Environmental Impact Study: 2509 Cedar Creek Road, North Dumfries, Ontario

FINAL REPORT

June 14, 2024

Prepared for:
Cedar Creek Holdings
130 Delta Park Boulevard
Brampton, ON
L6T 5E7

Prepared by:
Stantec Consulting Ltd.
100-300 Hagey Blvd.
Waterloo, ON N2L 0A4

File: 161414214

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Prepared by Laura Marshall

Laura Marshall, B.E.S.
Ecologist

Prepared by 
Digitally signed by Ellis, Kayla
Date: 2024.06.14 16:56:54 -04'00'

(signature)

Kayla Ellis, B.E.S.
Terrestrial Ecologist

Reviewed by 
Digitally signed by Geddes, Sean
Date: 2024.06.14 17:00:15 -04'00'

(signature)

Sean Geddes, B.Sc.
Senior Aquatic Biologist

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1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Cedar Creek Road Holdings Inc. ("the Client") to complete a Scoped Environmental Impact Study (EIS) in support of an Official Plan and Zoning By-Law Amendment Application related to the lands municipally known as 2509 Cedar Creek Road ("the Subject Lands") in the Township of North Dumfries, in the Regional Municipality of Waterloo, Ontario. The Subject Lands are shown on **Figure 1, Appendix A.**

The Subject Lands comprise 18.03 hectares in a rectangle and are bounded to the north by Cedar Creek Road with industrial use beyond, to the east and south by agricultural lands, and to the west by existing industrial development. Most of the area is presently vacant and used for agricultural purposes with a former residence located in the northwest portion of the property. The lands are located within the Highway 401/97 Employment Area and currently zoned as zone Z.11 (industrial) with small pockets in the north and south of the lands zoned as zone Z.12 (open space).

The proposed Official Plan and Zoning By-law amendment application is required to permit the redevelopment of the Site into seven industrial lots, with an access roadway from Cedar Creek planned along the western property limit and a stormwater management (SWM) facility planned in the south end of the property. The SWM facility is proposed to outlet to an easement that will traverse the southern and eastern perimeter of private lands to the east, eventually discharging to the southern edge of the Roseville Swamp Cedar Creek Provincially Significant Wetland (PSW) Complex on the west side of an existing Canadian Pacific Railway (CPR) line.

The Subject Lands are within the Cedar Creek Subwatershed of the Grand River Watershed which is in the administrative jurisdiction of the Grand River Conservation Authority (GRCA). The GRCA Regulation Limit associated with the Roseville Swamp Cedar Creek Provincially Significant Wetland Complex is on private property to the east. The SWM outlet channel will encroach upon the Regulated Area, any discharge from the SWM outlet channel will be directed toward the wetland edge.

1.1 STUDY AREA

The Study Area for the Scoped EIS is defined as the Subject Lands and Adjacent Lands, which encompass 120 meters surrounding the Subject Lands.

While no wetlands, woodlands, watercourses or GRCA regulated areas have been mapped within the Study Area, there are features of interest near the study area and are shown in context with the Subject Lands on **Figure 1, Appendix A.**

1.2 APPROACH

The objectives of this Scoped EIS are to:

- Evaluate features on the Subject Lands and in the Study Area and identify sensitive locations to be considered during design of the development
- Identify the potential impacts of the proposed development on natural heritage features and their ecological functions
- Identify suggested mitigation measures to address potential adverse effects of the proposed development on natural heritage features and their ecological functions, including avoidance where feasible and opportunities for ecological restoration
- Demonstrate no net negative impacts on the identified and assessed natural features of the proposed development with the implementation of appropriate mitigation measures.

This EIS was prepared in consideration of the policies outlined in **Section 2.0** and included a review of the Region of Waterloo Greenlands Network Implementation Guide (2016).

1.3 REGULATORY AND ADVISORY AGENCY CONSULTATION

A Terms of Reference (ToR) to guide the Scoped EIS was submitted to the Township of North Dumfries, Region of Waterloo and GRCA on March 4, 2023. Comments were received from GRCA on April 4, 2023, and were incorporated into a revised ToR, which is contained in **Appendix B**.

2.0 NATURAL HERITAGE POLICY CONTEXT

The following sections discuss legislation and polices that establish the natural heritage context for the Study Area. These, along with other background information and data, were used to identify natural features that require consideration through the planning and design process, and which may pose constraints to development. Legislation and policy are presented under separate headers for the federal, provincial, and municipal planning context.

2.1 FEDERAL CONTEXT

2.1.1 Fisheries Act, 1985

The *Fisheries Act*, 1985 (amended on August 28, 2019) is the main federal law governing fisheries in Canada and is administered by Fisheries and Oceans Canada (DFO). The *Fisheries Act* provides for the management and control of fisheries, the conservation and protection of fish, the protection of fish habitat and pollution prevention. Projects that may impact fish, fish habitat, aquatic species at risk (SAR) and aquatic invasive species may be subject to DFO review. The *Fisheries Act* prohibits causing the death of fish and the harmful alteration, disruption, or destruction (HADD) of fish habitat, unless authorized by the Minister of Fisheries, Oceans and the Canadian Coast Guard. Conditions and circumstances for projects to be exempt from review are listed on DFO's Fish and Fish Habitat Protection Program web pages. Following guidance and criteria provided on DFO's website regarding mitigation, waterbody types and codes of practice, proponents determine whether their projects in or near water will require review by DFO. DFO review is requested through the submission of a 'Request for Review' (RfR) form. Following completion of their review, DFO can proceed in two ways: 1) issue a Letter of Advice indicating that the proposed work complies with the *Fisheries Act* or, 2) refer the project to the Regulatory Review Unit for site specific review. If the project can avoid impacts to fish and fish habitat, project approval is not required. If impacts that cause a HADD cannot be avoided, proponents must apply for a *Fisheries Act* Authorization, and may be required to develop a habitat offsetting or compensation plan.

No fish habitat is present within the Subject Lands or within the Study Area. Fish habitat is associated with Cedar Creek and tributaries to the east of the Study Area.

2.1.2 Migratory Birds Convention Act, 1994 and Migratory Birds Regulation, 2022

The *Migratory Birds Convention Act*, 1994 (MBCA) prohibits the killing or capturing of migratory birds, as well as the damage, destruction, removal, or disturbance of their nests. The *Migratory Birds Regulation*, 2022 (MBR), further defines when nests of migratory bird species are protected, with special provisions in place for certain species of birds where their nests may be reused (e.g., Pileated Woodpecker, Great Blue Heron).

Most species of birds in Canada are protected under the MBCA, as defined by Article I, which names the families and subfamilies of birds protected, and provides clarification of which species are included. In Ontario, migratory birds generally nest between April 1 and August 31.

Environment and Climate Change Canada (ECCC) can issue permits allowing the destruction of nests for scientific, agricultural, or health and safety purposes. New development and site alterations would not qualify as a permitted activity under the MBCA and failure to comply with the MBCA/MBR could result in a charge initiated from a complaint by the public or a violation observed by an enforcement official.

2.2 PROVINCIAL CONTEXT

2.2.1 The Planning Act / Provincial Policy Statement

The Provincial Policy Statement (PPS; MMAH 2020) was issued under Section 3 of the *Planning Act*, 1990 (PA) and came into effect in 1996, with the most recent revision coming into effect on May 1, 2020. *The Planning Act* requires that decisions made by planning authorities are consistent with the policy statements of the PPS, which includes policies on development and land use patterns, resources and public health and safety. Section 2.1 of the PPS deals with natural heritage and requires that natural heritage systems are identified in certain ecoregions. This includes Ecoregion 6E, where the Subject Lands is located.

According to Section 2.1.5 of the PPS, development and site alteration are not permitted in the following features, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions:

a) Significant Woodlands
b) Significant Valleylands
c) Significant Wildlife Habitat
d) Significant Areas of Natural and Scientific Interest
e) Coastal wetlands that are not subject to policy 2.1.4(b)

Development and site alteration are not permitted in the following features, except in accordance with provincial and federal requirements:

a) Habitat of endangered or threatened species
b) Fish habitat

Development and site alteration are not permitted on lands that are adjacent to the natural heritage features and areas identified above unless the ecological function of the Adjacent Lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

2.2.1 A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)

A Place to Grow: Growth Plan for the Greater Golden Horseshoe (the "Growth Plan") came into effect on May 16, 2019, and Amendment 1 to the Plan was approved by the Lieutenant Governor in Council and took effect on August 28, 2020. The Growth Plan seeks to implement the Ontario government initiative to plan for growth and development in the province through to the year 2051. The Subject Lands are located within the Greater Golden Horseshoe, which encompasses the area located at the western end of Lake Ontario, stretching generally from Wellington County/Waterloo Region in the west, east to the counties of Peterborough and Northumberland, and north to Georgian Bay.

The Subject Lands are located within the "Designated Greenfield" Area as identified on 'Schedule 2 – A Place to Grow Concept' of the Growth Plan, and also on Map 2 *Planned Township Structure*, of the Township of North Dumfries Official Plan (2018). The Growth Plan defines this area as follows: *Lands within settlement areas (not including rural settlements) but outside of delineated built-up areas that have been designated in an official plan for development and are required to accommodate forecasted growth to the horizon of this Plan. Designated greenfield areas do not include excess lands.*

2.2.2 Conservation Authorities Act, 1990

The Conservation Authorities Act, 1990, was updated in late 2022 with the purpose to provide for the organization and delivery of programs and services that further the conservation, restoration, development, and management of natural resources in watersheds in Ontario.

Under this act, Ontario Regulation 150/06 (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses) is administered by the GRCA.

Pursuant to Ontario Regulation 150/06, prior permission is required from the GRCA for development within a river or stream valley, wetland, shoreline, or other hazardous land, and any alteration to a river, creek, stream, watercourse, or any interference with a wetland. The decision-making policies for such Permits are contained within the *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (GRCA 2015).

Generally, any development, interference or other alteration that may negatively impact the control of flooding, erosion, dynamic beaches, pollution, or the conservation of land are not permitted. However, development may be permitted where technical studies demonstrate no adverse impact.

Under Policy 8.1.14 (GRCA 2015), stormwater management facilities may be permitted within the riverine flooding hazard, but outside the riparian zone or effective flow area (whichever is greater) if there are no feasible alternatives, and it can be demonstrated that:

a) there is no loss of flood storage,

b) natural erosion and sedimentation processes within the receiving watercourse are not impacted,

c) *where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized and it can be demonstrated that best management practices including site and infrastructure design and appropriate remedial measures will adequately restore and enhance features and functions,*

d) *facilities are excavated with minimal berming, special policy areas and floodplain flow regimes for a range of rainfall events including the Regional Storm are maintained, and all excavated material is removed from the Riverine Flooding Hazard, and*

e) *design and maintenance performance requirements as determined by the GRCA for the receiving watercourse are met and the effect of the floodplain flow regime on the intended function of the facility is incorporated into the siting and design.*

The Subject Lands fall within the GRCA Regulation Limit, primarily associated with the Roseville Swamp Cedar Creek Provincially Significant Wetland Complex, as shown on **Figure 1**, **Appendix A**.

A new regulation under Ontario's Conservation Authorities Act referred to as Regulation 41/24: Prohibited Activities, Exemptions and Permits, came into effect on April 1, 2024. The updates consolidate the regulations of 36 conservation authorities into a single Minister's regulation. While this new Act is now in effect, the planning application process and consultation for the Subject Lands occurred under the previous Act and this EIS assumed that the process would continue under the guidance of Regulation 150/06.

2.2.3 Endangered Species Act, 2007

The *Endangered Species Act*, 2007 (ESA) protects species listed by the Committee on the Status of Species at Risk in Ontario (COSSARO) as threatened, endangered, or extirpated in Ontario and their habitats by prohibiting anyone from killing, harming, harassing or possessing protected species, as well as prohibiting any damage or destruction to the habitat of the listed species. Listed species are referred to as Species at Risk (SAR) and are provided with general habitat protection under the ESA aimed at protecting areas that species depend on to carry out their life processes, such as reproduction, rearing, hibernation, migration or feeding. For some species there are detailed habitat regulations that go beyond the general habitat protection to define specifically the extent and character of protected habitats.

Activities that may impact a protected species or its habitat require the prior issuance of a permit from the Ministry of the Environment, Conservation and Parks (MECP), unless the activities are exempted under O. Reg. 242/08, O. Reg. 830/21, and O. Reg. 829/21. These regulations identify activities which are exempt from the permitting requirements of the ESA and is subject to rigorous controls outside the permit process, including registration of the activity and preparation of a mitigation plan. Activities that are not exempt under these regulations require a complete permit application process.

2.2.4 Fish and Wildlife Conservation Act, 1997

The provincial *Fish and Wildlife Conservation Act,* 1997 (FWCA) provides protection of wildlife in Ontario including fish, furbearing mammals, game wildlife and specially protected wildlife through regulations for hunting, trapping, and fishing practices. Game and specially protected mammals, birds, reptiles, amphibians, and invertebrates are listed on Schedules 1-11 of the FWCA. Definitions provided for hunting include capturing or harassing wildlife (Section 5.0) and would include activities that collect or handle wildlife for inventories or other scientific purposes, or to relocate wildlife out of harm's way (e.g., during construction activities), including individuals and eggs. Sections 7.0 and 8.0 also provide protection for nest and eggs of specified bird species including raptors, and dens of furbearing animals, and beaver dams. Under the FWCA, the Minister has the authority to authorize activities that would otherwise be prohibited such as the safe capture of wildlife and removal of nests, dens, and dams, and also to impose conditions on an authorization.

2.3 MUNICIPAL PLANNING CONTEXT

2.3.1 Region of Waterloo Official Plan

The Region of Waterloo Official Plan (ROP; Region of Waterloo 2015) was approved by the Ontario Municipal Board (OMB) on June 18, 2015. The ROP identifies Landscape Level Systems and Core Environmental Features as components of the Greenlands Network, which is shown on Map 4 *Greenlands Network* of the ROP.

No features of any type are shown on the Subject Lands on Map 4 of the ROP; however, the wooded and wetland features of the Roseville Swamp Cedar Creek PSW Complex to the east of the Study Area are shown as Core Environmental Features on Map 4.

The Core Environmental Features Policies of the ROP state that development and site alteration will not be permitted within Core Environmental Features (Policy 7.C.9) and that development or site alteration will only be permitted on lands contiguous to a Core Environmental Feature where an EIS, or similar study, has determined that approval of the proposed development will not result in adverse environmental impacts on the features and ecological functions of the Core Environmental features (Policy 7.C.10). Where an EIS is required, appropriate buffers must be identified (minimum 10 m buffer) to protect Core Environmental Features from adverse impacts.

2.3.2 Township of North Dumfries Official Plan

The Township of North Dumfries Official Plan (OP) (consolidation prepared in 2018) recognizes a Greenlands Network comprised of Landscape Level Systems, Core Environmental Features, Fish Habitat, Supporting Environmental Features and the linkages among these elements, and lands designated within the Provincial Greenbelt Plan Natural Heritage System. The Greenlands Network is designated on Map 5A *Greenlands Network* of the OP and corresponding constraints are shown on Map 5B *Environmental Constraint Areas*. The environmental features comprising Core Environmental Features and Supporting Environmental Features on these maps are mapped collectively and not individually. As indicated in the OP, the boundaries of the environmental features that make up the Greenlands Network will be interpreted, as required, to support the review of development applications, through an Environmental Impact Statement (EIS), watershed study, or other appropriate studies accepted by the Township, the Region and other agencies having jurisdiction.

There are no Core Environmental Features or Supporting Environmental Features mapped on the Subject Lands or within the Study Area on Map 5A of the OP. Similarly, no constraints were identified on the Subject Lands or within the Study Area on Map 5B. Greenlands Network and corresponding Environmental Constraint Areas are shown on Maps 5A and 5B, respectively, for the wooded and wetland features of the Roseville Swamp Cedar Creek PSW Complex to the east of the Study Area.

3.0 METHODS

Natural features that may pose a constraint to development in the Study Area are identified in this report using the relevant provincial and municipal policies and guidance documents described above. Adjacent Lands are those within 120-m of the Subject Lands and are included in a review of background information and to the extent possible, field examination. The Subject Lands and Adjacent Lands are collectively referred to as the Study Area. The analysis included a review of background information and site investigations which are described below.

Prior, to the onset of the EIS field program, a proposed stormwater outlet channel was conceptualized along the south and eastern property boundaries on private lands to the east of the Subject Lands and was projected to potentially encroach upon a wooded edge flanking the Roseville Swamp Cedar Creek Provincially Significant Wetland Complex adjacent to the CPR right-of-way (ROW). The extent of encroachment was unknown at the time of the development of the fieldwork program, and so, for the purposes of assessing potential impact, it was assumed that an approximate 10 m wide easement would extend into the wooded edge and possibly the wetland boundary. Therefore, this study reviewed natural heritage elements in the vicinity of the terminus of the proposed outlet channel, beyond the limits of the Study Area for the Subject Lands. Through the progression of design, the potential encroachment was reduced to keep the SWM outlet out of the wetland and wooded edge. Regardless, the results of the analysis for those features is included in this EIS report.

3.1 BACKGROUND DATA COLLECTION AND REVIEW

The following background documents and information sources were consulted during the preparation of this report, including the following:

- Fisheries and Oceans Canada's (DFO) online Aquatic Species at Risk mapping tool (DFO 2023)
- Natural Heritage Information Centre (NHIC) Biodiversity Explorer and database (MNRF 2023a)
- Land Information Ontario (LIO) database (MNRF 2023b)
- Species at Risk in Ontario List (MECP 2023)
- Grand River Conservation Authority (GRCA) online regulated areas mapping
- Region of Waterloo Official Plan (2015)
- Township of North Dumfries Official Plan (2018 consolidation)
- A Place to Grow: Growth Plan for the Greater Golden Horseshoe (Office Consolidation 2020)
- Ontario Breeding Bird Atlas (Cadman et. al. 2007)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2023)
- eBird Database (eBird 2022)
- iNaturalist Database (iNaturalist 2023)

- Ontario Butterfly Atlas (TEA 2023)

The results of the background review, detailed in **Section 4.1**, were used to guide the field program detailed in **Section 3.2**, below.

3.2 FIELD INVESTIGATIONS

Field investigations were conducted in 2023 to document natural heritage features within the Study Area. Studies consisted of vegetation surveys, ecological land classification surveys (ELC), amphibian surveys, breeding bird surveys, bat ARU surveys, wildlife habitat assessments, incidental observations of wildlife, and headwater drainage feature/ aquatic habitat assessments. Dates of field investigations are provided in Table 1 below, with incidental observations of wildlife recorded during each visit.

Table 1: Summary of Field Investigations

Date	Investigation Type	Personnel
April 11, 2023	• Bat tree assessment • Snake hibernaculum and site reconnaissance	K. Ellis
April 13, 2023	• Amphibian Survey #1 • Additional bat tree assessment • Headwater Drainage Feature Assessment (HDFA) #1	L. Marshall, M. Place
May 10, 2023	• Spring flora survey • Ecological Land Classification #1 • HDFA #2	K. Ellis
May 23, 2023	• Amphibian Survey #2	L. Marshall, K. Ellis
May 30, 2023	• Breeding bird #1 • Bat ARU deployment	L. Marshall
June 9, 2023	• Breeding bird #2	J. Randall
June 21, 2023	• Amphibian survey #3 • Bat ARU pickup	L. Marshall, M. Larson
July 11, 2023	• Summer flora survey • Ecological Land Classification #2	K. Ellis
September 19, 2023	• Fall flora survey • Ecological Land Classification #3	K. Ellis

3.2.1 Vegetation Surveys

3.2.1.1 Ecological Land Classification

Vegetation communities on the Subject Lands were delineated and classified in the field using protocols outlined in the Ecological Land Classification (ELC) System for Southern Ontario (Lee et al. 1998) and the 2008 ELC code updates. Vegetation assessments documented a list of the dominant species in the canopy, sub-canopy, shrub and ground layers, and a detailed plant species list for each polygon. Flora

nomenclature in the provincial vascular plant list is provided by the Ontario Natural Heritage Information Centre (NHIC; MNRF 2023a).

Vegetation communities and plant species were reviewed to determine whether any of the communities were rare in the province, contained any provincially significant plant species or had the potential to provide significant habitat for wildlife. Provincial significance of vegetation communities was based on the rankings assigned by the NHIC (MNRF 2023a).

3.2.1.2 Botanical Inventory

A three- season botanical inventory of the Subject Lands was completed in spring, summer, and fall. Identification of potentially sensitive native plant species was based on their assigned coefficient of conservatism (CC) value provided by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 8, 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters and are usually typical of high-quality plant communities.

As prescribed in the *Region of Waterloo Greenlands Network Implementation Guide*, local significance was determined using the Region's "Significant Vascular Plant List." The list is currently being updated; however, the existing list was used for this report.

3.2.2 Amphibian Surveys

Amphibian call counts were conducted in accordance with the Marsh Monitoring Program (Bird Studies Canada 2009). No wetlands were present on the Subject Lands, so no amphibian surveys were completed within the Study Area associated with the Subject Lands. A survey was conducted at a single station (AMP01) at the edge of the Roseville Swamp Cedar Creek PSW Complex as shown on **Figure 2, Appendix A**, to target potentially suitable breeding pools. The station location was chosen to assess amphibian activity in potentially suitable breeding habitat near the proposed outlet of the future SWM outlet channel.

Surveys were conducted in April, May, and June 2023 in accordance with the timing windows laid out by the Marsh Monitoring protocol. The survey station included a 100-m radius semicircle with the observer located at the center and listening for a three-minute period. At each survey, all calling toads and frogs identified over the three-minute time period were recorded. Call levels were described using values of 1, 2, or 3, and, where possible, an estimate of the number of individuals calling. Level 1 indicates that individuals could be counted, and calls were not simultaneous. Level 2 indicates that individual calls were distinguishable with some simultaneous calling, and a reasonable estimate of the number of calling individuals was made. Level 3 indicates a full chorus with continuous and overlapping calls and no estimate of the number of individuals was possible. Toads and frogs calling from outside of the survey station were also noted.

3.2.3 Breeding Bird Surveys

Breeding bird surveys were conducted in 2023 during early morning hours using point counts in accordance with the Ontario Breeding Bird Atlas (Cadman et al. 2007), and by traversing the Subject Lands on foot and recording all species of birds that were heard or seen. The highest level of breeding evidence was recorded for each species using the codes in the Ontario Breeding Bird Atlas (Cadman et al. 2007) codes. Point counts were conducted at two stations on the Subject Lands (BBS02, BBS03) and one in the vicinity of the proposed outlet of the future stormwater outlet channel (BBS01) as shown on **Figure 2, Appendix A.**

3.2.4 Bat Tree Assessment and ARU Survey

Tree assessments were undertaken in April 2023 to identify trees that could be used by bats for maternity colony and roosting purposes. Trees with a DBH >10 cm, with cavities and / or an abundance of peeling bark were prioritized. The assessment was used to inform the placement of bat Automatic Recording Units (ARUs). The deployment of ARU units captured the appropriate timing for bat maternity activity surveys and recording took place from May 30 to June 21, 2023.

Three (3) bat ARU stations were established in natural suitable habitat, where possible, nearby an identified high quality snag tree. The ARU surveys followed the survey methodology from the MNRF's Bat and Bat Habitat: Guidelines for Wind Power Projects (MNR 2011) which recommends ten nights of surveys in June. The three ARU's were deployed throughout the Study Area to sample suitable maternity roost habitat. Although MNRF recommends ten nights, all nights recorded were analyzed.

ARUs were collected after the survey period and recorded data were analyzed with Wildlife Acoustics Kaleidoscope Pro software. The data processing involves running the software's automatic identification, which screens out noise files and provides a suggested species for each bat call file. For calls identified by Kaleidoscope Pro as non-SAR bats, the automatic species IDs were used and were not reviewed in detail. For high-frequency calls that were identified as a potential SAR bat, each call was reviewed by a qualified biologist to confirm the identification by visually assessing the call file spectrographs to identify if the frequency range and shape were consistent with the species assigned by the software. In addition, calls that were identified as 'No ID' by Kaleidoscope Pro with a minimum frequency of 35 kHz or above were reviewed, as they have the potential to be made by SAR bats. Where calls were not of sufficient quality to identify to species, they were classified as high frequency unknown (where the minimum frequency was 35 kHz or above) or low frequency unknown (where minimum frequency is less than 35 kHz). All calls with under five pulses were classified as high frequency unknown, low frequency unknown, or No ID, as a short call can not be reliably identified.

3.2.5 Incidental Wildlife

Observations of wildlife and signs of wildlife were recorded during field investigations, and included species that were detected by sight and sound, dens, nests, burrows, browse, tracks, and scat.

3.2.6 Significant Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle and that are important to migratory and non-migratory species. The Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (the Ecoregion Criteria; MNRF 2015) groups wildlife habitat into four categories:

- Seasonal concentration areas of animals
- Rare vegetation communities or specialized habitat for wildlife
- Habitat for species of conservation concern
- Animal movement corridors

Prior to field investigations, MNRF's LIO database was reviewed to identify records of significant wildlife habitat within the Study Area. Wildlife habitat assessments were conducted during vegetation surveys to identify presence or absence of wildlife habitat features detailed in the Ecoregion Criteria Schedule. Where applicable, a description of the attributes and location of each feature identified was recorded.

Seasonal concentration areas are sites where large numbers of a species gather together at one time of the year, or where several species congregate. Only the best examples of these concentration areas are typically designated as SWH.

Rare or specialized habitats are defined as separate components of SWH. Rare habitats are habitats with vegetation communities that are considered rare (S1-S3) in the province. These habitats are generally at risk and may support wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species. Specialized habitats include SWH for Species of Conservation Concern (SOCC), which are Special Concern and Provincially Rare (S1-S3, SH) plant and animal species (MNRF 2023a). Lists of these species are tracked by the Natural Heritage Information Centre (NHIC). Habitat for SOCC includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the remainder of the globe.

As per the Significant Wildlife Habitat Technical Guide (MNR 2000) and the Ecoregion Criteria, targeted species-use surveys for plants, amphibians, and breeding birds were used to confirm the presence of SWH.

3.2.7 Headwater Drainage Feature Assessments

Headwater drainage features (HDF) within the Subject Lands were assessed using the document entitled *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* (CVC and TRCA, 2014), hereafter referred to as *the guidelines*.

The guidelines employ a multiple survey approach to headwater drainage feature assessments (HDFA) to capture seasonal variability in hydroperiod and identify other potential ecological functions (e.g., terrestrial and wetland habitat for wildlife) of these features on the landscape. In general, the need for additional surveys and the timing of each visit is dictated by the results of the previous survey, as follows:

- HDFA #1: conducted during a window of approximately two weeks immediately after the snowpack has dissipated and the frost is out of the ground (typically late March – early April). This visit determines if a defined feature is present and if additional surveys are required, which is dictated by the presence of flow or standing water associated with the feature.
- HDFA #2: conducted after the freshet has ended when the melt/thaw related interflow has ceased and, preferably, after a few days with no precipitation and before vegetation has established that may obscure observation of the feature (typically late April through mid-May). This visit assesses flow condition and fish presence. If the feature is dry, a third visit is not required.
- HDFA #3: conducted if water was present in the feature during Site Visit 2. The timing of the third visit is from July to mid-September, preferably after several days without a significant (i.e., flow generating) amount of rain. This visit assesses flow condition and fish presence. The primary purpose is to determine where the upstream limits of flow, permanent aquatic habitat (which would include standing water upstream from where flow ceases) and fish utilization occur. The presence of flow during this visit automatically results in classification as an “important” feature.

Information collected consisted of identifying and describing the drainage features, including water presence, morphology, riparian conditions, and potential for contributing to fish habitat. Fish community sampling was not conducted as a part of the field investigation.

3.2.8 Fish Habitat

Fish habitat was determined to be absent within the Subject Lands, and background information was used to assess the presence of fish habitat in features outside of the Study Area. Fish habitat is present within an unnamed tributary to Cedar Creek that originates in a farm pond to the east of the Subject Lands. No formal fish habitat surveys were completed as part of this study.

4.0 RESULTS

The results of the background review and field surveys are summarized below.

4.1 BACKGROUND REVIEW

4.1.1 Designated Natural Features

The following designated natural features are present within the general area, as shown on **Figure 1, Appendix A**.

- Provincially Significant Wetlands (Roseville Swamp Cedar Creek Provincially Significant Wetland Complex)
- Core Environmental Feature (Roseville Swamp Cedar Creek Provincially Significant Wetland Complex; Township of North Dumfries Official Plan)
- Environmental Constraint Areas (Roseville Swamp Cedar Creek Provincially Significant Wetland Complex; Township of North Dumfries Official Plan)
- Permanent watercourses (Cedar Creek)
- Fish habitat (LIO)

Where open-source data were available during the background review, these features are mapped on **Figure 1**, **Appendix A**.

4.1.2 Species at Risk and Provincially Rare Species

A review of the NHIC database (MNRF 2023a), wildlife atlases and the 1-km NAD 83 grid squares that intersect within the Study Area identified records of SAR or provincially rare species (SOCC) within 1-km of the Subject Lands.

The species at risk and provincially rare species that have been identified as potentially occurring within these areas as listed below in **Table 2** and **Table 3,** respectively.

Table 2: Potential Species at Risk Occurring in the Study Area

Species	Status	
	Ontario ESA, SARO List	**Federal SARA, Schedule 1**
Plants		
American Chestnut (*Castanea dentata*) [7, 4]	Endangered	Endangered
Black Ash (*Fraxinus nigra*) [7]	Endangered	No Status
Birds		
Bobolink (*Dolichonyx oryzivorus*)[1], [2]	Threatened	Threatened
Bank Swallow (*Riparia riparia*) [2]	Threatened	Threatened
Eastern Meadowlark (*Sturnella magna*)[1], [2]	Threatened	Threatened
Mammals		
Eastern small-footed Myotis (*Myotis leibii*) [6]	Endangered	No Status
Little brown Myotis (*Myotis lucifungus*) [6]	Endangered	Endangered
Northern Myotis (*Myotis septentrionalis*) [6]	Endangered	Endangered
Tri-colored Bat (*Perimyotis subflavus*) [6]	Endangered	Endangered
American Badger (southwestern; *Taxidea taxus jacksoni*) [6]	Endangered	Endangered
Amphibians		
Jefferson Salamander (*Ambystoma jeffersonianum)* [3]	Endangered	Endangered
Reptiles		
Blanding's Turtle (*Emydoidea blandingi)* [1, 3]	Threatened	Endangered
Queensnake (*Regina septemvittata*) [3]	Endangered	Endangered

[1] Ministry of Natural Resources (MNRF) Natural Heritage Information Centre (NHIC) Database

[2] Ontario Breeding Bird Atlas (Cadman et. al., 2007)

[3] Ontario Reptile and Amphibian Atlas (Ontario Nature, 2023)

[4] Ministry of Environment, Conservation and Parks (MECP) 2023

[5] eBird Database (eBird 2023)

[6] Atlas of the Mammals of Ontario (Dobbyn, 1994)

[7] Tree Atlas

[8] Toronto Entomologist's Association (TEA, 2023)

Table 3: Potential Provincially Rare Species Occurring in the Study Area

Species	Status	
	Ontario ESA or Provincial Rank	Federal SARA, Schedule 1
Birds		
Barn Swallow (*Hirundo rustica*) [1, 5]	Special Concern	Threatened
Eastern Wood-Pewee (*Contopus virens*) [5]	Special Concern	Special Concern
Wood Thrush (*Hylocichla mustelina*) [1]	Special Concern	Threatened
Insects		
Monarch (*Danaus plexippus*) [8]	Special Concern	Special Concern
Reptiles		
Eastern Milksnake (*Lampropeltis Triangulum*) [3]	Not at Risk	Special Concern
Eastern Ribbonsnake (*Thamnophis sauritus*) [3]	Special Concern	Special Concern
Midland Painted Turtle (*Chrysemys picta marginata*) [3]	Not at Risk	Special Concern
Snapping Turtle (*Chelydra serpentina*) [1]	Special Concern	Special Concern

[1] Ministry of Natural Resources (MNRF) Natural Heritage Information Centre (NHIC) Database

[2] Ontario Breeding Bird Atlas (Cadman et. al., 2007)

[3] Ontario Reptile and Amphibian Atlas (Ontario Nature, 2023)

[4] Ministry of Environment, Conservation and Parks (MECP, 2023)

[5] eBird Database (eBird 2023)

[6] Atlas of the Mammals of Ontario (Dobbyn, 1994)

[7] Tree Atlas

[8] Toronto Entomologist's Association (TEA, 2023)

4.1.3 Fish Habitat

The tributary to Cedar Creek outletting from the farm pond to the east is mapped as a permanent, coldwater watercourse (MNRF 2023b). Available background fish community data include seven (7) fish species with coolwater thermal regime preferences (MNRF 2023b; Coker *et al.* 2001). The fish species are provincially ranked (sub-national S rank) as secure, common, widespread, and abundant (S5). The available background fisheries data include community studies completed by the GRCA within 1km of the Subject Lands and MNRF records on the LIO database; the species include (MNRF 2023b):

- White Sucker (Catostomus commersonii)
- Blacknose Dace (Rhinichthys obtusus)
- Central Mudminnow (Umbra limi)
- Brook Trout (Salvelinus fontinalis)

- Mottled Sculpin (Cottus bairdii)
- Slimy Sculpin (Cottus cognatus)
- Brook Stickleback (Culaea inconstans)

A review of the MNRF's Natural Heritage Information Centre (NHIC) database mapping did not identify any provincially protected SAR within the Study Area (NHIC 2023a). A review of DFO SAR mapping did not identify any federally protected aquatic SAR or critical habitat within the unnamed tributary to Cedar Creek (DFO 2023).

4.2 FIELD INVESTIGATIONS

Results of the targeted field investigations are summarized in the sections below.

4.2.1 Vegetation Surveys

4.2.1.1 Ecological Land Classification

The vegetation surveys identified wetlands, woodlands, hedgerows, thickets, mixed meadow, agricultural lands, and residential and industrial development within the Study Area. Vegetation communities in the Study Area are mapped on **Figure 2, Appendix A** and described below in **Table 4**, below. Vegetation communities documented are common and widespread in Ontario.

The majority of the Study Area was mapped as annual row crop agriculture (OAGM1). Hedgerow communities (TAGM5) surround much of the Subject Lands, with a mixed community comprised of mixed meadow and deciduous woodland (WODM4/MEMM3) present in the northwestern corner of the property where the former residence was located. Swamp (SWT) and a deciduous forest (FODM7-2) with a buckthorn thicket (THDM2-6) inclusion comprise the community types north of the terminus of the proposed SWM outlet.

Table 4: Vegetation Communities Documented in the Study Area

Type	Code	Title	Community Description	Area (ha) within the Subject Lands	Area (ha) within Adjacent Lands
WOODLAND COMMUNITIES					
Woodland/ Meadow	WODM4/ MEMM3	Dry - Fresh Deciduous Woodland Ecosite/Dry - Fresh Mixed Meadow Ecosite	Old homestead comprised of woodland with a meadow complex with two old foundations located in the centre. The community is dominated by the following species: sugar maple (*Acer saccharum*), black walnut (*Juglans nigra*), Norway maple (*Acer platanoides*), Manitoba maple (*Acer negundo*), black locust (*Robinia pseudoacacia*), sandbar willow (*Salix interior*), staghorn sumac (*Rhus typhina*), European buckthorn (*Rhamnus cathartica*), common lilac (*Syringa vulgaris*), Kentucky bluegrass (*Poa pratensis*), Canada goldenrod (*Solidago canadensis*), smooth brome (*Bromus inermis*), and orchard grass (*Dactylis glomerata*)	2.14	0.54
FOREST COMMUNITIES					
Forest/ Thicket	FODM7-2/ THDM2-6	Fresh – Moist Green Ash - Hardwood Lowland Deciduous Forest Type/ Buckthorn Deciduous Shrub Thicket Type	Forest located to the north of the Subject Lands. The community is dominated by the following species: green ash (*Fraxinus pennsylvanica*), black walnut, hawthorn species (*Crataegus* sp.), European Buckthorn, Manitoba maple, riverbank grape (*Vitis riparia*), garlic mustard (*Alliaria petiolata*), common buttercup (*Ranunculus acris*), spotted jewelweed (*Impatiens capensis*), Virginia waterleaf (*Hydrophyllum virginianum*). This community has an inclusion of Buckthorn Deciduous Shrub Thicket in the southern portion signifying cultural influence or a clear cutting of the original forest.		0.37

Table 4: Vegetation Communities Documented in the Study Area

Type	Code	Title	Community Description	Area (ha) within the Subject Lands	Area (ha) within Adjacent Lands
WETLAND AND SWAMP COMMUNITIES					
Swamp	SWD	Deciduous Swamp	Deciduous Swamp located to the east of the Subject lands.		1.78
Thicket Swamp	SWT	Thicket Swamp	Thicket Swamp located to the east of the Subject lands.		2.19
Meadow Marsh	MAMM1-3	Reed-canary Grass Graminoid Mineral Meadow Marsh Type	Meadow Marsh located along the west edge of the CP ROW. The western edge of this community delineates is the wetland boundary. The community is dominated by the following species: green ash, black walnut, glossy buckthorn (*Frangula alnus*), grey dogwood (*Cornus racemosa*), Vriginia clematis (*Clematis virginiana*), silky dogwood (*Cornus obliqua*), reed canarygrass (*Phalaris arundinacea*), spotted jewelweed, fowl mannagrass (*Glyceria striata*).		0.15
AGRICULTURAL COMMUNITIES					
Agriculture	IAGM1	Agricultural Buildings	Agricultural building		0.21
Agriculture	OAGM1	Annual Row Crops	Corn	0.85	22.03
Agriculture	OAGM1/ TAGM5	Annual Row Crops/ Fencerow	Corn field with treed fence line	15.86	0.4
Agriculture	OAGM4	Open Pasture	Open pasture with grazing cattle	0.35	3.07
CONSTRUCTED COMMUNITIES					
Constructed	CVC	Commercial and Institutional	Commercial industry to the north of the Subject Lands		3.67
Constructed	CVC_3	Heavy Industry	Commercial industry to the west of the Subject Lands		8.91
Constructed	CVI_1	Transportation	Cedar Creek Road, industrial laneways and railroad	0.01	2.45

4.2.1.2 Botanical Inventory

The following is a floristic summary for the Study Area based on botanical assessments carried out in 2023 by Stantec. A detailed list with scientific plant names and species statuses is provided in **Appendix C**.

- A total of 114 vascular plants were recorded, including one taxon identified to species, subspecies (ssp.) and variation (var.) levels.
- 63 of the 114 recorded plants are native to Ontario, and 51 are exotic species not native to Ontario.
- All but five native species had a provincial rank of S5 or S4, indicating they are common or uncommon (but not rare) and secure or apparently secure in Ontario.
- Two regionally rare plants were recorded within the Study Area: common hackberry (*Celtis occidentalis*) and swamp thistle (*Cirsium muticum*)
- No species at risk plant species (e.g., butternut, black ash) were observed in the Study Area.
- Two highly sensitive native plant species with a high coefficient of conservatism value of 8, 9 or 10 were observed in the Study Area (common hackberry and swamp thistle; coefficient of conservatism value of 8).

4.2.2 Amphibian Surveys

One amphibian call count station was established on the Subject Lands as shown on **Figure 2, Appendix A**.

Gray Treefrogs were heard on two of the three survey dates calling beyond 100m of the call station AMP01. These individuals were associated with the Roseville Swamp Cedar Creek Wetland Complex and the pond north of the call station. Spring Peepers were also heard on two of the three survey dates calling from the pond area. Both species are ranked as common and secure (S5) in Ontario. Results of the call count surveys are summarized in Table 5 below with the scientific names and species statuses included in **Appendix D.**

Table 5: Amphibian Calling Activity Levels

Station	Date	Species (Call Level Code and Number of Individuals)							Notes
		AMTO	GRTR	GRFR	NLFR	PIFR	SPPE	WOFR	
AMP01	April 13, 2023						1,5*		Heard in the wetland pocket north of the survey location
	May 23, 2023		1,2*				1,2*		Heard in the wetland pocket north of the survey location
	June 21, 2023		1,1*						Heard in the PSW east of the CP Rail line.

AMTO:	American Toad	*Anaxyrus americanus*
GRTR:	Gray Treefrog	*Hyla versicolor*
GRFR:	Green Frog	*Lithobates clamitans*
NLFR:	Northern Leopard Frog	*Lithobates pipiens*
SPPE:	Spring Peeper	*Pseudacris crucifer*
WOFR:	Wood Frog	*Lithobates sylvaticus*
CHFR:	Chorus Frog	*Pseudacris triseriata*

* Denotes species heard outside of the Study Area.

4.2.3 Breeding Bird Surveys

A total of 37 species were observed during breeding bird surveys in 2023, 30 of which are expected to be breeding within the Study Area. The seven species that are not expected to be breeding within the Study Area are Bank Swallow, Killdeer, European Starling, American Crow, Canada Goose, Rock Pigeon and Cedar Waxwing. These six species were either observed flying over during surveys (not indicative of breeding behaviour) or it was determined that breeding habitat was absent from the Study Area. All species observed have provincial breeding status ranks of S5B (Secure—Common, widespread, and abundant in the province) or S4B (Apparently Secure—Uncommon but not rare). Bank Swallow (*Riparia riparia*) is listed as “Threatened” in Ontario and Barn Swallow (*Hirundo rustica*) is listed as “Special Concern.” A complete list of bird species observed during field investigations in 2023 along with subnational rank, SARO and SARA statuses can be found in **Appendix D.**

4.2.4 Bat ARU Survey

A summary of the results of the bat ARU survey are provided in Table 6, below. Four species of bats were recorded during the bat acoustic surveys, including one SAR (Tri-coloured Bat). The Tri-coloured Bat call (1) was recorded at survey location MB09, which was located in the southern end of the Subject Lands, within the hedgerow separating agricultural fields (**Figure 2, Appendix A**). Tri-coloured Bat is an endangered species in Ontario and subject to protections under the *Endangered Species Act*.

Three other bat species were recorded, included Big Brown Bat, Hoary Bat, and Silver-haired Bat. Big Brown Bat was the most commonly recorded species and detection was concentrated in the area of MB04 in the woodland/wetland feature associated with the PSW. The next most recorded species were Hoary Bat and Silver-haired Bat. Big Brown Bat was recorded at two of the three locations (MB04 and MB08), whereas Hoary Bat and Silver-haired Bat were recorded at all three locations. Big Brown Bat are common and not listed as a SAR. Hoary Bat and Silver-haired Bat are designated federally as endangered by COSEWIC and have just recently been upgraded to endangered by COSSARO; however, protections will not be enacted until January 2025.

Table 6: Bat Acoustic Survey Results

ARU ID	Start Date	End Date	Number of Recording Nights	Number of Calls Recorded Per Species							
				Big Brown Bat	Hoary Bat	Silver-haired Bat	Tri-coloured Bat	High Frequency Unknown	Low Frequency Unknown	NoID	Total
MB04	30-May	21-Jun	22	34	28	33	-	9	161	150	**415**
MB08	30-May	21-Jun	22	1	22	10	-	-	34	21	**88**
MB09	30-May	21-Jun	22	-	39	37	**1**	4	27	21	**129**
Total				**35**	**89**	**80**	**1**	**13**	**222**	**191**	**632**

4.2.5 Incidental Wildlife

Incidental observations of wildlife and wildlife evidence included two reptiles (Eastern Gartersnake and Snapping Turtle), one mammal (Woodchuck), two birds (Bald Eagle and American Woodcock) and one amphibian (Wood Frog). Identified species have a provincial rank of S5 or S4, indicating they are secure / apparently secure in Ontario. Both Snapping Turtle and Bald Eagle are listed as “Special Concern” in Ontario. Two Wood Frogs and the American Woodcock were observed calling outside the Study Area within the Roseville Swamp Cedar Creek PSW Complex prior to amphibian surveys on April 13, 2023. Both Snapping Turtles (one alive, one deceased) were observed outside the Subject Lands. The complete list of wildlife species and their status and scientific names is provided in **Appendix D**.

4.2.6 Significant Wildlife Habitat

4.2.6.1 Seasonal Concentration Areas

Review of the NHIC and LIO databases did not identify seasonal concentration areas within the Study Area.

The potential for seasonal concentration areas to occur in the Study Area based on the results of the field surveys conducted is provided in Table 7, below.

Table 7: Seasonal Concentration Areas

Habitat Type	Habitat Features	Candidate SWH in the Study Area
Waterfowl Stopover and Staging Areas (Terrestrial)	Field with evidence of annual spring flooding from meltwater or runoff; aquatic habitats such as ponds, marshes, lakes, bays, and watercourses used during migration, including large marshy wetlands	None (candidate features not observed)
Waterfowl Stopover and Staging (Aquatic)	Ponds, lakes, marshes bays, coastal inlets used during migration. Sewage treatment ponds do not qualify.	None (candidate features not observed)
Shorebird migratory stopover area	Beaches and un-vegetated shorelines of lakes, rivers, and wetlands	None (candidate features not observed)
Raptor wintering areas	Combination of fields and woodland (>20 ha)	None (further outside of the study area, meadow and woodland complexes are too small to be considered significant)
Bat hibernacula	Abandoned mine shafts, underground foundations, caves, and crevices	None (candidate features not observed)
Bat maternity colonies	Mixed and deciduous forests and swamps with large diameter dead or dying trees with cavities	None in Study Area. Outside of the Study Area and associated with the PSW, units SWD and FODM7-2 have large trees and are likely to support roosting bats.
Turtle wintering area	Permanent waterbodies and large wetlands with sufficient depth and dissolved oxygen	None (candidate features not observed).
Reptile hibernacula	Rock piles or slopes, stone fences, crumbling foundations	**POTENTIALLY PRESENT** –An old foundation observed in the WODM4/MEMM3 section of the Subject Lands in the northwest could be below grade. Additional snake studies would be required to assess potential for hibernaculum in the area.
Colonially – nesting bird breeding habitat (bank and cliff)	Eroding banks, sandy hills, steep slopes, rock faces or piles	None (candidate features not observed)
Colonially – nesting bird breeding habitat (trees/shrubs)	Dead trees in large marshes and lakes, flooded timber, and shrubs, with nests of colonially nesting heron species.	None (candidate features not observed; breeding bird surveys did not document use by qualifying species)

Table 7: Seasonal Concentration Areas

Habitat Type	Habitat Features	Candidate SWH in the Study Area
Colonially – nesting bird breeding habitat (ground)	Rock islands and peninsulas in a lake or large river	None (candidate features not observed; breeding bird surveys did not document use by qualifying species)
Migratory butterfly stopover area	Meadows and forests that are a minimum of 10 ha and are located within 5km of Lake Erie or Lake Ontario	None (not located within 5km of Lake Erie or Lake Ontario)
Landbird migratory stopover area	Woodlands of a minimum size located within 5km of Lake Erie or Lake Ontario	None (SWT, SWD, FODM7-2 and WODM4 communities are too small to be considered significant)
Deer Yarding Areas	In winter, deer congregate in “yards” to survive severe winter conditions.	None (candidate features not documented by MNRF). Deer probably present on Subject Lands, but no yards observed.
Deer wintering congregation areas	Deer yards are mapped by MNRF.	None (no background records of features)

4.2.6.2 Rare or Specialized Habitats

The potential for rare or specialized habitats to occur in the Study Area is described for each habitat type in Table 8 and Table 9, below.

Table 8: Rare or Specialized Habitats

Habitat Type	Habitat Features	Candidate SWH in the Study Area
Sand barren, alvar, cliffs and talus slopes	Sand barren, Alvar, Cliff and Talus ELC Community Classes, and other areas of exposed bedrock and patchy soil development, near vertical exposed bedrock and slopes of rock rubble	None (not documented during vegetation surveys)
Prairie and savannah	Open canopy habitats (tree cover < 60%) dominated by prairie species	None (not documented during vegetation surveys)
Old growth forest	Relatively undisturbed, structurally complex; dominant trees > 100 years' old	None (not documented during vegetation surveys)
Other rare vegetation communities	Vegetation communities ranked S1-S3 by the NHIC.	None (not documented during vegetation surveys)

Table 9: Specialized Habitats of Wildlife considered SWH

Habitat Type	Habitat Features	Candidate SWH in the Study Area
Waterfowl nesting areas	Upland habitats adjacent to wetlands (within 120m)	None (SWT and SWD communities are likely too small to be considered significant)
Bald Eagle and Osprey nesting, foraging and perching habitat	Treed communities adjacent to rivers, lakes, ponds, and other wetlands with stick nests of Bald Eagle or Osprey	None (candidate features not observed)
Woodland raptor nesting habitat	Forested ELC communities >30 ha with 10 ha of interior habitat	None (FODM7, WODM4, SWD and SWT communities are too small and have insufficient interior habitat to be considered significant)
Turtle nesting areas	Exposed soil, including sand and gravel in open sunny areas near wetlands	None (candidate features not observed)
Seeps, springs, and mineral licks	Any forested area with groundwater at surface within the headwaters of a stream or river system	None (candidate features not observed)
Amphibian breeding habitat (woodland and wetland)	Treed uplands with vernal pools, and wetland ecosites	None. Results of the amphibian surveys at AMP01 did not identify suitable numbers of breeding amphibians to qualify for significance.
Woodland area sensitive breeding bird habitat	Large mature forest stands, woodlots >30ha and >200m from the forest edge	None (FODM7, WODM4, SWD and SWT communities are too small to be considered significant)

4.2.6.3 Habitat for species of conservation concern

Candidate habitats for species of conservation concern are discussed in Table 10**,** below**.**

Table 10: Habitat for Species of Conservation Concern

Habitat Type	Habitat Features	Candidate SWH in the Study Area
Marsh bird breeding habitat	Wetlands with shallow water with emergent aquatic vegetation	None (no marsh habitat present within the Study Area). Species listed in the SWH Criteria were not observed during field investigations in 2023.
Open country bird breeding habitat	Large grasslands and fields (>30ha)	None (MEMM3 community in northwestern is too small to be considered significant).
Shrub/early successional bird breeding habitat	Large shrub and thicket habitats (>10ha)	None (thickets are too small to be considered significant)
Terrestrial Crayfish	Wet meadows and edges of shallow marshes	None (evidence of terrestrial crayfish was not observed)
Special Concern and Rare Wildlife Species	Habitat that sustains species that are Special Concern or provincially rare (S1-S3, SH).	**POTENTIALLY PRESENT** – Barn Swallow, Bald Eagle and Snapping Turtle (all provincially listed as "special concern") were observed in the Study Area in 2023. Appropriate habitat for Barn Swallow exists in the Study Area. Appropriate habitat for Bald Eagle is absent., and Snapping Turtle habitat is outside of the Study Area and associated with the farm pond.

Animal movement corridors are distinct passageways or defined natural features that are used by wildlife to move between habitats, usually in response to seasonal requirements. Movement corridors are identified once the following seasonal concentration areas or specialized habitats are confirmed as SWH: amphibian breeding habitat and deer wintering habitat. Candidate animal movement corridors are discussed in Table 11**,** below.

Table 11: Summary of Animal Movement Corridors

Habitat Type	Habitat Features	Candidate SWH in the Study Area
Deer movement corridors	Associated with confirmed deer wintering habitat	None (deer wintering habitat was determined to be absent as noted above)
Amphibian movement corridors	Associated with confirmed amphibian breeding habitat	None (amphibian breeding habitat was absent)

4.2.6.4 SWH Summary

The SWH assessment identified two (2) candidate SWH components and one (1) confirmed SWH components for the general area:

- **Candidate Reptile Hibernaculum** – An old foundation in the WODM4/MEMM3 area of the northwest section of the Subject Lands may require further examination as a hibernaculum. The foundation could extend below grade and additional studies would be required to assess the potential for snake hibernaculum in the area.
- **Candidate Bat Maternity Colonies** – While not present in the Study Area, the wetland to the east includes FOD and SWD communities that have the potential to support bat maternity colonies. Hedgerows do not qualify as SWH.
- **Special Concern and Rare Wildlife** – Potentially Present – Barn Swallow, Bald Eagle and Snapping Turtle (all provincially listed as "Special Concern") were observed in the area in 2023; however, habitat locations were not confirmed. Appropriate habitat for Barn Swallow may exist on the Subject Lands. Snapping Turtle exists outside of the Study Area in the farm pond area and appropriate habitat for Bald Eagle is absent. Refer to **Figure 2, Appendix A** for locations of observed Special Concern wildlife.

4.2.7 Headwater Drainage Feature Assessments

Headwater Drainage Features (HDF) were assessed on April 13, 2023 (HDFA #1). While the absence of any flow during the first visit did not warrant the requirement for a second or third visit as per the guidelines (CVC and TRCA, 2014), additional observations were carried out on May 10, 2023 during site visits for other surveys. HDF segments that were reviewed are identified as HDF1, HDF2 and HDF3 on **Figure 2, Appendix A**.

A summary of the flow characteristics observed during site visits undertaken in accordance with the timing prescribed by the guidelines is provided below:

- HDF1: A dry, braided flow path was present through a tilled agricultural field. No defined feature was present and the flow path eventually dissipates on Subject Lands. The HDF conveys drainage from north of Cedar Creek Rd onto the Subject Lands through a culvert under Cedar Creek Rd.
- HDF2: A dry, braided flow path was present through a tilled agricultural field. No defined feature was present and the flow path eventually dissipates on Subject Lands. The HDF originates at the western edge of the Subject Lands, conveying drainage from the industrial area to the west
- HDF3: Similar to HDF2, HDF3 originates at the western edge of the Subject Lands, conveys drainage from the industrial area, and drains southward into HDF 2. The hydrological conditions and morphology of HDF3 were similar to HDF2.

These features are all within cultivated farmland and likely dry up soon after spring freshet, particularly given the infiltrative capacity of the underlying soils. The HDFs are likely cultivated and planted by mid-May. Their primary function is to convey drainage toward Cedar Creek but dry up or infiltrate before reaching the flow destination. The assessment of functions and resulting management recommendations as per the guidelines are summarized in Table 12 below.

Table 12: Summary of Headwater Drainage Feature Assessments

Drainage Feature	Step 1		Step 2	Step 3	Step 4	Management Recommendation
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	
HDF1	Limited or Recharge	Tilled agricultural field	Limited	Likely Contributing/ None	Limited	Maintain Recharge
HDF2	Limited or Recharge	Tilled agricultural field	Limited	Likely Contributing/ None	Limited	Maintain Recharge
HDF3	Limited or Recharge	Tilled agricultural field	Limited	Likely Contributing/ None	Limited	Maintain Recharge

4.2.8 Fish Habitat

None of the HDFs on the Subject Lands support fish habitat and their primary function is to deliver water primarily through ground water infiltration toward Cedar Creek in a short-lived period during spring freshet and precipitation events.

Fish habitat is present beyond the Study Area and is associated with the outlet tributary from the farm pond and Cedar Creek. Both of these features have been identified as supporting coldwater fish habitat.

4.2.9 Species At Risk

One SAR bat (Tri-coloured Bat) was recorded within the Study Area in 2023. The Tri-coloured Bat call (1) was recorded at survey location MB09, which was located near the south end of the Subject Lands, within the hedgerow separating agricultural fields (**Figure 2, Appendix A**).

Bank Swallow was observed during breeding bird surveys in 2023 and was the only confirmed bird Species at Risk present within the Study Area. However, no eroding banks or other suitable breeding habitat types were identified on site, and this species was assumed to be using the Study Area for foraging purposes only.

4.2.10 Designated Feature Summary

The following designated and observed natural features were identified in the Study Area:

- Candidate bat maternity habitat associated with large trees in the WODM4 community in the northwest area of the Subject Lands
- Potential snake hibernaculum associated with existing foundations if they extend below ground. Additional studies are required.
- Potential habitat for barn swallow as a species of concern. The barn swallow has been delisted to special concern by COSSARO and is no longer protected under the ESA.

Designated features observed during this study are primarily associated with the Roseville Swamp Cedar Creek PSW complex which is located beyond the limits of the Study Area.

5.0 DESCRIPTION OF PROPOSED DEVELOPMENT

5.1 DEVELOPMENT COMPONENTS

The proposed Draft Plan includes the creation of a new private condo street, seven industrial zoned lots and a stormwater management (SWM) facility block. The proposed SWM facility will be located at the southern end of the Subject Lands and will primarily function to infiltrate pre-treated runoff. A constructed conveyance channel (referred to as the SWM outlet channel throughout this report) will be provided in an approved easement to convey high flows towards the Roseville Swamp Cedar Creek PSW complex and ultimately, Cedar Creek.

Various criteria were applied to the design of lot grading and the road profiles to achieve desired drainage function and acceptability of the design from an approvals perspective. The objectives of the design were to:

- Match existing grades, where possible, to minimize grading and cut/fill quantities and minimize changes to the surface hydrology and hydrogeology of the area.
- Match existing road elevations, with consideration given to forecasted road redevelopments (i.e., future upgrades to Cedar Creek Road).
- Satisfy the Town of North Dumfries's requirements for minimum and maximum road grades.
- Where possible, provide a major overland flow route.
- Respect existing environmental feature configurations, elevations that are to be retained, and prescribed wetland buffer limits.
- Provide a spill point and conveyance for the existing municipal infiltration-based SWM facility located west of the Subject Lands.
- Provide continued drainage conveyance for external lands north and west of the Subject Lands to match existing conditions.

No traditional storm sewers are proposed for the proposed development. Lot grading was designed to split drainage in order to minimize the need to raise the grades on the overall development. In that regard, the lot grading was designed so that the front of each lot drains to a road ditch along the east side of the new street, while the rear lot area will drain to a rear lot ditch along the eastern property boundary of the Subject Lands. Both the roadside ditch and rear lot ditch will convey lot drainage to the proposed SWM facility. Storm bypasses are proposed such to convey external drainage from the north and west of the Site to the adjacent lands and mimic the existing drainage conditions.

Individual onsite sewage systems, utilizing conventional septic system and tertiary treatment with subsurface discharge of treated effluent, will provide sanitary servicing for each lot in the development. The individual onsite sewage systems will be located entirely within each lot boundary. It is intended that these services will be privately owned and operated by the lot occupiers.

The layout of the proposed Draft Plan showing lot locations, preliminary building and septic positioning, the new condo street and the location of the SWM facility is provided on **Figure 3, Appendix A**.

5.2 STORMWATER MANAGEMENT

As mentioned in Section 5.1, the SWM block is proposed at the southern end of the Subject Lands, and the new roadside ditch and rear lot conveyance ditch will deliver runoff to the SWM facility. The proposed SWM strategy for the development is described under separate cover in the *Functional Servicing and Stormwater Management Report* (Stantec 2024a). The strategy is to provide water quality and quantity control for the drainage generated within the Subject Lands and it incorporates minor and major system conveyance via grassed swales (east road ditch and rear lot ditch) to the proposed SWM Facility for water quality and quantity control. Infiltration has been incorporated on a lot-level basis where possible, as well as within the end of pipe SWM Facility.

The drainage from the external lands to the west of the Subject Lands will be routed around the perimeter of the Site via a swale (called the west road ditch), which will bypass the SWM facility and connect to the outlet channel that will extend easterly towards Cedar Creek. Similarly, the drainage from the external lands to the north of the Subject Lands will enter a storm sewer upon entry into the Subject Lands (called the By-Pass Storm Sewer) and be released east of the Site, where the existing flows drain. A plunge pool and spreader swale will be provided at the end of the By-Pass Storm Sewer on the east border of the Site. The plunge pool will help dissipate the energy from the pipe and provide more infiltration potential while the spreader swale will help to release the flows over a greater surface area, reducing the erosion potential to the neighbouring external lands to the east of the Subject Lands. Details of the plunge pool and spreader swale will be designed at a future design stage. The use of a perforated pipe system in the By-Pass Storm Sewer also will be investigated in future design stages to provide the potential for advanced infiltration into the surrounding soils before daylighting into the plunge pool.

The SWM criteria for the subject lands were established through the guidance documentation and pre-consultation with GRCA, the Township of North Dumfries and the Region of Waterloo. The SWM criteria are as follows:

- **Water Quality** – Provide sufficient permanent pool and extended detention volume to meet the MECP *Enhanced* (80% Total Suspended Solids [TSS] Removal) criteria and promote at-source removal
  of potential contaminants.
- **Water Quantity** – Provide sufficient water quantity control to maintain proposed peak flow rates to existing levels for all storms up to and including the 100-year storm event.
- **Infiltration and Water Balance** – Promote infiltration measures where possible and provide best efforts to match existing Infiltration rates.
- **Erosion Control** – Provide sufficient extended detention for the 25 mm storm event with a minimum
  24-hour drawdown period.

- **Erosion and Sediment Control** – Provide appropriate erosion and sediment control during construction/area grading to protect adjacent properties from potential siltation.

The SWM Facility is designed to infiltrate all minor storms up to and including the 10-year event, while major storm events greater than the 10-year storm will be attenuated in the infiltration cell prior to being discharged to the outlet channel at rates below existing conditions. The SWM Facility forebays will provide initial water quality treatment and isolation of sediment deposition for ease of cleanout and to minimize transport of fines from entering and clogging the infiltration cell. The infiltration cell will provide further water quality treatment through infiltration of most runoff events. Since the basin will be sized to infiltrate up to the 10-year storm event, it can be assumed it will also provide over 80% TSS removal prior to discharge to the lengthy downstream SWM outlet channel. For reference, the MECP infiltration basin volume requirement for quality control based on an Enhanced level of treatment is 608 m^3, whereas this facility contains over 7000 m^3 of infiltration volume.

The SWM Facility is proposed to be drained by a single outflow weir once the infiltration volume is exceeded. Flows that pond to an elevation higher than the infiltration depth will discharge over the weir into the outlet channel towards Cedar Creek. This will occur for events greater than the 10-year storm event. The SWM outlet is proposed to discharge to an outlet channel that will be established within an easement that will traverse the southern and eastern portions of the adjacent lands known as 2407 Cedar Creek Road, and flow, if it persist for that distance, will be discharged to move towards the southern edge of the Roseville Swamp Cedar Creek PSW Complex on the west side of the CP rail line. The outlet channel will be terminated approximately 5 m before it reaches the vegetated edge of a buckthorn deciduous shrub thicket, shown as polygon THDM2-6 on **Figure 2, Appendix A**.

As previously discussed, there are four grassed swales (ditches) associated with the development, including the west road ditch, east road ditch, rear lot ditch, and the outlet channel. Grassed swales are known to provide infiltration and water quality benefits as the water travels over the pervious area. However, the amount of infiltration and sediment removal efficiency the swale can achieve is hard to predict and these additional benefits have not been factored into the treatment and infiltration calculations. In addition, the outlet channel from the SWM facility will be similarly grass-lined, providing water quality polishing of overflow from the facility and an extensive length over which infiltration will occur due to the underlying soils.

5.2.1 Infiltration and Groundwater

Geotechnical work performed by Stantec identified predominantly sands across the Subject Lands, with smaller areas of gravel and silts. Based on the results of the *Preliminary Geotechnical Investigation* (Stantec, 2024b), it can be concluded that the soils are generally suitable for infiltration, and infiltration testing conducted as a part of the hydrogeological study (Stantec, 2024c) confirmed that this is the case. Locations with higher silt content have lower infiltration rates, as expected, whereas locations with higher amounts of non-cohesive sand and gravel, such as the south portion of the Subject Lands, have higher infiltration rates and present favorable conditions for on-site infiltration.

To promote at-source infiltration, it is proposed that all rooftops throughout the development be directed to soak-away pits sized to retain runoff from the 25 mm event. Additionally, flows from the development will be conveyed to the SWM facility through swales, again promoting infiltration, especially during smaller rainfall events.

As mentioned previously, the proposed SWM facility will be designed as an infiltration facility comprised of two dry forebays to provide initial water quality treatment and isolation of sediment at each inlet, followed by the main infiltration cell. The proposed SWM Facility provides additional retention volume to increase the groundwater recharge and decrease the excess runoff volume to the surrounding lands. The proposed system will be operational all year round. As the Subject Lands are outside of any Well Head Protection Areas (WHPAs), infiltration of winter runoff is assumed to not pose a significant risk to any drinking water sources. Additionally, infiltration of the winter runoff as opposed to directing this further downstream via surface flow will help reduce the impact of salt on the receiving wetland, which is connected to Cedar Creek. Nevertheless, a chloride impact assessment has been conducted and will be provided under separate cover.

The facility infiltrates all frequent storms (the 25 mm rainfall event alone represents approximately 80% of the annual precipitation volume) up to the 10-year storm and infiltration of this volume will make a significant contribution to the infiltration across the development, leading to an overall infiltration surplus and aiding in groundwater recharge that ultimately supports Cedar Creek proper and its surrounding PSW. In addition, any flow that may enter the SWM outlet channel will have to traverse 700 m of the channel length to result in any discharge from the terminus of the outlet channel. Given the high infiltrative capacity of the underlying soils, it is expected that the majority of that overflow will also infiltrate while travelling and the occurrence of actual discharge from the end of the channel will likely be infrequent.

A water balance analysis was completed as part of the Hydrogeological Assessment, documented under separate cover (Stantec, 2024c). The Hydrogeological Investigation report discusses in detail the calculation of the water balance taking all variables into account. To summarize, the volume of infiltration occurring in all catchments under the post-development condition is calculated to be approximately 15,114 m^3/year, equating to a deficit of approximately 44,566 m^3/year in comparison to pre-development conditions, but also in the absence of post-development mitigation measures. The volume of surface water runoff projected to occur under the post-development condition is approximately 120,643 m^3/year (668 mm/year), which represents a surplus of approximately 112,139 m^3/year compared to pre-development conditions, again in the absence of mitigation measures. Overall, with mitigation (retention, infiltration) there will be a surplus in annual infiltration of 66,050 m^3 and a surplus of runoff of 1,523 m^3 in comparison to pre-development conditions.

Further investigation/analysis will be necessary at the detailed design and site plan stages to confirm site water balance, infiltration rates, and depth to high groundwater levels at the base of the proposed infiltration facilities; however, it is assumed that as most of the Site is being infiltrated, the water balance targets will be maintained.

6.0 IMPACT ASSESSMENT

The proposed Draft Plan on the Subject Lands was overlain on an aerial base showing the existing natural heritage features as shown on **Figure 3, Appendix A**. The context of the Draft Plan in relation to the existing natural heritage features informs the assessment of potential direct and indirect impacts, including potential impacts associated with construction and potential long-term impacts associated with development of the subdivision. Direct impacts are quantifiable effects and include the direct loss of features, while indirect effects are qualitative in nature and may include effects such as sedimentation and noise impacts to wildlife on adjacent lands.

Site-specific and standard recommendations are identified below to mitigate potential impacts to natural features on the Subject Lands and on the Roseville Swamp Cedar Creek PSW Complex to the east. Site-specific measures are recommended to address the specific natural heritage features and functions identified for the Subject Lands and SWM Block lands, while standard measures address strategies that are typically generic and applicable to many situations, and often required for construction.

6.1 DIRECT IMPACTS AND MITIGATION

6.1.1 Stormwater Management and Site Level Water Balance

Impacts of stormwater management on nearby features, including the PSW to the east of the Study Area, are typically associated with the potential reduction in groundwater recharge associated with the elimination of pervious areas (due to the increase in impervious areas).

As discussed in Section 5.2, annual pre-development infiltration at the Site is projected to be reduced by 44,566 m^3 under the post-development condition without mitigation. However, to assist in mitigating this projected infiltration deficit, runoff captured under the developed condition will be directed to the proposed SWM facility and returned to the subsurface via an infiltration cell, resulting in an estimated annual stormwater volume of 110,616 m^3 being returned to the subsurface. Subsequently, pre-development infiltration volumes at the Site will be exceeded by approximately 66,050 m^3 under the post-development condition. Given this surplus of infiltration in comparison to pre-development conditions, no impacts are anticipated to groundwater discharge and subsequent discharge in Cedar Creek and the PSW located to the east.

As outlined in the Hydrogeological Study report, the Subject Lands do not intercept a Wellhead Protection Area (WHPA), Highly Vulnerable Aquifer (HVA), Intake Protection Zone (IPZ) or Issue Contributing Area (ICA). This Subject Lands is classified as a Significant Groundwater Recharge Area (SGRA). Overall, no protection policies specified in the SPP apply to the Subject Lands; however, suitable mitigation measures should be in place to address potential spills that may occur during construction.

The high groundwater table is expected to occur below proposed subsurface foundations and associated infrastructure proposed for the development and, as such, minimal to no groundwater dewatering during the construction of the proposed development is anticipated.

6.1.2 Vegetation Impacts

Direct vegetation impacts will occur through the removal of residential plantings associated with the house that was present at Cedar Creek Road. The remainder of the property is generally devoid of vegetation as it is under active agricultural production. Aside from the former residence area, vegetation is restricted to a few trees in hedgerow areas around the perimeter of the Subject Lands.

A single detection of a Tri-coloured Bat was recorded in the southern portion of the Subject Lands at MB09. As this species was detected on the Subject Lands, it is advised that consultation with MECP be undertaken prior to the removal of any trees on the Subject Lands. MECP will advise on any additional information that will be required in relation to vegetation removals and any permitting requirements, if applicable.

6.1.2.1 Buffers and Setbacks

As described in Section 3.0, the initial conceptual stormwater outlet channel was anticipated to possibly encroach upon the wooded edge flanking the Roseville Swamp Cedar Creek PSW Complex adjacent to the CPR ROW; however, the extent of encroachment was uncertain. Originally, it was anticipated that the wetland boundary and any woodland edge would be flagged and surveyed in conjunction with GRCA, the Township and the Region. During the examination of design alternatives, it was determined that the outlet channel need not encroach into the wooded edge or wetland boundary and could be terminated beyond the limits of each. Through discussion regarding this adjustment, it was agreed between the Region, Township and GRCA that the limits of these features would not require flagging and surveying. The outlet channel and any associated grading is proposed to end approximately 5 m from the edge of the buckthorn thicket (THDM2-6), resulting in a setback to the wetland (MAMM1-3) of over 50 m. The setback distances will be confirmed during detailed design.

There are no features on the Subject Lands that warrant protection or a buffer/setback.

6.1.2.2 Bird's Nests

Construction activities with the potential to remove migratory bird habitat such as vegetation clearing, should be avoided during the breeding season which is generally from April 1- August 31 in southern Ontario (Environment Canada 2017). Should vegetation clearing activities be unavoidable during this window, a mitigation program should be developed, which includes measures to reduce and avoid impacts to migratory birds and their nests. This program should include preventative and mitigation measures but may also include avoidance of clearing during key sensitive periods and in key locations. If clearing is to be completed during the bird nesting season, nest sweeps should be completed 3-5 days prior to clearing activities.

6.1.2.3 Species at Risk

As noted in **Sections 4.2.9 and 6.1.2**, candidate habitat for SAR bats may occur on the Subject Lands. With the detection of the endangered Tri-coloured bat, consultation with MECP should be undertaken through the submission of an Information Gathering Form (IGF) to determine if MECP requires further

information and/or data collection that would assist in determining the appropriate management approach to vegetation on the Subject Lands, and to determine if any additional authorization and mitigation requirements prior to tree removals.

Once MECP has provided feedback and to further reduce the likelihood of harm to non-SAR bats, it is recommended that trees > 10 cm diameter at breast height (DBH) be removed outside the bat active period, which includes a maternity roosting period. Bats typically give birth in late-May to early-June, and females fly with newborn young until they become excessively heavy. Young begin to fly in mid- to late-June, at age three to four weeks. Rearing is completed by August and bats move to hibernacula in August or September (Broders et al. 2006, Cagle and Cockrum 1943, Gerson 1984). Therefore, removal of trees > 10 cm DBH is not recommended between March 15 and September 30 (inclusive).

6.1.3 Aquatic Habitat Impacts

Stormwater from the Subject Lands will be treated to an Enhanced level of protection and primarily infiltrated up to the 10-year storm. Volumes exceeding the 10-year storm will be discharged to a vegetated outlet channel that will convey flow over 700 m, which will be an improvement over existing conditions where seasonal flows traverse a cultivated agricultural landscape and likely deliver suspended sediment loads to downstream areas. The length of the channel will also provide a polishing effect to runoff quality, and it is quite likely that the majority of flow will be infiltrated over that distance. As a result, no impacts are anticipated to Cedar Creek as a result of stormwater runoff.

Water balance calculations demonstrate that there will be a surplus to the required amount of infiltration for the Subject Lands, and no impacts to groundwater contributions to Cedar Creek are anticipated.

6.1.4 Headwater Drainage Feature Impacts

Table 11 in **Section 4.2.7** identifies the management recommendations for the headwater HDFs on the Subject Lands utilizing the management recommendation flowchart contained within the CVC/TRCA guidelines. For the three reaches, a management recommendation of “Maintain Recharge” was derived from the flowchart. For this management scenario it is recommended to maintain overall water balance by providing mitigation measures to infiltrate clean stormwater. As discussed in **Section 7.0**, the headwater features on the Subject Lands tend to dry up soon after spring freshet and any flow or standing water quickly infiltrates the underlying porous soils. Groundwater flow is in the direction of Cedar Creek, and therefore the goal of the management recommendations is to maintain recharge to the groundwater table that flows towards Cedar Creek. As discussed in **Sections 5.1** and **6.1.1**, infiltration approaches have been incorporated at source (soak-away pits, east ditch, rear lot ditch) and the SWM facility has been designed to promote infiltration and achieve this function. Additionally, the conveyance of any flow beyond the 10-year event through the 700 m outlet channel will provide additional infiltration to the groundwater table.

Given all of these approaches and the calculated surplus for infiltration, the recharge function of the existing HDFs will be replicated and exceeded.

6.2 INDIRECT IMPACTS AND MITIGATION

Natural heritage features are generally lacking on the Subject Lands, and Section 6.1 has addressed impacts related to removal of trees and alterations to site drainage. Indirect impacts such as intrusion into any vegetation slated for retention, siltation from sediment-laden runoff exiting the Subject Lands, spills of deleterious substances, noise and dust migration towards neighbouring areas were identified as potential indirect impacts on from construction. These impacts may cause potential impacts by introducing substances that could be harmful to vegetation and wildlife, such as fuel used by construction vehicles, and spreading of invasive species. Additional disturbance may be required to facilitate spill clean-up activities. Where they occur, these impacts are expected to be localized to the construction area and immediate adjacent areas.

6.2.1 Mitigation Recommendations

6.2.1.1 Standard Measures for Construction

Most of the indirect impacts noted above are due to a lack of vegetation management, lack of sediment and erosion controls, improper installation of controls and lack of maintenance of controls once installed. These potential indirect impacts are common to various types of construction and can be controlled using standard mitigation measures for erosion and sediment control. The primary principles associated with sedimentation and erosion protection measures are to:

- Reduce the duration of soil exposure
- Retain existing vegetation, where feasible
- Encourage re-vegetation
- Divert runoff away from exposed soils
- Keep runoff velocities low
- Trap sediment as close to the source as possible

To address these principles, the following mitigation measures should be implemented during construction:

- Silt fencing should be used along all construction areas adjacent to natural features. No equipment will be permitted to enter natural features beyond the fencing. For this site, silt fencing should be established at the property boundary to prevent migration of sediment to off-site areas.
- Equipment will be re-fueled >30 m away from natural features to avoid potential impacts, in the event that an accidental spill occurs.
- A spill kit should be kept on site with surplus materials to address any spills and prevent infiltration of contaminants into the ground.

As detailed in the FSR, a preliminary erosion and sediment control plan has been prepared and includes the following considerations:

- Steep slopes (>3:1) shall have erosion blankets.
- Light and/or heavy-duty silt fencing will be erected on all site boundaries where there is potential for runoff to be discharged offsite, to protect adjacent downstream lands from migration of sediment in overland flow. The location of this fencing will be adjacent to the limit of grading. Silt fence attached to paige wire fencing will be installed periodically throughout the Site adjacent to sensitive areas. Silt fencing should be erected before grading begins to protect adjacent and downstream areas from migration of sediment in overland flow.
- Storm service outlets will be installed during servicing and roadworks construction to provide lot level
  dead and live storage where appropriate.
- Erosion control berms/swales will be located in appropriate (critical) areas to divert flows to temporary sediment basins.
- A construction entrance feature (“mud-mat”) will be provided at all site entrances to minimize the offsite transport of sediment via construction vehicles.
- Runoff will be directed to a temporary sedimentation facility via swales to minimize untreated runoff discharged from the Site.
- The temporary sedimentation facility should not be sited in the location of the proposed permanent SWM Facility as it may inhibit the function of the final SWM Facility as an infiltration basin.
- Swales constructed onsite will have temporary rock check dams to help attenuate flows and encourage deposition of suspended sediment where appropriate.
- All disturbed areas where construction is not expected for 30 days shall be re-vegetated with 50 mm of topsoil and hydro-seeding according to OPSS 572.
- During construction, all catchbasins are to be sealed until roads are paved to prevent sediment deposition in the catchbasins’ sumps and conveyance of silt to the SWM Facility.
- An Erosion Control Implementation Schedule will be included with the Detailed Erosion and Sedimentation Control Plan, prepared in conjunction with the pre-grading application and/or final engineering design.

Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed.

7.0 SUMMARY AND CONCLUSION

This report was prepared to document natural features that require consideration through the design of the proposed development. The results of the background review and site investigations documented the following natural features in the Study Area:

- Candidate bat maternity habitat associated with large trees in the WODM4 community in the northwest area of the Subject Lands and possibly in hedgerow trees in the southern portion of the lands.
- Potential snake hibernaculum associated with existing foundations if they extend below ground. Additional studies are required.
- Potential habitat for barn swallow as a species of concern. The barn swallow has been delisted to special concern by COSSARO and is no longer protected under the ESA.

Designated features observed during this study are primarily associated with the Roseville Swamp Cedar Creek PSW complex which is located beyond the limits of the Study Area. Other features beyond the Study Area limits include:

- Provincially Significant Wetlands (Roseville Swamp Cedar Creek Provincially Significant Wetland Complex)
- Core Environmental Feature (Roseville Swamp Cedar Creek Provincially Significant Wetland Complex; Township of North Dumfries Official Plan)
- Environmental Constraint Areas (Roseville Swamp Cedar Creek Provincially Significant Wetland Complex; Township of North Dumfries Official Plan)
- Permanent watercourses (Cedar Creek)
- Fish habitat (LIO)

Mitigation approaches have been incorporated into the design of the Draft Plan to protect natural features where warranted, including measures to mitigate potential impacts to off-site features beyond the Study Area. These measures include:

- SWM strategy that provides an Enhanced level of treatment to SWM discharge
- SWM strategy that balances pre- and post-development infiltration on the Subject Lands to maintain contributions to the Roseville Swamp Cedar Creek PSW Complex to the east
- Additional infiltration measures such as soakaway pits, vegetated ditches and a vegetated SWM outlet channel that, while not included in calculations, will contribute to polishing of runoff and infiltration of water above that which will occur in the dedicated infiltration facility
- Standard measures for construction, including sediment and erosion control
- Timing restrictions to avoid wildlife during sensitive periods, such as breeding birds and bats.

Based on the review of existing conditions on the Subject Lands, no net negative effects are expected with respect to natural features and functions as a result of the proposed development. The environs of the Roseville Swamp Cedar Creek PSW Complex to the east of the Study Area are the primary natural heritage features in the general area and are provided protection guidance through the Official Plans of the Township of North Dumfries and Region of Waterloo, as well as regulatory protection through the GRCA. The proposed SWM strategy will exceed infiltration requirements for the Subject Lands and will match or exceed infiltration from pre to post conditions. No net effects to these important features are anticipated.

8.0 REFERENCES

Bird Studies Canada. 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. 2009 Edition. 13 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

Broders, H. G., G. J. Forbes, S. Woodley, and I. D. Thompson. 2006. Range extent and stand selection for roosting and foraging in forest-dwelling Northern Long-Eared Bats and Little Brown Bats in the Greater Fundy Ecosystem, New Brunswick. The Journal of Wildlife Management 70(5): 1174-1184.

Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii + 318pp

Cagle, F.R., and E.L. Cockrum. 1943. Notes on a summer colony of *Myotis lucifugus lucifugus*. Journal of Mammalogy 24:474-492.

Coker, G.A, C.B. Portt, and C.K. Minns. 2001. Morphological and Ecological Characteristics of Canadian Freshwater Fishes. Can. MS Rpt. Fish. Aquat. Sci. 2554: iv+89p.

Credit Valley Conservation Authority (CVC) and Toronto and Region Conservation Authority (TRCA). 2014. Evaluation, Classification and Management of Headwater Drainage Features Guideline. Approved July 2013, finalized January 2014.

eBird Canada. (2022). Retrieved January 4, 2023 from eBird Canada: http://ebird.org/content/canada/

Fisheries and Oceans Canada (DFO). 2023. Aquatic Species at Risk Maps. Available at: http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm. Accesse November 2023.

Gerson, H. (1984). Habitat Management Guidelines for Bats of Ontario. Ontario Ministry of Natural Resources.

Grand River Conservation Authority (GRCA) 2015. Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation.

iNaturalist 2023. Available from https://www.inaturalist.org. Accessed January 4, 2023

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC 005.

Ministry of the Environment, Conservation and Parks. 2023. Species at Risk in Ontario. Online database: https://www.ontario.ca/page/species-risk-ontario Accessed February 15, 2023.

Ministry of Municipal Affairs and Housing. 2020. Provincial Policy Statement. Issued under Section 3 of the Planning Act. May 1, 2020.

Ministry of Municipal Affairs and Housing. 2020. A Place to Grow: Growth Plan for the Greater Golden Horseshoe. Office Consolidation 2020.

Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. 151 pp.

Ministry of Natural Resources (MNR). 2011.Bats and Bat Habitats: Guidelines for Wind Power Projects. Second Edition. Ontario.

Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January 2015. MNRF Southern Region Resources Section, Peterborough, Ontario. 41 pp.

Ministry of Natural Resources and Forestry. 2023a. Natural Heritage Information Centre (NHIC) database. Provincial status of plants, wildlife and vegetation communities database. Accessed February 15, 2023. Available online: https://www.ontario.ca/page/natural-heritage-information-centre

Ministry of Natural Resources and Forestry. 2023b. Land Information Ontario Mapping. Accessed November, 2023. Available online: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

Ontario Nature. 2012. Ontario Reptile and Amphibian Atlas Program. Online: https://www.ontarioinsects.org/herp/index.html?Sort=0&area2=squaresCounties&records=all&myZoom=5&Lat=46.58&Long=-85.81 Retrieved January 4, 2023.

Regional Municipality of Waterloo. 2015. Waterloo Region Official Plan – 2031. As approved, with modifications, by the Ontario Municipal Board on June 18, 2015.

Regional Municipality of Waterloo. 2016. Region of Waterloo Greenlands Network Implementation Guideline.

Stantec Consulting Limited (Stantec). 2024a. Functional Servicing and Stormwater Management Report, 2509 Cedar Creek Road, Ayr, ON, Township of North Dumfries.

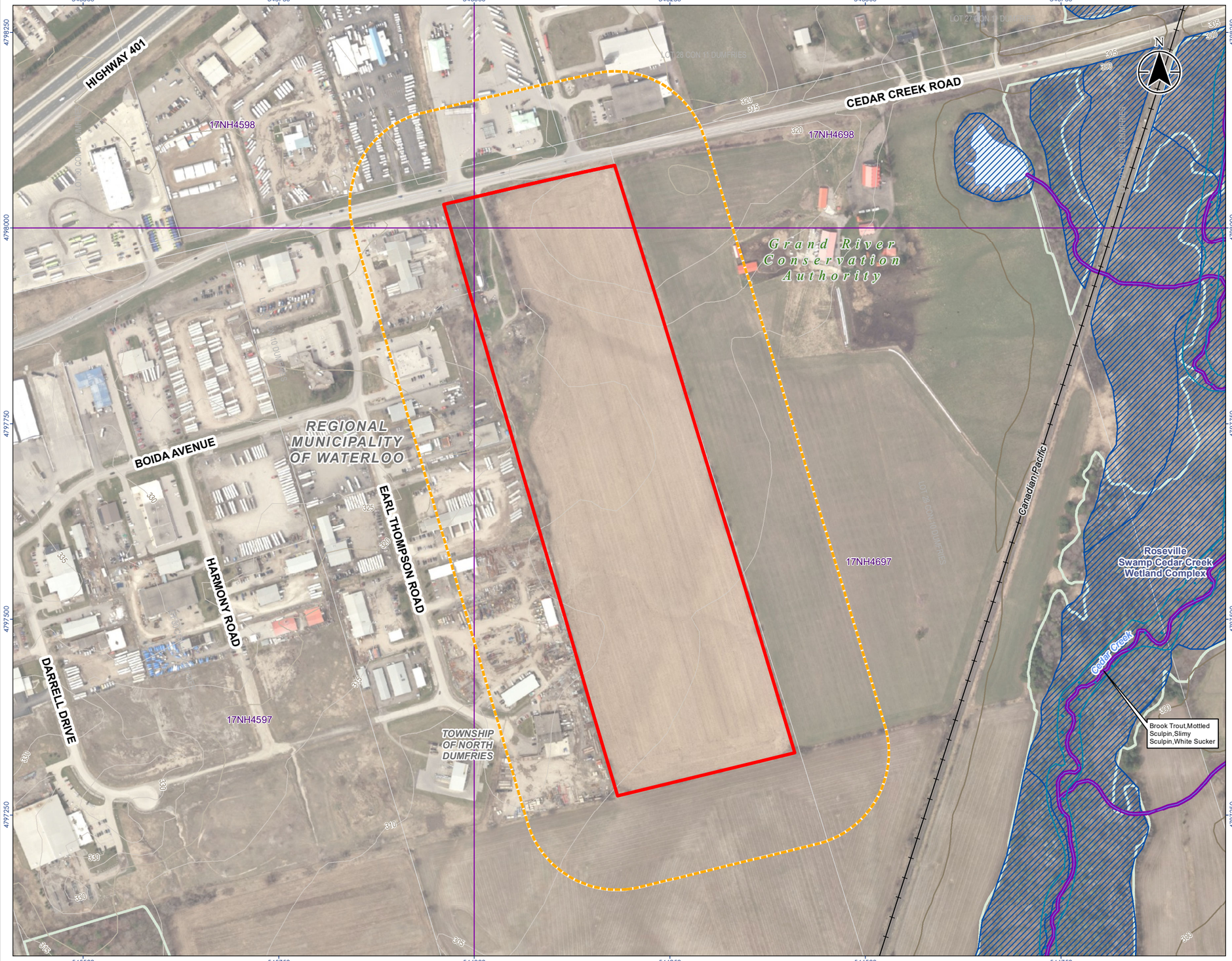
Stantec Consulting Limited (Stantec). 2024b. Geotechnical Investigation: Preliminary Geotechnical Investigation for Proposed Industrial Development, 2509 Cedar Creek Road, Ayr, ON

Stantec Consulting Limited (Stantec). 2024c. Hydrogeological Assessment, 2509 Cedar Creek Road, Township of North Dumfries, ON.

Toronto Entomologists' Association (TEA). 2023. *The Ontario Butterfly Atlas Online*. Accessed January 4, 2023, from Ontario Insects: http://www.ontarioinsects.org/atlas_online.htm

Township of North Dumfries. 2018. Township of North Dumfries Official Plan. Consolidation Date: November 2018.

APPENDIX A:
Figures



Stantec

Legend

- Subject Lands (Approximate)
- Study Area (120 m)
- Thermal Regime, Cold
- Railway
- Watercourse (Permanent)
- Conservation Authority Administrative Boundary
- Fish Spawning Area
- Waterbody
- Wetland, Provincially Significant
- Wooded Area
- Lot
- Municipal Boundary, Upper
- Municipal Boundary, Lower
- 1 km UTM Grid

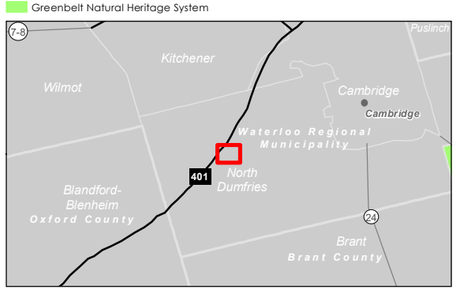
0 100 200 m

1:5,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthoimagery © First Base Solutions, 2023. Imagery Date, 2022.

Greenbelt Natural Heritage System



Project Location
Township of North Dumfries

161414214 REV1
Prepared by BF on 2024-01-10
Technical Review by DH on 2023-11-20

Client/Project
BIKRAM DHILLON - CEDAR CREEK ROAD HOLDINGS INC.
ENVIRONMENTAL IMPACT STATEMENT
2509 CEDAR CREEK NORTH DUMFRIES

Figure No.
1

Title
Existing Background Conditions

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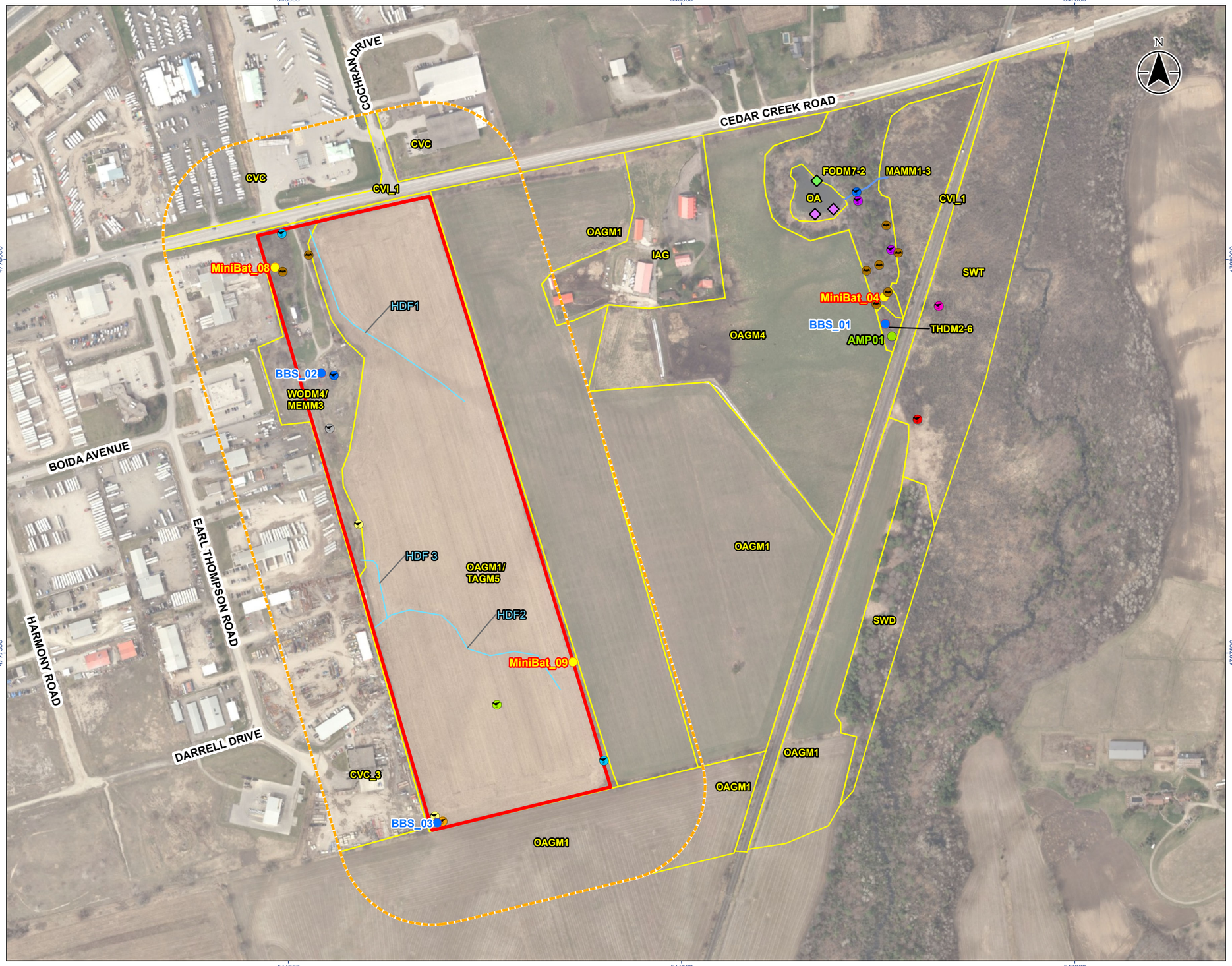

Stantec

Legend

- Subject Lands (Approximate)
- Study Area (120 m)
- Candidate Bat Maternity Roost Tree
- ELC Inclusion
- Headwater Drainage Feature
- Watercourse
- ELC Boundary

Amphibian Observations

- Gray Treefrog
- Spring Peeper

Survey Target Station

- Bat ARU Location
- Bird Monitoring
- Amphibian Call Station

Incidental Species Observations

- American Woodcock
- Bank Swallow
- Barn Swallow
- Bald Eagle
- Common Hackberry
- Eastern Gartersnake
- Snapping Turtle
- Wood Frog
- Woodchuck

ELC Description

- **CVC** - Commercial and Institutional
- **CVC_3** - Heavy Industry
- **CVI_1** - Transportation
- **FODM7-2** - Fresh – Moist Green Ash - Hardwood Lowland Deciduous Forest Type
- **IAG** - Agricultural Infrastructure
- **MAMM1-3** - Reed-canary Grass Graminoid Mineral Meadow Marsh Type
- **OA** - Open Water
- **OAGM1/TAGM5** - Annual Row Crops/Fencerow
- **OAGM1** - Annual Row Crops
- **OAGM4** - Open Pasture
- **SWD** - Deciduous Swamp
- **SWT** - Thicket Swamp
- **THDM2-6** - Buckthorn Deciduous Shrub Thicket Type
- **WODM4/MEMM3** - Dry - Fresh Deciduous Woodland Ecosite/Dry - Fresh Mixed Meadow Ecosite

0 100 200 m

1:5,000 (At original document size of 11x17)

Notes

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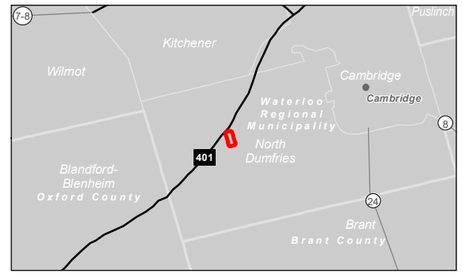


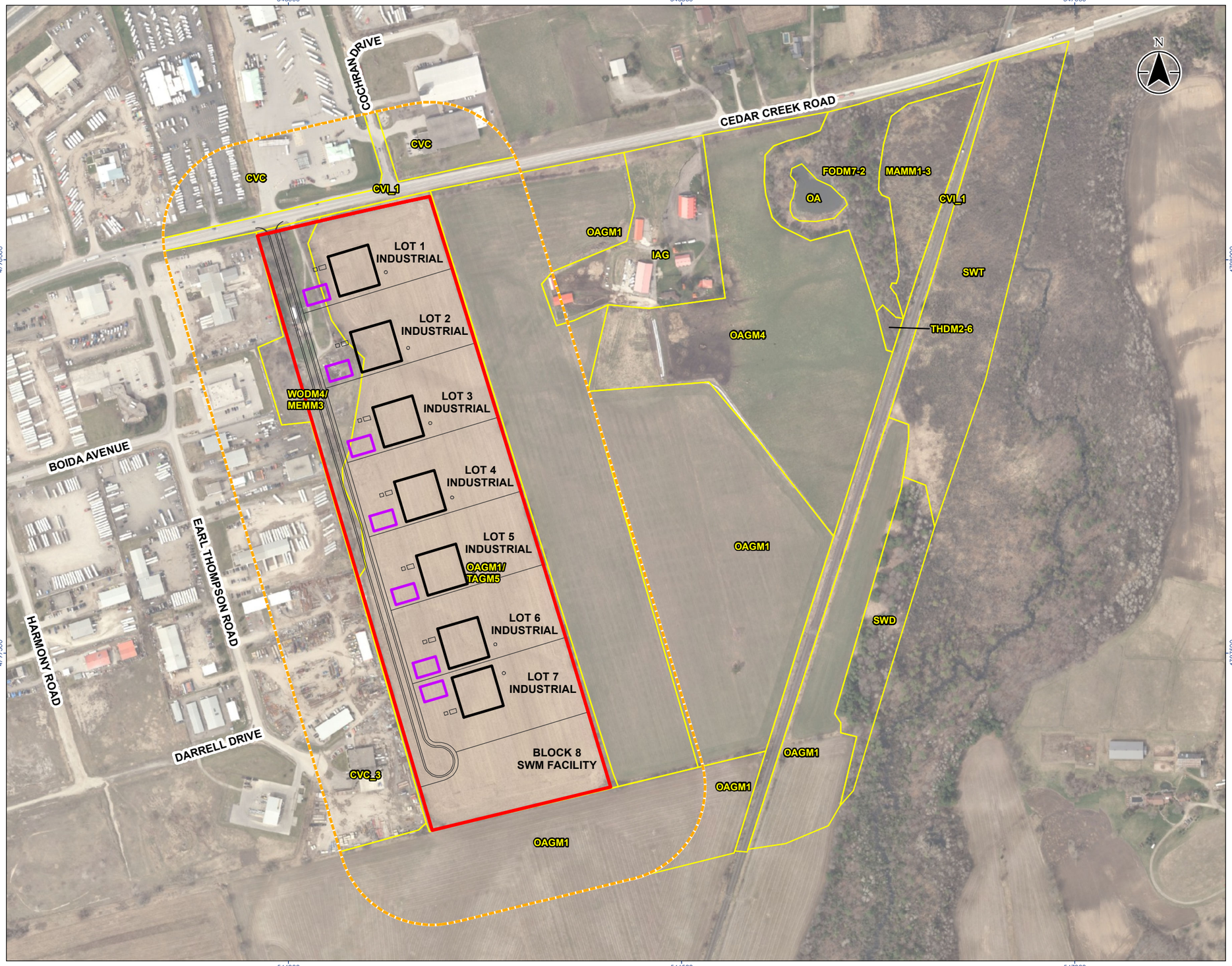
Project Location
Township of North Dumfries

161414214 REV1
Prepared by BF on 2024-01-26
Technical Review by DH on 2023-11-20

Client/Project
BIKRAM DHILLON - CEDAR CREEK ROAD HOLDINGS INC.
ENVIRONMENTAL IMPACT STATEMENT
2509 CEDAR CREEK NORTH DUMFRIES

Figure No.
2

Title
Existing Site Conditions



Stantec

Legend

- Subject Lands (Approximate)
- Study Area (120 m)
- ELC Inclusion
- ELC Boundary

Proposed Site Development

- Proposed Development Plan
- Proposed Building
- Proposed Septic Field

ELC Description

- **CVC** - Commercial and Institutional
- **CVC_3** - Heavy Industry
- **CVI_1** - Transportation
- **FODM7-2** - Fresh – Moist Green Ash - Hardwood Lowland Deciduous Forest Type
- **IAG** - Agricultural Infrastructure
- **MAMM1-3** - Reed-canary Grass Graminoid Mineral Meadow Marsh Type
- **OA** - Open Water
- **OAGM1/TAGM5** - Annual Row Crops/Fencerow
- **OAGM1** - Annual Row Crops
- **OAGM4** - Open Pasture
- **SWD** - Deciduous Swamp
- **SWT** - Thicket Swamp
- **THDM2-6** - Buckthorn Deciduous Shrub Thicket Type
- **WODM4/MEMM3** - Dry - Fresh Deciduous Woodland Ecosite/Dry - Fresh Mixed Meadow Ecosite

0 100 200 m

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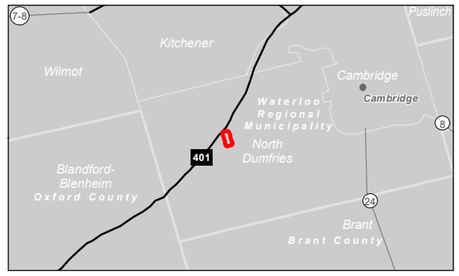


Project Location
Township of
North Dumfries

161414214 REV1
Prepared by BF on 2024-05-07
Technical Review by DH on 2023-11-20

Client/Project
BIKRAM DHILLON - CEDAR CREEK ROAD HOLDINGS INC.
ENVIRONMENTAL IMPACT STATEMENT
2509 CEDAR CREEK NORTH DUMFRIES

Figure No.
3

Title
Site Plan

APPENDIX B:
Terms of Reference

Stantec Consulting Ltd.
100-300 Hagey Boulevard
Waterloo ON N2L 0A4

April 3, 2023 (Updated May 9, 2024)
Project/File: 161414214

Bikram Dhillon
Cedar Creek Road Holdings Inc.
130 Delta Park Boulevard,
Brampton ON L6T 5E7

Dear Mr. Dhillon,

Reference: 2509 Cedar Creek Road, Ayr
Industrial Subdivision and Storm Outlet
Terms of Reference for Scoped Environmental Impact (EIS)

INTRODUCTION

Stantec Consulting Ltd. (Stantec) is pleased to provide this Scoped EIS Terms of Reference (ToR) for lands at 2509 Cedar Creek Road in the Township of North Dumfries in the Regional Municipality of Waterloo (herein referred to as the "Subject Lands"). The location of the Subject Lands is shown on **Figure 1, Attachment A.**

PROPOSED DEVELOPMENT

Although the Development Concept is still being refined, it is our understanding that the Client wishes to develop the Subject Lands to an industrial subdivision, with a stormwater management (SWM) block to be established at the south end of the lands. The SWM outlet is proposed to outlet to an easement that will traverse the southern and eastern perimeter of private lands to the east, eventually discharging to the southern edge of the Roseville Swamp Cedar Creek Provincially Significant Wetland Complex on the west side of the CP Rail line.

PLANNING CONTEXT

The Subject Lands are located within the Regional Municipality of Waterloo (Region), Township of North Dumfries and within the administrative jurisdiction of the GRCA. The GRCA Regulation Limit associated with the Roseville Swamp Cedar Creek Provincially Significant Wetland Complex (the wetland) is on private property to the east and will be encroached upon by the SWM outlet channel. The Subject Lands lie within the Cedar Creek Subwatershed of the Grand River Watershed.

Plans and policies relating to natural heritage that will be considered include:

- Provincial Policy Statement (2020)
- Natural Heritage Reference Manual (MNRF, 2010)
- Significant Wildlife Habitat Technical Guide (MNRF, 2000)
- Significant Wildlife Habitat Criteria Schedules for EcoRegion 6E (MNRF, 2015)

Reference: **2509 Cedar Creek Road, Ayr**
Industrial Subdivision and Storm Outlet
Terms of Reference for Scoped Environmental Impact (EIS)

- A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)
- Grand River Watershed Water Management Plan (2014)
- GRCA Regulations and Policies, records and database reviews
- GRCA online mapping
- Official Plan for the Regional Municipality of Waterloo (2015, as amended)
- Township of North Dumfries Official Plan (November 2018 Consolidation)
- Endangered Species Act and associated regulations
- MNRF's Land Information Ontario (LIO) database, including mapping of designated natural areas, topographic mapping, etc.
- MNRF's Natural Heritage Information Centre (NHIC) database
- Fisheries and Oceans Canada (DFO) species at risk mapping
- Topographic mapping
- Historical and current high resolution ortho imaging (aerial photographs)
- Previous data collected and/or reports prepared by others as available (MESP, Class EAs, ESRs etc.)

Table 1 provides a preliminary summary of the designated features that were found in the Study Area during the background review.

Table 1 Policy Context-Natural Heritage Features within 120 m of each Subject Lands

Policy Document	**Natural Heritage Feature Identified During Background Review**
Township of North Dumfries Official Plan (November 2018 Consolidation)	Core Environmental Features Environmental Constraints Area Hazard Lands
Official Plan for the Regional Municipality of Waterloo (2015, as amended)	Core Environmental Features
GRCA Online Mapping	Regulation Limit (GRCA) Floodplain Regulated Watercourse Wetland
MNRF/LIO Database	Provincially Significant Wetland: Roseville Swamp Cedar Creek Wetland Complex Wooded Area Watercourse (Permanent) Cold Thermal Regime

Reference: **2509 Cedar Creek Road, Ayr**
Industrial Subdivision and Storm Outlet
Terms of Reference for Scoped Environmental Impact (EIS)

Background Data Collection

The background information review will include, but is not limited to, a search of the following sources:

- Land Information Ontario (LIO) database (MNRF 2023)
- Natural Heritage Information Centre Data (NHIC; MNRF, 2023)
- Fisheries and Oceans Canada online mapping tool of aquatic SAR (DFO 2023)
- Species at Risk Ontario website (2023)
- Atlas of Breeding Birds of Ontario (Cadman et al., 2007) and ebird
- Atlas of the Mammals of Ontario (Dobbyn, 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019)
- GRCA Online Mapping (GRCA 2023)
- eBird (2023)
- iNaturalist (2023)
- Tree Atlas
- TEA (2023)

A preliminary background review identified the potential for fish habitat, significant wildlife habitat (SWH; MNRF 2015), including 8 species of conservation concern (SOCC), as well as 13 species at risk (SAR; protected by the Endangered Species Act) that may occur on the Subject Lands and in the Study Area. This includes:

- SAR
  - Two (2) species of plants (American Chestnut, Black Ash)
  - Two (2) reptiles (Queensnake, Blanding's Turtle)
  - Three (3) birds (Bank Swallow, Bobolink, Eastern Meadowlark)
  - Five (5) mammals (Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-colored Bat, American Badger)
  - One (1) amphibian (Jefferson Salamander)

- SOCC
  - One (1) butterfly (Monarch)
  - Four (4) reptiles (Midland Painted Turtle, Snapping Turtle, Eastern Milksnake, Eastern Ribbonsnake)
  - Three (3) birds (Barn Swallow, Eastern Wood-Pewee, Wood Thrush)

Based on the results of the background review, a field program was developed to collect data specific to the Subject Property and Study Area.

Reference: **2509 Cedar Creek Road, Ayr**
Industrial Subdivision and Storm Outlet
Terms of Reference for Scoped Environmental Impact (EIS)

Proposed Site Investigations

Field surveys that are proposed to be completed in 2023 are listed in **Table 2**.

Table 2 Proposed 2023 Field Investigations

Field Investigations	Targeted Dates
Headwater drainage feature assessment (3 visits, as determined by protocol)	April, May and July/August
Amphibian breeding surveys (3 visits), and amphibian habitat assessment	Visit 1: April 15-30 Visit 2: May 15-30 Visit 3: June 15-30
Flora inventory and vegetation community mapping using Ecological Land Classification (3 visits in spring, summer and fall)	Spring: May 2023 Summer: July 2023 Fall: September 2023
Habitat assessment for endangered bats (prior to leaf growth in trees)	March 2023
Breeding bird surveys (2 visits, 10 days apart)	late May to early July
Deployment of Bat Acoustic Recording Units (ARUs)	Coincident with breeding bird surveys
Wetland Delineation (OWES) using most up to date OWES protocols by certified OWES evaluators. Woodland Dripline Delineation (pre-flag) Confirmation staking and surveying of wetland and woodland boundaries with GRCA and Township through joint site walk.	Mid-June-August
Incidental wildlife observations and documentation of wildlife evidence	All visits to site

Reference: **2509 Cedar Creek Road, Ayr**
Industrial Subdivision and Storm Outlet
Terms of Reference for Scoped Environmental Impact (EIS)

Evaluation of Significance

The data obtained from the field investigations and review of background resources will be evaluated to determine sensitivity of features and functions. The criteria for determining significant features and functions will be evaluated according to the following documents:

- Provincial Policy Statement (2020)
- Natural Heritage Reference Manual (2010)
- Significant Wildlife Habitat Technical Guide (2000)
- Significant Wildlife Habitat Criteria Schedules for EcoRegion 7E (2015)
- Official Plan for the Regional Municipality of Waterloo (2015, as amended)
- Township of North Dumfries Official Plan (November 2018 Consolidation)

Impact Assessment

The significant natural features will be evaluated for potential impacts from construction and grading, stormwater management, erosion and sediment control, noise, and other development related impacts.

The Scoped EIS report will compile natural heritage data, including the following:

- Location, size and significance of woodlands and wetlands
- Key features defined in the Provincial Policy Statement, the Conservation Authorities Act, Township of North Dumfries Official Plan, the Official Plan for the Regional Municipality of Waterloo
- Vegetation communities, evaluated using Ecological Land Classification
- Potential Significant Wildlife Habitat
- Potential habitat for a species at risk or species of conservation concern
- Water features such as headwater drainage features, watercourses, lakes, ponds, springs and seeps, and recharge and discharge areas

The primary features of importance in the area are Cedar Creek, a coldwater stream that supports Brook Trout, and the Roseville Swamp Cedar Creek Provincially Significant Wetland Complex (the wetland) located approximately 500 m east of the Subject Lands. Groundwater is a key element to both the creek and wetland habitats.

Potential changes to site pervious cover and impacts to water balance will be assessed and addressed. The results of a water balance analysis will be incorporated into the EIS to discuss potential impacts to Cedar Creek and the wetland complex, and mitigation to reduce impacts will also be discussed.

The primary management approach to mitigate impacts on significant and sensitive natural features is to identify and avoid site-specific constraints to the extent possible.

Mitigation

Where impacts are unavoidable, mitigation measures to reduce or minimize impacts on features will be recommended. This will include standard construction mitigation measures (e.g., erosion and sediment

Reference: **2509 Cedar Creek Road, Ayr**
Industrial Subdivision and Storm Outlet
Terms of Reference for Scoped Environmental Impact (EIS)

control, tree and vegetation removal, timing restrictions to avoid nesting migratory birds) as well as measures to avoid impacts to wildlife habitat.

The approach to storm water management for the Subject Lands will be discussed, including the potential impacts of an outlet channel, and construction of a proposed outlet channel discharging to the wetland. Measures to reduce impacts will be examined and recommendations for design considerations will be incorporated into the EIS.

In addition to a discussion on site plan design, recommendations will be provided for mitigating potential impacts during construction, including establishing limits of development and buffers to natural features, establishment and maintenance of sediment and erosion controls, and dewatering considerations where applicable.

Summary

The purpose of this Terms of Reference is to provide an overview of the forthcoming Scoped Environmental Impact Study, including projected 2023 field studies for the proposed development at 2509 Cedar Creek Road in the Ayr. This work plan has been developed in consideration of the candidate features on the adjacent lands.

If you have any questions, or wish to discuss the content of the above, please feel free to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

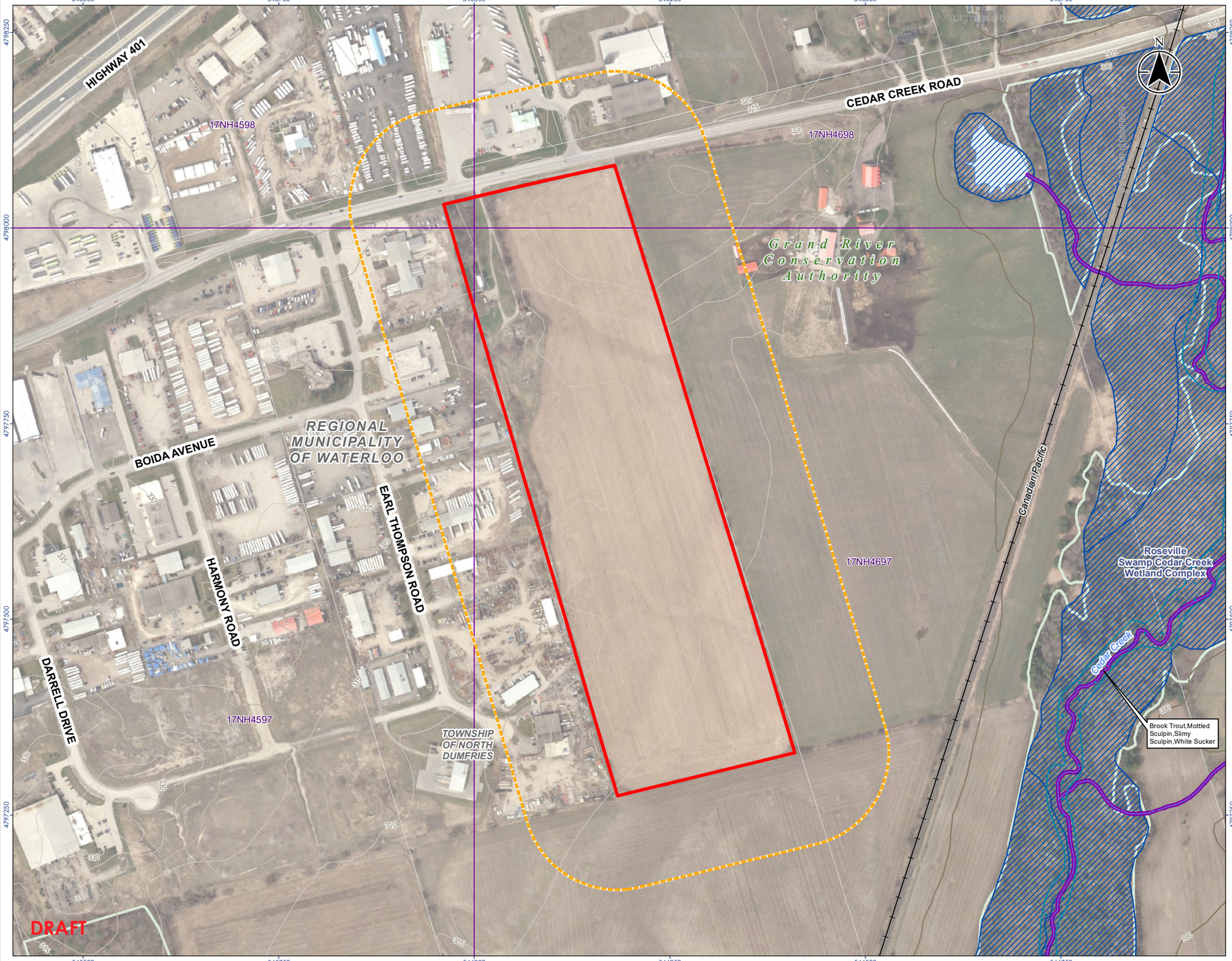
Kayla Ellis B.E.S
Ecologist
Mobile: 226-979-6972
Kayla.Ellis@stantec.com

Sean Geddes
Senior Aquatic Biologist
Phone: 519 585-7380
Mobile: 519 400-9837
Sean.Geddes@stantec.com

Attachment: Attachment A – Figure 1: Subject Lands

ATTACHMENT A

Figure 1: Subject Lands



Stantec

Legend

- Subject Lands (Approximate)
- Study Area (120 m)
- Thermal Regime, Cold
- Railway
- Watercourse (Permanent)
- Conservation Authority Administrative Boundary
- Fish Spawning Area
- Waterbody
- Wetland, Provincially Significant
- Wooded Area
- Lot
- Municipal Boundary, Upper
- Municipal Boundary, Lower
- 1 km UTM Grid

0 100 200 m

1:5,000 (At original document size of 11x17)

Notes

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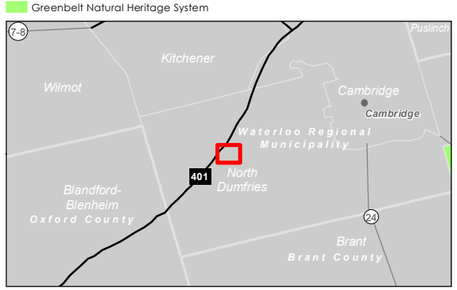
Greenbelt Natural Heritage System



Project Location
Township of North Dumfries

161414214 REV1
Prepared by BF on 2024-01-10
Technical Review by DH on 2023-11-20

Client/Project
BIKRAM DHILLON - CEDAR CREEK ROAD HOLDINGS INC.
ENVIRONMENTAL IMPACT STATEMENT
2509 CEDAR CREEK NORTH DUMFRIES

Figure No.
1

DRAFT

Title
Existing Background Conditions

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APPENDIX C:
Vascular Plant List

VASCULAR PLANT LIST - 2509 Cedar Creek Road, North Dumfries

Plant species observed on May 10, July 11 and September 19 2023

SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
PTERIDOPHYTES (FERNS & FERN ALLIES)						
Equisetum hyemale	Common Scouring-rush	S5			2	0
GYMNOSPERMS (CONIFERS)						
Pinus sylvestris	Scots Pine	SNA				3
Thuja occidentalis	Eastern White Cedar	S5			4	-3
ANGIOSPERMS (DICOTS)						
Acer negundo	Manitoba Maple	S5			0	0
Acer platanoides	Norway Maple	SNA				5
Acer saccharum	Sugar Maple	S5			4	3
Achillea millefolium	Common Yarrow	SNA				3
Alliaria petiolata	Garlic Mustard	SNA				0
Amaranthus retroflexus	Redroot Amaranth	SNA				3
Ambrosia artemisiifolia	Common Ragweed	S5			0	3
Apocynum androsaemifolium	Spreading Dogbane	S5			3	5
Arctium minus	Common Burdock	SNA				3
Artemisia vulgaris	Common Wormwood	SNA				5
Asclepias syriaca	Common Milkweed	S5			0	5
Berteroa incana	Hoary Alyssum	SNA				5
Betula papyrifera	Paper Birch	S5			2	3
Bidens sp.	Beggarticks species	SU				-3
Campanula rapunculoides	Creeping Bellflower	SNA				5
Carduus nutans	Nodding Thistle	SNA				3
Celtis occidentalis	Common Hackberry	S4			8	0
Centaurea stoebe	Spotted Knapweed	SNA				5
Chenopodium album	Common Lamb's-quarters	SNA				3
Cichorium intybus	Wild Chicory	SNA				5
Cicuta maculata	Spotted Water-hemlock	S5			6	-5
Circaea alpina	Small Enchanter's Nightshade	S5			6	-3
Cirsium arvense	Canada Thistle	SNA				3
Cirsium muticum	Swamp Thistle	S5			8	-5
Cirsium vulgare	Bull Thistle	SNA				3
Clematis virginiana	Virginia Clematis	S5			3	0
Cornus obliqua	Silky Dogwood	S5			2	-3
Cornus racemosa	Grey Dogwood	S5			2	0
Cornus sericea	Red-osier Dogwood	S5			2	-3
Crataegus sp.	Hawthorn species	SU				
Daucus carota	Wild Carrot	SNA				5
Dipsacus fullonum	Common Teasel	SNA				3
Echinocystis lobata	Wild Cucumber	S5			3	-3
Echium vulgare	Common Viper's Bugloss	SNA				5
Epilobium sp.	Willowherb species	SU				
Erigeron annuus	Annual Fleabane	S5			0	3
Erigeron canadensis	Canada Horseweed	S5			0	3
Frangula alnus	Glossy Buckthorn	SNA				0
Fraxinus pennsylvanica	Red Ash	S4			3	-3
Galium mollugo	Smooth Bedstraw	SNA				5
Galium sp.	Bedstraw species	SU				

VASCULAR PLANT LIST - 2509 Cedar Creek Road, North Dumfries

Plant species observed on May 10, July 11 and September 19 2023

SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
Geranium maculatum	Spotted Geranium	S5			6	3
Geranium robertianum	Herb-Robert	S5			2	3
Geum aleppicum	Yellow Avens	S5			2	0
Geum canadense	Canada Avens	S5			3	0
Hackelia virginiana	Virginia Stickseed	S5			5	3
Hydrophyllum virginianum	Virginia Waterleaf	S5			6	0
Hypericum perforatum	Common St. John's-wort	SNA				5
Hypericum punctatum	Spotted St. John's-wort	S5			5	0
Impatiens capensis	Spotted Jewelweed	S5			4	-3
Juglans nigra	Black Walnut	S4?			5	3
Lactuca hirsuta	Hairy Lettuce	S4			7	5
Leonurus cardiaca	Common Motherwort	SNA				5
Linaria vulgaris	Butter-and-eggs	SNA				5
Lotus corniculatus	Garden Bird's-foot Trefoil	SNA				3
Lythrum salicaria	Purple Loosestrife	SNA				-5
Malus sp.	Apple species	SU				
Malva parviflora	Small-flowered Mallow	SNA				
Medicago lupulina	Black Medick	SNA				3
Morus alba	White Mulberry	SNA				0
Nepeta cataria	Catnip	SNA				3
Parthenocissus vitacea	Thicket Creeper	S5			4	3
Plantago lanceolata	English Plantain	SNA				3
Podophyllum peltatum	May-apple	S5			5	3
Potentilla argentea	Silvery Cinquefoil	SNA				3
Potentilla recta	Sulphur Cinquefoil	SNA				5
Prunella vulgaris	Common Self-heal	S5			0	0
Prunus serotina	Black Cherry	S5			3	3
Prunus virginiana	Chokecherry	S5			2	3
Ranunculus acris	Common Buttercup	SNA				0
Rhamnus cathartica	European Buckthorn	SNA				0
Rhus typhina	Staghorn Sumac	S5			1	3
Robinia pseudoacacia	Black Locust	SNA				3
Rubus idaeus	Red Raspberry	S5			2	3
Rubus occidentalis	Black Raspberry	S5			2	5
Rumex crispus	Curled Dock	SNA				0
Rumex obtusifolius	Bitter Dock	SNA				-3
Salix interior	Sandbar Willow	S5			1	-3
Sanguinaria canadensis	Bloodroot	S5			5	3
Saponaria officinalis	Bouncing-bet	SNA				3
Securigera varia	Purple Crown-vetch	SNA				5
Silene latifolia	White Campion	SNA				5
Silene vulgaris	Bladder Campion	SNA				5
Solanum dulcamara	Bittersweet Nightshade	SNA				0
Solidago canadensis	Canada Goldenrod	S5			1	3
Symphyotrichum ericoides	White Heath Aster	S5			4	3
Symphyotrichum lanceolatum	Panicled Aster	S5			3	-3

VASCULAR PLANT LIST - 2509 Cedar Creek Road, North Dumfries

Plant species observed on May 10, July 11 and September 19 2023

SCIENTIFIC NAME	COMMON NAME	PROVINCIAL STATUS (S-RANK)	SARO STATUS	COSEWIC STATUS	COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
Symphyotrichum lateriflorum	Calico Aster	S5			3	0
Symphyotrichum novae-angliae	New England Aster	S5			2	-3
Symphyotrichum pilosum	Old Field Aster	S5				3
Symphyotrichum puniceum	Purple-stemmed Aster	S5			6	-5
Syringa vulgaris	Common Lilac	SNA				5
Tanacetum vulgare	Common Tansy	SNA				5
Taraxacum officinale	Common Dandelion	SNA				3
Toxicodendron radicans	Poison Ivy	S5			2	0
Trifolium repens	White Clover	SNA				3
Ulmus rubra	Slippery Elm	S5			6	0
Verbascum thapsus	Common Mullein	SNA				5
Verbena urticifolia	White Vervain	S5			4	0
Viburnum lentago	Nannyberry	S5			4	0
Vitis riparia	Riverbank Grape	S5			0	0
ANGIOSPERMS (MONOCOTS)						
Arisaema triphyllum	Jack-in-the-pulpit	S5			5	-3
Bromus inermis	Smooth Brome	SNA				5
Dactylis glomerata	Orchard Grass	SNA				3
Glyceria striata	Fowl Mannagrass	S5			3	-5
Narcissus poeticus	Poet's Narcissus	SNA				5
Panicum virgatum	Old Switch Panicgrass	S4			6	0
Phalaris arundinacea	Reed Canarygrass	S5			0	-3
Poa pratensis	Kentucky Bluegrass	S5			0	3
Poa sp.	Grass species	SU				
Setaria pumila	Yellow Foxtail	SNA				0

FLORISTIC SUMMARY	TOTAL
Total Species	114
Native Species	63
Introduced (exotic) species	51
Species at Risk in Ontario (END, THR or SC)	
Species at Risk in Canada (END, THR or SC)	
Rare in Ontario (S1, S2 or S3)	0
Uncommon to common in Ontario (S4)	5
Common to very common in Ontario (S5)	52
Highly sensitive plant species with C value of 8, 9 or 10	2
Wetland Plant Species (-5, -4 or -3)	19

APPENDIX D:
Wildlife Lists

Common Name	Scientific Name	S-rank	SARO Status	SARA Status	Date(s) Observed	Highest Breeding Evidence
Veery	*Catharus fuscescens*	S5B			30-May-23; 9-Jun-23	S
Song Sparrow	*Melospiza melodia*	S5			30-May-23; 9-Jun-23	S
Common Yellowthroat	*Geothlypis trichas*	S5B,S3N			30-May-23; 9-Jun-23	S
Black-capped Chickadee	*Poecile atricapillus*	S5			30-May-23; 9-Jun-23	S
Swamp Sparrow	*Melospiza georgiana*	S5B,S4N			30-May-23; 9-Jun-23	S
American Robin	*Turdus migratorius*	S5			30-May-23; 9-Jun-23	S
Northern Cardinal	*Cardinalis cardinalis*	S5			30-May-23; 9-Jun-24	S
House Wren	*Troglodytes aedon*	S5B			30-May-23; 9-Jun-23	S
Red-eyed Vireo	*Vireo olivaceus*	S5B			30-May-23	S
American Goldfinch	*Spinus tristis*	S5			30-May-23; 9-Jun-23	H
Blue Jay	*Cyanocitta cristata*	S5			30-May-23	H
Red-winged Blackbird	*Agelaius phoeniceus*	S5			30-May-23; 9-Jun-23	S
Great Crested Flycatche	*Myiarchus crinitus*	S5B			30-May-23	S
Brown-headed Cowbird	*Molothrus ater*	S5			30-May-23; 9-Jun-23	S
Eastern Kingbird	*Tyrannus tyrannus*	S4B			30-May-23	H
Bank Swallow	*Riparia riparia*	S4B	THR	THR	30-May-23; 9-Jun-23	X
Yellow Warbler	*Setophaga petechia*	S5B			30-May-23; 9-Jun-23	S
Northern Flicker	*Colaptes auratus*	S5			30-May-23; 9-Jun-23	S
Killdeer	*Charadrius vociferus*	S4B			30-May-23	X
Gray Catbird	*Dumetella carolinensis*	S5B,S3N			30-May-23; 9-Jun-23	S
European Starling	*Sturnus vulgaris*	SNA			30-May-23; 9-Jun-23	X
Horned Lark	*Eremophila alpestris*	S4			30-May-23	S
Barn Swallow	*Hirundo rustica*	S4B	SC	THR	30-May-23; 9-Jun-23	H
Field Sparrow	*Spizella pusilla*	S4B,S3N			30-May-23; 9-Jun-23	S
American Crow	*Corvus brachyrhynchos*	S5			30-May-23	X
Indigo Bunting	*Passerina cyanea*	S5B			30-May-23	S
Canada Goose	*Branta canadensis*	S5			30-May-23	X
Savannah Sparrow	*Passerculus sandwichensis*	S5B,S3N			30-May-23; 9-Jun-23	S
Vesper Sparrow	*Pooecetes gramineus*	S4B			30-May-23	S
Mourning Dove	*Zenaida macroura*	S5			30-May-23	S
Chipping Sparrow	*Spizella passerina*	S5B,S3N			30-May-23; 9-Jun-23	S
House Finch	*Haemorhous mexicanus*	SNA			30-May-23	S
Baltimore Oriole	*Icterus galbula*	S4B			9-Jun-23	S
Cedar Waxwing	*Bombycilla cedrorum*	S5			9-Jun-23	X
Alder Flycatcher	*Empidonax alnorum*	S5B			9-Jun-23	S
House Sparrow	*Passer domesticus*	SNA			9-Jun-23	S
Rock Pigeon	*Columba livia*	SNA			9-Jun-23	X

Common Name	Scientific Name	S-rank	SARO Status	SARA Status	Date(s) Observed
Reptiles					
Eastern Gartersnake	Thamnophis sirtalis sirtalis	S5			
Wood Frog	Lithobates sylvaticus	S5			
Amphibians					
Snapping Turtle	Chelydra serpentina	S4	SC	SC	
Mammals					
Woodchuck	Marmota monax	S5			
Plants					
Common Hackberry	Celtis occidentalis	S4			
Birds					
Bald Eagle	Haliaeetus leucocephalus	S4	SC		
American Woodcock	Scolopax minor	S4B			