963 County Rd 10 (Fallis North)

Environmental Impact Study

Vargas P Inc.

07 August 2025

→ **The Power of Commitment**

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1. Introduction

1.1 Background

GHD Limited (GHD) was retained by Vargas P Inc. ('Client') to complete an Environmental Impact Study (EIS) for the proposed draft plan of subdivision for the Fallis North commercial and residential development in Millbrook, Ontario for (Project). An EIS is required as part of the supporting documentation by the Township of Cavan-Monaghan Official Plan. Proposed draft plan of subdivision uses include single detached homes, town homes, residential areas, medium density areas, commercial areas, storm water management pond and a park, see **Appendix A** for the Project site plan.

1.2 Location, Site and Study Area

The Project is situated south of Larmer Line, east of County Road 10, and extends southward to the Fallis Line road allowance (Figure 1) and includes several privately owned lots fronting onto County Road 10 and is legally described as Lot 13, Concession 6 in the Township of Cavan-Monaghan, County of Peterborough, with a municipal address of 963 County Road 10 (the Site). The Site encompasses approximately 34 hectares and is characterized by large active agricultural fields, a tributary of Baxter Creek flowing through the northern portion, and a few fencerows.

The defined Study Area includes a 120-metre buffer surrounding the Site. Within the northwest portion of the Study Area are commercial businesses and residential properties interspersed with forested areas. To the east, the landscape is dominated by agricultural fields; to the west, municipal infrastructure including the Township office and associated facilities; and to the south, a draft-approved residential subdivision.

1.3 Scope and limitations

This report: has been prepared by GHD for Vargas P Inc. and may only be used and relied on by Vargas P Inc. for the purpose agreed between GHD and Vargas P Inc. as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Vargas P Inc. arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

ELC Types - 1st Approximation

Ecological Land Classification for Southern Ontario: First Approximation and Its Application. 1998.

ELC Code	Ecosite-Vegetation Type Description
CUM1-1	Dry-Moist Old Field Meadow
CUW1	Mineral Cultural Woodland
FOC2-2	Dry-Fresh White Cedar Coniferous Forest
FOD	Deciduous Forest
MAM2-2	Reed-canary Grass Mineral Meadow Marsh
MAM2-9	Jewelweed Mineral Meadow Marsh
MAM2-10	Forb Mineral Meadow Marsh
MAS2-9	Forb Mineral Shallow Marsh

4 FENCEROW
LARMER LINE
MMP4
BBS6
Hydro Line
Hydro Line
Ag
4 FENCEROW
BBS5
4 FENCEROW
4 FENCEROW
Ag
EXISTING RESIDENTIAL
8 FOD
HZ-01
6 CUM1-1
MMP3
6 CUM1-1
22,730 m²
SFQ001
FS001
SFQ002
7 FOC2-2
Seep
BBS4
Trib. of Baxter creek
COUNTY ROAD 10
Ag (SOYA)
Soil 2
Soil 1
5 MAM2-10
(to be removed)
1,114 m²
MMP2
Soil 3
Soil 4
1 CUM1-1
BBS3
HDF 1A
HDF 1B
Ag (SOYA)
4 FENCEROW
Culvert
BBS2
1 CUM1-1
HDF 2D
BBS1
4 FENCEROW
HDF 2C
MMP1
Ag
4 FENCEROW
1 CUM1-1
2 MAM2-2
(to be removed)
6,222 m²
HDF 2B
HDF 2C
4 FENCEROW
1 CUM1-1
72,682 m²
HDF 2A
EXISTING RESIDENTIAL
316 m²
3 CUW1
2621 m²
CUM1-1
433 m²

Legend

- Fish Community (electrofishing) Survey Location
- Soil Core Stations
- Culvert Location
- Seep (GHD)
- MMP - Amphibian Survey Stations
- SFQ - Surface Water Quality Location
- BBS - Breeding Bird Survey Location
- Utility Line
- Watercourse, OHN
- 30 m Setback from Significant Woodland
- 30 M Setback from Aquatic Habitat Zone 1
- Assessment Parcel
- Vegetation Communities
- Significant Woodland
- Forest Communities
- Wetland Communities

Headwater Drainage Feature (HDF) Line

- HDF 1A
- HDF 1B
- HDF 2A
- HDF 2B
- HDF 2C
- HDF 2D

Aquatic Habitat Zones

- HZ-01

1:4,200
0 30 60 90 120
Meters
Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N
Paper Size ANSI B

Charter Properties
Larmer Line & County Road 10, Fraserville, ON
Township of Cavan Monaghan
Environmental Impact Study

Preliminary Communities, Survey Points and Constraints

Project No. 12662580
Revision No.
Date Aug 6, 2025

Figure 1

Q:\GIS\PROJECTS\12662000s\12662580\GIS\Maps\Deliverables\EIS\12662580_202506_EIS\12662580_202506_EIS.aprx
Print date: 06 Aug 2025 - 11:37

Data source: Image @ County of Peterborough, 2018.

1.4 Study Rationale

This section identifies federal, provincial and other regulatory legislation, policies, official plans (OPs) and official plan amendments that are applicable and relevant to the Site and the immediate vicinity. This includes policies that triggered the study. These documents may identify Species at Risk, natural features and habitats or other features relevant to this study.

1.4.1 Federal Legislation

1.4.1.1 Fisheries Act

The purpose of the Fisheries Act is to maintain healthy, sustainable and productive Canadian fisheries through the prevention of pollution, and the protection of fish and their habitat. The Fisheries Act provides protection provisions for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects in and near water. These provide guidance on how to avoid and mitigate impacts to fish and fish habitat and comply with the Fisheries Act to avoid causing the death of a fish or harmful alteration, disruption or destruction (HADD) of fish habitat from your work, undertaking or activity.

Projects affecting waterbodies that support fish and fish habitat must comply with the provision of the Fisheries Act. The proponent is responsible for determining if the project is likely to cause impacts to fish and fish habitat and if these impacts can be avoided or mitigated. The proponent must gather information on the type and scale of impact on the fishery and determine if the impacts will result in the death of fish or a HADD of fish habitat. A Request for Review (RFR) should be submitted to Fisheries and Oceans Canada (DFO) if impacts cannot fully be avoided. Following DFO review, if it is determined that the impacts cannot be avoided or mitigated and will result in death of fish or a HADD of fish habitat, an authorization under Subsection 35 (2) of the *Fisheries Act* must be obtained from the DFO. Projects that have the potential to obstruct fish passage or affect flows needed by fish may require an authorization.

1.4.1.2 Species at Risk Act

The Species at Risk Act (SARA 2002) incorporates several prohibitions to protect individuals of listed Threatened (THR), Endangered (END), or Extirpated (EXT) species at risk (SAR) – as designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Per Section 34, Section 58 and Section 61, these prohibitions apply to aquatic species and migratory birds protected by the MBCA, on all lands, and any other listed wildlife species when on federal lands, or any lands if recommended by the Minister of the ECCC to the Governor in Council.

1.4.1.3 Migratory Birds Convention Act

The purpose of the Migratory Birds Convention Act (MBCA 1994) is to implement the Convention by protecting and conserving migratory birds, as populations and individual birds, and their nests. The MBCA (1994) and Migratory Birds Regulations (MBR; 2022), protect most species of migratory birds and their nests and eggs. General prohibitions under the MBCA and MBR protect migratory birds, their active nests and viable eggs and prohibit the deposit of harmful substances in waters/areas frequented by them. The MBR includes an additional prohibition against incidental take, defined by Environment and Climate Change Canada (ECCC) as: "The inadvertent harming, killing, disturbance or destruction of migratory birds, nests and eggs." The MBCA also includes special policies protecting pileated woodpecker nests and 18 other colonial nesting bird species.

ECCC implements policies and guidelines to protect migratory birds, and guidance on the ECCC website is provided to help to minimize the risk of detrimental effects to migratory birds and to achieve compliance with the law. Compliance with the MBCA and MBR is best achieved through a due diligence approach based on a site-specific analysis in consideration of the avoidance guidelines (timing windows) published by ECCC.

1.4.2 Provincial Legislation

1.4.2.1 Endangered Species Act

The purposes of the Ontario Endangered Species Act (ESA 2007) are to:

1. identify Species at Risk (SAR) based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge;
2. protect species that are at risk and their habitats, and to promote the recovery of species that are at risk;
3. promote stewardship activities to assist in the protection and recovery of species that are at risk. 2007, c. 6, s. 1. (Government of Ontario 2021)

The ESA clearly defines the five classifications of species status as extinct, extirpated, endangered, threatened, or special concern, and provides guidelines on the process of species status determination. Regulations made under this Act include Ontario Regulation 230/08 and 242/08. Ontario Regulation 230/08 provides the list of Species at Risk (SAR) in Ontario, which is updated regularly. This list was recently consolidated in 2024 (Government of Ontario, 2024). Species status provided in the list is assessed by an independent body, the Committee on the Status of Species at Risk in Ontario (SARO), based on the best-available science and Aboriginal Traditional Knowledge.

General habitat protection is afforded to all species listed as endangered or threatened. General habitat descriptions are technical, science-based documents that have been developed for some of the species that are likely to be affected by human activity (Government of Ontario 2022). Further information including a Recovery Strategy or Management Plan is required for each listed species, on a timeline dictated by the species status. Ontario Regulation 242/08 explains possible exemptions to the ESA and details on how the purpose of the ESA is to be carried out (Government of Ontario 2022).

Bill 5 recently passed by the Government of Ontario includes numerous changes to the ESA, including to the definition of “habitat” and other policies regarding the former conservation fund and permitting. A new Species Conservation Act is currently being prepared and is to be enacted in the near future to replace the ESA.

1.4.2.2 Provincial Planning Statement (2024)

The Provincial Planning Statement, 2024 (PPS) is the statement of the Ontario government’s policies on land use planning. It applies province-wide (in the province of Ontario) and provides provincial planning direction on land use planning. Municipalities use the PPS to develop their official plans and to guide and inform decisions on other planning matters. The PPS is issued under Section 3 of the Planning Act and all decisions affecting land use planning matters ‘shall be consistent with’ the Provincial Planning Statement (Government of Ontario 2024).

The Study Area is located within Ecoregion 6E. Policy Section 4.1 of the PPS 2024 outlines policies for Natural Heritage, and portions relevant to this project include:

4.1.4 Development and site alteration shall not be permitted in:

- *a. significant wetlands in Ecoregions 5E, 6E and 7E1; and*
- *b. significant coastal wetlands.*

4.1.5 Development and site alteration shall not be permitted in:

- *a. significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;*
- *b. significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);*
- *c. significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);*
- *d. significant wildlife habitat;*
- *e. significant areas of natural and scientific interest; and*

f. coastal wetlands in Ecoregions 5E, 6E and 7E1 that are not subject to policy 4.1.4.b), unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

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

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

4.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.4, 4.1.5 and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

1.4.3 Local and Other Regulatory Bodies

1.4.3.1 Township of Cavan-Monaghan Official Plan (Amendments to October 15, 2021)

Schedule 'A-1' (Land Use and Transportation) of the Township Official Plan shows the Site is designated as Community Commercial, while adjacent lands include designations as Urban Employment Area and Natural Linkage Area. Schedule 'B-1' (Natural Heritage System and Environmental Constraints) indicates adjacent lands include areas designated as significant woodlands, wetlands, or hazard lands.

1.4.3.2 Otonabee Region Conservation Authority Regulations and Policies

The Conservation Authority under whose jurisdiction the Site falls is the Otonabee Region Conservation Authority (ORCA). Under the Conservation Authorities Act, ORCA carries out programs that serve municipal and public interests including natural hazard management (e.g., flood and erosion control, drought), management of conservation authority owned lands, drinking water source protection and surface water and groundwater monitoring programs. A permitting process is triggered when development and activities have the potential to cause impacts to identified hazardous lands (such as floodplains, shorelines, and wetlands) that are within their Regulated Area. As both unevaluated wetlands and watercourses were identified on or adjacent to the Site, consultation with ORCA is required.

1.5 Other Resources Referenced

Prior to field surveys, background information for the Site and surrounding lands from a variety of on-line sources were reviewed to provide context for the setting and sensitivity of the site. Background information sources include:

1.5.1 Data Sources

- Recent Aerial imagery (County of Peterborough 2018)
- Ontario Ministry of Natural Resources and Forestry (MNRF) Land Information Ontario (LIO) database mapping
- Natural Heritage Information Centre (NHIC) Make a Map tool (2023)
- Ontario Breeding Bird Atlas data (Bird Studies Canada 2007)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Ontario Ministry of Natural Resources and Forestry (OMNF), Aquatic Resource Area, Fish Species List (OMNRF 2024)
- OMNRF Fish ON-Line (OMNRF 2024)
- Department of Fisheries and Oceans (DFO) Aquatic Species at Risk Mapping (DFO 2024)
- eBird and iNaturalist websites

1.5.2 Literature and Resources

– Natural Heritage Reference Manual (MNRF 2010)
– Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (OMNRF 2015)

1.6 Description of Development

The Project development is for a proposed residential subdivision located at 963 County Road 10, within the Fallis North area of Millbrook. The site plan includes a mix of residential and commercial uses, featuring 159 single detached dwellings, 148 semi-detached townhouse units, and 176 medium-density apartment units. In addition, the plan incorporates commercial blocks, public open space including a park, and supporting infrastructure such as internal roads, sidewalks, and a designated stormwater management pond (**Appendix A**).

Residential development will occupy approximately 12.76 hectares, while the commercial block spans 9.06 hectares within the overall 33.62-hectare site. A 1.95-hectare natural heritage system is being preserved adjacent to a tributary of Baxter Creek, which flows through the northern portion of the Site. A proposed road crossing and associated watercourse realignment has been included in the development plan (**Appendix A**).

1.7 Scope of Report

The objective of this EIS is to collect and analyze sufficient biological and ecological data to characterize the species, key natural heritage features, and ecological functions present within the Site. The assessment evaluates how these features may be affected by the proposed development and identifies environmentally sensitive areas and constraints. Additionally, the EIS outlines mitigation and compliance measures consistent with the applicable policies of the Township of Cavan Monaghan, the Otonabee Region Conservation Authority (ORCA), and provincial guidelines.

This report has been prepared in accordance with the Township of Cavan Monaghan Official Plan and the ORCA Environmental Impact Study Guidelines, aligning the methodology and recommendations with local and regional planning frameworks.

2. Study Methods

2.1 General Approach

The approach to the EIS preparation consisted of three distinct phases.

Background Review

GHD initiated the EIS process by collecting and reviewing existing information related to the Site and its surrounding area. This included data from a previous EIS conducted by GHD since 2018 for a nearby project located south of the current Site. Where applicable, findings from that study were incorporated into the background review for the current commercial-residential development, particularly in areas where the surveyed boundaries overlap.

Field Investigations

Site-specific biological surveys were conducted by qualified biologists during the spring and summer of 2025. The field visits were designed to validate background data and collect new ecological information. All portions of the Study Area and adjacent lands were assessed to document:

– Vegetation communities
– Wildlife presence, including species at risk

– Aquatic habitat features
– Ecological communities and linkages
– Other natural heritage features

Details of the survey methods and results are provided in **Section 2.2** of this report.

EIS Preparation and Analysis

This EIS was developed based on the combined results of the literature review and field surveys. The report has been prepared in accordance with the Township of Cavan Monaghan Official Plan and the ORCA Environmental Impact Study Guidelines.

Key components of this phase include:

– Mapping of key natural heritage and hydrologic features
– Identification of recommended buffers and vegetation protection zones (VPZs)
– Evaluation of the significance of natural features on the Site
– Assessment of potential impacts from the proposed development
– Recommendations for mitigation measures to protect sensitive features such as aquatic habitats, wetlands, and wildlife corridors

A figure is included to illustrate the location of natural features, applicable setbacks, and the proposed developable area of the Site.

2.2 Study Methodology

2.2.1 Physical Site Characteristics

GHD assessed characteristics of the Site and immediate adjacent lands (Study Area) during our field visits. These characteristics included existing disturbances, current land use, agricultural crops, age of vegetation cover, existing access lanes, general topography, and soils.

2.2.2 Biophysical Inventory

2.2.2.1 Vegetation

ELC Survey Method

Background information was collected from the Ministry of Natural Resources and Forestry (MNRF), LIO make-a-map. Preliminary mapping was completed via desktop analysis of air photos to identify vegetation communities on and adjacent to the Site. The best available (i.e., recent) aerial photographs were used to determine general habitat types and the location(s) of potential wetland areas, aquatic features, linkage areas and corridors prior to conducting field investigations. These areas were targeted for fieldwork to characterize species, natural features, and their functions.

GHD visited every vegetation community on the Site and determined their dominant species compositions. Delineation and classification of the vegetation community types was based on the Ecological Land Classification for Southern Ontario (ELC) program (Lee et al. 1998) and was done to the finest scale possible (e.g., vegetation type or ecosite). The presence of rare species or significant communities, if any, was documented and locations were mapped. Photographs and/or specimens were taken of plants requiring verification of identification.

Rare, significant, or unusual species were searched for. Species significance or rarity on a national, provincial, regional, and local level was based on published literature and standard status lists. These included the Species at

Risk Act (SARA 2025), the list produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2023), the Species at Risk List in Ontario (SARO 2024) and Oldham et al (1999).

2.2.2.2 Breeding Birds

Breeding Bird Surveys

Breeding bird surveys were conducted following the methodology used for the Ontario Breeding Bird Atlas (OBBA, 2021) point count methodology. A total of six point count stations were established that covered birds from habitats and ELC communities across the Site (**Figure 1**). Two surveys were conducted at each of these stations, during the peak breeding season (May 24 to July 10) more than a week apart. All birds seen or heard within each five-minute station period were documented and breeding evidence codes recorded. Breeding evidence codes were based on the codes from the OBBA 3rd Atlas.

Rarity on a national, provincial, and/or regional level was based on SARA (2025), COSEWIC (2023), SARO (2024) and MNRF (2014).

Area Searches

In addition to the breeding bird surveys (i.e., point counts), birds identified or encountered while on Site completing other surveys were recorded along with a breeding evidence code. The area of these surveys included all of the vegetation communities on and adjacent to the Site.

Rare, significant or uncommon species were searched for. Species significance or rarity on a national, provincial, regional or local level was based on published literature and standard status lists. These included SARA (2023), COSEWIC (2023), SARO (2024) and OMNRF (2014).

2.2.2.3 Amphibians

Modified Marsh Monitoring Program Surveys (MMP)

Targeted spring surveys for breeding amphibians were completed in the evening to record any calling breeding frogs or toads. Surveys were conducted following a modified Marsh Monitoring Program protocol (MMP). Some of the parameters of this protocol included:

- Stations being placed so that calling amphibians from wetlands and adjacent upland habitats could be detected.
- Stations being visited between April 1st and June 30th with a minimum of 15 days between visits.
- The timing for the surveys was such that surveyors recorded observations no earlier than 30 minutes after sunset and no later than midnight. Field conditions were recorded upon arrival (cloud cover, temperature, wind, precipitation).
- Surveys were conducted when evening temperatures were a minimum of 5ºC and 10ºC.
- Surveys were conducted for 3 minutes per survey time period.
- Protocol from Environment Canada's/Birds Canada Marsh Monitoring Program was utilized using associated call level codes:
    - Code 1: Calls not simultaneous- number of individuals can be accurately counted.
    - Code 2: Some calls simultaneous- number of individuals can be reliably estimated.
    - Code 3: Full chorus- calls continuous and overlapping, number of individuals cannot be reliably estimated.

Surveyors noted whether any species detected were within (or outside of) 100 meters of each survey station. The locations of the survey stations are illustrated on **Figure 1**.

Rare, significant or uncommon species were searched for. Species significance or rarity on a national, provincial, regional or local level was based on published literature and standard status lists. These included SARA (2025), COSEWIC (2023), SARO (2024) and OMNRF (2000).

2.2.2.4 Other Wildlife

Incidental observations of any other wildlife (including birds, mammals, amphibians and reptiles) encountered on Site were recorded. Documentation included notes about the species detected, their location and the type of encounter (i.e., direct sightings and indirect evidence such as calls, tracks, scat, burrows, dens, trails and browse).

Rare, significant or uncommon species were searched for. Species significance or rarity on a national, provincial, regional or local level was based on published literature and standard status lists. These included SARA (2025), COSEWIC (2023) and SARO (2024).

2.2.2.5 Wetland Boundary

GHD delineated (or confirmed the delineation of) the boundary of any wetlands on the Site using the protocols in the Ontario Wetland Evaluation System (OWES), Southern Manual, Fourth Edition (OMNR 2021 and updates) and ORCA Regulations. OWES includes several key indicators, including dominance of hydrophilic plants (water-loving), soils and seasonal high-water table/pooling. Soil augering was completed in all potential wetlands to a minimum of 60 cm or until refusal, to check for hydric soils (gleying and mottling), soil type and soil moisture. Boundaries were delineated in the field using a high accuracy handheld GPS unit.

2.2.2.6 Significant Wildlife Habitat (SWH)

Prior to site visits, a candidate list of SWH features was estimated based on the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E, 2015. During site visits, GHD biologists looked for evidence of those candidate significant wildlife habitat features (i.e., to estimate presence/absence). Upon compiling field data, further consideration was given to which candidate SWHs could be confirmed as present on or adjacent to the Site. In addition, field data was reviewed to determine if additional candidate SWH were present on or adjacent to the Site. For this project, GHD biologists specifically looked for evidence of congregating wildlife (including potential trees for bat maternity use), appropriate habitat for herpetofauna (for breeding, nesting and/or overwintering purposes), seeps and springs and the habitat of special concern and rare wildlife species.

2.2.2.7 Fish and Aquatic Habitat

Aquatic Habitat Assessment

An aquatic habitat assessment was completed for all watercourse features identified on Site. The features were assessed following standardized provincial aquatic methods from the Ontario Stream Assessment Protocol, Section 4, Module 11 (Stanfield 2017) and Ontario Ministry of Transportation (MTO) Environmental Guide for Fish and Fish Habitat Protocol Section 4.0 (MTO 2020). Aquatic habitat was quantified and characterized based on local substrate composition, vegetation, flow influence and condition, sediment transport, cover, channel morphology, groundwater indicators, riparian habitat, barrier presence and form, land use and landscape influences, human modifications and unique features. Appropriate assessment types were estimated on Site based on feature type using professional judgment.

Surface water quality parameters were measured in-situ using a Horiba U-52 Water Quality Meter. Parameters collected included temperature, pH, conductivity, turbidity, dissolved oxygen, total dissolved solids and salinity. The Canadian Water Quality Guidelines for the Protection of Aquatic Life (Canadian Council of Ministers of the Environment 2024, PWQO, 1994) were used to interpret water quality data.

Headwater Drainage Feature Assessment

Headwater Drainage Feature Assessment (HDF) were conducted using the Ontario Stream Assessment Protocol, Section 4, Module 11 Unconstrained Headwater Sampling, (Stanfield L. 2017). The rapid survey type was implemented, providing assessment of the feature type, hydrological condition, riparian vegetation, and sediment transport conditions associated with classified lengths of HDFs**.** Hydrology classification was determined based on GHD field observations and the criteria outlined in the Table 4, OSAP S4.M10. The riparian classification was

determined based on GHDs field observations and the criteria outlined in Table 5, OSAP S4.M10. The full HDF protocol was not followed as only a single site visit was conducted during the second assessment period (late April to May) to capture spring conditions. The Evaluation, Classification and Management of Headwater Drainage Features Guidelines (TRCA and CVC, 2014) management recommendations (Part 3), were used as a high-level guideline for future development recommendations along with current applicable policies, legislation, and industry best management practices.

Fish Community

Quantitative fish community sampling was conducted using a backpack electrofisher. A Licence to Collect Fish for Scientific Purposes was obtained from the MNR Peterborough-Bancroft District in advance of the works. A Smith-Root Model 24 backpack electrofisher was used employing the single pass technique outlined in the Ontario Stream Assessment Protocol (Stanfield 2017). The single pass survey technique allows the fish community characterization and provides a qualitative assessment of species abundance. This method requires a high shocking intensity (7-15 sec/m^2) and typically captures 60% of the population when all habitats are sampled (Stanfield 2017).

All fish captured were identified to species, enumerated and released alive at the site of capture. All fish captured were recorded on MNR Field Collection Records and released back into the watercourse unharmed. A report will be submitted to the MNR outlining the results of the fish community surveys. All collected fish were processed following the OSAP Module Section 3, Module 1 (Stanfield 2017). Fish total length (mm) and weight (g) were recorded for the first ten individuals of each species. The remaining individuals for each species were counted and weighed in bulk. Additional notes were taken if any impact to the fish was observed during collection and/or general physical condition including, sex/maturity, parasites/blackspot disease, lesions, tumours and any other indicators of poor health or predation.

2.2.2.8 Species at Risk

Species at Risk that had the potential to breed on the site or with suitable habitat were determined based on the literature review. The non-agricultural land on site is limited to fencerows and the drainage feature areas. As such targeted surveys for grassland birds and nocturnal species were not conducted.

While on site, biologists did search for suitable tree cavities for bat maternity and roosting, red-headed woodpecker nesting and pileated woodpecker nesting.

3. Survey Results

The methodologies for the field surveys conducted by GHD biologists are described above. The level of effort for each survey, dates, weather conditions, start and end time are summarized in **Table 1**.

Table 1 Surveys – Level of Effort

Survey Date	Survey Type	Weather	Start Time	End Time
August 9, 2022	Reconnaissance Site Visit	Overcast, 100% cloud cover, light rain, Beaufort Wind Scale 2, 19°C	10:00	14:00
August 16, 2022	Ecological Land Classification Headwater Drainage Features	20-70% cloud cover, Beaufort Wind Scale 2, 28°C	11:30	16:15
April 25, 2023	Headwater Drainage Features	40% cloud cover, Beaufort Wind Scale 2, 5°C	09:00	12:00
April 28, 2025	Marsh Monitoring Protocol	10% cloud cover, Beaufort Wind Scale 2, 12-10°C	21:00	22:00

Survey Date	Survey Type	Weather	Start Time	End Time
April 30, 2025	Aquatic Habitat Assessment, Headwater Drainage Features and Surface Water Quality	10% cloud cover, Beaufort Wind Scale 2, 3-10°C	09:00	13:00
May 20, 2025	Ecological Land Classification	Partly cloudy, 10% cloud cover, Beaufort Wind Scale 2, 14**°C**	17:05	21:45
	Marsh Monitoring Protocol			
June 18, 2025	Breeding Bird Surveys	Mostly cloudy, 90% cloud cover, Beaufort Wind Scale 1, 20-22 C	06:05	07:05
July 9, 2025		Mostly cloudy, 70% cloud cover, Beaufort Wind Scale 0, 17-20°C	06:40	07:50
July 18, 2025	Fish Community Sampling and Surface Water Quality.	Overcast, 100% cloud cover, Beaufort Wind Scale 0, 20-22°C	08:45	12:15
July 18, 2025	Wetland Delineation and soil cores	Overcast, 100% cloud cover Beaufort Wind Scale 0, 25°C	07:45	10:15

3.1 Biological Inventories

3.1.1 Vegetation

The vegetation communities were delineated on and adjacent to the Site by GHD according to methodologies outlined in **Section 2.2.2.1.** A summary of the level of effort, timing of surveys and environmental conditions is in **Table 1.**

3.1.1.1 ELC Code Descriptions

Excluding the agricultural fields, eight vegetation communities were identified within the Site. Each of these communities are described below in **Table 2** and illustrated on **Figure 1.**

A total of 146 plant species were identified during field surveys conducted on the Site. A complete plant list is found in **Appendix B.**

Table 2 ELC community descriptions

Community	ELC Code		Community Description
1	CUM1-1	Dry-Moist Old Field Meadow	Community 1 is located off County Road 10, in the southern portion of the Site (**Figure 1**). This area is made up of a diversity of herbaceous plant species typical of fields. Some of the plants identified here included common dandelion (*Taraxacum officinale*), orchard grass (*Dactylis glomerata)* and red clover (*Trifolium pratense*). 
2	MAM2-2	Reed-Canary Grass Mineral Meadow Marsh	Community 2 is a wetland located in the south portion of the Site. The wetland was dominated by common cattail (*Typha latifolia)*, reed canary grass (*Phalaris arundinaces)* and spotted jewelweed (*Impatiens capensis)*. Shrubs such as pussy willow (*Salix discolor)* and red-osier dogwood (*Cornus sericea)* were also found. 
3	CUW1	Mineral Cultural Woodland	This cultural woodland is located in the southeast of the Site. It is dominated by Scot's pine (*Pinus sylvestris*), lilac (*Syringa vulgaris*), crack willow (*Salix fragilis*), white birch (*Betula papyrifera*) and American basswood (*Tilia americana*).

Community	ELC Code		Community Description
4	Fencerow	Fencerow	Community 7 includes the fence rows that are on the Site which are shown on **Figure 1**. Trembling aspen (*Populus tremuloides)* and sugar maple (*Acer saccharum*) were the dominant species. 
5	MAM2-10	Forb Mineral Meadow Marsh	This wetland is identified in the central portion of the Site It is dominated by a mix of common cattail, spotted joe-pye weed (*Eupatorium maculatum)*, boneset, (*Eupatorium perfoliatum)* fox sedge (*Carex vulpinoidea)* and reed canary grass. 

Community	ELC Code		Community Description
6	CUM1-1	Dry-Moist Old Field Meadow	Community 6 is associated with the meadowlands adjacent the Baxter Creek tributary. The community is dominated by awnless brome grass (*Bromus inermis*), Queen-Anne's lace (*Daucus carota*), and white bedstraw (*Gallium molugo*). Some wetland associated species were also identified directly adjacent the length of the watercourse but could not be classed a separate wetland community. 
7	FOC2-2	Dry-Fresh White Cedar Coniferous Forest	This community is dominated eastern white cedar and is associated with the Significant Woodland on Site. 

Community	ELC Code		Community Description
8	FOD	Deciduous Forest	This small woodland is isolated from the Significant Woodland and is dominated by eastern white cedar, eastern red cedar (*Juniperus virginiana)*, and Manitoba maple (*Acer negundo)*. 

3.1.2 Breeding Bird Surveys

Surveys for breeding birds and targeted species at risk were conducted within the Study Area by GHD according to the methodologies outlined in **Section 2.2.2.2**. A summary of the level of effort, timing of surveys and environmental conditions is in **Table 1.**

A total of 30 bird species were detected during point count surveys. A total of six survey stations were established in various locations on the Site. The locations of these stations can be found on **Figure 1**. A complete list of the birds detected during station surveys can be found in **Appendix C**, with the detailed list of species and breeding codes identified per station found in **Appendix D.**

Species observed were typical of rural and agricultural habitats. Species recorded in more open areas included song sparrow (*Melospiza melodia*), savannah sparrow (*Passerculus sandwichensis)*, killdeer *(Charadrius vociferus)* and vesper sparrow *(Pooecetes gramineus)*. Edge habitats and fencerow species included American robin (*Charadrius vociferous*), eastern kingbird *(Tyrannus tyrannus)*, northern flicker *(Colaptes auratus)*, gray catbird *(Dumetella carolinensis)*, northern cardinal *(Cardinalis cardinalis)*, yellow warbler (*Dendroica petechia*) and chipping sparrow *(Spizella passerina)*.

Species recorded in the wooded areas on Site and in the Study Area included red-eyed vireo *(Vireo olivaceus)*, great-crested flycatcher (*Myiarchus crinitus*) and American redstart *(Setophaga ruticella)*.

Area searches

During other surveys on Site, incidental birds were recorded. A review of those observations found that all were already recorded during the BBS surveys, so no additional bird species were observed.

3.1.3 Amphibians

Four survey stations were established on Site (**Figure 1**). The placement of these stations was based on their proximity to potential habitat (seasonal ponding or water features) for calling frogs and toads.

No calling amphibians were detected on the Site or observed as incidental observations. Only spring peeper was heard during surveys but they were off-site to the west. The species was heard outside of the Site across County Road 10 in flooded fields greater than 200m away. Results are summarized in **Appendix E**.

3.1.4 Other Wildlife

While conducting other surveys on Site, biologists noted any sign of wildlife. White- tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*), were all identified by either tracks or scat. There were no incidental observations of amphibians, snakes or turtles detected while on Site or within the Study Area.

3.1.5 Wetlands

A total of two wetland communities were identified on the Site, namely Communities 2 and 5 (meadow marshes). Wetlands are depicted on **Figure 1**. All wetland communities found on Site are unevaluated and their characteristics are described in **Section 3.1.5.**

Soil cores were completed to confirm wetland status and refine wetland boundaries in both communities. Soil cores in Community 2 were taken in 2022 to establish and confirm wetland boundaries. Soil cores to confirm the wetland boundary in Community 5 were completed in 2025 to refine the wetland boundary. Soil core results for Community 5 are shown in **Table 3** below.

Table 3 Soil Core Results for Community 5

Soil Core	Substrate		Depth to Mottles	Depth to Gley	Moisture Regime	Standing water/water table
1	Loam	0-49 cm	50 cm	50 cm	Fresh-moist (3-4)	none
	Silty clay	>50 cm				none
2	Loam	0-30 cm	30 cm	30 cm	Very Moist (6)	none
	Silty clay	>30 cm				none
3	Sandy clay loam	0-34 cm	10 cm	35 cm	Very Moist (6)	none
	Silty clay	>34 cm				none
4	Sandy clay loam	0-30 cm	10 cm	30 cm	Very Moist (6)	none
	Silty clay	>30 cm				none

Note: soil moisture: dry-moderately dry (0), fresh (1-3), moist (4-6), wet (7-9).

3.1.6 Woodlands

Three small woodland communities were identified on Site, these were Communities 3 (CUW1), 7 (FOC2-2), and 8 (FOD). These woodlands are contiguous with extension of these communities off-site to the east. Their attributes were discussed in **Section 3.1.1.1**. and their boundaries are shown on **Figure 1**.

3.1.7 Fish and Fish Habitat

Fish and aquatic habitat surveys including headwater drainage features assessments were conducted within the Site following the methodologies outlined in **Section 2.2.2.7**. A summary of the level of effort and environmental conditions at the time of assessment have been provided in **Table 1**.

3.1.7.1 Fish Habitat Assessment

Habitat zones were determined and differentiated based on presence of barriers, substrate composition, channel morphology, riparian habitat, percent instream cover, hydrological connection, and unique features. One habitat zone was identified along the tributary of Baxter Creek that runs through the north portion of the Site in 2025 (**Figure 1**). The tributary originated west of the Site and flowed east, extending approximately 300 metres. Detailed habitat characteristics for habitat zone 1 have been provided in **Appendix E.** During the 2022 and 2025 site visit two headwater drainage features (HDF) were identified and assessed. The headwater drainage features have been illustrated in **Figure 1** and described in **Section 3.1.7.2**.

During the time of assessment in 2025, habitat zone 1 substrate composition was uniform consisting of mainly sand and cobble, with silt, some boulder and a small amount of gravel (**Photo 1**). In stream cover was low covering 0-24% of the surface of the water. Overhead cover was also considered low and consisted of shrubs. Instream cover was low and consisted of boulders, cobble, overhanging vegetation with limited undercut banks. The average water depth was 0.27 m and wetted width was 3 m. During the fish community surveys conducted in July 2025 water depths were significantly lower averaging approximately 0.02 m. The riparian habitat was dominated by a dry-moist old field meadow vegetation community (vegetation community 6). Please refer to **Section 3.1.1** for full vegetation community descriptions.

Photo 1 Habitat Zone 1, facing west, looking up stream. April 20,2025.

3.1.7.2 Headwater Drainage Feature

Two headwater drainage features (HDF) were identified on Site (HDF1 and HDF2) and are illustrated on **Figure 1** with detailed habitat characteristics described below. HDF1 was divided into two segments; HDF1A and HDF1B while HDF2 was divided in four segments; HDF2A, HDF2B, HDF2C and HDF2D. Representative photos from each segment have been included in **Photos 2-7.** HDF1 and part of HDF2 (HDF2C and HDF2D) were assessed in 2022 and 2025, HDF2A and HDF2B were assessed in 2022, 2023 and 2025.

HDF1A originated from vegetation community 1 a dry-moist old field meadow and was classified as a swale feature with cropped land being the dominate vegetation type. During the 2022 and 2025 site visit this segment was dry and the dominate substrate was silt. The hydrologically classification would be considered a contributing function, and the riparian classification would be considered limited function (CVC/TRCA, 2014). Refer to **Section 3.1.1** for full vegetation communities.

Photo 2 Headwater Drainage Feature 1A, facing west, April 30, 2025

HDF1B was located directly downstream of HDF1A and was classified as a wetland feature with wetland being the dominate vegetation type (vegetation community 5) within 1.5 m of each side of the feature. Cropped land was present from 1.5m to 30m of each site of the segment. During the 2022 site visit this segment was dry. However, during the 2025 site the segment had standing water with an average water depth of 0.25m and wetted width of 0.28 m. The dominate substrate was silt. The hydrologically classification would be considered contributing function, and the riparian classification would be considered limited function due to cropland being the dominate vegetation type (CVC/TRCA, 2014). Refer to **Section 3.1.1** for full vegetation communities. This segment continued east outside of the Site boundary and was not assessed since it was located outside of the Study Area.

Photo 3 Headwater Drainage Feature 1B, facing west, July 18, 2025

HDF2 originated from the southwest and south of the Site and has been divided into four sections: HDF2A, HDF2B, HDF2C and HDF2D (**Figure 1**).

HDF2A originated from south outside of the Site and was classified as a swale feature the dominate riparian vegetation was cropped land, located in vegetation community 1. During the time of the assessments in 2022 and 2023, the segment had minimal flows and the substrate was made up of fine organics. The hydrologically classification would be considered a recharge function, and the riparian classification would be considered limited function (CVC/TRCA, 2014). Refer to **Section 3.1.1** for full vegetation communities.

Photo 5 HDF2A, facing south April 25, 2023

HDF2B originated from the west outside of the Site adjacent to County Road 10, northwest of HDF2A within vegetation community 1. During the time of the assessments in August 2022, the segment was dry, but had standing water during the April 2023 assessment with no defined channel. The segment vegetation was dominated by cropped land and the substrate was dominated by fine organics. The hydrologically classification would be considered a recharge function, and the riparian classification would be considered limited function (CVC/TRCA, 2014). Refer to **Section 3.1.1** for full vegetation communities. The hydrologically classification would be considered a contributing function, and the riparian classification would be considered limited function (CVC/TRCA, 2014). Refer to **Section 3.1.1** for full vegetation communities.

HDF2A and HDF2B turn into a wetland feature downstream and merge into a singe feature. This wetland segment has been identified as HDF2C (vegetation community 2), the dominate riparian vegetation was a mixture of wetland and cropped land. The substrates were dominated by fine organics. During the August 2022 assessments this segment was dry and during the April 2025 assessment this segment had interstitial flows with an average water depth of 0.45 m and average wetted width of 0.80 m. The hydrologically classification would be considered a contributing function, and the riparian classification would be considered important function (CVC/TRCA, 2014). Refer to **Section 3.1.1** for full vegetation communities.

Photo 6 HDF2C, facing south July 18, 2025.

HDF2D was located directly downstream of HDF2C and was classified as a swale feature with cropped land being the dominate vegetation type (vegetation community 1). During the August 2022 site visit, this segment was dry however April 2025 assessment this segment had interstitial flows with an average water depth of 0.30 m and average wetted width of 0.80 m. The dominate substrate was silt. The hydrologically classification would be considered a contributing function, and the riparian classification would be considered limited function (CVC/TRCA, 2014). This segment continued east outside of the Site and was not assessed since it was located outside of the Study Area. Refer to **Section 3.1.1** for full vegetation communities.

Photo 7 **HDF 2D, facing west, April 30, 2025**

3.1.7.3 Surface Water Quality

Surface water quality was collected in Habitat Zone 1 on April 30, 2025, and July 18, 2025 (**Figure 1**). A summary of the results and information on parameter specifics has been provided in **Table 4**. Further discussions regarding the results have been provided in **Section 4.5**.

Table 4 ***Surface Water Quality Results***

Water Quality Parameters	Habitat Zone		Accepted Parameter Range
	01	01	
Date (dd/mm/yy)	20/04/25	18/07/25	N/A
Time (hh:mm)	09:46	09:10	N/A

Water Quality Parameters	Habitat Zone		Accepted Parameter Range
	01	01	
Weather conditions	Sunny, slight breeze	Sunny, clear, precipitation in the last 24hrs	N/A
Sample Depth (m)	0.22	0.4	N/A
Air Temperature (°C)	3	18	N/A
Water Temperature (°C)	8.65	17.21	N/A
Dissolved Oxygen (mg/L)	14.63	8.90	5-8*
Total Dissolved Solids (mg/L)	N/A	0.522	N/A
Conductivity (SPC·us/cm)	0.677	0.824	N/A
Salinity (ppt)	N/A	0.4	N/A
pH	6.74	7.19	8-10**
Turbidity (NTU)	3.6	56.5	Normal**

Note: BWS=Beaufort wind scale (Government of Canada, 2017), N/A= not applicable and/or specific guidelines not available. *lowest acceptable range for cool water biota (Canadian Council of Ministers of the Environment, 2002), ** Provincial Water Quality Objectives (PWQO) (Energy, 1994).

3.1.7.4 Fish Community Sampling

Fish community sampling was conducted by GHD biologists on July 18, 2025. The fish community sampling was conducted in the east portion of the tributary of Baxter Creek (habitat zone 1) within a large pool habitat (**Photo 8 Figure 1**). Water levels were extremely low during the time of sampling and not feasible in other portions of the tributary.

During the fish community surveys, a total of 84 individuals were collected. The species included, blacknose dace (*Rhinichthys atratulus*), brook stickleback (*Culaea inconstans*), creek chub (*Semotilus*), fathead minnow (*Pimephales promelas*) and white sucker (*Catostomus commersonii*). The most abundant fish species collected was the creek chub (**Photo 9**), where a total of 42 individuals were caught. A summary of the fish community catch, environmental conditions, and level of effort is provided in **Appendix G.** The fish community was composed of cool and warm water fish species that are common to the Otonabee Region watershed. Fish species collected, along with habitat preferences, species status and construction timing window has been provided in **Appendix H**.

Photo 8 Fish Sampling Area, facing north, July 18th, 2025

Photo 9 Most abundant species collected, creek chub. July 18, 2025

3.1.8 Significant Wildlife Habitat

In Ecoregion 6E, OMNRF has developed criteria that can be used to confirm five broad categories of Significant Wildlife Habitat (SWH): seasonal concentration areas of animals, rare vegetation communities, specialized habitat for wildlife, habitat for species of conservation concern (not including endangered or threatened species) and animal movement corridors. Within each category, there can be more than one specific type of Significant Wildlife Habitat (for example, seeps and springs are considered one type of specialized habitat for wildlife which is a category of SWH).

Prior to field work, GHD biologists identified the following candidate SWH types as having the potential to occur in the Site: bat maternity colonies, reptile hibernaculum, seeps and springs, amphibian breeding habitat (wetlands) and special concern and rare wildlife species.

No snags or cavity trees suitable for bat maternity use were found. There was also no evidence of reptile hibernaculum or seeps and springs. Despite wetlands on Site, amphibian call surveys did not identify any calling amphibians on Site. One species of Special Concern, the barn swallow, was observed foraging over the north fields of the Site. Habitat may be present for barn swallows in the barn on Site adjacent County Road 10.

4. Discussion and Analysis

4.1 Physical Site Characteristics

The Site was generally flat to rolling with the lowest elevation occurring along the tributary of Baxter Creek in the north. Much of the site is or was being used for agricultural row cropping. Some drainage features are noted in the south section and central sections of the Site. All fields are separated by fencerows.

4.2 Species and Communities

4.2.1 Vegetation

GHD found no plant species that are listed as nationally and/or provincially at risk (SARA 2025; COSEWIC 2023; SARO 2024; NHIC 2022) on the Site or Study Area (where access allowed). Four species are considered Regionally Rare (Oldham 1999) in Peterborough County, black walnut, flixweed, Guelder rose and crested sedge (**Appendix I**). Two of these species are non-native and therefore not discussed further in this report (flixweed and guelder rose). Crested sedge (*Carex cristatella)* is considered Regionally Rare in Peterborough County (Oldham 1999). This species was found towards the middle of Community 5, in a shallow depression that was observed while biologists completed wetland soil sampling. Black walnut was identified in communities 4 and 6.

None of the ecological community types identified on the Site are considered provincially rare (NHIC 2021).

The Ministry of Natural Resources and Forestry (MNRF)'s Natural Heritage Information Centre (NHIC) maintains records of rare species that have been reported in Ontario and makes that information available through a series of 1km x 1km grid squares. No NHIC tracked vegetation species were identified on the 1km x 1km grid squares that overlap the Site.

4.2.2 Birds

Two species at risk were identified during our bird surveys. One was a barn swallow (*Hirundo rustica*) which is a species of special concern and a bobolink (*Dolichonyx oryzivorus*) which is a threatened species.

The barn swallows were foraging overhead. Suitable nesting sites for this species, which is listed as special concern (SARO 2024), were not available on the Site, though there are barns which may provide suitable habitat in the vicinity of the Site. The bobolink was observed to the east of the Site in the Study Area, where there is suitable breeding and

nesting habitat for this species in the hayfields. Bobolink were heard calling to the east, but no birds were flushed or observed on the Site.

The Natural Heritage Information Centre maintains records of SAR and other tracked species in the province of Ontario. Information about these species can be obtained through an on-line website, with locational information available according to the 1km x 1km square in which each species was observed. For the square that overlaps the Site, there are records of, Barn Swallow (*Hirundo rustica*) Status: SARO: (SC), SARA: (Threatened); Bobolink (*Dolichonyx oryzivorus*) Status: SARO: (THR), SARA: (Threatened); Eastern Meadowlark (*Sturnella magna*) Status: SARO: (THR), SARA: (Threatened); Grasshopper Sparrow (*Ammodramus savannarum*) Status: SARO: (SC); Wood Thrush (*Hylocichla mustelina*) Status: SARO: (SC), SARA: (Threatened)

The agricultural crops on the Site currently, are not suitable for grassland nesting birds, such as eastern meadowlark, bobolink or grasshopper sparrow. None of these three species were observed on Site. There is suitable habitat to the east of the Site where hayfields, partially within the Study Area are present.

Wood thrushes prefer to inhabit mature deciduous and mixed forests, particularly those with well-developed undergrowth (e.g., saplings and tall shrubs). Suitable habitat for this species was absent from the Site. Habitat is not present within the Study Area and no birds were heard or observed.

4.2.3 Other Wildlife

No species of amphibian or reptiles were found on or adjacent to the Site. GHD also did not find any SAR mammals. The NHIC 1km x 1km square overlapping the Site does not contain records of Species at Risk other than the birds listed in **Section 4.2.2**.

4.3 Natural Features

4.3.1 Wetlands

According to the recent information from the Ontario Natural Heritage Information Centre (NHIC 2025), the Site contains no evaluated or unevaluated wetlands. GHD recorded two small wetlands associated with drainage swales on Site and are described in **Section 3.1.1.1** (Communities 2 and 5). In addition to the NHIC, the Cavan-Monaghan Official Plan – Schedule ‘B 1’, also depicts no wetland on Site. All wetlands were delineated in the field by GHD biologists as per OWES methodology and are depicted on **Figure 1**.

4.3.2 Significant Woodlands

A portion of Significant Woodland is identified along the Baxter Creek tributary in the east section of the Site. The Woodland is identified as Community 7 (FOC2-2) on **Figure 1**. The woodlands are contiguous with woodlands offsite as part of the Natural Heritage System – Natural Core Areas and Natural Linkage System.

The Cavan-Monaghan Official Plan states that Natural Core Areas*: include areas with the highest concentration of sensitive and/or significant natural features and functions.* Natural Core Areas contain several Key Natural Heritage Features, which includes Significant Woodlands.

4.3.3 Significant Wildlife Habitat

In the Provincial Planning Statement (2024) wildlife habitat is defined as, *“… areas of the natural environment where plants, animals, and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations.”* This document also states, “specific wildlife habitats of concern may include areas where the species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory and non-migratory species.”

Significant Wildlife Habitat often occurs within other natural heritage features and areas covered by Policy 2.1 of the Provincial Planning statement (e.g., significant wetlands and significant woodlands). Therefore, it has been suggested that identification and evaluation of SWH is best undertaken after other natural heritage features have been identified (Natural Heritage Reference Manual, 2010).

GHD biologists analyzed the information collected from the ecological communities on the Site and Study Area using the criteria for Significant Wildlife Habitat in Ecoregion 6E (2015). Based on our field data, only one of the five candidate types of SWH could be confirmed (based on species presence) on the Site and Study Area, that being habitat for special concern and rare wildlife species. A SWH analysis is outlined in **Table 5** below. This SWH category includes all Special Concern and Provincially Rare (Provincial S rank codes of S3 and lower) plant and animal species. One special concern species was identified during field surveys, the barn swallow.

Table 5 Significant Wildlife Habitat – Candidate and Confirmed

	Wildlife Species	Candidate SWH and Confirmed Habitat Criteria		Confirmed SWH and Defining Criteria	Candidate Habitat found on or adjacent to the Site	Confirmed Habitat found on or adjacent to the Site
		ELC Ecosite Codes	Habitat Criteria and Information Sources			
Bat Maternity Colonies ***Rationale:*** *Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.*	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario. Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees. Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.	Maternity Colonies with confirmed use by: >10 Big Brown Bats >5 Adult Female Silver-haired Bats The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Eco element containing the maternity colonies. Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects".	None found	Not confirmed
Amphibian Breeding Habitat (Wetland) ***Rationale:*** *Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario.*	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Northern Leopard Frog Pickerel Frog Mink Frog Green Frog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically, these wetland ecosites will be isolated (>120 m) from woodland ecosites; however, larger wetlands containing predominantly aquatic species (e.g. Bullfrog) may be	Wetlands >500 m2 (about 25 m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape	Studies confirm: Presence of breeding population of one or more of the listed newt/salamander species or two or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or two or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant.	None of the listed species identified calling on Site. No salamanders observed.	Not confirmed

	Wildlife Species	Candidate SWH and Confirmed Habitat Criteria		Confirmed SWH and Defining Criteria	Candidate Habitat found on or adjacent to the Site	Confirmed Habitat found on or adjacent to the Site
		ELC Ecosite Codes	Habitat Criteria and Information Sources			
	Bullfrog Blue-spotted Salamander Gray Treefrog Western Chorus Frog	adjacent to woodlands	and concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation.	The ELC ecosite wetland area and the shoreline are the SWH. A combination of observational study and call count surveys will be required during the spring (March–June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands.		
Special Concern and Rare Wildlife Species ***Rationale:*** *These species are quite rare or have experienced significant population declines in Ontario.*	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid.	Information Sources Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data.	Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable.	N/A	Confirmed-barn swallow identified foraging in agricultural fields and as incidental observations. Nesting habitat may be present in barn.
Seeps and Springs ***Rationale:*** *Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.*	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species	Field Studies confirm: Presence of a site with 2 or more seeps/springs should be considered SWH. The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. SWHMiST Index #30 provides development effects and mitigation measures	One seep identified in Community 6, does not meet threshold for SWH.	Not confirmed

	Wildlife Species	Candidate SWH and Confirmed Habitat Criteria		Confirmed SWH and Defining Criteria	Candidate Habitat found on or adjacent to the Site	Confirmed Habitat found on or adjacent to the Site
		ELC Ecosite Codes	Habitat Criteria and Information Sources			
Reptile Hibernaculum ***Rationale;*** *Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant*	***Snakes:*** *Eastern Gartersnake* *Northern Watersnake* *Northern Red-bellied Snake* *Northern Brownsnake* *Smooth Green Snake* *Northern Ring-necked Snake* ***Special Concern:*** *Milksnake* *Eastern Ribbonsnake* ***Lizard:*** ***Special Concern*** *(Southern Shield population): Five-lined Skink*	*For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats.* *Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.* *For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3*	*For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.* *Areas of broken or fissured rock are particularly valuable since they provide access to subterranean sites below the frost line.* *Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.* *Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures*	*Studies confirming:* *Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp.* *Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula* *(e.g. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)* *Note: If there are Special Concern Species present, then site is SWH* *Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH*	No rock piles, exposed rock, or alvar habitat identified.	Not confirmed

4.4 Other Natural Features

There are no provincially significant Areas of Natural and Scientific Interest (ANSI) located within 120m of the Site and Study Area. The nearest ANSI is the regionally significant Baxter Creek Wetlands which is located 2.5km north-east of the Study Area. No provincially significant valleylands have been previously identified in the Site or Study Area

4.5 Fish and Fish Habitat

4.5.1 Fish Habitat

The tributary to Baxter Creek (habitat zone 1) identified in the Site has defined natural channels and provided direct and indirect fish habitat. Specifically, it provides feeding, nutrients, overwintering habitat, hydrological and groundwater connections within the tributary and downstream fish habitat of Baxter Creek. These attributes are important for the sustainability of the existing cold water fish community present in the tributary of Baxter Creek and downstream Baxter Creek.

The headwater draining features (HDF1 and HDF2) have the potential to provide indirect fish habitat downstream to Baxter Creek. Specifically, the habitat provides sources of hydrological and groundwater connections, nutrients and food supply to fish. However, the headwater drainage features are predominantly composed of undefined channels with no identifiable depressions that represent continuous surface water flows. Therefore, the headwater drainage features are not classified as a “watercourse” under the current Conservation Authorities Act (Government of Ontario 2024b).

The headwater drainage features segments management recommendations were “mitigation”, “maintain recharge” and “conservation” based on the Evaluation, Classification and Management of HFD Guidelines (2014). Therefore, on-site flows should be maintained or replaced using lot level conveyance techniques. A summary of the functional classifications determined in **Section 3.1.7.3** have been summarized in **Table 6**.

Table 6 Summary of HDF Assessment Results and Management Recommendations (CVC and TRCA, January 2014).

HDF	Hydrology	Riparian	Management
HDF1A	Contributing Function	Limited Function	Mitigation
HDF1B	Contributing Function	Limited Function	Mitigation
HDF2A	Contributing Function	Limited Function	Mitigation
HDF2B	Recharge Function	Limited Function	Maintain recharge
HDF2C	Contributing Function	Important Function	Conservation
HDF2D	Contributing Function	Limited Function	Mitigation

Fish habitat in Ontario is managed federally by the Minister of Fisheries and Oceans Canada and therefore, the *Fisheries Act* applies to the Site tributaries and headwater drainage features. No critical habitat for Aquatic SAR was identified within the Site (DFO 2024).

Surface Water Quality

The surface water quality parameters collected within the Site were within the normal ranged for aquatic life except for pH. The pH was below the acceptable range for aquatic life, this can be caused by many factors such as rain events or agricultural runoff. The fish species caught during sampling were all species that can tolerate a lower pH and fall within being acceptable parameters for pH requirements. Creek chub have a typical range of 6-9 (McMahon, 1982), white suckers 5-9 (Twomey et. al, 1984), brook stickleback as low as 5.0 (Stewart et al, 2007), lowest extend for blacknose dace is 5.37 (MacAvoy and Bulger, 2004) and fathead minnows have a preference of 6.6 (Mount, 1973). While the

parameters for aquatic life is a pH between 8-10, these species can all survive in a waterbody that has a pH of 6.74 and 7.19. The baseline data may be used for construction and post construction effectiveness monitoring if required.

4.5.2 Fish Community Sampling

The thermal regime for Baxter Creek is classified as coldwater by MNR with known fish communities consisting of blacknose dace (*Rhinichthys atratulus*), bluntnose minnow (*Pimephales notatus*), brassy minnow (*Hybognathus hankinsoni*), brook stickleback (*Culaea inconstans*), brown trout (*Salmo trutta*), common shiner (*Luxilus cornutus*), creek chub (*Semotilus atromaculatus*), mottled sculpin (*Cottus bairdii*), northern pearl dace (*Margariscus margarita*), northern redbelly dace (*Chrosomus eos*) and white sucker (*Catostomus commersonii*) (ARA, 2024). These fish species are common to the Lake Ontario watershed and are widely distributed throughout southern Ontario. No SAR were identified within the Site (DFO 2024). GHDs fish sampling coincided with the Baxter Creek fish species list with the exception of fathead minnow which was not listed in the documented fish species.

5. Impact Assessment and Recommendations

The following section provides a description of the predicted impacts that may result from the proposed development. It also identifies mitigation measures to be implemented to avoid and/or minimize adverse effects to the natural environment features within or near the project. A summary of the impact assessment and recommendations can be found in **Table 7**.

5.1 Vegetation Communities and Species

5.1.1 Vegetation

Two native regionally rare species was found on the Site: crested sedge in Community 2, and black walnut with Communities 4 and 6. As Community 2 is scheduled to be removed to suit the development, crested sedge will be directly impacted. The species has several records (iNaturalist, 2025a) within Peterborough County and surrounding counties. The removal of this species from the drainage feature will not have a regional impact on crested sedge populations. Discussions with the Township to understand if a plant salvage may be required prior to the clearing of Community 2 would be recommended.

Black walnut populations will not be impacted by the development or removals. The species is well-established and common in Peterborough County (iNaturalist, 2025b), reflecting a potential range expansion since the publication of the rarity list (Oldham, 1999).

5.1.2 Birds and Other Wildlife

According to Environment and Climate Change Canada, the Site falls within Nesting Zone C2 (ECCC, 2018). The regional nesting period for Nesting Zone C2 extends from early April to late August. General impacts to the breeding birds identified during surveys include loss of nesting habitat and defended territories. Other impacts may include increased noise resulting in increased energy expenditure to advertise territories, potential window collisions with newly built structures, and road mortality. No vegetation removal should occur between the period of April 1 to August 31 of any given year.

Should development be proposed within that time, a nest search should be conducted by an experienced avian biologist to assess compliance with the Migratory Bird Regulations (2022). GHD also recommends that bird-friendly designs be incorporated into the building design, where possible, to decrease bird collisions (and mortality) with reflective surfaces. Installation of bird houses and swallow kiosks on the perimeter of the Site (primarily within the Natural Heritage System block) may also be beneficial to species to offset habitat loss.

Two provincially significant bird species was identified during field surveys (barn swallow and bobolink). Barn swallows are considered Special Concern (SARO, 2024) and were identified during breeding bird surveys and during ELC surveys. Barn swallows were observed flying over the fields foraging. A barn on Site may provide potential nesting habitat for this species. GHD did not locate any nests on-the Site during breeding bird surveys due to lack of access to the barn. The proposed development will require the removal of the barn structure to accommodate the development. The removal of the barn will result in a potential direct loss of nesting habitat for this species. GHD recommends offsetting this loss in the form of compensation. The nature of the compensation would include the installation of a barn swallow kiosk elsewhere on the Site. One kiosk is recommended to be installed within the protected area of the Natural Heritage System adjacent the Baxter Creek tributary in the north of the Site.

The bobolink was observed offsite in adjacent fields to the east. As no bobolink were recorded as breeding on Site, this species will be minimally affected by the development.

5.2 Wetlands

All wetlands on the Site were delineated by GHD biologists in the field (Communities 2 and 5 - **Figure 1**). None of these wetlands are mapped on Official Plan schedules and have not been evaluated as provincially or regionally significant. These meadow marshes have limited ecological functions, as seasonal ponding was not present and vegetation is primarily wet meadow grasses and sedges. Marsh specialist bird species were not observed due lack of pooling, the small size, isolated nature of the features, agricultural fields adjacent and lack of connectivity to other features such as wooded valleys, creeks or other wetlands. The wetlands on Site will be directly impacted by the development, as they are within the development envelope. Retention of isolated wetlands in the centre of a residential/commercial development is not recommended due to lack of connectivity and loss of hydrologic regime. The wetland known as Community 2 (MAM2-2) totals 6,222m^2 in area, while the wetland known as Community 5 (MAM2-10) totals 1,114m^2. Both wetlands are associated with headwater drainage features. The resulting wetland loss will total 7336m^2. To mitigate the loss of wetlands, it is recommended that a 2:1 wetland compensation ratio be implemented for an offsite location. One off-site option for wetland compensation may be in the EP lands owned by the client in Part of Lot 13, Concession 5 to the south of Fallis Line.

At the design stage a detailed compensation and restoration plan will be completed to support the wetland removal. As part of the wetland compensation plan, a monitoring plan that includes the duration of the monitoring and the specific parameters to be studied will be included. This usually involves monitoring of plant health of the nursery stock and seed mix, and general success of the wetland to meet the objectives and ecological functions. This plan will be submitted to ORCA and the Township as a condition of draft approval.

5.3 Woodlands and Significant Woodlands

Woodlands and Significant Woodlands on Site will not be negatively impacted by the proposed development. All woodlands will be protected by a 30m buffer from both the Significant Woodland dripline buffer, and the 30m watercourse buffer (**Figure 1**).

The proposed development will not have a negative impact on the adjacent significant and non-significant woodlands. The woodland is currently adjacent existing agricultural fields which is subject to impacts due to windthrow, dust, edge effect, erosion and anthropogenic disturbances. The implementation of a planted buffer directly adjacent the woodlands (where void of naturally occurring vegetation) will provide additional protection to the exposed woodlands. The remainder of the buffer will remain in natural self-sustaining vegetation

Site grading and construction works have the potential to impact the woodlands as a result of the proposed residential development. Impacts due to site-preparation and grading may include erosional gullies leading to the valley and into woodlands, impacting water level, reduced plant survival, and biodiversity loss. Installation of silt fence and other erosion control measures is required. An increase in human population in vicinity of the woodlands may result in increased foot traffic and introduction of invasive species due to landscape waste. The 30m buffer proposed will provide suitable protection for the woodlands.

During site preparation it is recommended that heavy-duty double-lined silt fencing (ESC fencing) be installed around the extent of the proposed development prior to the commencement of construction or potential placement of fill on the Site to protect the Significant Woodland from any potential sediment run off in the event of heavy rains or snow melts.

The proposed buffers are recommended to be enhanced with native, self-sustaining vegetation and plantings to provide further protection; it is recommended these areas where currently void of vegetation (within the existing agricultural fields) be planted with native shrubs and trees (when possible) and seeded with a native seed mix to reduce erosion and maintain a natural vegetated buffer.

If stormwater management facilities are planned for future phases of the development, the location and design should be reviewed to understand potential impacts on the natural heritage features associated with stormwater management.

5.4 Fish and Fish Habitat

The tributary of Baxter Creek provides direct and indirect fish habitat. Specifically, it provides cover, feeding, potential rearing, and potential spawning habitat for the Bater Creek fish community. These attributes are important for the sustainability of the cold fish community of Baxter Creek. The tributary will be protected by a 30 m setback from the highwater mark, with exception of the proposed stormwater management pond outlet, watercourse crossing and associated watercourse realignment as shown in the Project site plan (**Appendix A**).

The two headwater drainage features have the potential to function as indirect fish habitat to Baxter Creek by providing hydrological and groundwater connection, nutrients and potentially limited food supply when the feature surface waters are connected (i.e. spring freshet or storm events). The proposed site plan proposes the removal of both of these features. The detailed design should incorporate DFOs Interim standards and codes of practice for in-water site isolation (https://www.dfo-mpo.gc.ca/pnw-ppe/practice-practique-eng.html**)https://www.dfo-mpo.gc.ca/pnw-ppe/practice-practique-eng.html - interim-standard-in-water-site-isolation**. The detailed design should also incorporate mitigation measures to maintain recharge to the features through enhanced lot level conveyance, such as well-vegetated swales (native herbaceous, shrub and tree material), natural filtration, thermal mitigation and/or Low Impact Development (LID) options where feasible. It is recommended that in-water works be completed in the dry and that the downstream extent be isolated to avoid sediment downstream to fish bearing waters.

The proposed road crossing over Habitat Zone 1 (direct fish habitat) is required to accommodate access to the north portion of the development and will require channel realignment. The current conceptual design does not include culvert or channel realignment footprints. However, detailed design should include a closed foot design crossing, that is embedded a minimum of 0.3 m to allow fish passage and accommodate placement of native substrates. The channel realignment work has the potential to cause harmful alternation, disruption or destruction (HADD) of fish habitat. Therefore, the project must be reviewed under the Fisheries Act (FA) by DFO to determine if an Authorization is required under the FA. It is recommended that a DFO Request for Review (RFR) submission is completed as soon as possible to initiate DFO consultation early in the development application process.

Individual fish should be protected from death throughout the construction phase by implementation of a fish rescue from all in water work areas. A site-specific fish rescue plan is to be developed by a professional biologist for the site. Fish will be further protected by restricting all in-works to the NDMNRF timing windows in the spring (March 15 to July 15) to protect Eastern Blacknose Dace and the fall (Oct 1 to May 31) to protect Brown Trout sensitive life history processes. Therefore, in-water work will only be permitted between July 15 and Oct 1 of any year.

A site-specific sediment and erosion control plan will be developed and must be reviewed by a qualified aquatic ecologist (or equivalent professional). Appropriate measures are to be incorporated to protect fish and fish habitat from sedimentation risks, in accordance with applicable regulatory guidelines and best practices.

To further protect the watercourses of Baxter Creek and to comply with the PPS, additional recommendations have been provided in **Section 7** for incorporation into detailed design.

The final site plan design must be reviewed by a professional biologist to confirm that the watercourse crossing, watercourse realignment infrastructure, and stormwater management facility are designed in a manner that avoids or minimizes impacts to fish and fish habitat. The design shall comply with the requirements of the Fisheries Act.

5.5 Stormwater

There will be an increase in impervious surface flow through construction of the townhouse buildings and associated parking facilities. Stormwater will be discharged from the Site and provide contributing flows to the watercourse. It is typically recommended that stormwater outlets are located outside of the 30 m buffer, however, site conditions do not support this setback. Please refer to the Preliminary Site Servicing and Grading Plan in **Appendix A**.

To avoid point source erosion, the outfall to the watercourse should be designed to minimize impacts, such a bioswale planted with native shrubs and non-woody vegetation.

The stormwater design must incorporate mitigation measures to minimize impacts of discharged waters into the watercourse to protect the habitat for the fish species present in the watercourse and downstream in Baxter Creek. The design must be designed to provide MOE “Enchanted” level of stormwater treatment as defined in the MOE SWM.

A multiple treatment approach should be used to manage stormwater onsite. A combination of lot level conveyance and end-of-pipe treatments should be incorporated where possible. Low impact development (LID) practices should be considered to manage run-off through runoff prevention by minimizing impervious cover, incorporating rainwater collection systems and stormwater infiltration practices, and maintain existing vegetation where possible.

A detailed erosion and sediment control (ESC) plan must be prepared and reviewed by a professional biologist to minimize or avoid sediment transportation off-site into downstream aquatic habitat. GHD has provided additional SEC mitigation measures to be incorporated into the plan in **Section 7** of this report. In addition, the final stormwater management design must be reviewed by a professional aquatic ecologist (or equivalent) for compliance with the *Fisheries Act*.

5.6 Significant Wildlife Habitat

Special concern and rare wildlife species (barn swallow) were confirmed to be flying over the Site. Although old barns are present on the Site, there was no evidence of barn swallows in those sealed buildings. The beehive salt storage building to the west off-Site may be providing that function. Recommendations have been made to address barn swallows in **Section 5.1.2** (Birds and Other Wildlife).

A summary of impacts including mitigation and recommendations has been provided below in **Table 7.**

Table 7 Impact Assessment and Recommendations Summary

Feature or Function	Impact to Feature or Function	Mitigation	Residual Effect
Vegetation: Regionally Rare Species (crested sedge)	Loss of habitat for crested sedge within Community 5	Discussion with ORCA as to whether a plant salvage should occur to relocated crested sedge.	Habitat loss
Birds and Wildlife: General Breeding Birds Barn swallow	Potential loss of breeding bird habitat. Potential increase in bird mortality due to increase in window collisions once build out is complete. Bird breeding disturbance as a result of vegetation clearing. Potential impacts to barn swallow nesting and foraging habitat.	None Incorporation of bird friendly design on commercial structures to reduce bird window collisions. No vegetation removal from April 1 to August 31 of any given year to reduce impacts to breeding birds and be in compliance with federal policy. Demolishing of the barn should occur outside of the active breeding bird season which is identified as April 1st – August 31st.	None No net loss in barn swallow habitat with the proposed compensation.

Feature or Function	Impact to Feature or Function	Mitigation	Residual Effect
Wetlands	Removal of 7336 m^2 of wetland.	To the extent possible, proposed compensation (2:1) for wetland Community 2 and 5 to occur off-site in lands owned by applicant nearby but also within Cavan-Monaghan Township. The preparation of a wetland compensation plan should be prepared as a condition of draft plan approval.	None-No net loss of wetland as 2:1 compensation is proposed for the removal of wetland communities.
Significant Woodlands	Potential loss/ degradation of woodland.	A minimum 30 m buffer to be established from the dripline of Significant Woodland communities (Figure 1). Buffer **to be supplemented with native vegetation where vegetation is absent to enhance** habitat.	None
Significant Wildlife Habitat: Special Concern and Rare wildlife species (barn swallow)	See Birds and Wildlife row for details.	See Birds and Wildlife row for details	
Fish and Aquatic Habitat: Habitat Zone 1	Permanent alteration of fish and fish habitat in the tributary of Baxter Creek due to channel realignment	Closed foot culverts shall be imbedded 0.3m to accommodate native substates and allow fish passage during low flow events. Compliance with local fish timing windows, in-water work is only permitted between July 15 to October 1 of any given year. Fish salvage to be completed by a professional biologist prior to excavation works. Isolation of in-water work area with coffer dam. Follow DFO Intern code of practice. Dewater the isolated in-water work area and perform a fish rescue prior to any in-water works. Flows to be maintained through continuous on-site pumping. A detailed erosion and sediment (ESC) plan to be developed, reviewed by a professional biologist and implemented before in-water works occur.	High Detailed effects to be determined during the detailed design phase of the project.
	Loss of fish habitat from proposed watercourse crossing (length to be determined)	Apply NDMNRF spring and fall timing window restrictions March 15th - July 15th and Oct 1st -May 31st Fish passage to be maintained with embedded culvert design. Detailed sediment and erosion control plan to be developed. Plans to be review by a professional biologist (see **Section 7** for SEC details). Site specific fish rescue plan to be developed for in-water work areas.	Moderate Potential compensation/Offsetting Plan to be developed for fish habitat. DFO and/or municipality consultation required.
	Alteration of fish habitat from SWM facility.	No development within the 30 buffer with the exception of the road crossing and integrated SWM outlet.	Low

Feature or Function	Impact to Feature or Function	Mitigation	Residual Effect
		Detailed sediment and erosion control plan to be developed. Plans to be review by a professional biologist (see **Section 7** for SEC details). Outlet channel to be naturalized with native plantings and minimize bank erosion.	
Fish and Aquatic Habitat- Stormwater Management Facilities	Stormwater management, change to water quality	Stormwater ponds to remain outside of the 30 m buffer from Baxter Creek. No in-water works. Stormwater management should have a multiple treatment approach and include low impact development features. Stormwater pond outlet should have finishing treatment though a bioswale feature. Features to minimize thermal pollution and reduce the temperature of discharged waters to Baxter's Creek. Final design to be assessed by a professional biologist and comply with the *Fisheries Act.*	Moderate
Fish and Aquatic Habitat: HDF1 and HDF2	Loss of HDF feature	No change to hydrological inputs as feature function maintained by lot level conveyance. A Site-specific erosion and sediment control (ESC) plan to be developed and reviewed by a professional biologist before the start of works. In-water works to occur during the dry and isolated to prevent sedimentation during storm events. In-water work to following DFO Interim Codes of Practice for In-water site isolation as it relates to coffer dams.	Low negative

6. Policies and Legislative Compliance

The following section describes how the proposed development will be in conformance with the relevant federal, provincial, and other regulatory legislation, policies, official plans, and OP amendments that are applicable and relevant to the Site and Study Area.

6.1 Federal Legislation

6.1.1 Fisheries Act

The proposed works cannot fully meet the Department of Fisheries and Oceans (DFO) measures to protect fish and fish habitat. The scope of work is not covered under the standards and code of practice and will likely result in the harmful alteration, disruption and destruction (HADD) of fish habitat. It is recommended that a DFO Request for Review document is submitted to initiate project review under the Fisheries Act.

Additional project details are required to assess project compliance with the Fisheries Act.

6.1.2 Species at Risk Act

The lands are not federally owned and are not lands recommended by the Minister of the ECCC to the Governor in Council. No federally listed threatened or endangered species will be impacted as a result of the proposed development should the recommendations outlined in **Sections 5** and **7** be followed.

6.1.3 Migratory Birds Convention Act

The core breeding period in Ontario for migratory birds under the MBCA for Bird Conservation Region 13 (i.e., the one the Site lies within) extends from April 15 to August 15 (Environment and Climate Change Canada, 2014). Nest calendars for Nesting Zone C2 suggest the regional nesting period is from early April to late August (Government of Canada, 2018). As such, GHD recommends that the clearing of the trees and other vegetation for the development should exclude the period of April 1 – August 31 of any given year.

6.2 Provincial Legislation

6.2.1 Endangered Species Act

No Threatened or Endangered species were confirmed to be breeding on Site or inhabiting the Site. As the only provincially listed Species at Risk (Bobolink, Threatened) occurred within the agricultural area off-site, there is no constraint to the proposed development due to the Endangered Species Act. One species considered Special Concern, barn swallow, was also observed foraging over the Site, and potential nesting could occur within the barn on Site. As such, GHD has recommended appropriate timing windows for the removal of the barn so as not to inadvertently harm any potential barn swallows.

6.2.2 Provincial Planning Statement

The Site does contain significant woodland and Significant Wildlife Habitat. No significant valleylands or significant ANSIs were identified on or adjacent to the Site. Fish habitat was documented on the Site. As a result, Sections 4.1.4b), 4.1.5 a), c) and f) of the Provincial Planning Statement (PPS 2024) do not apply to this project. **Sections 5.2**, **5.3, 5.4** and **5.6** as well as **Section 7** of this EIS report include mitigation measures and recommendations that show, with their implementation, the proposed development will have no negative impacts on the natural features and functions listed in Section 4.1.4a), 4.1.5d), 4.1.7 and 4.1.8 of the PPS.

6.3 Local and Other Regulatory Bodies

6.3.1 Township of Cavan-Monaghan Official Plan (Amendments to October 14, 2020)

In this EIS report, **Section 5** describes measures that would permit the proposed development to proceed in a manner consistent with the Township of Cavan-Monaghan Official Plan. Recommendations are also identified in **Section 7** relating to the practices to be implemented prior to, during and post-development. Provided these are followed, there will be no negative impacts on natural heritage or hydrologic features or their functions. In addition, connectivity between these features would be maintained.

6.3.2 Otonabee Region Conservation Authority (ORCA) and Ontario Regulation 167/06

In this EIS report, **Section 5.4** (Aquatic Habitat) describes measures that would permit the proposed development to proceed in a manner that complies with ORCA policies and Ontario Regulation 167/06. A permit would be required as the alteration of the watercourse relates to flooding, erosion and hazard lands.

Recommendations have also been included (in **Section 7**) that will prevent any impacts to natural features or functions.

7. Summary of Recommendations

1. The construction envelope must be clearly defined and delineated. A line must be staked and clearly marked in the field prior to any construction activities occurring on the Site.
2. Prior to any site preparation activities (grading, placement of fill) erosion and sediment control measures should be installed along the construction envelope to minimize or prevent sediment laden runoff does not enter interfere with adjacent natural features. The silt fence should be inspected and maintained throughout the construction phase and remain in place until the soils are stabilized and re-vegetated.
3. Client to obtain relevant permits from the Township of Cavan-Monaghan and Otonabee Region Conservation Authority.
4. Any vegetation clearing shall occur outside of the breeding bird timing window of April 1 -August 31 if any given year (as per Environment and Climate Change Canada guidelines).
5. The Project Manager and Contractor are to implement mitigation measures in the EIS.
6. Construction should be undertaken during normal weather conditions, to the extent possible, and the project shall be designated to appropriate specifications to withstand variable weather conditions.
7. Proponent to obtain relevant permits from ORCA and Department of Fisheries and Oceans for wetland and watercourse alterations.
8. No in-water work between March 15 to July 15 of any given year to protect spawning species found in Baxter Creek.
9. The final development plan shall be reviewed by a professional biologist and the Department of Fisheries and Oceans (DFO) for project compliance under the Fisheries Act.

7.1 Sediment and Erosion Control

10. An Erosion and Sediment Control (ESC) Plan will be developed and implement for the site that minimizes risk of sedimentation of the bay and watercourse during all phases of the project.
11. The ESC will be reviewed by a professional biologist.
12. Track pads, concreate wash stations, refuelling stations, and stockpile locations should be identified on the SEC plan and isolated using sediment control materials.
13. Sediment and erosion control products will be selected for the site based on the manufacturer’s product specifications. Product installation and maintenance will follow the manufactures guidelines.
14. Sediment control measures shall be installed prior to the commencement of work and shall be maintained throughout the project to prevent the entry/outward flow of sediment into the watercourse.
15. Sediment and erosion control measures shall be inspected daily during the construction phase and periodically thereafter to assess function and maintenance requirements. Sediment fence to be checked regularly. Accumulated silt and debris will be removed from the fence and site after every precipitation event.
16. Disturbed soils will be stabilized and re-vegetation with native species suitable for the site.

17. If sediment and erosion control measures are not functioning, the construction supervisor shall order the work to be stopped. No further work shall be carried out until the construction methods and/or the sediment control plan is adjusted to address the sediment/erosion problem(s). Such occurrences should be document by the site inspector and provided to a qualified biologist.
18. Construction should be undertaken during normal weather conditions, to the extent possible, and the project shall be designed to appropriate specifications to withstand variable weather conditions.
19. Erosion and sediment control measures will be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear.
20. Biodegradable sediment and erosion control products should be used over non-biodegradable products. Specifically, erosion control blankets.

7.2 Operation of Machinery

21. No machinery shall enter the shoreline or watercourse.
22. All heavy equipment, machinery, and tools required for the work shall be regularly inspected, maintained and operated to avoid leakage of fuels and liquids and shall be stored in a manner that prevents any deleterious substance from entering the soil or nearby watercourses.
23. Vehicle and equipment refuelling and/or maintenance shall be conducted within a defined staging area 30 m from any waterbody. If 30 m is not achievable a portable spill containment berm may be used. Portable spill containment berms can be rented by companies such as Wise Environmental Solution Inc (W.I.S.E, 2017).
24. Any part of a vehicle and/or equipment entering the water will be free of fluid leaks and externally cleaned/degreased to prevent deleterious substances from entering the water.
25. Any stockpiled materials will be stored and stabilized away from the water above the high-water mark at a minimum of 30 m. Stockpiles will be enclosed by sediment fencing or installed down gradient for the purpose of preventing movement of sediment away from the stockpile.
26. The Project Manager/Contractor shall not allow any deleterious substances as defined in the Fisheries Act (such as silt), caused by the work, to enter or re-enter the watercourse.
27. An emergency spill kit shall be kept on site and employed without delay should a spill occur. In the case of a spill, the Ontario Spill Action Center shall be notified at 1-800-268-6060. All provincial and federal regulations shall be adhered to.
28. Maintain an adequate supply of clean-up materials on-site. Construction crews will be fully trained in their use to support timely and effective responses to spill incidents.

7.3 Concrete Leachate

29. Concrete leachate is alkaline and highly toxic to fish and aquatic life. Measures will be taken to prevent any incidence of concrete or concrete leachate from entering any waterbody.
30. Works involving the use of concrete, cement, mortars, and other Portland cement or lime-containing materials must be planned and executed to prevent the direct or indirect deposition of sediments, debris, concrete, concrete fines, wash water, or contact water into any waterbody.
31. All concrete, sealants or other compounds used for this project shall be utilized according to the appropriate Product Technical Data Sheet, stating guidelines and methods for proper use, and provided by the manufacturer of the product.

7.4 Fish Protection (DFO measures to protect fish and fish habitat)

32. No work in-water work.
33. Avoid killing fish by means other than fishing.
34. No development within the 30m buffer. The buffer will maintain riparian vegetation between areas of land activity and the high watermark of the watercourses.
35. No use of explosives in or near water.
36. Maintain riparian vegetation around wetland.
37. Carry out all works and activities by avoiding all work in or near water. No placement of fill or the temporary or permanent structures below the high-water mark.
38. No disturbance of bank material or building structures in the area than may result in erosion or scouring.
39. Prevent soil compaction using mats and pads.
40. Should work conditions change such that it is possible that fish or fish habitat may potentially be negatively impacted, all works shall cease until the problem has been corrected or authorization has been obtained from the appropriate authorities.
41. The Project Manager/Contractor shall not allow any deleterious substances as defined in the Canadian Fisheries Act (such as silt), caused by the work, to enter or re-enter the watercourse or lake. See Sediment and Erosion Control.

7.5 Watercourse Crossing

42. Respect MNR timing windows in the spring (March 15 to July 15) to protect Eastern Blacknose Dace and the fall (Oct 1 to May 31) to protect Brown Trout sensitive life history processes. Therefore, in-water work will only be permitted between July 15 and Oct 1 of any year.
43. Site specific fish salvage plan to be prepared by a fisheries biologist.
44. Watercourse crossings to be designed to minimize impacts to fish and fish habitat.
45. Bridge approaches to be constructed perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
46. Perform bridge construction activities well away from the waterbody, if possible (i.e. preparation of piers, footings and abutments, painting, concrete mixing, sandblasting). Appropriate measures are to be taken to prevent deleterious substances from entering the waterbody.
47. Machinery fording the waterbody to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and shall occur only if an existing crossing at another location is not available or practical to use.
48. Stormwater runoff from the bridge deck, side slopes and approaches shall be directed into a retention pond or vegetated area to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering the waterbody.
49. Respects the local MNR In-Water Work Timing Windows.
50. Maintain fish passage and existing channel morphology.

7.6 Stormwater

51. Development including stormwater features will be located outside of the 30 m buffer from the watercourse, with the exception of the outlet.
52. To avoid point source erosion, the outfall to all watercourse shall be designed to minimize impacts, such as a bioswale planted with native shrubs and non-woody vegetation.
53. A multiple treatment approach should be used to manage stormwater onsite.
54. Low impact development (LID) practices should be considered to manage run-off.
55. Stormwater management features to minimize thermal pollution and reduce the temperature of discharged waters to the watercourse to protect cool and warm water fish species.

7.7 Contaminant and Spill Management

56. A spill management plan will be developed for future development. The plan will provide direction for implementation actions without undue delay in the event of a sediment release or spill of a deleterious substance.
57. An emergency spill kit shall be kept on site, and employed without delay should a spill occur. In the case of a spill, the Ontario Spill Action Centre shall be notified at 1-800-268-6060; all provincial and federal regulations shall be adhered to.
58. Refuelling and maintenance of equipment shall be conducted off slopes and away from water bodies on impermeable pads to allow full containment of spills at a recommended distance of a minimum of 30 m from the shoreline. If 30 m is not achievable a portable spill containment berm may be used.
59. Materials classified as potential contaminants (e.g., paint, primers, gas, oil, degreasers, grout, or other chemicals) will be used a minimum of 30 m from the watercourse. If 30 m is not achievable a portable spill containment berm should be used.

8. Conclusion

GHD Limited has prepared this Environmental Impact Study in support of the planning submissions for a proposed commercial and residential development, as outlined in **Appendix A**. Within the Site, GHD delineated the boundaries of key natural features, including wetlands and fish habitat. Mitigation measures and recommendations have been provided to avoid, minimize, or prevent adverse effects on these features and their ecological functions, where feasible.

The proposed development will require wetland removal; however, no net loss is anticipated due to a proposed 2:1 wetland compensation strategy, with specific details to be finalized during detailed design. Similarly, headwater drainage features will be removed, but their hydrologic function will be maintained through lot-level conveyance to downstream fish habitat. Mitigation measures for these features will also be determined at the detailed design stage.

A proposed watercourse crossing over Baxter Creek may result in direct alteration of fish habitat. This crossing will be designed in accordance with applicable DFO and ORCA policies and legislation.

Provided that the mitigation measures, recommendations, and compensation strategies outlined in **Sections 5** and **7** of this report are implemented, the proposed development is not expected to result in significant negative impacts to the identified natural heritage features or their ecological functions. GHD's recommendations address potential impacts during site preparation, construction, and post-construction phases. Environmental permitting and habitat compensation are anticipated to be required from both DFO and ORCA.

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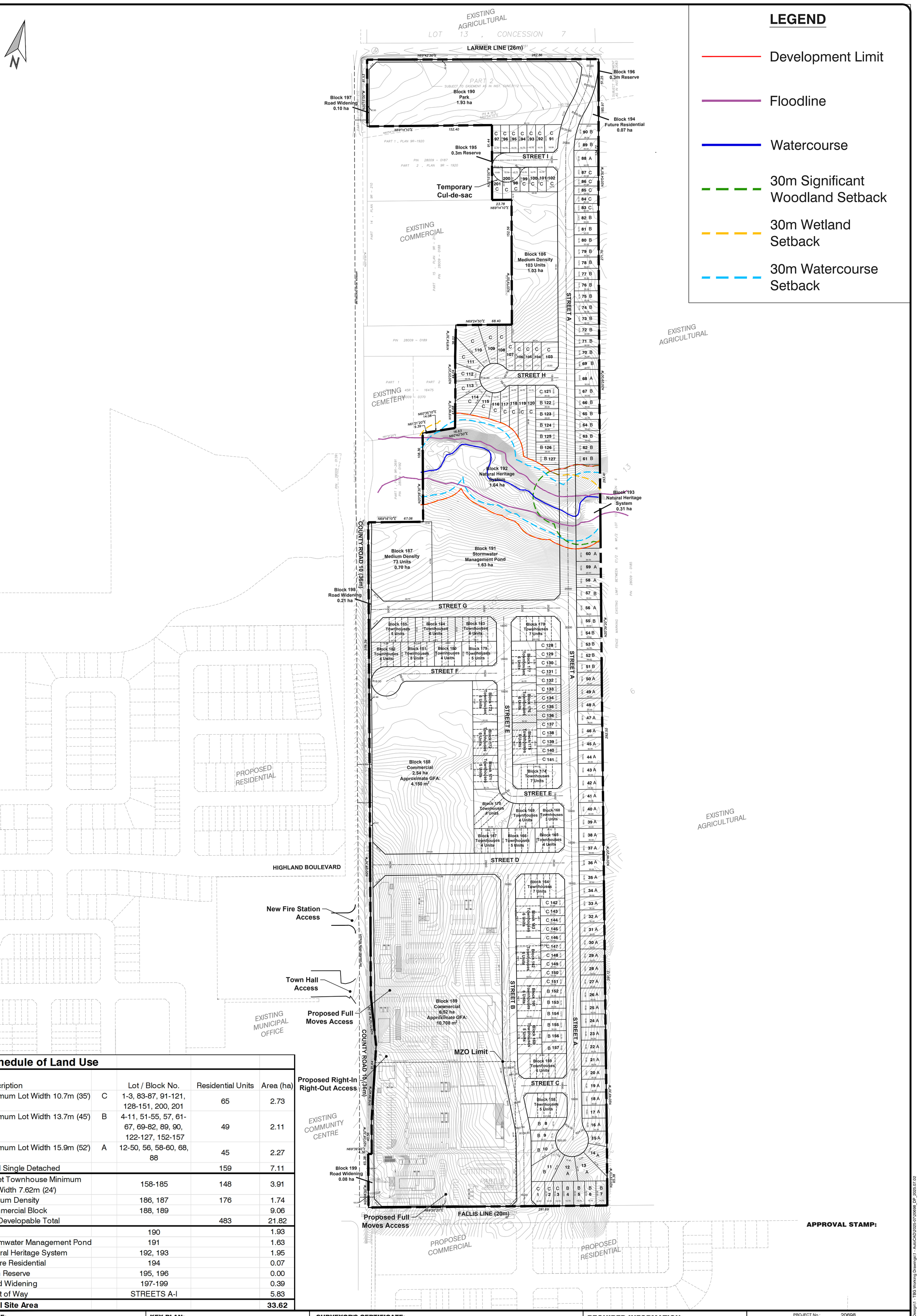
Appendices

Appendix A

Site Plan



Schedule of Land Use

Description		Lot / Block No.	Residential Units	Area (ha)
Minimum Lot Width 10.7m (35')	C	1-3, 83-87, 91-121, 128-151, 200, 201	65	2.73
Minimum Lot Width 13.7m (45')	B	4-11, 51-55, 57, 61-67, 69-82, 89, 90, 122-127, 152-157	49	2.11
Minimum Lot Width 15.9m (52')	A	12-50, 56, 58-60, 68, 88	45	2.27
Total Single Detached			159	7.11
Street Townhouse Minimum Lot Width 7.62m (24')		158-185	148	3.91
Medium Density		186, 187	176	1.74
Commercial Block		188, 189		9.06
Net Developable Total			483	21.82
Park		190		1.93
Stormwater Management Pond		191		1.63
Natural Heritage System		192, 193		1.95
Future Residential		194		0.07
0.3m Reserve		195, 196		0.00
Road Widening		197-199		0.39
Right of Way		STREETS A-I		5.83
Total Site Area				**33.62**

APPROVAL STAMP:

TITLE:

DRAFT PLAN OF SUBDIVISION

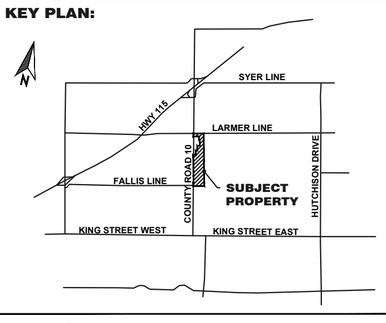
LEGAL DESCRIPTION:

DRAFT PLAN OF SUBDIVISION
PART OF LOT 13
CONCESSION 6
GEOGRAPHIC TOWNSHIP OF CAVAN
TOWNSHIP OF CAVAN
COUNTY OF PETERBOROUGH

PROJECT NAME

FALLIS NORTH

KEY PLAN:



ADDRESS

963 COUNTY ROAD 10

SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATE AND CORRECTLY SHOWN IN ACCORDANCE WITH A PLAN OF SURVEY PREPARED BY IBW SURVEYORS

IBW SURVEYORS
DAVID COMERY, O.L.S.

July 2, 2025
DATE

OWNER'S CERTIFICATE:

I HEREBY AUTHORIZE **THE BIGLIERI GROUP LTD.** TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE COUNTY OF PETERBOROUGH

SAVERIO MONTEMARANO
VARGAS P INC.

July 2, 2025
DATE

REQUIRED INFORMATION:

AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990.

(a) SEE PLAN
(b) SEE PLAN
(c) SEE KEY MAP
(d) SEE SCHEDULE OF LAND USE
(e) SEE PLAN
(f) SEE PLAN
(f.1) N/A
(g) SEE PLAN
(h) MUNICIPAL SERVICES AVAILABLE
(i) SANDY SILT, CLAYEY SILT, SILTY CLAY
(j) SEE PLAN
(k) MUNICIPAL SERVICES AVAILABLE
(l) SEE PLAN

NOTE:
DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

REVISIONS

No.	Description	Date	Int.
3			
2			
1	1st DPS/OPA/ZBA SUBMISSION	25/07/02	EC

PROJECT No.:	20698
DATE:	July 2, 2025
SCALE:	1:2000
DRAFTED BY:	EC
CHECKED BY:	
DRAWING No.:	DP-01

Biglieri
2472 Kingston Road, Toronto
21 King Street W, Suite 1502, Hamilton
(416) 693-9155
thebiglierigroup.com

C:\Users\ericc\The Biglieri Group\TBG_Project - 2020-2024\2020\20698\2 - TBG Design\1 - TBG Working Drawings\1 - AutoCAD\2025-07\20698_DP_2025.07.02

NOTE:

Distances Shown On This Plan Are In Metres And Can Be Converted To Feet By Dividing By 0.3048

The Position of Pole Lines, Conduits, Watermains, Sewers and Other Underground and Overground Utilities and Structures is Not Necessarily Shown on the Contract Drawing. While They Are Shown, The Accuracy Of Such Information is Not Guaranteed. The Contractor Is Hereby Required Before Starting Work, The Contractor Shall Inform Himself Of The Exact Location of All Such Utilities and Structures, and Shall Assume All Liability For Damage To Them.

LEGEND

- SUBDIVISION BOUNDARY
- 245.14 PROPOSED ELEVATION
- EXISTING ELEVATION
- EXISTING CONTOUR ELEVATION
- PROPOSED OVERLAND FLOW DIRECTION
- PEDESTRIAN NETWORK
- PROP. SANITARY MAINTENANCE HOLE
- PROP. STORM MAINTENANCE HOLE
- PROP. STORM CATCHBASIN MANHOLE
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATERMAIN

NOTE

THIS PLAN HAS BEEN PREPARED TO DEMONSTRATE FEASIBILITY OF THE PROPOSED DEVELOPMENT WITH RESPECT TO GRADING IN CONJUNCTION WITH THE DRAFT PLAN APPROVAL. DETAILED GRADING DESIGN WILL BE PREPARED AT THE SUBDIVISION ENGINEERING STAGE.

No.	Revision	Date	By	Appr'd

CONSULTANT:

PRELIMINARY

MILLBROOK EAST SUBDIVISION

BROMONT HOMES INC.

VALDOR ENGINEERING INC.
Consulting Engineers - Project Managers
741 ROWNTREE DAIRY ROAD, UNIT 2, WOODBRIDGE, ONTARIO, L4L 5T9
TEL (905)264-0054, FAX (905)264-0069 E-MAIL info@valdor-engineering.com
www.valdor-engineering.com

CITY OF KAWARTHA LAKES
COUNTY OF PETERBOROUGH

PRELIMINARY SITE SERVICING AND GRADING PLAN

Surveyed by:	Checked by: P.S.Z.	Project No.	21101
Drawn by: V.L.	Approved by: D.G.		
Designed by: V.L.	Date: June 6, 2025	Drawing No.	PSG-1
Scale: 1:750		Sheet No.	

Appendix B

Plant Species by Community

APPENDIX B Plant Species by Community

Families and genera for the plant species found in this appendix are listed in taxonomic order. The species are listed alphabetically by scientific name within each genus.

Three standard reference works were used for the botanical nomenclature and taxonomy (Newmaster et. al., 1998; Gleason and Cronquist 1991; Voss 1980; 1985). Other published works for botanical names included; ferns (Cody and Britton 1989); grasses (Dore and McNeill 1980); orchids (Whiting and Catling 1986); shrubs (Soper and Heimburger 1982) and trees (Farrar 1995).

Total: Number of communities where plant species was recorded
X : Plant species recorded

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
HORSETAIL FAMILY	*EQUISETACEAE*									
field horsetail	*Equisetum arvense*	3	X			X		X		
water horsetail	*Equisetum fluviatile*	1						X		
WOOD FERN FAMILY	*DRYOPTERIDACEAE*									
sensitive fern	*Onoclea sensibilis*	1						X		
PINE FAMILY	*PINACEAE*									
red pine	*Pinus resinosa*	1				X				
eastern white pine	*Pinus strobus*	1				X				
Scot's pine	*Pinus sylvestris*	1			X					
CYPRESS FAMILY	*CUPRESSACEAE*									
eastern red cedar	*Juniperus virginiana*	2				X				X
eastern white cedar	*Thuja occidentalis*	3						X	X	X

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
BUTTERCUP FAMILY	*RANUNCULACEAE*									
Canada anemone	*Anemone canadensis*	1			X					
marsh marigold	*Caltha palustris*	1						X		
round-lobed hepatica	*Hepatica americana*	1				X				
tall buttercup	*Ranunculus acris*	2	X					X		
early meadow rue	*Thalictrum dioicum*	1						X		
tall meadow rue	*Thalictrum pubescens*	1						X		
BARBERRY FAMILY	*BERBERIDACEAE*									
mayapple	*Podophyllum peltatum*	1				X				
POPPY FAMILY	*PAPAVERACEAE*									
bloodroot	*Sanguinaria canadensis*	1				X				
ELM FAMILY	*ULMACEAE*									
American elm	*Ulmus americana*	4	X		X	X		X		
WALNUT FAMILY	*JUGLANDACEAE*									
black walnut	*Juglans nigra*	2				X		X		
BEECH FAMILY	*FAGACEAE*									
bur oak	*Quercus macrocarpa*	1				X				
red oak	*Quercus rubra*	2				X		X		
BIRCH FAMILY	*BETULACEAE*									
white birch	*Betula papyrifera*	1			X					
ironwood	*Ostrya virginiana*	1				X				
PINK FAMILY	*CARYOPHYLLACEAE*									
mouse-eared chickweed	*Cerastium fontanum*	1	X							
BUCKWHEAT FAMILY	*POLYGONACEAE*									
curled dock	*Rumex crispus*	3	X	X			X			
great water dock	*Rumex orbiculatus*	1						X		
ST. JOHN'S-WORT FAMILY	*GUTTIFERAE*									
common St. John's-wort	*Hypericum perforatum*	2	X		X					

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
LINDEN FAMILY	*TILIACEAE*									
American basswood	*Tilia americana*	2			X	X				
VIOLET FAMILY	*VIOLACEAE*									
common blue violet	*Viola affinis Le Conte*	1				X				
GOURD FAMILY	*CUCURBITACEAE*									
wild cucumber	*Echinocystis lobata*	2	X					X		
WILLOW FAMILY	*SALICACEAE*									
trembling aspen	*Populus tremuloides*	2	X			X				
heart-leaved willow	*Salix cordata*	1					X			
pussy willow	*Salix discolor*	2		X			X			
crack willow	*Salix fragilis*	2		X	X					
MUSTARD FAMILY	*BRASSICACEAE*									
field mustard	*Brassica rapa*	1	X							
flixweed	*Descurainia sophia*	1	X							
wormseed mustard	*Erysimum cheiranthoides*	1	X							
dame's rocket	*Hesperis matronalis*	1						X		
field penny-cress	*Thlapsi arvense*	1	X							
PRIMROSE FAMILY	*PRIMULACEAE*									
fringed loosestrife	*Lysimachia ciliata*	1						X		
GOOSEBERRY FAMILY	*GROSSULARIACEAE*									
prickly gooseberry	*Ribes cynosbati*	1				X				
ROSE FAMILY	*ROSACEAE*									
hawthorn species	*Crataegus spp.*	1						X		
common strawberry	*Fragaria virginiana*	1				X				
apple	*Malus domestica*	2	X			X				
sulfur cinquefoil	*Potentilla recta*	1	X							
black cherry	*Prunus serotina*	1				X				
choke cherry	*Prunus virginiana*	2				X		X		
wild red raspberry	*Rubus idaeus*	1						X		

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
PEA FAMILY	*FABACEAE*									
crown-vetch	*Coronilla varia*	2	X					X		
bird's-foot trefoil	*Lotus corniculatus*	2	X					X		
black medick	*Medicago lupulina*	2	X		X					
alfalfa	*Medicago sativa ssp. Sativa*	2	X			X				
white sweet-clover	*Melilotus alba*	2	X		X					
black locust	*Robinia pseudo acacia*	1			X					
alsike clover	*Trifolium hybridum*	1				X				
red clover	*Trifolium pratense*	1	X							
white clover	*Trifolium repens*	1	X							
cow vetch	*Vicia cracca*	6	X	X	X	X	X	X		
LOOSESTRIFE FAMILY	*LYTHRACEAE*									
purple loosestrife	*Lythrum salicaria*	2		X			X			
EVENING PRIMROSE FAMILY	*ONAGRACEAE*									
Canada enchanter's nightshade	*Circaea lutetiana L. ssp.canadensis*	1							X	
purple-veined willow-herb	*Epilobium coloratum*	1						X		
hairy willow-herb	*Epilobium hirsutum*	1		X						
common evening primrose	*Oenothera biennis*	1	X							
DOGWOOD FAMILY	*CORNACEAE*									
red-osier dogwood	*Cornus stolonifera*	4	X	X		X	X			
BUCKTHORN FAMILY	*RHAMNACEAE*									
European buckthorn	*Rhamnus cathartica*	7	X		X	X	X	X	X	X
GRAPE FAMILY	*VITACEAE*									
Virginia creeper	*Parthenocissus inserta*	3			X	X	X			
wild grape	*Vitis riparia*	5	X		X	X		X	X	
MAPLE FAMILY	*ACERACEAE*									
Manitoba maple	*Acer negundo*	7	X	X		X	X	X	X	X
sugar maple	*Acer saccharum ssp.saccharum*	1				X				

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
CASHEW FAMILY	*ANACARDIACEAE*									
western poison-ivy	*Rhus rydbergii*	2			X			X		
staghorn sumac	*Rhus typhina*	4	X		X	X		X		
TOUCH-ME-NOT FAMILY	*BALSAMINACEAE*									
spotted jewelweed	*Impatiens capensis*	2		X				X		
CARROT FAMILY	*APIACEAE*									
bulbous water-hemlock	*Cicuta bulbifera*	1						X		
spotted water hemlock	*Cicuta maculata*	1						X		
Queen-Anne's lace	*Daucus carota*	4	X	X		X		X		
wild parsnip	*Pastinaca sativa*	2	X					X		
MILKWEED FAMILY	*ASCLEPIADACEAE*									
common milkweed	*Asclepias syriaca*	4	X		X		X	X		
swallow-wort	*Cynanchum rossicum*	5			X	X		X	X	X
MORNING-GLORY FAMILY	*CONVOLVULACEAE*									
swamp dodder	*Cuscuta gronovii*	1						X		
WATERLEAF FAMILY	*HYDROPHYLLACEAE*									
Virginia waterleaf	*Hydrophyllum virginianum*	1	X							
VERVAIN FAMILY	*VERBENACEAE*									
blue vervain	*Verbena hastata*	3		X			X	X		
MINT FAMILY	*LAMIACEAE*									
motherwort	*Leonurus cardiaca*	1							X	
American water-horehound	*Lycopus americanus*	2		X			X			
wild mint	*Mentha arvensis*	3	X	X				X		
PLANTAIN FAMILY	*PLANTAGINACEAE*									
narrow-leaved plantain	*Plantago lanceolata*	1	X							
broad-leaved plantain	*Plantago major*	1	X							
OLIVE FAMILY	*OLEACEAE*									
white ash	*Fraxinus americana*	2				X			X	
lilac	*Syringa vulgaris*	3			X	X				X

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
FIGWORT FAMILY	*SCROPHULARIACEAE*									
common mullein	*Verbascum thapsus*	1	X							
MADDER FAMILY	*RUBIACEAE*									
white bedstraw	*Galium mollugo*	1						X		
HONEYSUCKLE FAMILY	*CAPRIFOLIACEAE*									
tartarian honeysuckle	*Lonicera tatarica*	2				X		X		
red-berried elderberry	*Sambucus racemosa*	1							X	
Guelder rose	*Viburnum americanum*	1	X							
nannyberry	*Viburnum lentago*	1				X				

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
ASTER FAMILY	*ASTERACEAE*									
common yarrow	*Achillea millefolium*	1				X				
Russian knapweed	*Acroptilon repens*	1		X						
common ragweed	*Ambrosia artemisiifolia L.*	1				X				
common burdock	*Arctium minus*	2						X	X	
ox-eye daisy	*Chrysanthemum leucanthemum*	1	X							
chicory	*Cichorium intybus*	1	X							
Canada thistle	*Cirsium arvense*	3	X			X		X		
bull thistle	*Cirsium vulgare*	2	X			X				
daisy fleabane	*Erigeron annuus*	3	X			X			X	
Philadelphia fleabane	*Erigeron philadelphicus ssp. philadelphic*	2	X			X				
spotted joe-pyeweed	*Eupatorium maculatum*	1					X			
boneset	*Eupatorium perfoliatum*	1					X			
large-leaved aster	*Eurybia macrophylla*	1								X
grass-leaved goldenrod	*Euthamia graminifolia*	4	X			X	X	X		
elecampane	*Inula helenium*	2	X			X				
tall goldenrod	*Solidago altissima*	1	X							
blue-stemmed goldenrod	*Solidago caesia*	1				X				
Canada goldenrod	*Solidago canadensis*	6	X	X	X	X	X			X
zig-zag goldenrod	*Solidago flexicaulis*	1							X	
goldenrod species	*Solidago spp.*	2	X					X		
spiny-leaved sow thistle	*Sonchus asper*	1	X							
panicled aster	*Symphyotrichum lanceolatum ssp.hespe*	1					X			
calico aster	*Symphyotrichum lateriflorum var.laterifl*	2				X			X	
purple-stemmed Aster	*Symphyotrichum puniceum*	3	X	X			X			
common dandelion	*Taraxacum officinale*	4	X			X		X	X	

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
RUSH FAMILY	*JUNCACEAE*									
Canadian rush	*Juncus canadensis*	1		X						
common rush	*Juncus effusus*	1						X		
knotted rush	*Juncus nodosus*	1						X		
path rush	*Juncus tenuis*	1		X						
SEDGE FAMILY	*CYPERACEAE*									
Bebb's sedge	*Carex bebbii*	2		X			X			
crested sedge	*Carex cristatella*	1		X						
retrorse sedge	*Carex retrorsa*	1					X			
spiked sedge	*Carex spicata Hudson*	2	X			X				
awl-fruited sedge	*Carex stipata*	1					X			
tussock sedge	*Carex stricta*	1						X		
fox sedge	*Carex vulpinoidea*	2		X			X			
black bulrush	*Scirpus atrovirens*	3		X			X	X		
GRASS FAMILY	*POACEAE*									
redtop	*Agrostis gigantea*	1	X							
autumn bent grass	*Agrostis perennans*	1				X				
awnless brome grass	*Bromus inermis ssp.inermis*	6	X	X	X	X	X	X		
Canada bluejoint grass	*Calamagrostis canadensis*	1					X			
orchard grass	*Dactylis glomerata*	2	X			X				
quack grass	*Elymus repens*	2	X				X			
rice cut grass	*Leersia oryzoides*	1		X						
perennial rye grass	*Lolium perenne*	1	X							
witch grass	*Panicum capillare*	1				X				
reed canary grass	*Phalaris arundinacea*	4	X	X			X	X		
timothy	*Phleum pratense*	3	X	X		X				
fowl meadow grass	*Poa palustris*	2		X				X		
Kentucky blue grass	*Poa pratensis*	3				X	X	X		

Common Name	*Scientific Name*	Total	COMMUNITY NUMBER							
			1	2	3	4	5	6	7	8
CATTAIL FAMILY	*TYPHACEAE*									
common cattail	*Typha latifolia*	3		X			X	X		
LILY FAMILY	*LILIACEAE*									
asparagus	*Asparagus officinalis*	1	X							
trout lily	*Erythronium americanum ssp. american*	1				X				
Total Number of Plant Species	146		60	28	21	56	29	53	14	8

Number of Plant Species Per Community

Appendix C

Bird Species List

APPENDIX C Bird Status Report - Comprehensive

Bird species observed by GHD are listed in the order followed the American Ornithologists' Union (AOU) Check-list of North American birds (7th edition, 1999, 47th Supplement). Common and scientific nomenclature are based on those used by AOU. Breeding status and breeding evidence code are listed when observed. Any significant status for a species on national and provincial lists is displayed as well as those from relevant regional lists.

List Status :	**END - endangered**	A wildlife species facing imminent extirpation or extinction.
	END-R -endangered regulated	A wildlife species facing imminent extirpation or extinction in Ontario which has been regulated under Ontario's Endangered Species Act (ESA).
	THR - threatened	A wildlife species likely to become endangered if limiting factors are not reversed.
	SC - special concern	A wildlife species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.
	YES - Area Sensitive	A wildlife species that requires large areas of suitable habitat in order to sustain their population numbers.

*** Other status levels are not displayed**

List Sources:	**COSEWIC**	The Committee on the Status of Endangered Wildlife in Canada, October 2021.
	COSSARO	The Committee on the Status of Species at Risk in Ontario, June 2021.
	SARA	Species At Risk Act, Schedule 1, Government of Canada, February 2022.
	Area Sensitive	Significant Wildlife Technical Guide, Appendix C, OMNR, Oct. 2000
	Region 6	Southern Ontario Wetland Evaluation Appendix 11B, Version 3.2, March 2013

Breeding Status: (Observed By GHD)

B -species observed in breeding season in suitable habitat with some evidence of breeding (confirmed, probable or possible as per Ontario Breeding Bird Atlas, 2002).
F -species observed in breeding season but no evidence of breeding or suitable nest sites available on the study site (includes flyovers, migrants and foraging colonial breeders).
M -species observed outside of breeding season for that species and in area outside of the known breeding range for that species.

Breeding Evidence Code: (Observed By GHD)

OBSERVED
X -species observed in its breeding season (no evidence of breeding).

POSSIBLE BREEDING
H -species observed in its breeding season in suitable nesting habitat
S -singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat

PROBABLE BREEDING
P -pair observed in their breeding season in suitable nesting habitat
T -permanent territory presumed through registration of territorial song on at least 2days, a week or more apart, at the same place
D -courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V -visiting probable nest site
A -agitated behaviour or anxiety calls of an adult
B -brood patch on adult female or cloacal protuberance on adult male
N -nest-building or excavation of nest hole

CONFIRMED BREEDING
DD -distraction display or injury feigning
NU -used nest or egg shell found (occupied or laid within the period of study)
FY -recently fledged young or downy young, including young incapable of sustained flight
AE -adults leaving or entering nest site in circumstances indicating occupied nest
FS -adult carrying fecal sac
CF -adult carrying food for young
NE -nest containing eggs
NY -nest with young seen or heard

SOURCE: Ontario Breeding Bird Atlas March 2001

AOU Code	Common Name	Scientific Name	Observed Breeding Status	Breed Evidence Code	COSEWIC	COSSARO	SARA	Area Sensitive	Region 6		
WITU	Wild Turkey	*Meleagris gallopavo*	B	X				No			
KILL	Killdeer	*Charadrius vociferus*	B	S				No			
DOWO	Downy Woodpecker	*Picoides pubescens*	B	S				No			
NOFL	Northern Flicker	*Colaptes auratus*	B	X				No			
GCFL	Great Crested Flycatcher	*Myiarchus crinitus*	B	S				No			
EAKI	Eastern Kingbird	*Tyrannus tyrannus*	B	X				No			
REVI	Red-eyed Vireo	*Vireo olivaceus*	B	S				No			
BLJA	Blue Jay	*Cyanocitta cristata*	B	S				No			
AMCR	American Crow	*Corvus brachyrhynchos*	B	X				No			
CORA	Common Raven	*Corvus corax*	B	X				No			
TRES	Tree Swallow	*Tachycineta bicolor*	B	X				No			
BARS	Barn Swallow	*Hirundo rustica*	B	X	THR	THR	THR	No			
BCCH	Black-capped Chickadee	*Poecile atricapillus*	B	S				No			
AMRO	American Robin	*Turdus migratorius*	B	CF				No			
GRCA	Gray Catbird	*Dumetella carolinensis*	B	S				No			
BRTH	Brown Thrasher	*Toxostoma rufum*	B	S				No			
EUST	European Starling	*Sturnus vulgaris*	B	S				No			
CEWX	Cedar Waxwing	*Bombycilla cedrorum*	B	P				No			
YEWA	Yellow Warbler	*Dendroica petechia*	B	S				No			
AMRE	American Redstart	*Setophaga ruticilla*	B	S				No			
COYE	Common Yellowthroat	*Geothlypis trichas*	B	S				No			
CHSP	Chipping Sparrow	*Spizella passerina*	B	S				No			
VESP	Vesper Sparrow	*Pooecetes gramineus*	B	S				No			
SASP	Savannah Sparrow	*Passerculus sandwichens*	B	S				No			
SOSP	Song Sparrow	*Melospiza melodia*	B	S				No			
NOCA	Northern Cardinal	*Cardinalis cardinalis*	B	S				No			

BOBO	Bobolink	*Dolichonyx oryzivorus*	B	S	SC	THR	THR	No			
RWBL	Red-winged Blackbird	*Agelaius phoeniceus*	B	A				No			
COGR	Common Grackle	*Quiscalus quiscula*	B	S				No			
AMGO	American Goldfinch	*Carduelis tristis*	B	S				No			
TOTAL SPECIES OBSERVED:	**30**	**BREEDING SPECIES OBSERVED:**	**30**		**2**	**2**	**2**	**0**	**0**	**0**	**0**

Appendix D

Bird Status Report by Station

Breeding Bird Survey Stations - Quantitative Data Summary

Project ID: 12662-580

Project Name: Larmer Line

Location: Millbrook

Remarks:

				STATIONS																			
BCode	**Common Name**	***Scientific Name***	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
WITU	Wild Turkey	*Meleagris gallopavo*	**1**					1															
KILL	Killdeer	*Charadrius vociferus*	**3**	1		1			1														
DOWO	Downy Woodpecker	*Picoides pubescens*	**1**			1																	
NOFL	Northern Flicker	*Colaptes auratus*	**1**					1															
GCFL	Great Crested Flycatcher	*Myiarchus crinitus*	**1**						1														
EAKI	Eastern Kingbird	*Tyrannus tyrannus*	**1**						1														
REVI	Red-eyed Vireo	*Vireo olivaceus*	**7**	1	2	1	1	2															
BLJA	Blue Jay	*Cyanocitta cristata*	**2**		1			1															
AMCR	American Crow	*Corvus brachyrhynchos*	**3**	1	1	1																	
CORA	Common Raven	*Corvus corax*	**2**						2														
TRES	Tree Swallow	*Tachycineta bicolor*	**2**	1			1																
BARS	Barn Swallow	*Hirundo rustica*	**6**	1	1		1	2	1														
BCCH	Black-capped Chickadee	*Poecile atricapillus*	**1**				1																
AMRO	American Robin	*Turdus migratorius*	**9**	1	1	1	2	2	2														
GRCA	Gray Catbird	*Dumetella carolinensis*	**2**			1			1														
BRTH	Brown Thrasher	*Toxostoma rufum*	**1**				1																
EUST	European Starling	*Sturnus vulgaris*	**6**	1	1	1	1	1	1														
CEWX	Cedar Waxwing	*Bombycilla cedrorum*	**2**		1		1																
YEWA	Yellow Warbler	*Dendroica petechia*	**3**	1	1	1																	
AMRE	American Redstart	*Setophaga ruticilla*	**5**		2	1	2																
COYE	Common Yellowthroat	*Geothlypis trichas*	**1**				1																
CHSP	Chipping Sparrow	*Spizella passerina*	**3**			1		1	1														
VESP	Vesper Sparrow	*Pooecetes gramineus*	**1**					1															
SASP	Savannah Sparrow	*Passerculus sandwichensis*	**6**	1	1	2		1	1														

SOSP	Song Sparrow	*Melospiza melodia*	**12**	2	2	2	2	2	2															
NOCA	Northern Cardinal	*Cardinalis cardinalis*	**2**			1			1															
BOBO	Bobolink	*Dolichonyx oryzivorus*	**1**			1																		
RWBL	Red-winged Blackbird	*Agelaius phoeniceus*	**8**	2	2	2			2															
COGR	Common Grackle	*Quiscalus quiscula*	**4**	2	1			1																
AMGO	American Goldfinch	*Carduelis tristis*	**6**			2	2	1	1															
No. of Bird Species: 30		**Quantity of Birds:**	**103**	15	17	20	16	17	18															

Appendix E

Herpetozoa Status

APPENDIX E Herpetozoa Status Report

Project ID: 12662-580

Herpetozoa (amphibian and reptile) species observed by GHD are listed by class then by family taxonomic grouping. These species are identified by the common and scientific name used by the Natural heritage information Centre (NHIC). Any significant status for a species on national and provincial lists is displayed as well as those from relevant regional lists.

List Status :	**END - endangered**	A wildlife species facing imminent extirpation or extinction.
	END-R -endangered regulated	A wildlife species facing imminent extirpation or extinction in Ontario which has been regulated under Ontario's Endangered Species Act (ESA).
	THR - threatened	A wildlife species likely to become endangered if limiting factors are not reversed.
	SC - special concern	A wildlife species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.
	YES - Area Sensitive	A wildlife species that requires large areas of suitable habitat in order to sustain their population numbers.

*** Other status levels are not displayed**

List Sources:	**COSEWIC**	The Committee on the Status of Endangered Wildlife in Canada, October, 2021.
	COSSARO	The Committee on the Status of Species at Risk in Ontario, January, 2021.
	SARA	Species At Risk Act, Schedule 1, Government of Canada, 2022.
	Area Sensitive	Significant Wildlife Technical Guide, Appendix C, OMNR, Oct. 2000

Amphibian

Common Name	Scientific Name	COSEWIC	COSSARO	SARA	Area Sensitive
Treefrogs	*Hylidae*				
Spring Peeper	*Pseudacris crucifer*				No
No. of Species Observed: 1		**0**	**0**	**0**	**0**

No. of Species Observed in Projec 1

Appendix F

Fish Habitat

Table 1. Detailed Aquatic Habitat Observations- Habitat Zone 1

Feature Type	Flow Condition	Percent Substrate Composition	Percent Instream Cover	Percent Canopy Cover (%)	Overhead Cover (%)	Watercourse Hydrology	Average Water Depth (m)	Average Wetted Width (m)	Sediment Transportation	Bank Attributes	Zone Length (m)
Watercourse-Defined Channel	Substantial flow during baseflow conditions	10% boulder 35% cobble 5% gravel 30% sand 20% silt	5% Undercut Bank 10% Boulders/ Cobble 10% Overhanging Veg	0-24	2% shrubs	70% run 10% pool 20% riffle	0.27	3.14	Instream bank erosion and outlet scour with minimal sediment deposition	0.2-0.5 bank height and 75% partial bank cover with buffers present	300

Appendix G

Fish Sampling Data

Table 1 *Fish Community- Environmental Conditions and Sample Attributes*

Attributes	HZ1
Sample Date (dd-mm-yyyy)	18-07-2025
Air Temperature (°C)	18
Water Temperature (°C)	17
Gear Type	Electrofisher
Start Depth (m)	0.21
Middle Depth (m)	0.51
End Depth (m)	0.37
Effort (Hours)	0.5
Frequency (hertz)	45
Voltage	175
Site Length (m)	7.5
Average Width (m)	3.75
Average Depth (m)	0.41
Shocker Seconds	961
Effort sec/m²	34.1

Table 2 *Fish Community- Fish species, Catch and Catch Summary*

Family Name	Common Name	Scientific Name	Thermal Preference	HZ1
Catostomidae	White Sucker	*Catostomus commersonii*	Coolwater	3
Gasterosteidae	Brook Stickleback	*Culaea inconstans*	Coolwater	5
Leuciscidae	Blacknose Dace	*Rhinichthys atratulus/R.obtusus*	Coolwater	33
	Fathead Minnow	*Pimephales promelas*	Warmwater	1
	Creek Chub	*Semotilus atromaculatus*	Coolwater	42
		Abundance		84
		Diversity		5

Appendix H

Fish Community and Species Habitat Preferences

Appendix H. Fish Community collected in Habitat Zone 1- Habitat Preferences, Species Status and Construction Timing Window for Tributary of Baxter Creek

Family	Common Name	*Scientific Name*	Thermal Regime	Spawning Season	Habitat Preference General/Spawning	Species At Risk Status	NDMNRF Restricted Timing Window 9 NE Region
							March 15- July 15
Catostomidae	White Sucker	*Catostomus commersonii*	Coolwater	Spring (April-June)	Warm shallows of lakes and large lakes with water depths of 6-9m, pools and riffles of creeks. No nest, broadcasts eggs over gravel substrate in riffles and rapids.	None	
Gasterosteidae	Brook Stickleback	*Culaea inconstans*	Coolwater	Spring-summer (May-July)	Prefer small, boggy headwater streams, shallow lake margins, ponds, and clear pools and backwaters of creeks and small rivers; usually associated with aquatic vegetation; occasionally brackish water; preferred water temperature 21.3°C	None	
Leuciscidae	Blacknose Dace	*Rhinichthys atratulus/R.obtusus*	Coolwater	Spring-summer (May-June)	Typically inhabit small, cool, clear streams and rivers with rocky or gravelly bottoms. They prefer areas with riffles and pools, often utilizing undercut banks, roots, and overhanging vegetation for cover.	None	
	Fathead Minnow	*Pimephales promelas*	Warmwater	Spring (May-August)	Still waters of lakes, creeks, ponds and small rivers with substrates that are dominated by mud. Spawning typically occurs in rivers and lacustrine habitats.	None	
	Creek Chub	*Semotilus atromaculatus*	Coolwater	Spring-summer (May-June)	Pools of clear creeks and smaller rivers. Preferred temperature of 20.8°C.	None	

Appendix I

Significant Plants

APPENDIX I List of Significant Plant Species

Plant species observed by GHD with significant status on national, provincial and relevant regional lists are listed with status codes and where applicable the most current year of publication. Three standard reference works were used for the botanical nomenclature and taxonomy (Newmaster et. al., 1998; Gleason and Cronquist 1991; Voss 1980; 1985). Other published works for botanical names included; ferns (Cody and Britton 1989); grasses (Dore and McNeill 1980); orchids (Whiting and Catling 1986); shrubs (Soper and Heimburger 1982) and trees (Farrar 1995).

NATIONAL RANKING **Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Government of Canada**
Species at Risk Act (SARA), SCHEDULE 1 (Subsections 2(1), 42(2) and 68(2)), Government of Canada

PROVINCIAL RANKING **Species at Risk in Ontario (COSSARO), Government of Ontario**
Provincial Rank (SRANK), Natural Heritage Information Center, Government of Ontario

REGIONAL RANKING **Peterborough** Oldham, M.J. 1999

STATUS CODES

COSEWIC **COSSARO** **SARA**	**END *** **THR *** **SC ***	- Endangered Species - Threatened Species - Species of Concern	***Year of Status Publication included in Code**
SRANK	**S1** **S2** **S3**	- Extremely Rare - Very Rare - Rare to Uncommon	**Other national or provincial codes not listed**
Regional Lists	**R** **RS** **EXP**	- Rare native species -Regional significant - Extirpated native species	**Other Regional codes not listed**

			NATIONAL RANKINGS		PROVINCIAL RANKINGS		REGIONAL RANKINGS				
Common Name	**Scientific Name**		**COSEWIC**	**SARA**	**COSSARO**	**SRank**	**Peterborough**				
black walnut	Juglans nigra						R				
flixweed	Descurainia sophia						R				
Guelder rose	Viburnum americanum						R				
crested sedge	Carex cristatella						R				
Plants with Ranking	**Total:** 4	**Status List Total**	0	0	0		4	0	0	0	0

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