



Environmental Impact Study

514504 2nd Line Amaranth

Township of Amaranth, Dufferin County, Ontario

Submitted to:

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SJM,AS/SKM:tw

1. Introduction

GEI Consultants Canada Ltd. (GEI) has been retained by The Cellular Connection Ltd. to complete an Environmental Impact Study (EIS) for the proposed development of their property located at 514504 2nd Line, within the Township of Amaranth, Dufferin County, Ontario (hereafter referred to as the “Subject Lands;” **Figure 1, Appendix A**). The Subject Lands are approximately 33 ha in size, and are situated north of Side Road 15, west of 2nd Line, south of Side Road 20, and east of County Road 11. The site lies within the regulatory jurisdiction of both the Grand River Conservation Authority (GRCA), in the southwestern portion, and the Nottawasaga Valley Conservation Authority (NVCA), in the northeastern portion (**Figure 2, Appendix A**).

A previous version of this EIS, dated January 22, 2025, was submitted as part of an earlier development application. Comments on that submission were received from Dufferin County’s peer reviewer, RJ Burnside, on April 11, 2025, and from the NVCA on June 5, 2025. This updated EIS constitutes the second submission and has been revised to address the comments provided.

1.1. Project Overview

The Cellular Connection Ltd. proposes a 19-lot estate residential development, comprising 18 new lots for single detached dwellings and one existing lot with a residence that was under active construction during the 2024 ecological field season. The Subject Lands are primarily zoned “Rural,” with a southern portion designated as “Environmental Protection,” as per Schedule A (Land Use & Transportation) of the Township of Amaranth Official Plan (2005, Consolidated 2018). Additionally, the southern portion of the site falls within the Natural Heritage System (NHS) as defined by Dufferin County (2014, Consolidated 2017).

An EIS is required to support applications for an Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision necessary to facilitate the proposed development.

1.2. Purpose of the Report

The purpose of this EIS is to evaluate the potential impacts of the proposed development on the natural heritage features and ecological functions of the Subject Lands and the adjacent 120 m. The EIS was developed to address the applicable policies of the Provincial Planning Statement (PPS; MMAH 2024) and the associated provincial implementation guidance contained in the *Natural Heritage Reference Manual* (NHRM; MNR 2010). It also addresses the Dufferin County Official Plan (2014, Consolidated 2017) and the Township of Amaranth’s Official Plan (2005, Consolidated 2018), and Ontario Regulation (O. Reg.) 41/24, administered by the GRCA and the NVCA. This EIS has been prepared with the intent to satisfy the requirements of the aforementioned reviewing authorities.

1.3. Scope of the Report

The EIS addresses the following key components:

- Review of natural heritage background information, legislation, regulations, and policies relevant to the Subject Lands and the adjacent 120 m;

- Ecological field investigations, including targeted species surveys, to identify and delineate natural heritage features and assess species presence on the Subject Lands and the adjacent 120 m;
- Biophysical characterization of the Subject Lands and the adjacent 120 m;
- Analysis of the sensitivity of the natural heritage features and species known to be present within the Subject Lands and the adjacent 120 m;
- Evaluation of the significance of the natural heritage features;
- Description of the proposed development;
- Analysis of potential direct and indirect impacts of the proposed development on the natural heritage features, ecological functions, and species known to be present within the Subject Lands and the adjacent 120 m;
- Recommendations for mitigation measures to avoid or minimize impacts during and after development; and
- Overview of proposed restoration and enhancement measures, including monitoring to evaluate the effectiveness of these measures.

1.4. Terms of Reference

GEI consulted with the Township of Amaranth, the GRCA, and the NVCA regarding the scope of work required for this EIS. The Terms of Reference (TOR), dated March 18, 2024, received approval with comments from the Township on May 16, 2024, and from the GRCA on June 7, 2024. The NVCA provided comments on the TOR on June 6, 2024. This report integrates all feedback provided by these reviewing authorities. A copy of the TOR and related correspondence is included in **Appendix C**.

2. Natural Heritage Planning Context and Legislative Framework

The Subject Lands and the adjacent 120 m are subject to the policies and provisions of the following legislative, regulatory, and planning documents, along with any related guidance materials that support their implementation:

- PPS under the *Planning Act*, 1990 (MMAH 2024);
- Dufferin County Official Plan (2017);
- Township of Amaranth Official Plan (2018);
- O. Reg. 41/24 under the *Conservation Authorities Act*, 1990, administered by the GRCA and the NVCA;
- Provincial *Endangered Species Act*, 2007;
- Provincial *Fish and Wildlife Conservation Act*, 1997;
- Federal *Fisheries Act*, 1985; and
- Federal *Migratory Birds Convention Act*, 1994.

2.1. Provincial Planning Statement

The new PPS (MMAH 2024) came into effect on October 20, 2024. This document replaces the previous Provincial Policy Statement (2020) and *A Place to Grow: Growth Plan for the Greater Golden Horseshoe* (2020). Many of the Natural Heritage considerations remain the same. In general, the PPS provides policy direction on matters of provincial interest related to land use planning and development. It “supports a comprehensive, integrated and long-term approach to planning.” The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

This report addresses those policies that are specific to Natural Heritage (Section 4.1). Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat (SWH);
- Fish habitat;
- Habitat of Endangered and Threatened species; and
- Significant Areas of Natural and Scientific Interest (ANSIs).

The PPS states that development and site alteration shall not be permitted in significant wetlands within Ecoregions 5E, 6E, and 7E, or in significant coastal wetlands. Development and site alteration are also not permitted in fish habitat or in the habitat of endangered and threatened species, except in accordance with provincial and federal requirements.

Development and site alteration shall not be permitted in significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E, and 7E; non-significant coastal wetlands in Ecoregions 5E, 6E, and 7E; significant woodlands in Ecoregions 6E and 7E; significant valleylands in Ecoregions 6E and 7E; SWH; significant ANSIs, or on adjacent lands to any of the previously noted natural heritage features and areas (except for the habitat of endangered and threatened species), unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Of note, adjacent lands are defined in the PPS as “those lands contiguous to a specific natural heritage feature or area where it is likely that development or site alteration would have a negative impact on the feature or area. The extent of the adjacent lands may be recommended by the Province or based on municipal approaches which achieve the same objectives.”

2.2. Dufferin County Official Plan

The Dufferin County Official Plan (2014, Consolidated 2017) designates the Subject Lands as “Countryside Area” and “Provincially Significant Wetlands,” (PSW) per Schedule B: Community Structure and Land Use. In addition, the southern portion of the Subject Lands is designated “County Preliminary Natural Heritage System” on Schedule E1: Natural Heritage System.

Per Section 8.8.2 of the County’s Official Plan, the NHS comprises the following natural heritage features:

- PSWs;
- Provincially significant ANSIs;
- Fish habitat;
- Significant valleylands;
- Woodlands;
- Habitat of Endangered and Threatened species;
- SWH; and
- Unevaluated wetlands and locally/regionally significant wetlands.

In accordance with Section 5.3 of the County’s Official Plan, development and site alteration are not permitted in the following:

- Significant wetlands;
- Significant woodlands, significant valleylands, SWH, and ANSIs, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions;
- Fish habitat, except in accordance with provincial and federal requirements; and
- Habitat of Endangered and Threatened species, except in accordance with provincial and federal requirements.

2.3. Township of Amaranth Official Plan

The Township of Amaranth Official Plan (2005, Consolidated 2018) designates the Subject Lands primarily as “Rural,” with a portion along the southern boundary designated as “Environmental Protection,” as shown on Schedule A: Land Use & Transportation. In addition, the PSW along the southern property boundary is identified on Schedule B: Environmental Features. Per Section 4.1.13, an EIS is required for any development or site alteration proposed within 120 m of a PSW. The boundaries shown on Schedules A and B may be refined through the preparation of an EIS, per Section 3.8.4(l).

Per Section 3.8.1 of the Township’s Official Plan, the Environmental Protection designation is a general designation including:

- Natural hazardous lands and sites including areas of flooding, erosion, steep slopes or unstable soils;
- Fish habitat;
- Areas of SWH;
- ANSIs;
- Environmentally Sensitive Areas (ESAs);
- Wetlands;
- Significant habitats of Endangered and Threatened species;
- Significant forest areas;
- Valleylands; and
- Rivers, lakes, streams, and creeks.

The policies for Rural and Environmental Protection areas are outlined in Sections 3.2 and 3.8 of the Township’s Official Plan, respectively. The objectives for Environmental Protection include protection and enhancement of these areas, including prohibiting development “where an [EIS] has indicated that the proposal would have a negative impact on the functions, features or linkages of the Environmental Protection areas.”

In accordance with Section 4.1.1 of the Township’s Official Plan, uses permitted by the Official Plan may only be allowed provided that the long-term capacity of the site can support the use without a negative impact on environmental features, functions, and attributes, such as, water quantity and quality, natural vegetation, soil, and wildlife.

2.4. Grand River Conservation Authority and Nottawasaga Valley Conservation Authority

Effective April 1, 2024, O. Reg. 41/24: Prohibited Activities, Exemptions and Permits has come into force, replacing the former O. Reg. 150/06 and O. Reg. 176/06 Development, Interference with Wetlands, Alterations to Shorelines and Watercourses Regulation. O. Reg. 41/24 allows Conservation Authorities to implement Section 28 of the *Conservation Authorities Act* (1990, amended 2024), which states that:

28 (1) *No person shall carry on the following activities, or permit another person to carry on the following activities, in the area of jurisdiction of an authority:*

1. *Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland.*
2. *Development activities in areas that are within the authority's area of jurisdiction and are,*
 - i. *hazardous lands,*
 - ii. *wetlands,*
 - iii. *river or stream valleys the limits of which shall be determined in accordance with the regulations,*
 - iv. *areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to an inland lake and that may be affected by flooding, erosion or dynamic beach hazards, such areas to be further determined or specified in accordance with the regulations, or*
 - v. *other areas in which development should be prohibited or regulated, as may be determined by the regulations. 2017, c. 23, Sched. 4, s. 25.*

Pursuant to O. Reg. 41/24, any interference with or development in or on areas stated in the *Conservation Authorities Act* (e.g., hazardous lands, wetlands, river or stream valleys) requires permission from the Conservation Authority. The Conservation Authority may issue permits under Section 28.1 and may attach conditions on the permits per Section 9(1) of the Regulation.

A review of the GRCA and NVCA online mapping was completed to determine the extent of Conservation Authority regulated areas within the Subject Lands. The Whittington PSW and two of the unnamed waterbodies in the southwest portion of the Subject Lands were identified as GRCA-regulated features, while the unnamed watercourse and the White Whitten Drain along the northern property boundary were identified as NVCA-regulated features according to online mapping.

2.5. *Endangered Species Act, 2007 and Bill 5*

The Ministry of the Environment, Conservation and Parks (MECP) administers the provincial *Endangered Species Act, 2007*, which was developed to:

- Identify species at risk (SAR), based upon best available science;
- Protect SAR and their habitats and to promote the recovery of the SAR; and
- Promote stewardship activities that would support those protection and recovery efforts.

The *Endangered Species Act* protects all Threatened, Endangered, and Extirpated species listed in O. Reg. 230/08: Species at Risk in Ontario List (i.e., SARO). These species are legally protected from harm or harassment, and their associated habitats are legally protected from damage or destruction, as defined under the *Endangered Species Act*.

On April 17, 2025, the Government of Ontario introduced Bill 5, the *Protect Ontario by Unleashing our Economy Act, 2025*. On June 5, 2025, Bill 5 received Royal Assent, and it will modify and eventually replace the *Endangered Species Act* on a date to be determined. Upon its enactment, the *Endangered Species Act* and its associated regulations will be repealed, and the *Species Conservation Act, 2025* will come into force. The *Species Conservation Act* provides many of the same protections to SAR.

2.6. *Fish and Wildlife Conservation Act, 1997*

The Ministry of Natural Resources (MNR) administers the *Fish and Wildlife Conservation Act, 1997*, which governs the protection, management, and sustainable use of Ontario's fish and wildlife resources. The *Fish and Wildlife Conservation Act* establishes rules for activities such as hunting, fishing, and trapping, and provides measures to support the conservation of wildlife populations and their habitats.

Under the *Fish and Wildlife Conservation Act*, specific features used by wildlife receive legal protection. Examples include beaver dams and the dens of Black Bear and furbearing mammals, which are protected from damage or destruction, except in circumstances exempted for licensed trappers or for certain species (e.g., fox and skunk). The *Fish and Wildlife Conservation Act* also protects the nests and eggs of bird species that are not protected under the *Migratory Birds Convention Act* and are not otherwise excluded under the *Fish and Wildlife Conservation Act*.

2.7. *Fisheries Act, 1985*

Fisheries and Oceans Canada (DFO) administers the federal *Fisheries Act, 1985*, which defines fish habitat as "spawning grounds and other areas, including nursery, rearing, food supply, and migration areas, on which fish depend directly or indirectly in order to carry out their life processes" (subsection (2)1). The *Fisheries Act* prohibits the death of fish by means other than fishing (subsection 34.4 (1)) and the harmful alteration, disruption, or destruction of fish habitat (HADD; subsection 35. (1)). A HADD is defined as "any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes" (DFO 2019a).

Some projects may be eligible for exemption from the DFO review process, as specified under Step 3 of the DFO Fish and Fish Habitat Protection Program review process (DFO 2019b). Examples of exemptions include clear-span bridges and bridge maintenance projects where DFO mitigation measures are applied, artificial waterbodies with no hydrological connection to occupied fish habitat, and projects that follow the Standards and Codes of Practice defined by DFO.

All other projects or activities that have the potential to impact fish or fish habitat should be submitted to DFO through the "Request for Review" process. DFO will review the proposed project to determine whether there is potential to:

- i. Impact an aquatic SAR;
- ii. Cause the death of fish; or
- iii. Result in HADD of fish habitat.

The death of fish by means other than fishing or a HADD of fish habitat can be authorized by DFO under paragraphs 34.4(2)(b) or 35(2)(b) of the *Fisheries Act*. Authorizations require the preparation and submission of an application package identifying the impacts on fish and fish habitat; the avoidance, mitigation, and offsetting measures that will be implemented; and any monitoring that is proposed.

2.8. *Migratory Birds Convention Act, 1994*

Environment and Climate Change Canada (ECCC) administers the *Migratory Birds Convention Act, 1994*, which protects the nests of migratory bird species from destruction, including incidental take (i.e., the unintentional destruction of a nest), as well as from disturbance. The *Migratory Birds Convention Act* does not provide a set date where activities, such as tree removal, can be completed without the risk of incidental harm to the nests of birds. The requirement to ensure that there are no bird nests present within the work area rests with the proponent of the activity.

3. Data Collection Approach and Methods

GEI used two levels of investigation to obtain information about the natural heritage features and functions of the Subject Lands. This included a background review of existing information sources and detailed field surveys and assessments. The following sections describe each level of investigation in further detail.

3.1. Background Review

GEI reviewed the following background materials to identify existing natural heritage information and assess potential species presence for the Subject Lands:

- *The Physiography of Southern Ontario*, 3rd Edition. (Chapman & Putnam 1984);
- Aerial imagery (e.g., First Base Solutions, Google);
- MNR Geospatial Ontario: datasets through the Ontario GeoHub platform and the related *Make a Map: Natural Heritage Areas* (2024) mapping tool;
- MNR Natural Heritage Information Centre (NHIC): database accessed via the *Make a Map: Natural Heritage Areas* (2024) mapping tool;
- MECP guidance on bat SAR (2022);
- Birds Canada's Ontario Breeding Bird Atlas (Cadman *et al.* 2007);
- Ontario Nature's Ontario Reptile and Amphibian Atlas (2024);
- Toronto Entomologists' Association's Ontario Butterfly and Moth Atlases (2024a, 2024b);
- DFO's "Canadian Aquatic Species at Risk" distribution mapping (2024); and
- Citizen science databases (i.e., iNaturalist [2024] and eBird [2024]).

The results of the background review can be found in **Sections 4.1 to 4.4**.

3.2. Ecological Field Surveys

GEI conducted an ecological field survey program in 2024 to gather data necessary for assessing the significance and sensitivity of natural heritage features within the Subject Lands and the adjacent 120 m, identifying potential ecological constraints to development, and exploring opportunities for restoration and enhancement. Based on GEI's review of aerial imagery, background information, and the proposed Draft Plan, the following ecological field surveys were undertaken to identify and delineate natural heritage features and assess species presence within the Subject Lands:

- Ecological Land Classification (ELC);
- Three-season botanical inventory (spring, summer, and fall);
- Wetland boundary delineation;
- Breeding bird surveys (two rounds);

- Calling amphibian surveys (three rounds);
- Turtle basking surveys (three rounds);
- Terrestrial crayfish survey (one round);
- Headwater Drainage Feature Assessment (HDFa; three rounds); and
- Fish community sampling (one round).

The required survey types were confirmed through the approved TOR, included in **Appendix C**.

The following subsections describe the methods of these ecological field surveys. A summary of the survey types and dates is provided in **Table 1 (Appendix B)**. The results of the ecological field surveys can be found in **Sections 4.5 to 4.7**.

3.2.1. Vegetation and Landscape Survey Methods

The following subsections outline the methods used by GEI to conduct vegetation and landscape surveys within the Subject Lands and the adjacent 120 m.

3.2.1.1. Ecological Land Classification

GEI conducted Ecological Land Classification (ELC) to characterize the vegetation communities within the Subject Lands and the adjacent 120 m. The classification followed the sampling protocol outlined in the *Ecological Land Classification for Southwestern Ontario: First Approximation and its Application* (Lee et al. 1998).

Vegetation communities were initially identified using aerial imagery and subsequently ground-truthed and revised as necessary during field visits on May 10, July 26, and September 9, 2024. For areas outside the Subject Lands, vegetation communities were delineated and characterized through air photo interpretation. This analysis used spring 2023 imagery obtained from First Base Solutions. Generally, vegetation communities of at least 0.5 hectares in size were mapped; however, smaller distinct communities were also mapped where appropriate.

ELC classification was completed to the finest level of resolution (vegetation type) whenever feasible. When the observed species assemblage did not align with existing vegetation codes, the community was classified to the ecosite level. The provincial status of all vegetation communities was determined based on the NHIC plant communities list (2021).

3.2.1.2. Botanical Inventory

GEI conducted a three-season botanical inventory within the Subject Lands in 2024, with surveys completed during the spring (May 10), summer (July 26), and fall (September 9). Species nomenclature generally follows the *Database of Vascular Plants of Canada* (Brouillet et al. 2010+).

The provincial status of all plant species was determined based on NHIC rankings (2024). Local status was assessed based on data for Huron County, as outlined in *The Distribution and Status of the Vascular Plants of Southwestern Ontario* (Oldham 1993).

3.2.1.3. Wetland Boundary Delineation

GEI and GRCA staff staked the limits of the wetlands within GRCA jurisdiction (in the southern portion of the Subject Lands) on August 28, 2024. The staked wetland boundary was surveyed by a licensed Ontario Land Surveyor the same day. On August 30, 2024, the GRCA issued a Violation Notice for Unauthorized Works under Section 28 of the *Conservation Authorities Act* and O. Reg. 41/24 for the removal of wetland within their jurisdiction, as identified during the staking. This violation notice is discussed further in **Section 4.5.4.**

On May 27, 2024, the NVCA issued a Violation Notice for Unauthorized Works under Section 28 of the *Conservation Authorities Act* and O. Reg. 41/24 for the removal of vegetation from areas previously identified by the NVCA as wetland. As a result of this violation, the NVCA determined that on-site staking of the current wetland limits would not be undertaken. This violation notice is discussed further in **Section 4.5.4.**

3.2.2. Wildlife Survey Methods

The following subsections outline the methods used by GEI to conduct targeted wildlife surveys within the Subject Lands and the adjacent 120 m. The provincial status of all wildlife species was determined based on NHIC rankings (2024).

3.2.2.1. Breeding Bird Surveys

GEI conducted breeding bird surveys on the Subject Lands following the protocols of the *Atlas of the Breeding Birds of Ontario 2001–2005* (Cadman et al. 2007) and the *Ontario Forest Bird Monitoring Program* (Cadman et al., 1998). These protocols generally follow the *Bird and Bird Habitats: Guidelines for Wind Power Projects* (MNR 2020) recommended under the SWH Criteria Schedules for Ecoregion 6E (MNRF 2015a) but have been adjusted, based on professional experience, to implement a more comprehensive approach that combines area search and point count techniques.

GEI conducted two survey rounds during the peak breeding season, on June 12 and June 26, 2024, between dawn and five hours after dawn. These survey dates were chosen to ensure suitable weather conditions, without thick fog or precipitation and with wind speeds generally below 19 km/h. Four point-count stations in different habitat types were surveyed within the Subject Lands (**Figure 3, Appendix A**) and combined with area searches to help determine the presence, variety, and abundance of bird species. Each point-count station was surveyed for 10 minutes for birds within 100 m and beyond 100 m. All species recorded at a point-count station were mapped to provide spatial information and were observed for signs of breeding behaviour.

3.2.2.2. Calling Amphibian Surveys

GEI conducted amphibian call count surveys on the Subject Lands following the Marsh Monitoring Program (MMP) methodology (Birds Studies Canada 2009). Eight survey stations were selected based on aerial photography and a site reconnaissance, which identified potential breeding habitat at various ponds and wetlands within the Subject Lands and the adjacent 120 m (**Figure 3, Appendix A**).

Amphibian survey efforts began on March 13, 2024, with a diurnal call count survey targeting Western Chorus Frog due to the early warm spring conditions. This diurnal survey was combined with an early-season egg mass survey. Standard nocturnal call count surveys were conducted during the peak breeding season on April 8, May 15, and June 12, 2024, on warm nights with little wind and no heavy rain. The three survey rounds were conducted when minimum nighttime air temperatures were 5°C, 10°C, and 17°C, respectively, and surveys were conducted at least 15 days apart. Surveys began half an hour before dusk and ended before midnight.

The survey stations were surveyed for three minutes and the MMP call level codes system was used to identify frog activity: Level 1 when calls are not simultaneous and calling individuals can be counted, Level 2 when some calls are simultaneous but individual calls are distinguishable and the number of individuals can be estimated, and Level 3 when calls are continuous and overlapping in a full chorus. If loud noise such as from plane, train, or road traffic was present, the three-minute monitoring period was delayed until a quieter period. Information recorded included the date and time of each call count survey, species observed, air temperature, wind speed, degree of cloud cover, and level of precipitation (if any).

3.2.2.3. Turtle Basking Surveys

GEI conducted turtle basking surveys within the Subject Lands based on protocols set forth by the MNR (MNRF 2015b). Four survey stations were selected based on aerial photography and a site reconnaissance, which identified potential overwintering habitat at various ponds and open wetlands within the Subject Lands (**Figure 3, Appendix A**). GEI conducted three survey rounds during the peak basking season, on March 13, April 10, and May 7, 2024. Surveys were conducted between 8:00 and 17:00 under sunny conditions with air temperatures between 5°C and 25°C, or alternatively under overcast conditions with air temperatures between 15°C and 30°C. On days when afternoon air temperature exceeded 25°C, surveys were conducted between 8:00 and 10:00.

Binoculars were used to scan, from a distance, the edges and surface of each water body for basking turtles for 30 minutes per station. If possible, the perimeter of the feature was walked and surveyed, using polarized sunglasses, after scanning with binoculars. Information recorded during these surveys included the date and time of each basking survey, species observed, locations of observations (UTM coordinates), air temperature, and weather conditions.

3.2.2.4. Terrestrial Crayfish Survey

In accordance with the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF 2015a), Terrestrial Crayfish surveys were required to be conducted from April to August in all suitable ecosites with permanent or temporary water. Ideally, these surveys were performed before emergent vegetation restricted visibility of the bare ground.

Within the Urban Area, Terrestrial Crayfish surveys were conducted in June 2024, in conjunction with other survey types, across all suitable ecosites. Due to the difficulty of visually observing crayfish individuals, their presence was confirmed by identifying burrows, also referred to as chimneys. If identified, the locations of clusters, which signified a colony, or individual chimneys were recorded using a hand-held GPS device. Additional information, such as the surrounding vegetation within a 1 m radius, distance to water, and the number of chimneys observed, was also documented.

3.2.3. Aquatic Survey Methods

The following subsections outline the methods used by GEI to conduct headwater drainage feature and targeted fish surveys within the Subject Lands and the adjacent 120 m.

3.2.3.1. Headwater Drainage Feature Assessment

GEI assessed potential headwater drainage features within the Subject Lands using the *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* (CVC & TRCA 2014; hereafter referred to as the “H DFA Guidelines”). The H DFA Guidelines provide a standardized approach to identifying and evaluating headwater drainage features, assessing their ecological and biophysical functions, and providing long-term management recommendations to protect or maintain the important ecological or biophysical functions in a developing landscape

Prior to conducting the first round H DFA, GEI completed a desktop review to identify the locations of potential headwater drainage features. This process involved an ArcGIS mapping exercise using available LiDAR data to determine potential flow paths on the landscape based on topographic relief. The resulting map provided a screening tool for use during the first round H DFA in March 2023. All portions of the Subject Lands were assessed during the first round H DFA, even if the screening did not identify a feature as potentially present. Features identified during this screening that were found to be absent or dry upon the first round H DFA were not mapped.

In accordance with the H DFA Guidelines, GEI conducted three survey rounds to assess headwater drainage features on the Subject Lands, on March 13, May 22, and August 14, 2024.

During the first round H DFA, the Subject Lands were thoroughly walked to identify potential headwater drainage features. Each observed headwater drainage feature was divided into specific reaches following the reach delineation guidance in the H DFA Guidelines. Data collection for each reach was conducted in accordance with the *Ontario Stream Assessment Protocols for Unconstrained Headwater Sampling, Section 4: Module 11* (OSAP; Stanfield, ed. 2017), and a photographic record of each feature was taken during each survey event.

Upon completing the surveys, the collected data was analyzed to classify the headwater drainage features and determine appropriate management recommendations based on the hierarchical framework outlined in the H DFA Guidelines.

3.2.3.2. Fish Community Sampling

GEI conducted fish community sampling within the Subject Lands to confirm fish presence or absence and assess general species composition. Sampling was carried out at four locations (**Figure 3, Appendix A**) on March 13, 2024, in conjunction with the first round of H DFA survey work. Baited minnow traps were deployed in the morning and retrieved several hours later. Captured fish were identified to species, enumerated, and released back into the sampled feature.

All data were reported to the MNR in accordance with the requirements of the License to Collect Fish for Scientific Purposes permit.

4. Biophysical Characterization

The Subject Lands are located within a landscape characterized by a mix of agricultural uses and natural areas, with sparse, widely spaced residential properties. The primary natural heritage feature on the Subject Lands and the surrounding areas is the Whittington PSW Complex, located at the southern end of the Subject Lands and extending well beyond, as shown in **Figure 2 (Appendix A)**. Surrounding lands also include additional woodlands and wetlands. At the time of the ecological field surveys, the Subject Lands were undergoing active construction and land management but retained several dug ponds and surrounding marsh areas.

This section provides an overview of the physical and ecological characteristics of the Subject Lands and the adjacent 120 m. It describes the physiographic context, regional landscape ecology, and natural heritage features, including vegetation communities, aquatic habitats, and species records. Results of the background review and targeted ecological field surveys are presented to characterize species presence, habitat conditions, and ecological functions within the study area.

4.1. Physiography

The Subject Lands are located in the Dundalk Till Plain physiographic region, located in Dufferin, Grey, and Wellington counties. The Dundalk Till Plain spans approximately 2,396 km² and forms the highest region of peninsular Ontario, with elevations ranging from 1,400 to 1,750 feet. This gently undulating landscape is characterized by fluted and drumlinized topography shaped by glacial activity, with clay, gravel, and boulders deposited by retreating ice sheets. Shallow valleys and depressions, many poorly drained, dominate the surface and contribute to the region's extensive wetland complexes, including swampy areas with underfit or absent streams. The plain serves as the headwaters for major river systems, including the Grand, Saugeen, Maitland, and Nottawasaga.

Soils across the Dundalk Till Plain are diverse, ranging from poorly drained gleysolic soils in low-lying areas to better-drained loams and silt loams influenced by windborne deposits. The region supports a mix of wetlands and agricultural land, although slow drainage and seasonal saturation limit cultivation in some areas. Historically, the region was covered by hardwood forests, including maple, beech, and birch, alongside swamp forests of cedar, elm, and tamarack. Today, the landscape is dominated by agriculture and pasture, interspersed with wetlands (Chapman & Putnam 1984).

4.2. Landscape Ecology

The Subject Lands occur within the Lake Simcoe-Rideau Ecoregion 6E, which extends from Lake Huron to the Ottawa River and includes most of the northern Lake Ontario shoreline and the St. Lawrence River Valley. Ecoregion 6E falls within the Great Lakes–St. Lawrence forest region, an area of moderate climate where natural succession leads to forests dominated by shade-tolerant hardwood species, such as Sugar Maple (*Acer saccharum*) and American Beech (*Fagus grandifolia*), and hardwood species with intermediate shade tolerance, such as Red Oak (*Quercus rubra*) and Yellow Birch (*Betula alleghaniensis*). These forests also often include associations of White Pine (*Pinus strobus*) and Red Pine (*Pinus resinosa*).

Consideration of the larger ecological matrix or landscape provides insight into potential interactions between abiotic and biotic flows. The Subject Lands and surrounding landscape are well-connected, with extensive natural features such as the Whittington PSW and other woodlands and wetlands offering significant opportunities for the movement of organisms, matter, and energy. While agricultural lands also facilitate some wildlife movement, their contribution is more limited. The primary barriers to movement are 20 Sideroad to the north and 2nd Line to the east, both of which are small gravel roads that pose only minor impediments to wildlife passage.

4.3. Natural Heritage Areas Mapping

Through the MNR Geospatial Ontario's *Make a Map: Natural Heritage Areas* (2024) mapping tool, the following natural heritage features were identified within the Subject Lands and the adjacent 120 m (**Figure 2, Appendix A**):

- Three unnamed waterbodies are located within the Subject Lands, including one near the center and two near the southwest corner;
- An unnamed watercourse extends from the waterbody feature located near the center of the Subject Lands to the northern property boundary;
- The unnamed watercourse is mapped as feeding into the White Whitten Drain which runs along the northeastern corner of the Subject Lands;
- The Whittington PSW Complex extends onto the Subject Lands along the southern property boundary, with most of its extent located to the southwest; and
- An unevaluated wetland feature contiguous with the Whittington PSW Complex is mapped at the southern end of the Subject Lands. Three additional unevaluated features are mapped within 120 m of the Subject Lands, two of which are mapped as swamp (i.e., treed wetland) features.

No additional natural heritage features were identified within or adjacent to the Subject Lands through this mapping tool. Data from the NHIC database, while accessed via *Make a Map: Natural Heritage Areas*, are presented separately in **Section 4.4.1**.

4.4. Species Occurrence Records

The following subsections summarize species occurrence records for the Subject Lands, compiled from the background review. A summary of these results can be found in **Tables 2a to 2d (Appendix B)**.

4.4.1. Natural Heritage Information Centre

The MNR NHIC database was accessed via the *Make a Map: Natural Heritage Areas* (2024) mapping tool, and searched for records of provincially significant plants, vegetation communities, and wildlife within the Subject Lands and the surrounding areas. The database provides occurrence data in 1 km x 1 km (1 km²) area squares, with four squares overlapping the Subject Lands (17NJ6572, 17NJ6573, 17NJ6672, 17NJ6673). All species identified within the NHIC squares may not be found within the Subject Lands. Habitat type, availability, and size are all contributing factors in species presence and use.

The following four species of interest were noted:

- Species listed as Threatened or Endangered on the SARO List:
 - Bobolink (*Dolichonyx oryzivorus*) – Threatened;
 - Eastern Meadowlark (*Sturnella magna*) – Threatened; and
 - Short-eared Owl (*Asio flammeus*) – Threatened.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Snapping Turtle (*Chelydra serpentina*) – Special Concern.

4.4.2. Bat Species at Risk

Four bat species are listed on the SARO list as Endangered: Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Tri-coloured Bat (*Perimyotis subflavus*), and Northern Myotis (*Myotis septentrionalis*). These SAR bat species are known to form maternity roosts within wooded areas, individual trees, as well as anthropogenic structures such as barns, houses, garages, and sheds (MECP 2022).

The MECP considers SAR bats largely ubiquitous within forest and swamp communities, and therefore these species are potentially present within 120 m of the Subject Lands.

4.4.3. Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) Data Summary: 2001–2005 (Cadman *et al.* 2007) contains detailed information on the population and distribution status of birds in Ontario. The database provides occurrence data in 10 km x 10 km (100 km²) area squares, with one square overlapping the Subject Lands (17TNJ67). The Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all the listed bird species are found within the Subject Lands. Habitat type, availability, and size are all contributing factors to bird species presence and use.

A total of 84 bird species were recorded in the atlas square that overlaps with the Subject Lands, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO List:
 - Bank Swallow (*Riparia riparia*) – Threatened;
 - Bobolink – Threatened;
 - Chimney Swift (*Chaetura pelagica*) – Threatened;
 - Eastern Meadowlark – Threatened;
 - Eastern Whip-poor-will (*Antrostomus vociferus*) - Threatened
 - Least Bittern (*Ixobrychus exilis*) – Threatened;
 - Louisiana Waterthrush (*Parkesia motacilla*) – Threatened; and
 - Short-eared Owl – Threatened.

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Barn Swallow (*Hirundo rustica*) – Special Concern;
 - Black Tern (*Chlidonias niger*) – Special Concern;
 - Canada Warbler (*Cardellina canadensis*) - Special Concern;
 - Golden-winged Warbler (*Vermivora chrysoptera*) – Special Concern;
 - Upland Sandpiper (*Bartramia longicauda*) – S2B;
 - Wilson’s Phalarope (*Phalaropus tricolor*) – S2B, S4M;
 - Caspian Tern (*Hydroprogne caspia*) – S3B, S4M; and
 - Purple Martin (*Progne subis*) – S3B.

4.4.4. Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas (Ontario Nature 2024) contains detailed information on the population and distribution status of herpetofauna in Ontario. The database provides occurrence data in 10 km x 10 km (100 km²) area squares, with one square overlapping the Subject Lands (17NJ67). The Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all the listed herpetofauna species are found within the Subject Lands. Habitat type, availability, and size are all contributing factors to herpetofauna species presence and use.

A total of 12 herpetofauna species were recorded in the atlas square that overlaps with the Subject Lands, of which one is a salamander species, nine are frog and toad species, and two are turtle species. Of these species, the following species of interest was noted:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Snapping Turtle – Special Concern.

4.4.5. Ontario Butterfly and Moth Atlases

The Ontario Butterfly and Moth Atlases (Toronto Entomologists’ Association 2024a, 2024b) contain detailed information on the population and distribution status of butterflies and moths in Ontario. The database provides occurrence data in 10 km x 10 km (100 km²) area squares, with one square overlapping the Subject Lands (17NJ67). The Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all the listed butterfly and moth species are found within the Subject Lands. Habitat type, availability, and size are all contributing factors to butterfly and moth species presence and use.

A total of 16 species, including 12 butterfly species and 4 moth species, were recorded in the atlas square that overlaps with the Subject Lands. Of these species, the following species of interest was noted:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Monarch (*Danaus plexippus*) – Special Concern.

4.4.6. Aquatic Species at Risk Distribution Mapping

The DFO “Canadian Aquatic Species at Risk” (2024) distribution mapping tool was used to identify any known occurrences of aquatic SAR, including fish and mussels, within the White Whitten Drain, including reaches to the north (upstream) and south (downstream) of the Subject Lands. No aquatic SAR were identified through this review.

4.4.7. Citizen Science Databases (iNaturalist and eBird)

The iNaturalist (2024) database is a large citizen science-based project that aims to collect, archive, and share sightings of flora and fauna species. Users can submit observations to be reviewed and identified by naturalists and scientists to help provide accurate species observations. As the observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence. It should be noted that only “research grade” observations will be referenced.

This online database was examined to identify observations made within the Subject Lands or the adjacent 120 m. One species of interest (Monarch) was noted west of the Subject Lands. No other significant species were identified within the Subject Lands or the adjacent 120 m.

The eBird (2024) database is a large citizen science-based project that aims to gather bird diversity information in the form of checklists of birds, archive it, and share it to power new data-driven approaches to science, conservation, and education. As the observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence, and species may be filtered out based on habitat and target survey efforts.

This online database was examined to identify observations made within the Subject Lands or the adjacent 120 m; however, no significant bird species were identified in this area.

4.5. Vegetation and Landscape Survey Results

The following subsections present the results of the vegetation and landscape surveys conducted by GEI within the Subject Lands and the adjacent 120 m.

4.5.1. Vegetation Communities

The Subject Lands were previously agricultural but were undergoing active construction during the ELC surveys. Most vegetation had been removed, resulting in the area being predominantly classified as disturbed. ELC mapping of the existing conditions of the Subject Lands is provided in **Figure 4 (Appendix A)**, with detailed descriptions of each ELC unit in **Table 3 (Appendix B)**. Furthermore, mapping of historical wetlands, discussed further in **Sections 4.5.4 and 7.1**, is provided in **Figure 5 (Appendix A)**. No provincially rare vegetation communities were identified within the Subject Lands or the adjacent 120 m (NHIC 2021).

4.5.2. Vascular Plants

GEI identified 140 vascular plant species (taxa inclusive of subspecies, varieties, and hybrids) within the Subject Lands during the three-season botanical inventory. Of these, 65% (91 species) are native to Ontario, while 35% (49 species) are exotic. Among the native species, 96% (87 species) are ranked S5 (secure in Ontario), and 4% (4 species) are ranked S4 (apparently secure in Ontario). A complete list of vascular plant species is provided in **Table 4 (Appendix B)**.

4.5.2.1. Plant Species of Conservation Interest

None of the plant species identified within the Subject Lands during the botanical inventories are SAR or provincially rare (S1–S3) species. Furthermore, no locally rare species were identified within the Subject Lands, based on data for Huron County in *The Distribution and Status of the Vascular Plants of Southwestern Ontario* (Oldham 1993).

4.5.2.2. Potentially Sensitive Plant Species

Potentially sensitive plant species were identified using their assigned Coefficient of Conservatism (CC) value (Oldham et al., 1995), which range from 0 (low) to 10 (high) based on a species' tolerance of disturbance and habitat fidelity. Species with a low CC value tend to have little or no fidelity to pristine or unique natural ecosystems and can be found in a variety of natural or anthropogenic habitats. Species with a CC value of 7 to 10 are potentially sensitive (with 9 and 10 being the most sensitive) as they tend to have a consistent fidelity to high-quality, undisturbed, or unique ecosystems.

Three species with a CC value of 7 were identified within 120 m of the Subject Lands:

- Tamarack (*Larix laricina*): planted individuals in SWT2-2 on the lands formerly severed from the Subject Lands and in the CUP3 plantation to the north of the Subject Lands; and
- Wild Leek (*Allium tricoccum*): within the FOD5-1 at the northwest corner of the Subject Lands.

No species with a CC value of 7 to 10 were identified within the Subject Lands.

4.5.2.3. Invasive Plant Species

Invasive plant species can pose significant ecological threats by reproducing and spreading aggressively, outcompeting native plants, reducing biodiversity, and impairing the ecological function of natural areas. The severity of their impact depends on site conditions; however, under favorable conditions, these species can dominate and outcompete all others.

Urban Forest Associates (2002) developed a categorical ranking system to classify invasive plants in southern Ontario based on their ecological threat. Category 1 plants are considered the most invasive, capable of dominating a site indefinitely due to their highly efficient reproduction and dispersal mechanisms.

Of the 49 exotic plant species identified within the Subject Lands and the adjacent 120 m, four are classified as Category 1 by Urban Forest Associates:

- Canada Thistle (*Cirsium arvense*);

- Garlic Mustard (*Alliaria petiolata*);
- Purple Loosestrife (*Lythrum salicaria*); and
- European Buckthorn (*Rhamnus cathartica*).

4.5.3. Wetland Boundary Delineation

The results of the wetland staking conducted within GRCA jurisdiction (in the southern portion of the Subject Lands) on August 28, 2024, are presented in **Figure 4 (Appendix A)** and were used to inform ELC mapping for the Subject Lands.

4.5.4. Wetland Removals

On August 30, 2024, the GRCA issued a Violation Notice for Unauthorized Works under Section 28 of the *Conservation Authorities Act* and O. Reg. 41/24 for the removal of wetland within their jurisdiction (see mapping based on historical aerial imagery in **Figure 5, Appendix A**). To resolve the violation, the GRCA required the proponent to apply for a permit and to provide a supporting letter demonstrating how the completed wetland removal met applicable GRCA policies. The permit application was submitted by the proponent, and GEI prepared and submitted the required supporting letter, a copy of which is included in **Appendix D**. The GRCA subsequently issued a permit on May 28, 2025, thereby resolving the violation.

On May 27, 2024, the NVCA issued a Violation Notice for Unauthorized Works under Section 28 of the *Conservation Authorities Act* and O. Reg. 41/24 for the removal of vegetation from areas previously identified by the NVCA as wetland. To resolve the violation, the NVCA required delineation of the former wetland extent within their jurisdiction, based on a combination of background information review and site investigations, to inform on-site compensation requirements through restoration and enhancement. GEI completed the historical wetland extent delineation, the results of which are shown in **Figure 5 (Appendix A)**. The methods and results of this detailed review were submitted to the NVCA in a letter, a copy of which is included in **Appendix E**. Following subsequent discussions with the NVCA, including a meeting held on August 20, 2025, the proponent and the NVCA have agreed in principle on the general compensation approach required to resolve the outstanding violation. The restoration and enhancement plan provided in **Section 8** outlines the proposed compensation measures to implement this approach and to support the recovery of ecological functions lost or impaired as a result of the wetland removals.

4.6. Wildlife Survey Results

The following subsections present the results of the targeted wildlife surveys conducted by GEI within the Subject Lands and the adjacent 120 m.

4.6.1. Birds

A total of 41 bird species were observed within the Subject Lands and the adjacent 120 m, as listed in **Table 5 (Appendix B)**. Of this total, one species is confirmed, 17 are probable, and 12 are possible breeders on the Subject Lands. In addition, seven bird species were observed that were considered non-breeders, flyovers, or migrants, and three additional species were observed only on adjacent lands within 120 m: Bobolink, Brown-headed Cowbird (*Molothrus ater*), and Warbling Vireo (*Vireo gilvus*). Lastly, Upland Sandpiper was observed over 500 m from the Subject Lands.

A total of 29 (96%) of the 30 confirmed, probable, or possible breeders are provincially ranked S5 (common and secure), S4 (apparently common and secure), or SNA (species not native to Ontario). Of the 41 observed species, the following species of interest were noted on the Subject Lands:

- Species listed as Threatened or Endangered on the SARO List:
 - Eastern Meadowlark – Threatened
 - One Eastern Meadowlark was observed on the Subject Lands at PC 2 during the round 1 breeding bird survey. Additional observations were made off-site to the east in suitable breeding habitat during rounds 1 and 2. As no suitable breeding habitat was identified on the Subject Lands, it is presumed the Eastern Meadowlark was using the area solely for foraging. Observation locations within suitable breeding habitat are shown in **Figure 6 (Appendix A)**.
 - Barn Swallow – Special Concern
 - Barn Swallows were observed foraging in flight over the Subject Lands at PC 2 during the round 2 breeding bird survey, with no evidence of breeding. No suitable breeding structures were identified on the Subject Lands, as all structures were newly built and lacked the attachment sites preferred by this species.

The following species of interest was noted within 120 m of the Subject Lands:

- Species listed as Threatened or Endangered on the SARO List:
 - Bobolink – Threatened
 - Bobolink was observed off-site to the east in suitable breeding habitat during rounds 1 and 2 of the breeding bird surveys. No suitable breeding habitat was identified on the Subject Lands, though foraging opportunities exist. Observation locations within suitable breeding habitat are shown in **Figure 6 (Appendix A)**.

The following species of interest was observed beyond 120 m from the Subject Lands (estimated at over 500 m) and is included here for due diligence purposes:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Upland Sandpiper – S2
 - One singing male was detected off-site during the round 2 breeding bird survey, estimated to be over 500 m to the west in potentially suitable breeding habitat consisting of hay and old field meadow. No individuals were observed within the Subject Lands or the adjacent 120 m, and no suitable breeding habitat exists within the Subject Lands.

4.6.2. Amphibians

A total of six amphibian species were detected within the Subject Lands during the three rounds of call count surveys, including Spring Peeper (*Pseudacris crucifer*), Gray Treefrog (*Hyla versicolor*), American Toad (*Anaxyrus americanus*), Green Frog (*Rana clamitans*), Western Chorus Frog (*Pseudacris triseriata*), and Northern Leopard Frog (*Lithobates pipiens*). Additionally, five species were detected on lands

immediately adjacent to the Subject Lands, including four species also observed within the Subject Lands (Spring Peeper, American Toad, Gray Treefrog, and Western Chorus Frog) and one additional species, Wood Frog (*Lithobates sylvaticus*), which was not observed within the Subject Lands. All these species are provincially ranked as S5 (common and secure) or S4 (apparently common and secure).

Full survey results are provided in **Tables 6a and 6b (Appendix B)**. The results of the eight stations (locations shown in **Figure 3, Appendix A**) monitoring features within the Subject Lands and the adjacent 120 m are summarized below:

- **AMC1:** This station monitored a wetland (MAM/MAS) located on lands previously severed from the Subject Lands, west of 2nd Line. Four species were detected, with the highest call level code being 2.
- **AMC2:** This station focused on minor shallow pooling within the Subject Lands (MAM), the off-site PSW (SWT2-2) along the southern boundary, and the off-site pond to the south (OAO). Two species were detected calling at level 1. In the off-site areas, three species were detected, with the highest call level code being 2.
- **AMC3:** This station monitored the eastern shallow water wetland (MAM2/MAS2-1/SAS1) within the PSW on the Subject Lands and the off-site PSW (SWT2-2) along the southern boundary. Within the Subject Lands, one species was detected at level 1. In the off-site areas, three species were heard calling, with one species at call level 3. However, no additional species were heard at call level 3.
- **AMC4:** This station focused on the western shallow water wetland (MAM2/MAS2-1/SAS1) within the PSW on the Subject Lands and the off-site PSW (SWT2-2) along the southern boundary. Four species were detected within the Subject Lands, with one species at call level 3. The off-site areas had one species calling at level 2. Similar to AMC3, no additional species were detected at call level 3.
- **AMC5:** This station monitored the unevaluated shallow water wetland (MAM2/MAS2-1/SAS1) in the central portion of the Subject Lands. Five species were detected, with all species calling at level 1. Several young Northern Leopard Frogs were observed within this wetland during other surveys, confirming successful breeding of this species.
- **AMC6:** This station focused on the open water community (OAO) at the northern end of the Subject Lands and the off-site unevaluated wetland along the northern property boundary. Within the Subject Lands, one species was detected calling at level 1. In the adjacent off-site wetland, three species were detected, with the highest being level 2.
- **AMC7:** This station monitored the small wetland (MAS2-1) along the northern boundary of the Subject Lands and the off-site shallow water (SA) and open water (OAO) areas. Within the Subject Lands, three species were detected, with one species calling at level 3. Tadpoles observed in this wetland during other surveys are believed to belong to the Western Chorus Frog, which coincides with the species detected at call level 3. In the off-site wetland, three species were detected, with the highest call level being 2.
- **AMC8:** This station monitored a wetland feature that had been removed before the surveys began. The feature was dry during the May and June survey rounds, and no amphibians were detected during the first round of surveys.

4.6.3. Turtles

One turtle species, Midland Painted Turtle (*Chrysemys picta*), was observed within the Subject Lands. This species is provincially ranked S5 (common and secure).

Over the three rounds of targeted surveys, nine individual sightings were recorded at station BS1, with a maximum of four individuals observed during a single survey. One individual was also observed at station BS4 during the third-round survey, while no turtles were observed at the other two basking stations during any of the survey rounds. Additionally, five individuals were observed incidentally at BS3 during other survey efforts later in the spring, increasing the maximum number of Midland Painted Turtles observed at one time to five and suggesting potential turtle movement across the site. These results are discussed further in **Section 5.5**. Full survey details are provided in **Table 7 (Appendix B)**.

Turtle nesting areas were also assessed, but no permanent and suitable nesting areas were identified within the boundary of the Subject Lands based on the soil textures and disturbed nature of the site. Most of the Subject Lands consist of tilled soils and gravel roads with high levels of anthropogenic disturbance, which provide possible nesting opportunities, but none that would be considered a suitable natural nesting habitat.

4.6.4. Terrestrial Crayfish

Several Terrestrial Crayfish chimneys were recorded within all wetland communities within the Subject Lands as well as on the edge of one wetland community (SWT2-2) north of the Subject Lands. Observed chimney locations are shown in **Figure 6 (Appendix A)**. The species of chimney-building crayfish was not determined, and therefore its provincial conservation ranking (S-Rank) is unknown; however, these observations were considered as part of the SWH assessment in **Section 5.5**.

4.6.5. Incidental Observations

Incidental wildlife observations were recorded during surveys conducted by GEI in 2024. Direct observations, calls, tracks, scat and runways were used to assess wildlife present within the Study Area. These observations were used to document wildlife and wildlife habitat, and to characterize the nature, extent, and significance of animal usage within the Subject Lands and the adjacent 120 m.

The following species were documented incidentally during the 2024 ecological field surveys (those species observed incidentally but also detected during targeted wildlife surveys are excluded from this list):

Incidental wildlife observations were recorded during surveys conducted by GEI in 2024. Evidence such as direct sightings, calls, tracks, scat, and runways was used to identify wildlife present within the Subject Lands and the adjacent 120 m. These observations contributed to documenting wildlife and wildlife habitat, as well as characterizing the nature, extent, and significance of animal activity in the area.

Species documented incidentally during the 2024 ecological field surveys are listed below, excluding those already reported in other sections as part of targeted wildlife surveys:

- Mammals:
 - Coyote (*Canis latrans*);

- Muskrat (*Ondatra zibethicus*);
- Raccoon (*Procyon lotor*); and
- White-tailed Deer (*Odocoileus virginianus*).
- Birds:
 - Belted Kingfisher (*Megaceryle alcyon*);
 - Canada Goose (*Branta canadensis*);
 - Downy Woodpecker (*Dryobates pubescens*);
 - Field Sparrow (*Spizella pusilla*);
 - Great Crested Flycatcher (*Myiarchus crinitus*);
 - Lesser Yellowlegs (*Tringa flavipes*);
 - Northern Rough-winged Swallow (*Stelgidopteryx serripennis*);
 - Spotted Sandpiper (*Actitis macularius*);
 - Virginia Rail (*Rallus limicola*);
 - White-throated Sparrow (*Zonotrichia albicollis*); and
 - Yellow-bellied Sapsucker (*Sphyrapicus varius*).
- Reptiles:
 - Eastern Gartersnake (*Thamnophis sirtalis sirtalis*).
- Insects:
 - Monarch (*Danaus plexippus*).

Most of the incidentally observed species are provincially ranked S5 (common and secure) or S4 (apparently common and secure), except for the following species:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Monarch – Special Concern; and
 - Lesser Yellowlegs – S3S4B, S5M.

4.7. Aquatic Survey Results

The following subsections present the results of the headwater drainage feature assessment and fish community sampling conducted by GEI within the Subject Lands and the adjacent 120 m.

4.7.1. Headwater Drainage Feature Assessment

As shown in **Figure 7 (Appendix A)**, a total of four headwater drainage features comprising six reaches were identified and evaluated on the Subject Lands. The physical and biological characteristics of each reach are briefly summarized below.

HDF H1

This headwater drainage feature consists of a single reach (H1S1) that flows south from an upstream wetland feature (MAM2-2/MAS2/SAS1) along the southern boundary of the Subject Lands. This feature originates at a piped outlet control structure on the southern side of the wetland pool, designed to regulate its water levels. Characterized by a complete lack of riparian vegetation, H1S1 cuts a narrow erosional swale across a stripped and disturbed landscape. H1S1 was observed to be flowing during the first and second round surveys, but it was dry during the third.

HDF H2

This headwater drainage feature consists of a single reach (H2S1) that flows south from an upstream wetland feature (MAM2-2/MAS2/SAS1) along the southern boundary of the Subject Lands. This feature originates at a piped outlet control structure on the southern side of the wetland pool, designed to regulate its water levels. Characterized by a complete lack of riparian vegetation, H1S1 cuts a narrow erosional swale across a stripped and disturbed landscape. H1S1 was observed to be flowing during the first and second round surveys and held isolated pooling at the time of the third.

HDF H3

This headwater drainage feature consists of three distinct reaches: H3S1, H3S2, and H3S3.

H3S1 is an anthropogenically created riprap swale that originates in the wetland feature (MAM2-2/MAS2/SAS1) located near the center of the Subject Lands and flows north toward the open water (OAO) community. No riparian growth is present along its length. Flowing water was observed in this reach during the first and second round surveys, but it was dry during the third.

H3S2, another riprap swale, begins in the open water (OAO) community and flows north toward the property boundary. This reach was flowing during all three survey rounds.

H3S3 is a channelized and poorly defined swale that crosses a disturbed and vegetation-stripped landscape. It receives flow from H3S2, continuing east and eventually connecting with the White Whitten Drain. This reach was flowing during all three survey rounds.

HDF H4

This headwater drainage feature consists of a single reach (H4S1) that flows north from a small wetland (MAS2-1) in the northeastern corner of the Subject Lands. This poorly defined swale within a heavily disturbed area connects the upstream wetland pool to the White Whitten Drain. Standing water was observed within H4S1 during the first and second round surveys, but it was dry during the third.

4.7.2. Headwater Drainage Feature Management Recommendations

Part 2 of the HDFA Guidelines (CVC & TRCA 2014) provides a structured approach for classifying headwater drainage features through a step-by-step assessment of specific functions, including hydrology, riparian function, and the provision of fish or terrestrial wildlife habitat. **Table 8 (Appendix B)** provides the results of this analysis, which is based on three rounds of headwater drainage feature assessment surveys conducted in 2024, as well as supporting fish community and amphibian surveys.

Part 3 of the HDFA Guidelines provides guidance on linking the characteristics and functions of headwater drainage features to specific management recommendations. To assist practitioners, the HDFA Guidelines include Figure 2, titled “Flowing Chart Providing Direction on Management Options.” This flow chart outlines a series of decision points based on hydrology, fish habitat, riparian vegetation, and terrestrial habitat, guiding users toward an appropriate management recommendation for each feature segment. The possible management recommendations are as follows:

- Protection;
- Conservation;
- Mitigation;
- Maintain Recharge;
- Maintain/Replicate Terrestrial Linkage; and
- No Management Required.

The flow chart was used to determine management recommendations for the headwater drainage features within the Subject Lands per the HDFA Guidelines, as indicated in the second-to-last column of **Table 8 (Appendix B)**. In some instances, GEI adjusted the flow chart’s management recommendations to better reflect the ecological and hydrological importance of specific headwater drainage features based on site-specific observations. These adjustments are consistent with common practice in southern Ontario, where professional judgment is integrated at every step of the evaluation process. Reviewing authorities widely accept this iterative approach, which refines management recommendations to reflect site-specific conditions.

- **HDF H2S1:** While this feature would typically receive a Protection recommendation based on the HDFA Guidelines due to the presence of water during all survey rounds, it primarily functions as a drainage channel with no terrestrial or riparian vegetation. Its flow is sustained by a drainage control structure installed to maintain upstream wetland water levels. Therefore, a Mitigation recommendation was assigned to ensure wetland mitigation and maintain downstream flows.
- **HDF H3S2:** While this feature would typically receive a Protection recommendation based on the HDFA Guidelines due to the presence of water during all survey rounds, this feature is an artificially created riprap channel with no riparian or terrestrial habitat. Therefore, a Conservation recommendation was assigned to ensure the feature’s hydrological function is maintained.
- **HDF H3S3:** While this feature would typically receive a Protection recommendation based on the HDFA Guidelines due to the presence of water during all survey rounds, this feature is a cut swale across a barren, vegetation-stripped landscape. Therefore, a Conservation recommendation was assigned to ensure the feature’s hydrological function is maintained.

GEI’s final management recommendations, along with supporting rationale, are documented in the final column of **Table 8 (Appendix B)**. These management recommendations are also depicted in **Figure 7 (Appendix A)** and summarized as follows:

Mitigation (H1S1, H2S1, H3S1, H4S1)

- Replicate or enhance functions using enhanced lot-level conveyance measures, such as well-vegetated swales (including herbaceous, shrub, and tree material) to mimic online wet vegetation pockets or replicate functions through constructed wetland features connected to downstream systems.
- Replicate on-site flow and outlet flows at the upstream end of the system to maintain feature functions using vegetated swales, bioswales, etc. If stormwater diversion has removed or will remove catchment drainage, restore lost functions through enhanced lot-level controls (e.g., restoring the original catchment using clean roof drainage).
- Replicate functions through lot-level conveyance measures (e.g., vegetated swales) connected to the natural heritage system, where feasible, and/or implement low-impact development (LID) stormwater options.

Conservation (H3S2, H3S3)

- Maintain, relocate, and/or enhance the drainage feature and its riparian corridor zone.
- If stormwater diversion has removed or will remove catchment drainage, restore lost functions through enhanced lot-level controls (e.g., restoring the original catchment using clean roof drainage), where feasible.
- Maintain or replace on-site flows using mitigation measures and/or wetland creation, if required.
- Maintain or replace external flows to downstream systems.
- Use natural channel design techniques to preserve or enhance the overall productivity of the reach.
- Ensure the drainage feature maintains connectivity to downstream systems.

4.7.3. Fish Community Sampling

Fish community sampling on the Subject Lands identified two fish species. Brook Stickleback (*Culaea inconstans*), a highly tolerant and widespread species in Ontario, were captured at both FS1 and FS4 (**Figure 3, Appendix A**). Additionally, a single Central Muddminnow (*Umbra limi*), another a highly tolerant and widespread species, was captured at FS1 alongside the Brook Stickleback.

At FS4, the riprap lining within the channel inlet and outlet is believed to act as a barrier to fish passage, as flow levels are insufficient to surpass the riprap. Similarly, the outlet control structure at FS1 was identified as a barrier to fish passage, effectively isolating the wetland from the surrounding aquatic landscape.

Fish were not detected in any other wetland pools on the Subject Lands. However, fish presence was visually confirmed within the White Whitten Drain, which is located off-site and could not be sampled.

The results of fish community sampling are presented in **Table 9 (Appendix B)**.

5. Analysis of Ecological and Natural Heritage Significance

This section evaluates the presence, significance, and regulatory considerations of natural heritage features within the Subject Lands and the adjacent 120 m, as defined by the PPS (MMAH 2024). In addition to significant natural heritage features identified in the PPS, this section evaluates NHS components of the Dufferin County Official Plan (2014, Consolidated 2017), Environmental Protection components of the Township of Amaranth Official Plan (2005, Consolidated 2018), as well as GRCA- and NVCA-regulated features under O. Reg. 41/24. Additional context regarding these documents is provided in **Section 2**.

5.1. Provincial Planning Statement

Eight types of significant natural heritage features are defined in the PPS (MMAH 2024), as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- SWH;
- Fish habitat;
- Habitat of Endangered and Threatened species; and
- Significant ANSIs.

The presence or absence of these features within the Subject Lands and the adjacent 120 m is discussed in the following subsections. Guidance in the NHRM (MNR 2010) was used to assess the potential significance of natural heritage features and their associated functions.

5.1.1. Significant Wetlands

Within Ontario, PSWs are identified by the MNR or by their designates. Other evaluated or unevaluated wetlands may be identified for conservation by Dufferin County, the Township of Amaranth, the GRCA or the NVCA, or GEI during site-specific ecological surveys.

During the ecological field surveys completed by GEI in 2024, the following wetland features are currently present within the Subject Lands and the adjacent 120 m (see **Figure 8, Appendix A** and cross-reference with **Figure 4, Appendix A** for ELC codes):

- The Whittington PSW Complex extends onto the Subject Lands along the southern property boundary within the GRCA's jurisdiction. Its boundaries were staked in the field with GRCA on August 28, 2024, and the results are shown in **Figure 4 (Appendix A)**.

- One unevaluated marsh community (MAM2-2/MAS2/SAS1) is located near the center of the Subject Lands in NVCA jurisdiction. As staking with NVCA has not been conducted, this wetland boundary is considered approximate.
- One small unevaluated marsh community (MAS2-1) is located at the northeast corner of the Subject Lands in NVCA jurisdiction. As staking with NVCA has not been conducted, this wetland boundary is considered approximate.
- Additional wetlands are located outside of the Subject Lands, but within 120 m. These include wetland areas to the north of the Subject Lands (MAM2-2, SWT2-2, MAM2-10, SA), wetland areas to the east of the Subject Lands (MAM2-2, MAM2, MAS2, SWT2-2, SWT2), and the Whittington PSW Complex extending south of the Subject Lands (SWT2-2, SWT2).

As discussed in **Section 4.5.4**, the GRCA and the NVCA identified that several wetlands within the Subject Lands were previously disturbed, altered, or removed. The historical extent of wetlands within the Subject Lands is shown in **Figure 5 (Appendix A)**.

5.1.2. Significant Coastal Wetlands

Within Ontario, Significant Coastal Wetlands are identified by the MNR or by their designates. There are no Significant Coastal Wetlands located within the Subject Lands or the adjacent 120 m.

5.1.3. Significant Woodlands

Significant woodlands are identified by the planning authority using criteria established by the MNR in the NHRM (2010), applicable provincial plans, and any additional criteria set by the planning authority.

Based on the ELC surveys conducted in 2024, there are no woodlands located within the Subject Lands; however, woodlands are present within 120 m of the property. These include a deciduous forest (FOD5-1) and various cultural plantations (CUP3-8, CUP3) near the northwestern property boundary, with some canopy extending over the property line. Additionally, swamp (i.e., treed wetland) communities associated with the Whittington PSW to the south meet the criteria for woodland. These woodland communities are also mapped as part of the Dufferin County NHS.

The Dufferin County Official Plan (2014, Consolidated 2017) defines Significant Woodlands as:

“an area which is ecologically important in terms of features such as species composition, age of trees, and stand history; functionally important due to its contribution to the broader landscape because of its location, size, or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources.”

This definition defers to the PPS (MMAH 2024). Therefore, to inform the assessment of Significant Woodlands within 120 m of the Subject Lands, GEI referred to the NHRM (MNR 2010) and the additional detailed criteria outlined in the MNR’s *Natural Heritage Assessment for Renewable Energy Projects* (2012), which provide additional guidance on the natural heritage policies in the PPS.

According to Table 7-2 of the NHRM (MNR 2010), four general criteria are used to assess the significance of a woodland: size, ecological function, uncommon characteristics, and economic and social values. These criteria are evaluated in the subsections below.

5.1.3.1. Size Criteria

According to the NHRM (MNR 2010), a woodland's size should be considered when assessing its significance. The NHRM specifies that the size threshold for significance varies depending on the surrounding area's forest cover as follows:

- Where woodland cover is less than 5% of the land cover, woodlands 2 ha or larger should be considered significant;
- Where woodland cover is about 5–15%, woodlands 4 ha or larger should be considered significant;
- Where woodland cover is about 15–30%, woodlands 20 ha or larger should be considered significant;
- Where woodland cover is about 30–60%, woodlands 50 ha or larger should be considered significant; and
- Where woodland cover exceeds 60%, no minimum size is suggested, and other factors should be considered.

As per the *Upper Nottawasaga River Subwatershed Health Check* (NVCA 2023) report, the overall NVCA watershed has 32.2% forest cover, while the Upper Nottawasaga River Subwatershed (where the Subject Lands are located) contains 34.8% forest cover. Consequently, the applicable size threshold for significant woodlands in this area is 50 ha.

Following ELC surveys conducted in 2024, GEI assessed the size of all woodlands within 120 m of the Subject Lands. In accordance with NHRM (MNR 2010) guidance, woodland communities separated by gaps of 20 m or less were considered continuous for the purposes of this assessment.

All woodlands north of the Subject Lands and the cultural woodlands to the south of the Subject Lands were determined to be less than 50 ha and therefore did not meet the size significance criterion. In contrast, the large deciduous forest to the south of the Subject Lands, associated with the Whittington PSW, exceeds 50 ha and is therefore considered significant (**Figure 8, Appendix A**). Since this southern woodland meets the size criterion for significance, it is not further evaluated for significance in the following sections.

5.1.3.2. Ecological Function

The ecological function significance criterion comprises five subcategories: woodland interior habitat, proximity to other features, linkage function, water protection, and woodland diversity. These subcategories are evaluated in **Table 5-1** for the woodland communities located north of the Subject Lands.

Table 5-1. Evaluation of Woodland Ecological Function

Criteria	Standards	Criteria Standards Met?
Woodland interior	Woodlands should be considered significant if they have 8 ha or more of interior habitat where woodlands cover about 30–60% of the land cover.	No – All woodland communities north of the Subject Lands and the cultural woodland to the south are smaller than 3 ha.
Proximity to other woodlands or other habitats	Woodlands should be considered significant if a portion of the woodland is located within a specified distance (e.g., 30 m) of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland and the entire woodland meets the minimum area threshold (e.g., 0.5–20 ha, depending on circumstance).	No – While the woodland communities north of the Subject Lands and the cultural woodland to the south are in proximity to fish habitat (discussed in Section 5.6), these woodlands do not meet the minimum area threshold.
Linkages	Woodlands should be considered significant if they are located within a defined natural heritage system or provide a connecting link between two other significant features, each of which is within a specified distance (e.g., 120 m) and meets minimum area thresholds (e.g., 1–20 ha, depending on circumstance).	No – The woodland communities north of the Subject Lands are generally isolated on the landscape due to surrounding agriculture/disturbance. The cultural woodland to the south is located in proximity to other natural heritage features; however, it does not provide a unique linkage function. In addition, these woodlands do not meet the minimum area thresholds.
Water protection	Woodlands should be considered significant if they are located within a sensitive or threatened watershed or a specified distance (e.g., 50 m or top of valley bank if greater) of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and meet minimum area thresholds (e.g., 0.5–10 ha, depending on circumstance).	No – While the woodland communities north of the Subject Lands and the cultural woodland to the south are in proximity to a watercourse and/or fish habitat (discussed in Section 5.6) they do not meet the minimum area threshold. The woodlands are not located above a vulnerable aquifer based on the Township of Amaranth Official Plan (2005, Consolidated 2018) Schedule B: Environmental Features. In addition, these woodlands do not meet the minimum area thresholds.

Criteria	Standards	Criteria Standards Met?
Woodland diversity	Woodlands should be considered significant if they have a naturally occurring composition of native forest species that have declined significantly south and east of the Canadian Shield and meet minimum area thresholds (e.g., 1–20 ha, depending on circumstance), and/or a high native diversity through a combination of composition and terrain (e.g., a woodland extending from hilltop to valley bottom or to opposite slopes) and meet minimum area thresholds (e.g., 2–20 ha, depending on circumstance).	No – The woodland to the south is cultural and all woodland communities north of the Subject Lands are cultural plantations apart from the FOD5-1 (Figure 4, Appendix A). The FOD5-1 is dominated by commonly occurring Silver Maple (<i>Acer saccharinum</i>), with occasional occurrences of Black Cherry (<i>Prunus serotina</i>) and White Ash (<i>Fraxinus americana</i>). In addition, these woodlands do not meet minimum area thresholds for this criterion.

5.1.3.3. Uncommon Characteristics

The uncommon characteristics criterion refers to woodlands that are uncommon in terms of species composition, cover type, age, or structure. This criterion is evaluated in **Table 5-2** below for the woodland communities located north of the Subject Lands.

Table 5-2. Evaluation of Woodland Uncommon Characteristics

Standards	Criteria Standards Met?
Woodlands should be considered significant if they have a unique species composition or the site is represented by less than 5% overall in woodland area and meets minimum area thresholds (e.g., 0.5 ha, depending on circumstance).	No – The woodland communities north of the Subject Lands and the cultural woodland to the south do not have a unique species composition.
Woodlands should be considered significant if they have a vegetation community with a provincial ranking of S1, S2 or S3 (as ranked by the NHIC and meet minimum area thresholds (e.g., 0.5 ha, depending on circumstance).	No – All of the woodland communities north of the Subject Lands and the cultural woodland to the south are ranked S5 (secure in Ontario) or S4 (apparently secure in Ontario) or are not ranked.

Standards	Criteria Standards Met?
<p>Woodlands should be considered significant if they have habitat (e.g., with 10 individual stems or 100 m² of leaf coverage) of a rare, uncommon or restricted woodland plant species and meet minimum area thresholds (e.g., 0.5 ha, depending on circumstance):</p> <ul style="list-style-type: none"> • Vascular plant species for which the NHIC’s southern Ontario coefficient of conservatism is 8, 9 or 10. • Tree species of restricted distribution such as sassafras or rock elm. • Species existing in only a limited number of sites within the planning area. 	<p>No – The woodland to the south is cultural and all woodland communities north of the Subject Lands are cultural plantations apart from the FOD5-1 (Figure 4, Appendix A). No rare, uncommon, or restricted plant species were identified through surveys of this feature conducted from the property limit.</p>
<p>Woodlands should be considered significant if they have characteristics of older woodlands or woodlands with larger tree size structure in native species and meet minimum area thresholds (e.g., 1–10 ha, depending on circumstance):</p> <ul style="list-style-type: none"> • Older woodlands could be defined as having 10 or more trees/ha greater than 100 years old. • Larger tree size structure could be defined as 10 or more trees/ha at least 50 cm in diameter, or a basal area of 8 or more m²/ha in trees that are at least 40 cm in diameter. 	<p>No – The woodland to the south is cultural and all woodland communities north of the Subject Lands are cultural plantations apart from the FOD5-1 (Figure 4, Appendix A). The FOD5-1 was not assessed as an old growth forest through surveys of this feature conducted from the property limit.</p>

5.1.3.4. Economic and Social Values

According to the NHRM (MNR 2010), woodlands are considered significant under the economic and social values criterion if they meet any of the following:

- Exhibit high productivity in terms of economically valuable products, while maintaining continuous native natural attributes, and meet minimum area thresholds (e.g., 2–10 ha, depending on circumstances);
- Provide high value in special services, such as air-quality improvement or recreation, at a sustainable level compatible with long-term retention, and meet minimum area thresholds (e.g., 0.2–10 ha, depending on circumstances); or
- Possess important identified appreciation, education, cultural, or historical value, and meet minimum area thresholds (e.g., 0.2–10 ha, depending on circumstances).

Based on available background information and field data collected by GEI, the woodland communities to the north of the Subject Lands and the cultural woodland to the south do not meet any of the above criteria. In conclusion, none of these woodlands meet criteria for significance, and are therefore considered “other” woodlands, as shown in **Figure 8 (Appendix A)**.

5.1.4. Significant Valleylands

Significant valleylands should be defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM (MNR 2010). Recommended criteria for designating significant valleylands include prominence as a distinctive landform, degree of naturalness, and importance of its ecological functions, restoration potential, and historical and cultural values.

There are no significant valleylands located within the Subject Lands or the adjacent 120 m.

5.1.5. Significant Wildlife Habitat

SWH is one of the more complex natural heritage features to identify and evaluate. There are several provincial documents that discuss identifying and evaluating SWH including the NHRM (MNR 2010), the *Significant Wildlife Habitat Technical Guide* (MNR 2000), and the SWH Ecoregion Criteria Schedules. The Subject Lands are located in Ecoregion 6E and were therefore assessed using the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNR 2015a).

There are four broad categories of SWH types: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. The following subsection discusses each of these broad categories in relation to the Subject Lands. **Table 10 (Appendix B)** provides more detail on the SWH analysis.

5.1.5.1. Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather at one time of the year, or where several species congregate. Seasonal concentration areas include deer yards; wintering sites for snakes, bats, raptors, and turtles; waterfowl staging and molting areas; bird nesting colonies; shorebird staging areas; and migratory stopover areas for passerines or butterflies. Only the best examples of these concentration areas are designated as SWH. Areas that support Special Concern species or provincially vulnerable to imperiled species (S1–S3) or that support a large proportion of the population are examples of seasonal concentration areas that should be designated as significant.

Confirmed Turtle Wintering Areas SWH was identified within the Subject Lands in the shallow water wetland located at the southwestern corner of the property, as shown in **Figure 9 (Appendix A)**. As discussed in **Section 4.4.3**, this wetland (associated with BS1) had the highest turtle activity in early spring, during dates closest to thawing conditions, with four individuals observed. Later in the spring, five Midland Painted Turtles were incidentally observed in the central shallow water wetland (associated with BS3). These observations confirm that the minimum SWH threshold of five Midland Painted Turtles was met within the Subject Lands. However, BS1 is identified as the feature most likely to support suitable turtle overwintering conditions, as it exhibited consistent early spring activity. In contrast, BS3, where a higher number of turtles were observed later in the season, is considered less likely to serve as an overwintering site, given the absence of turtle activity during earlier targeted basking surveys. These findings also indicate that turtles are likely moving between wetlands within the Subject Lands.

Candidate Raptor Wintering Areas SWH was identified within the deciduous forest located to the south of the Subject Lands, as shown in **Figure 9 (Appendix A)**. Targeted surveys were not conducted as this feature is located off-site; however, it meets the size criteria thresholds and characteristics that could support raptor wintering areas, including proximity to sites with limited disturbance and fallow or lightly grazed meadows.

Candidate Bat Maternity Colonies SWH was identified within the deciduous forest and cultural woodland communities located within 120 m of the Subject Lands, as shown in **Figure 9 (Appendix A)**. Although targeted surveys were not conducted in these off-site woodlands, bats are generally considered ubiquitous in woodland habitats. Consequently, these woodlands are deemed likely to support bat maternity colonies.

5.1.5.2. Rare Vegetation Communities and Specialized Wildlife Habitat

Rare habitats are those with vegetation communities considered rare in the province. S-Ranks are rarity rankings applied to species at the provincial level and are part of a system developed by the Nature Conservancy (Arlington, VA). Generally, community types with S-Ranks of S1–S3 (extremely rare to rare/uncommon in Ontario), as defined by the NHIC, could qualify. These habitats are assumed to be at risk and likely support significant wildlife species.

No rare vegetation communities were identified within or adjacent to the Subject Lands.

Specialized habitats are microhabitats that are critical to some wildlife species. The NHRM (MNR 2010) defines specialized habitats as those that provide for species with highly specific habitat requirements, areas with exceptionally high species diversity or community diversity, and areas that provide habitat that greatly enhances species' survival. Only habitats identified as exceptional examples, such as supporting a great diversity of species or large number of individuals, are typically designated as significant.

Candidate Woodland Raptor Nesting SWH was identified within the large deciduous woodland located to the south of the Subject Lands, as shown in **Figure 9 (Appendix A)**. Targeted surveys were not conducted as this feature is located off-site; however, it meets the size criteria thresholds and characteristics that could support woodland raptor nesting areas, including over 10 ha of interior habitat.

Candidate Seeps and Springs SWH was identified within the large deciduous woodland located to the south of the Subject Lands, as shown in **Figure 9 (Appendix A)**. The presence of nearby thicket swamp and marsh communities, along with visible surface water in these wetland areas on spring aerial photographs, indicates shallow groundwater conditions near the forest. It is possible that some lower-lying areas within the deciduous woodland may have support seeps and springs, though this could not be confirmed as the community is located off-site.

Candidate Woodland Area-sensitive Bird Breeding SWH was identified within the large deciduous woodland located to the south of the Subject Lands, as shown in **Figure 9 (Appendix A)**. Targeted surveys were not conducted as this feature is located off-site; however, it meets the size criteria thresholds and characteristics that could support woodland area-sensitive bird nesting, including the presence of interior habitat.

5.1.5.3. Habitat for Species of Conservation Concern

Species of conservation concern include those that are Special Concern and provincially rare (S1–S3, SH). Several specialized wildlife habitats are also included in this SWH category, such as terrestrial crayfish habitat and significant breeding bird habitats for marsh, open country, and early successional bird species. Habitats of species of conservation concern do not include habitats of Endangered or Threatened species as identified by the *Endangered Species Act*. **Section 5.7** discusses Endangered and Threatened species.

Confirmed Terrestrial Crayfish SWH was identified within the Subject Lands. Several burrows were observed in or immediately adjacent to wetlands located on and within 120 m of the Subject Lands, as shown in **Figure 6 (Appendix A)**. These wetlands meet the criteria for Terrestrial Crayfish habitat, as indicated in **Figure 9 (Appendix A)**.

Candidate Special Concern and Rare Wildlife Species SWH was identified within the large deciduous woodland located south of the Subject Lands, as shown in **Figure 9 (Appendix A)**. Although targeted surveys were not conducted in this off-site feature, it appears to have suitable habitat characteristics to support two Special Concern bird species identified during the background review: Golden-winged Warbler and Canada Warbler. These species were not observed within the Subject Lands during targeted breeding bird surveys or incidentally but could potentially occur on adjacent lands.

5.1.5.4. Animal Movement Corridors

Animal movement corridors are areas traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements. Animal movement corridors are only identified as SWH where a confirmed or candidate significant wildlife habitat has been identified by MNR or the planning authority.

For ecoregion 6E, animal movement corridors include Amphibian Movement Corridors (a required component of Wetland Amphibian Breeding Habitats SWH) and Deer Movement Corridors (a required component of Deer Yarding Areas and Deer Winter Congregation Areas). As none of these SWH types exist within the Subject Lands or the adjacent 120 m, animal movement corridors are also absent.

5.1.6. Fish Habitat

Fish habitat is defined in the federal *Fisheries Act*, 1985 as “water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas.”

Fish community sampling was carried out on the Subject Lands, the results of which are presented in **Section 4.5.3**. Three locations within the Subject Lands and the adjacent 120 m were identified as direct fish habitat:

- The open water (OAO) community in the northern portion of the Subject Lands (see **Figure 8, Appendix A** and cross-reference with **Figure 4, Appendix A** for ELC codes). No navigable passage was identified to or from this feature.
- The eastern shallow water wetland (MAM2/MAS2-1/SAS1) community in the southern portion of the Subject Lands (see **Figure 8, Appendix A** and cross-reference with **Figure 4, Appendix A** for ELC codes). No navigable passage was identified to or from this feature.

- Fish were visually confirmed in the White Witten Drain that runs along the northeastern property boundary (**Figure 8, Appendix A**), though this feature could not be sampled as it was off-site. This watercourse appears to be connected to upstream features that offer navigable passage.

Both other shallow water wetland (MAM2/MAS2-1/SAS1) communities and all four headwater drainage features within the Subject Lands are considered indirect fish habitat (**Figure 8, Appendix A**).

5.1.7. *Habitat of Endangered and Threatened Species*

Endangered and Threatened species are those identified on the SARO list (O. Reg. 230/08). GEI reviewed existing background information and identified known SAR records from the broader landscape surrounding the Subject Lands, as summarized in **Section 4.4**. Furthermore, GEI completed targeted ecological field surveys, the results of which are summarized in **Sections 4.5 to 4.7**.

The Endangered and Threatened species identified through background review (**Section 4.4**) were evaluated to determine their presence and the potential for suitable habitat within the Subject Lands and the adjacent 120 m, based on GEI’s ecological field survey results. The results of this evaluation are presented in **Table 5-3** below.

Table 5-3. Evaluation of Habitat of Endangered and Threatened Species

Species Name	SARO Ranking	Breeding Habitat Requirements	Species Presence or Habitat Potential
Bobolink	Threatened	Nests on the ground in tall grasslands, undercut pastures, and overgrown fields and meadows. Prefer areas with dense vegetation and a well-developed thatch layer, which provides essential cover for nesting and protection from predators.	Candidate – Several Bobolink were observed in suitable breeding habitat off-site to the east, but none were observed on the Subject Lands. The Subject Lands were undergoing active construction and vegetation removal, and no suitable breeding habitat was observed, though foraging opportunities remain.
Eastern Meadowlark	Threatened	Nests on the ground in tall grasslands, undercut pastures, and overgrown fields and meadows. Prefer areas with dense vegetation and a well-developed thatch layer, which provides essential cover for nesting and protection from predators.	Candidate – Eastern Meadowlark was observed foraging on the Subject Lands and several individuals were observed in suitable breeding habitat off-site to the east. The Subject Lands were undergoing active construction and vegetation removal, and no suitable breeding habitat was observed, though foraging opportunities remain.

Species Name	SARO Ranking	Breeding Habitat Requirements	Species Presence or Habitat Potential
Short-eared Owl	Threatened	Nests on the ground in marshes, dunes, and tundra. Will occasionally use fallow pasture and row crops. Prefer areas with tall grasses or low vegetation that provide adequate cover for nesting.	No –Short-eared Owl was not observed during the breeding bird surveys. While the open water marshes around dug pond areas could potentially offer suitable foraging habitat, the Subject Lands were undergoing active construction and vegetation removal, and no suitable breeding habitat was observed within the Subject Lands or the adjacent 120 m.
Louisiana Waterthrush	Threatened	Nests on the ground along forested watercourses, ravines, and swampy areas, requiring habitats with clear, fast-flowing streams or small rivers, often shaded by an intact forest canopy. Nests are typically well-concealed, along steep, well-vegetated stream banks, in root tangles, mossy hummocks, or under logs and rocks.	No –Louisiana Waterthrush was not observed during the breeding bird surveys. This species generally avoids disturbed or open landscapes and prefers forested environments with a consistent water flow, which are not present within the Subject Lands or the adjacent 120 m.
Bank Swallow	Threatened	Nests colonially on in vertical sand or soil banks with minimal vegetation, such as natural bluffs, eroding streamside banks, or human-made features like sand or gravel pits.	No –Bank Swallow was not observed during the breeding bird surveys. No steep, exposed vertical banks composed of friable soil or sand are present within the Subject Lands or the adjacent 120 m.
Least Bittern	Threatened	Nests in marshes with dense cattail (<i>Typha</i> spp.) or other emergent vegetation interspersed with patches of open water. Build floating nests within the vegetation, anchored to the stems above shallow water.	No – Least Bittern was not observed during the breeding bird surveys. While the open water marshes around dug pond areas could potentially offer suitable habitat; however, Least Bittern is sensitive to habitat alteration. The Subject Lands were undergoing active construction and vegetation removal, and no suitable breeding habitat was observed within the Subject Lands or the adjacent 120 m.

Species Name	SARO Ranking	Breeding Habitat Requirements	Species Presence or Habitat Potential
Chimney Swift	Threatened	Nests in cavities, historically in large, hollow trees but has adapted to urban environments by using chimneys and other vertical, enclosed spaces. Prefer areas that offer secure vertical surfaces and are typically close to open areas for foraging, such as ponds, fields, and urban spaces.	No – While residential structures are present within the Subject Lands and the adjacent 120 m, Chimney Swift was not observed during breeding bird surveys and is assumed to be absent.
Eastern Whip-poor-will	Threatened	Nests on the ground in dry, deciduous or mixed forests with little underbrush. Prefers areas that provide camouflage for their eggs and young, with while nearby open habitats such as clearings, shrublands, or open fields for foraging.	Candidate – Eastern Whip-poor-will have not been detected to date; however, targeted surveys were not completed. Forested areas are present within 120 m of the Subject Lands, of which the large FOD6-5 appears to offer the most suitable breeding habitat based on observations from the property boundary; however, there is no suitable habitat within the Subject Lands.
SAR Bats (Eastern Small-footed Myotis, Little Brown Myotis, Tri-coloured Bat, and Northern Myotis)	Endangered	Roost in wooded areas within natural features such as cavities, loose bark, and crevices of individual trees. They also use anthropogenic structures such as barns, houses, garages, and sheds, particularly where roosting spaces like attics, eaves, or walls are available.	Candidate – Several treed areas such as swamps and woodlands are located within 120 m of the Subject Lands and likely provide SAR bat habitat. Individual trees within the Subject Lands are young conifers, and do not provide suitable habitat.

The evaluation of Endangered or Threatened species and their habitat identified potentially suitable habitat within 120 m of the Subject Lands, including grassland habitat for Bobolink and Eastern Meadowlark, a large deciduous woodland for Eastern Whip-poor-will, and several treed areas suitable for SAR bats (**Figure 8, Appendix A**). No other Endangered or Threatened species or their habitats within the Subject Lands or the adjacent 120 m were identified through background review or observed during ecological field surveys in 2024. Additionally, no Endangered or Threatened species or their habitat were identified within the Subject Lands.

5.1.8. Significant Areas of Natural and Scientific Interest

ANSIs are identified by the MNR as having provincially or regionally significant representative geological or ecological features.

There are no ANSIs located within the Subject Lands or the adjacent 120 m.

5.2. Official Plans of Dufferin County and the Township of Amaranth

The Dufferin County Official Plan (2014, Consolidated 2017) and the Township of Amaranth Official Plan (2005, Consolidated 2018) set out policies to protect their NHS and Environmental Protection areas, respectively, as described in **Sections 2.2 and 2.3**.

The following components of Dufferin County's NHS were identified within the Subject Lands and the adjacent 120 m:

- Unevaluated wetlands and locally/regionally significant wetlands (see **Section 5.1.1**);
- PSWs (see **Section 5.1.1**);
- Fish habitat (see **Section 5.1.6**);
- Woodlands (see **Section 5.1.3**);
- Habitat of Endangered and Threatened species (see **Section 5.1.7**); and
- SWH (see **Section 5.1.5**).

The following components of the Township of Amaranth's Environmental Protection designation were identified within the Subject Lands and the adjacent 120 m:

- Fish habitat (see **Section 5.1.6**);
- Areas of SWH (see **Section 5.1.5**);
- Wetlands (see **Section 5.1.1**);
- Significant habitats of Endangered and Threatened species (see **Section 5.1.7**);
- Significant forest areas (see **Section 5.1.3**); and
- Rivers, lakes, streams, and creeks (White Whitten Drain).

5.3. Grand River Conservation Authority and Nottawasaga Valley Conservation Authority Regulated Features

Wetlands within the Subject Lands (see **Section 5.1.1**) fall under the regulatory authority of both the GRCA and the NVCA. The PSW communities in the southern portion of the Subject Lands are regulated by the GRCA, and the unevaluated wetland communities in the northern portion of the Subject Lands are regulated by the NVCA.

Each agency issued a Violation Notice in response to the historical disturbance, alteration, or removal of wetland areas within their jurisdiction. The GRCA violation has since been resolved through a permitting process, while the NVCA violation remains outstanding pending completion of on-site compensation through restoration and enhancement. Additional detail is provided in **Section 4.5.4**.

The White Whitten Drain, located along the northern property boundary, is also regulated by the NVCA. Additionally, headwater drainage feature H3 is identified as a regulated watercourse feature in NVCA mapping (2024). However, based on GEI's ecological field surveys, this feature does not meet the definition of a "watercourse" under O. Reg. 41/24, which specifies a watercourse as "a defined channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs," because it lacks a defined channel and regularly occurring flow.

5.4. Summary of Ecological and Natural Heritage Significance

An analysis of existing natural heritage features on the Subject Lands and the adjacent 120 m was completed, followed by an evaluation of their significance against provincial and municipal criteria. The results of this analysis determined that the following significant natural heritage features will require impact assessment in **Section 7**:

- Unevaluated wetlands (within Subject Lands and adjacent 120 m);
- PSWs (within Subject Lands and adjacent 120 m);
- Woodlands (adjacent 120 m only);
- Significant woodlands (adjacent 120 m only);
- Confirmed and Candidate SWH:
 - Confirmed SWH (within Subject Lands):
 - Turtle Wintering Areas; and
 - Terrestrial Crayfish.
 - Candidate SWH (adjacent 120 m only):
 - Raptor Wintering Areas;
 - Bat Maternity Colonies;
 - Woodland Raptor Nesting;
 - Seeps and Springs;
 - Woodland Area-sensitive Bird Breeding; and
 - Special Concern and Rare Wildlife Species.
- Direct and indirect fish habitat (within Subject Lands and adjacent 120 m);
- Habitat of Endangered and Threatened species (adjacent 120 m only):
 - Candidate Bobolink breeding habitat;
 - Candidate Eastern Meadowlark breeding habitat;
 - Candidate Eastern Whip-poor-will breeding habitat; and
 - Candidate SAR bat roosting habitat.
- Rivers, lakes, streams, and creeks (White Whitten Drain).

The locations of these significant natural heritage features are shown in **Figures 8 and 9 (Appendix A)**.

Additional natural heritage features not evaluated in the significance analysis but identified in the biophysical characterization, as well as those deemed relevant based on regulatory requirements or site-specific conditions, will also be addressed in the impact assessment in **Section 7**.

6. Description of Development Proposal

The proposed development consists of a 19-lot estate residential development, comprising 18 new lots for single detached dwellings and one existing lot with a residence that was under active construction during the 2024 ecological field season. The development includes one road for vehicular access, with two access points off 2nd Line situated at the north and south ends of the site. The proposal also incorporates two NHS blocks. The Draft Plan overlaid on aerial imagery is presented in **Figure 10 (Appendix A)** for reference.

The Functional Servicing and Stormwater Management Report (FSSR) prepared by GEI (2025) has been submitted under separate cover. The FSSR provides a detailed overview of the proposed development, including site grading, stormwater management, sanitary and water servicing, and environmental and construction considerations. A summary of these components is provided in the subsections below.

6.1. Site Grading and Drainage

The site exhibits an overall elevation drop of approximately 5.3 meters, sloping from the southwest to the northeast property lines. A drainage divide exists near the centre of the site, with the northern portion of the property generally draining northeast within the Nottawasaga River watershed and the southern portion of the property generally draining west and south within the Grand River watershed. Existing grades vary significantly due to natural high and low points throughout the site, with existing pond features currently collecting site drainage.

The proposed grading design will aim to match existing grades at property boundaries where practical. Furthermore, site drainage was designed to maintain a similar drainage area to each watershed, with a difference of only around 1%. Overland flow for storm events up to the 100-year design event will be managed using 0.5 m flat-bottom ditches, culverts, and dry ponds as part of the stormwater management (SWM) plan. For storm events exceeding the 100-year design event, flow will be directed through ditches and culverts to an existing ditch running along the west side of 2nd Line.

6.2. Stormwater Management

The post-development SWM strategy is designed to meet the requirements of the GRCA and the NVCA. Controls will ensure that peak flows for all storm events up to the 100-year design event are maintained at pre-development levels.

Low Impact Development (LID) measures, including roadside ditches with permanent pools and infiltration trenches, will provide quantity, quality, and erosion controls. The design achieves Enhanced Protection (Level 1) criteria per MECP guidelines, including 80% Total Suspended Solids (TSS) removal.

Key SWM components are as follows:

- **Quantity Control:** Post-development peak flows will be controlled to pre-development levels or less using five dry ponds located throughout the site. Ponds 1 and 2 provide detention and flow control to the Grand River watershed, while Ponds 3 through 5 provide detention and flow control to the Nottawasaga River watershed. The ponds are supported by a system of 100-year capacity swales and culverts that convey runoff to each facility.

- **Quality Control:** Enhanced Protection (Level 1) criteria (80% TSS removal) is provided for all front-lot drainage areas and right-of-way runoff through roadside ditches with permanent pools and underlying infiltration trenches. Runoff from rooftops, backyards, and open spaces is considered clean (assumed 100% TSS removal) and therefore does not require water quality treatment.
- **Erosion Control:** Runoff from the 5 mm design event will be detained on-site for at least 48 hours using infiltration trenches or soak-away pits installed at the lot level.
- **Flow Split:** The pre- and post-development drainage split between the Grand River and Nottawasaga River watersheds remains consistent; within 1%.

6.3. Sanitary Servicing and Water Supply

Key sanitary servicing and water supply components are as follows:

- **Sanitary Servicing:** Each lot will be serviced by individual private septic systems, which will be designed during the detailed design stage.
- **Water Supply:** Potable water for each lot will be provided through individual private wells. No municipal water infrastructure exists near the site, and no watermains are proposed.
- **Fire Protection:** Dry hydrants will be installed to draw water from the existing and proposed ponds on the site. A 400,000 L cistern with a dry hydrant connection has also been installed on Lot 15, with final fire protection details to be confirmed at detailed design.

7. Impact Assessment and Mitigation Measures

This section evaluates the potential impacts of the proposed development on the natural heritage features of the Subject Lands and the adjacent 120 m, as identified in the biophysical characterization and significance analysis, as well as those deemed relevant based on regulatory requirements or site-specific conditions. Potential impacts are assessed for both short- and long-term effects on natural heritage features and their ecological functions. Where appropriate, measures are identified to avoid or mitigate negative impacts.

Ecological impacts are generally categorized into three types:

1. **Direct impacts:** Typically associated with the physical removal or alteration of natural features resulting from development activities.
2. **Indirect impacts:** Changes to less visible functions or pathways that could degrade natural heritage features over time.
3. **Induced impacts:** Post-development effects that may result in increased demand on natural resources, leading to cumulative environmental stress.

Figure 11 (Appendix A) provides a visual overview of the natural heritage constraints identified within the Subject Lands and the adjacent 120 m, which are discussed in the following subsections.

7.1. Provincially Significant Wetlands and Unevaluated Wetlands

Several units of the Whittington PSW Complex extend onto the Subject Lands along the southern property boundary within the GRCA's jurisdiction. Additionally, two unevaluated wetlands are located within the NVCA's jurisdiction on the Subject Lands, and unevaluated wetlands are also present on adjacent lands to the north and east (see **Figure 8, Appendix A**). As discussed in **Section 4.5.4**, several wetlands were disturbed, altered, or removed within both GRCA and NVCA jurisdiction. The historical extent of wetlands within the Subject Lands is shown in **Figure 5 (Appendix A)**.

7.1.1. Direct Impacts

The PSW communities in the southern portion of the Subject Lands are regulated by the GRCA. One unevaluated wetland, located north of the PSW communities, is identified in GRCA mapping (2024) but was previously removed from the landscape (see **Figure 12, Appendix A**). Using historical aerial imagery, GEI calculated the area of this wetland to total 0.37 ha.

The unevaluated wetland communities in the northern portion of the Subject Lands are regulated by the NVCA. Several historical wetland communities were disturbed, altered, or removed (see **Figure 12, Appendix A**). GEI calculated the total area of wetland loss, including the conversion of wetland to an open aquatic (OAO) feature, to be 2.09 ha. In addition to these existing site alterations, the small 0.03 ha shallow marsh (MAS2-1) community in the northeast corner of the Subject Lands is proposed for removal.

Proposed compensation for existing and proposed wetland removals through ecological restoration and enhancement measures is discussed in **Section 8**.

7.1.2. Potential Indirect Impacts

7.1.2.1. Hydrology

Potential indirect impacts to wetlands within the Subject Lands and the adjacent 120 m include alterations to drainage and water balance. Development can significantly alter local hydrology by affecting surface runoff, infiltration, and groundwater flow, potentially changing both the quantity and direction of water movement. Modifying the grade of an area may redirect flows and disrupt the balance between infiltration and runoff. The introduction of impermeable surfaces, such as paved roads and buildings, further reduces infiltration capacity and increases surface runoff, potentially altering the natural water balance and drainage patterns critical for wetland function (MNR 2010).

These hydrological changes can have consequences for wetlands, which are sensitive to variations in water levels and hydrological inputs. The degree of sensitivity to hydrological changes varies by wetland type, but substantial alterations—whether increasing or decreasing water inputs—can potentially lead to shifts in vegetation community types or even the loss of the wetland vegetation characteristics if water availability becomes excessive or insufficient (MNR 2010).

7.1.2.2. Construction-Related Disturbances

Construction activities pose risks to wetlands by increasing erosion and sedimentation through the exposure of bare soil during grading, excavation, and vegetation removal. Without effective erosion and sediment control (ESC) measures, sediment-laden runoff can carry nutrients and pollutants into wetlands, potentially degrading water quality and causing vegetation community shifts. These impacts may be particularly pronounced in areas with steep slopes or near sensitive ecological features. Dust generated by construction machinery can also settle on vegetation and aquatic features, potentially interfering with photosynthesis and harming wetland ecosystems (MNR 2010).

Other construction-related disturbances near wetland edges may further degrade adjacent habitat quality. Improperly secured construction waste, such as plastics and packaging, can be carried by wind into surrounding natural areas. Additionally, the risk of soil and water contamination increases during construction due to the potential for accidental spills of fuels, oils, or other hazardous substances during equipment maintenance and refueling activities (MNR 2010).

Other potential indirect impacts include noise disturbance, which may disrupt sensitive wildlife species, potentially altering their behaviour or causing temporary displacement from wetland habitats. Invasive species introduction is another potential concern, as equipment and materials entering the site could inadvertently transport seeds or plant fragments of invasive species, which may establish themselves and compete with native vegetation in the wetlands (MNR 2010).

7.1.3. Mitigation Measures

7.1.3.1. Ecological Setbacks

The establishment of setbacks from wetlands helps protect the form and function of these retained natural areas from potential development impacts. The Dufferin County Official Plan (2014, Consolidated 2017) and the Township of Amaranth's Official Plan (2005, Consolidated 2018) do not prescribe specific wetland setback distances. However, the GRCA's *Environmental Impact Study Guidelines and Submission Standards for Wetlands* (2005) require a 30 m setback from PSWs, and the NVCA's *Planning and Regulation Guidelines* (2009) require a 30 m setback from all wetlands.

For wetlands regulated by the GRCA, the Draft Plan incorporates a 30 m setback from PSWs, with the exception of the southern road connection to 2nd Line, where the proposed road encroaches into the outer 15 m of the setback (**Figure 12, Appendix A**).

For wetlands regulated by the NVCA, a 30 m setback is provided for all wetlands, with limited reductions to 15 m for Lots 10, 18, and 19, as well as two localized reductions along the proposed road (**Figure 12, Appendix A**). Where a reduced setback is proposed from lots, septic systems are nonetheless required to maintain a minimum 30 m separation from wetlands. Furthermore, as discussed with the NVCA during a meeting on August 20, 2025, where the full 30 m setback cannot be achieved, compensation will be provided through enhanced restoration of wetland setback areas. Compensation will also be provided for the prior and proposed removal of 5.35 ha of wetland setback area (**Figure 12, Appendix A**). **Section 8** outlines the proposed restoration and enhancement strategy.

7.1.3.2. Hydrology

To mitigate potential impacts to wetland hydrology and water quality, the proposed SWM strategy includes roadside ditches with permanent pools and infiltration trenches to promote infiltration, achieve water balance objectives, and meet water quality standards. Enhanced Protection (Level 1) criteria will be achieved through these measures (80% TSS removal). The design also maintains the pre- and post-development drainage split between the GRCA and NVCA watersheds, ensuring the hydrological balance of the area is preserved.

Furthermore, a Wetland Water Balance Risk Evaluation (WWBRE) in accordance with the Toronto and Region Conservation Authority's (TRCA) 2017 guidance document will be completed for the retained wetlands and submitted under separate cover. TRCA's risk evaluation protocol consists of determining the potential magnitude of post-development hydrological change without mitigation as well as assessing the ecological sensitivity of the wetland to that hydrological change. The magnitude of hydrological change and the ecological sensitivity of the wetland are then used in the wetland risk evaluation decision tree, which categorizes wetlands at no, low, medium, or high risk for hydrological impacts. Each risk category has recommended measures for wetland water balance study protocols and water balance modeling requirements (e.g., hydroperiod resolution), to determine whether additional mitigation measures are required.

7.1.3.3. Construction Management Practices

Although no specific ESC measures are currently identified, an ESC Plan will be developed during detailed design to minimize construction-phase impacts on the retained wetlands. The ESC Plan should include measures such as sediment control fencing, sediment traps, mud mats, or other best management practices to prevent sediment-laden runoff from entering sensitive features during construction. Given the proximity of the works to sensitive features, enhanced measures are likely to be required. Regular monitoring of ESC measures by a qualified inspector during construction is also recommended to ensure effectiveness.

To further reduce potential impacts on retained natural features, construction equipment and materials should be stored as far as possible from wetlands. Vehicle refueling and maintenance should occur off-site or in designated areas well away from wetlands to prevent accidental spills of fuels, oils, or other hazardous materials from entering these features. Additionally, all vehicles and equipment should arrive at the construction site clean and free of any soil or vegetation to prevent the introduction of invasive species. Before leaving the site, in line with best management practices, vehicles and equipment should be cleaned again to prevent the spread of invasive species to other areas.

7.1.3.4. Mitigation Summary

With the implementation of these mitigation and compensation measures—including setbacks as shown in **Figure 11 (Appendix A)**, SWM measures, the recommended ESC Plan, careful construction management practices, and ecological restoration and enhancement efforts—no net negative impacts are anticipated to the retained wetlands based on the information currently available. A WWBRE will be completed to determine the magnitude of potential hydrological change and to identify whether additional mitigation or monitoring measures are required. Provided that all mitigation and monitoring recommendations arising from the WWBRE are implemented, no net negative hydrological impacts to the retained wetlands are expected.

7.2. Significant Woodlands and Other Woodlands

A significant woodland associated with the Whittington PSW is located south of the Subject Lands. Other woodlands are also present within 120 m of the Subject Lands (**Figure 8, Appendix A**).

7.2.1. Direct Impacts

Woodlands are generally located outside the Subject Lands, with some trees within the northwestern woodland extending onto the Subject Lands. Per the Arborist Report prepared by Kuntz Forestry (2024), and submitted under separate cover, four trees along the edge of the woodland are proposed for removal. These limited tree removals are not anticipated to impact the overall function of the woodland feature. Aside from these four tree removals, no direct impacts to significant or other woodlands are anticipated as a result of future development.

7.2.2. Potential Indirect Impacts

7.2.2.1. Construction-Related Disturbances

Potential indirect impacts on the significant woodland and other woodlands could include construction-related disturbance and associated ecological stressors. Dust generated by heavy machinery may settle on vegetation, potentially interfering with photosynthesis and reducing plant health. Improperly secured construction waste, such as plastics and packaging, may be carried by wind into surrounding natural areas, degrading habitat quality. Additionally, soil and water contamination risks are heightened during construction due to the potential for accidental spills of fuels, oils, or other hazardous substances during equipment maintenance and refueling activities (MNR 2010).

Other potential indirect impacts during construction include noise disturbance and light pollution, which may disrupt sensitive wildlife species, potentially altering their behaviour or causing temporary displacement from woodland habitats. Invasive species introduction is another concern, as equipment and materials entering the site could inadvertently transport seeds or plant fragments of invasive species, which may establish themselves and compete with native vegetation in the woodlands (MNR 2010).

7.2.3. Mitigation Measures

7.2.3.1. Ecological Setbacks

The establishment of setbacks from woodlands helps protect the form and function of these retained natural areas from potential development impacts. The Dufferin County Official Plan (2014, Consolidated 2017) and the Township of Amaranth's Official Plan (2005, Consolidated 2018) do not prescribe specific woodland setback distances.

GEI recommends a minimum 10 m setback from the significant woodland located south of the Subject Lands to provide adequate protection from future development and occupancy, as illustrated in **Figure 11 (Appendix A)**. The Draft Plan is situated more than 100 m from the significant woodland, substantially exceeding the recommended minimum setback.

7.2.3.2. Construction Management Practices

To further reduce potential impacts on retained natural features, construction equipment and materials should be stored as far as possible from woodlands. Vehicle refueling and maintenance should occur off-site or in designated areas well away from woodlands to prevent accidental spills of fuels, oils, or other hazardous materials from entering these features. Additionally, all vehicles and equipment should arrive at the construction site clean and free of any soil or vegetation to prevent the introduction of invasive species. Before leaving the site, in line with best management practices, vehicles and equipment should be cleaned again to prevent the spread of invasive species to other areas.

7.2.3.3. Mitigation Summary

With the implementation of these mitigation measures—including the setback as shown in **Figure 11 (Appendix A)** and careful construction management practices—no net negative impacts are anticipated to the retained woodlands as a result of the proposed development.

7.3. Significant Wildlife Habitat

Confirmed and Candidate SWH identified within the Subject Lands and the adjacent 120 m is as follows (**Figure 9, Appendix A**):

- Confirmed SWH (within Subject Lands):
 - Turtle Wintering Areas; and
 - Terrestrial Crayfish.
- Candidate SWH (adjacent 120 m only):
 - Raptor Wintering Areas;
 - Bat Maternity Colonies;
 - Woodland Raptor Nesting;
 - Seeps and Springs;
 - Woodland Area-sensitive Bird Breeding; and
 - Special Concern and Rare Wildlife Species.

The Confirmed SWH within the Subject Lands is located within the existing wetland areas. Potential impacts and recommended mitigation measures for these areas, as outlined in **Section 7.1**, would also apply to protect the Confirmed SWH.

The Candidate SWH within the adjacent 120 m is located within the existing woodland communities. Potential impacts and recommended mitigation measures for these areas, as outlined in **Section 7.2**, would also apply to protect the Candidate SWH within 120 m of the Subject Lands.

In addition to the potential impacts and mitigation measures discussed in **Sections 7.1 and 7.2**, the proposed local residential road will introduce a small barrier to wildlife movement within the Subject Lands, particularly for the northern NHS block. This small, low-speed road will service only 19 residential lots, and therefore the potential for wildlife–vehicle interactions is not expected to be significant. Nevertheless, compared to existing conditions, it may reduce movement opportunities for turtles, amphibians, and other small-bodied wildlife both northward and southward to and from the northern NHS block. Opportunities to mitigate this barrier effect will be explored through the restoration and enhancement design, as discussed in **Section 8**.

7.4. Direct and Indirect Fish Habitat

Fish habitat within the Subject Lands includes the open water (OAO) community in the northern portion and the eastern shallow water wetland (MAM2/MAS2-1/SAS1) in the southern portion, both identified as direct fish habitat with no navigable passage. Additionally, fish were visually confirmed in the off-site White Whitten Drain along the northeastern boundary. Other shallow water wetlands and headwater drainage features on-site are considered indirect fish habitat, contributing to downstream aquatic ecosystems. **Figure 8 (Appendix A)** shows the locations of these features.

7.4.1. Direct Impacts

The Draft Plan includes a proposed crossing of the White Whitten Drain at the northern end of the Subject Lands to provide access to the future subdivision (**Figure 11, Appendix A**). This crossing will require the replacement of an existing culvert with a new culvert designed to municipal standards. The replacement culvert is expected to be larger in both length and width compared to the existing culvert. Direct impacts to the White Whitten Drain may include temporary disturbance to the channel and surrounding riparian habitat during construction activities, as well as disturbance to fish due to in-water or near-water work, potential injury/mortality during construction, and changes in habitat due to flow alterations.

All other direct and indirect fish habitat is located within the two NHS blocks, and as a result, no direct impacts are anticipated to these features.

7.4.2. Potential Indirect Impacts

7.4.2.1. Hydrology

Potential indirect impacts to fish habitat within the Subject Lands and the adjacent 120 m include alterations to drainage and water balance. Development can significantly alter local hydrology, which is critical for maintaining fish habitat, particularly in areas where fish rely on wetlands. Changes to surface runoff, infiltration, and groundwater flow can affect both the quantity and direction of water movement. Modifying the grade of an area may redirect flows and disrupt the balance between infiltration and runoff. The introduction of impermeable surfaces, such as paved roads and buildings, further reduces infiltration capacity and increases surface runoff, potentially altering the natural water balance and drainage patterns that support fish habitat (MNR 2010).

7.4.2.2. Construction-Related Disturbances

Construction activities pose risks to fish habitat by increasing erosion and sedimentation through the exposure of bare soil during grading, excavation, and vegetation removal. Without effective ESC measures, sediment-laden runoff can carry nutrients and pollutants into aquatic habitats, potentially degrading water quality and impairing fish habitat. Dust generated by construction machinery can also settle on aquatic features, potentially interfering with light penetration and disrupting aquatic ecosystem functions (MNR 2010).

Other construction-related disturbances near aquatic features may further degrade adjacent habitat quality. Improperly secured construction waste, such as plastics and packaging, can be carried by wind into surrounding aquatic habitats. Additionally, the risk of sediment and water contamination increases during construction due to the potential for accidental spills of fuels, oils, or other hazardous substances during equipment maintenance and refueling activities (MNR 2010).

7.4.3. Mitigation Measures

7.4.3.1. Ecological Setbacks

The establishment of setbacks from fish habitat helps to protect the form and function of these retained natural areas from potential development impacts. The Dufferin County Official Plan (2014, Consolidated 2017) and the Township of Amaranth's Official Plan (2005, Consolidated 2018) do not prescribe specific fish habitat setback distances.

GEI recommends a 15 m setback from fish habitat, measured from the top-of-bank for watercourses and from the edge of the wetland for waterbodies within the Subject Lands. These proposed setbacks are illustrated in **Figure 11 (Appendix A)**.

7.4.3.2. Hydrology

To mitigate potential impacts to wetland hydrology and water quality, the proposed SWM strategy includes roadside ditches with permanent pools and infiltration trenches to promote infiltration, achieve water balance objectives, and meet water quality standards. Enhanced Protection (Level 1) criteria will be achieved through these measures (80% TSS removal). The design also maintains the pre- and post-development drainage split between the GRCA and NVCA watersheds, ensuring the hydrological balance of the area is preserved.

7.4.3.3. Construction Management Practices

Although no specific ESC measures are currently identified, an ESC Plan will be developed during detailed design to minimize construction-phase impacts to fish habitat. The ESC Plan should include measures such as sediment control fencing, sediment traps, mud mats, or other best management practices to prevent sediment-laden runoff from entering sensitive features during construction. Given the proximity of the works to sensitive features, enhanced measures are likely to be required. Regular monitoring of ESC measures by a qualified inspector during construction is also recommended to ensure effectiveness.

In addition to the ESC Plan, the following avoidance and mitigation measures are recommended for culvert replacement during detailed design and construction planning:

- In-water work should occur outside the warm/cool water spring fisheries timing window (i.e., outside March 15 to June 30) to avoid impacts on reproductive activities of local fish species;

- A work-site isolation system, such as a temporary diversion or bypass pumping system, should be implemented to allow culvert replacement in dry conditions. The isolation system should follow DFO's Interim Standard: In-Water Site Isolation and must accommodate expected flows without negatively impacting upstream or downstream water levels;
- Appropriately sized fish screens should be used on any bypass pumps to prevent entrainment or impingement of fish;
- Fish rescues should be conducted in the work area prior to complete dewatering;
- A spill prevention and response plan should be developed and implemented throughout construction to minimize contamination risks; and
- Disturbance to riparian vegetation should be minimized, and all disturbed areas should be re-vegetated post-construction.

To further reduce potential impacts on retained natural features, construction equipment and materials should be stored as far as possible from fish habitat. Vehicle refueling and maintenance should occur off-site or in designated areas well away from fish habitat to prevent accidental spills of fuels, oils, or other hazardous materials from entering these features.

7.4.3.4. Culvert Design

For culvert design, it is recommended to minimize the length of the new culvert and consider replacing it with an open-bottom box culvert or an embedded closed-bottom culvert with a natural substrate to improve fish passage and habitat quality. Depending on the final design of the culvert, it may be necessary to consult with DFO through the Request for Review process to determine if there are any permitting requirements under the *Fisheries Act*.

7.4.3.5. Mitigation Summary

With the implementation of these mitigation and compensation measures—including setbacks as shown in **Figure 11 (Appendix A)**, SWM measures, the recommended ESC Plan, work-site isolation during construction, careful construction management practices, and culvert design—no net negative impacts are anticipated to fish habitat as a result of the proposed development. Additionally, adherence to restricted activity timing windows and consultation with DFO will further minimize potential impacts to fish and fish habitat, which will support the maintenance of aquatic ecosystem integrity.

7.5. Habitat of Endangered and Threatened Species

Candidate habitat of Endangered and Threatened species within 120 m of the Subject Lands is as follows (**Figure 8, Appendix A**):

- Candidate Bobolink breeding habitat;
- Candidate Eastern Meadowlark breeding habitat;
- Candidate Eastern Whip-poor-will breeding habitat; and
- Candidate SAR bat roosting habitat.

The Candidate Bobolink and Eastern Meadowlark breeding habitat is located in the fields to the east of the Subject Lands, across 2nd Line. There are no anticipated impacts to this habitat.

The Candidate Eastern Whip-poor-will breeding habitat and SAR bat roosting habitat within the adjacent 120 m is located within the existing woodland communities. Potential impacts and recommended mitigation measures for these areas, as outlined in **Section 7.2**, would also apply to protect the Candidate habitat of Endangered and Threatened species within 120 m of the Subject Lands.

Per the Arborist Report prepared by Kuntz Forestry (2024) and submitted under separate cover, four trees along the edge of the woodland are proposed for removal. Due to the potential presence of SAR bats, tree removals must occur outside the SAR bat timing window (March 15 to November 30).

7.6. Migratory Birds

GEI observed a total of 30 confirmed, probable, or possible breeding bird species within the Subject Lands and the adjacent 120 m during breeding bird surveys. Among these, Killdeer (*Charadrius vociferus*), a species known to nest in bare ground environments, was documented as a probable breeder within the Subject Lands.

Per the *Migratory Birds Convention Act*, the proponent is responsible for ensuring that no active bird nests are present within the work area before commencing activities. Per the Arborist Report prepared by Kuntz Forestry (2024) and submitted under separate cover, four trees along the edge of the woodland are proposed for removal. Furthermore, although there is limited groundcover vegetation due to previous land management practices, potential interactions with migratory birds as a result of construction activities remain possible, particularly for species like Killdeer that nest on bare ground.

To comply with the *Migratory Birds Convention Act*, tree removals and earth-moving activities should occur outside the breeding bird timing window (March 30 to August 30). If these activities are planned within the breeding bird timing window, a qualified ecologist should conduct a nest sweep survey no more than 48 hours before tree removal or ground-disturbing activities. This survey will confirm whether construction can proceed without impacting migratory birds or their nests.

7.7. Potential Induced Impacts

Human occupancy introduces the potential for long-term indirect impacts on adjacent retained natural areas. These impacts include encroachment, recreational use, artificial light, and noise, each of which can affect ecological integrity if not managed appropriately.

7.7.1. Encroachment

Encroachment impacts may result from activities such as the collection of firewood, clearing of natural vegetation, disposal of yard waste or litter, and the use of fertilizers, pesticides, road salt, and oil. Free-ranging domestic animals can also disturb the small vertebrate fauna of retained natural areas through predation or general disturbance. Cats, in particular, are known to have serious impacts on small mammal and bird populations (Blancher 2013, Loss et al. 2013).

To mitigate these impacts, the proposed development incorporates ecological setbacks from retained natural heritage features, as well as educational signage or homeowner's manual (discussed in **Section 8**) to discourage encroachment and promote stewardship of the retained natural areas and their setbacks.

7.7.2. Recreational Use

Recreational use of retained natural areas by residents may lead to the trampling of vegetation, soil compaction, erosion, and the destruction of habitat. This activity could also result in the introduction and spread of invasive non-native plant species, which may outcompete and displace native species (Saunders et al. 1991). Non-native plant introductions can occur through the intentional planting of decorative species in landscaped areas, as well as through seeds carried on residents' shoes or domestic animal fur (Foxcroft et al. 2013).

To mitigate these impacts, the proposed development incorporates ecological setbacks from retained natural heritage features, as well as educational signage or homeowner's manual (discussed in **Section 8**) to discourage recreational use and promote stewardship of the retained natural areas and their setbacks.

7.7.3. Artificial Light

Artificial light associated with residential development can disrupt wildlife activity patterns, particularly for nocturnal species and migratory birds, which are sensitive to the disorienting effects of light (Longcore & Rich 2004). Artificial light can also reduce nocturnal pollination, negatively affecting plant reproductive success (Knop et al. 2017).

To mitigate these effects, GEI encourages the use of shielded light fixtures designed to direct light downward and away from sensitive natural features. This approach aligns with guidelines such as the DarkSky International's recommendations for outdoor lighting and the City of Toronto's Green Standard (Version 4) for Low-rise Residential (2022). Implementing these measures will minimize light spill and reduce its potential impacts on adjacent habitats.

7.7.4. Noise Pollution

Noise pollution, particularly from post-development sources such as traffic, HVAC systems, and general human activity, has the potential to disrupt wildlife activity patterns. Songbirds are especially vulnerable to noise interference, as their communication relies on acoustic signals, which can be masked by low-frequency urban sounds (Proppe et al. 2013).

While the anticipated low-density residential development is expected to result in little to no increase in noise compared to current conditions, the proposed ecological setbacks will help mitigate potential noise impacts by providing distance from the retained natural heritage features.

7.7.5. Cumulative Impacts

Cumulative impacts refer to the combined, long-term effects of multiple stressors associated with development—such as hydrological alteration, artificial light, noise, human presence, and encroachment—on the ecological integrity of retained and downstream natural features. Although any individual activity may appear minor in isolation, the accumulation of these influences over time can potentially degrade habitat quality, reduce biodiversity, and impair ecosystem functions, particularly along feature edges or in landscapes where past disturbances have already altered natural conditions. To address these risks, the proposed development integrates a series of mitigation measures aimed at reducing both individual and cumulative impacts. Together, these measures are intended not only to prevent localized degradation but also to reduce the incremental pressures that often drive long-term ecological decline.

These measures include the establishment of ecological setbacks from all retained natural heritage features, the exclusion of formal trails within the NHS and associated setback areas, and the installation of educational signage or homeowner's manual to promote stewardship and discourage human occupancy stressors such as inappropriate landscaping practices or free-ranging pets.

From a hydrological perspective, the proposed SWM system is designed to maintain pre- and post-development drainage patterns and water balance conditions, thereby reducing the potential for cumulative downstream effects on water quality, wetland hydrology, and fish habitat. In addition, the forthcoming WWBRE will identify whether further mitigation is required to prevent incremental hydrological impacts on retained wetlands.

Although several wetlands and wetland setback areas have been previously altered or removed, the proposed restoration and enhancement measures are intended to offset these losses, improve ecological function within the NHS, and strengthen the long-term resilience of natural features on and adjacent to the Subject Lands.

Collectively, the ecological setbacks, educational signage or homeowner's manual, hydrological controls, and compensation measures are expected to substantially reduce cumulative impacts and support the long-term ecological integrity of the retained NHS. If additional mitigation or monitoring recommendations are identified through the WWBRE, their implementation will further reduce the potential for cumulative impacts on wetlands and downstream features.

8. Restoration and Enhancement Opportunities

As discussed in **Sections 4.5.4 and 7.1**, several wetlands within both GRCA and NVCA jurisdictions on the Subject Lands were historically disturbed, altered, or removed. The historical wetland extent is illustrated in **Figure 5 (Appendix A)**, while the extent of prior and proposed wetland and wetland setback removals is shown in **Figure 12 (Appendix A)**. The GRCA violation has been resolved through a permitting process; however, the NVCA violation remains outstanding until on-site compensation is implemented. Following discussions with the NVCA, including a meeting on August 20, 2025, the proponent and the NVCA have agreed in principle on the general compensation approach required to resolve the outstanding violation.

The total amount of wetland removal within NVCA jurisdiction is 2.12 ha (2.09 ha previously removed and 0.03 ha proposed for removal). In addition, the existing and proposed works result in the removal of 5.35 ha of wetland setback area within NVCA jurisdiction.

Compensation for wetland removal is proposed as follows:

- **1:1 compensation** where wetland is restored in place; and
- **2:1 compensation** where wetland is restored elsewhere on the site.

Compensation for wetland setback loss is proposed as follows:

- Where wetland setback is restored in place—whether as wetland or as a vegetated wetland setback—**no compensation ratio is applied**;
- Where wetland setback is lost, the Draft Plan provides **equivalent or greater areas of vegetated wetland setback elsewhere on the site**; and
- Where the Draft Plan is set back less than 30 m from the wetland, **additional woody vegetation plantings** are proposed to augment the vegetated setback and enhance buffer function.

To implement this compensation framework, the conceptual restoration plan (**Figure 13, Appendix A**) identifies the areas where wetland and wetland setback losses will either be restored in place or compensated elsewhere on the Subject Lands. The final layout of the wetland restoration may be refined during the detailed landscape design to account for local topography and hydrological conditions, and to incorporate more naturalized feature geometry. The current layout is provided for illustrative purposes to demonstrate the overall restoration concept and compensation approach.

Of the total NVCA wetland removals, 0.79 ha will remain removed as part of the proposed development, while 1.33 ha of former wetland area is proposed to be restored in place at a 1:1 ratio. An additional 1.58 ha of additional wetland construction is proposed elsewhere on the site to meet the required 2:1 compensation ratio for areas that cannot be restored in place.

For NVCA wetland setback losses, 1.93 ha will remain removed under the Draft Plan, 2.19 ha of wetland setback will be restored in place, and at least 4.94 ha of vegetated wetland setback restoration is proposed elsewhere on the site. This latter value represents a conservative estimate, as a portion of the area included in the wetland removal calculation will also be restored as vegetated setback. This portion is illustrated within the 0.97 ha enhanced setback restoration layer, which depicts areas where additional woody vegetation plantings are proposed in locations where setbacks are less than 30 m.

This conceptual strategy aims to achieve no net loss of ecological function within the two NHS blocks and to restore wetlands in place to the extent feasible. It outlines proposed restoration and enhancement measures designed to support the long-term integrity and resilience of the NHS blocks, improve the ecological functions of the retained natural heritage features, and offset disturbances from previous land management activities.

These measures will be refined in consultation with the reviewing authorities. At this stage, the conceptual strategy is being presented for review and feedback. Once there is agreement on the overall approach, GEI will prepare a design brief and advance the detailed restoration plan, including planting and grading specifications, as well as detailed monitoring and adaptive management components.

8.1. Conceptual Wetland Restoration and Wildlife Habitat Enhancement Strategy

Restoration within the NHS blocks (**Figure 13, Appendix A**) will focus on wetland creation and wildlife habitat enhancements, with a particular emphasis on supporting turtle, amphibian, and Monarch populations. The area currently contains two natural heritage features: a shallow marsh community (MAM2-2/MAS2-1/SAS1) and an open water community (OAO). The open water feature was historically a marsh but has been anthropogenically altered and no longer retains wetland characteristics. Restoration efforts will aim to re-establish wetland characteristics and enhance habitat for target species such as turtles and frogs.

Key proposed conceptual restoration measures include:

- **Turtle Habitat Enhancement:**
 - **Restoration of Open Water Feature:** Regrade and reshape the existing open water area to create a mix of shallow and deep zones. Deeper areas will serve as overwintering habitat for turtles, while shallow, gradual banks will provide basking areas and habitat diversity. These modifications will restore the feature's original marsh characteristics and enhance its ecological function.
 - **Basking Habitat Structures:** Incorporate large rocks and logs within and around the waterbody to provide basking opportunities for turtles. These structures will also offer shelter and resting spots, contributing to the habitat complexity required for turtles.
- **Amphibian Habitat Restoration:**
 - **Restoration of Open Water Feature:** Shape shallow banks with gradual slopes to promote the establishment of aquatic vegetation and amphibian egg attachment sites. These areas will serve as egg-laying and nursery zones for amphibians.
 - **Native Vegetation Plantings:** Introduce emergent and floating aquatic vegetation to provide attachment sites for amphibian eggs and shelter for larvae. The selected plant species will stabilize soils, improve water quality, and create microhabitats to support amphibian populations.
 - **Fish-Free Zones:** Establish isolated or semi-isolated shallow zones within the restoration area to create fish-free breeding habitats for amphibians. These areas will be designed to prevent fish access using hydrological controls or physical barriers, ensuring a safe environment for amphibian eggs and larvae.

- **Monarch Habitat Restoration:** Include Milkweed species (*Asclepias* spp.) in the native seed mix to support Monarch breeding by providing essential host plants for caterpillars. Additionally, seed a mix of nectar-rich flowering species to provide foraging resources for adult Monarchs throughout their life cycle. These plantings will also support other pollinator populations.
- **Wildlife Fencing and Crossing Opportunities:** Explore potential opportunities to minimize wildlife–vehicle interactions and support safe wildlife movement across the residential road, such as wildlife exclusion fencing and wildlife crossing structures.

These targeted measures aim to provide specialized habitats for the known species of turtles and amphibians present within the Subject Lands (refer to **Sections 4.6.2 and 4.6.3**), while enhancing the overall ecological integrity of the wetland system. By addressing species-specific requirements, the proposed restoration efforts will establish a balanced and self-sustaining wetland environment that supports aquatic and semi-aquatic species. Additionally, these measures will strengthen the ecological integrity of the NHS block and maintain direct linkages with wetland areas to the north and south.

8.2. Conceptual Wetland Buffer Enhancement Strategy

The Draft Plan incorporates a 30 m setback from all wetlands, with limited reductions to 15 m in certain locations. Buffer enhancement measures are proposed to strengthen the ecological function of these setback areas, improve habitat conditions adjacent to the wetlands, and provide a natural and protective interface between the development and the retained natural features (**Figure 13, Appendix A**).

Key proposed conceptual restoration measures include:

- **Trail Removal and Restoration:** The trails previously installed within wetland setback areas in both GRCA and NVCA jurisdictions have been removed. These disturbed areas will be restored through native seed mix application.
- **Transitional Native Vegetation Seeding:** Establish native seed mix bands that follow existing moisture gradients from wet to dry, where suitable based on local site conditions, within all wetland setback areas in both GRCA and NVCA jurisdictions.
- **Shrub Plantings to Enhance Reduced Setbacks:** Plant native shrub species in areas where the wetland setback in NVCA jurisdiction is less than 30 m, to provide additional buffering from future adjacent land uses and to increase habitat and species diversity.
- **Educational Signage or Homeowner’s Manual:** Install interpretive signage or prepare homeowner’s manual to educate future residents about the ecological importance of the restored wetlands and setbacks, promote stewardship, and support the long-term success of restoration efforts. Signage/manual topics may include:
 - Information on the restoration program, including the role and importance of wetlands and their vegetated buffers;
 - Considerations for wildlife movement and potential crossing areas along the local road;
 - Stewardship practices, such as keeping companion animals contained and adopting sustainable landscaping practices.

These enhancements will strengthen the resilience of the retained wetland features, help protect their ecological functions, and mitigate potential human impacts.

8.3. Next Steps and Implementation

The restoration and enhancement measures outlined above provide a high-level overview to facilitate discussions with the reviewing authorities. Once there is agreement on the overall approach, GEI will prepare a design brief and advance the detailed restoration plan, including planting design, species selection, wildlife habitat structure specifications, grading requirements, soil preparation, and implementation guidance. This plan will also include an ecological monitoring component, outlining metrics to evaluate the success of restoration efforts. Monitoring targets may include indicators such as the average wetness coefficient of plant species within wetland communities to ensure restoration goals are met. Hydrological monitoring will also be incorporated as required, based on any additional recommendations arising from the WWBRE. By restoring and enhancing existing wetland features, creating additional wetland areas, and planning for long-term ecological resilience, this strategy aims to achieve a net ecological benefit for the Subject Lands and the surrounding environment.

9. Conclusions and Recommendations

GEI prepared this EIS to support applications for an Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision to facilitate the proposed subdivision and future low-density residential development of the property located at 514504 2nd Line in the Township of Amaranth, Dufferin County, Ontario.

Through desktop review and ecological field investigations, GEI identified several significant natural heritage features within the Subject Lands and the adjacent 120 m:

- Unevaluated wetlands (within Subject Lands and adjacent 120 m);
- PSWs (within Subject Lands and adjacent 120 m);
- Woodlands (adjacent 120 m only);
- Significant woodlands (adjacent 120 m only);
- Confirmed and Candidate SWH:
 - Confirmed SWH (within Subject Lands):
 - Turtle Wintering Areas; and
 - Terrestrial Crayfish.
 - Candidate SWH (adjacent 120 m only):
 - Raptor Wintering Areas;
 - Bat Maternity Colonies;
 - Woodland Raptor Nesting;
 - Seeps and Springs;
 - Woodland Area-sensitive Bird Breeding; and
 - Special Concern and Rare Wildlife Species.
- Direct and indirect fish habitat (within Subject Lands and adjacent 120 m);
- Habitat of Endangered and Threatened species (adjacent 120 m only):
 - Candidate Bobolink breeding habitat;
 - Candidate Eastern Meadowlark breeding habitat;
 - Candidate Eastern Whip-poor-will breeding habitat; and
 - Candidate SAR bat roosting habitat.
- White Whitten Drain.

The locations of these significant natural heritage features are shown in **Figures 8 and 9 (Appendix A)**.

This EIS evaluated the potential direct, indirect, and induced impacts of the proposed development on these natural heritage features and their ecological functions. A suite of mitigation measures—including ecological setbacks, stormwater management controls, erosion and sediment control (ESC) measures, construction management best practices, and long-term ecological stewardship initiatives—has been identified to avoid or minimize impacts. With full implementation of these measures, no net negative impacts are anticipated to the retained natural heritage features.

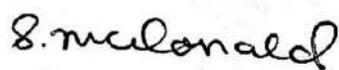
Several wetland communities within GRCA and NVCA jurisdiction were previously disturbed, altered, or removed as a result of previous land management practices. To address both prior and proposed impacts, a comprehensive wetland restoration and enhancement strategy has been developed (**Section 8**). This strategy includes 1:1 or 2:1 wetland compensation depending on whether restoration occurs in place or elsewhere on-site; restoration and enhancement of wetland setback areas including restoration of the areas where trails were previously installed and have since been removed; and targeted habitat enhancements for turtles, amphibians, and Monarch butterflies within the NHS blocks. These measures are intended to achieve no net loss of ecological function and to improve the long-term resilience of the NHS blocks.

Potential hydrological impacts will be further evaluated through a WWBRE, which will determine the magnitude of potential hydrological change and identify whether additional mitigation or monitoring is required. The proposed stormwater management (SWM) strategy—including roadside ditches with permanent pools, infiltration trenches, dry ponds, and maintenance of the pre- and post-development watershed drainage split—supports the protection of wetland hydrology, water quality, and downstream aquatic habitat. Implementation of any additional recommendations arising from the WWBRE will be required to support the protection of retained wetlands.

Together, the proposed restoration, enhancement, and mitigation measures are expected to maintain the ecological integrity of the Subject Lands and contribute a net ecological benefit for the surrounding environment. These approaches will be refined through ongoing consultation with Dufferin County, the Township of Amaranth, the GRCA, and the NVCA.

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Appendix A Figures

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Figure 2: Background Natural Heritage Mapping

Figure 3: Ecological Field Survey Station Locations

Figure 4: Ecological Land Classification (Existing Conditions)

Figure 5: Historical Wetland Extent on Subject Lands

Figure 6: Observed Species of Interest Locations

Figure 7: Headwater Drainage Feature Assessment

Figure 8: Significant Natural Heritage Features

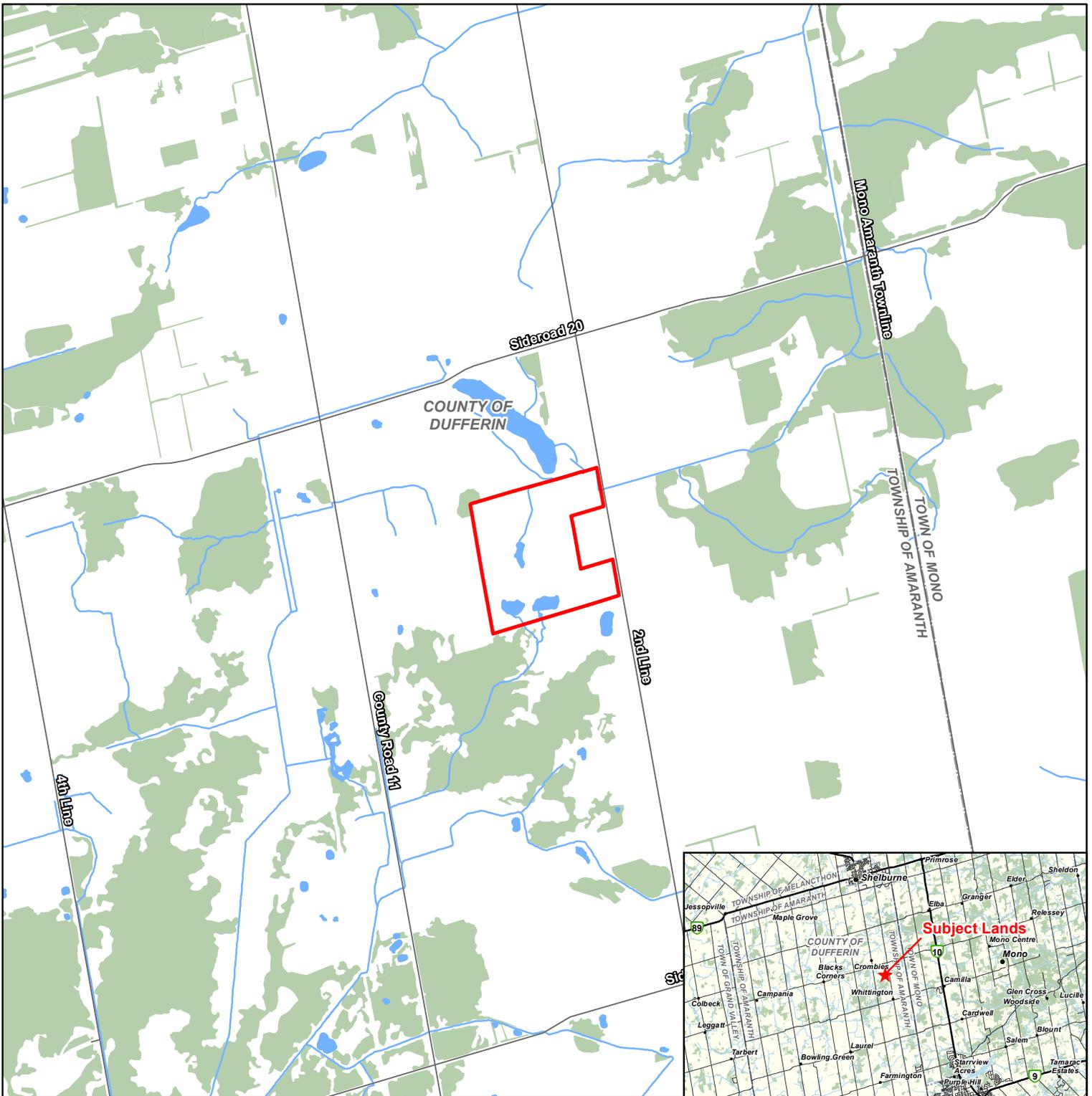
Figure 9: Significant Wildlife Habitat

Figure 10: Proposed Development

Figure 11: Natural Heritage Constraints to Development

Figure 12: Wetland Removals Before Compensation

**Figure 13: Conceptual Wetland Restoration and Compensation Plan in NVCA
Jurisdiction (Outstanding Violation)**



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- Legend**
- Subject Lands
 - Municipal Boundary
 - Watercourse
 - Waterbody
 - Wooded Area

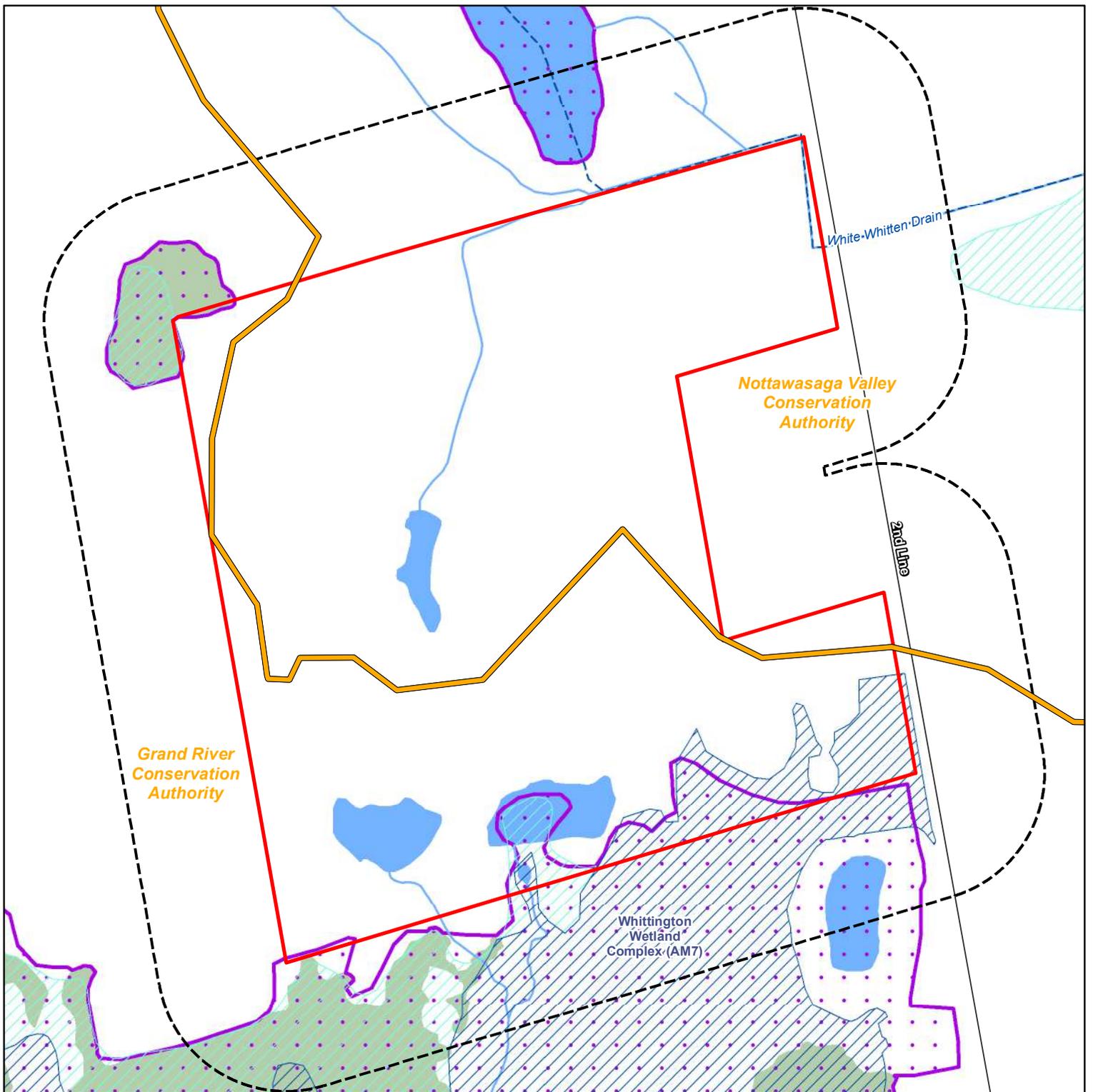
2nd Line, Amaranth
 The Cellular Connection

Figure 1
 Location of Subject Lands

0 500 m
 1:25,000



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Legend

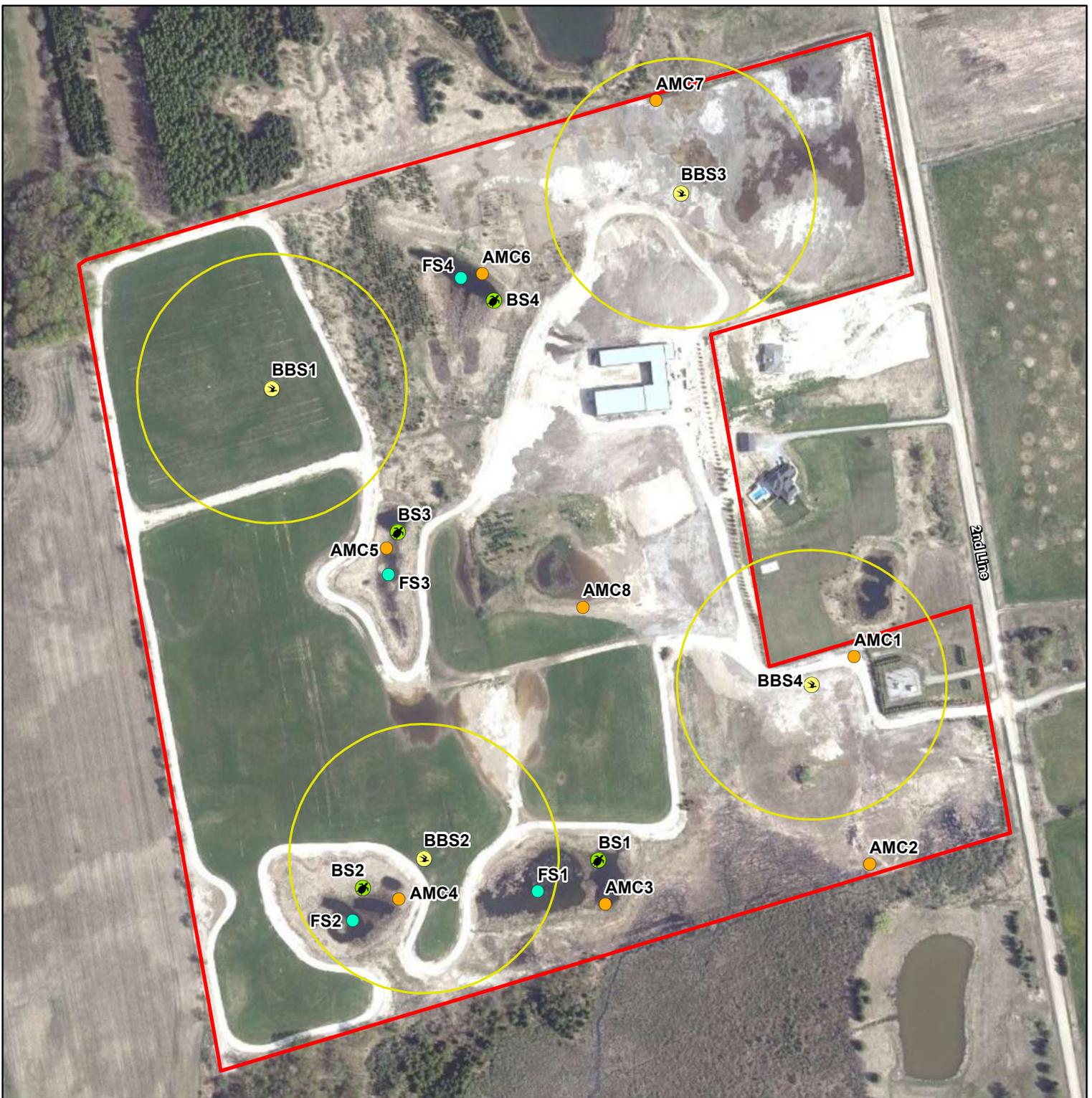
- Subject Lands
- Subject Lands + 120 metres
- Conservation Authority Administrative Boundary
- Natural Heritage System (Dufferin County)
- Constructed Drain
- Watercourse
- Waterbody
- Provincially Significant Wetland
- Unevaluated Wetland
- Wooded Area

2nd Line, Amaranth
 The Cellular Connection

Figure 2
 Background Natural
 Heritage Mapping

0 100 m
 1:5,000





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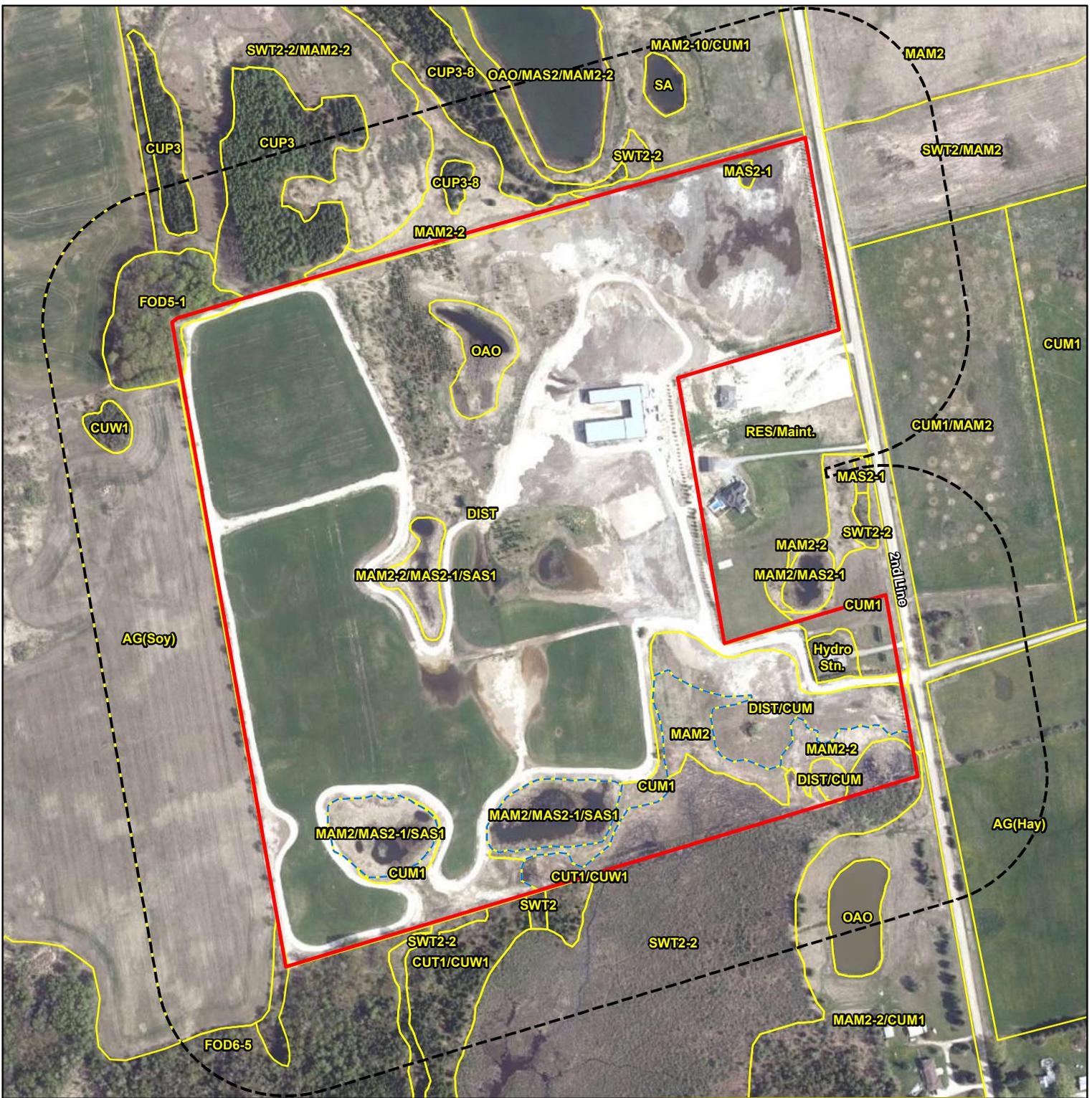
Legend

- Subject Lands
- Breeding Bird Survey Station + 100 m
- Breeding Bird Survey Station
- Calling Amphibian Survey Station
- Turtle Basking Survey Station
- Fish Sampling Station

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Figure 3
 Ecological Field Survey
 Station Locations





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Legend

- Subject Lands
 - Subject Lands + 120 metres
 - Staked Wetland (GRCA, August 29, 2024)
 - Ecological Land Classification
- ELC Legend**
- AG, Agricultural
 - CUM, Cultural Meadow
 - CUM1, Mineral Cultural Meadow
 - CUP3, Coniferous Plantation
 - CUP3-8, White Spruce - European Larch Coniferous Plantation
 - CUT1, Mineral Cultural Thicket
 - CUW1, Mineral Cultural Woodland
 - DIST, Disturbed
 - FOD5-1, Dry - Fresh Sugar Maple Deciduous Forest

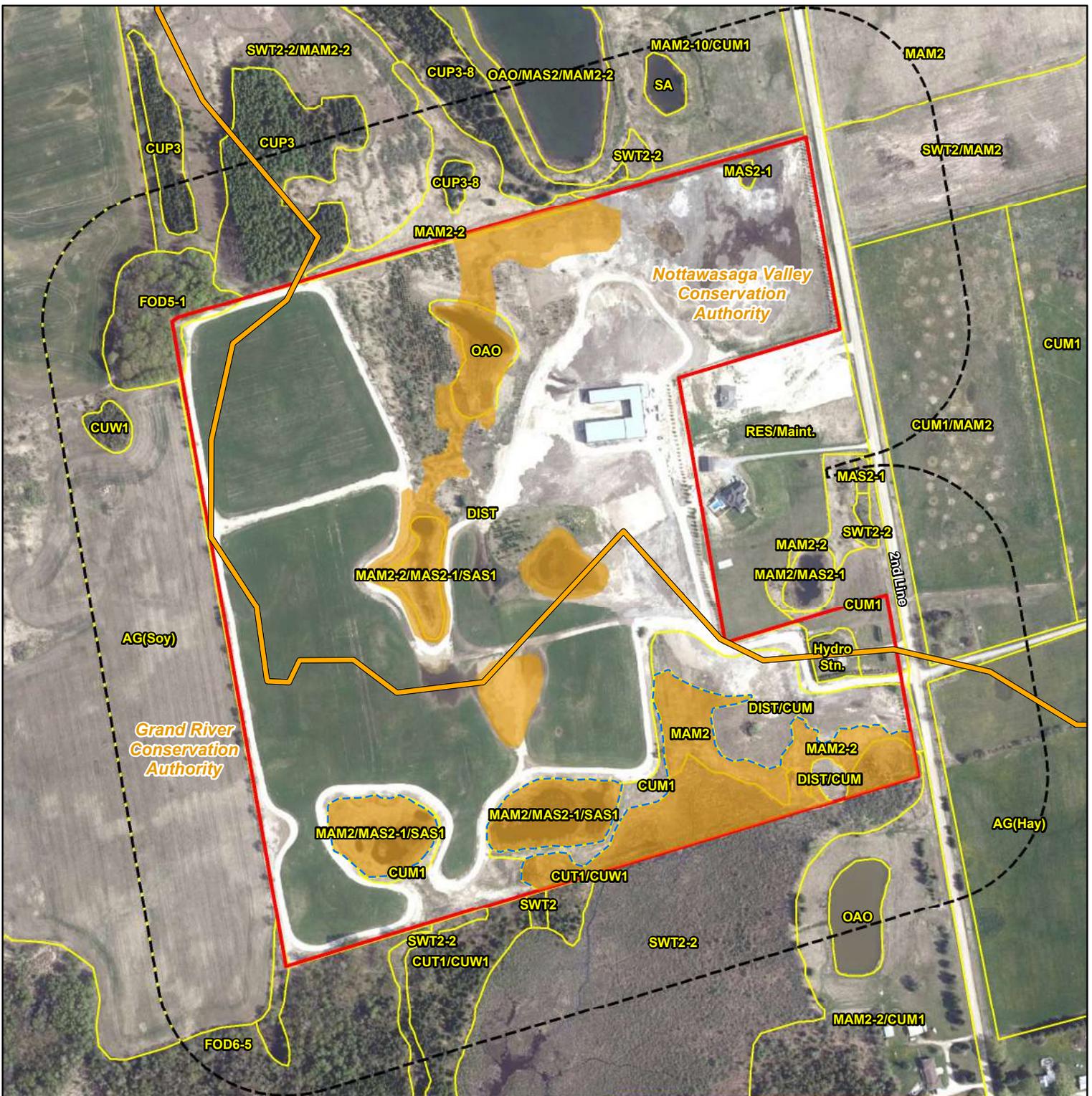
- FOD6-5, Dry-Fresh Sugar Maple - Hardwood Deciduous Forest
- Hydro Stn., Hydro Station
- MAM2, Mineral Meadow Marsh
- MAM2-2, Reed-cannary Grass Mineral Meadow Marsh
- MAM2-10, Forb Mineral Meadow Marsh
- MAS2, Mineral Shallow Marsh
- MAS2-1, Cattail Mineral Shallow Marsh
- OAO, Open Aquatic
- RES/Maint., Residential/Maintained
- SA, Shallow Water
- SAS1, Submerged Shallow Aquatic
- SWT2, Mineral Thicket Swamp
- SWT2-2, Willow Mineral Thicket Swamp

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 The Cellular Connection

Figure 4 Ecological Land Classification (Existing Conditions)

0 50 m
 1:5,000





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Legend

- Subject Lands
- Subject Lands + 120 metres
- Conservation Authority Administrative Boundary
- Historical Wetland Extent on Subject Lands
- Staked Wetland (GRCA, August 29, 2024)
- Ecological Land Classification

ELC Legend

- AG, Agricultural
- CUM, Cultural Meadow
- CUM1, Mineral Cultural Meadow
- CUP3, Coniferous Plantation
- CUP3-8, White Spruce - European Larch Coniferous Plantation
- CUT1, Mineral Cultural Thicket
- CUW1, Mineral Cultural Woodland
- DIST, Disturbed

- FOD5-1, Dry - Fresh Sugar Maple Deciduous Forest
- FOD6-5, Dry-Fresh Sugar Maple - Hardwood Deciduous Forest
- Hydro Stn., Hydro Station
- MAM2, Mineral Meadow Marsh
- MAM2-2, Reed-cattail Grass Mineral Meadow Marsh
- MAM2-10, Forb Mineral Meadow Marsh
- MAS2, Mineral Shallow Marsh
- MAS2-1, Cattail Mineral Shallow Marsh
- OAO, Open Aquatic
- RES/Maint., Residential/Maintained
- SA, Shallow Water
- SAS1, Submerged Shallow Aquatic
- SWT2, Mineral Thicket Swamp
- SWT2-2, Willow Mineral Thicket Swamp

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Figure 5
Historical Wetland Extent
on Subject Lands





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Legend

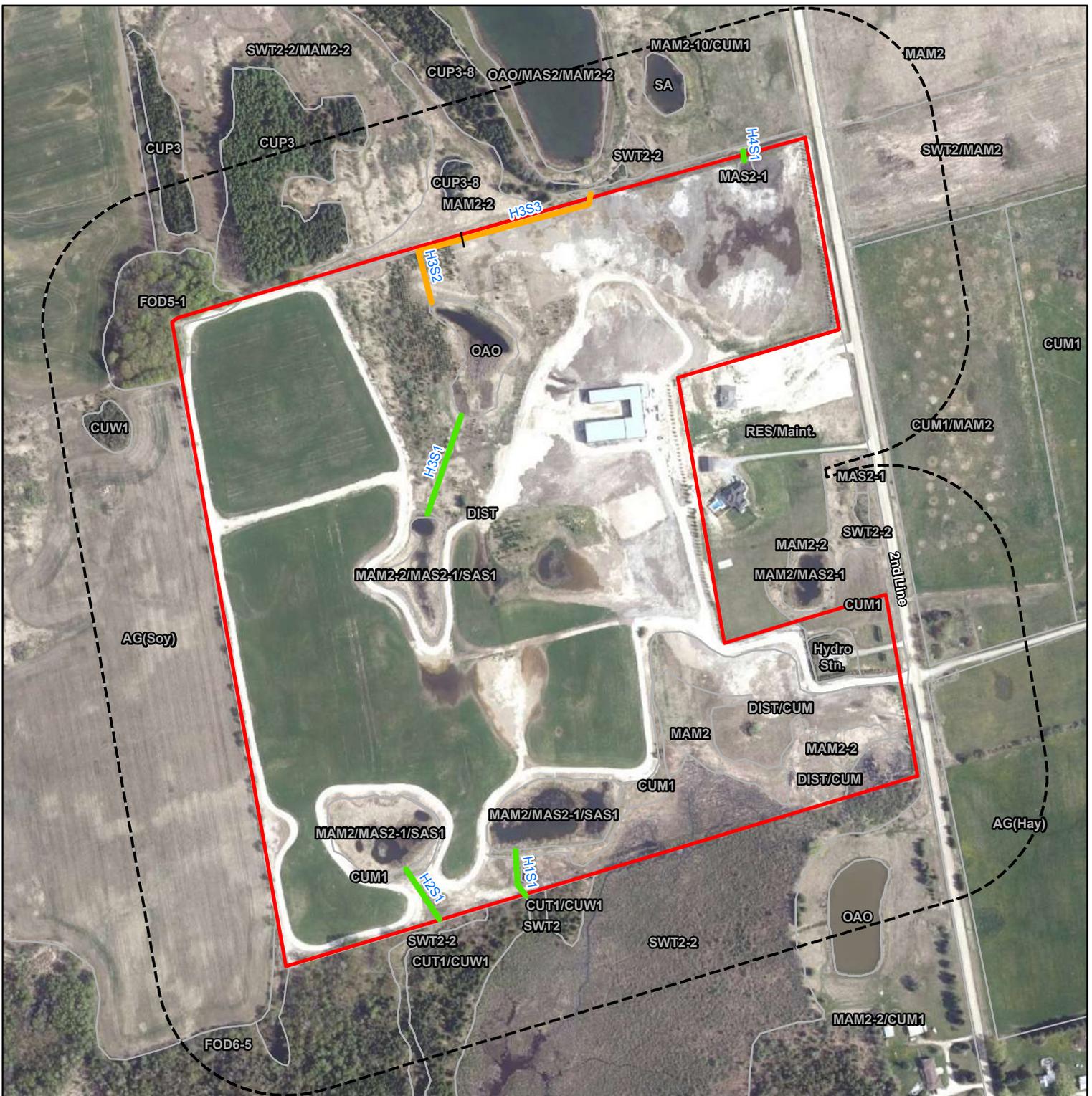
- Subject Lands
- Subject Lands + 120 metres
- 🐸 Terrestrial Crayfish Chimney Observation
- Eastern Meadowlark Observation
- Bobolink Observation

2nd Line, Amaranth
 The Cellular Connection

Figure 6
 Observed Species of
 Interest Locations

0 75 m
 1:5,500





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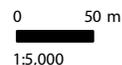
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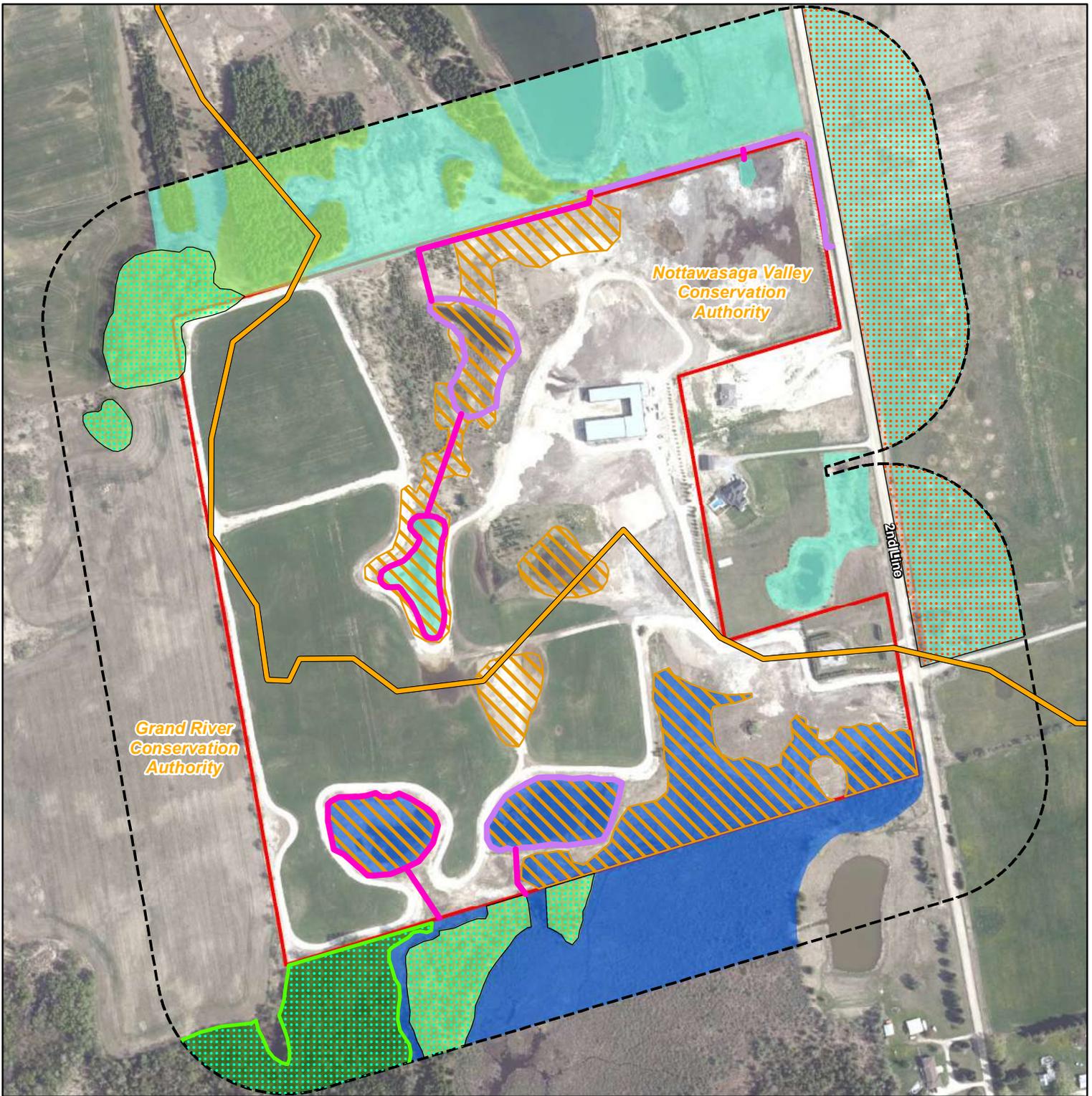
- Subject Lands
- Subject Lands + 120 metres
- HDF Management Recommendation**
- Conservation
- Mitigation
- Reach Break
- Ecological Land Classification
- ELC Legend**
- AG, Agricultural
- CUM, Cultural Meadow
- CUM1, Mineral Cultural Meadow
- CUP3, Coniferous Plantation
- CUP3-8, White Spruce - European Larch Coniferous Plantation
- CUT1, Mineral Cultural Thicket
- CUW1, Mineral Cultural Woodland
- DIST, Disturbed

- FOD5-1, Dry - Fresh Sugar Maple Deciduous Forest
- FOD5-20, Dry-Fresh Sugar Maple - Hardwood Deciduous Forest
- Hydro Stn., Hydro Station
- MAM, Meadow Marsh
- MAM2, Mineral Meadow Marsh
- MAM2-2, Reed-canary Grass Mineral Meadow Marsh
- MAM2-10, Forb Mineral Meadow Marsh
- MAS, Shallow Marsh
- MAS2, Mineral Shallow Marsh
- MAS2-1, Cattail Mineral Shallow Marsh
- OAO, Open Aquatic
- RES/Maint., Residential/Maintained
- SA, Shallow Water
- SWT2, Mineral Thicket Swamp
- SWT2-2, Willow Mineral Thicket Swamp

2nd Line, Amaranth
 The Cellular Connection

Figure 7 Headwater Drainage Feature Assessment





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Legend

- Subject Lands
- Subject Lands + 120 metres
- Conservation Authority Administrative Boundary
- Direct Fish Habitat
- Indirect Fish Habitat
- Provincially Significant Wetland
- Unevaluated Wetland
- Historical Wetland Extent on Subject Lands
- Significant Woodland
- Other Woodland
- Candidate SAR (Bats) Roosting Habitat
- Candidate SAR (Bobolink & Eastern Meadowlark) Breeding Habitat
- Candidate SAR (Eastern Whip-poop-will) Breeding Habitat

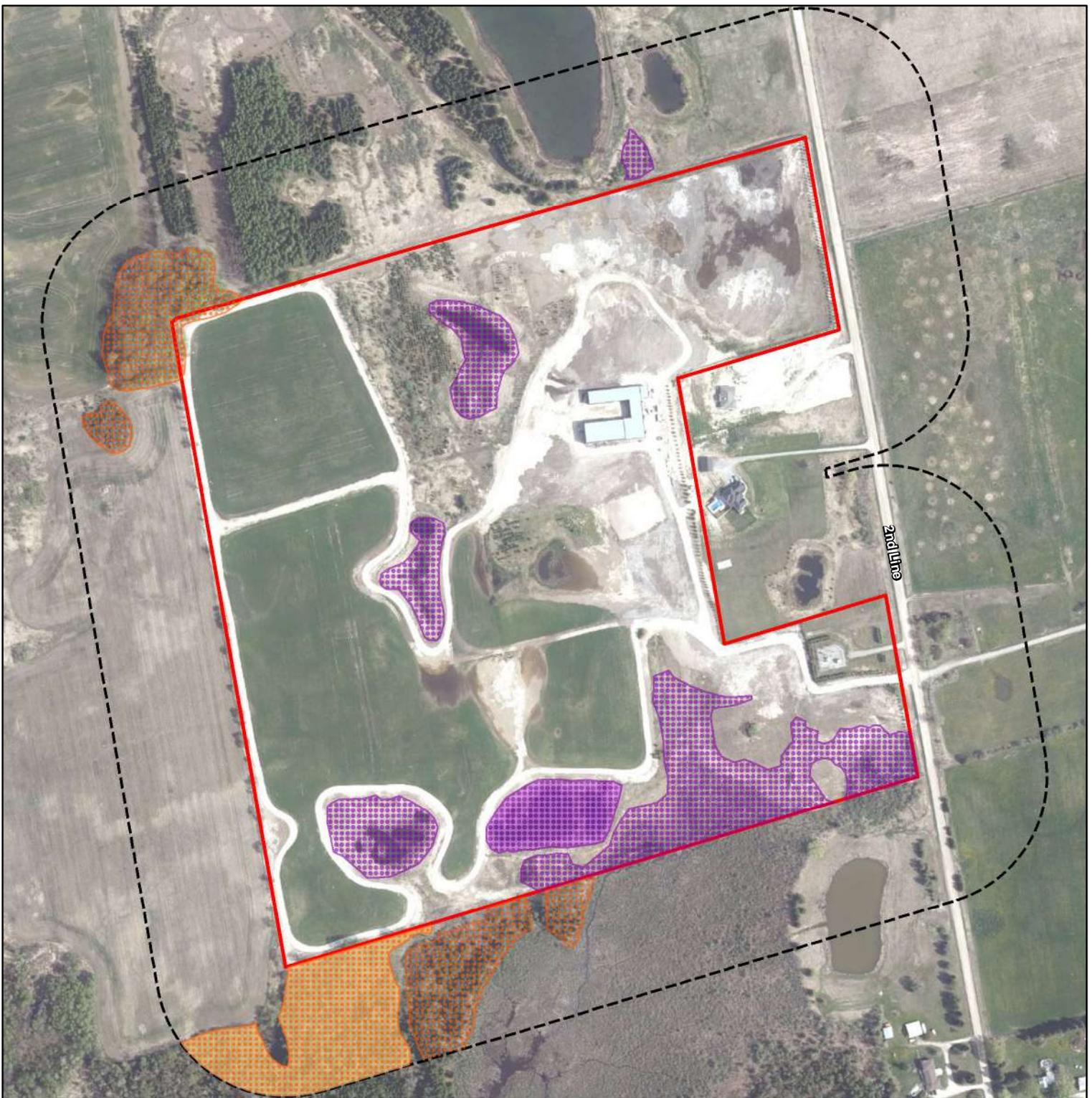
2nd Line, Amaranth
 The Cellular Connection

Figure 8
 Significant Natural
 Heritage Features

0 75 m
 1:5,000



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Legend

- Subject Lands
- Subject Lands + 120 metres
- Confirmed SWH**
- Terrestrial Crayfish
- Turtle Wintering
- Candidate SWH**
- Bat Maternity Colonies
- Raptor Wintering Areas
- Woodland Raptor Nesting
- Seeps and Springs
- Woodland Area-Sensitive Bird Breeding
- Special Concern and Rare Wildlife Species

2nd Line, Amaranth
 The Cellular Connection

Figure 9
 Significant Wildlife Habitat

0 75 m
 1:5,000





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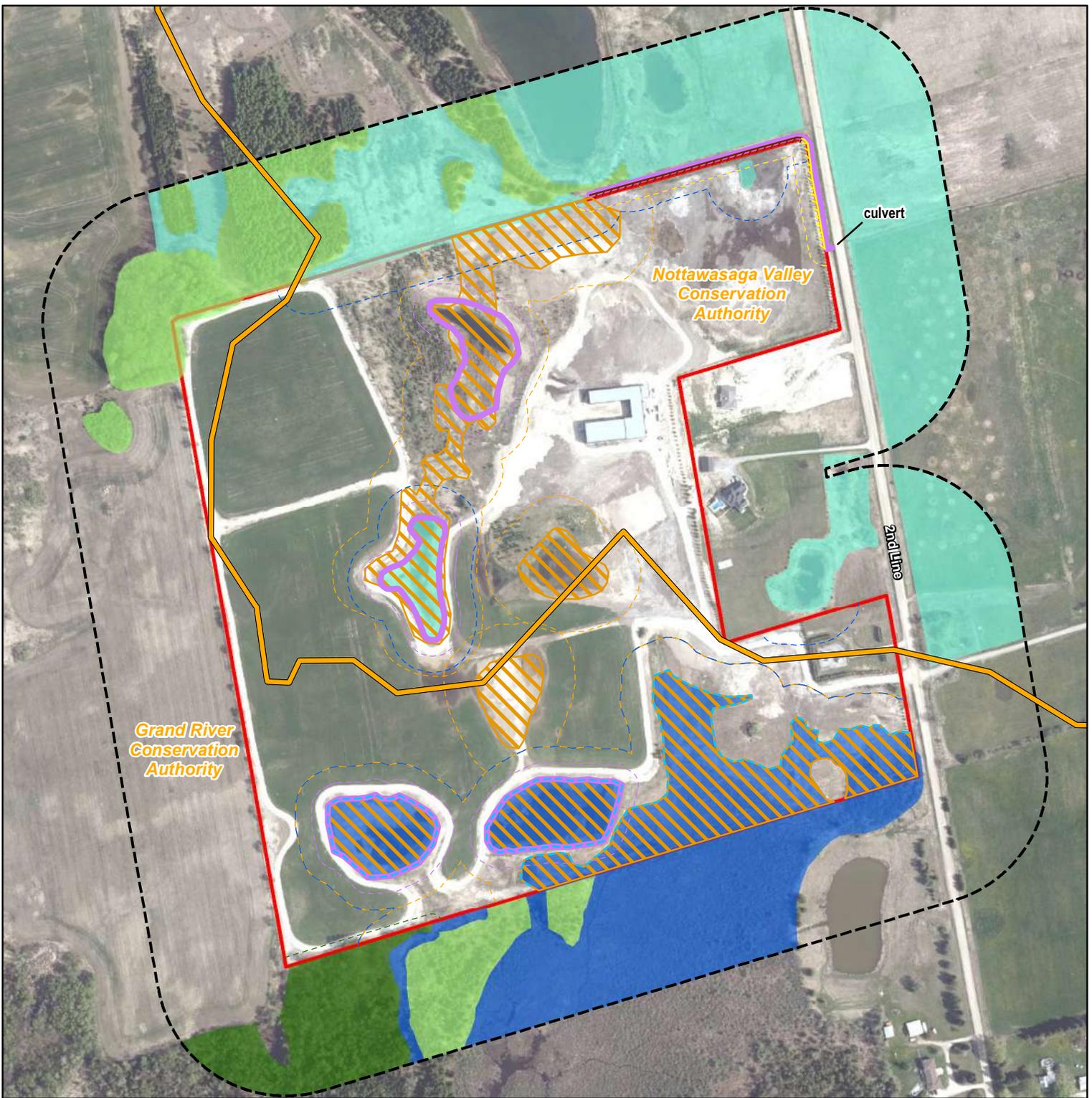
Legend

- Subject Lands
- Subject Lands + 120 metres
- Draft Plan
- Grading Plan
- SWM Dry Pond

2nd Line, Amaranth
 The Cellular Connection

Figure 10
 Proposed Development





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Legend

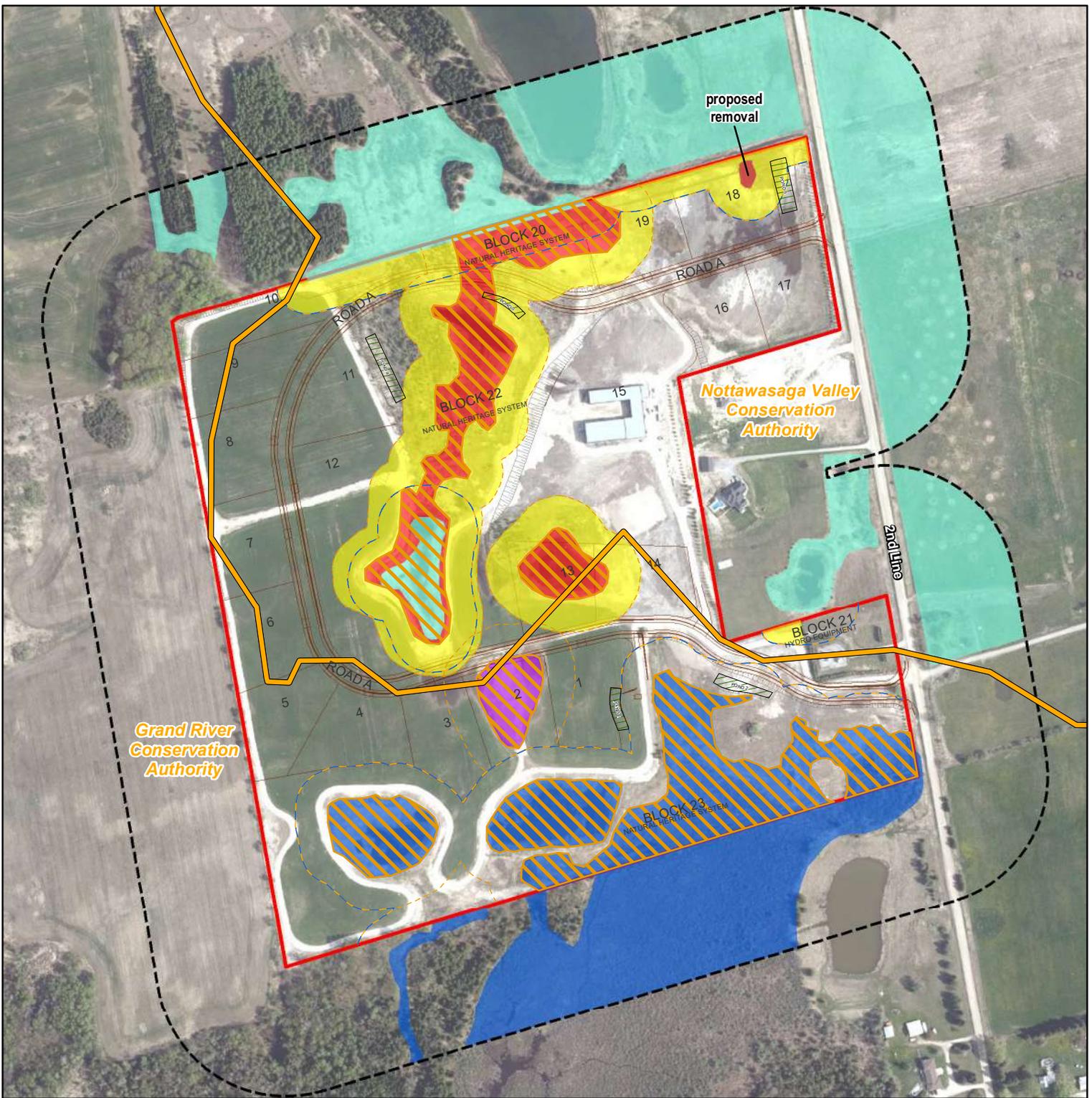
- Subject Lands
- Subject Lands + 120 metres
- Conservation Authority Administrative Boundary
- Fish Habitat
- Fish Habitat + 15 metres
- Surveyed Top of Bank
- Estimated Top of Bank
- Top of Bank + 15 metres
- Staked Wetland (GRCA, August 29, 2024)
- Provincially Significant Wetland
- Unevaluated Wetland
- Wetland + 30 metres
- Historical Wetland Extent on Subject Lands
- Historical Wetland on Subject Lands + 30 metres
- Significant Woodland
- Significant Woodland + 10 metres
- Other Woodland

2nd Line, Amaranth
 The Cellular Connection

Figure 11
 Natural Heritage Constraints
 to Development

0 50 m
 1:5,000





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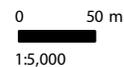
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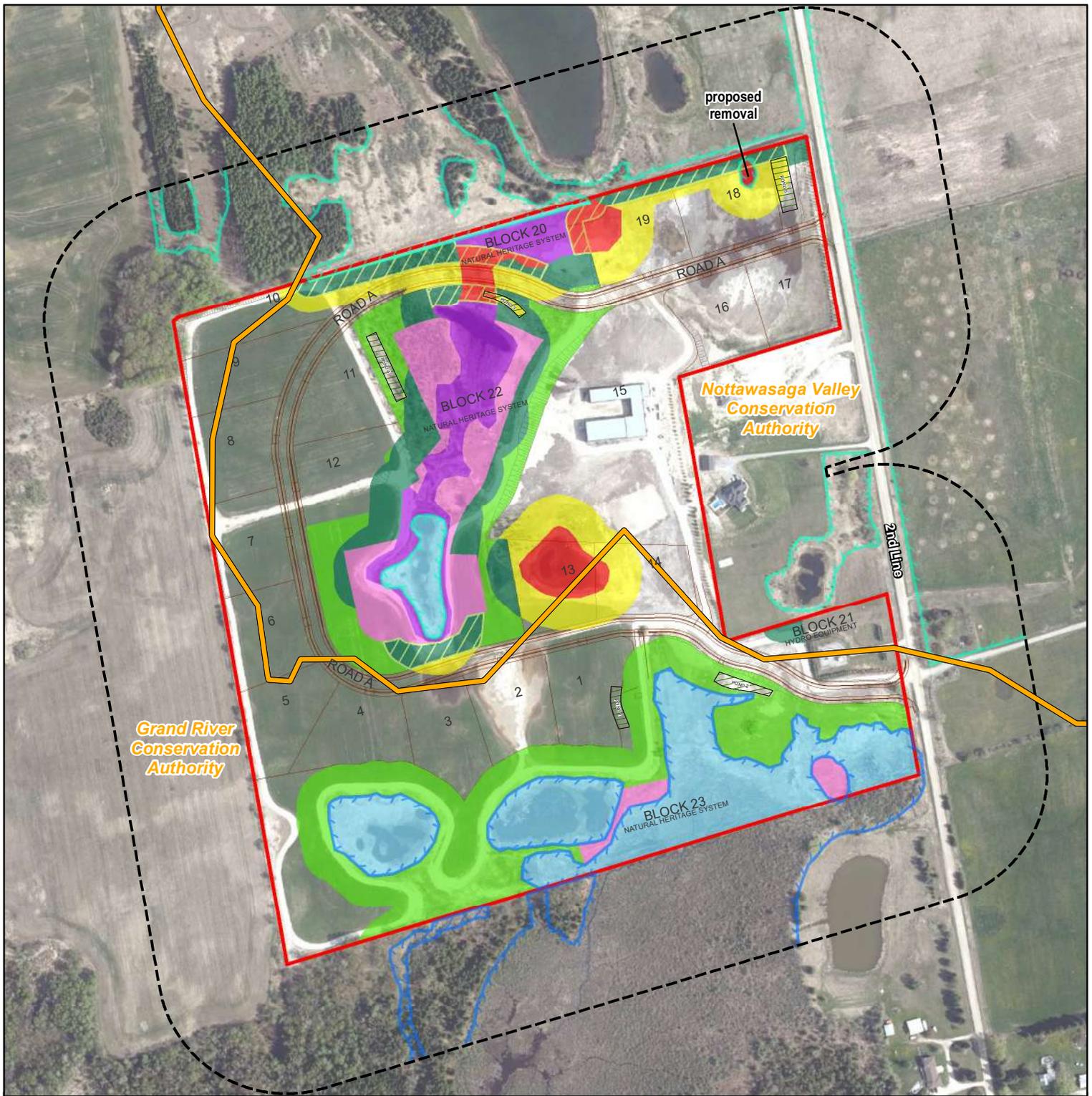
Legend

- Subject Lands
- Subject Lands + 120 metres
- Conservation Authority Administrative Boundary
- Draft Plan
- Grading Plan
- SWM Dry Pond
- Provincially Significant Wetland
- Unevaluated Wetland
- Wetland + 30 metres
- Historical Wetland Extent on Subject Lands
- Historical Wetland on Subject Lands + 30 metres
- NVCA Wetland Removal - Outstanding Violation (2.12 ha)
- NVCA Wetland Setback Removal - Outstanding Violation (5.35 ha)
- GRCA Wetland Removal - Resolved Violation (0.37 ha)

2nd Line, Amaranth
 The Cellular Connection

Figure 12
 Wetland Removals
 Before Compensation





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Legend

- Subject Lands
- Subject Lands + 120 metres
- Conservation Authority Administrative Boundary
- Draft Plan
- Grading Plan
- SWM Dry Pond
- Provincially Significant Wetland
- Unevaluated Wetland
- Existing Retained Wetland (3.91 ha)
- Removed NVCA Wetland (0.79 ha)
- Removed NVCA Wetland Setback (1.93 ha)
- Wetland Restoration and Compensation Plan**
- Wetland Restoration - 1:1 In Place (1.33 ha)
- Wetland Restoration - 2:1 Compensation (1.58 ha)
- Wetland Setback Restoration - In Place (2.19 ha)
- Wetland Setback Restoration - Compensation (4.94 ha)
- Enhanced Wetland Setback Restoration (0.97 ha)

2nd Line, Amaranth
 The Cellular Connection

Figure 13
 Conceptual Wetland Restoration
 and Compensation Plan in
 NVCA Jurisdiction
 (Outstanding Violation)

0 50 m
 1:5,000



Appendix B Tables

Table 1: Ecological Field Survey Program (2024)

Table 2: Species Occurrence Records from Background Review

Table 3: Ecological Land Classification (ELC) Community Descriptions

Table 4: Vascular Plant Species List

Table 5: Bird Species List

Table 6: Amphibian Call Count Survey Results

Table 7: Turtle Basking Survey Results

**Table 8: Headwater Drainage Feature Classification and Management
Recommendations**

Table 9: Fish Community Sampling Results

Table 10: Significant Wildlife Habitat Assessment for Ecoregion 6E

Table 1: Ecological Field Survey Program (2024)

SURVEYORS (SURNAME, INTL)	SURVEY ROUND	SURVEY TYPE	DATE (2024)	TIME		AIR TEMP (c°)	WATER TEMP (c°)	HUMIDITY (%)	CLOUD COVER (%)	BEAUFORT WIND SPEED	PRECIPITATION COMMENTS
				START	END						
Williamson, L.	1	Site reconnaissance Daytime amphibian survey Turtle basking	MR 13	10:00	13:00	20	NA	28	20	4	No precipitation
Kimble, B.	1	Headwater drainage feature assessment Fish community sampling	MR 13	10:00	15:00	20	NA	28	20	4	No precipitation
Williamson, L. Cartwright, C.	1	Amphibian call count surveys	AP 8	20:30	21:30	18	NA	48	15	3	No precipitation
Williamson, L. Cartwright, C.	2	Turtle basking surveys	AP 10	11:00	14:00	18	NA	37	65	3	No precipitation
Williamson, L. Cartwright, C.	3	Turtle basking surveys	MA 7	12:30	15:30	20	NA	39	50	3	No precipitation
Martin, S.	1	ELC and spring botanical inventory	MA 10	9:00	14:00	15	NA	47	60	3	No precipitation
Cartwright, C. Balsdon M.	2	Amphibian call count surveys	MA 15	21:10	22:00	21	NA	58	10	3	No precipitation
Kimble, B.	2	Headwater drainage feature assessment	MA 22	10:00	14:30	27	NA	58	10	5	No precipitation
Doyle, T.	1	Breeding bird surveys	JN 12	6:20	8:00	30	NA	58	15	4	No precipitation
Cartwright, C.	3	Amphibian call count surveys	JN 12	21:30	22:30	22	NA	57	15	3	No precipitation
Doyle, T.	2	Breeding bird surveys	JN 26	7:00	8:15	27	NA	79	90	3	Light rain

SURVEYORS (SURNAME, INTL)	SURVEY ROUND	SURVEY TYPE	DATE (2024)	TIME		AIR TEMP (c°)	WATER TEMP (c°)	HUMIDITY (%)	CLOUD COVER (%)	BEAUFORT WIND SPEED	PRECIPITATION COMMENTS
				START	END						
Martin, S.	2	ELC and summer botanical inventory	JL 26	9:00	17:00	NA	NA	NA	NA	NA	NA
Kimble, B.	3	Headwater drainage feature assessment	AU 14	10:00	14:00	23	NA	53	10	1	No precipitation
Szabo, A.	NA	Wetland staking with GRCA	AU 28	11:00	13:00	NA	NA	NA	NA	NA	NA
Martin, S.	3	ELC and fall botanical inventory	SE 9	9:00	17:00	NA	NA	NA	NA	NA	NA

LEGEND:

BEAUFORT WIND SPEED SCALE	
0	Calm (<1 km/hr)
1	Light Air (1-5 km/hr)
2	Light Breeze (6-11 km/hr)
3	Gentle Breeze (12-19 km/hr)
4	Moderate Breeze (20-28 km/hr)

MONTH (CODE)	
JA	January
FB	February
MR	March
AP	April
MA	May
JN	June
JL	July
AU	August
SE	September
OC	October
NO	November
DE	December

Table 2a: Natural Heritage Information Centre (NHIC) Data

Common Name	Scientific Name	S-Rank	G-Rank	SARO	COSEWIC	Last Observed	Extirpated
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	G5	THR	THR		No
Eastern Meadowlark	<i>Sturnella magna</i>	S4B, S3N	G5	THR	THR		No
Short Eared Owl	<i>Asio flammeus</i>	S4B?, S2S3N	G5	THR	THR		No
Snapping Turtle	<i>Chelydra serpentina</i>	S4	G5	SC	SC		No

Note: "Last Observed" date is not provided in the NHIC database search.

Table 2b: Ontario Breeding Bird Atlas (OBBA) Significant Species

Common Name	Scientific Name	S-Rank	G-Rank	SARO	COSEWIC	Last Observed	Extirpated
Bank Swallow	<i>Riparia riparia</i>	S4B	G5	THR	THR		No
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	G5	THR	THR		No
Chimney Swift	<i>Chaetura pelagica</i>	S3B	G4G5	THR	THR		No
Eastern Meadowlark	<i>Sturnella magna</i>	S4B, S3N	G5	THR	THR		No
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4B	G5	THR	SC		No
Least Bittern	<i>Ixobrychus exilis</i>	S4B	G4	THR	THR		No
Louisiana Waterthrush	<i>Parkesia motacilla</i>	S2B	G5	THR	THR		No
Short Eared Owl	<i>Asio flammeus</i>	S4B?, S2S3N	G5	THR	THR		No
Barn Swallow	<i>Hirundo rustica</i>	S4B	G5	SC	SC		No
Black Tern	<i>Chlidonias nige</i>	S3B, S4M	G4G5	SC	NAR		No
Canada Warbler	<i>Cardellina canadensis</i>	S5B	G5	SC	THR		No
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	S3B	G4	SC	THR		No
Upland Sandpiper	<i>Bartramia longicauda</i>	S2B	G5	NA	NA		No
Wilson's Phalarope	<i>Phalaropus tricolor</i>	S2B, S4M	G5	NA	NA		No
Caspian Tern	<i>Hydroprogne caspia</i>	S3B, S5M	G4G5	NAR	NAR		No
Purple Martin	<i>Progne subis</i>	S3B	G5	-	-		No

Note: "Last Observed" date is not provided in the OBBA database search.

Table 2c: Ontario Nature Herpetology Atlas Significant Species

Common Name	Scientific Name	S-Rank	G-Rank	SARO	COSEWIC	Last Observed	Extirpated
Snapping Turtle	<i>Chelydra serpentina</i>	S4	G5	SC	SC	2019	No

Table 2d: Ontario Butterfly and Moth Atlases Significant Species

Common Name	Scientific Name	S-Rank	G-Rank	SARO	COSEWIC	Last Observed	Extirpated
Monarch	<i>Danaus plexippus</i>	S2N, S4B	G4	SC	END	2022	No

Table 3: Ecological Land Classification (ELC) Community Descriptions

ELC TYPE	COMMUNITY DESCRIPTION*	S-RANK (NHIC 2021)
FOREST		
<i>Deciduous Forest</i>		
FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest Type	<ul style="list-style-type: none"> Community located at the northeastern corner of the Subject Lands, with some of its canopy overhanging. Sugar Maple dominates, with associations of Black Cherry and White Ash. The shrub layer is dominated by Chokecherry. The groundcover layer is dominated by Garlic Mustard, Yellow Trout Lily, Wild Leek, Woolly Blue Violet, and Broad-leaved Enchanter's Nightshade. 	S5
FOD6-5 Dry-Fresh Sugar Maple – Hardwood Deciduous Forest Type	<ul style="list-style-type: none"> Large community located immediately south of the Subject Lands. The edge visible from the Subject Lands is dominated by Sugar Maple, with associations of Ironwood, Black Cherry, Paper Birch, Trembling Aspen, White Elm, and Balsam Fir. The shrub layer is dominated by Chokecherry, with abundant Thicket Creeper. The groundcover layer includes abundant Yellow Trout Lily, Virginia Strawberry, and Broad-leaved Enchanter's Nightshade. 	S5
CULTURAL		
<i>Cultural Plantation</i>		
CUP3 Coniferous Plantation	<ul style="list-style-type: none"> Two plantations located north of the Subject Lands are dominated by White Spruce. 	N/A
CUP3-8 White Spruce Coniferous Plantation Type	<ul style="list-style-type: none"> Two plantations located north of the Subject Lands are dominated by White Spruce and Tamarack. 	N/A
<i>Cultural Meadow</i>		
CUM Mineral Cultural Meadow	<ul style="list-style-type: none"> Community at the southern end of the Subject Lands in a disturbed (DIST) area, characterized by early successional species highly tolerant of disturbance, including Queen Anne's Lace and Red Clover. Other abundant species include Common Ragweed, Purple Cow Vetch, and Bird's-foot Trefoil. 	N/A

ELC TYPE	COMMUNITY DESCRIPTION*	S-RANK (NHIC 2021)
CUM1 Mineral Cultural Meadow Ecosite	<ul style="list-style-type: none"> Communities at the southern end of the Subject Lands are characterized by a variety of early successional species, including Bird's-foot Trefoil, Purple Cow Vetch, Smooth Brome, Tall Goldenrod, and Heal-all. Community bordering the southern edge of lands formerly severed from the Subject Lands and extending onto the Subject Lands is dominated by Tall Goldenrod, with other abundant species including Queen Anne's Lace, Purple Cow Vetch, Canada Thistle, and New England Aster. Large community north of the Subject Lands, complexed with a meadow marsh (MAM2-10) community, is dominated by Tall Goldenrod and Redtop. 	N/A
Cultural Thicket		
CUT1 Mineral Cultural Thicket Ecosite	<ul style="list-style-type: none"> Community complexed with the cultural woodland (CUW1) south of the Subject Lands is dominated by shrubs, including Chokecherry and Red Raspberry. 	N/A
Cultural Woodland		
CUW1 Mineral Cultural Woodland Ecosite	<ul style="list-style-type: none"> Community complexed with the cultural thicket (CUT1) south of the Subject Lands is dominated by trees, including White Spruce, Paper Birch, Trembling Aspen, and White Elm. Small community west of the Subject Lands at the northern end is dominated by Scots Pine, with associations of Common Apple and White Ash. The shrub layer is dominated by Red Raspberry, Red-osier Dogwood, and Riverbank Grape, while the groundcover layer is dominated by Smooth Brome and Tall Goldenrod. 	N/A
SWAMP		
Thicket Swamp		
SWT2 Mineral Thicket Swamp Ecosite	<ul style="list-style-type: none"> Community located southwest of the Subject Lands, west of the large deciduous forest (FOD), is dominated by Bebb's Willow, Heart-leaved Willow, and Red-osier Dogwood, with scattered individuals of White Elm also present. The groundcover layer is dominated by Reed Canarygrass, Lance-leaved Aster, and Tall Goldenrod. 	N/A
SWT2-2 Willow Mineral Thicket Swamp Type	<ul style="list-style-type: none"> Community located on the lands previously severed from the Subject Lands is dominated by Heart-leaved Willow and Red-osier Dogwood, with abundant Riverbank Grape. The groundcover layer is dominated by Reed Canarygrass, with Tall Goldenrod and Lance-leaved Aster also abundant. Community consisting of a narrow strip south of the Subject Lands is dominated by Reed Canarygrass, with abundant Rough-stemmed Goldenrod, Lance-leaved Aster, Spotted Jewelweed, Fox Sedge, and Spotted Joe Pye Weed. 	S5

ELC TYPE	COMMUNITY DESCRIPTION*	S-RANK (NHIC 2021)
	<ul style="list-style-type: none"> Community comprising the largest unit of the PSW at the southern end of the Subject Lands and extending well beyond the property boundary is dominated by Bebb's Willow and Heart-leaved Willow, with Red-osier Dogwood and White Meadowsweet also present. The groundcover is dominated by Reed Canarygrass, Blue Cattail, Fox Sedge, Marsh Bedstraw, and Porcupine Sedge. Community forming a complex with the meadow marsh (MAM2-2) north of the Subject Lands, adjacent to the cultural plantation (CUP3), is dominated by Meadow Willow, with Heart-leaved Willow also abundant. The groundcover is dominated by Reed Canarygrass. Small community located north of the Subject Lands towards the east side is dominated by Meadow Willow, with Heart-leaved Willow also abundant. 	
MARSH		
<i>Meadow Marsh</i>		
MAM2 Mineral Meadow Marsh Ecosite	<ul style="list-style-type: none"> The community located at the southern end of the Subject Lands is dominated by Blue Cattail, with Redtop, Field Horsetail, Lance-leaved Aster, Path Rush, and Dudley's Rush also abundant. Scattered individuals of Heart-leaved Willow and Red-osier Dogwood are present. Communities surrounding the three shallow aquatic (SAS1) ponds on the Subject Lands are dominated by Reed Canarygrass, with Field Horsetail and Northern Water-plantain also present. The community located on the lands formerly severed from the Subject Lands is dominated by Reed Canarygrass, with Spotted Joe Pye Weed and Grass-leaved Goldenrod also abundant. 	N/A
MAM2-2 Reed-canary Grass Mineral Meadow Marsh Type	<ul style="list-style-type: none"> The community located at the southern end of the Subject Lands is dominated by Reed Canarygrass, with associations of other wetland species including Spotted Joe Pye Weed, Lance-leaved Aster, and Bebb's Sedge. Scattered individuals of Heart-leaved Willow, Bebb's Willow, Red-osier Dogwood, and Meadowsweet are also present. The community located on the lands formerly severed from the Subject Lands is dominated by Reed Canarygrass, with Spotted Joe Pye Weed, Grass-leaved Goldenrod, and Lance-leaved Aster also abundant. The community located to the north of the Subject Lands, in a complex with the thicket swamp (SWT2-2) community and near the large pond, is dominated by Reed Canarygrass. 	S5
MAM2-10 Forb Mineral Meadow Marsh Type	<ul style="list-style-type: none"> The community complexed with the cultural meadow (CUM) is located to the north of the Subject Lands along the eastern end, beyond the White Whitten Drain. It is dominated by Lance-leaved Aster and Grass-leaved Goldenrod. 	S4S5

ELC TYPE	COMMUNITY DESCRIPTION*	S-RANK (NHIC 2021)
<i>Shallow Marsh</i>		
MAS2 Mineral Shallow Marsh Ecosite	<ul style="list-style-type: none"> The community surrounding the large pond to the north of the Subject Lands appears to be dominated by Narrow-leaved Cattail as viewed from a distance. 	N/A
MAS2-1 Cattail Mineral Shallow Marsh Type	<ul style="list-style-type: none"> Communities forming a ring around each of the three shallow aquatic (SAS1) communities on the Subject Lands are dominated by Narrow-leaved Cattail. The small wetland at the northeastern corner of the Subject Lands has an abundance of Narrow-leaved Cattail. The community located on the lands formerly severed from the Subject Lands is dominated by Blue Cattail, with Reed Canarygrass also abundant. 	S5
AQUATIC		
<i>Shallow Aquatic</i>		
SA Shallow Aquatic	<ul style="list-style-type: none"> A small pond located north of the Subject Lands could not be directly observed but appeared shallow when viewed from a distance. 	N/A
SAS1 Submerged Shallow Aquatic Ecosite	<ul style="list-style-type: none"> Three shallow water communities on the Subject Lands are dominated by a species of pondweed (identified to genus), with Lesser Duckweed also abundant. 	N/A
<i>Open Aquatic</i>		
OAO Open Aquatic	<ul style="list-style-type: none"> A dug pond located at the northern end of the Subject Lands, previously identified as a shallow aquatic community based on aerial imagery, appears to have been recently expanded into an open water community. Due to the recent disturbance and ongoing discussions with the NVCA, this open aquatic community is still mapped as a wetland, though it no longer functions as such. It will be considered a target area for ecological restoration and enhancement efforts. A large pond is located north of the Subject Lands and a smaller pond is located south of the Subject Lands. 	S5

* Please see Table 4 for the Latin names of plant species mentioned in this table

FAMILY	LATIN NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM (NHIC SEP 19 2023)	WETNESS INDEX (NHIC SEP 19 2023)	OWES WETLAND SPECIES	WEEDINESS INDEX	INVASIVE EXOTIC RANK (Urban Forest Associates 2002)	PROVINCIALY TRACKED (NHIC) (NHIC FEB 6 2024)	PROVINCIAL STATUS (S-RANK) (NHIC FEB 6 2024)	GLOBAL STATUS (G-RANK) (NHIC FEB 6 2024)	SARO (MNR) (NHIC FEB 6 2024)	COSEWIC STATUS (NHIC FEB 6 2024)	DUFFERIN	AUTHORITY
Alismataceae	Alisma triviale	Northern Water-Plantain	1	-5	I			N	S5	G5				L.
Amaranthaceae	Chenopodium simplex	Maple-Leaved Goosefoot	0	5				N	S5	G5			X	(Torr.) S.Fuentes, Uotila & Borsch
Amaryllidaceae	Allium tricoccum var. tricoccum	Wild Leek	7	3				N	S4	G5			X	Aiton
Apiaceae	Cicuta bulbifera	Bulbous Water-Hemlock	5	-5	I			N	S5	G5			X	L.
Apiaceae	Cicuta maculata var. angustifolia	Narrow-Leaved Water-Hemlock						N	S4?	G5T5				Hooker
Apiaceae	Osmorhiza claytonii	Hairy Sweet Cicely	5	0				N	S5	G5			X	(Michx.) C.B. Clarke
Apocynaceae	Asclepias syriaca	Common Milkweed	0	5				N	S5	G5			X	L.
Araceae	Arisaema triphyllum ssp. triphyllum	Jack-In-The-Pulpit	5	-3	T			N	S5	G5T5			X	(L.) Schott
Araceae	Lemna minor	Small Duckweed	5	-5	I			N	S5	G5			X	L.
Asteraceae	Achillea millefolium	Common Yarrow	3	3		-1		N	SNA	G5			I	L.
Asteraceae	Ambrosia artemisiifolia	Common Ragweed	0	3				N	S5	G5			X	L.
Asteraceae	Anthemis arvensis	Corn Chamomile	5	5		-1		N	SNA	GNR			I	L.
Asteraceae	Arctium minus	Common Burdock	3	3		-2		N	SNA	GNR			I	(Hill) Bernh.
Asteraceae	Bidens frondosa	Devil's Beggarticks	3	-3	I			N	S5	G5			X	L.
Asteraceae	Centaurea x moncktonii	Meadow Knapweed	5	5				N	SNA	GNA				C.E. Britton
Asteraceae	Cichorium intybus	Wild Chicory	5	5		-1		N	SNA	GNR			I	L.
Asteraceae	Cirsium arvense	Canada Thistle	3	3		-1	1	N	SNA	G5			I	(L.) Scop.
Asteraceae	Cirsium vulgare	Bull Thistle	3	3		-1		N	SNA	GNR			I	(Savi) Tenore
Asteraceae	Erigeron annuus	Annual Fleabane	0	3				N	S5	G5				(L.) Pers.
Asteraceae	Eupatorium perfoliatum	Common Boneset	2	-3	I			N	S5	G5			X	L.
Asteraceae	Euthamia graminifolia	Grass-Leaved Goldenrod	2	0				N	S5	G5			X	(L.) Nutt.
Asteraceae	Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed	3	-5	I			N	S5	G5T5			X	(L.) E.E. Lamont
Asteraceae	Leucanthemum vulgare	Oxeye Daisy	5	5		-1		N	SNA	GNR			I	Lam.
Asteraceae	Rudbeckia hirta var. pulcherrima	Black-Eyed Susan	0	3				N	S5	G5T5			X	Farwell
Asteraceae	Solidago altissima var. altissima	Tall Goldenrod	1	3				N	S5	G5			X	L.
Asteraceae	Solidago gigantea	Giant Goldenrod	4	-3	T			P	S5	G5			X	Aiton
Asteraceae	Solidago rugosa ssp. rugosa	Rough-Stemmed Goldenrod (ssp. rugosa)	4	0	T			N	S5	G5T5			X	Miller
Asteraceae	Sonchus arvensis ssp. arvensis	Field Sow-Thistle	3	3				N	SNA	GNR			I	L.
Asteraceae	Sonchus oleraceus	Common Sow-Thistle	3	3		-1		N	SNA	GNR			I	L.
Asteraceae	Symphotrichum lanceolatum	Panicled Aster	3	-3	I			P	S5	G5				(Willd.) G.L. Nesom
Asteraceae	Symphotrichum novae-angliae	New England Aster	2	-3				N	S5	G5			X	(L.) G.L. Nesom
Asteraceae	Symphotrichum puniceum	Purple-Stemmed Aster	6	-5	I			N	S5	G5			X	(L.) A. & D. Löve
Asteraceae	Taraxacum officinale	Common Dandelion	3	3		-2		N	SNA	G5			I	F.H. Wiggers
Athyriaceae	Athyrium filix-femina var. angustum	Northeastern Lady Fern	4	0	T			N	S5	G5T5			X	(Willdenow) G. Lawson
Balsaminaceae	Impatiens capensis	Spotted Jewelweed	4	-3	I			N	S5	G5			X	Meerburgh
Berberidaceae	Caulophyllum thalictroides	Blue Cohosh	5	5				N	S5	G5			X	(L.) Michx.
Betulaceae	Betula papyrifera	Paper Birch	2	3	T			N	S5	G5			X	Marshall
Betulaceae	Ostrya virginiana	Eastern Hop-Hornbeam	4	3				N	S5	G5			X	(Miller) K. Koch
Brassicaceae	Alliaria petiolata	Garlic Mustard	0	0		-3	1	N	SNA	GNR			I	(M. Bieb.) Cavara & Grande
Brassicaceae	Brassica napus	Rapeseed	5	5		-1		N	SNA	GNR				L.
Brassicaceae	Capsella bursa-pastoris	Common Shepherd's Purse	3	3		-1		N	SNA	GNR			I	(L.) Medikus
Caprifoliaceae	Valeriana officinalis	Common Valerian	3	3		-1		N	SNA	GNR			I	L.
Cornaceae	Cornus alternifolia	Alternate-Leaved Dogwood	6	3				N	S5	G5			X	L. f.
Cornaceae	Cornus sericea	Red-Osier Dogwood	2	-3	I*			N	S5	G5			X	L.
Cupressaceae	Thuja occidentalis	Eastern White Cedar	4	-3	T			N	S5	G5			X	L.
Cyperaceae	Carex bebbii	Bebb's Sedge	3	-5	I			N	S5	G5			X	(L.H. Bailey) Olney ex Fern.
Cyperaceae	Carex crinita var. crinita	Fringed Sedge	6	-5	I			N	S5	G5T5			X	Lamarck
Cyperaceae	Carex gracillima	Graceful Sedge	4	3	T			N	S5	G5			X	Schweinitz
Cyperaceae	Carex hystericina	Porcupine Sedge	5	-5	I			N	S5	G5			X	Muhlenb. ex Willdenow
Cyperaceae	Carex projecta	Necklace Sedge	5	-3	I			N	S5	G5			X	Mackenzie
Cyperaceae	Carex pseudocyperus	Cyperus-Like Sedge	6	-5	I			N	S5	G5			X	L.
Cyperaceae	Carex vulpinoidea	Fox Sedge	3	-5	I			N	S5	G5			X	Michaux
Cyperaceae	Eleocharis palustris	Common Spikerush	6	-5	I			N	S5	G5			X	(L.) Roemer & Schultes
Cyperaceae	Schoenoplectus tabernaemontani	Soft-Stemmed Bulrush	5	-5	I			N	S5	G5			X	(C.C. Gmelin) Palla
Cyperaceae	Scirpus atrovirens	Dark-Green Bulrush	3	-5	T			N	S5	G5			X	Willdenow
Cyperaceae	Scirpus cyperinus	Common Woolly Bulrush	4	-5	I			N	S5	G5			X	(L.) Kunth
Equisetaceae	Equisetum arvense	Field Horsetail	0	0	T			N	S5	G5			X	L.
Fabaceae	Lotus corniculatus	Garden Bird's-Foot Trefoil	3	3		-2	2	N	SNA	GNR			I	L.
Fabaceae	Medicago lupulina	Black Medick	3	3		-1	4	N	SNA	GNR			I	L.
Fabaceae	Medicago sativa ssp. sativa	Alfalfa (ssp. sativa)	5	5		-1	4	N	SNA	GNR			I	L.
Fabaceae	Meillotus albus	White Sweet-Clover	3	3		-3	2	N	SNA	G5			I	Medik.
Fabaceae	Trifolium pratense	Red Clover	3	3		-2	4	N	SNA	GNR			I	L.
Fabaceae	Vicia cracca	Tufted Vetch	5	5		-1	2	N	SNA	GNR			I	L.
Fagaceae	Fagus grandifolia	American Beech	6	3				N	S4	G5			X	Ehrhart

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Grossulariaceae	Ribes americanum	Wild Black Currant	4	-3	T			N	S5	G5			X	Miller
Grossulariaceae	Ribes cynosbati	Eastern Prickly Gooseberry	4	3				N	S5	G5			X	L.
Hypericaceae	Hypericum perforatum ssp. perforatum	Common St. John's-Wort		5		-3	4	N	SNA	GNR			I	L.
Juncaceae	Juncus alpinoarticulatus	Alpine Rush	5	-5	I			N	S5	G5			X	Chaix
Juncaceae	Juncus articulatus	Jointed Rush	5	-5	I			N	S5	G5			X	L.
Juncaceae	Juncus canadensis	Canada Rush	6	-5	I			N	S5	G5				J. Gay ex Laharpe
Juncaceae	Juncus dudleyi	Dudley's Rush	1	-3	T			N	S5	G5			X	Wiegand
Juncaceae	Juncus effusus	Soft Rush	4	-5				N	S5	G5			X	L.
Juncaceae	Juncus nodosus	Knotted Rush	5	-5	I			N	S5	G5			X	L.
Juncaceae	Juncus tenuis	Path Rush	0	0				N	S5	GNR			X	Willdenow
Lamiaceae	Clinopodium vulgare	Wild Basil	4	5				N	S5	G5			X	L.
Lamiaceae	Lycopus uniflorus	Northern Water-Horehound	5	-5	I			N	S5	G5			X	Michaux
Lamiaceae	Mentha canadensis	Canada Mint	3	-3	I			N	S5	G5			X	L.
Lamiaceae	Prunella vulgaris ssp. lanceolata	Lance-Leaved Self-Heal	0	0	T			N	S5	G5T5			X	(W.P.C. Barton) Piper & Beattie
Lamiaceae	Prunella vulgaris ssp. vulgaris	Common Self-Heal		0		-1		N	SNA	G5TU			I	L.
Liliaceae	Erythronium americanum ssp. americanum	Yellow Trout Lily	5	5				N	S5	G5T5			X	Ker Gawler
Lythraceae	Lythrum salicaria	Purple Loosestrife		-5	I	-3	1	N	SNA	G5			X	L.
Malvaceae	Tilia americana	Basswood	4	3				N	S5	G5			X	L.
Oleaceae	Fraxinus americana	White Ash	4	3				N	S4	G4			X	L.
Onagraceae	Circaea canadensis ssp. canadensis	Canada Enchanter's Nightshade	2	3				N	S5	G5T5			X	(L.) Hill
Onagraceae	Epilobium ciliatum ssp. ciliatum	Northern Willowherb	3	-3	I*			N	S5	G5T5			X	Raf.
Onagraceae	Epilobium coloratum	Purple-Veined Willowherb	3	-5	I			N	S5	G5			X	Biehler
Onagraceae	Oenothera biennis	Common Evening Primrose	0	3				N	S5	G5			X	L.
Orchidaceae	Epipactis helleborine	Broad-Leaved Helleborine		3		-2		N	SNA	GNR			I	(L.) Crantz
Pinaceae	Abies balsamea	Balsam Fir	5	-3	T			N	S5	G5			X	(L.) Miller
Pinaceae	Larix laricina	Tamarack	7	-3	I			N	S5	G5			X	(Du Roi) K. Koch
Pinaceae	Picea glauca	White Spruce	6	3	T			N	S5	G5			X	(Moench) Voss
Pinaceae	Pinus strobus	Eastern White Pine	4	3	T			N	S5	G5			X	L.
Pinaceae	Pinus sylvestris	Scots Pine		3		-3	2	N	SNA	GNR			I	L.
Plantaginaceae	Plantago lanceolata	English Plantain		3		-1		N	SNA	G5			I	L.
Poaceae	Agrostis gigantea	Redtop		-3		-2		N	SNA	G4G5			I	Roth
Poaceae	Bromus inermis	Smooth Brome		5		-3	4	N	SNA	G5T5			I	Leysser
Poaceae	Dactylis glomerata	Orchard Grass		3		-1	3	N	SNA	GNR			I	L.
Poaceae	Elymus repens	Quackgrass		3		-3	3	N	SNA	GNR			I	(L.) Gould
Poaceae	Glyceria striata	Fowl Mannagrass	3	-5	I			N	S5	G5			X	(Lam.) Hitchcock
Poaceae	Phalaris arundinacea var. arundinacea	Reed Canary Grass	0	-3	T		P	N	S5	G5TNR			X	L.
Poaceae	Phleum pratense ssp. pratense	Common Timothy		3		-1		N	SNA	GNRTNR			I	L.
Poaceae	Poa annua	Annual Bluegrass		3		-2		N	SNA	GNR			I	L.
Poaceae	Poa compressa	Canada Bluegrass		3				N	SNA	GNR			I	L.
Poaceae	Poa palustris	Fowl Bluegrass	5	-3	I			N	S5	G5			X	L.
Poaceae	Setaria viridis var. viridis	Green Foxtail		5		-1	4	N	SNA	GNRTNR			I	(L.) Palisot de Beauvois
Polygonaceae	Fallopia convolvulus	Eurasian Black Bindweed		3		-1		N	SNA	GNR			I	(L.) A. Löve
Polygonaceae	Persicaria maculosa	Spotted Lady's-Thumb		-3	T	-1		N	SNA	G3G5			I	Gray
Polygonaceae	Rumex crispus	Curled Dock		0	T	-2		N	SNA	GNR			I	L.
Ranunculaceae	Clematis virginiana	Virginia Clematis	3	0	T			N	S5	G5			X	L.
Ranunculaceae	Ranunculus acris	Common Buttercup		0	T	-2		N	SNA	G5			I	L.
Ranunculaceae	Ranunculus sceleratus	Cursed Buttercup	2	-5	I			N	S5	G5			I	L.
Rhamnaceae	Rhamnus cathartica	European Buckthorn		0	T	-3	1	N	SNA	GNR			I	L.
Rosaceae	Agrimonia gryposepala	Hooked Agrimony	2	3				N	S5	G5			X	Wallroth
Rosaceae	Fragaria virginiana	Wild Strawberry	2	3				N	S5	G5			X	Miller
Rosaceae	Malus pumila	Common Apple		5		-1		N	SNA	G5			I	Miller
Rosaceae	Prunus virginiana var. virginiana	Chokecherry	2	3				N	S5	G5T5			X	L.
Rosaceae	Rubus idaeus ssp. idaeus	European Red Raspberry		3				N	SNA	G5T5			I	L.
Rosaceae	Rubus occidentalis	Black Raspberry	2	5				N	S5	G5			X	L.
Rosaceae	Sorbus aucuparia	European Mountain-Ash		5		-2	4	N	SNA	G5			I	L.
Rosaceae	Spiraea alba var. alba	White Meadowsweet	3	-3	I			N	S5	G5T5			X	Du Roi
Rubiaceae	Galium mollugo	Smooth Bedstraw		5		-2	2	N	SNA	GNR			I	L.
Rubiaceae	Galium palustre	Common Marsh Bedstraw	5	-5	I			N	S5	G5			X	L.
Salicaceae	Populus balsamifera	Balsam Poplar	4	-3	T			N	S5	G5			X	L.
Salicaceae	Populus tremuloides	Trembling Aspen	2	0	T			N	S5	G5			X	Michaux
Salicaceae	Salix alba	White Willow		-3	T	-2	3	N	SNA	G5			X	L.
Salicaceae	Salix bebbiana	Bebb's Willow	4	-3	I			N	S5	G5			X	Sargent
Salicaceae	Salix eriocephala	Cottony Willow	4	-3	T			N	S5	G5			X	Michaux
Salicaceae	Salix petiolaris	Meadow Willow	3	-3	I			N	S5	G5			X	J.E. Smith
Sapindaceae	Acer saccharinum	Silver Maple	5	-3	I			N	S5	G5			X	L.

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Scrophulariaceae	Verbascum thapsus ssp. thapsus	Common Mullein		5		-2		N	SNA	GNRTNR			I	L.
Typhaceae	Typha angustifolia	Narrow-Leaved Cattail		-5	I		P	N	SNA	G5			X	L.
Typhaceae	Typha latifolia	Broad-Leaved Cattail	1	-5	I			N	S5	G5			X	L.
Typhaceae	Typha x glauca	Blue Cattail		-5	I		P	N	SNA	GNA				Godron
Ulmaceae	Ulmus americana	White Elm	3	-3	T			N	S5	G4			X	L.
Viburnaceae	Sambucus racemosa	Red Elderberry	5	3			P	N	S5	G5			X	L.
Viburnaceae	Viburnum lentago	Nannyberry	4	0	T			N	S5	G5			X	L.
Viburnaceae	Viburnum opulus var. opulus	Cranberry Viburnum		-3		-1	4	N	SNA	G5TNR			I	
Violaceae	Viola pubescens	Downy Yellow Violet	5	3				N	S5	G5			X	Aiton
Vitaceae	Parthenocissus vitacea	Thicket Creeper	4	3				N	S5	G5			X	(Knerr) Hitchcock
Vitaceae	Vitis riparia	Riverbank Grape	0	0				N	S5	G5			X	Michaux

STATISTICS		
Species Diversity		
Total Number of Species:	140	
Native Species:	91	65%
Exotic Species:	49	35%
S1-S3 Species:	0	0%
S4 Species:	4	4%
S5 Species:	87	96%
Provincially Tracked Species:	0	0%
Floristic Quality Assessment (FOA)		
Mean Co-efficient of Conservatism (CC)	3.4	
CC 0 - 3 = lowest sensitivity	41	45%
CC 4 - 6 = moderate sensitivity	47	52%
CC 7 - 8 = high sensitivity	2	2%
CC 9 - 10 = highest sensitivity	0	0%
Floristic Quality Index (FQI)	32	
Weedy & Invasive Species		
Mean Weediness Index (Oldham et al):	-1.7	
-1 = low potential invasiveness	22	45%
-2 = moderate potential invasiveness	13	27%
-3 = high potential invasiveness	8	16%
Mean Exotic Rank (Urban Forest Associates):	3	
Category 1	4	8%
Category 2	5	10%
Category 3	3	6%
Category 4	8	16%
Potentially Invasive (P)	4	8%
Wetland Species		
Mean Wetness Index	0.1	
Upland	20	14%
Facultative upland	46	33%
Facultative	16	11%
Facultative wetland	29	21%
Obligate wetland	28	20%

EXPLANATION OF TERMINOLOGY (See the following pages for additional detailed information on terms.)

Botanical and Common Name: From Newmaster et. al, 1998. Species requiring confirmation noted (cf).

Co-efficient of Conservatism: This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific habitat integrity.

Wetness Index: This value, ranging from -5 (obligate wetland) to 5 (upland) provides the probability of a species occurring in wetland or upland habitats. Each wetland category has been assigned a numerical value to facilitate the quantification of the wetness index. The wetland categories and their corresponding values are as follows:

- OBL: -5
- FACW+: -4
- FACW: -3
- FACW-: -2
- FAC+: -1
- FAC: 0
- FAC-: 1
- FACU+: 2
- FACU: 3

FAMILY	LATIN NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM (NHIC SEP 19 2023)	WETNESS INDEX (NHIC SEP 19 2023)	OWES WETLAND SPECIES	WEEDINESS INDEX	INVASIVE EXOTIC RANK (Urban Forest Associates 2002)	PROvincially TRACKED (NHIC) (NHIC FEB 6 2024)	PROvincIAL STATUS (S-RANK) (NHIC FEB 6 2024)	GLOBAL STATUS (G-RANK) (NHIC FEB 6 2024)	SARO (MNR) (NHIC FEB 6 2024)	COSEWIC STATUS (NHIC FEB 6 2024)	DUFFERIN	AUTHORITY
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FACU: 4
UPL: 5

FACW (Facultative Wetland): usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability)
FAC (Facultative): equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability)
FACU (Facultative Upland): occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability)
UPL (Upland): occurs almost never in wetlands under natural conditions (estimated <1% probability)

Further refinement of the Facultative categories are denoted by a "+" or "-" to express exaggerated tendencies for those species. The "+" denotes a greater estimated probability occurring in wetlands than species in the general indicator category, but a lesser probability than species occurring in the next higher category. The "-" denotes a lesser estimated probability of occurring in wetlands than species in the general indicator category, but a greater probability than species occurring in the next lower general category.

Weediness Index: This value, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance.

Invasive Exotic Rank (Urban Forest Associates 2002)

Category 1: Aggressive invasive exotic species that can dominate a site to exclude all other species and remain dominant on the site indefinitely.

Category 2: Exotic species that are highly invasive but tend to only dominate certain niches or do not spread rapidly from major concentrations.

Category 3: Exotic species that are moderately invasive but can become locally dominant when the proper conditions exist.

Category 4: Exotic species that do not pose a serious threat to natural areas unless they are competing directly with more desirable vegetation.

Potentially Invasive (PI): Have potential to become invasive. Some of these species have the potential to become invasive exotics in Ontario. They can reproduce aggressively on occasion but have not been shown to be a serious threat to natural areas in Ontario.

Provincial Status: Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. S4 and S5 species are generally uncommon to common in the province. Species ranked S1-S3 are considered to be rare in Ontario. These rankings are based on the total number of extant Ontario populations and the degree to which they are potentially or actively threatened with destruction. The ranks are:

S1: Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2: Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3: Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4: Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5: Secure - Common, widespread, and abundant in the nation or state/province.

SH: Possibly Extirpated (Historical)—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

SR: Reported in Ontario, but without persuasive documentation.

SX: Presumed Extirpated—Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SNA: Unranked — Status not assigned.

HYB: Hybrid — Equivalent to "SNA"; "n" suffix indicates native; "e" suffix indicates exotic.

SU: Unranked — Nation or state/province conservation status not yet assessed.

Rank ranges, e.g. S2S3, indicate that the rank is either S2 or S3, but that current information is insufficient to differentiate.

"?" following a rank indicates uncertainty about the assigned rank.

Q: Questionable taxonomy —Taxonomic distinctiveness of this entity is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or the inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority conservation status.

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Provincial (Ontario) Status:
Natural Heritage Information Centre (NHIC). 2000. Provincial status of plants, wildlife and vegetation communities database. <http://www.mnr.gov.on.ca/MNR/nhic/nhic.html>. OMNR, Peterborough.

Local Status:
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Table 6a: Amphibian Call Count Survey Results (Subject Lands)

SURVEY ROUND	STATION NUMBER	SPECIES CODE											WATER Present (Y/N)	
		NOAM	AMTO	FOTO	GRTR	SPPE	CHFR	WOFR	NLFR	PIFR	GRFR	BULL		MIFR
1	AMC2	X												Y
2	AMC2		1(2)						1(1)					Y
3	AMC2	X												Y
1	AMC3	X												Y
2	AMC3					1(3)								Y
3	AMC3	X												Y
1	AMC4					3								Y
2	AMC4		1(3)		1(4)	1(5)								Y
3	AMC4				1(2)						1(1)			Y
1	AMC5					1(9)								Y
2	AMC5		1(3)		1(3)	1(7)			1(1)					Y
3	AMC5				1(1)						1(1)			Y
1	AMC6	X												Y
2	AMC6	X												Y
3	AMC6				1									Y
1	AMC7						3							Y
2	AMC7		1			1(6)								Y
3	AMC7	X												Y
1	AMC8	X												Y
2	AMC8	X												N
3	AMC8	X												N

Note: For each species, the first number indicates the call level code, and the second number (in brackets) represents the number of individuals heard calling.

Table 6b: Amphibian Call Count Survey Results (Adjacent Lands within 120 m)

SURVEY ROUND	STATION NUMBER	SPECIES CODE											WATER Present (Y/N)	
		NOAM	AMTO	FOTO	GRTR	SPPE	CHFR	WOFR	NLFR	PIFR	GRFR	BULL		MIFR
1	AMC1					2(10)								Y
2	AMC1		1(1)		1(2)	2(10)								Y
3	AMC1				1(6)						1(1)			Y
1	AMC2					2		2						Y
2	AMC2					1								Y
3	AMC2				1									Y
1	AMC3					3								Y
2	AMC3		1		1	1								Y
3	AMC3				1									Y
1	AMC4							2						Y
2	AMC4	X												Y
3	AMC4	X												Y
1	AMC6					CC2	CC2							Y
2	AMC6	X				CC1								Y
3	AMC6				CC1									Y
1	AMC7					3	CC2	2						Y
2	AMC7		1											Y
3	AMC7	X												Y

Note: For each species, the first number indicates the call level code, and the second number (in brackets) represents the number of individuals heard calling. Where the number of individuals could not be counted, only the call level code is indicated.

LEGEND:

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOAM	No Amphibians	No amphibians despite survey effort
AMTO	American Toad	<i>Anaxyrus americanus</i>
FOTO	Fowler's Toad	<i>Anaxyrus fowleri</i>
GRTR	Gray Treefrog	<i>Hyla versicolor</i>
SPPE	Spring Peeper	<i>Pseudacris crucifer</i>
CHFR	Western Chorus Frog	<i>Pseudacris triseriata</i>
WOFR	Wood Frog	<i>Lithobates sylvaticus</i>
NLRF	Northern Leopard Frog	<i>Lithobates pipiens</i>
PIFR	Pickereel Frog	<i>Lithobates palustris</i>
GRFR	Green Frog	<i>Lithobates clamitans</i>
BULL	American Bullfrog	<i>Lithobates catesbeianus</i>
MIFR	Mink Frog	<i>Lithobates septentrionalis</i>

CALL CODES	
X	No amphibians heard
1	Calls can be counted without error
2	Calls overlap but can be reliably estimated
3	Calls overlap too much to estimate number

Note: For each species, the first number is the call code and the second number, which is in brackets, is the number of individuals of that species heard calling.

Table 7: Turtle Basking Survey Results

DATE SURVEYED	SURVEY ROUND	TRANSECT OR STATION NUMBER	SPECIES CODE								
			NOTU	MPTU	SNTU	MATU	BLTU	SSTU	WOTU	STIN	SPTU
MA 13	1	BS1		3							
MA 13	1	BS2	X								
MA 13	1	BS3	X								
MA 13	1	BS4	X								
AP 10	2	BS1		4							
AP 10	2	BS2	X								
AP 10	2	BS3	X								
AP 10	2	BS4	X								
MA 7	3	BS1		2							
MA 7	3	BS2	X								
MA 7	3	BS3	X								
MA 7	3	BS4		1							

Notes: Five Midland Painted Turtles were observed incidentally at BS3. No nesting evidence (e.g., test digs, claw marks, predated nests) was observed on site.

LEGEND:

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOTU	No turtles observed despite survey effort	
MPTU	Midland Painted Turtle	<i>Chrysemys picta marginata</i>
SNTU	Snapping Turtle	<i>Chelydra serpentina</i>
MATU	Northern Map Turtle	<i>Graptemys geographica</i>
BLTU	Blanding's Turtle	<i>Emydoidea blandingii</i>
SSTU	Spiny Soft-shelled Turtle	<i>Apalone spinifera</i>
WOTU	Wood Turtle	<i>Glyptemys insculpta</i>
STIN	Stinkpot Turtle	<i>Stemotherus odoratus</i>
SPTU	Spotted Turtle	<i>Clemmys guttata</i>

DATE	
MONTH	CODE
January	JA
February	FE
March	MR
April	AP
May	MA
June	JN
July	JL
August	AU
September	SE
October	OC
November	NO
December	DE

Table 8: Headwater Drainage Feature Classification and Management Recommendations

DRAINAGE FEATURE SEGMENT	STEP 1. HYDROLOGY		STEP 2. RIPARIAN	STEP 3. FISH HABITAT	STEP 4. TERRESTRIAL HABITAT	MANAGEMENT RECOMMENDATION PER HDFA GUIDELINES	FINAL MANAGEMENT RECOMMENDATION
	FUNCTION	MODIFIERS					
H1S1	FT – 7 FC – 4 (Round 1) FC – 4 (Round 2) FC – 1 (Round3) Valued – Feature was flowing at the first and second visit but dry by the third. Wetland present upstream.	Feature is a piped outlet control structure to a wetland pool.	Limited – Disturbed land with no vegetation.	Contributing – No suitable fish habitat is present. Feature may provide contributing functions to support downstream direct fish habitat.	Limited – Feature is a swale resulting from a buried drainage.	Mitigation	Mitigation
H2S1	FT – 7 FC – 4 (Round 1) FC – 4 (Round 2) FC – 2 (Round3) Important – Feature held standing water at third visit, with wetland present upstream.	Feature is a piped outlet control structure to a wetland pool.	Limited – Disturbed land with no vegetation.	Contributing – No suitable fish habitat is present. Feature may provide contributing functions to support downstream direct fish habitat.	Limited – Feature is a swale resulting from a buried drainage.	Protection	Mitigation – Feature is a result of a piped control structure to the wetland pond and demonstrates a complete lack of riparian or terrestrial habitat.

DRAINAGE FEATURE SEGMENT	STEP 1. HYDROLOGY		STEP 2. RIPARIAN	STEP 3. FISH HABITAT	STEP 4. TERRESTRIAL HABITAT	MANAGEMENT RECOMMENDATION PER HDFA GUIDELINES	FINAL MANAGEMENT RECOMMENDATION
	FUNCTION	MODIFIERS					
H3S1	FT – 7 FC – 4 (Round 1) FC – 4 (Round 2) FC – 1 (Round3) Valued – Feature was flowing at the first and second visit but dry by the third.	Feature is a piped outlet control structure to a wetland pool. Feature has been conveyed through rip rap channel.	Limited – Disturbed land with no vegetation.	Contributing – Feature provides contributing functions to direct fish habitat downstream (allochthonous transport and contribution of flows).	Limited – Feature is an anthropogenic ally created rip rap swale.	Mitigation	Mitigation
H3S2	FT – 7 FC – 4 (Round 1) FC – 4 (Round 2) FC – 4 (Round3) Important – Feature was flowing during all inspections.	Feature has been conveyed through rip rap channel.	Limited – Disturbed land with no vegetation.	Contributing – Feature provides contributing functions to direct fish habitat downstream (allochthonous transport and contribution of flows).	Limited – Feature is an anthropogenic ally created rip rap swale.	Protection	Conservation – Feature is anthropogenically influenced and completely lacking riparian or terrestrial habitat.

DRAINAGE FEATURE SEGMENT	STEP 1. HYDROLOGY		STEP 2. RIPARIAN	STEP 3. FISH HABITAT	STEP 4. TERRESTRIAL HABITAT	MANAGEMENT RECOMMENDATION PER HDFA GUIDELINES	FINAL MANAGEMENT RECOMMENDATION
	FUNCTION	MODIFIERS					
H3S3	FT – 7 FC – 4 (Round 1) FC – 4 (Round 2) FC – 4 (Round3) Important – Feature was flowing during all inspections.		Limited – Disturbed land with no vegetation.	Contributing – Feature provides contributing functions to direct fish habitat downstream (allochthonous transport and contribution of flows).	Limited – Feature is a poorly defined swale across disturbed lands.	Protection	Conservation – Feature is anthropogenically influenced and completely lacking riparian or terrestrial habitat.
H4S1	FT – 7 FC – 4 (Round 1) FC – 4 (Round 2) FC – 1 (Round3) Valued – Feature was flowing at the first and second visit but dry by the third. Wetland present upstream.		Limited – Disturbed land with no vegetation.	Contributing – Feature provides contributing functions to direct fish habitat downstream (allochthonous transport and contribution of flows).	Limited – Feature is a poorly defined swale across disturbed lands.	Mitigation	Mitigation

LEGEND:

FT	Feature Types (1-defined natural channel, 2-channelized, 3-multi-thread, 4-no defined feature, 5-tiled drainage, 6-wetland, 7-swale, 8-roadside ditch, 9-online pond outlet)
FC	Flow Conditions (1-no surface water, 2-standing water, 3-interstitial flow, 4-surface flow minimal, 5-surface flow substantial)

Note: Codes correspond with Ontario Stream Assessment Protocol (OSAP) guidelines

Table 9: Fish Community Sampling Results

SPECIES		STATION IDENTIFICATION			
Common Name	Scientific Name	FS1	FS2	FS3	FS4
Brook Stickleback	<i>Culaea inconstans</i>	8	-	-	96
Central Mudminnow	<i>Umbra limi</i>	1	-	-	-
Total Fish Caught		9	-	-	68
Species Richness		2	-	-	1

Table 10: Significant Wildlife Habitat Assessment for Ecoregion 6E

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
1. SEASONAL CONCENTRATION AREAS					
Waterfowl Stopover and Staging Areas (Terrestrial)	Yes – CUM and CUT communities are present on and within 120 m of the Subject Lands.	No – Habitat criteria not met; no spring flooding noted in spring aerial imagery or during spring site reconnaissance.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Waterfowl Stopover and Staging Areas (Aquatic)	Yes – MAS/SAS communities are present on and within 120 m of the Subject Lands.	Yes – Several open aquatic communities are present on the Subject Lands.	N/A	No – No Waterfowl Concentration Areas identified through NHIC search, and no congregations of waterfowl observed during breeding bird surveys.	SWH type does not occur on or within 120 m of the Subject Lands.
Shorebird Migratory Stopover Areas	Yes – MAM communities are present on and within 120 m of the Subject Lands	No – Appropriate muddy, unvegetated shorelines are not present on-site.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Raptor Wintering Areas	Yes – FOD communities near CUM and CUW/CUT communities are present within 120 m of the Subject Lands.	Yes – The large deciduous woodland south of the Subject Lands meets the size criteria.	No raptor wintering surveys were conducted, as the suitable habitat is located off-site.	N/A	Candidate – SWH type does not occur on the Subject Lands; however, candidate SWH is assumed within the large deciduous woodland.
Bat Hibernacula	No – Suitable ecosites are not present on or within 120 m of the Subject Lands.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Bat Maternity Colonies	Yes – FOD and CUW communities are present within 120 m of the Subject Lands, but are not present on the Subject Lands.	N/A	N/A	N/A	Candidate – Bat maternity SWH has been assumed within 120 m of the Subject Lands. No suitable bat maternity SWH is present within the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Turtle Wintering Areas	Yes – MA, SA, and OA communities are present on and within 120 m of the Subject Lands.	Yes – Suitable waterbodies are present within the Subject Lands.	Yes – Turtle basking surveys were completed.	Yes – During targeted surveys, a total of four Midland Painted Turtles were observed during turtle basking surveys at BS1, which is below the threshold for significance. However, five turtles were observed at the central shallow water wetland associated with BS3 later in spring, indicating that the Subject Lands support the presence of five Midland Painted Turtles.	Confirmed – Five turtles were observed incidentally on the Subject Lands the central shallow water wetland; however, the turtle basking survey observations indicate that it is the shallow water wetland at the southwestern corner associated with BS1 that supports overwintering. Turtle wintering habitat will be considered as part of restoration and enhancement for the Subject Lands.
Reptile Hibernacula	Yes – Snakes have the potential to occur within all ecosites other than wetlands.	No – No suitable rock outcrops, old foundations, abandoned wells or natural/naturalized features were identified on the Subject Lands.	N/A	No – No suitable hibernacula sites were observed during the site reconnaissance. Habitat and defining criteria not met.	SWH type does not occur on or within 120 m of the Subject Lands.
Colonial Bird Nesting Sites (Bank/Cliff)	Yes – CUM communities are present on and within 120 m of the Subject Lands.	No – Habitat criteria not met; no exposed soil banks were observed during field investigations within the Subject Lands.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Colonial Bird Nesting Sites (Tree/Shrub)	No – Suitable ecosites are not present on or within 120 m of the Subject Lands.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Colonial Bird Nesting Sites (Ground)	Yes – CUM communities are present on and within 120 m of the Subject Lands.	No – Habitat criteria not met; no rocky island or peninsulas on or within 120 m of the Subject Lands.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Migratory Butterfly Stopover Areas	Yes – CUM and FOD vegetation communities are present on and within 120 m of the Subject Lands.	No – The Subject Lands are located more than 5 km from Lake Ontario.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Landbird Migratory Stopover Areas	Yes – FOD communities are present within 120 m of the Subject Lands, but are not present on the Subject Lands.	No – The Subject Lands are located more than 5 km from Lake Ontario.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Deer Yarding Areas	Yes – FOD and CUP vegetation communities are present within 120 m of the Subject Lands, but are not present on the Subject Lands.	No – No deer yarding areas identified through MNRF mapping.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Deer Winter Congregation Areas	Yes – FOD vegetation communities are present within 120 m of the Subject Lands, but are not present on the Subject Lands.	No – No deer winter congregation areas identified through MNRF mapping.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
2. RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE					
2a. Rare Vegetation Communities					
Rare Vegetation Types (cliffs, talus slopes, sand barrens, alvars, old-growth forests, savannahs, and tallgrass prairies)	No – ELC Ecosites are not present on or within 120 m of the Subject Lands.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Other Rare Vegetation Types (S1 to S3 communities)	No – Provincially rare S1, S2, or S3 communities were not observed during ELC surveys.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
2b. Specialized Wildlife Habitat					
Waterfowl Nesting Area	Yes – Upland communities are present adjacent to MAM/MAS/SAS communities on and within 120 m of the Subject Lands.	Yes – Several on-site wetlands meet the minimum size criterion.	Yes – Breeding bird studies were conducted.	No – Minimum criteria for number of species and individuals was not met.	SWH type does not occur on or within 120 m of the Subject Lands.
Bald Eagle and Osprey Habitats	Yes – FOD communities located near ponds and wetlands are present within 120 m of the Subject Lands, but are not present on the Subject Lands.	No – requires areas associated with larger bodies of water (running or still) that can support sufficient fish populations for their diet. The adjacent lands offer marginal breeding habitat and are unlikely to support these species.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Woodland Raptor Nesting Habitat	Yes – FOD and CUP communities are present within 120 m of the Subject Lands. No forested communities are present on the Subject Lands	Yes – The forested communities north of the Subject Lands do not meet minimum size requirements; however, the woodlands south of the Subject Lands associated with the PSW are assumed to be large enough.	Yes – Breeding bird studies were conducted.	No – the listed species were not observed during breeding bird surveys. However, these surveys were restricted to the Subject Lands.	Candidate – SWH type does not occur on the Subject Lands; however, candidate SWH is assumed within the large deciduous woodland.
Turtle Nesting Areas	Yes – MAS and SAS communities are present on the Subject Lands.	No – No permanent suitable nesting areas were observed on site. Most of the Subject Lands were disturbed, including tilled soils and gravel roads.	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Seeps and Springs	Yes – FOD community with potential for seeps and springs is located immediately to the south of the Subject Lands.	Yes – the presence of nearby thicket swamp and marsh communities which have water visible on spring air photo indicates seasonally high groundwater conditions in the area. It is possible that seeps and springs occur within any lower lying areas of the FOD community, though this was not confirmed, as no surveys were completed within this community.	N/A	N/A	Candidate – SWH type does not occur on the Subject Lands; however, candidate SWH is assumed within the large deciduous woodland.
Woodland Amphibian Breeding Habitats (Within or < 120 m from Woodland)	Yes – FOD communities are present within 120 m of the Subject Lands, but are not present on the Subject Lands.	Yes – The southern wetland communities are within 120 m of a large FOD community and are > 500 m ² in size.	Yes – Amphibian call count surveys were conducted.	Yes – AMC stations 2, 3, and 4 surveyed wetlands within 120 m of woodlands. None of the stations met SWH thresholds for number of listed species and individuals/call level codes.	SWH type does not occur on or within 120 m of the Subject Lands.
Wetland Amphibian Breeding Habitats (Wetland > 120 m from Woodland)	Yes – SW, MA, SA, and OA communities are present on and within 120 m of the Subject Lands.	Yes – Several of the wetland communities on site and adjacent to the Subject Lands are >120 m from surrounding woodlands and are > 500 m ² in size.	Yes – Amphibian call count surveys were conducted.	Yes – AMC stations 1, 5, 6, 7 and 8 surveyed wetlands that are > 120 m from woodlands. None of the stations met SWH thresholds for number of listed species and individuals/call level codes.	SWH type does not occur on or within 120 m of the Subject Lands.
Woodland Area-Sensitive Bird Breeding Habitat	Yes – FOD and CUP communities are present within 120 m of the Subject Lands, but are not present on the Subject Lands.	Yes – The large deciduous woodland south of the Subject Lands meets the size criteria.	Yes – Breeding bird studies were conducted.	No – Minimum criteria for number of species and individuals was not met. However, these surveys were restricted to the Subject Lands.	Candidate – SWH type does not occur on the Subject Lands; however, candidate SWH is assumed within the large FOD to the south of the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
3. SPECIES OF CONSERVATION CONCERN					
Marsh Bird Breeding Habitat	Yes – MAM and SAS communities are present on and within 120 m of the Subject Lands	Yes – Several open aquatic communities are present on the Subject Lands.	Yes – Breeding bird studies were conducted	No – Species and abundance criteria were not met.	SWH type does not occur on or within 120 m of the Subject Lands.
Open Country Bird Breeding Habitat	Yes – CUM vegetation communities are present within 120 m of the Subject Lands.	No – The CUM communities on the Subject Lands do not meet the minimum size criterion (> 30 ha).	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Shrub/Early Successional Bird Breeding Habitat	Yes – CUT/CUW communities are present to the south of the Subject Lands.	No – The CUT/CUW communities do not meet the minimum size criterion (> 10 ha).	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Terrestrial Crayfish	Yes – MAM and MAS communities are present on and within 120 m of the Subject Lands.	Yes – Edge habitat is present surrounding wet meadows and shallow marshes.	Yes – Wetland communities were screened for terrestrial crayfish burrows.	Yes – Crayfish burrows were noted within and/or adjacent to the Whittington PSW, the central MAM2-2/MAS2/SAS1, the northern OAO community, and along the northern property boundary (see Figure 5, Appendix A).	Confirmed – All crayfish chimneys were found in or immediately adjacent to wetlands. Those wetlands are considered confirmed SWH and will be considered as part of mitigation and restoration measures for the Subject Lands.
Special Concern and Rare Wildlife Species					
(i) Snapping Turtle (SC)	Yes – Prefers shallow water with soft mud and leaf litter substrate. Females also use gravelly and sandy areas near streams as nesting sites (i.e., gravel road shoulders).	N/A	Yes – Turtle basking surveys were completed.	This species was not recorded during turtle basking surveys or incidentally on the Subject Lands.	SWH type does not occur on or within 120 m of the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
(ii) Monarch (SC)	Yes – Adult monarchs require a variety of nectaring plants for foraging habitat and, in general, habitat can be varied, including prairies, meadows, marshes, and roadsides. However, monarchs only breed on Milkweed (NCC 2023a).	No – While occasional Common Milkweed (<i>Asclepias syriaca</i>) and Swamp Milkweed (<i>Asclepia incana</i>) were observed within the Subject Lands, their low abundances do not suggest the presence of significant breeding habitat. However, suitable breeding habitat exists.	N/A	While targeted surveys were not required, incidental screening for butterflies and their larvae was completed during other surveys. Monarch adults were observed within the Subject Lands; however, no larvae were observed on Milkweed plants.	SWH type does not occur on or within 120 m of the Subject Lands. However, Monarch habitat will be considered as part of ecological enhancement for the Subject Lands.
(iii) Black Tern (SC)	No – Nests in large freshwater marshes. Prefers dense marshes adjacent to shallow lakes. Wetlands on site are not large enough to provide suitable habitat.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
(iv) Barn Swallow (SC)	No – Structures with suitable nest attachment sites are not present within the Subject Lands, and none were identified on adjacent lands.	N/A	N/A	No –Barn Swallow was observed foraging over the Subject Lands during the breeding bird surveys; however, there were no suitable breeding structures and no breeding behaviour was observed.	SWH type does not occur on or within 120 m of the Subject Lands.
(v) Golden-winged Warbler (SC)	Yes – Potentially suitable habitat with sparse trees and shrubs is present within 120 m of the Subject Lands. This species can tolerate the proximity of some anthropogenic disturbance.	N/A	Yes – Breeding bird studies were conducted.	The species was not recorded during Breeding Bird Surveys conducted on the Subject Lands.	Candidate – SWH type does not occur on the Subject Lands; however, candidate SWH is assumed within the large FOD to the south of the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
(vi) Canada Warbler (SC)	Yes – Potentially suitable woodland habitat is present to the south of the Subject Lands.	N/A	Yes – Breeding bird studies were conducted	The species was not recorded during Breeding Bird Surveys conducted on the Subject Lands.	Candidate – SWH type does not occur on the Subject Lands; however, candidate SWH is assumed within the large FOD to the south of the Subject Lands.
(vii) Upland Sandpiper (S2B)	No – Nests in large areas of grassland habitat but may be found foraging in meadows, pastures, and other croplands. Prefers short grasses. Grassland and meadow areas on site are not large enough to support breeding for this species.	N/A	Yes – Breeding bird studies were conducted.	No – This species was observed over 500 m from the Subject Lands in suitable breeding habitat; however, no suitable breeding habitat exists within the Subject Lands.	SWH type does not occur on or within 120 m of the Subject Lands.
(viii) Wilson's Phalarope (S2B, S4M)	Yes – Breeds in small marshes and shallow wetlands.	N/A	Yes – Breeding bird studies were conducted.	The species was not recorded during Breeding Bird Surveys conducted on the Subject Lands.	SWH type does not occur on or within 120 m of the Subject Lands.
(ix) Caspian Tern (S3B, S4M)	No – Habitat ranges from ocean shores to lakes and rivers. Nests in flat, open areas with low vegetative cover.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
(x) Purple Martin (S3B)	No – Ontario's martins usually nest in birdhouses provided by humans. Seldom do they nest in woodpecker holes in trees since their numbers are severely in decline. Artificial habitat and suitable natural habitat is not present within the Subject Lands and is not expected within 120 m.	N/A	No – However, breeding bird studies were conducted.	The species was not recorded during Breeding Bird Surveys conducted on the Subject Lands.	SWH type does not occur on or within 120 m of the Subject Lands.

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET <small>(MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)</small>	SWH TYPE PRESENT
(xi) Lesser Yellowlegs (S3S4B)	No - Breeding habitat is primarily located in the boreal forest region of Canada and Alaska, and it is distinct from their more widespread migratory and wintering habitat.	N/A	No – However, breeding bird studies were conducted.	The species was not recorded during Breeding Bird Surveys conducted on the Subject Lands. It was observed incidentally foraging on the Subject Lands; however, the Subject Lands and the adjacent 120 m are outside this species' breeding range.	SWH type does not occur on or within 120 m of the Subject Lands.
4. ANIMAL MOVEMENT CORRIDORS					
Amphibian Movement Corridors	No – Wetland Amphibian Breeding SWH is not present within the Subject Lands or the adjacent 120 m.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.
Deer Movement Corridors	No – Deer wintering habitat was not identified on or within 120 m of the Subject Lands.	N/A	N/A	N/A	SWH type does not occur on or within 120 m of the Subject Lands.

Appendix C Terms of Reference and Reviewing Authority Comments



March 18, 2024

Township of Amaranth
374028 6th Line
Amaranth, ON L9W 0M6

Attention: Valerie Schmidt, Senior Planner
GSP Group Inc. on behalf of the Township of Amaranth

Dear Ms. Schmidt,

**RE: Environmental Impact Study Terms of Reference
514504 2nd Line, Hamlet of Laurel, Township of Amaranth, Ontario**

1. INTRODUCTION

GEI Consultants Ltd. (GEI) has been retained by The Cellular Connection Ltd. to complete an Environmental Impact Study (EIS) for the proposed development of their property located at 514504 2nd Line in the Hamlet of Laurel, Township of Amaranth, Ontario (herein referred to as the Subject Lands; **Figure 1, Appendix A**). The Subject Lands are generally located north of Side Road 15, west of 2nd Line, south of Side Road 20, and east of County Road 11. Furthermore, the Subject Lands straddle the regulatory limits of the Grand River Conservation Authority (GRCA) at the southwestern portion of the site and the Nottawasaga Valley Conservation Authority (NVCA) at the northeastern portion of the site (**Figure 2, Appendix A**).

The Cellular Connection Ltd. is proposing a total of 29 lots with single detached dwellings within the Subject Lands (including one lot with the existing residence). An EIS is required in support of an application for an Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision to permit the development of the Subject Lands. The EIS will be prepared in accordance with the policies of the Provincial Policy Statement (PPS; MMAH 2020), the Township of Amaranth Official Plan (2005, Consolidated 2018), the Dufferin County Official Plan (2014, Consolidated 2017), as well as GRCA and NVCA regulations and guidelines.

The Subject Lands are primarily zoned "Rural," with a portion along the southern boundary zoned "Environmental Protection," per Schedule A (Land Use & Transportation) of the Township of Amaranth Official Plan (2005, Consolidated 2018). The southern portion of the Subject Lands is also mapped as part of the Natural Heritage System (NHS) for Dufferin County (2014, Consolidated 2017) and as part of the NHS of the Growth Plan for the Greater Golden Horseshoe (MMAH 2020), as shown in **Figure 2 (Appendix A)**.

These Terms of Reference (TOR) are based on the existing natural feature types present within and adjacent to the Subject Lands and the adjacent lands, as determined through a review of existing background information and air photo imagery. The Subject Lands consist primarily of agricultural fields and cultural vegetation communities, with several ponds and natural vegetation pockets throughout the site. In addition, the Whittington Provincially Significant Wetland (PSW) complex extends onto the Subject Lands along the southern property boundary (**Figure 2, Appendix A**).

The EIS will provide an ecological characterization of the natural features within the Subject Lands and will assess their significance in accordance with the policies of the PPS, the Township of Amaranth and Dufferin County, as well as NVCA and GRCA regulations. The EIS will also include an assessment of potential impacts from the proposed development and will recommend mitigation measures.

These TOR describe the proposed ecological field surveys and outline the proposed content of the EIS report that will be prepared in accordance with the policies of Section 4.1.13 of the Township's Official Plan, GRCA's *Environmental Impact Study Guidelines and Submission Standards for Wetlands* (2005), and NVCA's *Planning and Regulation Guidelines* (2009) for EISs. The approved TOR will be included as an appendix within the EIS.

2. ENVIRONMENTAL IMPACT STUDY SUBMISSION CONTENT

GEI will prepare an EIS report based on a review of existing background information as well as detailed field surveys and assessments. The EIS will focus on the Subject Lands (as shown in **Figure 1, Appendix A**) and the adjacent 120 m (i.e., the "adjacent lands," as identified within the *Natural Heritage Reference Manual*; MNR 2010). The EIS will include the following information:

- A review of existing natural heritage background information, policies, and legislation applicable to the Subject Lands and the adjacent 120 m;
- A field review of the natural heritage features on the Subject Lands through the completion of targeted ecological field surveys, including identification of their boundaries;
- A biophysical description of the Subject Lands and the adjacent 120 m;
- An evaluation of the sensitivity of the natural heritage features and their functions within the Subject Lands and the adjacent 120 m;
- An assessment of whether any of the existing natural heritage features within the Subject Lands meet the test of "significance" as defined by the PPS;
- Environmental hazards that need to be addressed as part of the development, if any;
- A description of the proposed development;
- Identification and discussion of the potential direct and indirect impacts that could occur to the identified natural heritage features and functions as a result of the proposed development;
- Recommendations for mitigation measures to avoid or minimize impacts before and after development; and
- Recommendations for enhancement of natural heritage features and functions, where appropriate, including any monitoring that may be required to ensure that mitigation measures are achieving the intended goals.

2.1 Natural Heritage Planning Considerations

GEI will undertake an assessment of the significance and sensitivity of the natural heritage features found on and adjacent to the Subject Lands and the potential impacts to these features from the proposed development application to comply with the provisions of the following legal, regulatory, and policy documents as well as associated guidance documents:

- Township of Amaranth Official Plan (2018);
- Dufferin County Official Plan (2017);

- Provincial Policy Statement under the *Planning Act, 1990* (MMAH 2020);
- Ontario Regulation 150/06 and Ontario Regulation 176/06 under the *Conservation Authorities Act, 1990* and other relevant GRCA and NVCA planning documents;
- Provincial *Endangered Species Act, 2007*;
- Federal *Fisheries Act, 1985*; and
- Federal *Migratory Birds Convention Act, 1994*.

2.1.1 Township of Amaranth Official Plan

The Township of Amaranth Official Plan (2005, Consolidated 2018) designates the Subject Lands primarily as “Rural,” with a portion along the southern boundary designated as “Environmental Protection,” as shown on Schedule A: Land Use & Transportation. In addition, the PSW along the southern property boundary is identified on Schedule B: Environmental Features. Per Section 4.1.13, an EIS is required for any development or site alteration proposed within 120 m of a PSW. The boundaries shown on Schedules A and B may be refined through the preparation of an EIS, per Section 3.8.4(l).

The policies for Rural and Environmental Protection areas are outlined in Sections 3.2 and 3.8 of the Township’s Official Plan, respectively. The objectives for Environmental Protection include protection and enhancement of these areas, including prohibiting development “where an [EIS] has indicated that the proposal would have a negative impact on the functions, features or linkages of the Environmental Protection areas.”

In accordance with Section 4.1.1 of the Township’s Official Plan, uses permitted by the Official Plan may only be allowed provided that the long-term capacity of the site can support the use without a negative impact on environmental features, functions, and attributes, such as, water quantity and quality, natural vegetation, soil, and wildlife.

2.1.2 Dufferin County Official Plan

The Dufferin County Official Plan (2014, Consolidated 2017) designates the Subject Lands as “Countryside Area” and “Provincially Significant Wetlands,” per Schedule B: Community Structure and Land Use. In addition, the southern portion of the Subject Lands is designated “County Preliminary Natural Heritage System” on Schedule E1: Natural Heritage System.

Per Section 8.8.2 of the County’s Official Plan, the NHS comprises the following natural heritage features:

- Provincially significant wetlands;
- Provincially significant areas of natural and scientific interest;
- Fish habitat;
- Significant valleylands;
- Woodlands;
- Habitat of endangered and threatened species;
- Significant wildlife habitat (SWH); and
- Unevaluated wetlands and locally / regionally significant wetlands

In accordance with Section 5.3 of the County’s Official Plan, development and site alteration are not permitted in the following:

- Significant wetlands;
- Significant woodlands, significant valleylands, significant wildlife habitat, and significant areas of natural and scientific interest (ANSIs), unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions;
- Fish habitat, except in accordance with provincial and federal requirements; and
- Habitat of endangered and threatened species, except in accordance with provincial and federal requirements.

2.1.3 Provincial Policy Statement

The PPS (MMAH 2020) provides guidance on matters of provincial interest surrounding land use planning and development. It “supports improved land use planning and management, which contributes to a more effective and efficient land use planning system.” The PPS is to be read in its entirety and land use planners and decision makers need to consider all relevant policies and how they work together.

The Government of Ontario released a draft Provincial Planning Statement in April 2023, last updated in June 2023 (Ontario 2023). Depending on the timing of the preparation of the EIS, the new Provincial Planning Statement may be in effect, and those policies would be referenced within the EIS. However, no major changes have been made to the natural heritage policies, and as such the policies in Section 2.1 of the current PPS would still apply.

Policies in Section 2.1 (Natural Heritage) of the current PPS identify eight types of significant natural heritage features, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- SWH;
- Fish habitat;
- Habitat of endangered and threatened species; and
- ANSIs.

The PPS states that development and site alteration shall not be permitted in significant wetlands within Ecoregions 5E, 6E and 7E, or in significant coastal wetlands. Development and site alteration shall not be permitted in significant woodlands, significant valleylands, SWH or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

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

Development and site alteration may be permitted on lands adjacent to the above features provided it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

2.1.4 Nottawasaga Valley Conservation Authority and Grand River Conservation Authority

Effective January 1, 2023, following the implementation of Bill 23, the role of Conservation Authorities in reviewing development applications has changed. Previously, the GRCA and NVCA reviewed planning application submissions associated with future development of properties within its jurisdictional boundaries. In addition, the GRCA and NVCA provided planning and technical advice to planning authorities to assist them in fulfilling their responsibilities regarding natural hazards, natural heritage, and other relevant policy areas pursuant to the *Planning Act*, as both a watershed-based resource management agency and through planning advisory services, in addition to their regulatory responsibilities. With the changes associated with Bill 23, the commenting role Conservation Authorities will play in Planning Act applications may vary from municipality to municipality.

GRCA administers the Development, Interference with Wetlands, Alterations to Shorelines and Watercourses Regulation, Ontario Regulation (O. Reg.) 150/06 and NVCA administers the Development, Interference with Wetlands, Alterations to Shorelines and Watercourses Regulation, O. Reg. 176/06. These regulations define the areas of interest that allow GRCA and NVCA to:

- *Prohibit, regulate, or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland; and*
- *Prohibit, regulate, or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.*

Pursuant to the Development, Interference with Wetland and Alterations to Shorelines and Watercourse Regulations (GRCA, O. Reg. 150/06; and NVCA, O. Reg. 172/06), any development in or on areas defined in the regulation (e.g., river or stream valleys, hazardous land, wetlands) requires permission from the Conservation Authority. The Conservation Authority may grant permission for development in or on these areas if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development. The regulation also states that it is prohibited to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream, or watercourse or change or interfere in any way with a wetland without permission from the Conservation Authority.

In February 2024, the Government of Ontario released O. Reg. 41/24: Prohibited Activities, Exemptions and Permits, which comes into force on April 1, 2024. These regulations will replace O. Reg. 150/06 and O. Reg. 172/06 referenced above and will be referenced within the EIS.

A review of the GRCA and NVCA online mapping was completed to determine the extent of Conservation Authority regulated areas within the Subject Lands. The Whittington PSW and two of the unnamed waterbodies in the southwest portion of the Subject Lands were identified as GRCA regulated features, while the unnamed watercourse and the White Whitten Drain along the northern property boundary were identified as NVCA regulated features.

2.1.5 Endangered Species Act, 2007

The Ministry of the Environment, Conservation and Parks (MECP) administers the provincial *Endangered Species Act, 2007* (ESA; amended 2021), which was developed to:

- Identify Species at Risk (SAR), based upon best available science;
- Protect SAR and their habitats and to promote their recovery; and
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA protects all Threatened, Endangered, and Extirpated species listed on the Species at Risk in Ontario List (SARO; O.Reg. 230/08). These species are legally protected from harm or harassment, and their associated habitats are legally protected from damage or destruction, as defined under the ESA.

2.1.6 Fisheries Act, 1985

Fisheries and Oceans Canada (DFO) administers the federal *Fisheries Act, 1985* (amended 2019), which defines fish habitat as which defines fish habitat as “spawning grounds and other areas, including nursery, rearing, food supply, and migration areas, on which fish depend directly or indirectly in order to carry out their life processes”. The *Fisheries Act* prohibits the death of fish by means other than fishing and the harmful alteration, disruption, or destruction of fish habitat (HADD). A HADD is defined as “any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat’s capacity to support one or more life processes” (DFO 2019).

The death of fish by means other than fishing or a HADD of fish habitat can be authorized by DFO under the *Fisheries Act*. Authorizations require the preparation and submission of an application package identifying the impacts on fish and fish habitat; the avoidance, mitigation, and offsetting measures that will be implemented; and any monitoring that is proposed.

2.1.7 Migratory Bird Convention Act, 1994

Environment and Climate Change Canada (ECCC) administers the *Migratory Birds Convention Act, 1994* (amended 2017), which protects the nests of migratory bird species from destruction, including incidental take (i.e., the unintentional destruction of a nest), as well as from disturbance. The *Migratory Birds Convention Act* does not provide a set date where activities, such as tree removal, can be completed without the risk of incidental harm to the nests of birds. The requirement to ensure that there are no bird nests present within the work area rests with the proponent of the activity.

2.2 Biophysical Description of Site

The EIS will provide a description of the existing natural environment conditions that may be affected by the proposed development within the Subject Lands. This will include a summary of relevant background information and a description of ecological field survey results.

2.2.1 Secondary Source Review

A preliminary background review of available secondary source information is provided below. Additional background reports that are made available to GEI by reviewing agencies will be reviewed and incorporated into the EIS, as appropriate.

NHIC Database

The NHIC (MNRF 2024) was searched for records of provincially significant plants, vegetation communities and wildlife on and in the vicinity of the Subject Lands. The database provides occurrence data by 1 km² area squares, with four squares overlapping the Subject Lands (17NJ6572, 17NJ6573, 17NJ6672, 17NJ6673). The following species of interest were noted:

- Species listed as Threatened or Endangered on the SARO List:
 - Eastern Meadowlark (*Sturnella magna*) – Threatened;
 - Short-eared Owl (*Asio flammeus*) – Threatened; and
 - Bobolink (*Dolichonyx oryzivorus*) – Threatened.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Snapping Turtle (*Chelydra serpentina*) – Special Concern.

Land Information Ontario Natural Features

Based on the MNRF (2024) LIO database, the following features are mapped within and adjacent to the Subject Lands (**Figure 2, Appendix A**):

- Three unnamed waterbodies are located within the Subject Lands, including one near the center and two near the southwest corner;
- An unnamed watercourse extends from the waterbody feature located near the center of the Subject Lands to the northern property boundary;
- The unnamed watercourse is mapped as feeding into the White Whitten Drain which runs along the northeastern corner of the Subject Lands;
- The Whittington PSW Complex extends onto the Subject Lands along the southern property boundary, with most of its extent located to the southwest; and
- An unevaluated wetland feature contiguous with the Whittington PSW Complex is mapped at the southern end of the Subject Lands. Three additional unevaluated features are mapped within 120 m of the Subject Lands, two of which are mapped as swamp (i.e., woodland and wetland) features.

No other known natural heritage features were identified within or adjacent to the Subject Lands.

Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (Cadman et al. 2007). The data is presented on 100 km² area squares with one square overlapping the Subject Lands (17TNJ67). It should be noted that the Subject Lands are a small component of the overall bird atlas squares, and therefore it is unlikely that all bird species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in bird species presence and use.

A total of 84 bird species were recorded in this atlas square, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO List:
 - Eastern Whip-poor-will (*Antrostomus vociferus*) - Threatened

- Least Bittern (*Ixobrychus exilis*) – Threatened;
 - Bank Swallow (*Riparia riparia*) – Threatened;
 - Bobolink – Threatened;
 - Chimney Swift (*Chaetura pelagica*) – Threatened;
 - Short-eared Owl – Threatened;
 - Louisiana Waterthrush (*Parkesia motacilla*) – Threatened; and
 - Eastern Meadowlark – Threatened.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Black Tern (*Chlidonias niger*) – Special Concern;
 - Barn Swallow (*Hirundo rustica*) – Special Concern;
 - Golden-winged Warbler (*Vermivora chrysoptera*) – Special Concern;
 - Canada Warbler (*Cardellina canadensis*) - Special Concern;
 - Upland Sandpiper (*Bartramia longicauda*) – S2B;
 - Wilson’s Phalarope (*Phalaropus tricolor*) – S2B, S4M;
 - Caspian Tern (*Hydroprogne caspia*) – S3B, S4M; and
 - Purple Martin (*Progne subis*) – S3B.

Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas contains detailed information on the population and distribution status of Ontario herpetofauna (Ontario Nature 2024). The data is presented on 100 km² area squares with one square overlapping the Subject Lands (17NJ67). It should be noted that the Subject Lands are a small component of the overall atlas squares, and therefore it is unlikely that all herpetofauna species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in herpetofauna species presence and use.

A total of 12 species were recorded in the atlas square that overlaps with the Subject Lands, of which one is a salamander species, nine are frog and toad species, and two are turtle species. Of these species, the following species of interest was noted:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
 - Snapping Turtle – Special Concern.

Ontario Butterfly and Moth Atlas

The Ontario Butterfly and Moth Atlases (Toronto Entomologists’ Association 2024a, 2024b) contain detailed information on the population and distribution status of butterflies and moths in Ontario. The database provides occurrence data by 10 km x 10 km squares. The Subject Lands are located within atlas square 17NJ67, which was used to determine a potential butterfly and moth species list for the area. The Subject Lands are a small component of the overall atlas squares, and therefore all the butterfly and moth species listed for this atlas square may not be found within the Subject Lands. Habitat type, availability, and size are all contributing factors to reptile and amphibian species presence and use.

A total of 16 species including 12 butterfly species and 4 moth species were recorded in this atlas square. Of these reported species, one species of interest was noted, Monarch (*Danaus plexippus*) which is identified as a species of Special Concern on the SARO List.

Aquatic SAR Distribution Mapping

The DFO Aquatic Species at Risk Map (2024) was reviewed to identify any known occurrences of aquatic SAR, including fish and mussels, on the Subject Lands. No aquatic SAR were identified.

iNaturalist

The iNaturalist (2024) database is a large citizen science-based identification and data collection app. It allows any citizen to submit observations to be reviewed and identified by other naturalists and scientists to help provide accurate species observations. As the observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence, and species may be filtered out based on habitat and target survey efforts.

This online database was examined to identify observations made within the Subject Lands that were research grade. One species of interest (Monarch) was noted west of the Subject Lands. No other significant species were found on the Subject Lands or within 120 meters of its boundaries.

eBird

The eBird (2024) database is a large citizen science-based project with a goal to gather bird diversity information in the form of checklists of birds, archive it, and share it to power new data-driven approaches to science, conservation, and education. As the observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence, and species may be filtered out based on habitat and target survey efforts.

This online database was examined to identify observations made on or within 120 m of the Subject Lands. However, no significant bird species were identified in this area.

2.2.2 Ecological Field Surveys

An ecological field survey program is proposed in 2024 to provide the data required to complete a significance assessment for the natural features present on and adjacent to the Subject Lands. Ecological field surveys will focus on the features of the Subject Lands as well as the immediately adjacent lands, as observable from the property boundary. Based on background information provided by The Cellular Connection Ltd., aerial imagery of the Subject Lands, and the habitat features that appear to be present, GEI proposes the following ecological field surveys:

- Ecological Land Classification (ELC);
- Three-season botanical inventory (i.e., spring, summer, and fall);
- Amphibian call count surveys (three rounds);
- Breeding bird surveys (two rounds);
 - Note, should grassland habitat be identified within the Subject Lands that could support Bobolink or Eastern Meadowlark (two SAR birds), a third breeding bird survey may be required.
- Headwater Drainage Feature Assessment (HDFFA, three rounds); and
- Fish community sampling (one round).

All incidental species observations will be recorded and provided within the Master Wildlife Table. All species identified will include federal, provincial, and local status rankings.

In addition to the fieldwork listed above, any natural feature limits (e.g., wetlands, woodlands) will be staked with reviewing agencies, including staff from the Township, GRCA, and NVCA as applicable. It is our understanding that the Whittington PSW was previously staked with reviewing agencies; as such, it is not proposed to be re-staked at this time.

Botanical and ELC Surveys

ELC and three-season botanical surveys are proposed for the spring, summer, and fall. GEI will classify the vegetation communities on the Subject Lands using the methodology of the *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* (Lee et al. 1998). Any observations of SAR plants (e.g., Butternut) will also be documented.

Amphibian Call Count Surveys

Three rounds of amphibian call count surveys will be conducted in accordance with the Marsh Monitoring Program (BSC 2014) in late March/April (minimum 5°C), May (minimum 10°C) and June (minimum 17°C) 2024. Call count surveys will identify frogs and toad species that are present and breeding in wetland communities. All appropriate sampling locations will be surveyed during optimal weather conditions (low wind levels, no heavy rain) during the evening.

Breeding Birds Surveys

Two breeding bird surveys (area searches, point counts) will be conducted according to Ontario Breeding Bird Atlas Protocol (Bird Studies Canada, 2006). Surveys will be completed at least two weeks apart between late May and early July. Point count stations will be surveyed between dawn and five hours after dawn. Surveys will consist of a combination of point count surveys and area searches to be completed under favourable weather conditions (i.e., without thick fog or precipitation and wind speeds generally below 19 km/h).

It is GEI's understanding that the Subject Lands are predominately row crop agricultural fields, and therefore it is unlikely that grassland habitat is present. If suitable habitat is present for grassland birds, such as Bobolink or Eastern Meadowlark, then a third-round survey (July) would be completed following the MECP (n.d.) "Survey Protocol for Bobolink and Eastern Meadowlark".

Headwater Drainage Feature Assessment

Three rounds of HDFA will be completed during the spring and summer months to understand the nature of hydrologic features on the Subject Lands. HDFAs will identify ephemeral, intermittent, and permanent features on the landscape. Headwater drainage features will be divided into reaches as appropriate and will be assessed utilizing the Evaluation, Classification and Management of Headwater Drainage Feature Guidelines (the Guideline: TRCA and CVC 2014). The guideline recommends three rounds of surveys to complete the HDFA. The first visit is to occur under spring freshet conditions, generally around mid-March to mid-April, weather dependent. The second visit is to occur in late spring, allowing at least two days after a rainfall event, generally around mid-April to end of May, weather dependent. A third visit will verify the flow regime of the features as intermittent or permanent and will generally be completed early July to end of August, weather dependent.

Fish Community Sampling

One fish community sampling event will be completed in conjunction with the first round HDFA survey to confirm the distribution and extent of direct fish habitat in the features on the Subject Lands and to identify species diversity and relative abundance. By completing the fish community sampling during the spring sampling events, this will aid in determining whether seasonal fish habitat is present within the Subject Lands.

Prior to commencing the survey, GEI will obtain a License to Collect Fish for Scientific Purposes from the MNR/Guelph District. During these sampling events, a Halltech HT-2000 Battery Backpack Electrofisher and two D-frame dip nets with a 500-micron mesh size will be used to retrieve fish and semi-aquatic organisms (e.g., frogs) from the feature. Sampling will be conducted using the Ontario Stream Assessment Protocol standard single pass survey method (Stanfield 2017). The survey will be completed within a defined stretch through riffles, pools and runs. Fish captured will be transferred into aerated buckets for processing. Each fish will be identified to species level, enumerated, and weighed before being returned to the channel, downstream from the sampling location. Weather conditions and electrofisher shocking parameters (e.g., voltage and frequency) will be recorded. All data recorded will be reported to the MNR in accordance with the License requirements.

Feature Staking

In addition to the fieldwork listed above, any natural feature limits (e.g., wetlands, woodlands) will be staked. Should reviewing agencies (including the Township, GRCA, and NVCA) be available and interested, feature staking may be confirmed with their staff in the field. Agreed-upon feature boundaries will be surveyed in the field by an Ontario Land Surveyor (OLS).

Based on **Figure 2 (Appendix A)**, an unevaluated wetland unit was identified along the southern limit of the Subject Lands. It is our understanding that the Whittington PSW was previously staked with reviewing agencies; as such, it is not proposed to be re-staked at this time.

No woodlands have been identified within the Subject Lands based on background information review; as such, no woodland staking is proposed at this time.

Should other wetlands or any woodlands be identified through ELC, these would also be staked.

2.2.3 Ontario Wetland Evaluation System

GEI will complete a wetland evaluation for each individual wetland unit following the guidelines outlined in the recently updated Ontario Wetland Evaluation System (OWES; MNR 2022). This updated version of OWES has generally removed the concept of wetland complexing, allowing wetlands to be evaluated for provincial significance on a per unit basis. Wetlands less than 2 ha are generally not evaluated (and thereby treated as non-significant) unless there is sufficient rationale for doing so. GEI has developed a systematic set of criteria to determine whether rationale exists for comprehensive evaluation of wetlands smaller than 2 ha.

2.3 Natural Heritage Feature Analysis

Eight types of significant natural heritage features are defined in the PPS (MMAH 2020), as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- SWH;
- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant ANSIs.

All eight types of significant natural heritage feature types will be evaluated. SWH will be assessed using the Significant Wildlife Habitat Technical Guide (MNR 2000) and the SWH Ecoregion Criterion Schedule 6E (MNR 2015). All four general types of SWH (seasonal concentration areas, rare or specialized habitats, habitat for species of conservation concern, and animal movement corridors) will be evaluated. The EIS will also address whether any GRCA or NVCA regulated features (watercourses, wetlands, shorelines, or other hazardous lands) are present within the Subject Lands.

If required, all SAR information will be disclosed to the MECP through their Information Gathering Form, or a similar process, upon completion of the EIS prior to site alteration/development. The Information Gathering Form is a proponent led process, and engagement with the MECP is not always warranted if it can be determined that impacts to SAR and their habitat can be avoided (e.g., habitat does not overlap with development) or effectively mitigated (e.g., timing restrictions could be used during construction to avoid impacts).

2.4 Description of Proposed Development

The EIS will provide an overview of the proposed development, including key details outlined within engineering reports (e.g., stormwater management). A conceptual site plan will be provided, overlaying significant natural heritage features.

2.5 Impact Assessment, Avoidance and Mitigation Measures

The EIS will present and discuss the potential direct and indirect impacts from the proposed development on the natural heritage features and associated functions that occur on and adjacent to the Subject Lands. Where available, engineering reports will be incorporated into the impact assessment to assess potential impacts to the Subject Lands. The EIS will include discussion on how the proposed development application conforms to relevant natural heritage planning policies and regulations (as discussed above in **Section 2.1**).

The EIS will identify opportunities for the protection and/or enhancement of retained natural heritage features. Design modifications will be made, where necessary, to avoid and/or minimize potential impacts. Appropriate mitigation will be recommended, including setback requirements from natural features and appropriate timing windows for vegetation removal. Potential negative impacts and residual effects will be identified, if any. The EIS will identify potential construction and post-construction natural heritage monitoring requirements, if required.

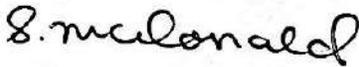
The EIS will provide mapping to depict the limits of the natural heritage features and associated setbacks as well as potential restoration areas, as applicable.

3. FINAL REMARKS

Ecological field investigations for the property located at 514504 2nd Line will be conducted in 2024. Following completion of these investigations, an EIS will be prepared to document the existing natural heritage conditions, results of the ecological field investigations, analyses of feature significance, impact assessment, recommended mitigation and, if required, restoration measures and monitoring.

We trust that the above information and proposed EIS TOR will be met with your approval. Should you have any questions or comments, please do not hesitate to contact the undersigned.

Yours truly,
GEI Consultants



Sarah McDonald
Ecologist
519-365-4964
smcdonald@geiconsultants.com



Agneta Szabo
Lead Ecologist
647-242-6492
aszabo@geiconsultants.com



Sean Male
Senior Ecologist & Vice President
289-407-7483
smale@geiconsultants.com

APPENDICES (1)

Appendix A: Figures

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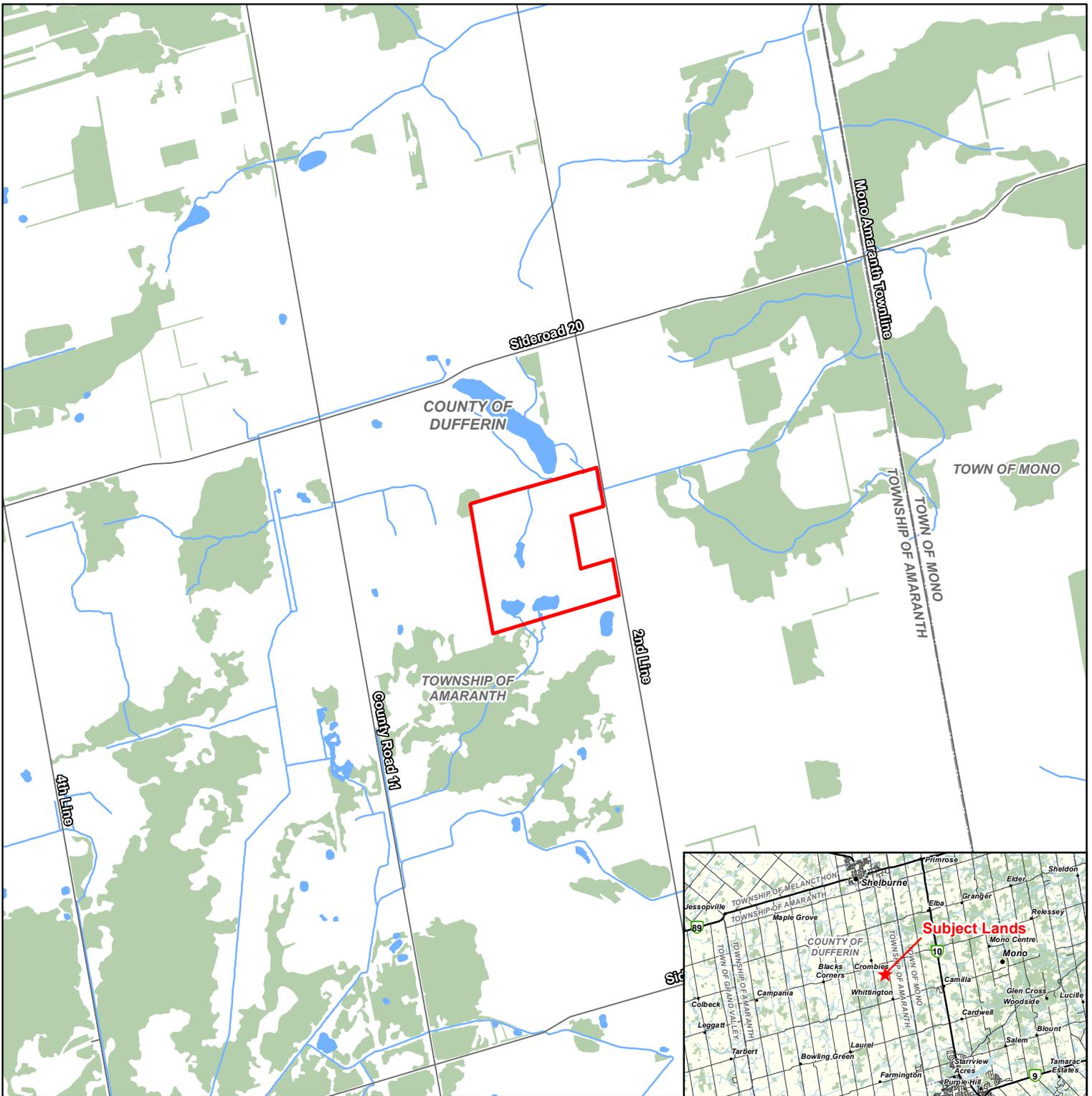
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APPENDIX A

Figures



Project 2305387

NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024.

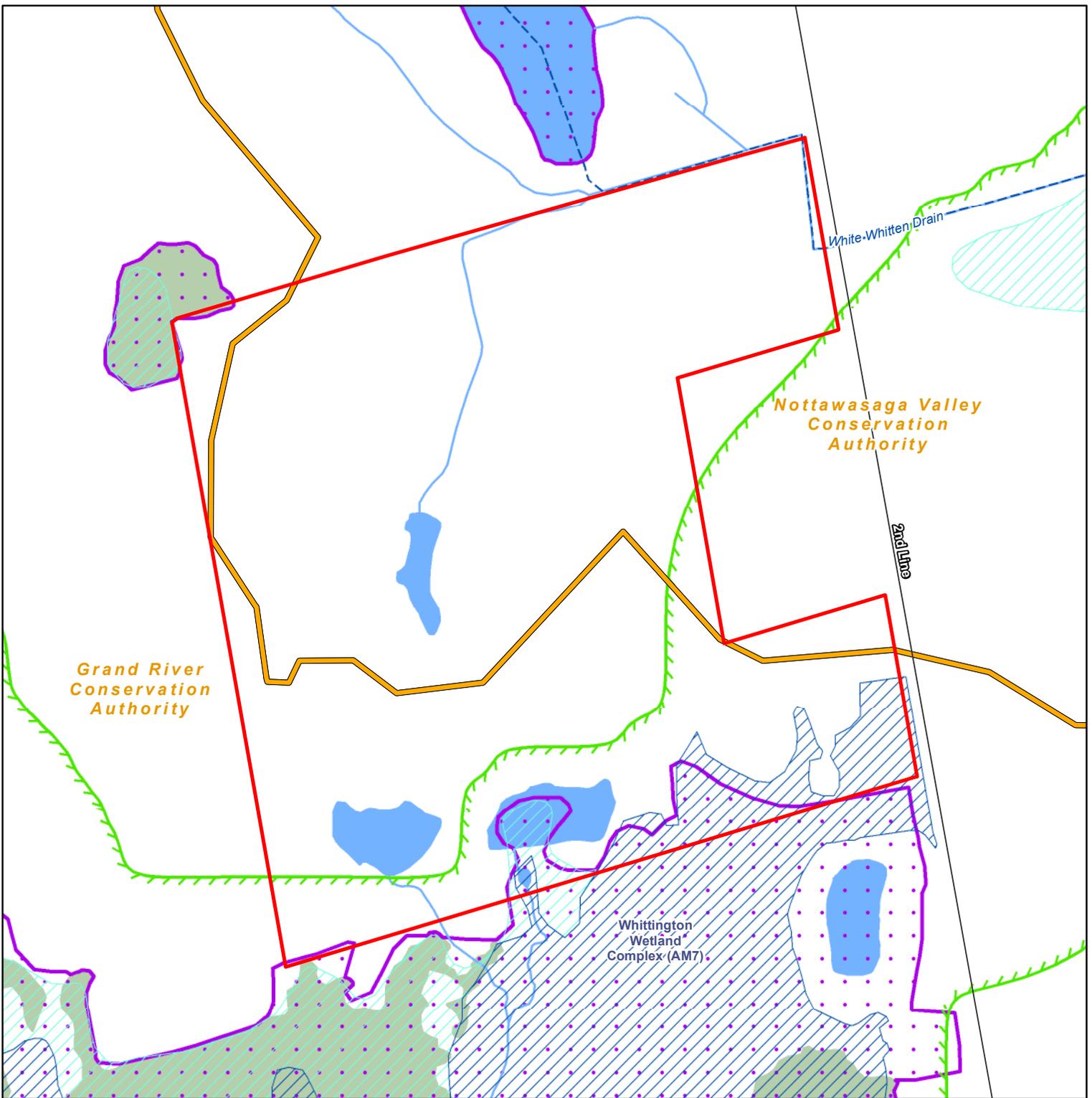
- Legend**
- Subject Lands
 - Municipal Boundary, Lower/Single Tier
 - Watercourse
 - Waterbody
 - Wooded Area

2nd Line, Amaranth
 The Cellular Connection

Figure 1
 Location of Subject Lands

0 500 m
 1:25,000





Project 2305387

NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024; © Dufferin County, 2024.

Legend

- Subject Lands
- Road
- Conservation Authority Administrative Boundary
- Growth Plan for the Greater Golden Horseshoe
- Natural Heritage System (Dufferin County)
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Constructed Drain
- Watercourse
- Waterbody
- Wooded Area

2nd Line, Amaranth
 The Cellular Connection

Figure 2
 Landscape Setting



Szabo, Agneta

From: Szabo, Agneta
Sent: May 16, 2024 5:07 PM
To: Ashley Harris
Cc: Valerie Schmidt; Male, Sean; McDonald, Sarah; Stuart Turk
Subject: RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Categories: *

Hello Ashley,

Thank you for getting back to me—this comment has been noted and will be addressed in the EIS.

We have also contacted the Conservation Authorities, and they are reviewing the Terms of Reference as well.

Have a good evening,

Agneta

GEI AGNETA SZABO, M.Env.Sc. (she/her)
Ecologist
647.242.6492
650 Woodlawn Road West, Block C, Unit 2, Guelph, ON N1K 1B8



From: Ashley Harris <aharris@amaranth.ca>
Sent: Thursday, May 16, 2024 4:08 PM
To: Valerie Schmidt <vschmidt@gspgroup.ca>; Szabo, Agneta <aszabo@geiconsultants.com>
Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>
Subject: [EXT] RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

EXTERNAL EMAIL

Hi Agneta

Our Township Engineer did a review of your Terms of Reference. Please see their comment below.

Our only comment is that the Terms of Reference state that there are no woodlands on site but do not consider that there are woodlands on adjacent properties. The EIS should consider whether setbacks from adjacent woodlands and wetlands are required. Thank you GF

Please also remember to reach out to the Conservation Authorities as mentioned by Valerie in the email below.

Thank you.

Ashley Harris

Planning Coordinator
Township of Amaranth
374028 6th Line | Amaranth | ON | L9W 0M6
Tel: 519-941-1007



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From: Valerie Schmidt <vschmidt@gspgroup.ca>
Sent: Wednesday, April 24, 2024 9:58 AM
To: Szabo, Agneta <aszabo@geiconsultants.com>
Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>; Ashley Harris <aharris@amaranth.ca>
Subject: RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Hi Agneta,

We have sent the TOR to our external environmental consultant to review.

The conservation authorities were not involved in the pre-consultation meeting. I would suggest contacting them directly to confirm any requirements. They may require a review fee.

Thanks,
Valerie

Valerie Schmidt
MCIP, RPP
Senior Planner

office: 519.569.8883
direct: 226.243.7445
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From: Szabo, Agneta <aszabo@geiconsultants.com>
Sent: Wednesday, April 10, 2024 2:23 PM
To: Valerie Schmidt <vschmidt@gspgroup.ca>
Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>

Subject: RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Good afternoon, Valerie.

I'm following up to confirm receipt of our EIS TOR submission, below. In case this helps, I have attached the pre-consultation summary we received for this file.

Please let me know if you have any questions or comments regarding the TOR.

Thank you,

Agneta

GEI AGNETA SZABO, [M.Env.Sc.](#) (she/her)
Ecologist
647.242.6492
650 Woodlawn Road West, Block C, Unit 2, Guelph, ON N1K 1B8

[Redacted]

From: Szabo, Agneta
Sent: Monday, March 18, 2024 5:53 PM
To: vschmidt@gspgroup.ca
Cc: smale@geiconsultants.com; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>
Subject: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Good afternoon, Valerie.

Attached are the Terms of Reference (TOR) for an Environmental Impact Study (EIS) prepared on behalf of The Cellular Connection Ltd. for their property located at 514504 2nd Line in the Township of Amaranth, Ontario.

The TOR outlines the proposed ecological field surveys for the EIS and describes the proposed structure and content of the EIS report.

Please circulate the TOR to staff at the Township and the Conservation Authorities as needed and let me know if you have any questions or comments.

Kind regards,

Agneta

GEI AGNETA SZABO, [M.Env.Sc.](#) (she/her)
Ecologist
647.242.6492
650 Woodlawn Road West, Block C, Unit 2, Guelph, ON N1K 1B8

[Redacted]



June 7, 2024
Via email

Agneta Szabo, Ecologist
GEI Consultants
650 Woodlawn Road West, Block C Unit 2
Guelph, ON, N1K 1B8

Dear Ms. Szabo,

Re: 514504 2nd Line, Township of Amaranth
Terms of Reference –Environmental Impact Study

Grand River Conservation Authority (GRCA) staff has reviewed the above-noted Terms of Reference for a Scoped Environmental Impact Study (EIS) at 514504 2nd Line in the Township of Amaranth. It is our understanding that the EIS is to support a proposed Official Plan Amendment, Zoning By-law Amendment and Draft Plan of Subdivision for the subject lands.

GRCA Comments

Information available at this office indicates that a portion of the subject property is regulated by the GRCA due to the presence of a wetlands, watercourses/waterbodies, and the regulated allowance to these features. Proposed development/site alteration within GRCA regulated area will require prior written consent from the GRCA in the form of a permit pursuant to Ontario Regulation 41/24. GRCA resource mapping has been enclosed with this letter.

The GRCA offer the following comments on the submitted Terms of Reference:

1. The EIS ToR should indicate that potential impacts to local site perviousness and water balance of wetlands on and adjacent to the subject property will be assessed and addressed. If a water balance assessment is being completed under separate cover (e.g. in a separate water balance study or stormwater management report), the relevant results of that report should be incorporated appropriately into the EIS. Water balance study protocols, hydroperiod resolution (e.g. monthly), and proposed mitigations should be scoped to the sensitivity of the wetland features present, and the scale of the developments' impact on hydrology. Additionally, potential temporary impacts that site grading, construction and dewatering activities may have on groundwater and surface flow towards the adjacent wetland should be assessed, with mitigation proposed as needed, in the EIS.
2. It should be specified that the wetland boundary delineation and wetland evaluation will be completed by someone certified in the OWES.
3. GRCA's main concern with regards to the headwater drainage feature assessment will be in assessing and maintaining the hydrologic function of these features.
4. Distances of the proposed construction from confirmed wetland boundaries, along with setbacks, should be included on construction drawings at detailed design. It should be

indicated that these wetland boundaries have been confirmed with GRCA staff, and on which date.

5. It is recommended that monitoring of average wetness coefficient of plant species in wetland communities be included in post-construction monitoring proposed, to aid in detection of potential hydrologic impacts to these wetland units.
6. Details on the following mitigations should be included in construction drawings and documents submitted for permitting:
 - a) An erosion and sediment control plan to protect wetlands present.
 - b) Location of any required staging areas.
 - c) A contingency dewatering plan.
7. Please include GRCA feature boundaries on all figures. GRCA GIS data can be accessed on our website at the following address: <https://data.grandriver.ca/downloads-geospatial.html>.

Should you have any questions, please contact me at 519-621-2763 extension 2236, or clorenz@grandriver.ca.

Sincerely,



Chris Lorenz, M.Sc.
Resource Planner
Grand River Conservation Authority

Enclosed: GRCA Resource Mapping

Szabo, Agneta

From: Tyler Mulhall <tmulhall@nvca.on.ca>
Sent: June 6, 2024 1:39 PM
To: Szabo, Agneta
Subject: [EXT] RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Categories: *

EXTERNAL EMAIL

Good afternoon Agneta,

NVCA staff undertook a site visit on the property on Monday June 3, 2024 as it related to the discovery of unauthorized works on the property within the area of the mapped natural heritage features.

I would like to set up a time to discuss the TOR as provided to the Township. I would also like to have an understanding if GEI has attended the site at all, as the owner has made reference to his consultants attendance and timelines which do not coincide with what was provided by the Township. At present time, review of the TOR is on hold, while we investigate further. NVCA staff have confirmed that the wetlands on the property within NVCA's regulated portion of the property have been removed through site alteration.

NVCA staff will need to determine next steps following the above discussion.

Please let me know of a time when GEI is available to meet.

Kindly,

Please note: Regulations and Permit Staff are experiencing a significant volume of applications and inquiries at this time and some delays or disruptions in correspondence may be experienced. Additionally, the NVCA has a hybrid work arrangement, if you wish to meet with me at the office, please book an appointment by calling our Receptionist at 705-424-1479. If your matter is urgent please contact permits@nvca.on.ca.

Tyler Mulhall, C. Tech (he/him/his) | Planner
Provincial Offences Officer
Nottawasaga Valley Conservation Authority
8195 8th Line, Utopia, ON L0M 1T0
T 705-424-1479 ext. 245
tmulhall@nvca.on.ca | nvca.on.ca

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From: Szabo, Agneta <aszabo@geiconsultants.com>
Sent: Tuesday, June 4, 2024 1:22 PM
To: Planning Dept <Planning@nvca.on.ca>; 'Chris Lorenz' <clorenz@grandriver.ca>
Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>; Arlene Beaumont <Arlene@weoughtred.ca>; Ashley Harris <aharris@amaranth.ca>

Subject: RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

You don't often get email from aszabo@geiconsultants.com. [Learn why this is important](#)

Goor afternoon, Chris and Mariella.

I hope you had an enjoyable weekend and start to your week.

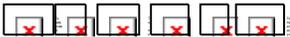
I am following up on the status of your review of the Terms of Reference for the 514504 2nd Line, Amaranth Environmental Impact Study.

I would also like to coordinate a date for the wetland staking. I have cc'd Ashley Harris from the Township, in case they/their representative would like to attend the staking as well.

Thank you,

Agneta

GEI AGNETA SZABO, [M.Env.Sc.](#) (she/her)
Ecologist
647.242.6492
650 Woodlawn Road West, Block C, Unit 2, Guelph, ON N1K 1B8



From: Planning Dept <Planning@nvca.on.ca>

Sent: Thursday, May 9, 2024 10:18 AM

To: 'Chris Lorenz' <clorenz@grandriver.ca>; Szabo, Agneta <aszabo@geiconsultants.com>

Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>; Emma Perry <eperry@nvca.on.ca>; Tyler Mulhall <tmulhall@nvca.on.ca>; Planning Dept <Planning@nvca.on.ca>

Subject: [EXT] RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

EXTERNAL EMAIL

Good morning,

As the NVCA was not circulated on the pre-consultation request, we would request all materials from the pre-consultation be circulated first for review and comment by NVCA staff which may include the review of the TOR for the EIS (review fees applicable).

Please circulate the materials at your earliest convenience so that NVCA staff can begin review. Please reach out should you have any further questions or concerns.

Thank you,

Mariella Leccese (she/her/hers)
Development Review Assistant

Planning Department

Nottawasaga Valley Conservation Authority

8195 8th Line, Utopia, ON L0M 1T0

T 705-424-1479

planning@nvca.on.ca | www.nvca.on.ca

To see if your property is regulated by the NVCA, use our [Interactive Mapping Tool](#).

To find out if your property may be affected by NVCA policies and regulations, complete our online property inquiry form at <https://permit.nvca.on.ca/>.

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From: Chris Lorenz <clorenz@grandriver.ca>

Sent: Thursday, May 9, 2024 9:48 AM

To: Szabo, Agneta <aszabo@geiconsultants.com>; Planning Dept <Planning@nvca.on.ca>

Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>

Subject: RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

You don't often get email from clorenz@grandriver.ca. [Learn why this is important](#)

Good morning Agneta,

The Township circulated your TOR for review last week; GRCA will review and provide comment.

GRCA was not circulated the pre-consultation request and therefore did not participate in the meeting. Had we participated, one of the items requested would have been completion on an EIS, so for now the next steps would be our review and comment on the TOR.

Thanks,

Chris Lorenz, M.Sc.

Resource Planner

Grand River Conservation Authority

519-621-2763 ext. 2236

From: Szabo, Agneta <aszabo@geiconsultants.com>

Sent: Tuesday, May 7, 2024 3:02 PM

To: planning@nvca.on.ca; Chris Lorenz <clorenz@grandriver.ca>

Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>

Subject: FW: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Good afternoon.

Attached are the Terms of Reference (TOR) for an Environmental Impact Study (EIS) prepared on behalf of The Cellular Connection Ltd. for their property located at 514504 2nd Line in the Township of Amaranth, Ontario.

This property is partially within Grand River Conservation Authority jurisdiction and partially within Nottawasaga Valley Conservation Authority jurisdiction, as shown on Figure 2 of the TOR. The TOR outlines the proposed ecological field surveys for the EIS and describes the proposed structure and content of the EIS report.

Per the emails below, the Township is currently reviewing the TOR; however, it is our understanding that the Conservation Authorities were not involved in the pre-consultation meeting. Please let us know what the next steps are.

Kind regards,

Agneta

GEI AGNETA SZABO, [M.Env.Sc.](#) (she/her)
Ecologist
647.242.6492
650 Woodlawn Road West, Block C, Unit 2, Guelph, ON N1K 1B8



From: Valerie Schmidt <vschmidt@gspgroup.ca>
Sent: Wednesday, April 24, 2024 9:58 AM
To: Szabo, Agneta <aszabo@geiconsultants.com>
Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>; Ashley Harris <aharris@amaranth.ca>
Subject: [EXT] RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

EXTERNAL EMAIL

Hi Agneta,

We have sent the TOR to our external environmental consultant to review.

The conservation authorities were not involved in the pre-consultation meeting. I would suggest contacting them directly to confirm any requirements. They may require a review fee.

Thanks,
Valerie

Valerie Schmidt
MCIP, RPP
Senior Planner

office: 519.569.8883
direct: 226.243.7445
mobile: 226.339.5193

email: vschmidt@gspgroup.ca



72 Victoria Street South
Suite 201
Kitchener, ON N2G 4Y9

www.gspgroup.ca



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From: Szabo, Agneta <aszabo@geiconsultants.com>

Sent: Wednesday, April 10, 2024 2:23 PM

To: Valerie Schmidt <vschmidt@gspgroup.ca>

Cc: Male, Sean <smale@geiconsultants.com>; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>

Subject: RE: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Good afternoon, Valerie.

I'm following up to confirm receipt of our EIS TOR submission, below. In case this helps, I have attached the pre-consultation summary we received for this file.

Please let me know if you have any questions or comments regarding the TOR.

Thank you,

Agneta

GEI AGNETA SZABO, [M.Env.Sc.](https://www.geiconsultants.com) (she/her)
Ecologist
647.242.6492
650 Woodlawn Road West, Block C, Unit 2, Guelph, ON N1K 1B8



From: Szabo, Agneta

Sent: Monday, March 18, 2024 5:53 PM

To: vschmidt@gspgroup.ca

Cc: smale@geiconsultants.com; McDonald, Sarah <smcdonald@geiconsultants.com>; Stuart Turk <stuartturk@hotmail.com>

Subject: 514504 2nd Line, Hamlet of Laurel, Township of Amaranth - Terms of Reference for an Environmental Impact Study

Good afternoon, Valerie.

Attached are the Terms of Reference (TOR) for an Environmental Impact Study (EIS) prepared on behalf of The Cellular Connection Ltd. for their property located at 514504 2nd Line in the Township of Amaranth, Ontario.

The TOR outlines the proposed ecological field surveys for the EIS and describes the proposed structure and content of the EIS report.

Please circulate the TOR to staff at the Township and the Conservation Authorities as needed and let me know if you have any questions or comments.

Kind regards,

Agneta



AGNETA SZABO, [M.Env.Sc.](#) (she/her)
Ecologist
647.242.6492
650 Woodlawn Road West, Block C, Unit 2, Guelph, ON N1K 1B8



Appendix D Letter Re: GRCA Wetlands Violation

Grand River Conservation Authority (GRCA) Wetland Removal

May 14, 2025
Project No. 2305387

VIA EMAIL: stuartturk@hotmail.com

Stuart Turk
The Cellular Connection Ltd.
78 Farnham Avenue
Toronto, ON M4V 1H4

Re: Grand River Conservation Authority (GRCA) Wetland Removal
514504 Second Line
Amaranth, Ontario

Dear Stuart Turk,

GEI Consultants Canada Ltd. (GEI) has completed a review and assessment of a previously removed wetland on the property located at 514504 2nd Line in the Hamlet of Laurel, Township of Amaranth, Ontario (herein referred to as the Subject Lands; **Figure 1, Appendix A**). The Subject Lands are located north of Side Road 15, west of 2nd Line, south of Side Road 20, and east of County Road 11. Furthermore, the Subject Lands straddle the regulatory limits of the Nottawasaga Valley Conservation Authority (NVCA) at the northeastern portion of the site and the Grand River Conservation Authority (GRCA) at the southwestern portion of the site (**Figure 2, Appendix A**).

GEI understands that a wetland located within GRCA's jurisdiction was previously removed and that a permit application has been submitted to the GRCA. As part of the application review process, GRCA has requested a letter confirming whether the removal meets the applicable policy criteria outlined in Sections 8.4.4 and 8.4.5 of GRCA's (2024) policies:

8.4.4 Development activity within a naturally occurring wetland may be permitted where the wetland is less than 0.5 hectares (1.24 acres) and it can be demonstrated that the wetland is not:

- a) located within a floodplain or watercourse,*
- b) there are no negative or adverse impacts on flooding and erosion, and*
- c) hazards related to unstable soils can be addressed.*

8.4.5 Development activity within or interference with an anthropogenic wetland less than 2 hectares (5 acres) may be permitted where it can be demonstrated that the wetland's hydrologic functions can be maintained or enhanced elsewhere within the subwatershed or planning area and the wetland is not:

- a) located within a floodplain or watercourse,*
- b) there are no negative or adverse impacts on flooding and erosion, and*
- c) hazards related to unstable soils can be addressed.*

This letter has been prepared in response to this request and provides the necessary supporting information for GRCA's permit review.

Historical Aerial and Satellite Imagery Review

GEI reviewed available high-resolution historical aerial imagery from MNR (2025a) and Dufferin County, supplemented by historical satellite imagery from Google for years without aerial imagery coverage. Available imagery spanned from 2006 to 2023 and was assessed to determine the presence and timing of removal of the subject wetland feature.

The wetland is visible in the earliest imagery from 2006 (**Figure A**), indicating it is likely naturally occurring, as no restoration work is known to have occurred on the property prior to 2008–2011. Accordingly, this letter addresses the criteria in Section 8.4.4 of GRCA's (2024) policies for naturally occurring wetlands, which are more restrictive than those in Section 8.4.5. The feature remained present from 2006 (**Figure A**, indicated with a blue box) through 2021 (**Figure B**, indicated with a blue box), appearing as a small, vegetated depression without a clearly defined watercourse. It was removed between 2021 and 2023.

Figure A. 2006 Aerial Imagery (Source: Geospatial Ontario)



Figure B. 2021 Satellite Imagery (Source: Google)



Background Information Review

GEI reviewed the following sources for background information relating to historical wetland extent delineation within the Subject Lands:

- Ministry of Natural Resources (MNR) Make A Map: Natural Heritage Areas mapping tool;
- MNR Ontario Watershed Information Tool (OWIT) mapping tool;
- GRCA regulation mapping tool; and
- *Scoped Environmental Impact Assessment: Part of Lot 19, Concession 2, Township of Amaranth County of Dufferin* (Azimuth 2018).

The MNR (2025a) natural heritage areas mapping does not identify the removed wetland. However, it is shown in GRCA (2025) regulation mapping (see **Appendix B**) as a regulated wetland, with a regulated watercourse extending from its southern extent and flowing toward an existing regulated wetland that forms part of the Whittington Provincially Significant Wetland (PSW) complex. Further south, an additional section of regulated watercourse is mapped, connecting this first, smaller PSW unit and the larger PSW complex. No GRCA-regulated floodplain—engineered, estimated, or approximated—is mapped in the vicinity of the removed wetland.

The Ontario Watershed Information Tool (OWIT; MNR 2025b) provides a means of generating watershed maps and estimating watershed characteristics. OWIT mapping does not identify a waterbody or watercourse in the vicinity of the removed wetland. As such, drainage area and watercourse length could not be calculated; however, these are expected to be minor, as the feature is located just south of the drainage divide between the GRCA and NVCA watersheds. Notably, the drainage area associated with the mapped regulated watercourse to the south, connecting the two smaller PSW units and the larger PSW complex, was less than 10 ha.

The removed wetland was previously documented in Azimuth’s 2018 Scoped Environmental Impact Assessment (EIA) report, where it was classified as a Forb Mineral Meadow Marsh (MAM2-10).

Natural Heritage Review

Based on a review of historical aerial imagery, the removed wetland was approximately 0.3 hectares in size, which is below the 0.5 ha upper threshold for potential development within a naturally occurring wetland, as outlined in Section 8.4.4 of GRCA’s (2024) policies.

The drainage feature mapped as a regulated watercourse (GRCA 2025; see **Appendix B**) extending from the southern extent of the removed wetland was not present on the landscape during ecological field surveys conducted by GEI in 2024 as part of an Environmental Impact Study (EIS; GEI 2025). However, the section of regulated watercourse mapped by GRCA (2025) as connecting the smaller PSW unit and the larger PSW complex was confirmed by GEI to be a headwater drainage feature, which was assessed through a Headwater Drainage Feature Assessment (HDFA) conducted between March and August 2024 (GEI 2025).

The feature—labelled Reach H1S1 in the HDFA figure (**Appendix C**)—consists of a single reach flowing south from a piped outlet control structure designed to regulate water levels. It flows through a narrow swale within a stripped and disturbed landscape devoid of riparian vegetation. Flow was observed during the first and second HDFA survey rounds but was absent during the third. The HDFA management recommendation for this feature was “mitigation”.

Fluvial Geomorphic Review

This section addresses the first two criteria of Section 8.4.4 of GRCA’s (2024) policies, specifically that the wetland is:

- a) not located within a floodplain or watercourse; and
- b) not associated with negative or adverse impacts on flooding and erosion.

The removed wetland was not located within a floodplain or watercourse. While GRCA (2025) regulation mapping shows a regulated watercourse originating at the southern extent of the removed wetland, this feature was not observable in historical imagery or identified through the OWIT (MNR 2025b). Furthermore, while this drainage feature had already been removed from the landscape prior to GEI’s ecological field surveys in 2024, another drainage feature located just to the south—connecting the smaller PSW unit and the larger PSW complex—was determined to be a headwater drainage feature (GEI 2025; see **Appendix C**). This headwater drainage feature consists of a narrow, seasonally flowing swale with an upstream drainage area of less than 10 ha.

Any potential minor impacts to flooding or erosion resulting from the removal of the wetland would be confined to the short, approximately 40 m area between the removed wetland and the smaller PSW unit. Based on GEI’s 2024 HDFA and a review of aerial imagery and available mapping, the smaller PSW unit continues to discharge southward into the larger PSW complex through the seasonally flowing swale. As such, no adverse or negative impacts to downstream flood conveyance or erosion risk are anticipated as a result of the wetland removal.

Geotechnical Review

This section addresses the third criterion of Section 8.4.4 of GRCA's (2024) policies, specifically that:

- c) hazards related to unstable soils can be addressed.

GRCA (2024) policy Section 8.8 defines Hazard Lands as follows:

"Hazardous land is defined in the Regulation as land that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock.

The Grand River watershed contains other hazardous lands including organic soils and unstable bedrock such as the karst formations. Organic and peat soils, formed by the decomposition of vegetative and organic materials into humus can release humic acids to the ground water system and create highly combustible methane gas. Peat and other organic soils also lack soil structure making them susceptible to erosion and unable to support structure because they compress easily."

While the guidelines do not explicitly define "unstable soils," in the context of wetland removal, this typically refers to the presence of organic or peat deposits, as well as erosion- or slope-related instability.

GRCA's online regulation mapping indicates that there are no slope hazards on or near the Subject Lands. Topographic contour data for the property was also reviewed and does not show any steep slopes in the area. Therefore, there are no hazards related to unstable soils from a slope stability perspective.

A geotechnical investigation was completed for the property: *Geotechnical Investigation, Proposed Residential Subdivision, 514504 2nd Line, Amaranth, Ontario* (Report No. 230114-G1, dated January 2, 2024, by Canada Engineering Services Inc.). Boreholes were advanced across the site, including Borehole 8, located just west of the former wetland. Borehole 8 encountered 1 m of topsoil and organics, underlain by stiff to very stiff silt and clay till, followed by dense silty sand till.

Key findings from the geotechnical report include:

- All building foundations will be constructed on the underlying silt and clay till or silty sand till below the topsoil, or on engineered fill. Subgrades must be verified by geotechnical engineering personnel;
- Floor slabs may be constructed as slabs-on-grade, provided that all deleterious materials, including topsoil, organics, and soft spots, are removed;
- Pavement subbase thicknesses may need to be increased depending on subgrade conditions and results of site inspection; and
- No issues are anticipated for excavations related to sewers and footings, provided backfill operations are inspected by qualified personnel.

Based on the above, any potential organic or peat materials within the former wetland area can be addressed through standard construction practices, as outlined in the geotechnical report (CES 2024).

Conclusions and Recommendations

Based on a review of available background information, historical imagery, ecological field surveys, and geotechnical investigations, GEI is of the opinion that the removal of the subject wetland meets the criteria outlined in Section 8.4.4 of GRCA's (2024) policies for development within a naturally occurring wetland. The feature was less than 0.5 ha in size, not located within a floodplain or watercourse, and its removal is not expected to result in adverse or negative impacts on flooding, erosion, or soil stability. While organic soils were encountered in proximity to the former wetland, they can be managed during construction in accordance with recommendations provided in the supporting geotechnical report (CES 2024).

GEI recommends that the conclusions of this letter be considered in support of GRCA's permit review. Should any further clarification be required, please do not hesitate to contact one of the undersigned. GEI would be pleased to provide additional support.

Sincerely,

GEI Consultants Canada Ltd.

Prepared By:



Agneta Szabo
Project Manager & Ecologist
aszabo@geiconsultants.com
647-242-6492



Ahmed Siddiqui, P.Geo. (Limited)
Senior Fluvial Geomorphologist
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416-991-3169



Russell Wiginton, P.Eng.
Senior Geotechnical Engineer
rwiginton@geiconsultants.com
613-876-1441

Reviewed By:

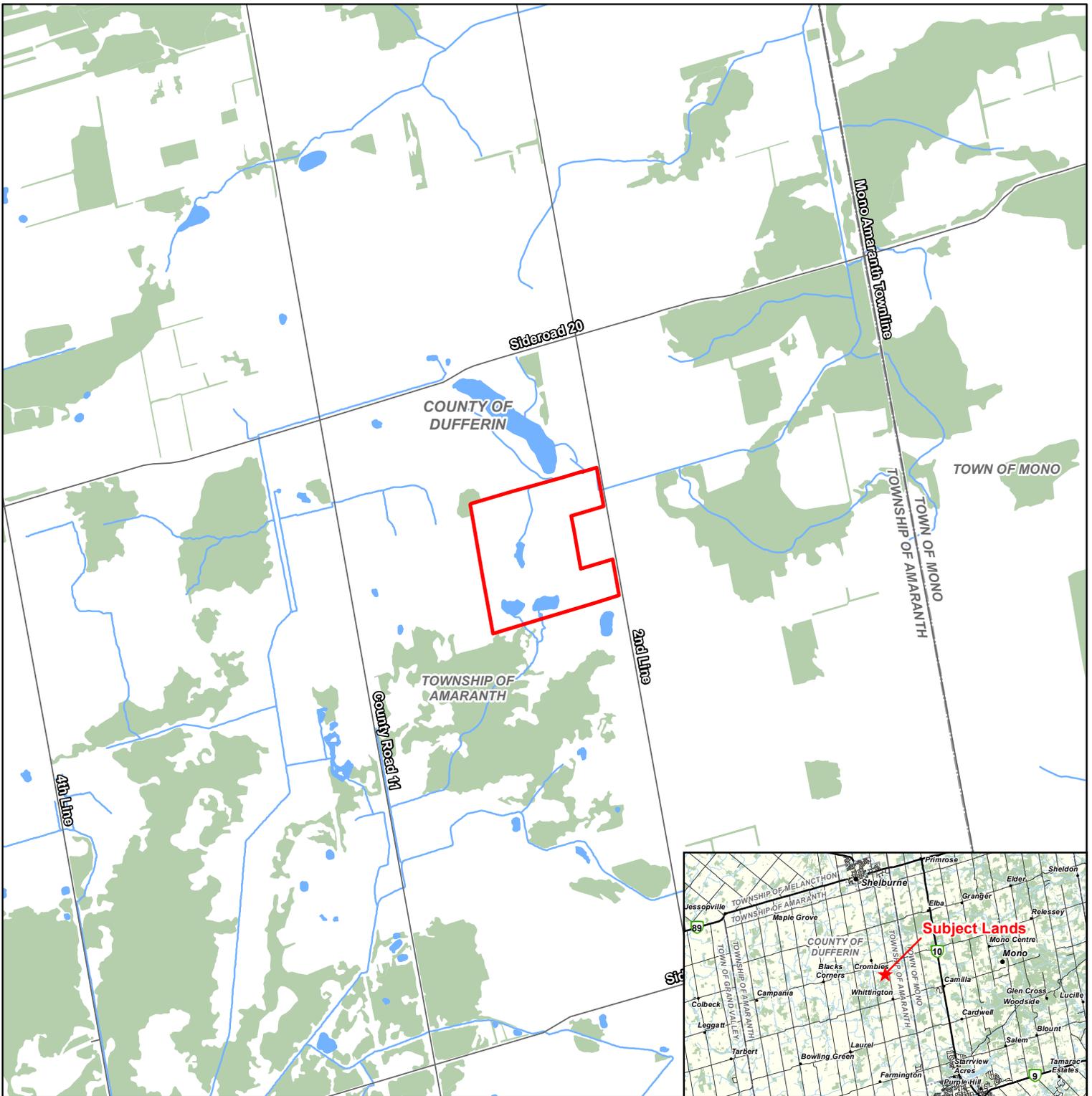


Sean Male
Vice President & Senior Ecologist
smale@geiconsultants.com
289-407-7483

Appendices

- | | |
|------------|---|
| Appendix A | Figures |
| Appendix B | GRCA Regulation Mapping |
| Appendix C | Figures Extracted from Environmental Impact Study |

Appendix A Figures



Project 2305387

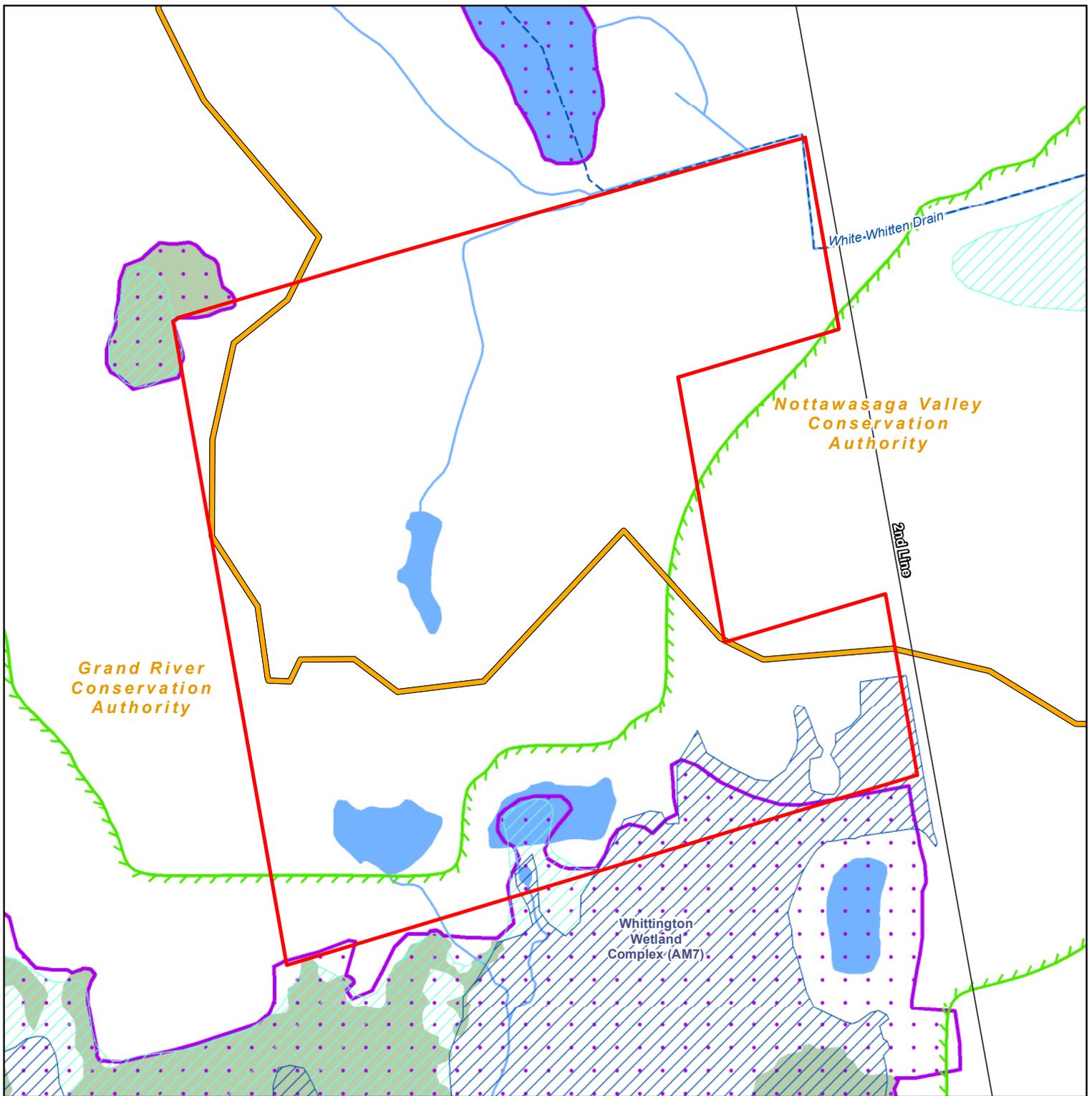
NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024.

- Legend**
- Subject Lands
 - Municipal Boundary, Lower/Single Tier
 - Watercourse
 - Waterbody
 - Wooded Area

2nd Line, Amaranth
 The Cellular Connection

Figure 1
 Location of Subject Lands





Project 2305387

NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024; © Dufferin County, 2024.

Legend

- Subject Lands
- Road
- Conservation Authority Administrative Boundary
- Growth Plan for the Greater Golden Horseshoe
- Natural Heritage System (Dufferin County)
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Constructed Drain
- Watercourse
- Waterbody
- Wooded Area

2nd Line, Amaranth
 The Cellular Connection

Figure 2
 Landscape Setting



Appendix B GRCA Regulation Mapping



Appendix B: GRCA Regulation Mapping

Legend

-  Regulation Limit (GRCA)
- Floodplain (GRCA)**
 -  Engineered
 -  Estimated
 -  Approximate
-  Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)**
 -  Steep
 -  Oversteep
 -  Toe
- Slope Valley (GRCA)**
 -  Steep
 -  Oversteep
-  Regulated Watercourse (GRCA)
-  Regulated Waterbody (GRCA)
-  Wetland (GRCA)
-  Lake Erie Flood (GRCA)
-  Lake Erie Shoreline Reach (GRCA)
-  Lake Erie Dynamic Beach (GRCA)
-  Lake Erie Erosion (GRCA)
-  Parcel - Assessment (MPAC/MNRF)



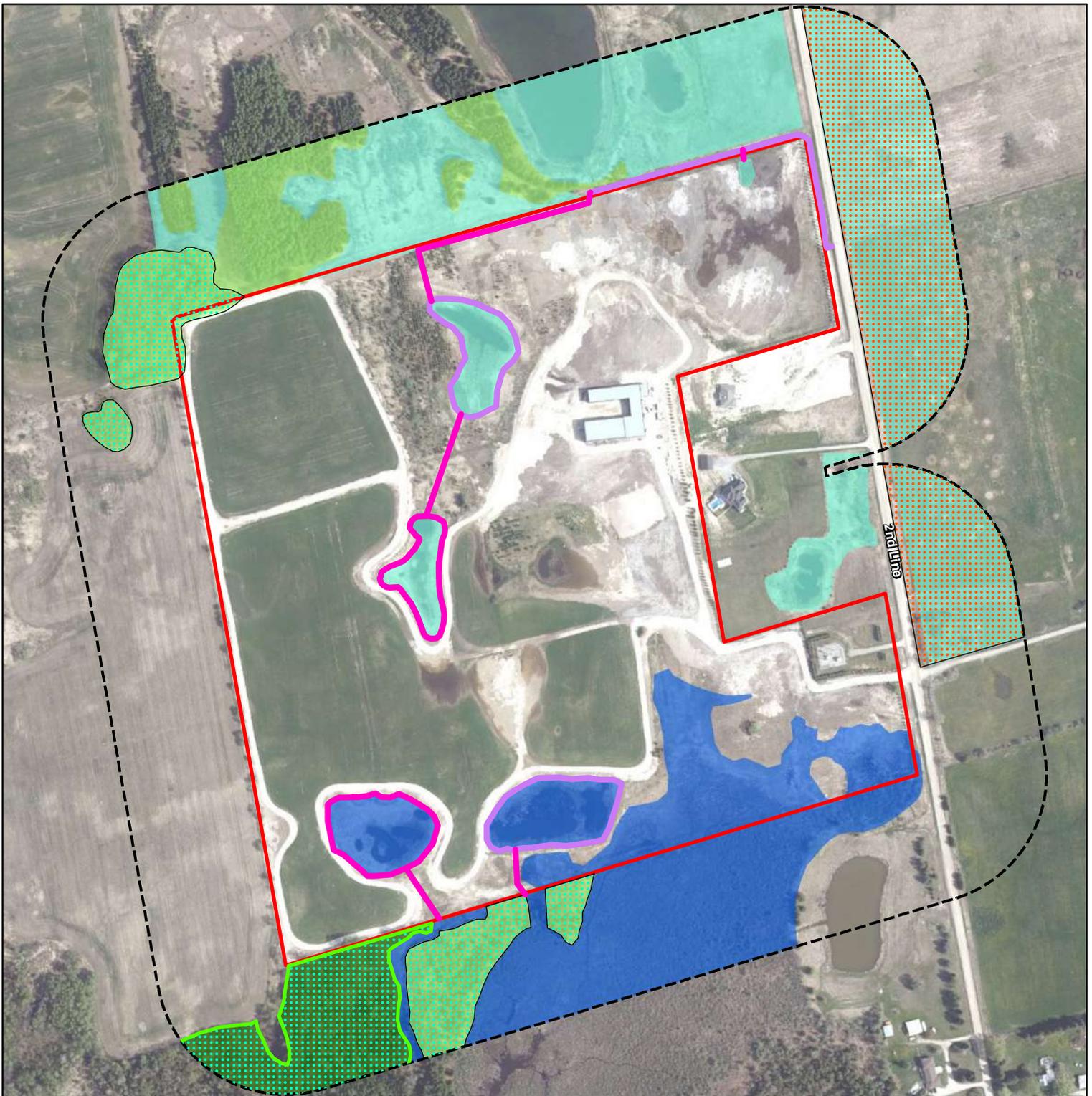
Copyright Grand River Conservation Authority, 2025.

Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

The source for each data layer is shown in parentheses in the map legend. See [Sources and Citations](#) for details.



Appendix C Figures Extracted from Environmental Impact Study



Project 2305387

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024; © Dufferin County, 2024.
3. Orthoimagery © Dufferin County, 2024. Imagery from 2023.

Legend

- Subject Lands
- Subject Lands + 120 metres
- Direct Fish Habitat
- Indirect Fish Habitat
- Provincially Significant Wetland
- Unevaluated Wetland
- Significant Woodland
- Other Woodland
- Candidate SAR (Bats) Roosting Habitat
- Candidate SAR (Bobolink & Eastern Meadowlark) Breeding Habitat
- Candidate SAR (Eastern Whip-poop-will) Breeding Habitat

2nd Line, Amaranth
The Cellular Connection

Figure 7 Significant Natural Heritage Features

0 75 m
1:5,000



Appendix E Letter Re: NVCA Wetlands Violation

Historical Wetland Extent Delineation

September 18, 2024
Project No. 2305387

VIA EMAIL: stuartturk@hotmail.com

Stuart Turk
The Cellular Connection Ltd.
78 Farnham Avenue
Toronto, ON M4V 1H4

**Re: Historical Wetland Extent Delineation
514504 Second Line
Amaranth, Ontario**

Dear Stuart Turk:

GEI Consultants Canada Ltd. (GEI) completed a historical wetland extent delineation for your property located at 514504 2nd Line in the Hamlet of Laurel, Township of Amaranth, Ontario (herein referred to as the Subject Lands; **Figure 1, Appendix A**). The Subject Lands are generally located north of Side Road 15, west of 2nd Line, south of Side Road 20, and east of County Road 11. Furthermore, the Subject Lands straddle the regulatory limits of the Nottawasaga Valley Conservation Authority (NVCA) at the northeastern portion of the site and the Grand River Conservation Authority (GRCA) at the southwestern portion of the site (**Figure 2, Appendix A**).

The NVCA issued a Violation Notice for Unauthorized Works dated May 27, 2024, related to “unauthorized development, interference with a wetland and watercourse alteration of a mapped Municipal Drain” within the Subject Lands. The stated reason for this Violation Notice was the removal of vegetation from areas that the NVCA had formerly identified as wetland. The NVCA has requested that the former extent of the wetlands within their jurisdiction be established through a combination of background information review and site investigations to inform requirements for ecological restoration and/or offsetting.

Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits provides the following definition for wetlands:

“wetland” means land that,

(a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface,

(b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse,

(c) has hydric soils, the formation of which have been caused by the presence of abundant water, and

(d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which have been favoured by the presence of abundant water.

In the field, the dominance (50% cover or greater) of hydrophytic or water-tolerant vegetation is the most reliable indicator of wetland conditions, as vegetation species reflect the long-term hydrological conditions of an area. Other data such as water levels, soil characteristics, and topography can also be used to inform this assessment (MNRF 2022). Due to the removal of the majority of the vegetation within the area subject to this assessment, GEI relied on a combination of background information review and a site investigation to collect data regarding the vegetation, water levels, and soils of the Subject Lands within the NVCA's jurisdiction.

Background Information Review

GEI reviewed the following sources for background information relating to historical wetland extent delineation within the Subject Lands:

- Ministry of Natural Resources and Forestry (MNRF) Land Information Ontario (LIO) geographic database and natural features mapping;
- *Scoped Environmental Impact Assessment: Part of Lot 19, Concession 2, Township of Amaranth County of Dufferin* (Azimuth 2018);
- *Hydrogeological Investigation Report for Proposed Residential Subdivision: 514504 2nd Line, Amaranth Ontario* (CESI 2024);
- Historical aerial and satellite imagery; and
- Historical Google Street View.

Land Information Ontario

Based on the MNRF (2024) LIO database, the following wetland features are mapped within and adjacent to the Subject Lands (**Figure 2, Appendix A**):

- The Whittington Provincially Significant Wetland (PSW) Complex extends onto the Subject Lands along the southern property boundary within the GRCA's jurisdiction;
- An unevaluated wetland is mapped contiguous with the Whittington PSW Complex at the southern end of the Subject Lands within the GRCA's jurisdiction;
- An unevaluated wetland is mapped just outside the Subject Lands at the northwest corner within the GRCA's jurisdiction;
- An unevaluated wetland is mapped within 120 m of the Subject Lands to the east within the NVCA's jurisdiction.

No other known wetlands were identified within or adjacent to the Subject Lands through LIO.

2018 Scoped Environmental Impact Assessment

The 2018 Scoped Environmental Impact Assessment prepared by Azimuth identifies several additional wetlands within the Subject Lands, including within NVCA jurisdiction. A copy of this mapping is provided in **Appendix B**. Please note that mapping of the boundary between GRCA and NVCA jurisdictions in Azimuth's 2018 mapping is not up to date. Current mapping of this boundary is shown in **Figure 2, Appendix A** and will be referenced in this discussion.

Azimuth's 2018 delineation includes two wetland units within NVCA jurisdiction:

- One large wetland extending from the northeast corner of the Subject Lands and down to around the center of the Subject Lands, consisting mainly of MAM2-10 with inclusions of two SA and one MAS2-1 communities. The easternmost boundary of this wetland is indicated to have been confirmed in the field with NVCA.
- One SA community at the center of the Subject Lands surrounded by an unlabeled wetland community type.

2024 Hydrogeological Investigation Report

Canada Engineering Services Inc. (CESI) carried out hydrogeological investigations within the Subject Lands, beginning in October 2023 and are currently ongoing. The preliminary hydrogeological report was reviewed to determine whether the existing monitoring well data could assist in identifying the historical wetland boundary extent.

One monitoring well (corresponding to Borehole 3 in the report) is located within the large MAM2-10 wetland extent mapped by Azimuth in the northeastern portion of the Subject Lands. The soils within this borehole were identified as silty sand for the first meter overlaying silt and clay till for the remaining nine metres below. A water level measurement was taken within the borehole on November 3, 2023, found to be 1.09 meters below the ground level.

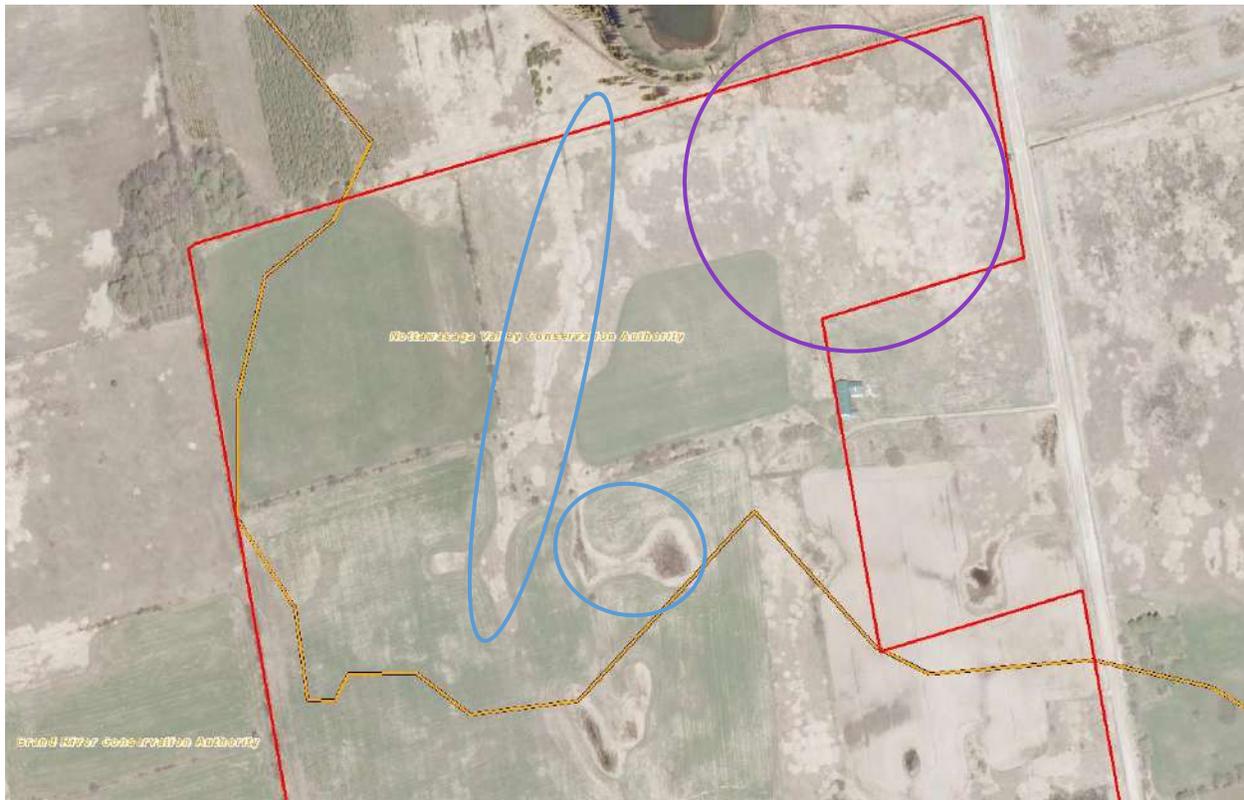
Historical Aerial and Satellite Imagery

GEI completed a review of high-resolution historical aerial imagery from LIO and Dufferin County, as well as historical satellite imagery from Google for years when high-resolution aerial imagery was unavailable. The imagery, spanning from 2006 to 2023, was analyzed to understand the history of site alterations within the Subject Lands and the historical extent of the wetlands within the NVCA's jurisdiction.

This review was conducted by a botanist skilled in interpreting wetland communities from aerial imagery. However, it is essential to acknowledge the limitations of aerial imagery interpretation without ground-truthing vegetation types. This is particularly pertinent for meadow marsh wetland types, which are often more challenging to interpret accurately from aerial imagery alone.

Interpretation of wetland community boundaries is typically best completed based off high-resolution spring (i.e., leaf-off) aerial imagery, when water levels are seasonally high. As such, in the following series of photos (**Figures A to M**), spring aerial imagery was used to interpret wetland community boundaries and Google satellite imagery was referenced only for the purposes of understanding site alterations.

Figure A. 2006 Aerial Imagery



Source: LIO 2006

Aerial imagery from late spring 2006 shows the presence of a narrow band of wetland vegetation along the headwater drainage feature traversing the Subject Lands in addition to a shallow marsh community at the centre of the Subject Lands. These areas are circled in blue. These areas have evident presence of standing water within the shallow marsh community at the centre as well as within the headwater drainage feature. The area to the northeast, circled in purple, has a slightly different colour signature than the wetland community. Furthermore, there are no aquatic features present in this area. As such, the nature of the community in the northeastern corner is ambiguous based on this image.

There were no created wetland communities present within the Subject Lands at this time.

Figure B. 2008 Aerial Imagery



Source: LIO 2008

Aerial imagery from spring 2008 shows the presence of a narrow band of wetland vegetation along the headwater drainage feature traversing the Subject Lands in addition to a shallow marsh community at the centre of the Subject Lands. These areas are circled in blue. The area to the northeast, circled in purple, has a slightly different colour signature than the wetland community. The nature of the community in the northeastern corner is ambiguous based on this image.

There were no created wetland communities present within the Subject Lands at this time.

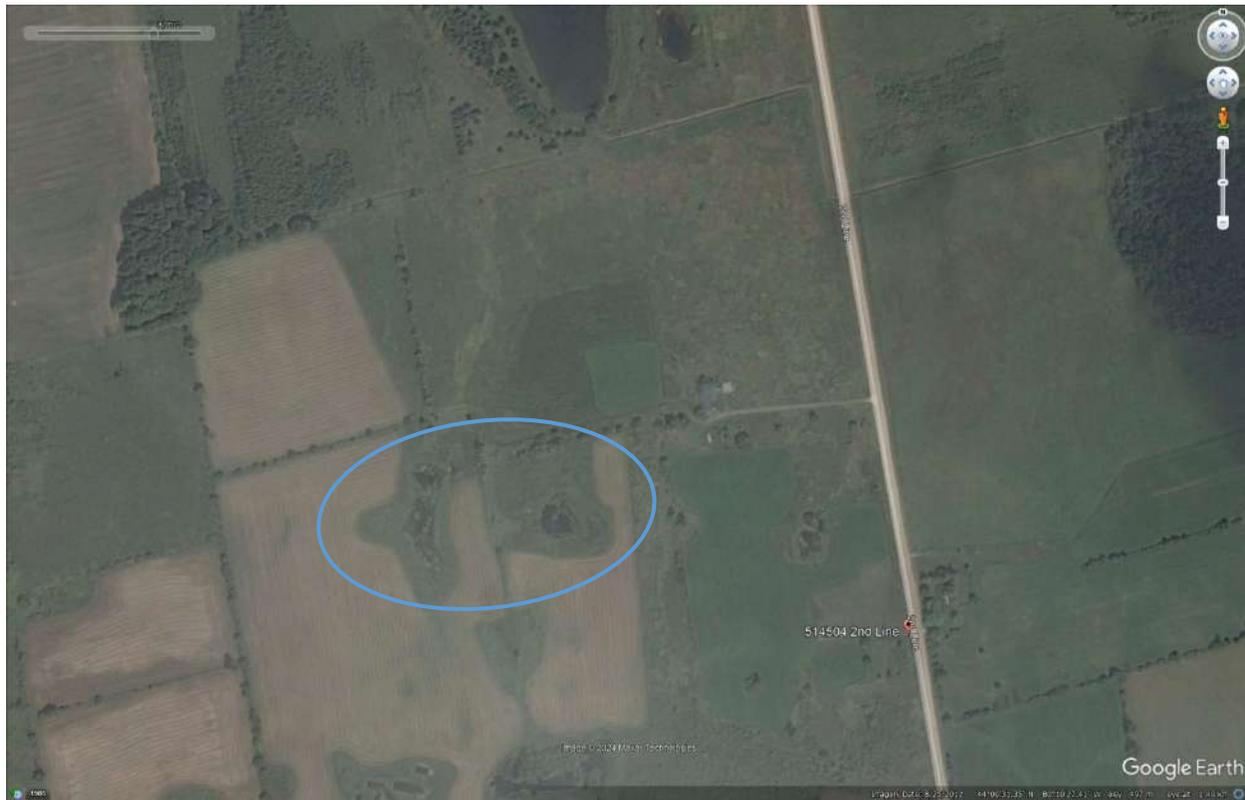
Figure C. 2011 Satellite Imagery



Source: Google 2011

Satellite imagery from summer 2011 shows the creation of two shallow water wetland communities, circled in blue, since the last available imagery in 2008. It is GEI's understanding based on signage present on the Subject Lands as well as communications with the landowner that these shallow water wetland communities were created by Ducks Unlimited Canada. It is expected that these locations were selected due to the presence of existing wetland and the headwater drainage feature. Their creation appears to have expanded the total area of wetland within the Subject Lands.

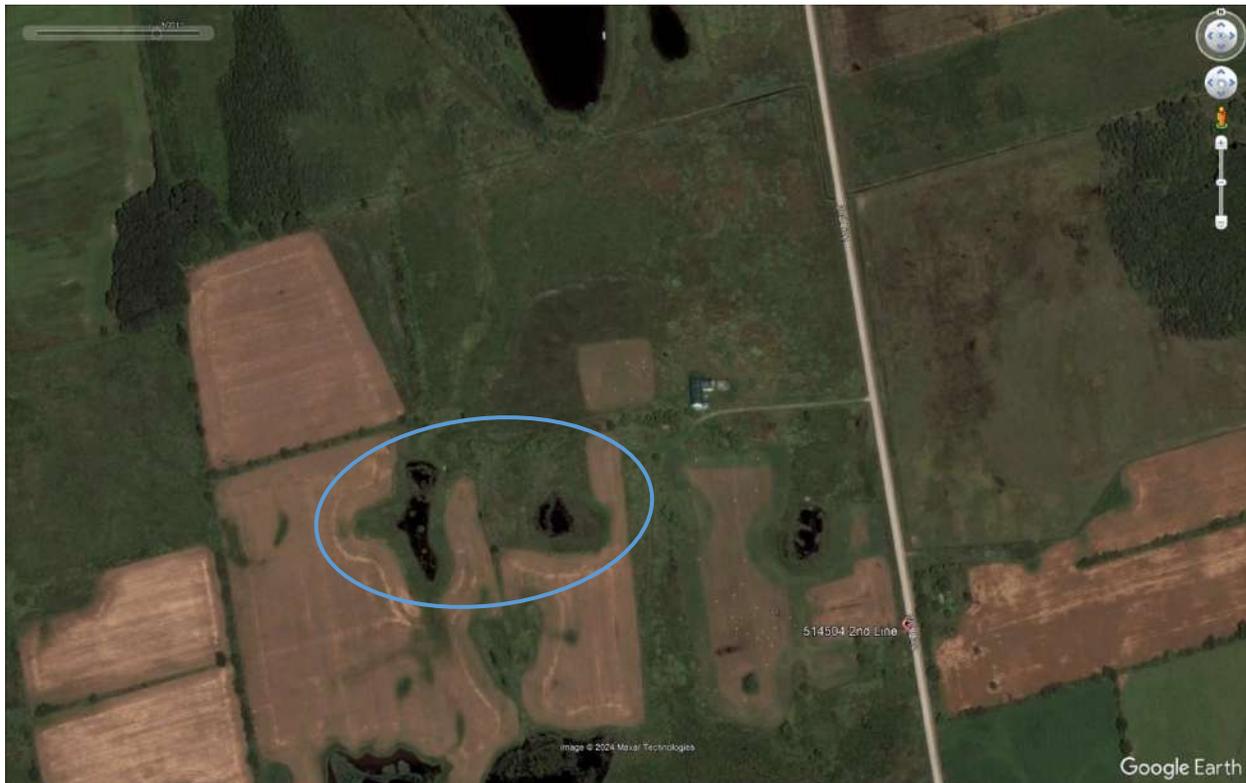
Figure D. 2012 Satellite Imagery



Source: Google 2012

Satellite imagery from summer 2012 continues to show the two shallow water wetland communities, circled in blue, with no additional site alteration.

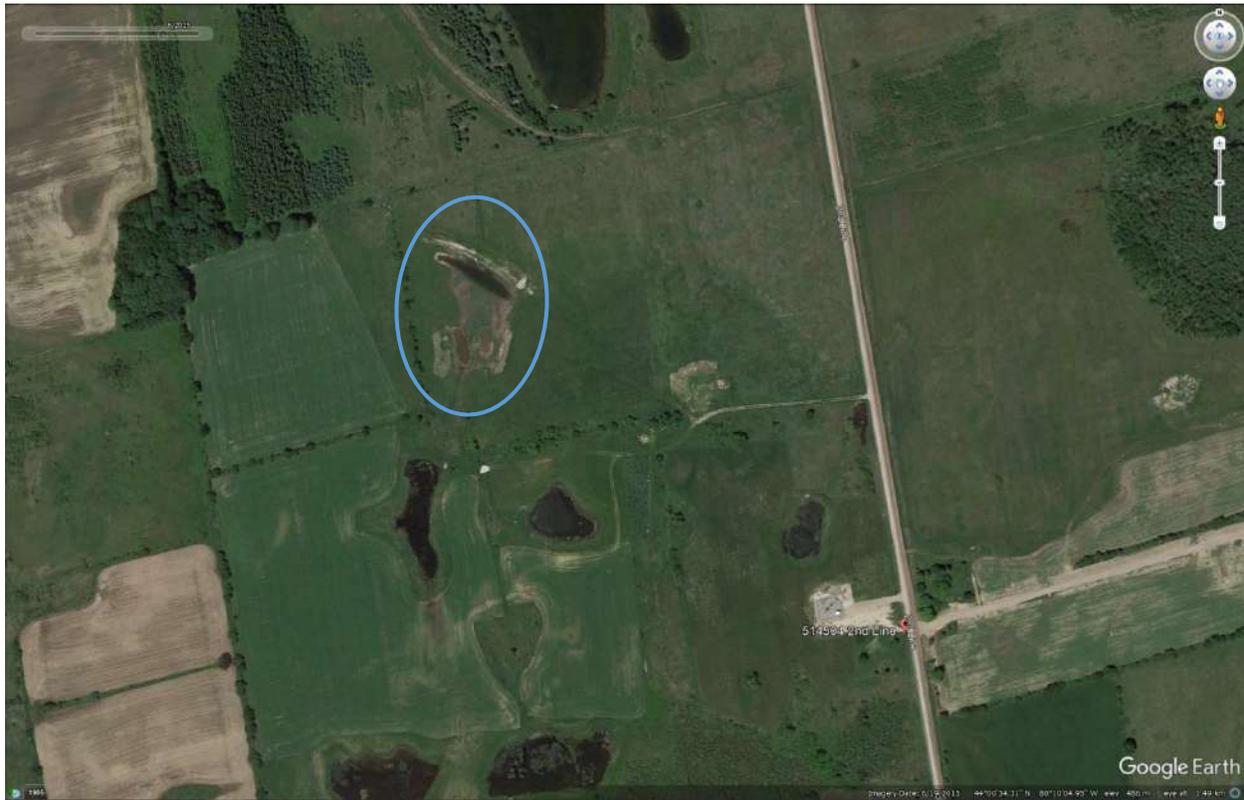
Figure E. 2013 Satellite Imagery



Source: Google 2013

Satellite imagery from summer 2013 continues to show the two shallow water wetland communities, circled in blue, with no additional site alteration.

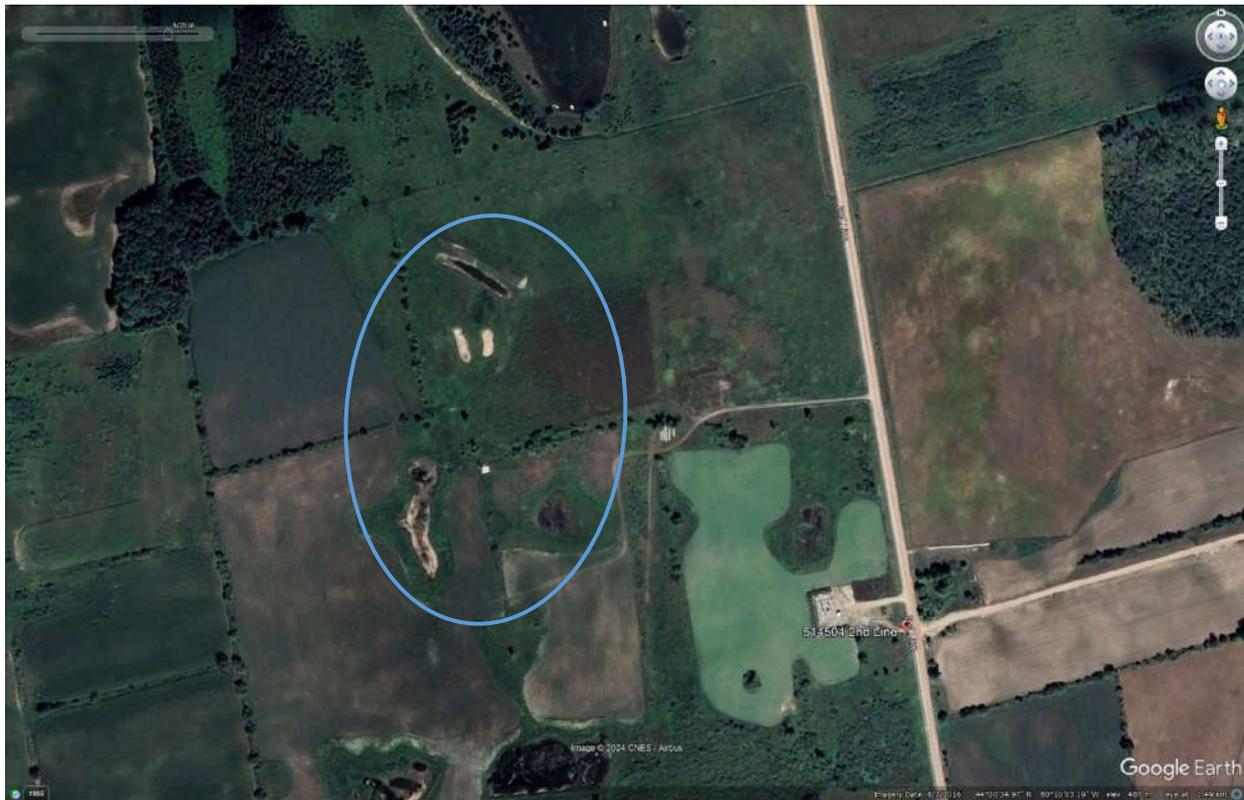
Figure F. 2015 Satellite Imagery



Source: Google 2015

Satellite imagery from summer 2015 shows the creation of another open or shallow water feature created within the existing wetland that bordered the headwater drainage feature, which appears to be in a state of disturbance at the time of this imagery.

Figure G. 2016 Satellite Imagery



Source: Google 2016

Satellite imagery from summer 2016 continues to show the two originally created shallow water wetland communities and the now additional open to shallow water community, circled in blue, with no additional site alteration.

Figure H. 2017 Satellite Imagery



Source: Google 2017

Satellite imagery from summer 2017 continues to show the two originally created shallow water wetland communities and the now additional open to shallow water community, circled in blue, with no additional site alteration.

Figure I. 2018 Aerial Imagery



Source: Dufferin County 2018

Aerial imagery from spring 2018 depicts three dug-out shallow water wetland communities, with the most recently created community featuring an open water area. The aquatic features, including the headwater drainage feature and the shallow and open water communities, are bordered by a narrow band of wetland vegetation, which is circled in blue. The area to the northeast, circled in purple, exhibits a slightly different color signature compared to the wetland but shares some colour and texture properties in a few locations. This region also appears similar to the upland community on the severed property to the south (indicated with a purple arrow). Based on this imagery, the northeastern area appears to be predominantly upland, with potential pockets of wetland vegetation.

Figure J. 2019 Satellite Imagery



Source: Google 2019

Satellite imagery from summer 2019 continues to show the two originally created shallow water wetland communities and the now additional open to shallow water community, circled in blue, with no additional site alteration.

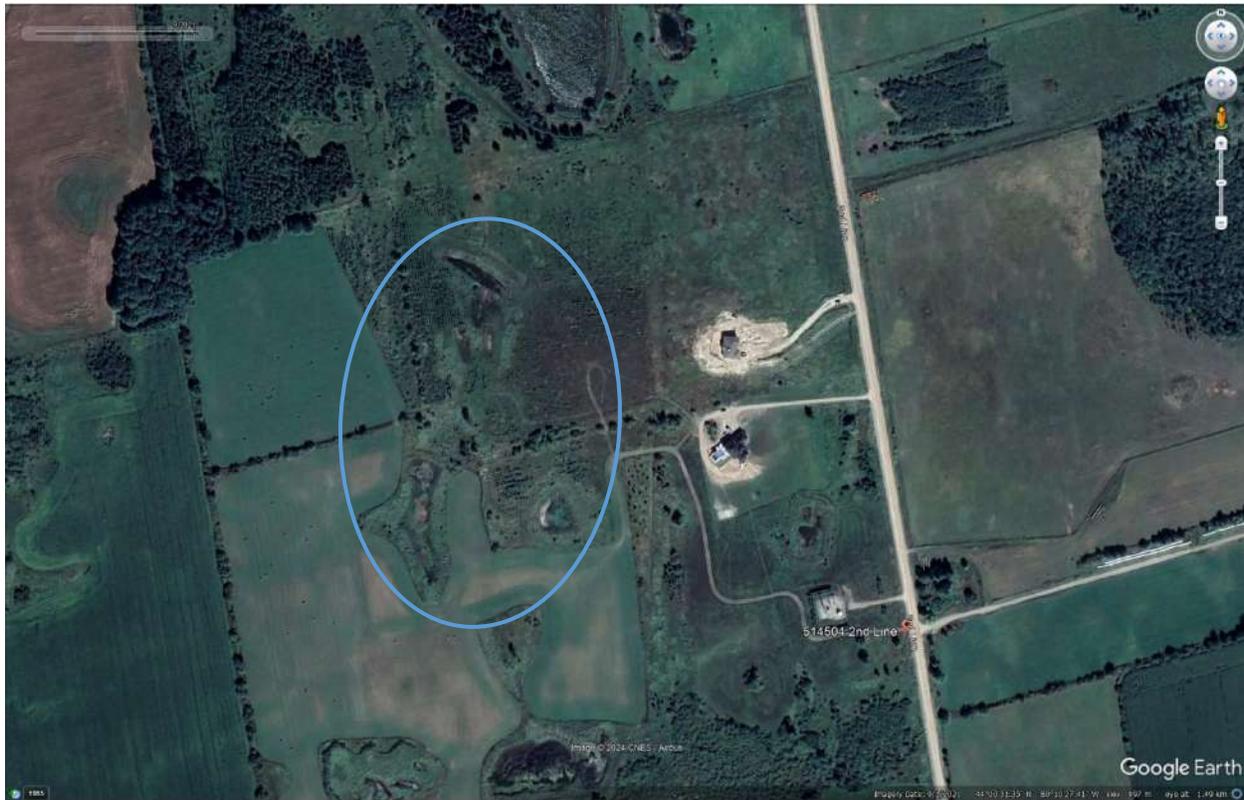
Figure K. 2020 Aerial Imagery



Source: Dufferin County 2020

Aerial imagery from spring 2020 depicts three dug-out shallow water wetland communities, with the most recently created community featuring an open water area. The aquatic features, including the headwater drainage feature and the shallow and open water communities, are bordered by a narrow band of wetland vegetation, which is circled in blue. The area to the northeast, circled in purple, exhibits a slightly different color signature compared to the wetland but shares some colour and texture properties in a few locations. This region also appears similar to the upland community on the severed property to the south (indicated with a purple arrow). Based on this imagery, the northeastern area appears to be predominantly upland, with potential pockets of wetland vegetation.

Figure L. 2021 Satellite Imagery



Source: Google 2021

Satellite imagery from summer 2021 continues to show the two originally created shallow water wetland communities and the now additional open to shallow water community, circled in blue, with no additional site alteration.

Figure M. 2023 Aerial Imagery



Source: Dufferin County 2023

Aerial imagery from summer 2023 shows site alteration surrounding the wetland areas including the creation of a farm lane as well as earthworks resulting in the removal of vegetation. The area in the northeastern corner also shows earthworks resulting in the removal of vegetation.

Historical Google Street View

The nature of the vegetation communities in the northeast corner of the Subject Lands is ambiguous. While the Azimuth (2018) report identified the entire area as meadow marsh, aerial imagery suggests that there may be, at most, pockets of wetland within a predominantly upland area. Meadow marshes are often difficult to distinguish from aerial photographs and ideally require ground truthing. Due to the general absence of vegetation in the area, GEI reviewed historical Google Street View imagery from 2011 to assess the nature of the vegetation.

This imagery, presented in **Figures N and O** below, shows the vegetation visible from the roadside. Species identified include Tall or Canada Goldenrod (*Solidago altissima* or *Solidago canadensis*), Queen Anne's Lace (*Daucus carota*), Smooth Brome (*Bromus inermis*), and Redtop (*Agrostis gigantea*), none of which are classified as wetland species (MNR 2022). The visible area appears to be upland cultural meadow or pastureland. There are no confirmed wetland species visible from Google Street View, and as such it remains unclear whether any wetland pockets are present within the area.

Figure N. 2011 Google Street View (Facing East)



Source: Google 2011

Figure O. 2011 Google Street View (Facing Northeast)



Source: Google Street View 2011

Site Investigation

GEI conducted a site investigation on July 24, 2024, to assess the remaining vegetation immediately adjacent to the areas subjected to vegetation removal as well as to observe any vegetation re-growth within the areas subjected to vegetation removal. Additionally, GEI collected soil samples within the ambiguous northeastern portion of the Subject Lands, both within the area identified as wetland in the Azimuth (2018) report and within the area identified as upland.

Vegetation Investigation

GEI assessed the vegetation immediately adjacent to the areas subjected to vegetation removal. A photographic record is provided in **Appendix C**, and a map showing the locations of these photographs is provided in **Figure 3 (Appendix A)**.

Along the northern property boundary, the adjacent vegetation predominantly consisted of wetland species, including Reed Canarygrass (*Phalaris arundinacea*) and Cattails (*Typha* spp.), indicated with a blue oval in **Figure P** below. Additionally, a small shallow marsh wetland community was present at the northeastern property boundary within the Subject Lands, in the area circled in blue in **Figure P** below. This small marsh is connected to the adjacent municipal drain to the north through a dug trench.

In the easternmost portion of the Subject Lands, the adjacent vegetation along the northern, eastern, and southern property boundaries, indicated by purple arrows in **Figure P**, consisted entirely of upland communities. Furthermore, the severed properties to the south (circled in purple) also consisted entirely of upland vegetation.

Within the ambiguous northeastern portion of the Subject Lands, some vegetation regrowth was observed. The regenerating species included several individuals of upland species such as Smooth Brome, Queen Anne's Lace, Alfalfa (*Medicago sativa*), Timothy (*Phleum pratense*), Canada Thistle (*Cirsium arvense*), Common Dandelion (*Taraxacum officinale*), Rugel's Plantain (*Plantago rugelii*), Common Plantain (*Plantago major*), Wild Chamomile (*Matricaria chamomilla*), Curled Dock (*Rumex crispus*), and Red Clover (*Trifolium pratense*). A single individual of Panicked Aster (*Symphotrichum lanceolatum*), which is a wetland species, was observed in this area.

In contrast, within the disturbed areas surrounding the dug-out wetlands, regenerating vegetation included Cattails, Panicked Aster, and Reed Canarygrass, all of which are wetland species. However, wetland vegetation was observed to be nearer to the dug-out wetlands as compared to Azimuth's (2018) mapping. This observation is consistent with the aerial imagery discussed earlier in this memorandum. At the time of this site visit, the headwater drainage feature was lined with a wide band of riprap.

Figure P. Vegetation on Adjacent Lands



Source: Dufferin County 2020

Soil Investigation

Due to the ambiguity of the vegetation community type in the northeastern corner, soil samples were collected for field analysis using a hand auger, and the depth of the water table was measured. While soil samples and a single measurement of water levels cannot be relied upon conclusively, the intent of this data collection was to assess additional parameters that may help determine the former vegetation characteristics of this area.

The locations of the collected soil samples are shown in **Figure 4 (Appendix A)**. Two soil samples were collected within the area identified by Azimuth's (2018) report, and one soil sample was collected outside of this area. Rainfall occurred both the day prior to and during the site visit, resulting in observed areas of ponding. Soil samples were taken immediately adjacent to these areas of ponding. A copy of the field data card is provided in **Appendix D**.

All three soil samples had a similar texture, as well as a similar distribution of mottling (indicating fluctuating water levels; with light mottling observed around 20 to 30 cm and heavy mottling observed around 30 to 60 cm) and gleying (indicating long-term saturated conditions; with light gleying observed around 80 cm). The water table in all three locations was at similar levels and more than 70 cm below the ground surface.

The soil textures were estimated in the field using the methodology of the *Field Manual for Describing Soils in Ontario* (2009). In all three samples, regardless of their location within or outside of the wetland area as indicated in Azimuth's (2018) report, the soils generally consisted of silty clay loam overlying silty clay. These soil textures have relatively low hydraulic conductivity and, in combination with the observed positioning of mottling and gleying, are considered hydric. This soil type has the potential to support wetland vegetation; however, soil type alone cannot definitively indicate wetland conditions as other factors, including topography, contribute to wetland formation (MNRF 2022).

The soil texture results and the water levels at the time of the site visit, as well as during the hydrogeological investigations conducted by CESI in 2023 (which measured water levels at 1.09 m below ground level on November 3, 2023), did not clarify the former nature of the wetland vegetation. Similar results could be found in both a moist upland meadow community and a drier meadow marsh community.

Conclusions and Recommendations

GEI used a combination of background information review and a site investigation to approximate the historical wetland extent within the NVCA jurisdiction portion of the Subject Lands.

In the field, the dominance (50% cover or greater) of hydrophytic or water-tolerant vegetation is the most reliable indicator of wetland conditions, as vegetation species reflect the long-term hydrological conditions of an area. Other data such as water levels, soil characteristics, and topography can also inform this assessment (MNRF 2022). Due to the removal of the majority of the vegetation within the area subject to this assessment, GEI relied on the data presented within this memorandum to delineate the historical wetland extent. The resulting delineation is provided in **Figure 4 (Appendix A)** overlaid on the 2020 high-resolution aerial imagery base from Dufferin County.

GEI's findings generally align with Azimuth's (2018) report mapping in the areas surrounding the dug-out wetlands, which were expanded by Ducks Unlimited Canada sometime between 2008 and 2011 (based on available historical imagery) in areas with pre-existing wetland communities and a headwater drainage feature. However, high-resolution aerial imagery and observations of regenerating vegetation during the site visit indicate that the actual wetland boundaries are somewhat smaller than Azimuth's delineation.

Apart from the small shallow marsh observed at the northeastern property boundary, the northeastern portion of the Subject Lands remains ambiguous. Historical aerial imagery indicates a slightly different color signature in this area compared to the wetland community, with some shared textural properties towards the center. The aerial imagery in this area also shares similarities to the vegetation immediately south on the severed property, which was confirmed to consist of an upland community during the site visit, which also corresponds with Azimuth's mapping. Based on aerial imagery alone, GEI's interpretation is that the central portion of this area may have included some wetland pockets. This, however, could not be confirmed through Google Street View (2011) or through site observations of regenerating vegetation in this area, which all consisted of upland species. Soil samples collected in this area could not differentiate the area mapped as wetland by Azimuth from the area mapped as upland. Water table depths within the sampled locations were also similar (see **Appendix D**).

Based on the available information, GEI was able to confirm former wetland presence within the areas shown in **Figure 4 (Appendix A)** but could not confirm former wetland presence within the northeastern portion of the Subject Lands. As such, based on available information, GEI recommends that this area be excluded from wetland mapping.

If you have any questions, please contact one of the undersigned.

Sincerely,

GEI Consultants Canada Ltd.

Prepared By:



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Ecologist
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Reviewed By:

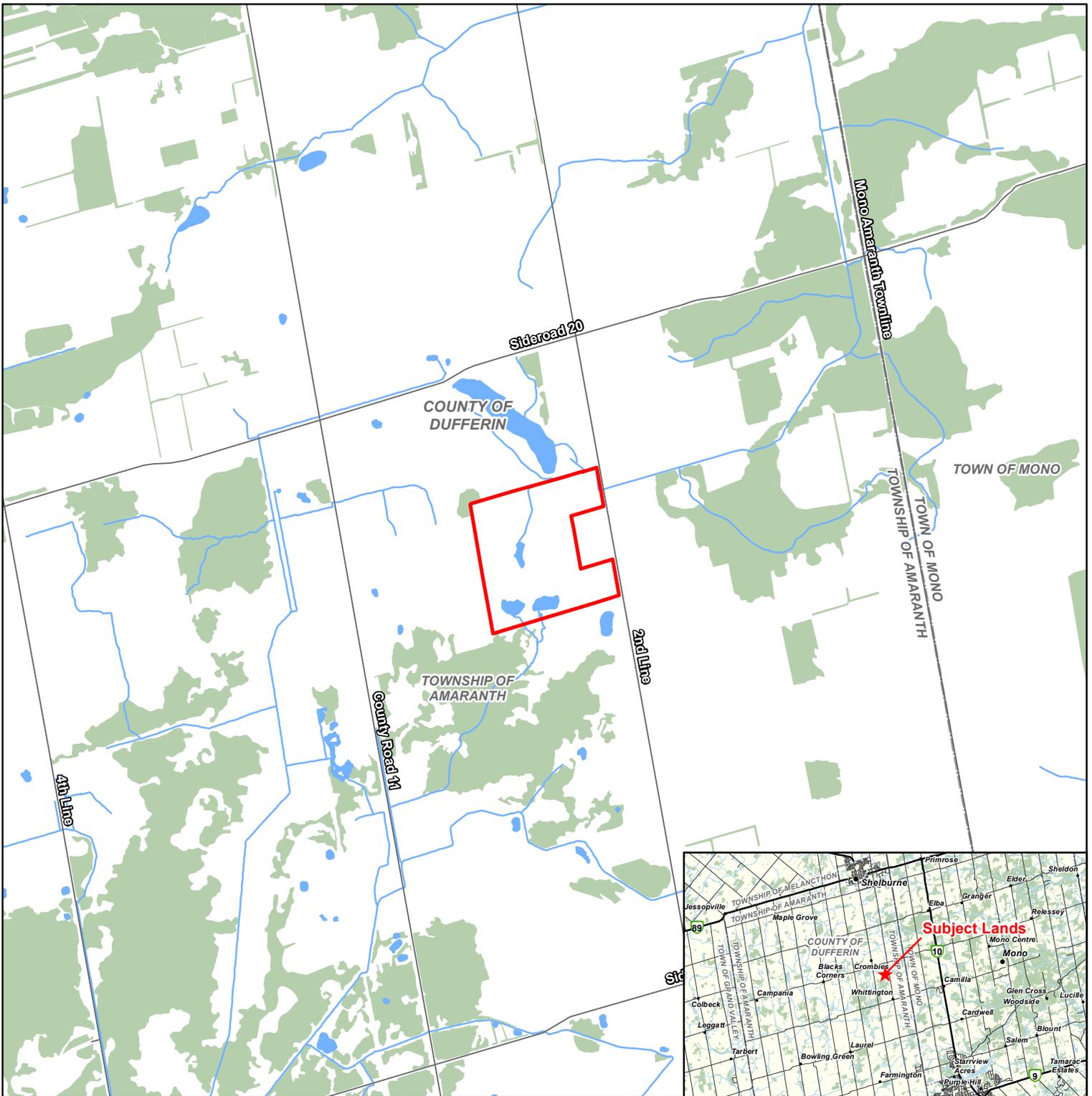


Sean Male
Senior Ecologist & Vice President
smale@geiconsultants.com
289-407-7483

Appendices

Appendix A	Figures
Appendix B	Azimuth ELC Mapping
Appendix C	Photolog
Appendix D	Soils Fieldsheet

Appendix A Figures



Project 2305387

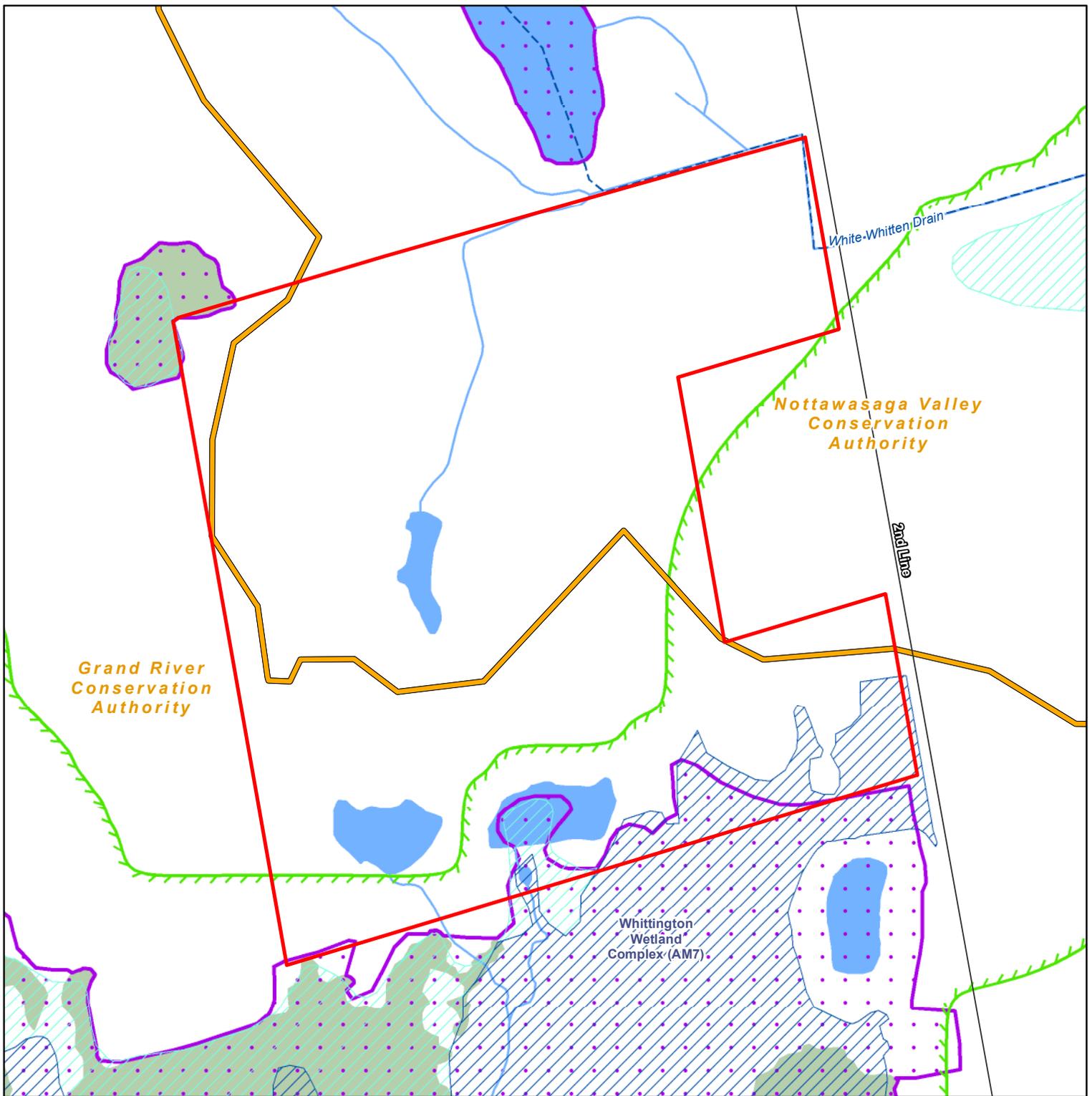
NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024.

- Legend**
- Subject Lands
 - Municipal Boundary, Lower/Single Tier
 - Watercourse
 - Waterbody
 - Wooded Area

2nd Line, Amaranth
 The Cellular Connection

Figure 1
 Location of Subject Lands





Project 2305387

NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024; © Dufferin County, 2024.

Legend

- Subject Lands
- Road
- Conservation Authority Administrative Boundary
- Growth Plan for the Greater Golden Horseshoe
- Natural Heritage System (Dufferin County)
- Provincially Significant Wetland
- Wetland - Not evaluated per OWES
- Constructed Drain
- Watercourse
- Waterbody
- Wooded Area

2nd Line, Amaranth
 The Cellular Connection

Figure 2
 Landscape Setting





Project 2305387

NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024; © Dufferin County, 2024.
 3. Orthoimagery © Dufferin County, 2024. Imagery from 2023.

Legend

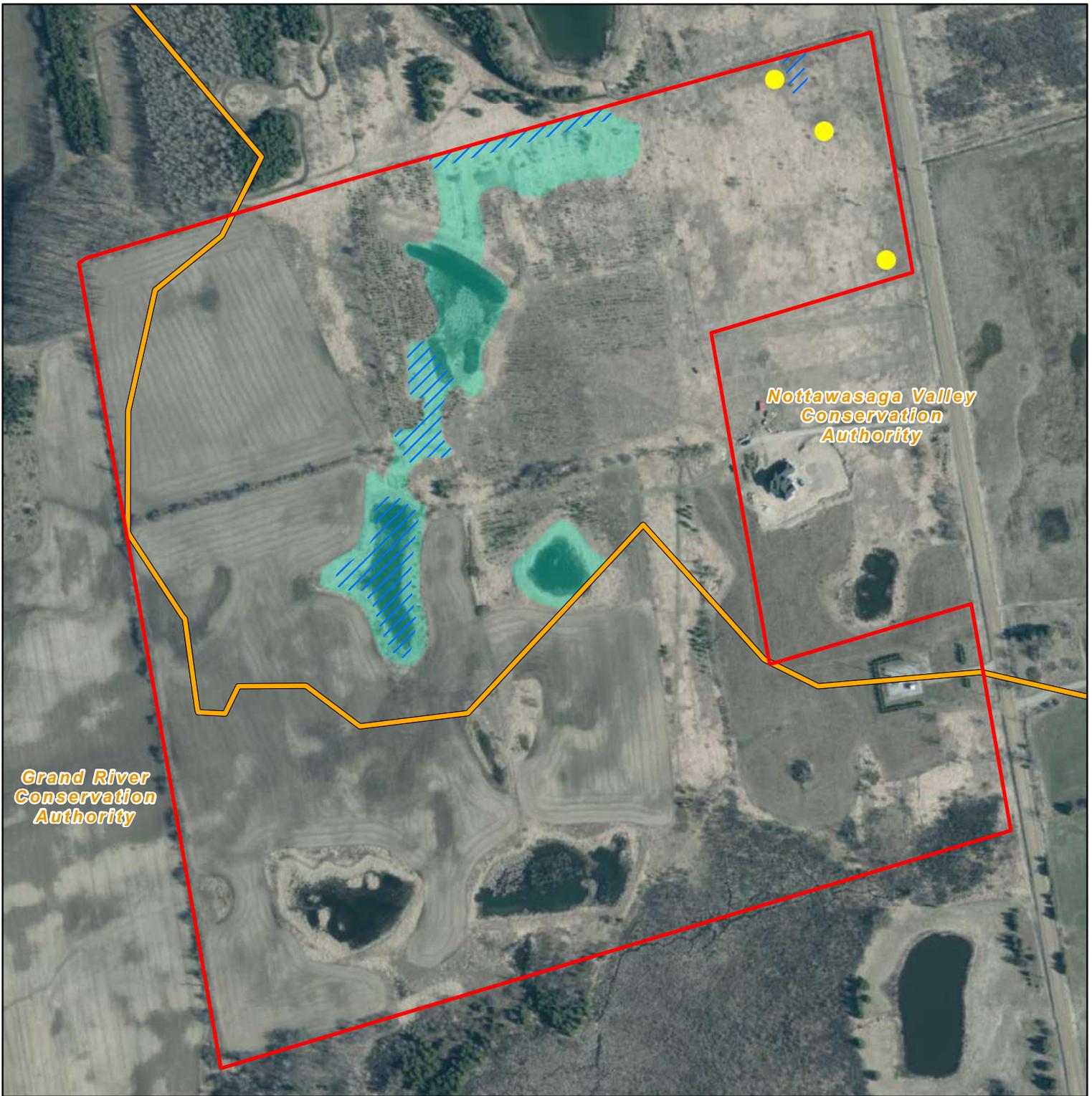
- Subject Lands
- Photo Location

2nd Line, Amaranth
 The Cellular Connection

Figure 3
 Photo Locations

0 50 m
 1:4,000





Project 2305387

NOTES:
 1. Coordinate System: NAD 1983 UTM Zone 17N.
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2024; © Dufferin County, 2024.

Legend

- Subject Lands
- Conservation Authority Administrative Boundary
- Areas Where Wetland Vegetation Was Observed (GEI July 2024)
- Historical Wetland Extent (GEI Air Photo Interpretation)
- Soil Sample Locations

2nd Line, Amaranth
 The Cellular Connection

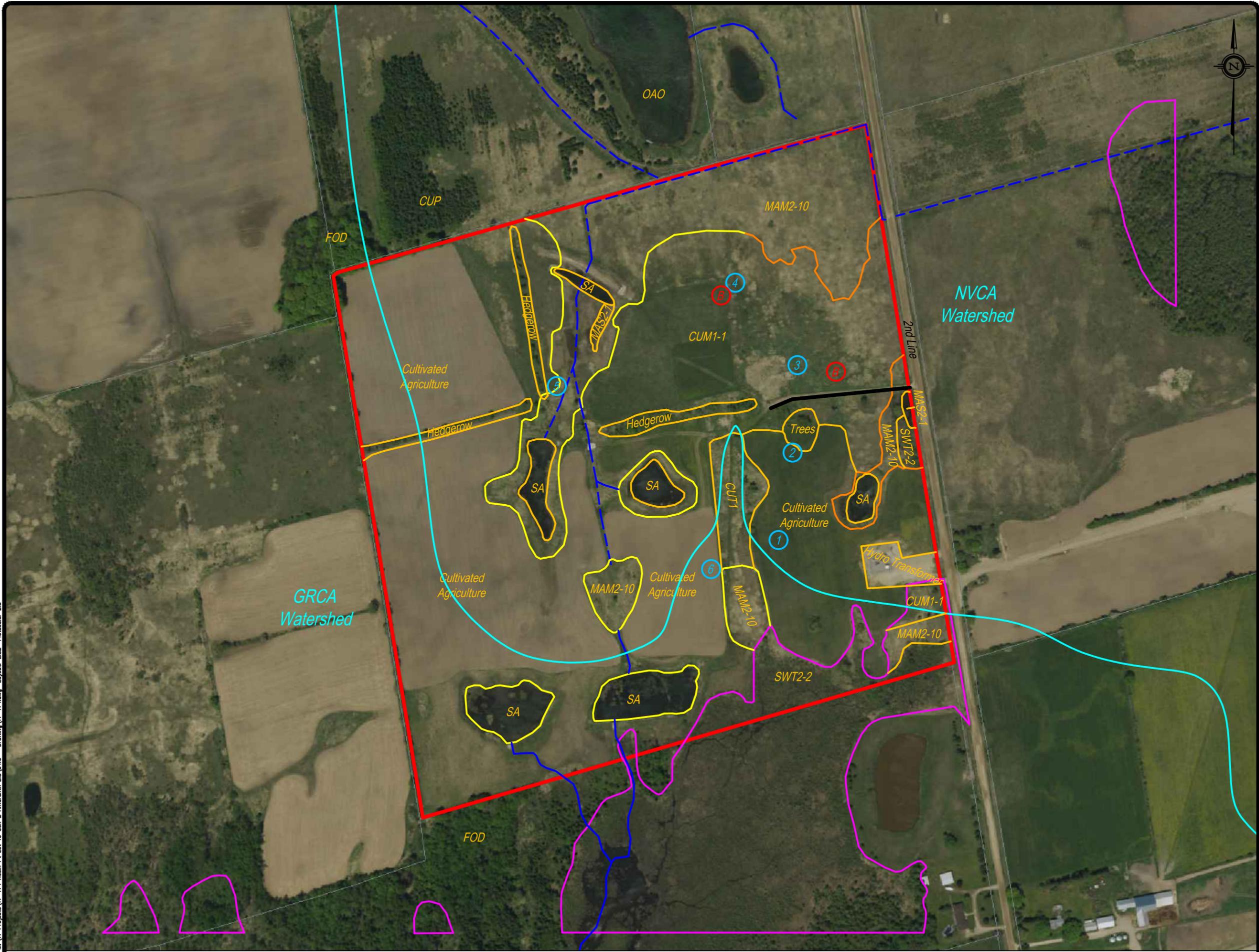
Figure 4
 Historical Wetland Extent
 Within NVCA Jurisdiction

0 100 m
 1:4,000



Appendix B Azimuth ELC Mapping

Printed by: MCCARTNEY on February 8, 2018 at 2:23pm
 File: M:\17 Projects\17-174 Rosin Pt Lot 19 Con 2 Amaranth EIS\04.0 - Drafting\17-174.dwg Layout: ES2 PlotScale: 2.5
 DAYSTAMP: M:\17 Projects\17-174 Rosin Pt Lot 19 Con 2 Amaranth EIS\04.0 - Drafting\17-174.dwg



- LEGEND:**
- Approx. Property Boundary
 - GRCA Regulated Watercourse
 - - - Drainage
 - Existing Driveway
 - Whittington Wetland PSW
 - Wetland (boundary confirmed with NVCA in field)
 - Wetland
 - Watershed Divide
 - ⊕ Bird Point Count Station
 - Ⓟ Bobolink (Probable Breeding)
 - Vegetation Communities
 - CUM1-1 Dry-Moist Old Field Meadow Type
 - CUP Cultural Plantation
 - CUT1 Mineral Cultural Thicket Ecosite
 - FOD Deciduous Forest
 - MAM2-10 Forb Mineral Meadow Marsh Type
 - MAS2-1 Cattail Mineral Shallow Marsh Type
 - OAO Open Aquatic
 - SA Shallow Aquatic
 - SWT2-2 Willow Mineral Thicket Swamp Type



Environmental Features

Pt Lot 19 Concession 2,
Amaranth, ON

DATE ISSUED:	January 2018	Figure No.
CREATED BY:	JLM	2
PROJECT NO.:	17-174	
REFERENCE:	MNRF	

Appendix C Photolog



Photo 1 – Vegetation removal within the Subject Lands, with water ponding following heavy rainfall.



Photo 2 – Vegetation removal within the Subject Lands, with water ponding following heavy rainfall.



Photo 3 – White Sweet-clover (*Melilotus albus*), an upland plant species, growing within northeastern portion of the Subject Lands.



Photo 4 – Queen Anne's Lace (*Daucus carota*), an upland plant species, growing within northeastern portion of the Subject Lands.

APPENDIX C

Second Line Amaranth

2305387

PHOTOGRAPHIC RECORD





Photo 5 – Common Plantain (*Plantago major*) and Common Dandelion (*Taraxacum officinale*), all upland plant species, growing within northeastern portion of the Subject Lands.



Photo 6 – Red Clover (*Trifolium pratense*), Hawkweed (*Hieracium* sp.), and Smooth Brome (*Bromus inermis*), all upland plant species, growing within northeastern portion of the Subject Lands.



Photo 7 – Alfalfa (*Medicago sativa*), Common Plantain, Rugel's Plantain (*Plantago rugellii*), and Smooth Brome, all upland plant species, growing within northeastern portion of the Subject Lands.



Photo 8 – Prickly Lettuce (*Lactuca serriola*), Timothy (*Phleum pratense*), Common Plantain, and Common Dandelion, all upland plant species, growing within northeastern portion of the Subject Lands.

APPENDIX C

Second Line Amaranth

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PHOTOGRAPHIC RECORD





Photo 9 – Wetland vegetation growing within ditch on adjacent lands to the south (left side of photograph) and upland vegetation growing within Subject Lands (right side of photograph).



Photo 10 – Vegetation removal within the Subject Lands, with water ponding following heavy rainfall, with upland vegetation growing along Second Line (left side of photograph).



Photo 11 – Upland vegetation growing along Second Line (left side of photograph).



Photo 12 – Upland vegetation growing along Second Line and within Subject Lands.

APPENDIX C
Second Line Amaranth
2305387
PHOTOGRAPHIC RECORD





Photo 13 – Upland vegetation growing on either side of municipal drain, with wetland vegetation on the adjacent lands to the north (top of photograph).



Photo 14 – Distant view of small wetland area along northern property boundary.



Photo 15 – Small wetland area and dug trench located along northern property boundary.



Photo 16 – Wetland vegetation growing along dug trench connecting to municipal drain and contiguous wetland vegetation on adjacent lands to the north.

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PHOTOGRAPHIC RECORD





Photo 17 – Wetland vegetation growing on the neighbouring lands to the north and along the municipal drain (left side of photograph) and the dug trench connecting the wetland pocket to the drain.



Photo 18 – Along the majority of the northeastern property boundary, wetland vegetation is constrained to the neighbouring lands to the north, on the other side of the municipal drain (left side of photograph).



Photo 19 – Upland vegetation along the majority of the northeastern property boundary.



Photo 20 – Contiguous wetland vegetation on adjacent lands to the north (right side of photograph) along the northwestern property boundary.

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PHOTOGRAPHIC RECORD





Photo 21 – Contiguous wetland vegetation on adjacent lands to the north (left side of photograph) along the northwestern property boundary.



Photo 22 – Wetland vegetation regenerating along the northernmost pond.



Photo 23 – Wetland vegetation regenerating along central pond.



Photo 24 – Riprap lining the headwater drainage feature.

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PHOTOGRAPHIC RECORD





Photo 25 – Wetland vegetation growing along the southernmost pond.



Photo 26 – Wetland vegetation growing along the southernmost pond.



Photo 27 – Wetland vegetation regenerating around the ponds.



Photo 28 – Wetland vegetation regenerating around the ponds.

APPENDIX C
Second Line Amaranth
2305387
PHOTOGRAPHIC RECORD



Appendix D Soils Fieldsheet

ELC

SOILS ONTARIO

SITE: 514504 SECOND LINE AMALANTH

POLYGON:

DATE: JULY 24, 2024

SURVEYOR(S): AS, SM

Slope

UTM

P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1										
2										
3										
4										
5										

SOIL

TEXTURE x HORIZON

	1	2	3	4	5
	<u>LOAM</u> <u>5</u> SI-CL-LOAM <u>58</u> SI-CLAY	<u>S+CL-LOAM</u> <u>22</u> SI-CLAY	<u>SI-CL-LOAM</u> <u>15</u> SI-CLAY		

*measurements in cm

A	TEXTURE	LOAM	SI-CL-LOAM	SI-CL-LOAM		
	COURSE FRAGMENTS					
B	TEXTURE	SI-CL-LOAM	SI-CLAY	S+CLAY		
	COURSE FRAGMENTS					
C	TEXTURE	SI-CLAY				
	COURSE FRAGMENTS					
	EFFECTIVE TEXTURE	SI-CL	SI-CL	SI-CL		
	SURFACE STONINESS					
	SURFACE ROCKINESS					

DEPTH TO / OF

MOTTLES	LIGHT: 30 HEAVY: 58	LIGHT: 22 HEAVY: 28	LIGHT: 18 HEAVY: 38		
GLEYS	790	86	81		
BEDROCK					
WATER TABLE	76	81	76		
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					

SOIL SURVEY MAP

LEGEND CLASS

--	--	--	--	--	--