Appendix 8. Breeding Bird Survey Results.

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

Job Name:	Highway 7 Pit	RiverStone #:	224-040

Species	Survey 1 Station #												Incidental	Survey 2 Station #											Incidental	Survey 3 Station #											Incidental
	1	2	3	4	5	6	7	8	9	10	11	12		1	2	3	4	5	6	7	8	9	10	11	12		1	2	3	4	5	6	7	8	9	10	11	12	
Alder Flycatcher (Empidonax alnorum)																				Po			Po															
American Crow (Corvus brachyrhynchos)			x		x		x	x	x	x	x	x					x		x	x			x		x		x							x	x		x		x
American Goldfinch (Spinus tristis)			x					x					x		x	x		x		x						x			x	Po		x						x
American Robin (Turdus migratorius)	Po	Po	Po	Po		x	Po	Po	Po	Po			x			Po	Po		Po						Po			Po	Po		Po	Po	x		Po	Po		x		x
Baltimore Oriole (Icterus galbula)													x																										
Barn Swallow (Hirundo rustica)																																							x
Belted Kingfisher (Megaceryle alcyon)															Co																								
Black-and-white Warbler (Mniotilta varia)	Po	Po					Po	Po	Po											Po	Po		Po	Po		x				Po			Po	Po		Po			x
Black-billed Cuckoo (Coccyzus erythropthalmus)																																							x
Black-capped Chickadee (Poecile atricapillus)					x				Po		Po							Po	Po		x	x			x					Co			Po	Po			x		x
Blue Jay (Cyanocitta cristata)	x	x	Po	x	x			x			x		Co			x	x		x	x		x	x	x			x		x	x		x				x		x
Brown-headed Cowbird (Molothrus ater)		Po																		Po																		
Canada Goose (Branta canadensis)													x																										
Cedar Waxing (Bombycilla cedrorum)										Po		Po														x					Po								x
Chestnust-sided Warbler (Setophaga pensylvanica)																															Po		Po						
Chipping Sparrow (Spizella passerina)			x																							x													
Common Grackle (Quiscalus quiscula)							x		x		x										x					x													
Common Raven (Corvus corax)													x																										

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Appendix 9. Turtle Survey Results.

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

Table 1: Results of Completed Blanding's Turtle Surveys in 2024

Date	Conditions	Station #	Species and Total Number Observed
April 26, 2024	Air Temperature 14ºC, Beaufort Wind 0-1, Cloud Cover 0% Start Time 11:10 pm, Finish 12:41pm	1	No turtles
		2	No turtles
		3	No turtles
May 16, 2024	Air Temperature 23ºC, Beaufort Wind 1, Cloud Cover 60% Start Time 3:50 pm, Finish 4:21pm	1	No turtles
		2	No turtles
		3	No turtles
June 2, 2024	Air Temperature 17ºC, Water Temperature 9-10ºC, Beaufort Wind 0-1, Cloud Cover 100%	1	No turtles
		2	No turtles
		3	No turtles
June 4, 2023	Air Temperature 26-27ºC, Water Temperature 19-20ºC, Beaufort Wind 1, Cloud Cover 60-70%	1	No turtles
		2	No turtles
		3	No turtles
June 12, 2023	Air Temperature 21ºC, Water Temperature n/a, Beaufort Wind 2, Cloud Cover 50-60%	1	No turtles
		2	No turtles
		3	No turtles

Appendix 10. Assessment of Provincially Endangered and Threatened Species and their Habitat**.**

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Species	Status	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
American Ginseng (*Panax quinquefolius*)	END (SCA)	American Ginseng requires well-drained but moist acidic to neutral soils overlying limestone or marble bedrock. They are obligate understory plants found in undisturbed mature deciduous and mixed forests, and occasionally in coniferous forests and swamps.	YES	NO	NO	NO	The subject property and surrounding landscape are either currently or historically disturbed and do not contain appropriate habitat for American Ginseng. This species was also not observed during RiverStone's site investigations. Further discussion is not provided.
Bank Swallow (*Riparia riparia*)	THR (SARA)	The Bank Swallow is a small aerial insectivore bird that nests colonially in burrows they excavate within banks. Colonies will nest in bluffs, riverbanks, aggregate pits, roadside embankments, and topsoil piles near open habitat that provides a steady source of insects. Colony sites must also be near roosting areas in wetland, reed, or cane beds.	YES	YES, NHIC and OBBA	NO	YES	Bank Swallows are known to nest in the slopes of aggregate pits, such as the one found on adjacent lands. However, Bank Swallows were not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Black Ash (*Fraxinus nigra*)	END (SCA)	The Black Ash grows everywhere in Ontario except the Far North. These trees require moisture, and are commonly found in northern swampy woodlands, from eastern Manitoba, throughout Ontario, and as far east as Newfoundland.	YES	YES, iNaturalist records	YES	YES	Black Ash was observed within wetlands on the subject property. Further discussion is provided in the report.
Blanding's Turtle (*Emydoidea blandingii*)	THR (SCA)	Blanding's Turtle are semi-aquatic and use wetland habitats with shallow water and abundant vegetation. Their habitat includes a broad range of wetlands, forest clearings, and meadows. They breed in aquatic habitat and nest in open natural and anthropogenic upland areas.	YES	YES, iNaturalist and Herp Atlas	YES	YES	Although there are Blanding's Turtle records in the local landscape and appropriate habitat on the subject property, Blanding's Turtle were not observed during RiverStone's turtle surveys. Further discussion is not provided.
Bobolink (*Dolichonyx oryzivorus*)	THR (SARA)	Nests and forages in meadows, grasslands, hayfields, and pastureland. Fields must have 25% or less woody plant cover. They typically require large fields (>4ha) and avoid small, fragmented habitats. They also avoid habitat within 75 m of a forest edge.	YES	YES, NHIC and OBBA	YES	YES	The subject property and adjacent lands contain field habitat. However, the fields on the subject property are undergoing succession and provide poor quality habitat for this species. Bobolink were also not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Butternut (*Juglans cinerea*)	END (SCA)	Butternut is shade intolerant and grows in rich, moist, well-drained loams often along streambanks. Butternut is also found in well-drained gravel sites. It is often found at forest edges where it can access abundant sunlight.	YES	YES, iNaturalist records	YES	YES	Although the subject property and adjacent lands contain appropriate habitat for this species, it was not observed during RiverStone's vegetation inventory. Further discussion is not provided.
Chimney Swift (*Chaetura pelagica*)	THR (SARA)	The Chimney Swift historically nested and roosted in large hollow trees, rock walls, and other vertical surfaces. They now use human-made structures like uncapped chimneys and have high site fidelity to nesting chimneys. 95% of nests are within 1 km of a waterbody.	YES	YES, eBird records	NO	NO	The subject property does not contain anthropogenic structures or large trees appropriate for roosting by Chimney Swift. This species was also not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Eastern Meadowlark (*Sturnella magna*)	THR (SARA)	Nests and forages in meadows, grasslands, shrubby fields, hayfields and pastureland. Prefers habitat with >80% grass cover. Needs a minimum of 5 ha of continuous habitat.	YES	YES, NHIC and OBBA	YES	YES	The subject property and adjacent lands contain field habitat. Meadowlark were also observed on the subject property during breeding bird surveys. Further discussion is provided in the report.

[1]Highlighted species are present on or are likely to be present on the subject property.

Species	Status	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
Eastern Red Bat (*Lasiurus borealis*)	END (SCA)	The range of the Eastern Red Bat extends from east of the Western Cordillera to the Gulf of Mexico. They are long-distance migrants that travel to the southern United States to overwinter. Their summer habitat is deciduous and coniferous forests. Roost habitat is within the foliage of supercanopy trees.	YES	NO	YES	YES	The subject property and adjacent lands contain appropriate habitat for this species. Additionally, Eastern Red Bat were detected during acoustic monitoring. Further discussion is provided in the report.
Eastern Small-footed Myotis (*Myotis leibii*)	END (SCA)	Eastern Small-footed Myotis overwinter in caves and mines in Ontario and do not disperse far from their hibernacula during the summer. They can be found roosting in rocky habitats singly or in groups but will also use human structures as day roosts. They are aerial insectivores and forage in forests, rocky habitats, and ponds.	YES	NO	NO	NO	Rocky habitats appropriate for roosting are not present on the subject property or adjacent lands. Further discussion is not provided.
Hoary Bat (*Lasiurus cinereus*)	END (SCA)	The Hoary Bat is a long-distance migrant with a range that extends from British Columbia to the Atlantic provinces. Hoary Bats roost alone or with their pups on tree branches in deciduous and coniferous forests of any age class. Maternity roost trees tend to be large and as tall or taller than the surrounding canopy. Foraging habitat includes wetlands, open areas, and forest edges and gaps.	YES	NO	YES	YES	The subject property and adjacent lands contain appropriate habitat for this species. Additionally, Hoary Bat were detected during acoustic monitoring. Further discussion is provided in the report.
Least Bittern (*Ixobrychus exilis*)	THR (SARA)	Breeds in large marshes within Southern Ontario. Creates nest platforms from tall, dense emergent vegetation within 10m of water and prefers Typha spp. Will use other emergent vegetation. Needs 200 ha of wetland for nesting and foraging but does not need to be continuous wetland. Prefers complexes of smaller wetlands. Will avoid marshes surrounded by >30% forest cover or containing large trees.	YES	NO	YES	YES	The subject property and adjacent lands contain a large wetland complex including cattail marsh. However, Least Bittern were not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Lesser Yellowlegs (*Tringa flavipes*)	THR (SCA)	Lesser Yellowlegs migrate through southern Ontario, stopping in wetlands, flooded fields, river and lake shorelines, and sewage lagoons. They prefer marshes dominated by Softstem Bulrush and Smooth Cordgrass. During migration they form flocks ranging from a few dozen to several thousand birds. They may form mixed flocks with Greater Yellowlegs and Solitary Sandpiper.	YES	YES, iNaturalist records	NO	NO	Although the subject property and adjacent lands contain a large wetland complex, this wetland does not contain the appropriate vegetation communities. Lesser Yellowlegs was also not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Little Brown Myotis (*Myotis lucifugus*)	END (SCA)	Their hibernacula are within caves and abandoned mines, wells, and tunnels. Maternity colonies are within a few kilometers of hibernacula within snag trees, rock crevices, exfoliating tree bark, and anthropogenic structures. Roosts and swarming sites are in similar areas around the hibernacula.	YES	NO	YES	YES	The subject property and adjacent lands contain appropriate roosting habitat for this species. However, it was not detected during RiverStone's acoustic monitoring. Further discussion is not provided.
Northern Myotis/Northern Long-eared Bat (*Myotis septentrionalis*)	END (SCA)	Northern Myotis are found below the tree line in Canada and are mostly absent from the prairies. They use live and dead trees near water in forest habitats when active and migrate to caves and abandoned mines for hibernation.	YES	NO	YES	YES	The subject property and adjacent lands contain appropriate roosting habitat for this species. However, it was not detected during RiverStone's acoustic monitoring. Further discussion is not provided.

[1]Highlighted species are present on or are likely to be present on the subject property.

Species	Status	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
Red-Headed Woodpecker (*Melanerpes erythrocephalus*)	END (SARA)	The Red-headed Woodpecker lives in open woodland and woodland edges and is often found in parks, golf courses and cemeteries. These areas typically have many dead trees, that the bird uses for nesting and perching. The Red-headed Woodpecker is found across southern Ontario, where it is widespread but rare.	YES	NO	NO	NO	The subject property and adjacent lands do not contain open woodland or areas of dead trees. Red-headed Woodpecker was also not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Silver-haired Bat (*Lasionycteris noctivagans*)	END (SARA)	Silver-haired Bats are found throughout all of Ontario but are uncommon near Hudson Bay. They migrate to the United States and southeastern British Columbia to overwinter. They roost under bark and within cavities in coniferous and deciduous trees, and may also roost in anthropogenic structures. Foraging habitat is within forests and forest edges.	YES	NO	YES	YES	The subject property and adjacent lands contain appropriate roosting habitat for this species. However, it was not detected during RiverStone's acoustic monitoring. Further discussion is not provided.
Spotted Turtle (*Clemmys guttata*)	END (SCA)	The Spotted Turtle uses a mix of terrestrial and aquatic habitats. Aquatic habitats include wetlands, ponds, vernal pools, creeks, streams, sheltered bay edges, stormwater ponds, and man-made channels. Their terrestrial habitats are shorelines, rocky outcrops, upland forests, open fields, and meadows.	YES	NO	YES	YES	Although appropriate habitat for Spotted Turtle is present on the subject property and adjacent lands, this species was not observed during RiverStone's turtle surveys. Further discussion is not provided.
Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)	END (SCA)	Suckley's Cuckoo Bumble Bee is a nest parasite of the Western Bumble Bee and Yellow-banded Bumble Bee. It is mainly a western species but has occasional records throughout Ontario. They are habitat generalists found in most areas Ontario, and generalist nectar foragers. The bees they parasitize tend to build nests in abandoned rodent burrows.	YES	NO	YES	YES	Although appropriate habitat is present on the subject property and adjacent lands this species was not observed during RiverStone's site investigations. Further discussion is not provided.
Tricolored Bat (*Perimyotis subflavus*)	END (SCA)	The Tri-colored Bat have a scattered distribution and are found as far north as Sudbury. They are found in a variety of forested habitats They overwinter alone in caves and mines and roost in dead vegetation clumps and lichen in forested habitats near water.	YES	NO	YES	YES	Although appropriate habitat is present on the subject property and adjacent lands this species was not observed during RiverStone's site investigations. Further discussion is not provided.

[1]Highlighted species are present on or are likely to be present on the subject property.

Appendix 11. Results of Desktop Screening and On-site Assessment for Significant Wildlife Habitat.

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Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Seasonal Concentration Areas for Wildlife Species					
Waterfowl Stopover and Staging Areas (Terrestrial)	American Black Duck, Wood Duck, Green-winged Teal, Blue-winged Teal, Mallard, Northern Pintail, Northern Shoveler, American Wigeon, Gadwall	CUM1, CUT1, in addition to evidence of spring flooding	Fields flooded with sheet water during Spring (mid March to May)	**Studies Confirm**: Annual mixed species aggregations of 100 or more total birds **Area of SWH Defined As:** Ecosite plus 100-300m radius	Cultural meadow on the subject property does not flood with sheet water during the spring. Further discussion is not provided.
Waterfowl Stopover and Staging Areas (Aquatic)	Canada Goose, Cackling Goose, Snow Goose, American Black Duck, Northern Pintail, Northern Shoveler, American Wigeon, Gadwall, Green-winged Teal, Blue-winged Teal, Hooded Merganser, Common Merganser, Lesser Scaup, Greater Scaup, Long-tailed Duck, Surf Scoter, White-winged Scoter, Black Scoter, Ring-necked Duck, Common Goldeneye, Bufflehead, Redhead, Ruddy Duck, Red-breasted Merganser, Brant, Canvasback	MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, SWD1, SWD2, SWD3, SWD5, SWD6, SWD7	Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Reservoirs managed as large ponds qualify.	**Studies Confirm**: Mixed species aggregations of 100 or more total birds for 7 days, **and/or** annual use by Ruddy Ducks, Canvasbacks, or Redheads **Area of SWH Defined As:** Ecosites plus 100m radius, includes wetlands and shorelines	Although an appropriate ecosite is present on the subject property and adjacent lands, the required number of individual birds was not observed during RiverStone's site investigations. Further discussion is not provided.
Shorebird Migratory Stopover Areas	Greater Yellowlegs, Lesser Yellowlegs, Marbled Godwit, Hudsonian Godwit, Black-bellied Plover, American Golden-Plover, Semipalmated Plover, Solitary Sandpiper, Spotted Sandpiper, Semipalmated Sandpiper, Pectoral Sandpiper, White-rumped Sandpiper, Baird's Sandpiper, Least Sandpiper, Purple Sandpiper, Stilt Sandpiper, Short-billed Dowitcher, Red-necked Phalarope, Whimbrel, Ruddy Turnstone, Sanderling, Dunlin	BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1, MAM2, MAM3, MAM4, MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars, groynes, armour rock, and seasonally flooded, muddy and un-vegetated shoreline habitats.	**Studies Confirm**: Mixed species aggregations of 3 or more listed species with >1000 shorebirds counted over the migration period, **and/or** any site with >100 Whimbrel for 3 or more years **Area of SWH Defined As:** ELC shorelines plus 100m radius	The required ecosites are not present on the subject property or adjacent lands. Further discussion is not provided.
Raptor Wintering Area	Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, Snowy Owl **Special Concern**: Short-eared Owl, Bald Eagle	**Hawks/Owls**: one each from forest (FOD, FOM, FOC) and upland (CUM, CUT, CUS, CUW) **Bald Eagle**: forest (FOD, FOM, FOC, SWD, SWM, SWC) on shorelines of large water bodies	Combination of fields and woodlands that provide roosting, foraging and resting habitats. **Hawks/Owls**: >20 ha with a combination of forest and upland; >15ha field habitat; field area windswept with limited snow depth/accumulation **Bald Eagle**: open water, large trees and snags	**Studies Confirm: 1** or more Short-eared Owls, 1 or more Bald Eagles, or at least 10 individuals and 2 of the listed species **and** used ≥3 times in 5 years for a minimum of 20 days **Area of SWH Defined As:** n/a	RiverStone completed raptor wintering surveys on the subject property and did not observe the required species. Further discussion is not provided.
Bat Hibernacula	Big Brown Bat, Tri-coloured Bat	CCR1, CCR2, CCA1, CCA2 Buildings are not SWH	Caves, mine shafts, underground foundations, Karsts Does not include active mines	**Studies Confirm:** confirmed hibernating bats **Area of SWH Defined As:** 200m radius around hibernaculum entrance, 1000m radius for wind farms	The required ecosites are not present on the subject property or adjacent lands. Further discussion is not provided.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Bat Maternity Colonies	Big Brown Bat, Silver-haired Bat	All Ecosites in Community Series: FOD, FOM, SWD, SWM Buildings are not SWH	Tree cavities and snags; deciduous or mixed stands with >10/ha >25cm dbh trees, Silver-haired Bats prefer forests with 21 snags/ha	**Studies Confirm:** confirmed use by >10 Big Brown Bats **or** >5 adult female Silver-haired Bats **Area of SWH Defined As:** entire woodland/forest ELC **or** Ecoelement containing maternity colonies	RiverStone recorded Big Brown Bat on the subject property during acoustic monitoring. Based on the volume of calls, it is highly likely that more than 10 Big Brown Bats are present in woodland habitat on the property. Further discussion is provided in the report.
Turtle Wintering Areas	Midland Painted Turtle **Special Concern**: Northern Map Turtle, Snapping Turtle	**Snapping and Midland Painted Turtles**: Community classes SW, MA, OA, SA, ELC Community Series FEO, BOO **Northern Map Turtle**: open water areas with current Not sewage lagoons or stormwater ponds	Water deep enough to not freeze, soft mud substrates; permanent water bodies, large wetlands, bogs or fens with adequate Dissolved Oxygen	**Studies Confirm:** 5 over-wintering Midland Painted Turtles, **or** 1 or more overwintering Northern Map Turtles or Snapping Turtles **Area of SWH Defined As:** ELC with overwintering turtles, if site is within a stream or river only the deep-water pool is protected	RiverStone completed turtle basking surveys on the subject property. No turtles were observed. Further discussion is not provided.
Reptile Hibernaculum	**Snakes**: Eastern Gartersnake, Northern Watersnake, Northern Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, Northern Ring-necked Snake **Special Concern**: Five-lined Skink, Milksnake, Eastern Ribbonsnake	**Snakes:** any forest ecosite other than very wet ones; talus, rock barrens, crevice, cave, and alvar sites; rock piles or slopes, stone fences, crumbling foundations **Skink:** Community Series FOD, FOM and Ecosites FOC1, FOC3	**Snakes:** sites with access below the frost line, wetlands with hummocks **Skink:** mixed forests with rock outcrops providing cover rock overlaying granite bedrock with fissures	**Studies Confirm:** use by ≥5 individuals from one species **or** use by individuals from ≥2 species; congregation of ≥5 individuals from one species **or** individuals from ≥2 species near potential hibernacula; if SC species are present site is SWH; any active skink hibernaculum **Area of SWH Defined As:** feature containing hibernacula plus 30m radius	Forests on the subject property do not have features that provide access below the frost line. RiverStone only observed a single Eastern Gartersnake during site investigations. Further discussion is not provided.
Colonially-nesting Bird Breeding Habitat (Bank and Cliff)	Cliff Swallow, Northern Rough-winged Swallow	Found in CUM1, CUT1, CUS1, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1	Exposed banks, sandy hills, borrow pits, steep slopes, sand piles that are undisturbed or naturally eroding Does not include man-made structures or active aggregate pits	**Studies Confirm:** 1 or more nesting sites with ≥8 Cliff Swallow pairs **and/or** Rough-winged Swallow Pairs during the breeding season **Area of SWH Defined As:** colony and 50m radius from peripheral nests	Although appropriate exposed bank habitat is present on adjacent lands, Cliff Swallow and Northern Rough-winged Swallow were not observed during RiverStone's breeding bird surveys. Further discussion is not provided.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Colonially-nesting Bird Breeding Habitat (Tree/Shrubs)	Great Blue Heron, Black-crowned Night Heron, Great Egret, Green Heron	SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1	Live or dead standing trees in wetlands, lakes, islands, peninsulas, may use shrubs or other emergent vegetation; most nests 11-15m from ground	**Studies Confirm:** ≥5 active Great Blue Heron or other listed species nests **Area of SWH Defined As:** colony plus 300m radius **or** extent of forest ecosite containing colony **or** any island <15ha with a colony	Although the subject property and adjacent lands contain appropriate habitat and the listed species were observed, nests were not observed. Further discussion is not provided.
Colonially-nesting Bird Breeding Habitat (Ground)	Herring Gull, Great Black-backed Gull, Little Gull, Ring-billed Gull, Common Tern, Caspian Tern, Brewer's Blackbird	MAM1-6, MAS1-3, CUM, CUT, CUS **Brewer's Blackbird**: close to watercourses in open fields	**Gulls and Terns:** rocky islands or peninsulas in open water, marshy areas **Brewer's Blackbird:** near streams and irrigation ditches in farmland	**Studies Confirm:** >25 active nests of Herring Gulls or Ring-billed Gulls, >5 active nests of Common Terns, >2 active nests of Caspian Terns, ≥5 Brewer's Blackbird pairs, any active nesting colony of Little Gulls or Great Black-backed Gulls **Area of SWH Defined As:** colony plus 150m radius **or** extent of ecosites containing colony **or** any island <3ha	Although the appropriate ecosites are present on the subject property and adjacent lands, breeding by the required species was not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Migratory Butterfly Stopover Areas	Painted Lady, Red Admiral **Special Concern**: Monarch	One Community Series each from field (CUM, CUT, CUS) and forest (FOC, FOD, FOM, CUP)	Minimum 10ha combination of field and forest located within 5km of Lake Ontario	**Studies Confirm**: >3000 Monarch Use Days (days a site is used * the number of individuals), **or** >3000 Monarch Use Days with Painted Ladies or Red Admirals present **Area of SWH Defined As**: n/a	The subject property is not located within 5 km of Lake Ontario. Further discussion is not provided.
Landbird Migratory Stopover Areas	All migratory songbirds and raptors	Community Series FOC, FOM, FOD, SWC, SWM, SWD	Woodlots > 10ha within 5km of Lake Ontario; significance increases with proximity to shoreline and size	**Studies Confirm**: use by > 200 birds/day with > 35 species, **and** at least 10 species recorded on 5 different survey days **Area of SWH Defined As**: n/a	The subject property is not located within 5 km of Lake Ontario. Further discussion is not provided.
Deer Yarding Areas	White-tailed Deer	Community Series FOM, FOC, SWM, SWC and Ecosites CUP2, CUP3, FOD3, CUT	**Stratum** I: coniferous forest with >60% canopy cover **Stratum II**: mixed or deciduous forest surrounding Stratum I	**Confirm Studies**: mapping by MNRF **Area of SWH Defined As**: n/a	The MNRF has not mapped deer yarding areas on the subject property or adjacent lands. Further discussion is not provided.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Deer Winter Congregation Areas	White-tailed Deer	Community Series FOC, FOM, FOD, SWC, SWM, SWD, conifer plantations	Woodlots > 100ha, smaller woodlots can be SWH based on MNRF assessment	**Confirm Studies**: mapping by MNRF, all woodlots >100ha are significant **Area of SWH Defined As**: n/a	The MNRF has not mapped deer winter congregation areas on the subject property or adjacent lands. Further discussion is not provided.
Rare Vegetation Communities					
Cliffs and Talus Slopes		Community Series TAO, CLO, TAS, CLS, TAT, CLT	Any cliff > 3m or talus slope	**Confirm Studies:** any ELC for cliffs or talus slopes **Area of SWH Defined As:** n/a	The required ecosites are not present on the subject property or adjacent lands. Further discussion is not provided.
Sand Barren		SBO1, SBS1, SBT1	Exposed sand, sparsely vegetated, <60% tree cover	**Confirm Studies:** confirmed ELC for Sand Barrens, <50% exotic vegetative cover **Area of SWH Defined As:** n/a	The required ecosites are not present on the subject property or adjacent lands. Further discussion is not provided.
Alvar	**Indicator species**: Carex crawei, Panicum philadelphicum, Eleocharis compressa, Scutellaria parvula, Trichostema brachiatum	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2	Level calcerous bedrock, rock pavement, overlain by thin veneer of soil, <60% tree cover	Confirm Studies: >0.5ha, at least 4 indicator species, <50% exotic vegetative cover, in good condition **Area of SWH Defined As**: n/a	The subject property and adjacent lands do not contain exposed bedrock. Further discussion is not provided.
Old Growth Forest		Community Series FOD, FOC, FOM, SWD, SWC, SWM	Woodland ≥30ha with at least 10ha interior habitat with 100m edge buffer	**Studies Confirm**: dominant trees are >140 years old, no recognizable forestry activities **Area of SWH Defined As**: combined ecosites or ecoelements with old growth characteristics	Woodland on the subject property and adjacent lands has been disturbed and does not contain old growth characteristics. Further discussion is not provided.
Savannah	See Appendix N of the Significant Wildlife Habitat Technical Guide.	TPS1, TPS2, TPW1, TPW2, CUS2	Tallgrass prairie with 25-60% tree cover, cannot be remnant site	**Studies Confirm**: ≥1 Savannah indicator species **and** <50% exotic vegetative cover **Area of SWH Defined As**: ecosite	The subject property contains a small area of Cultural Savannah. However, none of the indicator species are present and exotic species are abundant. Further discussion is not provided.
Tallgrass Prairie	See Appendix N of the Significant Wildlife Habitat Technical Guide.	TPO1, TPO2	Dominated by prairie grasses, <25% tree cover	**Studies Confirm**: ≥1 Prairie indicator species **Area of SWH Defined As**: ecosite	The required ecosites are not present on the subject property or adjacent lands. Further discussion is not provided.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Other Rare Vegetation Communities		Provincially Rare S1, S2, and S3 vegetation communities in Appendix M of the SWHTG	Beaches, Fens, Forest, Marsh, Barrens, Dunes, Swamps	**Studies Confirm**: confirmed ELC from Appendix M of the SWHTG **Area of SWH Defined As**: ELC	The subject property and adjacent lands do not contain any provincially rare vegetation communities.
Specialized Habitats for Wildlife					
Waterfowl Nesting Area	American Black Duck, Northern Pintail, Northern Shoveler, Gadwall, Blue-winged Teal, Green-winged Teal, Wood Duck, Hooded Merganser, Mallard	Upland habitat adjacent to MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4	Area extending 120m from >0.5ha wetland, **or** a cluster of ≥3 <0.5ha wetlands, adjacent upland areas at least 120m wide, trees >40cm dbh with nesting cavities	**Studies Confirm:** ≥3 nesting pairs from listed species excluding Mallards, **or** ≥10 nested pairs including Mallards, **or** active nesting American Black Ducks **Area of SWH Defined As:** wetland and 120m boundary, boundary may vary to provide nesting habitat	The subject property and adjacent lands contain appropriate vegetation communities. However, nesting by the required species was not confirmed during RiverStone's breeding bird surveys. Further discussion is not provided.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Osprey **Special Concern**: Bald Eagle	Community Series FOD, FOM, FOC, SWD, SWM, SWC	Forested shorelines along lakes, ponds, rivers, or wetlands **Osprey**: nest at the top of tree **Eagle**: nest in notch of super canopy tree Does not include nests on man-made structures	**Studies Confirm:** one or more active nests in area, nest must be used annually, must be inactive ≥3 years to be non-significant **Area of SWH Defined As:** Osprey nest and 300m radius or contiguous woodland stand Bald Eagle nest and 400-800m radius plus perching and foraging habitat	The subject property and adjacent lands contain appropriate vegetation communities. However, the required species were not observed during RiverStone's site investigations. Further discussion is not provided.
Woodland Raptor Nesting Habitat	Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl, Broad-winged Hawk	All forested Ecosites, also SWC, SWM, SWD, CUP3	Natural or conifer plantation stands >30ha with >10ha of interior habitat with 200m edge buffer, stick nests found in conifer, deciduous, or mixed forests, Coopers Hawk nest on forest edges	**Studies Confirm:** 1 or more active nests from listed species **Area of SWH Defined As:** active Red-shouldered Hawk, Northern Goshawk nest and 400m radius or 28ha of suitable habitat Active Barred Owl nest and 200m radius Active Broad-winged Hawk, Coopers Hawk nest and 100m radius Active Sharp-shinned Hawk nest and 50m radius	The subject property and adjacent lands contain appropriate vegetation communities. However, nesting by the required species was not confirmed during RiverStone's breeding bird surveys. Further discussion is not provided.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Turtle Nesting Areas	Midland Painted Turtle **Special Concern**: Northern Map Turtle, Snapping Turtle	MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1	Close to water with open, sunny areas containing sand and gravel turtles can dig in, does not include road shoulders	**Studies Confirm:** ≥5 nesting Midland Painted Turtles, **or** ≥1 nesting Northern Map Turtle or Snapping Turtle **Area of SWH Defined As:** area/areas with exposed mineral soils plus 30-100m radius, including travel routes from wetland to nesting area	Turtles were not observed during RiverStone's turtle surveys. Further discussion is not provided.
Seeps and Springs	Wild Turkey, Ruffed Grouse, Spruce Grouse, White-tailed Deer, Salamander spp.	Any forested ecosite near headwaters	Forested area with <25% meadow/field/pasture within headwaters of river or stream	**Studies Confirm: ≥**2 seeps/springs **Area of SWH Defined As:** area containing seeps/springs	Seeps and springs were not observed during RiverStone's site investigations. Further discussion is not provided.
Amphibian Breeding Habitat (Woodland)	Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog	Community Series FOC, FOM, FOD, SWC, SWM, SWD	Wetland, pond, pool >500m^2 within 120m of a woodland	**Studies Confirm**: breeding by ≥1 listed newt/salamander species **or** ≥2 listed frog species with at least 20 adults or egg masses **or** ≥2 listed frog species with Call Level Codes of 3 **Area of SWH Defined As**: wetland plus 230m radius of woodland, including travel corridor	RiverStone completed anuran calling surveys on the subject property. The species observed did not meet the requirements to confirm SWH. Further discussion is not provided.
Amphibian Breeding Habitat (Wetlands)	Eastern Newt, American Toad, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog	ELC Classes SW, MA, FE, BO, OA, SA	Wetlands >500m^2, bullfrogs require permanent waterbodies	**Studies Confirm**: breeding by ≥1 listed newt/salamander species **or** ≥2 frog/toad species with at least 20 adults or egg masses **or** ≥2 frog/toad species with Call Level Codes of 3 **or** confirmed breeding Bullfrogs **Area of SWH Defined As**: ELC ecosite and shoreline are SWH	A single Bullfrog was heard calling on June 21, 2024. Bullfrog were not observed during any other surveys at or adjacent to this feature. Although this is evidence that the species is present, this single observation is not sufficient to conclude that the species is breeding on the subject property. Further discussion is not provided.
Woodland Area-Sensitive Bird Breeding Habitat	Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery, Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Scarlet Tanager, Winter Wren **Special Concern**: Cerulean Warbler, Canada Warbler	Community Series FOC, FOM, FOD, SWC, SWM, SWD	Habitats where interior forest birds are breeding, typically forests >30ha and >60 years old; interior forest habitat is at least 200 m from forest edge habitat.	**Studies Confirm**: breeding pairs/nesting by ≥3 listed species, any site with breeding Cerulean Warblers or Canada Warblers **Area of SWH Defined As**: n/a	The required vegetation communities are present on the subject property and adjacent lands. However, the required breeding evidence was not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Habitats of Species of Conservation Concern					

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Marsh Bird Breeding Habitat	American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan **Special Concern**: Black Tern, Yellow Rail	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1 **Green Heron:** SW, MA, CUM1	Shallow water with emergent vegetation **Green Heron:** edge of sluggish streams, ponds, marshes sheltered by shrubs and trees	**Studies Confirm:** ≥5 nesting pairs of Sedge Wren or Marsh Wren **or** 1 pair of Sandhill Cranes, **or** breeding by ≥5 of the listed species, **or** ≥1 pairs of Trumpeter Swans, Black Terns, Green Herons, or Yellow Rails **Area of SWH Defined As:** area of ELC used for breeding	Although the required ecosites are present and some of the listed species were observed, the required breeding evidence was not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Open Country Bird Breeding Habitat	Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow **Special Concern**: Short-eared Owl	CUM1, CUM2	Grassland areas >30ha, includes cultural fields and meadows, agricultural land not used for farming in last 5 years	**Studies Confirm:** nesting/breeding of ≥2 listed species **or** ≥1 breeding Short-eared Owls **Area of SWH Defined As:** contiguous grassland ELC	The subject property does not contain grasslands larger than 30 ha, and the required breeding evidence was not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Shrub/Early Successional Bird Breeding Habitat	**Indicator Species**: Brown Thrasher, Clay-coloured Sparrow **Common Species**: Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher **Special Concern**: Yellow-breasted Chat, Golden-winged Warbler	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2	Large fields >10ha succeeding to shrub and thicket, shrub thickets >10ha	**Studies Confirm:** nesting/breeding of ≥1 Indicated Species **and** at least 2 Common Species, **or** breeding Yellow-breasted Chat or Golden-winged Warbler **Area of SWH Defined As:** contiguous field/thicket ELC	RiverStone did not observe the required breeding evidence during the breeding bird surveys. Further discussion is not provided.
Terrestrial Crayfish	Chimney or Digger Crayfish, Devil or Meadow Crayfish	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM, CUM1 with inclusions of meadow marsh or swamp	Wet meadow/shallow marsh edges	**Studies Confirm**: ≥1 individuals or burrows in suitable habitat **Area of SWH Defined As**: area of ELC with burrows	Although the appropriate ecosites are present on the subject property and adjacent lands, terrestrial crayfish species were not observed. Further discussion is not provided.
Special Concern and Rare Wildlife Species	Species tracked by NHIC	n/a	ELC surrounding recorded occurrence	**Studies Confirm:** confirmation species is present **Area of SWH Defined As:** area of habitat to the finest ELC scale that protects habitat form and function	Further discussion is provided in the report.
Animal Movement Corridors					

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Ecoregion 6E[1]	Species	Candidate SWH Habitat - ELC Ecosites	Candidate Significant Wildlife Habitat - Habitat Criteria	Confirmed Significant Wildlife Habitat	Discussion
Amphibian Movement Corridors	Eastern Newt, American Toad, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog	Any ecosite associated with water	Corridor linking summer and breeding habitat	**Studies Confirm:** confirmed Amphibian Breeding Habitat- Wetland, at least 15m of vegetation on both sides of waterway **or** up to 200m wide **Area of SWH Defined As:** corridor is part of buffer surrounding Amphibian Breeding Habitat- Wetland	Amphibian breeding habitat is not present on the subject property. Further discussion is not provided.
Deer Movement Corridors	White-tailed Deer	Any forested ecosite	Identified by MNRF, follow riparian areas, woodlots, ravines, or ridges	**Studies Confirm:** confirmed Deer Wintering Habitat **Area of SWH Defined As:** corridors at least 200m wide with gaps <20m, with 15m of vegetation on both sides of waterways	Deer wintering habitat is not present on the subject property or adjacent lands. Further discussion is not provided.
Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 6E					
6E-14 Mast Producing Areas	Black Bear	Community Series FOM, FOD	Woodland ecosites >30ha with mast-producing tree species (cherry, oak, beech)	**Studies Confirm**: woodlands >30ha with 50% composition of FOM1-1, FOM2-1, FOM3-1, FOD1-1, FOD1-2, FOD2-1, FOD2-1, FOD2-3, FOD2-4, FOD4-1, FOD5-2, FOD5-3, FOD5-7, FOD6-5 **Area of SWH Defined As**: n/a	Cherry, oak, and beech are not abundant on the subject property. Further discussion is not provided.
6E-17 Lek	Sharp-tailed Grouse	CUM, CUT, CUS	Grassland >15ha adjacent to shrubland, grassland >30ha adjacent to deciduous woodland	**Studies Confirm**: confirmed courtship activities **Area of SWH Defined As**: field/meadow ecosites plus 200m radius	Sharp-tailed Grouse were not observed on the subject property during RiverStone's breeding bird surveys. Further discussion is not provided.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]Shaded rows denote habitat categories that may be present within a subject property.

Species	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
American Bumble Bee (*Bombus pensylvanicus*)	The American Bumble Bee is at the northern edge of its range in Ontario. They use open habitats such as farmlands, meadows, and grasslands. They nest in dense long grass, abandoned rodent burrows, and abandoned birds' nests. Queens overwinter underground in compost piles and rotting logs.	YES	YES, Bumble Bee Watch	YES	YES	Although appropriate habitat is present on the subject property and adjacent lands this species was not observed during RiverStone's site investigations. Further discussion is not provided.
Bald Eagle (*Haliaeetus leucocephalus*)	The Bald Eagle's range in Ontario concentrates around the Great Lakes. Their habitat is along the shorelines of lakes and rivers. They nest in super-canopy trees (White Pine and Trembling Aspen) on peninsulas and islands that provide a nest area, perches, and open flight paths. They prefer large lakes with long shorelines, shallow areas, and high fish diversity.	YES	YES, eBird records	NO	NO	Although the Ouse River is present on the local landscape, appropriate perching and foraging habitat is not present on the subject property or adjacent lands. Further discussion is not provided.
Barn Swallow (*Hirundo rustica*)	The Barn Swallow forages in open to semi-open agricultural, residential, and aquatic habitats that provide abundant insect prey. Nests are mostly in man-made structures (e.g., buildings, bridges) but can occur in caves and under cliff overhangs. Nesting is almost always colonial and birds have high fidelity to nest sites.	YES	YES, OBBA and eBird records	NO	NO	Structures on the subject property were searched for Barn Swallow nests and nests were not found. Further discussion is not provided.
Black Tern (*Chlidonias niger*)	The Black Tern's range is concentrated along the Great Lakes and southern Shield. They prefer wetlands ≥ 20 ha or smaller wetlands in a complex that are limestone-based, rich, and have 50/50 emergent vegetation and open water. They nest on platforms, debris, and mounds in emergent vegetation.	YES	NO	NO	NO	Wetland on the subject property and adjacent lands does not contain sufficient open water for Black Tern. Further discussion is not provided.
Canada Warbler (*Cardellina canadensis*)	The Canada Warbler is a small forest songbird that nests on the ground in moist boreal and mixedwood habitats. They breed below the tree line in Ontario. They prefer forests with dense shrub layers that provide cover and perches. They are found in forested swamps, shrub thicket swamps, riparian woodlands, moist forests, brushy ravines, open and treed muskeg, and mature forests with canopy gaps.	YES	YES, NHIC and OBBA	YES	YES	Although appropriate vegetation is present, Canada Warbler were not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Common Nighthawk (*Chordeiles minor*)	Common Nighthawks are nocturnal aerial insectivores that breed in Canada, the US, and Mexico. They nest in open areas and on top of flat open rooftops and can be found in natural and anthropogenic habitats. They require open areas with an abundance of flying insects to forage, and nest and roost in open areas that provide an escape route. Nests are on the ground near but not in shade.	YES	NO	YES	YES	Although appropriate open habitats are present on the subject property and adjacent lands, Common Nighthawk were not observed during RiverStone's breeding bird surveys or Eastern Whip-poor-will surveys. Further discussion is not provided.

[1]Shaded rows denote species or communities for which negative impacts have been deemed possible.

Species	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
Eastern Musk Turtle (*Sternotherus odoratus*)	The Eastern Musk Turtle is mostly found along the shores of the Great Lakes and the southern edge of the Canadian Shield. They nest in or on vegetation or substrates near aquatic areas. They overwinter communally by burrowing into soft substrates.	YES	YES, iNaturalist records	YES	YES	Although wetlands and pooled water are present on the subject property and adjacent lands, turtles were not observed during RiverStone's site investigations. Further discussion is not provided.
Eastern Ribbonsnake (*Thamnophis sauritus*)	Only one subspecies of the Eastern Ribbonsnake is present in Ontario, at the northern limit of the species' range. Eastern Ribbonsnakes are found along the shorelines of open wetlands in southern Ontario, the Bruce Peninsula, and the southern edge of the Shield.	YES	NO	YES	YES	Although open wetland is present on the subject property and adjacent lands, Eastern Ribbonsnake were not observed during RiverStone's site investigations. Further discussion is not provided.
Eastern Whip-poor-will (*Antrostomus vociferus*)	The Eastern Whip-poor-will forages in open natural and anthropogenic habitats and nests in semi open forests and forest edges with well-drained soils and moderate vegetation cover. Habitat immediately at the nest will be a short herbaceous plant, shrub, or sapling providing cover and shade with nearby perches for adults.	YES	NO	YES	YES	Although appropriate open habitats are present on the subject property and adjacent lands, Eastern Whip-poor-will were not observed during RiverStone's breeding bird surveys or Eastern Whip-poor-will surveys. Further discussion is not provided.
Eastern Wood Pewee (*Contopus virens*)	The Eastern Wood-pewee nests along the edge of deciduous and mixed forests. They prefer forests dominated by sugar maple, elm, and oak and use forest edges and clearings to forage for insects. They prefer an open understory. Their Ontario breeding range is south of boreal forest where deciduous and mixed forests are dominant.	YES	YES, NHIC and OBBA	YES	YES	The subject property and adjacent lands contain appropriate habitat and Eastern Wood-pewee were observed during RiverStone's breeding bird surveys. Further discussion is provided in the report.
Golden-winged Warbler (*Vermivora chrysoptera*)	The Golden-winged Warbler uses forests for nesting and foraging. Their Ontario range is north of Hamilton to the north shore of Lake Huron. They prefer areas with 50-75% forest cover with at least 50% deciduous or mixed forest and <30% coniferous forest. They nest in early successional habitat composed of shrubs, herbs, saplings, and scattered mature trees. They will use early successional habitat created by either human or natural disturbance.	YES	NO	YES	YES	Although vegetation communities on the subject property and adjacent lands are appropriate for Golden-winged Warbler, this species was not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Grasshopper Sparrow (*Ammodramus savannarum*)	The Grasshopper Sparrow nests in medium to large grasslands (at least 6 ha) surrounded by other grasslands and pastures but will also use cereal crops and corn as habitat. They prefer grassland species adapted to poor, dry soil and landscapes with minimal shrub and herb cover. Their range in Ontario is south of Lake Nipissing.	YES	YES, NHIC and OBBA	YES	YES	The subject property and adjacent lands contain appropriate habitat and Grasshopper Sparrow were observed during RiverStone's breeding bird surveys. Further discussion is provided in the report.

[1]Shaded rows denote species or communities for which negative impacts have been deemed possible.

Species	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
Monarch (*Danaus plexippus*)	Monarch rely on milkweed species for egg laying and larvae development. Pupae are attached away from the host plant, and adults range widely. Adults feed on wildflowers, and Monarch can be found in Southern Ontario and along the north shore of the Great Lakes. During migration Monarchs roost in large trees along the shoreline of the Great Lakes.	YES	YES, Ento Atlas	YES	YES	The subject property and adjacent lands contain milkweed and Monarch were observed during RiverStone's site investigation. Further discussion is provided in the report.
Northern Sunfish (*Lepomis peltastes*)	In southern Ontario and Rainy River Northern Sunfish are found in shallow areas of warmwater lakes, ponds, and slow watercourses. They prefer clear water and open sand and gravel areas with scattered vegetation.	YES	NO	YES	YES	Although fish habitat is present on the subject property and adjacent lands, Northern Sunfish were not collected during RiverStone's electrofishing. Further discussions is not provided.
Olive-sided Flycatcher (*Contopus cooperi*)	The Olive-sided Flycatcher's breeding range is coniferous and coniferous-dominated forests, and they breed in nearly all of Ontario. They forage for insects in canopy gaps and need open canopies created by disturbance or wetland pockets. Their nests are near the tips of conifer branches.	YES	NO	YES	YES	The subject property and adjacent lands contain coniferous-dominated forests appropriate for Olive-sided Flycatcher. However, this species was not observed during RiverStone's breeding bird surveys. Further discussion is not provided.
Peregrine Falcon (*Falco peregrinus*)	The Peregrine Falcon is found along the Great Lakes and in Southern Ontario. They nest on cliff-faces but are indiscriminate about nesting habitat and will use natural or man-made ledges and nest boxes. Their breeding habitats must provide abundant prey (ex., seabird colonies, shorebird and waterfowl staging and nesting areas, or areas with high numbers of pigeons).	YES	NO	NO	NO	The subject property and adjacent lands do not contain cliffs or other habitats appropriate for nesting by Peregrine Falcon. This species was also not observed during RiverStone's site investigation. Further discussion is not provided.
Red-necked Phalarope (*Phalaropus lobatus*)	Red-necked Phalarope are circumpolar breeders that overwinter in Central and South America. They migrate through southern Ontario. They stopover in wetlands, waterbodies, sewage lagoons, and flooded fields.	YES	NO	YES	YES	The subject property and adjacent lands contain wetlands. However, Red-necked Phalarope have not been recorded while migrating through the local landscape and were not observed during RiverStone's site investigations. Further discussion is not provided.
Snapping Turtle (*Chelydra serpentina*)	The Snapping Turtle is found south of Wawa and Kirkland Lake. They prefer slow-moving water with soft mud and abundant vegetation. They are found along shorelines, in streams, and in wetland complexes. Nests are dug into gravel or sand banks near water. They will use anthropogenic structures and waterbodies as habitat. They are highly tolerant to pollution.	YES	YES, iNaturalist and Herp Atlas	YES	YES	A predated Snapping Turtle nest was observed within the gravel driveway adjacent to Sand Road on the subject property. Further discussion is provided in the report.

[1]Shaded rows denote species or communities for which negative impacts have been deemed possible.

Species	General Description of Habitat and Range	Is the study area within the current known range of the species.	Do applicable databases contain records for this species within or adjacent to the study area.	Is suitable habitat present within the study area.	Is suitable habitat present within lands adjacent to the study area.	Discussion of relevance to proposal
West Virginia White (*Pieris virginiensis*)	The West Virginia White is found in the Halton Regional Forest, Manitoulin Island, Algoma District, Peterborough, and the Frontenac Axis. It requires most hardwood and mixed forests with rich soils and closed canopies. It is very sensitive to habitat fragmentation. Its host plants are Two-leaved Toothwort (primary host), Slender Toothwort, and Cut-leaved Toothwort. It may use Rock Cress and Garlic Mustard.	YES	NO	NO	NO	Habitat on the subject property and adjacent lands is fragmented and the host plants for this species were not observed. Further discussion is not provided.
Wood Thrush (*Hylocichla mustelina*)	Wood Thrush deciduous and mixed forest breeding habitat must include (lower elevations, trees >16m, >70% canopy closure, high deciduous tree diversity, moderate subcanopy and shrub density, shade, open forest floor, moist soil, decaying leaf litter). They prefer mosaics and second-growth forests.	YES	YES, NHIC and OBBA	YES	YES	Appropriate habitat for Wood Thrush is present on the subject property and adjacent lands, and Wood Thrush were observed during RiverStone's breeding bird surveys. Further discussion is provided in the report.
Yellow-banded Bumble Bee (*Bombus terricola*)	The Yellow-banded Bumble Bee is found south of the tree line, and they are less common south and west of Kitchener-Waterloo. They use open habitats and forest openings and are limited by their requirement for nectar sources from April to September. Colonies nest in rodent burrows and mated females overwinter in loose soil or rotting logs.	YES	YES, Bumble Bee Watch	YES	YES	Although appropriate habitat is present on the subject property and adjacent lands this species was not observed during RiverStone's site investigations. Further discussion is not provided.

[1]Shaded rows denote species or communities for which negative impacts have been deemed possible.

Appendix 12. Proposed Licencing Plan.

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

Potential Limit of Extraction

Sand Road Pit Extension

Part of Lot 14, Concession 5
Part of Lot 15, Concession 6
Geographic Township of Asphodel
Township of Asphodel-Norwood
County of Peterborough

Legend

- Licence Boundary
- Limit of Extraction
- 120m Offset from Licence Boundary (white)
- Area Removed from the Licence Boundary
- Area Removed from thee Limit of Extraction (white)
- Proposed Operational Crossing (white)

Date: October 2025

Sources: Aerial photography from Microsoft Bing, date unknown

Scale - 1:7000

0 100 200 Meters

R:\Brian\21100C Drain Brothers - Sand Road Expansion\Drawings\Figures\Potential Limit of Extraction\CAD\21100C - Potential Limit of Extraction.dwg

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
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