Caledon Station

Community-Wide Comprehensive Environmental Impact Study and Management Plan

Draft Plans of Subdivision

Prepared For:

Argo Macville Draft Plan of Subdivision (21T22001):
Argo Macville I Corporation
Argo Macville II Corporation
Argo Macville III Corporation
Argo Macville V Corporation
Argo Humberking Corporation

Argo Humber Station Draft Plan of Subdivision (21T-22002):
Argo Humber Station Limited

Humberking Draft Plan of Subdivision (PRE-2023-0080):
Humberking (I) Developments Limited
Humberking (IV) Developments Limited

Prepared By:

Beacon Environmental Limited

Date:
2024-07-03

Project:
214476

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Table of Contents

page

Figures

Tables

Appendices

1. Introduction

The Caledon Station community, which is generally located north of King Street, east of The Gore Road and west of the CP railway corridor and Humber Station Road (**Figure 1**), is planned to be Caledon's first transit-oriented community. In accordance with this vision, the Caledon Station Secondary Plan identifies higher densities and a mix of uses, particularly within the defined Bolton GO Major Transit Station Area (MTSA), to achieve the planning objective of creating a compact, pedestrian and transit-oriented development. Under existing conditions, it comprises an area of approximately 182 hectares (450 acres) of predominantly agricultural land with natural heritage features which include headwater drainage features and non-provincially significant wetlands. It is located within the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

In 2023, a Final Comprehensive Environmental Impact Study and Management Plan (Final CEISMP; Beacon, *et al.*) was submitted to the Town of Caledon (Town) in support of a Local Official Plan Amendment (LOPA) for the Caledon Station Secondary Plan. Terms of Reference (TOR) for that CEISMP were prepared and approved by the Region of Peel and Toronto and Region Conservation Authority (TRCA) in April 2013. These TOR were used by the Town's consultant team to guide the environmental studies and analyses required to prepare the CEISMP. A copy of these TOR is presented in **Appendix A**.

The CEISMP was authored by Beacon Environmental Limited (Beacon) in collaboration with Glen Schnarr & Associates Inc., Urbantech Consulting and DS Consultants Ltd. on behalf of the Caledon Community Partners. This Final CEISMP characterized existing environmental conditions, identified constraints and opportunities to future development, and recommended environmental protection, mitigation and management measures. While some information gaps remained in the Final CEISMP, these gaps did not affect the proposed Land Use Plan or Framework Plan or the limits of the proposed Natural Heritage System (NHS). The Final CEISMP demonstrated that the Caledon Station Land Use Plan conformed with applicable environmental protection legislation, regulations, and policies, including the Town's environmental performance measures.

Subsequent to the Final CEIMSP submission, and in support of the Official Plan Amendment (OPA), Secondary Plan approval and the development of Secondary Plan policies, a series of consultation meetings were held with the Town and TRCA. In addition, the following submissions were made to address Secondary Plan requirements:

- Final Wetland Evaluation and Mapping Update for the Macville Area Wetlands, Town of Caledon, Region of Peel (Beacon 2023);
- Caledon Station Climate Adaptation Plan (Pratus Group December 2023);
- Caledon Station Secondary Plan Area TRCA Comment Response Memo (Urbantech November 2023), which included:
    - Comment response matrix;
    - Updated hydraulic and hydrologic models;
    - FSR addendum (Tables, Figures and Drawings); and
    - Caledon Station Community Stormwater Erosion Analysis report (Beacon 2023);
- Caledon Station Secondary Plan Area TRCA Comment Response Memo for OPA Approval (Urbantech February 2024), which included:
    - Comment response matrix;
    - Existing and proposed Comprehensive Constraint Mapping (Beacon 2024);

- Groundwater Table Depth and LID Feasibility Mapping; and
- Erosion Control – LID Retention Volume Calculations.

This Community-Wide CEISMP has been prepared in support of Draft Plan of Subdivision Applications for the following Draft Plan areas (**Figure 1**):

- **Argo Macville Draft Plan of Subdivision (21T-22001):** Argo Macville I Corporation, Argo Macville II Corporation, Argo Macville III Corporation, Argo Macville V Corporation and Argo Humberking Corporation;
- **Argo Humber Station Draft Plan of Subdivision (21T-22002):** Argo Humber Station Limited; and
- **Humberking Draft Plan of Subdivision (PRE-2023-0080) East and West Lands:** Humberking (I) Developments Limited and Humberking (IV) Developments Limited.

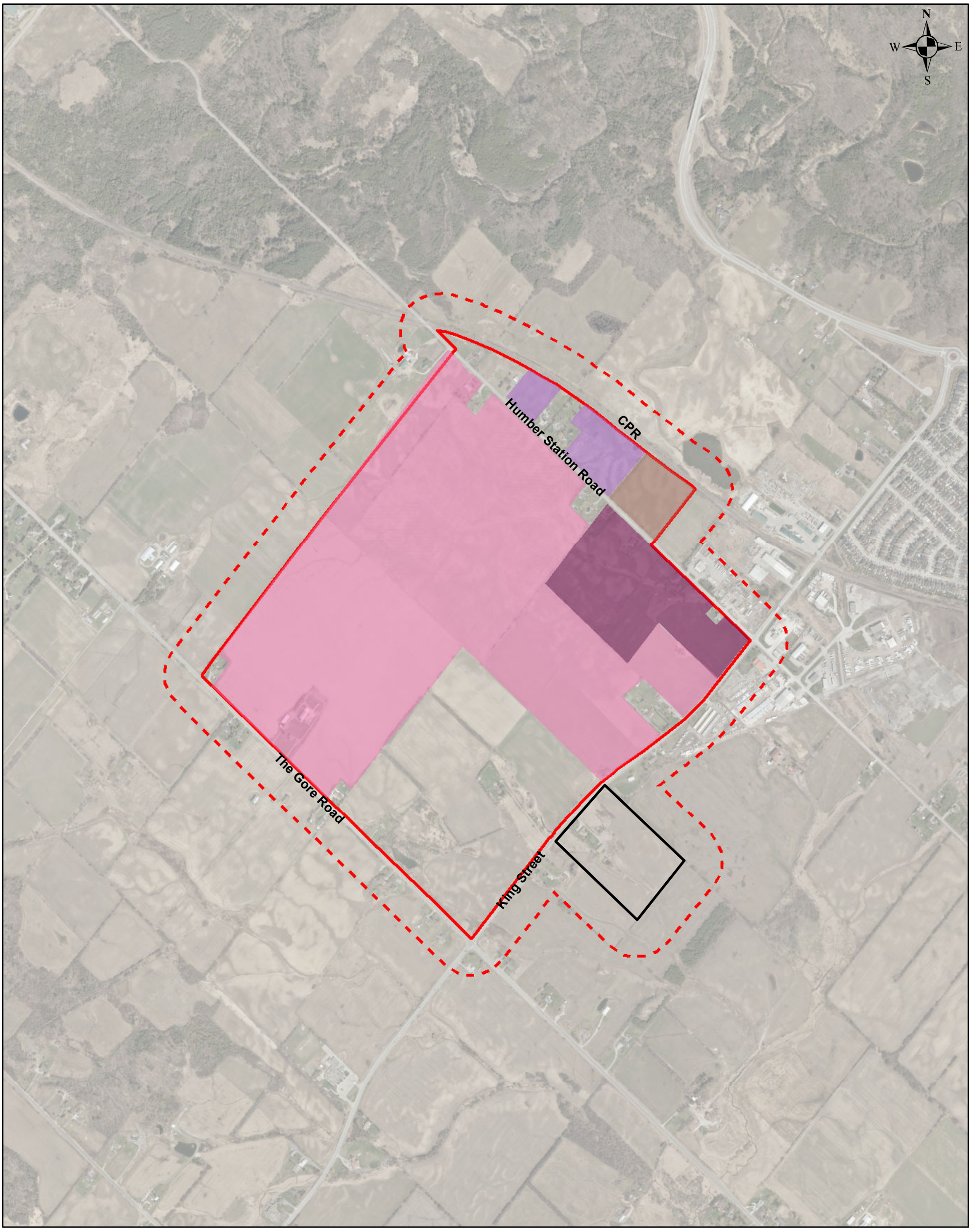
It should be noted that the Argo Macville Draft Plan of Subdivision is reliant on other lands south of King Street owned by the proponent for servicing. While not part of the Caledon Station Secondary Plan Area, these lands have been subject to the same level of study as the Secondary Plan Area and are identified in figures and subsequent sections of this report as "*other lands owned by proponent required for servicing*."

The purpose of this report is to integrate relevant findings from the submissions made to address Secondary Plan requirements, to address information gaps identified in the Final CEISMP, and fulfill Draft Plan of Subdivision application requirements for each of the subject properties. To this end, the report has been formatted to follow the organizational structure of the Final CEISMP, with the addition of stand-alone report sections, figures and drawings that are specific to each of the Draft Plan areas. Specifically, this report demonstrates conformance with the Caledon Station Framework Plan, Land Use Plan and Final CEISMP for each Draft Plan of Subdivision.

1.1 Study Team

Members of the study team involved in the preparation of the Community-Wide CEISMP/FSR and supporting documents are listed below:

- Beacon Environmental Limited - Ecology and Fluvial Geomorphology;
- DS Consultants Ltd. - Geotechnical and Hydrogeology;
- Gerrard Design - Land Use Design;
- R.J Burnside & Associates Ltd. - Water Distribution;
- Glen Schnarr & Associates Inc. – Planning;
- Humphries Planning Group Inc. – Planning;
- NAK Design Strategies - Landscape Design; and
- Urbantech Consulting - Municipal Design, Water Resources and Group Engineering.



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- ARGO MACVILLE DRAFT PLAN AREA
- ARGO HUMBER STATION DRAFT PLAN AREA
- HUMBERKING WEST DRAFT PLAN AREA
- HUMBERKING EAST DRAFT PLAN AREA

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PROJECT No. 214476

FIGURE 1

SITE LOCATION

June 2024 Scale 1:12,000

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2. Regulatory Framework for Environmental Protection

The regulatory framework presented in **Table 2** provides a summary of key statutory requirements and policy tests that informed the constraint analysis presented in the Final CEISMP, and the design of the Caledon Station Secondary Plan Land Use Plan and Framework Plan. Refer to **Figure 2** for the location of existing environmentally designated protection areas that are proximal to the Caledon Station Secondary Plan Area.

Table 1. Regulatory Framework for Environmental Protection

Level of Government	Act/Regulation/ Policy/Guideline	Type	Purpose	Relevance to the Caledon Station Secondary Plan Area
Federal	*Fisheries Act* (1985)	Act	Fish and fish habitat are protected under the federal *Fisheries Act* which is administered by the Fish and Fish Habitat Protection Program (FFHPP) within Fisheries and Oceans Canada (DFO).	The protection provisions of the *Fisheries Act* apply to all fish and fish habitat throughout Canada and the Act sets out authorities for the regulation of works, undertakings or activities that risk harming fish and fish habitat. If a project is taking place in or near water, the proponent is responsible for understanding project related impacts on fish and fish habitat and applying measures to avoid and/or mitigate potential impacts (i.e., harmful, alteration, disruption, or destruction) to fish and fish habitat.
	Migratory Birds Convention Act (1994)	Act	To protect listed migratory bird species and their nests.	To comply with this legislation, activities that can potentially impact breeding birds must be avoided. Construction staging plans will need to demonstrate conformance with the Act.
	Species at Risk Act (2002)	Act	To protect the habitats of federally listed species at risk.	Outside of federal lands, the *Species at Risk Act* prohibitions apply only to aquatic species and migratory birds that are also listed in the *Migratory Birds Convention Act*. This is applicable to the Secondary Plan Area as nesting birds are present.
Provincial	*Conservation Authorities Act* (1990)	Act	The *Conservation Authorities Act* and provides the legislative, operational jurisdictional and regulatory framework for Conservation Authorities.	Under the Act, Conservation Authorities have the authority to regulate activities in areas under their jurisdiction through issuance of permits.
	Fish and Wildlife Conservation Act (1997)	Act	The *Fish and Wildlife Conservation Act* enables the Ministry of Natural Resources (MNR) to provide sound management of the province's fish and wildlife.	The *Fish and Wildlife Conservation Act* protects the nest or eggs of bird not already protected on the *Migratory Birds Convention Act* with some exceptions.
	Endangered Species Act (2007)	Act	This Act provides protection to the habitats of endangered and threatened species in Ontario.	Habitat for provincially listed Species at Risk is present within the Secondary Plan Area. Where habitat exists for threatened or endangered species, such habitats are to be protected in accordance with the provisions of the Act and its regulations (Ontario Regulation 242/08, Ontario Regulation 832/21). If a proposed activity has the potential to impact the habitats of threatened or endangered species, proponents are directed to consult with the Ministry of Environment, Conservation and Parks (MECP).
	A Place to Grow: Growth Plan for the Greater Golden Horseshoe 2019 (and Amendment No. 1 2020) (The Growth Plan for the Greater Golden Horseshoe 2019 was prepared and approved under the Places to Grow Act, 2005.)	Provincial Plan	The *Places to Grow Act* was implemented to promote growth plans which reflect the needs, strengths and opportunities of the communities involved, and promotes growth that balances the needs of the economy with the environment. *A Place To Grow: Growth Plan for the Greater Golden Horseshoe* is a long-term plan intended to manage growth through building complete communities, curbing sprawl and protecting the natural environment.	The Growth Plan policies relate to managing growth, housing, designated growth areas, moving people, water/wastewater, natural heritage system and public open space.
	Provincial Policy Statement (2020)	Policy	The Provincial Policy Statement (PPS) provides policy direction to municipalities on matters of provincial interest as they relate to land use planning and development. The PPS provides for appropriate land use planning and development while protecting Ontario's natural heritage and water resources and managing impacts of natural hazards.	All land use planning in Ontario is required to be consistent with the policies of the PPS. These are outlined in • Section 2.1 - Natural Heritage (Policies 2.1.1 - 2.1.9); • Section 2.2 – Water (Policies 2.2.1-2.2.3); and • Section 3.1 - Natural Hazards (Policies 3.1.1-3.1.8).
	Ontario Regulation 166/06 (2013)	Regulation	This Regulation allows TRCA to regulate development activities in and adjacent to wetlands, watercourses and valleylands.	Recently, O.Reg. 41/24 has resulted in regulatory changes under the *Conservation Authorities Act*. The changes have been made to narrow the scope of Conservation Authorities to focus on regulating natural hazards, removing any requirement to comment on or provide support to municipal partners on natural heritage matters that do not involve regulated lands. A permit must be obtained from TRCA prior to development or site alteration within regulated areas.
	Living City Policies (TRCA 2014a)	Policy	These policies relate to how TRCA manages its watersheds and regulates activities within its jurisdiction.	The Secondary Plan Area supports features and areas that are regulated by TRCA (e.g., wetlands and floodplains). The Living City Policies provide direction to land use planning within regulated areas to ensure that land use planning and development are consistent with their regulations.
	Natural Heritage Reference Manual (2010)	Guideline	This manual provides guidance for implementing the natural heritage policies of the Provincial Policy Statement.	Natural heritage features as described under section 2.1 of the PPS are located within the Secondary Plan Area. Significant features require protection within an NHS.
	Significant Wildlife Habitat Criteria for Ecoregion 6E (2015)	Guideline	Provides the recommended criteria for identifying Significant Wildlife Habitat (SWH) within Ecoregion 6E.	SWH has been identified as one of the natural heritage feature areas under the Provincial Policy Statement. Tables 1.1 through 1.4 within the Schedules provide guidance for SWH designation for the four categories of SWH outlined in the Significant Wildlife Habitat Technical Guide and its Appendices, while Table 1.5 contains

Level of Government	Act/Regulation/ Policy/Guideline	Type	Purpose	Relevance to the Caledon Station Secondary Plan Area
				and provides descriptions for exceptions criteria for ecoregional SWH which will be identified at an ecodistrict scale.
	Significant Wildlife Habitat Technical Guide (2000)	Guideline	This guide supports the Natural Heritage Reference Manual. It provides detailed information on the identification, description, and prioritization of significant wildlife habitat.	Planning authorities require proponents to use the guide when completing an ecological site assessment for significant wildlife habitat.
	Redside Dace Development Guidance (2016)	Guideline	The purpose of this document is to provide guidance to persons interested in developing areas in southern Ontario that have Redside Dace (*Clinostomus elongatus*) habitat.	One of the drainage features associated with the Secondary Plan Area demonstrates attributes that may be considered consistent with contributing habitat for Redside Dace. As such, development activities must implement best management practices to avoid or mitigate impacts on Redside Dace and their habitat.
Regional	Region of Peel Official Plan (2022)	Policy	The Peel Region Official Plan contains policies aimed at protecting, maintaining, and restoring a Regional Greenlands System consisting of “Core Areas”, “Natural Areas and Corridors (NACs)”, and “Potential Natural Areas and Corridors (PNACs)”.	The Region of Peel Greenlands System consists of Core Areas, Natural Areas and Corridors (NAC) and Potential Natural Areas and Corridors (PNACs). Currently, Schedule A of the Regional Official Plan does not identify any components of its Greenlands System on the Subject Lands. One of the objectives of the CEISMP is to evaluate features that may qualify are components of the Regional Greenlands System and to identify which of these are to be included within the future NHS and to demonstrate how the land use plan and preliminary framework plans accommodate the NHS.
		Policy	In addition, the ROP has New Urban Area policies that outline studies required in support of official plan amendments.	The Final CEISMP was considered the equivalent of a subwatershed study and satisfied the New Urban Area environmental policies
Municipal	Town of Caledon Official Plan (2018)	Policy	The Town of Caledon Official Plan (2018) provides direction as to the land use within the Town.	Like the Region of Peel Greenlands System, the Town of Caledon has an Ecosystem Framework that consists of four ecosystem components: Natural Core Areas, Natural Corridors, Supportive Natural Systems, and Natural Linkages. Natural Core Areas and Natural Corridors are designated Environmental Policy Area (EPA). Schedule A of the Town’s Official Plan does not map any EPA within the Secondary Plan Area. One of the objectives of the Final CEISMP was to evaluate features that may qualify are components of the Regional Greenlands System and to identify which of these are to be included within the future NHS and to demonstrate how the land use plan and preliminary framework plans accommodate the NHS.
Conservation Authority	Regulation for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (2006)	Policy	This document outlines the procedures and guiding policies of the TRCA in administering Ontario Regulation 166/06, as well as providing legislative background.	A permit must be obtained from TRCA prior to development or site alteration within their regulated area.
	The Living City Policies for Planning and Development in the Watershed (2014a)	Policy	This document contains TRCA’s policies for how to define, protect, enhance, and secure a Natural Heritage System.	The LCP defines the “Natural System” as a combination of 1) water resources, 2) natural features and areas, 3) natural hazards, and 4) any associated potential “natural cover” and/or buffers. Development and site alteration are not permitted in the Natural System, except in accordance with the policies provided in the LCP. Recently, O.Reg. 41/24 has resulted in regulatory changes under the Conservation Authorities Act. The changes have been made to narrow the scope of Conservation Authorities to focus on regulating natural hazards, removing any requirement to comment on or provide support to municipal partners on natural heritage matters that do not involve regulated lands. A permit must be obtained from TRCA prior to development or site alteration within regulated areas.
	TRCA’s Humber River Watershed Plan (2008b)	Guideline	Describes current conditions of the Humber River Watershed and provides strategies to protect and enhance.	Chapter 5 of this plan provides management strategies for the environment (including water, air quality and climate change, the aquatic system and the terrestrial system).

3. Existing Conditions

Existing biophysical conditions for the Caledon Station Secondary Plan Area were characterized in the Final CEISMP, and included:

- Bedrock and Surficial Geology;
- Topography, Slopes and Soils;
- Groundwater Resources;
- Surface Water Resources;
- Terrestrial Resources; and
- Aquatic Resources.

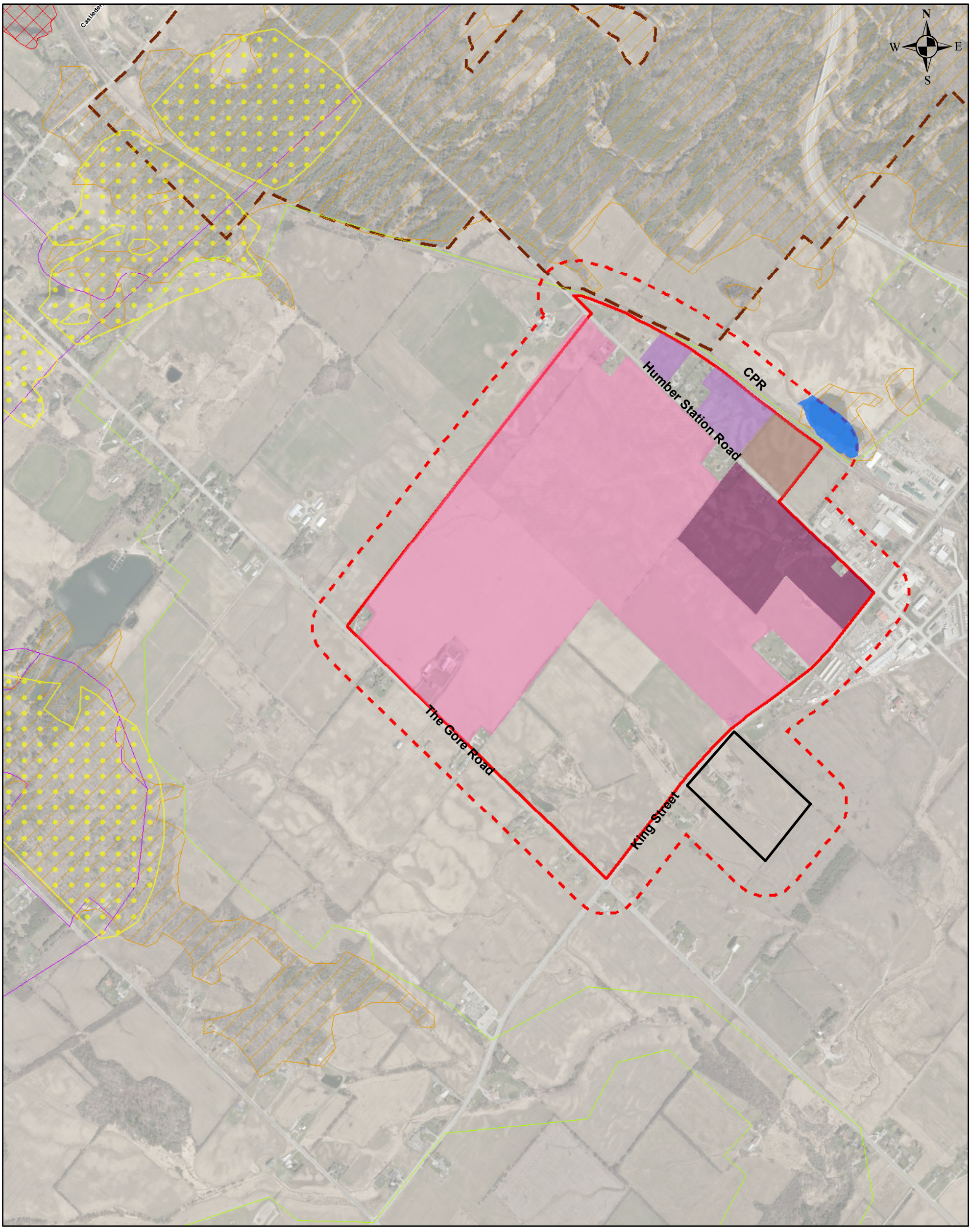
3.1 Background

Background information related to natural heritage resources in the Caledon Station Secondary Plan Area that were obtained and reviewed as part of the Final CEISMP included the following:

- Ministry of Natural Resources' Natural Heritage Information Centre (NHIC) rare species database (accessed August 2020);
- Ontario Breeding Bird Atlas (Cadman *et al*. 2007);
- Ontario Herpetofauna Summary Atlas (Ontario Nature 2020);
- Ontario Butterfly Atlas (MacNaughton *et al.* 2016);
- Fisheries and Oceans Canada Aquatic Species at Risk Distribution Mapping (DFO 2020);
- Historical and current aerial photography (1956 – 2018); and
- 2023 drone inspection of Headwater Drainage Feature (HDF) WHT6.

In addition to the above, the Final CEISMP also relied on the following technical studies and background information which included the following:

- Bolton Residential Expansion Study: Background Environmental Study in Support of a Regional Official Plan Amendment, Dougan & Associates, Aquafor Beech Limited, Cam Portt & Associates, BluePlan Engineering Consultants Ltd. and Meridian Planning (October 2014b);
- Bolton Residential Expansion Study – Phase 3: Technical Memorandum- Development of a Preliminary Natural Heritage System, Dougan & Associates, Aquafor Beech Limited, Cam Portt & Associates, BluePlan Engineering Consultants Ltd. and Meridian Planning (Revised June 16, 2014a);
- Headwater Drainage Features Assessment Aquafor Beech Limited (June 16, 2013);
- Bolton Residential Expansion Study: Phase 2 Technical Memorandum – Natural Heritage, Dougan & Associates (June 19, 2013);
- Regional Natural Heritage Study (NHS) Integration Project (Credit Valley Conservation; CVC 2019);
- Scoped Subwatershed Study, Part A: Existing Conditions and Characterization (Final Report) – Peel Settlement Area Boundary Expansion. Wood Environment & Infrastructure Solutions – January 2022;



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- ARGO HUMBER STATION DRAFT PLAN AREA
- HUMBERKING WEST DRAFT PLAN AREA
- HUMBERKING EAST DRAFT PLAN AREA
- GREENBELT
- OAK RIDGES MORAINE
- REGION OF PEEL GREENLANDS SYSTEM
- CALEDON ENVIRONMENTAL POLICY AREA
- PROVINCIALLY SIGNIFICANT WETLANDS
- ANSI, LIFE SCIENCES
- BOLTON RESOURCE MANAGEMENT TRACT

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FIGURE 2

DESIGNATED ENVIRONMENTAL AREAS

June 2024 Scale 1:12,500

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- Scoped Subwatershed Study, Part B: Detailed Studies and Impact Assessment (Final Report) – Peel Settlement Area Boundary Expansion. Wood Environment & Infrastructure Solutions – January 2022;
- Scoped Subwatershed Study, Part C: Implementation Plan (Final Report) – Peel Settlement Area Boundary Expansion. Wood Environment & Infrastructure Solutions – January 2022;
- Preliminary Hydrogeological Investigation. DS Consultants Ltd. – May 2023; and
- Final Functional Servicing Report (FSR). Urbantech Consulting - June 2023.

3.1.1 CVC (2019) Regional NHS Integration Project

In 2018, the Region initiated the Regional NHS Integration Project, requiring Credit Valley Conservation (CVC) and Toronto and Region Conservation Authority (TRCA), in addition to other constituent Conservation Authorities (CAs), to integrate their NHS mapping for the Region. CVC, as the project manager, worked collaboratively with member municipalities and CAs to produce CA NHS mapping within the Region of Peel and the accompanying Regional NHS Integration Project methodology report.

In the first phase of the project, a Town of Caledon CA NHS was created. The Caledon CA NHS map was then further refined for the purposes of the Greenlands System Regional Official Plan Amendment (ROPA) discussion paper to incorporate areas where the NHS boundaries had been locally refined to reflect recent planning approvals. In Phase 2 of the project, a Peel CA NHS was developed by integrating the Town of Caledon CA NHS with CA NHS mapping for the Cities of Brampton and Mississauga. This mapping was recommended for consideration and use by the Region and Town of Caledon to inform their Official Plan updates and watershed planning, as appropriate. As the CA NHS is a landscape-level tool, it was anticipated that further refinement of the CA NHS mapping may be needed at local- and site-level scales.

All lands within the Peel CA NHS were classified as “natural cover” or “potential enhancement areas”. The Town of Caledon CA NHS mapping identified potential enhancement areas based on watershed-scale targets for natural cover quantity and quality, noting that current levels of natural cover were insufficient to protect biodiversity and ecological function of natural systems. The report provided the following definitions for natural cover and potential enhancement areas:

> *NATURAL COVER - is land occupied by naturally or culturally occurring vegetation. These areas can be dominated by native and non-native species. Natural cover broadly includes woodlands, wetlands, aquatic habitat (watercourses and waterbodies), successional habitat including meadows, as well as other natural cover (e.g., sand dunes, rock barrens, cliffs).*
>
> *POTENTIAL ENHANCEMENT AREAS - are non-natural and naturalizing lands that can be restored or managed to improve ecosystem function within the system. For the CA NHS presented in this report, the term ‘potential enhancement areas’ is broadly used to describe TRCA’s potential natural cover, as well as lands within the CVC, LSRCA, NVCA and CH NHSs that are urban, agriculture, open space, cultural meadow or cultural thicket (referred to as ‘enhancement areas’ in CVC’s NHS).*

The report identified potential enhancement areas in the Caledon CA NHS. The extent of these areas was intended to provide well-distributed natural cover across the watershed and meet science-based watershed-scale targets for natural cover quantity and quality. The following considerations regarding potential enhancement areas were specifically noted in the report:

- Buffers – in the Caledon CA NHS buffer areas were mapped as either potential enhancement area or natural cover, depending on the land use within the buffer;
- Valleylands – valleyland areas without existing natural cover in the Caledon CA NHS were considered potential enhancement areas; and
- Tableland Potential Enhancement Areas – the Caledon CA NHS included tableland potential enhancement areas.

These potential enhancement areas, which included areas of agriculture, open space and successional land cover, were identified in the report as opportunities to maintain and enhance the functionality and connectedness of the CA NHS. They also included areas of urban land use that provided a degree of ecological function due to their placement in the system (e.g., infiltration, habitat, linkage functions on lake shorelines or in valleylands). **Image 1** illustrates features mapped as watercourses and areas of existing natural cover (green) in the Town of Caledon CA NHS mapping (Figure A3). The report did not identify any potential enhancement areas within the Caledon Station Secondary Plan Area.

Image 1. Town of Caledon CA NHS mapping of the Caledon Station Secondary Plan Area (CVC 2019)

3.1.2 Wood (2022) SABE Scoped SWS

Peel Region retained Wood Environment and Infrastructure Solutions (Wood 2022) to complete an Environmental Screening and Scoped SWS to provide water resources and natural heritage input in support of the SABE study. Results of the Scoped SWS were used to develop a ROPA for the SABE. In addition to policy direction provided by federal, provincial and local level guidance documents, the Scoped SWS referenced the CVC (2019) Regional NHS Integration Project report to inform and support the identification of a preliminary NHS for the SWS Functional Study Area (FSA).

Goals of the Scoped SWS included:

- *Develop a system (NHS) that balances policy direction, emerging science and natural heritage planning best practices.*
- *Establish a robust, connected and ecologically resilient system (NHS) for the long-term benefit of environmental and public health, well-being and safety.*
- *Provide opportunities and direction for the enhancement of the NHS to establish a sustainable system in a changing landscape matrix and that supports climate change resilience.*

While not specifically addressed through the study, opportunities to align land use planning (e.g., open space, parks, trails) with NHS planning to provide outdoor appreciation and recreational opportunities and promote healthy communities was noted as an additional goal.

Informed by a Net Gain Mitigation Hierarchy, the Scoped SWS recommended a Preliminary NHS comprised of the following components:

1. Key Features – comprised of all Core Areas as defined in the Regional Official Plan (ROP) and a sub-section of ROP Natural Areas and Corridors (NAC) and Potential Natural Areas and Corridors (PNAC) features;
2. Supporting Features – as defined through criteria identified in the Scoped SWS;
3. Linkages – to provide connectivity within and external to the FSA;
4. Enhancements – opportunities to strengthen the NHS and support net benefit targets; and
5. Other Features – small and/or isolated features that meet criteria as defined in the Scoped SWS.

The report notes that opportunities to align land use planning with the proposed NHS to provide outdoor appreciation and recreational opportunities, and achieve a net benefit to the system, should also be considered. In accordance with the Scoped SWS Mitigation Hierarchy objectives, these areas include parks.

3.1.2.1 Enhancements

The following enhancement categories were identified through the Scoped SWS:

- Defined Enhancements:
  - Shape, Size Contiguity (In-System);
  - Shape, Size Contiguity (Out of System);
  - Floodplain; and
  - Linkage (Minimum Vegetated Width);
- Undefined Enhancement Areas:
  - Linkage (Permeable Landscape Zones);
  - Provincial NHS; and
  - Unmapped Enhancements.

The Scoped SWS (Part C) report states that general opportunities for Defined Enhancements have been identified but that, through subsequent stages of work:

> *Defined enhancement areas will be further identified or refined through subsequent study.*

NHS enhancement targets identified in the Scoped SWS were as follows:

- Identify distributed enhancement opportunities across the NHS to support the development of a robust and sustainable system; and
- Increase natural cover by 30%.

For purposes of these targets, 'natural cover' was defined as all existing natural cover within the FSA using the following mapped Ecological Land Classification (ELC) vegetation community series:

- Aquatic;
- Open/Early Successional (including Hedgerow, Cultural Meadow and Cultural Thicket);
- Wetland;
- Forest; and
- Woodland (including Cultural Woodland and Plantation).

The preliminary NHS, including Features, Linkages and recommended Enhancement Areas as they pertain to the Caledon Station Secondary Plan Area, was illustrated in Figure DA2-11c of the Scoped SWS. In addition to Key Features, Supporting Features and Other Features, a preliminary floodplain enhancement opportunity was identified along the eastern drainage feature. The report did not identify any Preliminary Landscape Linkage enhancement opportunities within the Secondary Plan Area.

3.1.2.2 Buffers

In contrast with the CVC (2019) Regional NHS Integration Project report, buffer areas were not identified as potential enhancement areas in the Wood (2022) Scoped SWS. Instead, these areas are identified as mitigation measures to address potential impacts associated with land use change. Specifically, the Scoped SWS Part B report states:

> *… while not considered as 'enhancement areas' (due to their primary function being to mitigate impacts), buffers established as self-sustaining natural vegetation will add natural cover to the landscape and the NHS, providing some associated benefits and supports to the system…. Buffers are to be informed by both existing conditions and sensitivities, and the anticipated impacts that a buffer is being used to mitigate. Where possible, opportunities to address impacts (avoid, minimize) 'at-source' through siting and design for land uses should be considered as part of a layered approach to mitigation.*

The Scoped SWS (Part C) report provides the following direction on the application of buffers and buffer width(s):

> *Outside of the [Greenbelt] Plan area(s), buffers shall be applied as part of a mitigation strategy for addressing impacts associated with development. Generally, this will include application to wetlands, woodlands, valleylands, watercourses and fish habitat and*

specialized habitats (e.g., sand barrens), and may include application to successional habitats.

Buffer width(s) should be informed by sensitivity and significance of the natural heritage feature and its contribution to the long-term ecological functions of the FSA NHS, the type of [site-specific] development and its potential impacts.

Guidance for the identification of buffers for areas outside of the Greenbelt Plan NHS should be taken from the Living City Policies (TRCA 2014), Regional and Local Municipal policies (as applicable), best practices and current literature, as appropriate. Buffers for features of the NHS will be established through detailed studies (e.g., detailed Subwatershed Study, Secondary Plan, etc.).

The Scoped SWS (Part C) report identified the following considerations in determining buffer widths:

- Feature Hydrology – consideration of water budget and water quality, which can have direct and indirect influences of natural heritage features and the species they support;
- Habitat Requirements – consideration of species with specialist habitat requirements, which can be more sensitive to changes in habitat conditions;
- Species Behaviour – consideration of species behavioural traits which can influence their sensitivity or tolerance to human activities; and
- Fragmentation – landscape fragmentation can increase impacts and sensitivity to new pressures.

3.2 Physical Resources

This section characterizes the physical resources of the Caledon Station Secondary Plan Area. To understand the physical setting, topographic maps, environmental, geotechnical, and hydrogeological reports were used. Additionally, the borehole logs from site specific investigations and Water Well Records (MECP WWRs) from the MECP were used to interpret the geological and hydrogeological conditions.

3.2.1 Bedrock Geology

Available published mapping indicates that bedrock in the area is predominantly comprised of shales and minor limestone part of the Queenston Formation (MNDM Map 2544 Bedrock Geology of Ontario). As part of the borehole drilling program for the Subject Lands, bedrock was not encountered to 11.3 meters below ground surface (mbgs) (Elev. 250.4 meters above sea level [masl]), which was the maximum depth of investigation. Based on the MECP water well records, there are ten (10) water well records which were reportedly completed into bedrock. The thickness of the overburden generally ranged from 29.9 mbgs to 76.2 mbgs, based on nine (9) well records (MECP WWR No. 4908193, 1908194, 1907399, 1906470, 4905615, 7275497, 4903854, 7267796 and 4904216). There is one (1) well record (MECP WWR No. 4905839) located approximately 490 m northeast of the Subject Lands with a reported depth to bedrock of 11.6 mbgs. This well record is located within the valley lands of the Humber River, and for this reason the ground surface elevation of the well is likely significantly lower than that of the Secondary Plan Area lands.

3.2.2 Physiography and Surficial Geology

Much of the land surface topography and geology in southern Ontario was formed during the most recent glaciation period, known as the Wisconsin Glaciation, which was accompanied by various meltwater lakes and channels. The Pleistocene deposits present in the Caledon and Brampton area were associated with the advancing and retreating of this ice sheet. This glaciation had begun 27,000 years ago and reached its furthest point of advancement approximately 20,000 years ago. During this time, the entirety of southern Ontario was covered by glacial ice until 14,000 years ago when the glacial ice began to retreat.

The Caledon Station Secondary Plan Area is located within a physiographic region of southern Ontario known as the South Slope and within a physiographic landform feature known as the Drumlinized Till Plain (Chapman and Putnam 1984). Topogrpahy is characterized by gently rolling slopes, with elevations ranging from approximately 281 masl at the highest point in the northwest corner, to 262 masl in the southwest corner.

The South Slope physiographic region lies between the Oak Ridges Moraine in the north and the Peel Plain in the south. The South Slope consists of low-lying till plains, with undulating to gently rolling terrain and incised valleys around larger creeks and rivers. The South Slope has a gently, but steady slope to the southeast towards Lake Ontario, which results in overall good drainage. Surficial geology mapping made available by the Ontario Geological Survey (2010) indicates that surficial deposits consist entirely of Halton till. Halton till is characterized by tight soils with relatively low resulting soil percolation rates that promote surface water runoff following precipitation events.

Soil conditions within the north half of the Secondary Plan Area were first investigated in 2014 by SPL Consultants Ltd. (SPL). The investigations included completion of twenty-one (21) boreholes (refer to Figure 1 within DS Consultants Ltd. 2021 Geotechnical Investigation). A summary of the investigation findings is provided below:

- Based on all twenty-one (21) boreholes, SPL (2014) encountered a topsoil/organic layer with a thickness ranging from 200 to 300 mm throughout the site. The topsoil is underlain with a shallow layer of disturbed/reworked till extending 0.7 to 1.4 mbgs. Localised fill was encountered in BH14-07 on the Henry property, extending 2.1 mbgs (meters below ground surface);
- SPL (2014) encountered a surficial layer of clayey silt till to silty clay till in all but one borehole throughout the two investigations. This layer extended to depths ranging from 1.1 to 4.0 mbgs (former Henry property) and 7.1 to 11.1 mbgs (former Cook property). The consistency of this material was stiff to hard with N values ranging from 11 to 60 and moisture contents ranging from 9% to 19%;
- Sandy silt till was encountered in boreholes BH14-03, BH14-05, BH14-09, BH14-11, BH14-03, BH14-09, and BH14-11. This layer extended 4.0 to 9.1 mbgs throughout and reached the limit of exploration at some locations. N values ranged from 23 to greater than 100 blows per 300mm penetration and moisture contents ranged from 6% to 11%; and
- Native cohesionless sandy silt to silty sand was encountered in all boreholes but BH14-05 and BH14-11 (former Henry property) and extended to the depth of termination in all locations. Only BH14-04 and BH14-10 contained this material on the former Cook property, and it extended to depth of termination in BH14-04 but only to 2.1 mbgs in BH14-10. N values ranged from 3 to greater than 100 blows per 300mm penetration indicating a very loose to very dense state. Natural water contents ranged from 14% to 25%.

As part of current investigations, on-site subsurface soils were interpreted from the boreholes/monitoring wells (BHs/MWs) drilled by DS. The locations of the BHs/MWs are shown in Figure 4A within the Preliminary Hydrogeological Investigation (DS Consultants Ltd. 2023) and detailed subsurface conditions are presented on the borehole logs. The stratigraphic conditions encountered in the boreholes are further summarized below.

3.2.2.1 Topsoil/Fill/Disturbed Native

At all borehole locations but BH20-04, topsoil was encountered at the surface. Topsoil depths vary from 200 mm to 550 mm with an average thickness of 340 mm. It should be noted that the thickness of the topsoil explored at the borehole locations may not be representative of the Study Area and should not be relied on to calculate the amount of topsoil at the site.

Fill or weathered/disturbed native material (possible fill in BH22-9) consisting of clayey silt to silty clay and sandy silt to silty sand soils were detected in all the boreholes below the topsoil layer and extended to approximate depths ranging from 0.4 to 2.3 m below the existing ground surface. In the area of Borehole BH20-4, the fill layer was overlain by a concrete slab, approximately 300 mm in thickness. In the area of Borehole BH22-9, the weathered/disturbed clayey silt to silty clay with inclusions of gravel, organic staining, and no readily apparent structure. Hence, this layer may be possible fill. The fill and weathered/disturbed native materials were generally brown to dark brown in color and contained trace of organics, gravel, and rootlets. SPT 'N' values measured in fill and weathered/disturbed native materials ranged from 3 to 15 blows per 300mm penetration, indicating a soft to stiff consistency or loose to compact state.

3.2.2.2 Halton Till Deposits (Clayey Silt Till to Silty Clay Till)

Glacial till deposit of clayey silt till to silty clay was encountered below the weathered/disturbed soil layer in Boreholes BH22-1 to BH22-5, BH22-8, BH22-10, BH22-11, BH22-14 to BH22-35, BH22-37 to BH22-40 and BH22-42, below a thin sandy silt to silty sand deposit in BH22-36 and BH22-41, below the fill layer in BH20-1 to BH20-3 and BH20-5 to BH20-16, and extended to approximate depths ranging from 1.5 to 12.8 m below existing ground surface, i.e., the maximum explored depth of Boreholes BH22-14, BH22-16, BH22-17, BH22-19, BH22-20, BH22-21, BH22-24, BH22-34, BH22-36, BH22-37 to BH22-41, BH20-6, BH20-7, BH20-10, BH20-14 and BH20-15. The clayey silt till was interrupted by a cohesionless silt deposit between 4.6 and 6.1 m depth in BH22-24 and by a gravelly sand deposit between 1.8 and 10.7 m depths in BH22-34. This, in general, moist to very moist clayey to silty clay till deposit was brown to grey in color and contained some sand too sandy and trace to some gravel. SPT 'N' values measured in the clayey silt to silty clay till ranged from 8 to more than 50 blows per 300 mm of penetration, indicating a stiff to hard consistency (generally very stiff to hard).

3.2.2.3 Clayey Silt

A thin layer of clayey silt with trace sand was encountered below the clayey silt/silty clay till deposit in BH22-18 and extended to a depth of 7.6 m below existing ground surface. SPT 'N' value measured in the clayey silty was in the order of 29 blows per 300 mm of penetration, indicating a very stiff consistency.

3.2.2.4 Newmarket Till (Sandy Silt Till)

A cohesionless sandy silt till deposit was encountered below the clayey silt to silty clay till deposit in Boreholes BH22-1, BH22-3, BH22-10, BH22-11, BH22-15, BH22-22, BH22-23, BH22-28, and BH22-33, below a sand deposit in BH22-2 and 22-42, and below the clayey silt layer in BH22-18. The sandy silt till deposit extended to depths ranging from 3.1 to 12.8 m below existing ground surface, i.e., the maximum depth explored in BH22-2, BH22-15, BH22-18, BH22-23, and BH22-42. SPT 'N' values measured within this sandy silt till deposit ranged from 21 to more than 50 blows per 300 mm of penetration, indicating compact to very dense relative density.

3.2.2.5 Modern Alluvium

Cohesionless deposits of silt, sandy silt to silty sand, sand, sand and gravel and sandy gravel/gravelly sand soils with inclusions of clay and varying amounts of gravel was encountered underlying or embedded in the clayey silt to silty clay till and/or sandy silt till deposits in Boreholes BH22-1, BH22-2, BH22-3, BH22-4, BH22-5, BH22-8, BH22-10, BH22-11, BH22-24, BH22-25, BH22-26, BH22-27, BH22-28, BH22-29 to BH22-35, BH22-42, BH20-1 to BH20- 3, BH20-5, BH20-8, BH20-9, BH20-11 to BH20-13 and BH20-16, below the weathered/disturbed soils in BH22-6, BH22-7, BH22-9, BH22-12, BH22-13, BH22-36 and BH22-41, and below the fill in BH20-4. These cohesionless deposits extended to depths ranging from 0.8 to 13.6 m below existing ground surface, i.e., the maximum depths explored in BH22-1, BH22-3, BH22-4, BH22-5, BH22-6, BH22-7, BH22-8, BH22-9, BH22-10, BH22-11, BH22-12, BH22-13, BH22-25 to BH22-33, BH22-35, BH20-1 to BH20- 3, BH20-5, BH20-8, BH20-9, BH20-11 to BH20-13 and BH20-16. SPT 'N' values measured within these sandy, silty deposits ranged from 7 to more than 50 blows per 300 mm of penetration, indicating loose to very dense relative density. Disturbance of the split spoon samples noted at depth in BH22-27 and BH22-30 is likely attributable to heaving of the water bearing silty sand/sand. This moist to wet deposit was brown to grey in color and layers of sand and gravel and/or sandy gravel/gravelly sand materials were encountered in the area of Borehole BH22-33 between depths of 6.1 and 9.1 m, BH22-34 between depths of 1.8 and 10.7 m, and BH20-16, between depths of 1.5 and 3.3 m and between depths of 4.5 and 6.2 m. SPT 'N' values measured within this sand and gravel and sandy gravel/gravelly sand layers ranged from 24 to 66 blows per 300mm of penetration, indicating compact to very dense relative density.

3.2.3 Groundwater Resources

As part of the Preliminary Hydrogeological Investigation, DS Consultants Ltd. (2023) completed a search of the MECP WWR database. Based on the MECP water well records search, there are seventy-three (73) water wells within 500 meters of the Secondary Plan Area. Forty-seven (47) water wells are noted as domestic supply wells and six (6) wells are noted as commercial or industrial supply wells. Eight (8) wells are noted as test holes or monitoring wells. The remaining twenty-three (12) wells are either abandoned or unknown use. Private domestic and commercial water supply wells are drilled into sandy aquifers confined under clay till. The depths of these wells range from 5.5 to 65.2 mbgs. Domestic water supply records exist for wells drilled between the dates of January 15th, 1957 to June 13th, 2016.

3.2.3.1 Hydrostratigraphy

The major regionally extensive hydrostratigraphic units in the general area are comprised of the following, from shallowest to deepest (TRCA 2007):

- Surficial Aquifer (incl. weathered Halton Till);
- Halton Till (Aquitard);
- Oak Ridges Aquifer / Mackinaw Interstadial (ORAC);
- Newmarket Till (Aquitard);
- Thorncliffe Aquifer (incl. tunnel channels);
- Sunnybrook Aquitard;
- Scarborough Aquifer; and
- Weathered Bedrock.

The regionally extensive surficial aquifer consists of a sequence of glaciolacustrine deposits which cover the underlying tills (Halton and Newmarket). These deposits generally consist of near shore sands and gravel beach deposits within the shoreline of the ancient glacial Lake Iroquois in the southern portion of the watershed and glaciolacustrine fine sands, silt and clay deposits north of the ancestral lake footprint. These also include the upper weathered portion of the underlying Halton Till deposits. Generally, these deposits form a thin veneer over the underlying deposits, however, may be several meters thick locally.

The Halton Till underlies the surficial aquifer and is predominantly comprised of sandy silt to clayey silt till interbedded with silt, clay, sand and gravel. The Halton Till becomes rich in clay content in areas where the glacial ice has overridden glaciolacustrine deposits. This unit is considered a regionally extensive aquitard layer, which generally confines the underlying Oak Ridges Aquifer.

The Oak Ridges Aquifer is a stratified sediment complex that is related to the Oak Ridges Moraine physiographic feature. This stratigraphic unit is 160 km long and varies from 5 km to 20 km in width. The Oak Ridges Aquifer overlies the Newmarket Till and older sediments. The Oak Ridges Aquifer deposits are understood to have been deposited in a glacial lake that formed between the two retreating glacial ice lobes (Lake Ontario and Simcoe) and the Niagara Escarpment in the west approximately 12,000 to 13,000 years ago. The aquifer generally comprises of glaciofluvial, transitional to glaciolacustrine subaqueous fan and delta sediments.

The Newmarket Till was deposited 18,000 to 20,000 years ago by the Laurentide ice sheet. The till predominantly comprises of calcite-cemented sandy silt to silty sand with limestone clasts and represents a dividing aquitard between the overlying shallow aquifer system (Oak Ridges) and the underlying deep aquifer systems (Thorncliffe Aquifer and the Scarborough Aquifer). Breaches in the till have been formed through meltwater erosion activity and is referred to as Tunnel Channels. The Tunnel channels are associated with subglacial floods and predominantly consist of sandy sediments under confined conditions within the Newmarket Till. These tunnel channels also breach into underlying deeper aquifer systems and can yield high volumes of groundwater.

The Thorncliffe Aquifer underlies the Newmarket Till and was deposited approximately 45,000 years ago. This aquifer comprises of glaciofluvial deposits consisting of sand and silty sand in the lower lying areas of the underlying deposits. In the southern portion, the formation consists of silt, sand and pebbly silt and clay deposits originating from glacial meltwater entering into ancient Lake Iroquois. Breaches of the tunnel channels also reach into the Thorncliffe Aquifer and are a strong source of groundwater yield.

The Sunnybrook Drift Aquitard was deposited approximately 45,000 years ago and are comprised of silt and clay material. The Sunnybrook Drift aquitard formed were deposited at the base of a glacially dammed lake, which was reportedly 100 m deeper than modern day Lake Ontario (TRCA 2009). The Sunnybrook Drift acts as an aquitard divide between the upper Thorncliffe Aquifer and the underlying Scarborough Aquifer.

The Scarborough Aquifer is the deepest overburden hydrostratigraphic unit in the Humber River watershed and marks the commencement of the Wisconsin glaciation approximately 70,000 to 90,000 years ago. The aquifer deposits comprise organic rich sand deposits overlying silts and clays. The deposits originated from a fluvial-deltaic system, which was fed by braided meltwater rivers draining from an ice sheet. Weathered bedrock underlies the Scarborough Aquifer system.

The direction of groundwater flow in the shallow and deep flow systems generally follows the regional topography from the Oak Ridges Moraine in the north towards Lake Ontario in the south. The influence of the surface topography on the direction of groundwater flow is greatest in the shallower flow systems with wanning influence towards the deeper flow systems. There are deviations in the regional groundwater flow patterns towards local streams and/or watercourses in the watershed. The predicts there are inter-watershed flows into the Humber River in the East Caledon area from the Credit River into the Oak Ridges Aquifer and the Thorncliffe Aquifer.

3.2.3.2 Groundwater Levels

DS Consultants Ltd. (2023) implemented a manual groundwater monitoring program starting in August 2020 and continuing on a monthly basis to assess long-term groundwater fluctuations. The Preliminary Hydrogeological Investigation (DS Consultants Ltd. 2023) presents a summary of the measured groundwater level elevations in all monitoring wells and piezometers for August 2020 through March 2023. At this time, groundwater levels were found to range between 255.2 masl (BH20-7) and 276.40 masl (BH22-1). Based on measured water levels, the localized groundwater flow was interpreted to be in a general southeasterly direction.

Continuous water level monitoring was conducted on four monitoring wells at BH20-1, BH20-5, BH20-7, BH20-9, BH20-11, BH20-16, BH22-13, BH22-22, BH22-29, BH22-36 and BH22-42. Continuous monitoring was completed using a fixed interval pressure and temperature data recording device which was corrected for atmospheric pressure. Generally, water levels declined during the late summer to the fall monitoring period, increasing throughout the winter, peaking in mid spring. Groundwater levels in MWs increased following precipitation events. Season variation ranged from 0.43 m (BH20-3) to 3.7 m (BH20-11) during the monitoring period.

3.2.3.3 Horizontal and Vertical Gradients

The average horizontal gradient is about 0.009 metre/metre from west to east across the north half of the site. From north to south the average horizontal groundwater gradient is around 0.001 m/m in the north half to 0.008 in the south half of the Secondary Plan Area. The vertical hydraulic gradient is generally downward, except for an upward gradient observed in nested piezometers W8-PZS and W8-PZD. The vertical hydraulic gradient at Wetland 8 is estimated during the current monitoring period to be 0.036 m/m.

3.2.3.4 Recharge/Discharge Areas

The surface water and groundwater monitoring program included a site visit on an every 1-month basis to retrieve the water level data from the Levelogger™ and to collect manual readings within all surface stations and monitoring wells. Observations for any evidence of groundwater seepage and/or springs were obtained during bimonthly monitoring events. Based on the monitoring of groundwater levels in the nested piezometers screened within the shallow soils, shallow vertical hydraulic gradient was generally observed upward at Wetlands 1 through 3, and Wetland 8, and a downward vertical hydraulic gradient was generally observed at Wetlands 4 through 7. The groundwater elevations in the monitoring wells are noted to be lower than the levels measured in the piezometers. On this basis, based on the minimum outflow from most wetlands and observed water levels, surface water was a likely source of shallow groundwater recharge during the monitoring period.

Upward groundwater gradients were noted at the location of Wetlands 1 through 3 and Wetland 8. Groundwater levels in Monitoring Wells BH20-6, BH20-12, BH22-17, BH22-32 and BH22-39 indicated near surface potentiometric levels and had the potential for groundwater seepage during periods of higher groundwater table (e.g., during the spring).

3.2.3.5 Hydraulic Conductivity

Single Well Response Tests (SWRTs) were completed in nine (9) select monitoring wells on August 6th and 7th, 2020, and in eighteen (18) monitoring wells between November 1st and November 3rd, 2022 to estimate hydraulic conductivity (K) for the representative geological units in which the wells are screened. SWRTs were completed by performing a rising head test (slug test) using a bailer to extract a known volume of water from the well. A Levelogger™ was placed at the bottom of the wells to monitor recovery. Hydraulic conductivity values were calculated using the Bouwer and Rice method. A summary of the hydraulic conductivity testing results is provided in **Table 2** below.

Table 2. Summary of Hydraulic Conductivity (K) Test Results

Well ID	Screen Interval (masl)	Screened Formation	K- Value(m/s)
BH20-1	272.2 m to 273.7	Silt	7.3×10^{-7}
BH20-5	264.0 m to 275.5	Silty sand	5.3×10^{-7}
BH20-6	262.5 m to 264.0	Clayey silt till, sand seams	1.4×10^{-7}
BH20-9	266.5 m to 268.0	Silty clay till, some sand	3.2×10^{-6}
BH20-11	261.0 m to 262.5	Silt, some sand	5.2×10^{-8}
BH20-12	257.3 m to 258.8	Silt	7.3×10^{-7}
BH20-14	257.1 m to 258.6	Silty clay till, some sand	6.0×10^{-7}
BH20-15	255.0 m to 256.5	Clayey silt till, some sand	7.4×10^{-9}
BH20-16	251.8 m to 259.4	Silty sand, some clay	1.5×10^{-8}
BH22-1	271.4 m to 274.5	Silty Clay to Clayey Silt Till & Sandy Silt	3.0×10^{-6}
BH22-3	268.6 m to 271.6	Sandy Silt Till	2.8×10^{-7}
BH22-5	272.2 m to 275.2	Sandy Silt & Silt	4.3×10^{-8}
BH22-10	260.8 m to 263.8	Sandy Silt to Silty Sand	3.0×10^{-7}
BH22-13	264.1 m to 267.1 m	Sandy Silt	1.6×10^{-6}

Well ID	Screen Interval (masl)	Screened Formation	K- Value(m/s)
BH22-14	259.4 m to 262.4 m	Silty Clay to Clayey Silt Till	2.9×10^{-10}
BH22-17	261.5 m to 264.5 m	Silty Clay to Clayey Silt Till	1.2×10^{-8}
BH22-20	258.8 m to 261.8 m	Silty Clay to Clayey Silt Till	1.0×10^{-8}
BH22-22	260.2 m to 263.2 m	Silty Clay to Clayey Silt Till	1.8×10^{-8}
BH22-25	260.3 m to 263.3 m	Silty Sand	3.6×10^{-7}
BH22-27	259.0 m to 262.0 m	Sandy Silt	1.9×10^{-6}
BH22-28	260.3 m to 263.3 m	Sandy Silt	3.4×10^{-6}
BH22-29	259.8 m to 262.8 m	Sand	6.7×10^{-6}
BH22-32	253.1 m to 256.1 m	Sandy Silt	5.4×10^{-6}
BH22-33	257.5 m to 260.5 m	Sandy Gravel & Silty Sand to Sandy Silt	4.6×10^{-6}
BH22-36	257.8 m to 260.8 m	Native, Sandy Silt and Silty Clay Till	5.3×10^{-9}
BH22-40	256.4 m to 259.4 m	Silty Clay Till	1.1×10^{-9}
BH22-42	259.1 m to 262.1 m	Silty Clay Till & Sand	2.5×10^{-9}

3.2.3.6 Groundwater Chemistry

The Provincial Groundwater Quality Monitoring Network (PGMN) was approved in April 2000 by the Ontario Cabinet in response to the observed low water conditions noted during 1999 in many parts of southern Ontario. The PGMN is a partnership program that comprise of all 36 Conservation Authorities and 10 municipalities in the province of Ontario. The mandate of the PGMN is to collect and manage ambient/baseline groundwater levels and quality data from major aquifers in the province to ensure the groundwater resources are not being impacted from activities and development on land and/or from exploitation of water resources. The PGMN consists of over 400 groundwater monitoring wells across Ontario, of which there are currently twenty-one (21) wells in the Humber River Watershed (TRCA 2013).

The initial round of groundwater sampling in the PGMN wells was undertaken by the MECP and the samples were analyzed against the Provincial Water Quality Objectives (PWQO) for a wide variety of parameters including anions, cations, heavy metals, nutrients, bacteria, chlorinated solvents, volatile organic compounds (VOCs), herbicides and pesticides (TRCA 2008a). The results of the analytical testing completed by the MECP indicated that the groundwater quality met the permissible limit of all analyzed parameters against their respective PWQO criteria.

The subsequent round of groundwater sampling was conducted by the TRCA in 2004 and 2005 and the monitoring program included a reduction in the original list of analyzed parameters by the MECP. The sampling of the PGMN monitoring wells by the TRCA included analysis of groundwater quality for anions, cations and heavy metals. The results of the sampling by the TRCA were compared against the Ontario Drinking Water Quality Objectives (ODWQS) and the PWQO, where applicable. The PGMN monitoring wells located in the Bolton and Caledon East area which were sampled as part of this monitoring program are reportedly screened within the Thorncliffe (Intermediate) Aquifer. The results of

the analytical testing completed by the TRCA in the watershed indicated that the groundwater quality generally met the permissible limit of all analyzed parameters against the most stringent criteria between the ODWQS and PWQO. The TRCA (2008a) reported exceedance of some analyzed parameters against the ODWQS in the Bolton and Caledon East PGMN wells during the Fall 2004 sampling period, as per the following:

- There was an exceedance in the Bolton PGMN well (W327) for total manganese;
- There was an exceedance in the Caledon East PGMN well (W330) for total dissolved solids (TDS); and
- There was an exceedance in both the Bolton (W327) and Caledon East (W330) PGMN wells for iron and total hardness.

The exceedance for iron, total manganese, and total hardness are reportedly not unusual in groundwater and are generally naturally occurring.

As per the TRCA (2013), the overall quality of groundwater in the watersheds of the TRCA is classified as “Good” with the optimal quality of groundwater to be found in the Thorncliffe (Intermediate) Aquifer on the Oak Ridges Moraine. Most wells in the watershed indicate concentrations for nitrates and nitrites are within acceptable levels and display minimal impacts from agricultural practices or leaky septic systems. There are exceedances in the chloride levels above the Canadian drinking water standards in several monitoring wells located in the urbanized areas of the watershed. These exceedances are likely as a result of road salt application for de-icing purposes during the winter period and/or background concentrations in the deep aquifers overlying the shale bedrock which contain naturally elevated concentrations of chloride (TRCA 2013).

Three (3) nonfiltered groundwater samples were collected from select monitoring well locations (BH22-13, BH22-17 and BH22-32), on November 3rd, 2023, to assess the groundwater quality. The collected samples were submitted to SGS Laboratory in Lakefield, Ontario. SGS Laboratory is a Canadian Association of Laboratory Accreditation Inc. (CALA) and Canadian Standard Association (CSA) certified. Groundwater quality results were compared to parameters listed in the Provincial Water Quality Objectives (PWQO) for surface water to assess the suitability of discharge to nearby surface water features. **Table 3** presents a summary of exceeded parameters, and the certificate of analysis is provided in Appendix E within the Hydrogeological Investigation (DS Consultants Ltd. 2023**)**.

Table 3. Parameters in Groundwater Exceeding MECP Guidelines

Parameter Exceeded	Guideline	Unit	Borehole #	Guideline limit	Concentration
Cobalt	MECP O.Reg. 153/04	mg/L	22-17	**0.0009**	**0.00106**
Copper	MECP O.Reg. 153/04	mg/L	22-17	**0.0005**	**0.0025**
	MECP O.Reg. 153/04	mg/L	22-32	**0.0005**	**0.0011**
Phosphorus	MECP O.Reg. 153/04	mg/L	22-13	**0.01**	**0.011**
	MECP O.Reg. 153/04	mg/L	22-17	**0.01**	**0.098**
	MECP O.Reg. 153/04	mg/L	22-32	**0.01**	**0.073**
4AAP- Phenolics	MECP O.Reg. 153/04	mg/L	22-13	**0.001**	**0.003**
	MECP O.Reg. 153/04	mg/L	22-17	**0.001**	**0.002**
	MECP O.Reg. 153/04	mg/L	22-32	**0.001**	**<0.002**

Based on the results of the analytical testing, the quality of groundwater from the monitoring wells met the permissible limit of all analyzed parameters with the exception of Total Cobalt, Total Copper, Total Phosphorus and 4AAP Phenolics which exceeded its respective PWQO criteria.

3.2.4 Surface Water Resources

3.2.4.1 Subwatershed Catchment Areas

The Caledon Secondary Plan Area is situated at the approximate drainage divide between the headwaters of the West Humber River and Main Humber River, with the majority draining to the West Humber River watershed and the northeast portion draining to the Main Humber River watershed. **Figure 3** illustrates the drainage features relevant to the Caledon Station Secondary Plan Area and Final CEISMP Study Area.

Under existing conditions, land use is predominantly agricultural, which has led to modification of the headwater features. In general, the hydrology of these headwater features was characterized as ephemeral or intermittent. **Table 4** identifies the existing drainage outlets and respective contributing drainage areas.

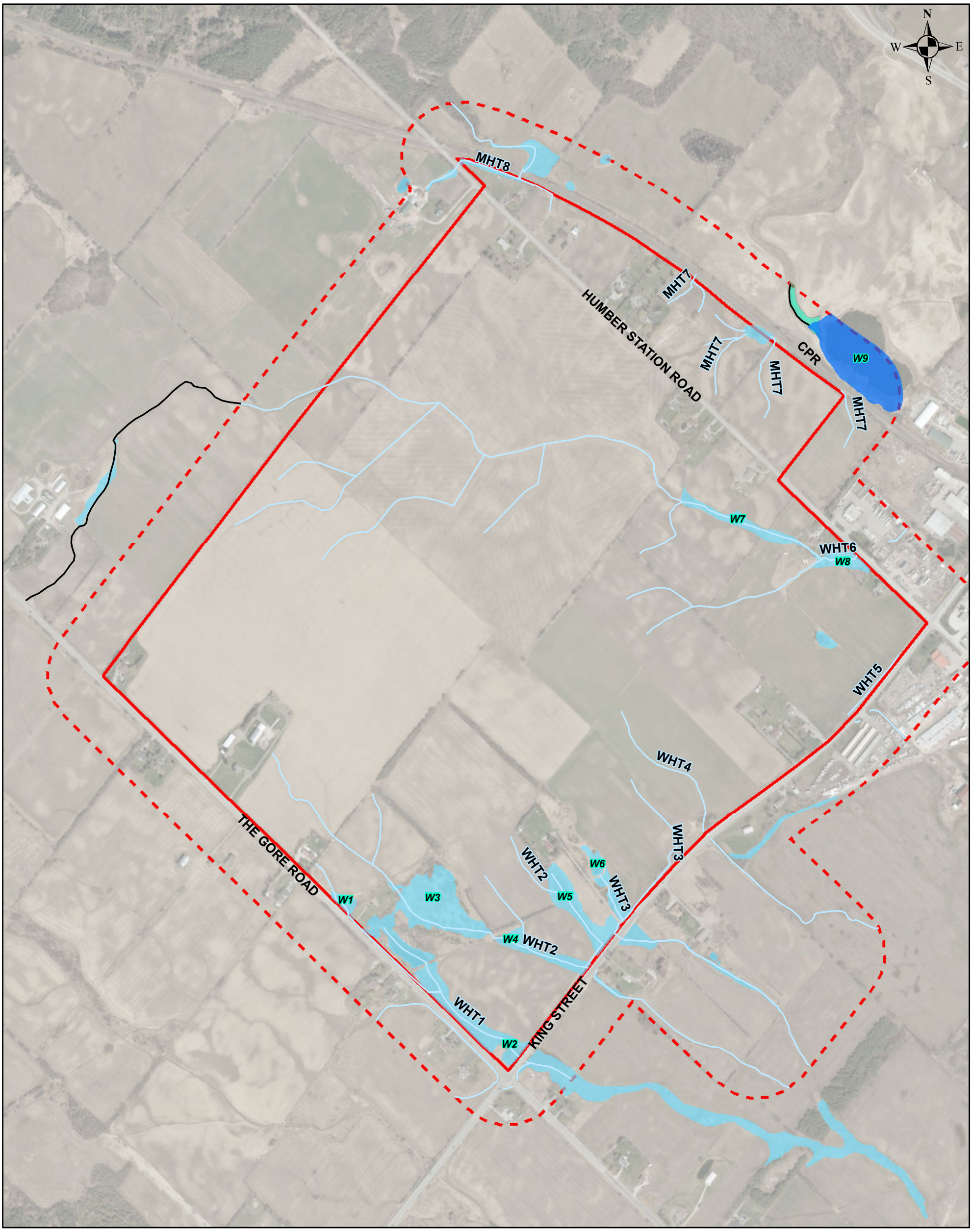
Under proposed conditions, southeasterly drainage west of Humber Station Road will be consolidated to a single outlet at Humber Station Road (Node 5). The consolidation to Node 5 includes drainage contributions from private property. Consolidation is not proposed for the three (3) existing King Street crossings (Nodes 1, 2 and 3). The existing and proposed conditions to each culvert were evaluated in the Final FSR (Urbantech Consulting 2023).

Table 4. Existing Study Area Drainage Outlets

Outlet	Existing Drainage Area [ha]
West Humber River Outlet / Flow Node	
Node E4, 3.50m Wide Concrete Box Culvert at The Gore Road	571.36
Total West Humber River Drainage Area at The Gore Road Crossing	**571.36**
Main Humber River Outlets	
Node 6, 800mm Concrete Box Culvert Across CPKC	18.80
Node 7, Culvert Across CPKC	2.78
Node 8, 700mm Concrete Box Culvert Across CPKC	19.00
Total Main Humber Drainage Area Within MVSP	**40.58**

External Drainage

Approximately 79 ha of external drainage area within the West Humber River watershed drains into the Caledon Station Secondary Plan Area (Urbantech Consulting 2024).



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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PROJECT No. 214476

FIGURE 3

HEADWATER FEATURES

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3.2.4.2 Headwater Drainage Features

Headwater drainage features (HDFs) in the Secondary Plan Area were assessed by Aquafor Beech Limited in 2013 in support of the Town of Caledon's Bolton Residential Expansion Study to evaluate their relative importance and to determine how each HDF is to be managed in the future. The Aquafor Beech Limited (2013) Headwater Drainage Feature Assessment (HDFA) was completed in accordance with TRCA's 2009 Interim Guidelines.

TRCA subsequently adopted new guidelines (2014b) for undertaking HDFA's. The TRCA *Evaluation, Classification, and Management of Headwater Drainage Features Guideline (*TRCA 2014b*)* guideline defines headwaters as follows:

> *Non-permanently flowing drainage features that may not have defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales and connected headwater wetlands*, but do not include rills or furrows. *wetlands that are connected downstream through surface flow are considered to be headwater drainage features for the purposes of this guideline.*

Consideration of HDFs through the land use planning process is relevant because alteration or removal of these features through land development can affect ecohydrological functions that are important for sustaining natural features and ecosystems.

In 2020, Beacon completed a field review all HDFs relevant to the Secondary Plan Area for the purposes of validating the mapping and findings prepared by Aquafor Beech Limited in 2013. As part of the validation exercise, the following task were completed:

- The original HDFA was reviewed;
- Tile drainage mapping was reviewed to identify HDFs affected;
- All HDFs within the Secondary Plan Area were walked on June 8, 2020;
- Mapping of HDFs was updated to reflect the 2020 field conditions;
- Photographs of select HDF were taken to supplement the original HDFA (**Appendix B**);
- HDF Classifications were reviewed to confirm consistency with 2020 field observations and adjusted where necessary;
- HDF Management Recommendations were reviewed and adjusted where necessary; and
- Findings were summarized.

The validation exercise resulted in several refinements to the HDF mapping. The changes were based on field confirmation of existing tile drain networks and culvert locations. All HDFs and reaches were also assigned new names/number to be consistent with the tributary nomenclature utilized in the Final CEISMP.

In reviewing the HDF classifications, Beacon relied upon field observations as well as updated ecological community classifications, wildlife data, hydrological data, and hydrogeological data. Management recommendations for all HDF reaches is provided in **Table 5**. In general, findings of the 2020 validation exercise were consistent with the Aquafor Beech Limited (2013) HDFA, with the following exceptions:

- Field observations resulted in the addition of a number of additional HDF reaches, particularly east of Humber Station Road;
- HDF reach mapping along Tributary WHT6 was updated to reflect portions of the drainage feature that are enclosed within tile drains and upstream portions of the drainage feature that were not previously mapped by Aquafor Beech Limited;
- Results of the culvert assessment provided by Urbantech Consulting resulted in the delineation of WHT4 (previously mapped as part of WHT3);
- Management classifications associated with the downstream reaches of WHT1, WHT2, and WHT3 were revised to 'Conservation' based on the presence of wetland riparian vegetation; and
- The portion of WHT6 between The Gore Road and the Final CEISMP Study Area was assigned a reach (WHT6-O). Management classifications associated with reaches WHT6-D and WHT6-E were revised to 'Conservation' based on the presence of wetland riparian vegetation within Reach WHT6-O.

The following sections summarize assessed HDF reaches by management classification. **Figure 4** illustrates HDFA reaches and associated management recommendations.

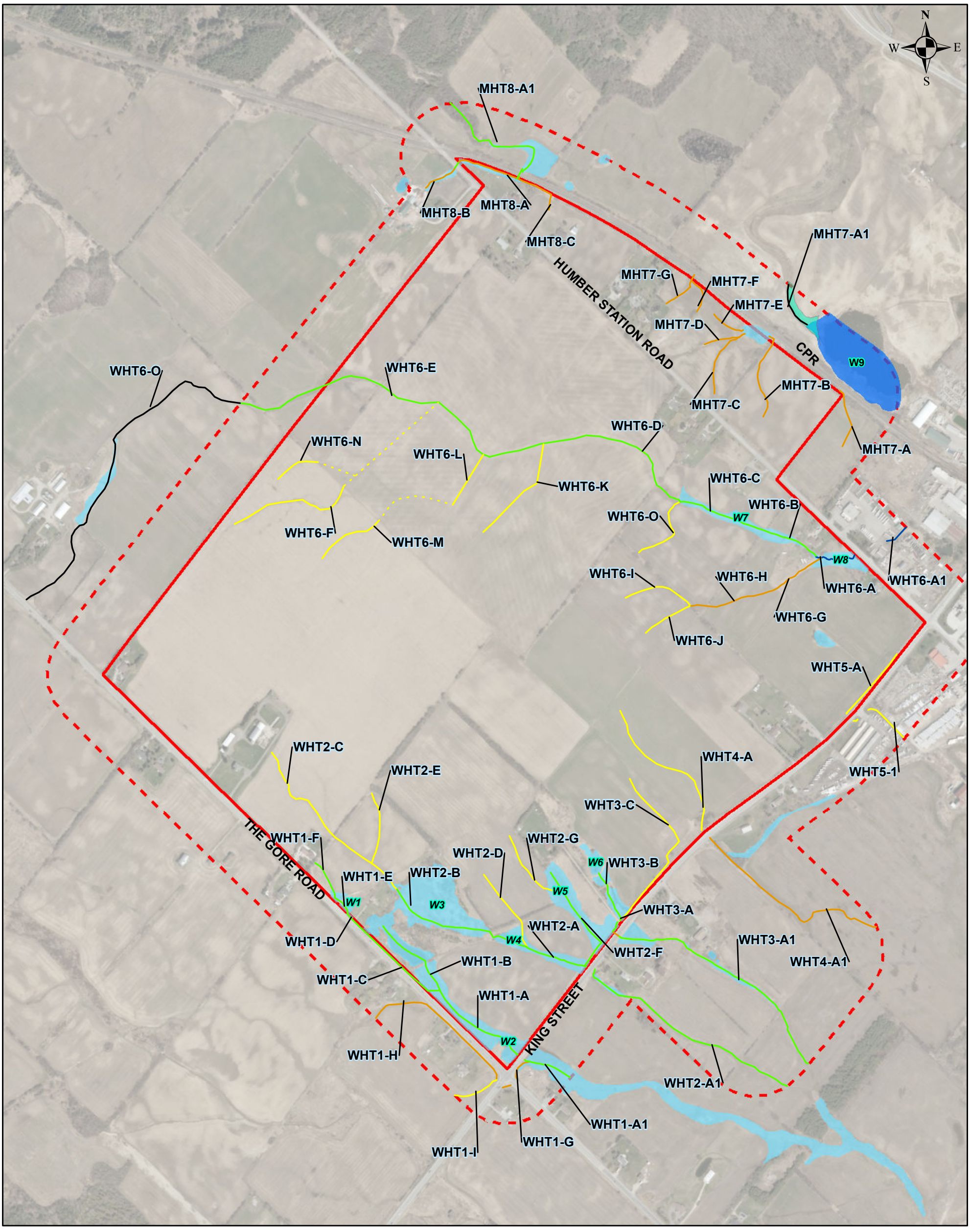
No Management Required

The majority of the HDF reaches assessed within the Subject Lands were characterized as actively farmed, poorly defined features. These reaches provide limited hydrologic functions and do not provide aquatic or terrestrial habitat. In accordance with the TRCA (2014b) Guidelines, these reaches have been identified as 'No Management Required'.

Mitigation

Within the Subject Lands, all assessed HDF reaches east of Humber Station Road (draining to the main Humber River) were classified as mitigation. These features were characterized as providing surface drainage to downstream fish habitat, with meadow vegetation within riparian communities. While amphibian calls were documented for Reach MHT8-A, this feature was characterized as a heavily modified (channelized) ditch along the rail line embankment. As the vegetation community was classified as Anthropogenic (no wetland present), terrestrial habitat for this reach was classified as 'Valued' (i.e., potential steppingstone habitat), refer to **Appendix B** (**Photograph 17**).

HDFA results for WHT6-G and WHT6-H were presumed to have been subject to historical tile drainage and provide surface drainage (valued hydrology) to downstream reaches. In accordance with the TRCA (2014b) Guidelines, these reaches have been identified as 'Mitigation".



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS

- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HEADWATER FEATURE MANAGEMENT RECOMMENDATIONS

- PROTECTION
- CONSERVATION
- MITIGATION
- NO MANAGEMENT REQUIRED
- NO MANAGEMENT REQUIRED - ENCLOSED
- UNASSESSED DRAINAGE

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FIGURE 4

HEADWATER FEATURE MANAGEMENT

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Conservation

Reaches WHT1-A through WHT1-F, WHT2-A, WHT2-B and WHT2-F, WHT3-A and WHT3-B, WHT6-B and WHT6-C all had valued or contributing hydrology with wetland riparian vegetation. Breeding amphibians were recorded in the WHT2-A meadow marsh. A management classification of "Conservation" is recommended for these reaches.

Beacon completed a desktop review of available aerial imagery and conducted roadside surveys to evaluate WHT6-O upstream of the Secondary Plan Area. The findings of this review confirmed that the feature type consists predominantly of a farm drainage swale, however an approximately 150 m segment of this feature is situated within a reed canary grass marsh community. Based on our understanding of this area, the marsh does not support habitat for fish or amphibians and has been subject to various modifications over the years. A management recommendation of 'Conservation was applied to this reach, which reflects the presence of the wetland vegetation community.

Reaches WHT6-D and WHT6-E were presumed to have been subject to historical tile drainage and provide surface drainage (valued hydrology) to downstream reaches, however, due to the presence of riparian wetland vegetation within Reach WHT6-O, the TRCA (2014b) *Guidelines* stipulate that the more conservative management classification of "Conservation" be recommended for these reaches. Similarly, several HDF reaches within the Final CEISMP Study Area that could not be assessed because of limited access were assigned a management recommendation of "Conservation" based on the presence of wetland vegetation.

Protection

Reaches WHT6-A, WHT6-A1 and WHT7-A1 were identified as "Protection". For WHT6-A, this recommendation was based on the presence of flow during the June 8, 2020 sample event (important hydrology), presence of breeding amphibian habitat and wetland riparian vegetation (**Appendix B - Photograph 1**).

Draft Plans of Subdivision

Work completed by Beacon in support of the Draft Plan of Subdivision applications did not result in any revisions to the HDFA recommendations presented in the Final CEISMP. **Figures 3A-3D** illustrate HDFs relevant to individual Draft Plan areas, while **Figures 4A-4D** present HDF management recommendations respectively.

Table 5. Headwater Drainage Feature Assessment Summary

HDF Reach	HDF Reach (Aquafor Beech Limited 2013)	Step 1		Step 2	Step 3	Step 4	Management Recommendation	Governing Factor
		Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat		
WHT6-A	1a	Important Functions	Historically channelized	Important Functions	Important Functions	Important Functions	Protection	Management recommendation governed by hydrology, riparian vegetation and presence of breeding amphibians
WHT6-B	1b	Valued Functions	Historically channelized	Important Functions	Valued Functions	Valued Functions	Conservation	Management recommendation governed by riparian vegetation
WHT6-C	1c	Valued Functions	Historically channelized	Important Functions	Valued Functions	Valued Functions	Conservation	Management recommendation governed by riparian vegetation
WHT6-D	1d	Valued Functions	Agriculture, Tile Drain	Limited Functions	Contributing Functions	Limited Functions	Mitigation	Management recommendation governed by hydrology.
WHT6-E	1e	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-F	1f	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-G	1g	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	Mitigation	Management recommendation based on Aquafor Beech Limited (2013) report and potential for tile drainage.
WHT6-H	1h	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	Mitigation	Management recommendation based on Aquafor Beech Limited (2013) report and potential for tile drainage.
WHT6-I	1i	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-J	1j	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-K	1k	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-L	1l	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-M	1m	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-N	1n	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT6-O	N/A	Valued Functions	Agriculture	Important Functions	Contributing Functions	**Valued Functions	Conservation	Management recommendation based on riparian vegetation.
WHT5-A	1o	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
MHT7-A	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by reference reach MHT7-C.
MHT7-B	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by reference reach MHT7-C.
MHT7-C	2a	Limited Functions	Anthropogenic	Contributing Functions	Contributing Functions	Limited Functions	Mitigation	n/a
MHT7-D	N/A	Limited Functions	Anthropogenic	Contributing Functions	Contributing Functions	Limited Functions	Mitigation	n/a
MHT7-E	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by reference reach MHT7-C.

HDF Reach	HDF Reach (Aquafor Beech Limited 2013)	Step 1		Step 2	Step 3	Step 4	Management Recommendation	Governing Factor
		Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat		
MHT7-F	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by reference reach MHT7-C.
MHT7-G	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by reference reach MHT7-C.
MHT8-A	2b	Limited Functions	Anthropogenic	Contributing Functions	Contributing Functions	*Valued Functions	Mitigation	Heavily modified ditch along existing rail line.
MHT8-B	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by reference reach MHT8-A.
MHT8-C	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by reference reach MHT8-A.
WHT2-A	3a	Valued Functions	Wetland	Important Functions	Contributing Functions	Important Functions	Conservation	Management recommendation is governed by riparian vegetation (meadow marsh) and the presence of breeding amphibians
WHT2-B	3b	Valued Functions	Wetland	Important Functions	Contributing Functions	**Valued Functions	Conservation	Management recommendation governed by riparian vegetation
WHT2-C	3c	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT2-D	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by riparian vegetation.
WHT2-E	3e	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT2-F	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by wetland unit.
WHT2-G	3d	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT3-A	3g	Valued Functions	Wetland	Important Functions	Contributing Functions	**Valued Functions	Conservation	n/a
WHT3-B	3f	Valued Functions	Wetland	Important Functions	Contributing Functions	**Valued Functions	Conservation	n/a
WHT3-C	3h	Limited Functions	Agriculture	Limited Functions	Contributing Functions	Limited Functions	No Management Required	n/a
WHT1-A	4a	Valued Functions	Wetland	Important Functions	Contributing Functions	**Valued Functions	Conservation	Management recommendation governed by riparian vegetation
WHT1-B	4b	Valued Functions	On-line pond	On-line pond	On-line pond	On-line pond	Conservation	Amphibians calling
WHT1-C	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by riparian vegetation.
WHT1-D	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by riparian vegetation.
WHT1-E	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by riparian vegetation.
WHT1-F	N/A	Not Assessed						Feature was not identified in HDFA ArcHydro mapping. Management recommendation is governed by riparian vegetation.

[1]**Protection – Important Functions:**
Protect and/or enhance the existing feature and its riparian zone corridor, and groundwater discharge or wetland in-situ;
Maintain hydroperiod;
Incorporate shallow groundwater and base flow protection techniques such as infiltration treatment;
Use natural channel design techniques or wetland design to restore and enhance existing habitat features, if necessary; realignment not generally permitted;
Design and locate the stormwater management system (e.g. extended detention outfalls) are to be designed and located to avoid impacts (i.e. sediment, temperature) to the feature.

Conservation – Valued Functions:
Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
Maintain or replace external flows,
Use natural channel design techniques to maintain or enhance overall productivity of the reach;
Drainage feature must connect to downstream.

Mitigation – Contributing Functions:
Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage);
Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details);

Recharge Protection – Recharge Functions:
Maintain overall water balance by providing mitigation measures to infiltrate clean stormwater, unless the area qualifies as an Area of High Aquifer Vulnerability under the Oak Ridges Moraine Conservation Plan (ORMCP) or Significant Recharge Areas under the *Source Water Protection Act*. These areas will be subject to specific policies under their respective legislation.
Terrestrial features may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with them.

Maintain or Replicate Terrestrial Linkage – Terrestrial Functions:
Maintain the corridor between the other features through in-situ protection or if the other features require protection, replicate and enhance the corridor elsewhere
If the feature is wider than 20 m, it may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with it.

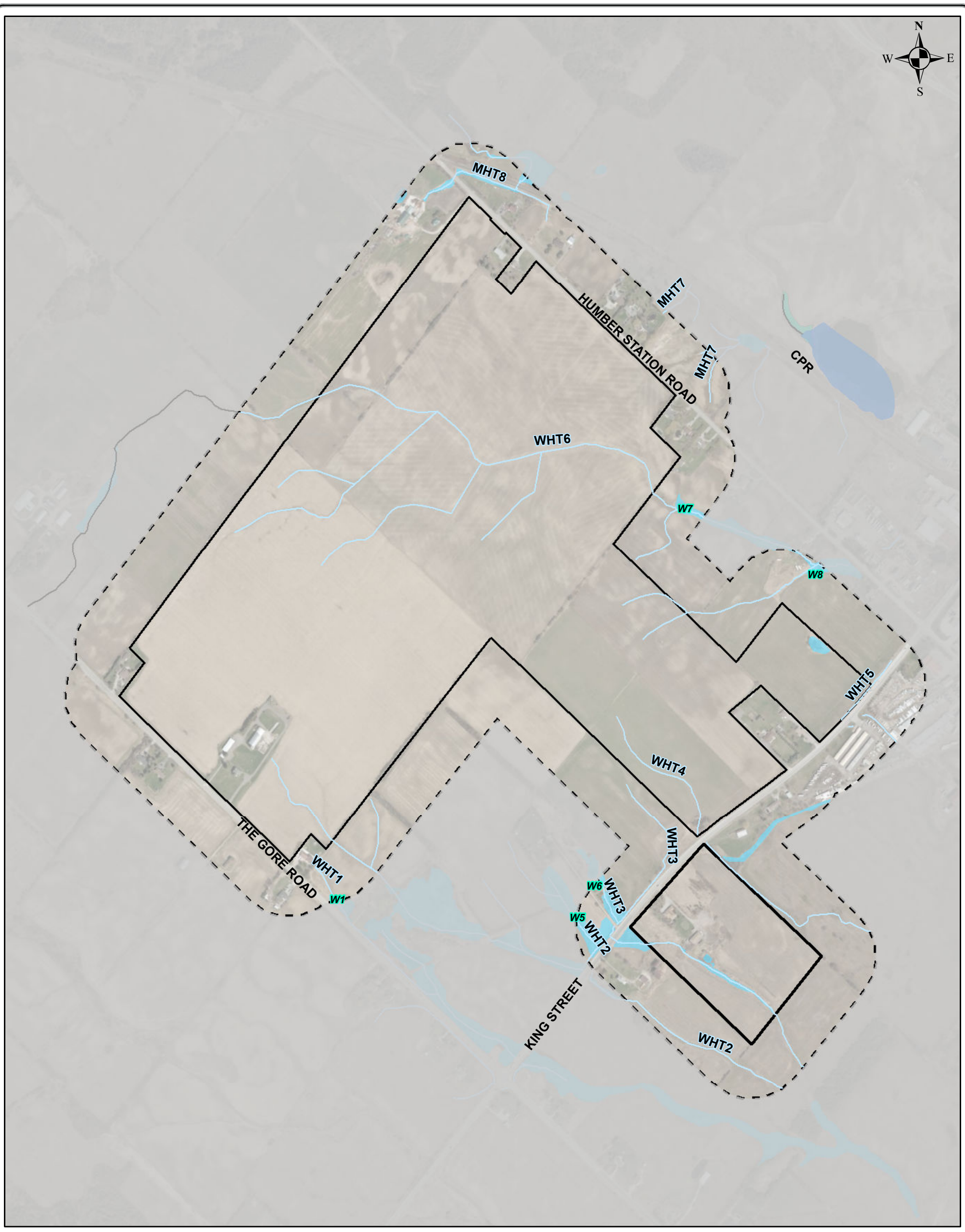
No Management Required – Limited Functions:
The feature that was identified during desktop pre-screening has been field verified to confirm that no feature and/or functions associated with headwater drainage features are present on the ground and/or there is no connection downstream. These features are generally characterized by lack of flow, evidence of cultivation, furrowing, presence of a seasonal crop, and lack of natural vegetation. No management recommendations required.

[1] **Hydrology**
Important Functions: Perennial, standing surface water in wetlands
Valued Functions: Intermittent; water is present in the spring as a result of seasonally high groundwater discharge or seasonally extended contributions from wetlands or other areas that support intermittent flow or water storage conditions
Limited Functions: Dry or Standing Water; characterized by no definition or flow, no groundwater seepage or wetland functions, evidence of cultivation, furrowing, presence of a seasonal crop, lack of natural vegetation, fine textured soils

[1] **Riparian**
Important Functions: Feature type is wetland and/or any of the riparian corridor categories on either side of the feature is dominated by forest or thicket/scrubland communities or wetland
Limited Functions: Riparian corridor is dominated by cropped land or no vegetation, and there are no important, valued or contributing riparian functions
Contributing Functions: the riparian corridor is dominated by lawn

[1] **Fish Habitat**
Important Functions: Any fish species present in spring and mid-summer; suitable spawning habitat for any fish species; species-at-risk present at any time; or feature provides critical habit to downstream species-at -risk
Valued Functions: Fish present in spring only or suitable habitat identified for feeding, cover, refuge, migration; or contributing habitat for species at risk
Contributing Functions: Allochthonous transport through feature to downstream habitat

[1] **Terrestrial Habitat**
Important Functions: Wetlands with breeding amphibians
Valued Functions: Wetland; considering wetland pockets associated with the HDF that are within 400 m of other wetlands upstream and downstream is recommended for assessing stepping stone habitat function; no breeding amphibians present
*Valued Functions: no wetland vegetation present but amphibian calls recorded
**Valued Functions Wetland habitat occurs within the corridor but no breeding amphibians present
Limited Functions: No terrestrial habitat present



LEGEND

- ARGO MACVILLE DRAFT PLAN AREA
- STUDY AREA
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 3A

HEADWATER FEATURES
ARGO MACVILLE DRAFT PLAN AREA

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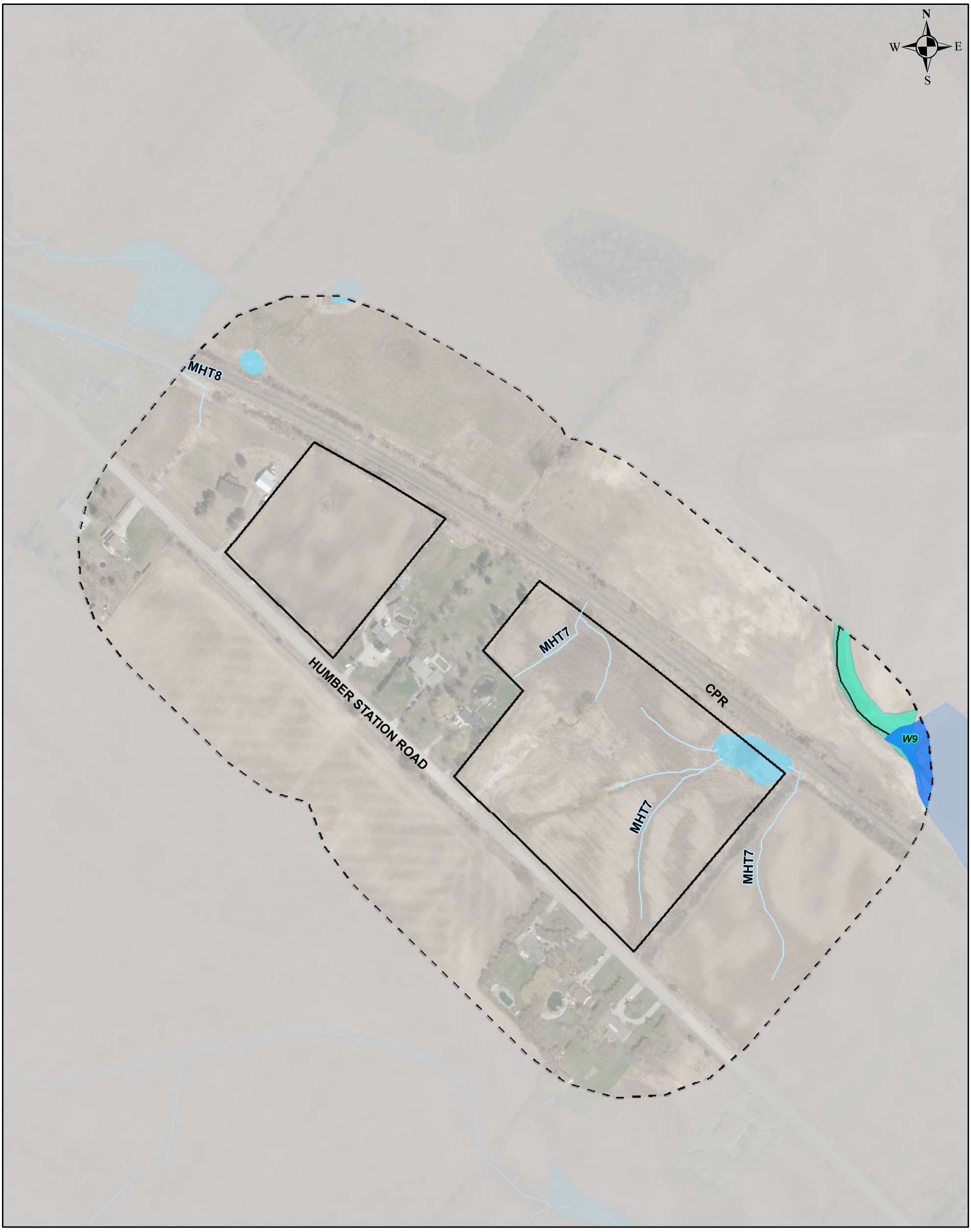

LEGEND

- ARGO HUMBER STATION DRAFT PLAN AREA
- STUDY AREA
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 3B

HEADWATER FEATURES
ARGO HUMBER STATION DRAFT PLAN AREA

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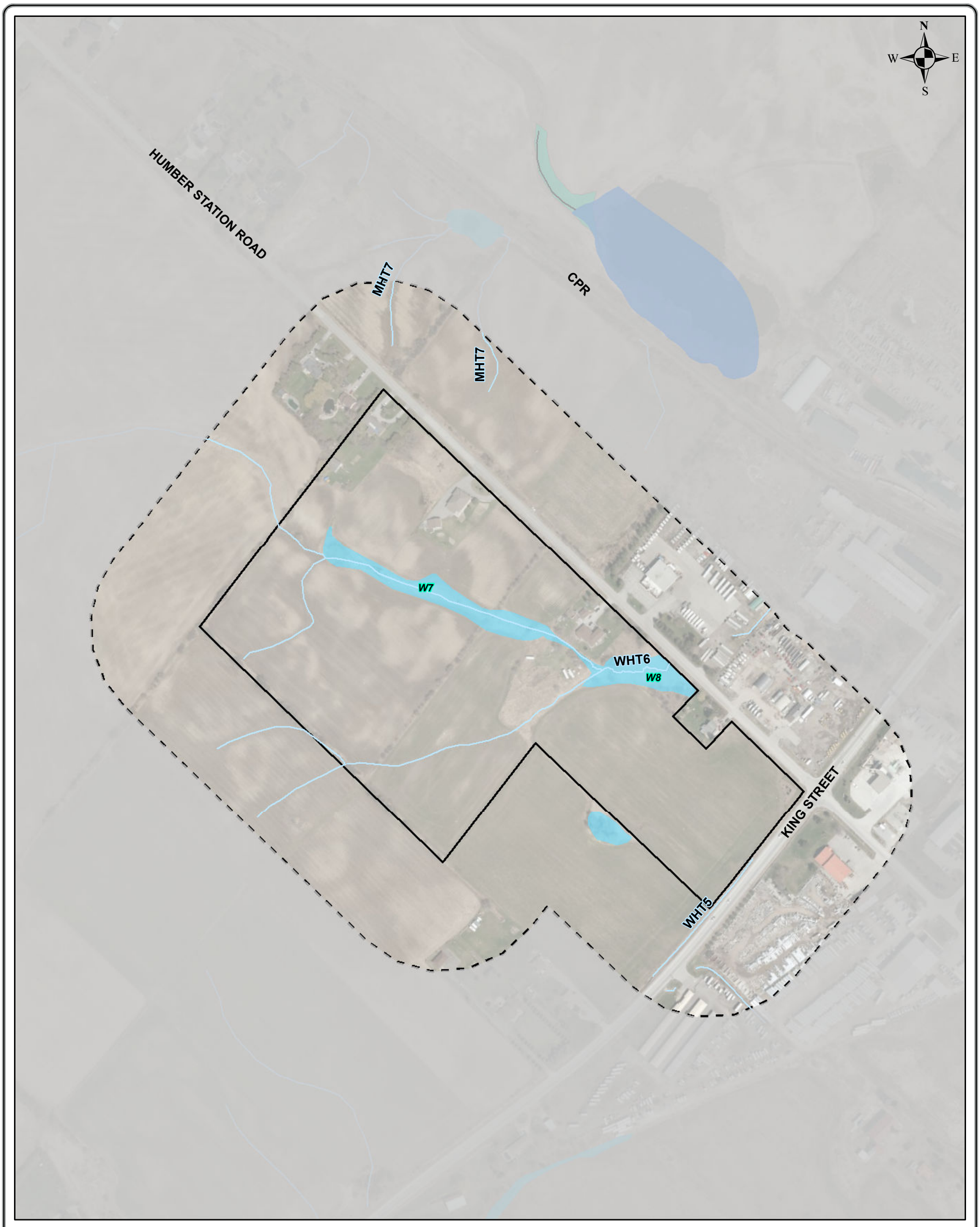

LEGEND

- HUMBERKING WEST DRAFT PLAN AREA
- STUDY AREA
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 3C

HEADWATER FEATURES
HUMBERKING WEST DRAFT PLAN AREA

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W
E
S

HUMBER STATION ROAD

MHT7

MHT7

MHT7

W9

CPR

KING STREET

LEGEND

- HUMBERKING EAST DRAFT PLAN AREA
- STUDY AREA
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 3D

HEADWATER FEATURES HUMBERKING EAST DRAFT PLAN AREA

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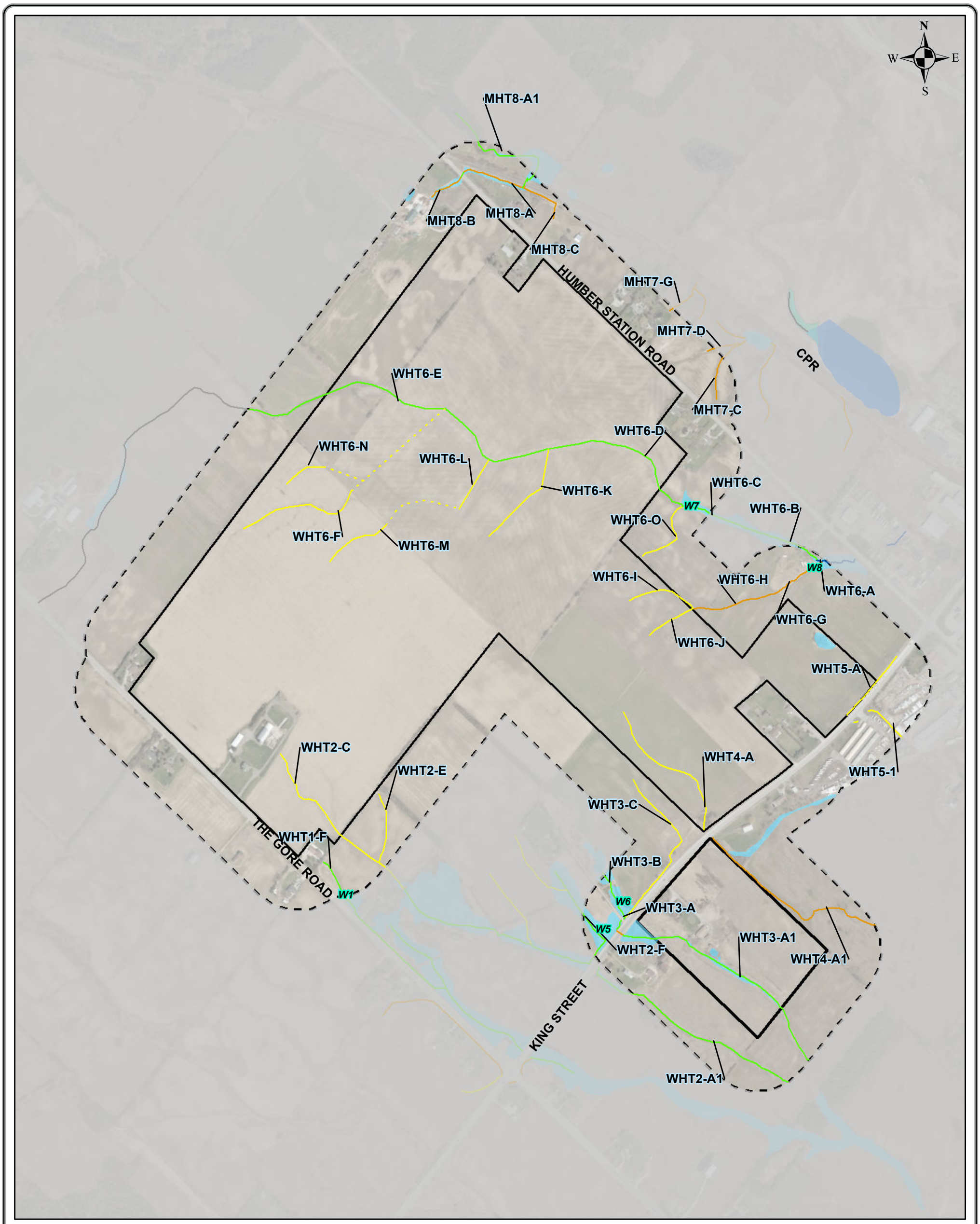

LEGEND

- ARGO MACVILLE DRAFT PLAN AREA
- STUDY AREA
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS

- W1 — WETLAND NUMBER
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HEADWATER FEATURE MANAGEMENT RECOMMENDATIONS

- PROTECTION
- CONSERVATION
- MITIGATION
- NO MANAGEMENT REQUIRED
- NO MANAGEMENT REQUIRED - ENCLOSED
- UNASSESSED DRAINAGE

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FIGURE 4A

HEADWATER FEATURE MANAGEMENT ARGO MACVILLE DRAFT PLAN AREA

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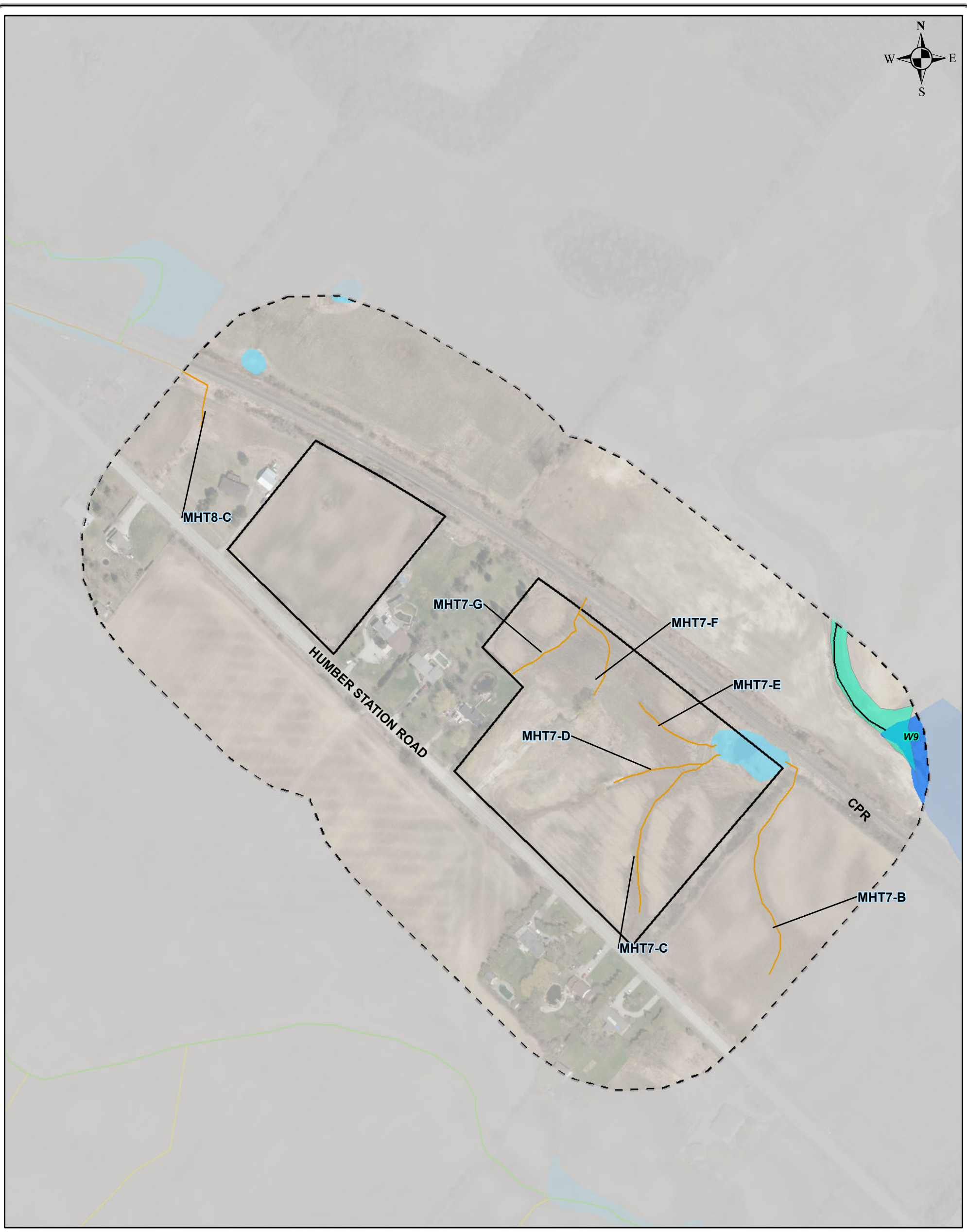

LEGEND

- ARGO HUMBER STATION DRAFT PLAN AREA
- STUDY AREA
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HEADWATER FEATURE MANAGEMENT RECOMMENDATIONS

- PROTECTION
- CONSERVATION
- MITIGATION
- NO MANAGEMENT REQUIRED
- NO MANAGEMENT REQUIRED - ENCLOSED
- UNASSESSED DRAINAGE

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Caledon Station
Community-Wide Comprehensive Environmental Impact Study

PROJECT No. 214476

FIGURE 4B

HEADWATER FEATURE MANAGEMENT ARGO HUMBER STATION DRAFT PLAN

June 2024 Scale 1:3,000

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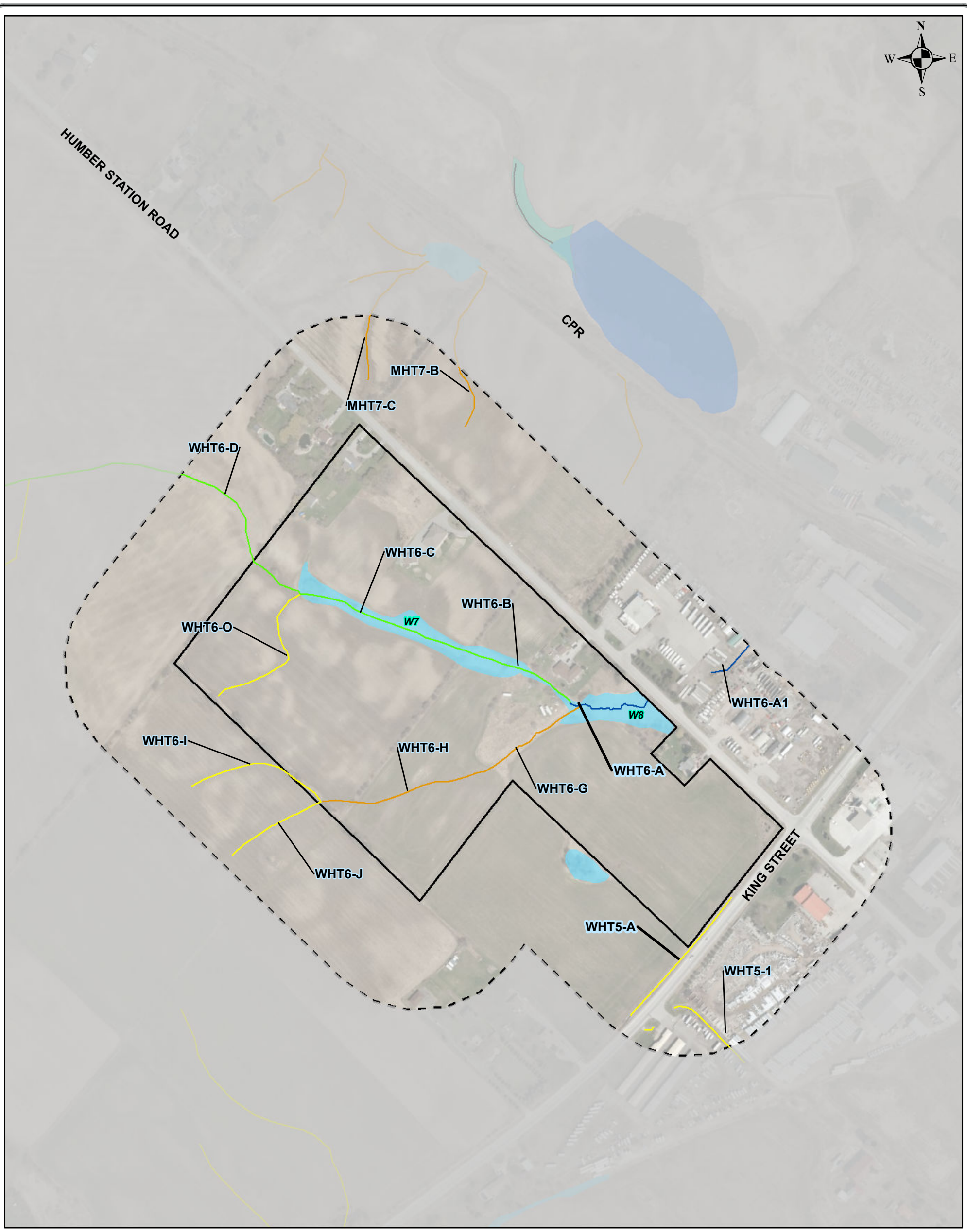

LEGEND

- HUMBERKING WEST DRAFT PLAN AREA
- STUDY AREA
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HEADWATER FEATURE MANAGEMENT RECOMMENDATIONS

- PROTECTION
- CONSERVATION
- MITIGATION
- NO MANAGEMENT REQUIRED
- NO MANAGEMENT REQUIRED - ENCLOSED
- UNASSESSED DRAINAGE

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FIGURE 4C

HEADWATER FEATURE MANAGEMENT HUMBERKING WEST DRAFT PLAN

June 2024 Scale 1:4,000

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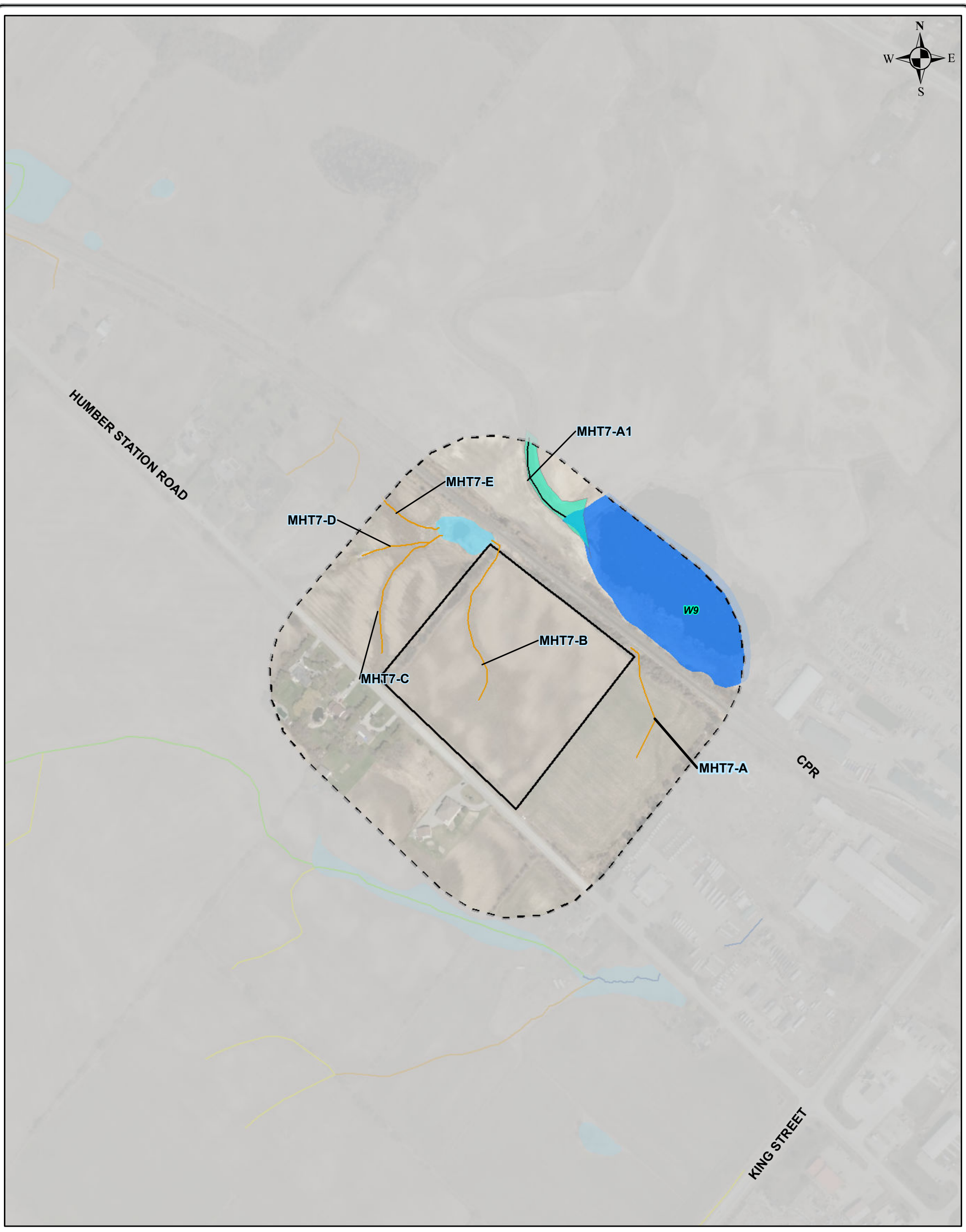

LEGEND

- HUMBERKING EAST DRAFT PLAN AREA
- STUDY AREA
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HEADWATER FEATURE MANAGEMENT RECOMMENDATIONS

- PROTECTION
- CONSERVATION
- MITIGATION
- NO MANAGEMENT REQUIRED
- NO MANAGEMENT REQUIRED - ENCLOSED
- UNASSESSED DRAINAGE

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FIGURE 4D

HEADWATER FEATURE MANAGEMENT HUMBERKING EAST DRAFT PLAN AREA

June 2024 Scale 1:4,000

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3.2.4.3 Fluvial Geomorphology

Fluvial geomorphology is the study of the physical form and function of surface water features. Typically, it is a consideration when undertaking subwatershed studies and land use planning studies because it informs how the watercourses are managed.

Geomorphic Assessment

The CEISMP TOR recommend that a fluvial geomorphic assessment of watercourses be undertaken to:

- Characterize hydrologic features within the Study Area including sensitive reaches, areas of erosion and aggradation, channel migration, etc.;
- Determine the relationship between hydrology of the stream and geomorphology, aquatic resources and water quality, using a continuous simulation modeling approach;
- Meander belt width analysis and delineation of the 100-year erosion limit; and
- Assessment of stream bank erosion and the potential for such erosion within the 100-year timeframe, with consideration for potential impacts on the morphology of the valley or stream corridor.

The HDFs within the Secondary Plan Area generally lack a defined channel. The few HDFs that do exhibit evidence of channel form lack consistent flow conditions that could result in lateral channel migration. Consequently, it is our opinion that a fluvial geomorphic assessment of stream bank erosion, aggradation and channel migration is not warranted and that the HDFA validation exercises effectively characterized the relationship between hydrology, geomorphology and aquatic resources for the purposes of this study.

Detailed Data Collection – SWM Erosion Analysis

Detailed geomorphic data field data was collected to determine a threshold for sediment entrainment that was then used to review and refine, as appropriate, extended detention volumes for erosion control for the proposed stormwater management facilities. The selection of the detailed field site location was governed by the following considerations:

- Lands owned by applicant (accessibility);
- Downstream location relative to proposed stormwater management facilities;
- Presence of a (relatively) natural channel form (i.e., defined active channel);
- Location of proposed location of stormwater management facilities (determine which stream reaches will receive stormwater contributions post-development); and
- Existing conditions could be considered representative of headwater drainage features within the Secondary Plan Area.

Based on these criteria, a detailed geomorphic field site was established at the downstream limit of HDF WHT3-A1 (other lands owned by the proponent that are required for servicing). While historically modified (channelized), this reach displayed a defined active channel and will receive stormwater drainage from the Secondary Plan Area. Based on available mapping and field observations, it was also considered representative of conditions downstream of other proposed stormwater management facilities. Further, utilization of a reach with a defined low flow channel represents a conservative

approach relative to an undefined swale, as frequent flows will be contained within the low flow channel, resulting in higher velocities and shear stress.

Detailed data collection was completed by Beacon staff on May 4, 2023 utilizing a Real-Time Kinematic (RTK) surveying unit and Total Station. Four (4) representative cross-sections were surveyed, extending beyond the active (bankfull channel) to include a portion of the adjacent floodplain. Cross-sectional measurements of bankfull or 'active' channel dimensions were developed using standard protocols and accepted field indicators. At each cross-section, bed and bank characteristics and composition were noted. Additionally, a longitudinal survey of bed morphology, planform, and bankfull elevations was completed.

The surveyed extent of Tributary WHT3 Reach A1 displayed a governing energy gradient of 1.77%. The channel displayed moderate degree of entrenchment. While bankfull indicators were not well-defined, channel widths were estimated to range from 1.2 to 1.7 m, averaging 1.4 m. The average bankfull depth was 0.10 m, resulting in a width-to-depth ratio of 15. Channel boundary materials were predominantly comprised of clay, silt and sand with some gravel. A summary of reach-based geomorphic characteristics and calculated hydraulic parameters is provided below in **Table 6**.

Table 6. Summary of Field-based Geomorphic and Calculated Hydraulic Parameters

Field-Based Measurements	Reach WHT3-A1
Bankfull gradient (%)	1.77
Average bankfull width (m)	1.4
Average bankfull depth (m)	0.10
Maximum bankfull depth (m)	0.22
Median grain size (D_{50}) (mm)	fines
Estimated Manning's 'n' value	0.038
Derived Parameters	
Bankfull discharge (m^3/s)	0.13
Bankfull velocity (m/s)	0.75
Bankfull tractive force (N/m^2)	18.5

Erosion Threshold Determination

Erosion and deposition are natural processes that are necessary for the maintenance of channel form and function. Changes in land use can result in changes in the magnitude and duration of surface runoff produced by rain events, which can result in increased rates of erosion. Appropriate stormwater management techniques can typically mitigate the impacts associated with land use change by reducing the magnitude of post-development storm events. Surface runoff is collected and detained in stormwater management facilities (SWMF), then released at a prescribed flow rate. Ideally, this controlled release also closely mimics the duration of pre-development storms. The total volume of post-development runoff can also be reduced through the implementation of low impact development techniques (LIDs). The overall objective of these management tools is to match, to the extent possible, pre-development flow conditions.

Erosion thresholds often represent the hydraulic parameter by which pre- and post-development flow conditions are compared. An erosion threshold defines the theoretical hydraulic conditions under which sediment is entrained and transported within the channel. Specifically, the threshold represents a depth,

velocity, or discharge at which sediment of a particular size class (usually the median or average grain size material) may potentially be entrained. This does not necessarily imply that systemic erosion (i.e., widening or degradation of the channel) will occur if the threshold is exceeded; it simply indicates flow conditions at which sediment entrainment (i.e., initiation of motion of materials) is likely to occur.

The TRCA (2012) Stormwater Management Criteria, provides geomorphologic methodologies for determining erosion thresholds. **Table 7** presents an overview of threshold analysis resources presented in the TRCA guidance document.

Table 7. Overview of Commonly Applied Sediment Entrainment Models

Sediment Entrainment Model	Type	Range of Applicability
Chow (1959)	Critical Shear Stress	Cohesive materials (Clay and Silt)
Fischenich (2001)	Critical Shear Stress	Cohesive and non-cohesive material
Hjulstrom (1967)	Critical Velocity	Non-cohesive material (sand and coarser)
Komar (1987)	Critical Velocity	Non-cohesive material (gravel and larger)
Miller et al. (1977)	Critical Shear Stress	Non-cohesive material (sand and coarser)
Neill (1967)	Critical Velocity	Non-cohesive material (sand and coarser)
Temple (1982)	Tractive Force	Vegetated Channels
vanRijn (1984)	Critical Shear Stress	Non-cohesive material (medium sand and coarser)

It should be noted that, in natural systems, erosion thresholds are exceeded regularly, ensuring the downstream delivery of sediment. As such, the key to maintaining natural channel function of a system is not to prevent exceedance of the threshold, but to ensure that existing rates of erosion are not exacerbated under the future land use scenario.

The recommended erosion threshold for Reach WHT3-A1 is presented in **Table 8**. Based on the channel boundary materials (silty clay loam with very few stones), the recommended erosion threshold-condition hydraulic parameters referenced Fischenich (2001) permissible velocities for sandy loam soils. Associated threshold-condition hydraulic parameters were then back-calculated referencing this threshold condition. Calculated discharge and (maximum) water depth values were then compared to flow conditions observed at the time of assessment and estimated bankfull flow conditions. Based on this approach, the proposed erosion threshold is considered to be reflective of existing geomorphic conditions observed along the assessed watercourse.

The threshold discharge condition of 0.09 m^3/s represents approximately 68% of the estimated bankfull flow, at a water depth above flow conditions observed at the time of assessment. Given that sediment transport was not observed during the field investigation, and the feature was generally charactered as stable (minimal evidence of active erosion observed), this threshold flow condition is considered appropriate.

Table 8. Recommended Erosion Threshold – Reach WHT3-A1

Reach	Threshold-Condition Hydraulic Parameters (calculated using representative cross-sections)						Critical Discharge as a Percentage of Bankfull Discharge (%)
	Channel Bed				Channel Banks		
	Critical Depth (m)	Critical Velocity (m/s)	Critical Shear Stress (N/m^2)	Critical Discharge (m^3/s)	Critical Velocity* (m/s)	Critical Shear Stress (N/m^2)	
Tributary WHT3 Reach A1	0.14	0.68	15	0.09	0.51	11	68

* Governing threshold condition (Fischenich (2001) - critical velocity for Sandy Loam)

3.2.4.4 Surface Water Quality

As the HDFs are primarily ephemeral and intermittent, there is no water quality data available. According to the TRCA's Watershed Report Card (2018), the West Humber received a surface water quality grading as "poor" whereas the Main Humber was graded as "fair". This grade is based off of phosphorous and *Escherichia coli* (*E.coli*) concentrations.

3.2.4.5 Hydraulics

The Humber River Hydrology Update (TRCA 2018) developed a hydraulic model for the Main and West Humber Rivers. Urbantech Consulting obtained the HEC-RAS hydraulic model from the TRCA in August 2020 to assess the existing conditions and Regulatory Floodplain within the Secondary Plan Area. For the Final FSR, Urbantech Consulting extended the 2018 existing model northwest towards Gore Road to represent headwater features that drain 75.6 hectares of external catchments north of the CSSP lands. Topographic LiDAR data with a resolution of 0.5m was obtained to generate a high-resolution terrain model for the model updates. The existing model updates also involved flow updates based on the hydrology modelling.

This Regional Storm has been used to delineate the Regulatory Floodplain within the Caledon Station Secondary Plan Area based on the updated HEC-RAS model.

3.2.5 Existing Water Balance

3.2.5.1 Existing Site Water Balance

To understand and compare existing hydrologic conditions over the Caledon Station Secondary Plan Area, a Thornthwaite site water balance was completed. The Thornthwaite water balance (Thornthwaite, 1948; Mather, 1978; 1979) is an accounting type method used to analyze the allocation of water among various components of the hydrologic cycle. Inputs to the model are monthly temperature, site latitude, precipitation, and stormwater run-on. Outputs include monthly potential and actual evapotranspiration, evaporation, water surplus, total infiltration, and total runoff. For ease of calculation, a spreadsheet model was used for the computation.

When precipitation (P) occurs, it can either runoff (R) through the surface water system, infiltrate (I) to the water table, or evaporate/evapotranspiration (ET) from the earth's surface and vegetation. The sum of R and I is termed as the water surplus (S). When long-term averages of P, R, I and ET are used, there is no net change in groundwater storage (ST). Annually, however, there is a potential for small changes in ST. The annual water budget can be stated as:

$$P = ET + R + I + ST$$

As provided below.

Precipitation (P)

Based on the 30-year average for the Toronto Lester B. Pearson Climate Station in Ontario, the average precipitation for the area is about 786 mm/year for the period between 1981 and 2010. Also, the average monthly temperature from this station has been used. The Hydrogeological Investigation (DS Consultants Ltd. 2024) summaries the monthly distribution of precipitation.

Storage (St)

Groundwater storage (ST) of native soils for the existing Subject Lands was estimated using values of Water Holding Capacity (mm) of respective land use and soil types identified in Table 3.1 of the Storm Water Management (SWM) Planning & Design Manual (MOE March 2003). The land uses, soil types and respective water holding capacities chosen to represent existing conditions on the Subject Lands include combinations of pasture/shrub, moderately rooted crop and urban lawn with a silty clay soil. Respective water holding capacities (200 mm, 150 mm and 75 mm) were applied to March for monthly calculations. Using the procedures outlined in the SWM Planning & Design Manual for the above land use and soil type, the annual change in storage is zero (0).

Evapotranspiration (Et)

Monthly Potential Evapotranspiration (PET) is estimated using monthly temperature data and is defined as a water loss from a homogeneous vegetation-covered area that never lacks water (Thornthwaite,1948; Mather, 1978). In the Thornthwaite water balance model, PET is calculated using the Hamon equation (Hamon, 1061);

$$PET\ Hamon = 13.97 * d * D2 * Wt$$

Where:
d = the number of days in the month
D = the mean monthly hours of daylight in units of 12 hours
Wt = a saturated water vapour density term = 4.95 * e0.627/100
T = the monthly mean temperature in degrees Celsius

The calculated Actual Evapotranspiration (AET) is based on PET and changes in ST (∆ ST). Where there is not enough P to satisfy PET, a reduction in ST occurs. As a result, volumes of AET are less than PET. Also, it is assumed that evaporation will occur and will amount to approximately 15% of the total precipitation for an impervious cover.

Precipitation Surplus (S)

Precipitation surplus is calculated as P–ET. For pervious areas, ET is considered AET and for impervious areas, ET is evaporation.

Infiltration (I) and Runoff (R)

For pervious areas, precipitation surplus has two components in the Thornthwaite model: a runoff component (overland flow that occurs when soil moisture capacity is exceeded) and an infiltration component. The accumulation of infiltration factors for topography, soil types and cover as prescribed in Table 3.1 of the SWM Planning & Design Manual (CVC and TRCA 2010) give infiltration factors for existing conditions on the Caledon Station Secondary Plan Area as shown below in **Table 9**. The runoff component calculated in the pre-development model is the remaining volume of precipitation surplus following AET, ET, and infiltration.

Table 9. Existing Conditions – Infiltration Factor

Land Uses / Soil Types	Topography	Soil	Cover	Total Infiltration Factor
Urban Lawn - Pervious Development/Clay Loam	0.10	0.15	0.05	0.30
Moderately rooted crops/ Clay Loam	0.10	0.15	0.10	0.35
Tile Drained Moderately Rooted Crop / Clay Loam	0.05	0.05	0.05	0.15
Pasture and Shrub/ Clay Loam	0.10	0.15	0.15	0.40

The Caledon Station Secondary Plan Area has a total area of about 188.7 ha and is primarily agricultural with some natural areas consisting of NHS lands, hedgerows and swales. There are also some existing rural development consisting of pervious landscaped areas and impervious buildings and asphalt/paved area. The Hydrogeological Investigation (DS Consultants Ltd. 2024) identifies the pre-development conceptual model considered for establishing current hydrologic conditions. To predict outputs of the pre-development site water balance, various inputs were entered into the Thornthwaite model including monthly precipitation and temperature, site latitude, water holding capacity values for native soils and factors of infiltration.

Based on the above analysis, the resulting annual evapotranspiration, infiltration and runoff volumes for each hydrological land use of the Subject Lands during the pre-development period is summarized in **Table 10**.

Table 10. Summary of Pre-Development Water Balance

Land Uses / Soil Types	ET Volume (m^3/year)	AET Volume (m^3/year)	Infiltration Volume (m^3/year)	Runoff Volume (m^3/year)
Urban Lawn - Pervious Development/ Clay Loam	0	51,215	8,702	20,306
Moderately rooted crops/ Clay Loam	0	623,703	103,100	191,471
Tile Drained Moderately Rooted Crop / Clay Loam	0	207,421	14,695	83,269
Pasture and Shrub/ Clay Loam	0	105,407	17,917	26,875
Impervious Areas	3,734	0	0	24,838
Total	**3,734**	**987,746**	**144,413**	**321,921**

Detailed calculations are presented in the Hydrogeological Investigation (DS Consultants Ltd. 2024).

3.2.5.2 Existing Feature Based Water Balance

Pre-development catchment mapping showing topographical drainage divides and wetland catchments were provided by Urbantech (2021) to document existing drainage patterns across the site and determine which areas are within the catchments of wetlands W1 through W9. The mapping was completed to inform the proposed functional servicing for the development. Wetland and constraints mapping was provided by Beacon. The Pre-Development catchment map is presented in Figure 9 within the Hydrogeological Investigation (DS Consultants Ltd. 2024).

The pre-development mapping shows catchments for 9 wetland units including W1 through W9. Catchments for wetlands W1 to W6 includes west areas of the Site which drain south across King Rd. Each of these catchments are limited to within the Site boundaries with exception to some ditch and road runoff from the east side of The Gore Rd. The largest subcatchment is mapped draining directly into W7 and includes approximately 75.9 ha of upgradient area which runs onto the Site via HDF WHT6-E. The drainage feature appears to be captured within a collector pipe which is observed to transect the Site from the north boundary to somewhere between wetland W7 and W8. The entire catchment area within the Site is currently tile drained. Flow exists the Site at wetland W8 via a culvert across Humber Station Road approximately 30m north of the southeast corner of the Site. Wetland catchment W9 is located east of the Site and the CP Rail. The wetland is not within the Sites boundaries however there is a small portion of the catchment within the proposed development area.

3.3 Natural Heritage Resources

Natural heritage resources in the Secondary Plan Area were documented in the various studies prepared for the Town of Caledon by Dougan & Associates, Cam Portt & Associates, Aquafor Beech Ltd., BluePlan Engineering Consultants Ltd., and Meridian Planning (2014a and 2014b) during the BRES process. Information from these background studies was reviewed and integrated with field work completed by Beacon in support of the Final CEISMP. This comprehensive characterization of natural heritage resources is provided in the sections below.

3.3.1 Landscape Scale Natural Heritage Systems

The Caledon Station Secondary Plan Area is located on the farmed till plains of the South Slope physiographic region several kilometres south of where the Oak Ridges Moraine converges with the Niagara Escarpment. The Niagara Escarpment is located 4 km to the west and the Oak Ridges Moraine, which is located 2 km to the west and north, form part of the provincial Greenbelt which supports protected natural areas and linkages. Along with the Humber River valleylands, these natural features and areas form part of a broader provincial and regional Natural Heritage System (NHS) identified in the Growth Plan NHS and Region of Peel Greenlands System (refer to **Figure 5**).

The Oak Ridges Moraine is an irregular ridge approximately 3-12 km wide and 170 km in length that extends from the Niagara Escarpment in the west to the Trent River in the east. The Niagara Escarpment is a bedrock escarpment and cuesta that extends 1,200 km from Rochester, NY to Green Bay, WI., and traverses southern Ontario from Niagara Falls to Manitoulin Island. The Humber River valleylands connects its headwaters in Caledon to Lake Ontario, some 40 km downstream and represents a significant landscape north-south linkage corridor. The Humber River valleylands are contained within the Bolton Resource Management Tract (BRMT). The BRMT is a 973-ha area comprised of a mix of valleylands, forests, and wetlands owned by TRCA that connects the Humber Rover to the Oak Ridges Moraine.

Existing land use within the Secondary Plan Area is primarily agricultural. Natural features are limited to HDFs and small, not Provincially significant wetlands which are concentrated near the southern boundary. These features function to provide some local scale connectivity, however connections to the broader regional and provincial NHS described above is limited due to fragmentation and barriers such as the CP rail line which effectively separates the Secondary Plan Area from the Humber River valleylands to the east. Treed features are generally limited to hedgerows, most of which are short and fragmented and offer little connectivity due to poor cover.

The Region Official Plan (ROP) does not identify any core area of its Greenlands System within the Secondary Plan Area. Similarly, the Town of Caledon Official Plan does not map any of the features as Environmental Policy Area. There are however several wetland features located east of the CP rail line that have been identified as part of the Provincially Significant Bolton Wetland Complex.

3.3.2 Ecological Land Classification

Ecological communities within the Secondary Plan Area were initially mapped in 2013 and 2014 by Dougan & Associates *et al.* (2014b) as part of the BRES process. The boundaries of wetland communities were staked by MNRF staff on June 1, 2016. In 2020, Beacon conducted field investigations to confirm the previous findings.

The Final CEISMP classified and mapped ecological communities in accordance with the Ecological Land Classification (ELC) System for southern Ontario (Lee *et al*. 1998). The ELC System classifies ecological communities based on their vegetation composition and structure, site history, substrate type, moisture regime, drainage class, and other attributes. Under the ELC System, ecological communities are classified to the ecosite or ecoelement level depending on scale and specific application.

Ecological communities were mapped and described to the ecosite level, and where possible to the ecoelement level, using ELC protocols. The ELC classifications are based on vegetation and soils information gathered from representative communities. Floristic surveys were conducted to document vegetation composition and structure for each representative community, including recording species relative abundance and ranking dominant species according to vegetation strata (canopy, subcanopy, understory, and ground layers).

A total of 18 ecological community types were identified, including communities corresponding with anthropogenic and agricultural lands (**Table 11**). The locations of the communities and their corresponding polygon or unit identifiers are mapped in **Figure 6**.

Table 11. Ecological Community Descriptions

Unit	Type	Description
1	Anthropogenic	Existing rural residential properties containing residential and commercial development.
2	Agriculture - Annual Row crops	Corn, wheat, and soybean fields.
3	Agriculture - Hay	Alfalfa fields.
4	Hedgerow (H)	Hedgerows in the Study Area are largely dominated by Common Buckthorn, hawthorns (*Crataegus* sp.), Domestic Apple (*Malus pumila*), and Manitoba Maple (*Acer negundo*), with occasional White Elm (*Ulmus americana*) and Basswood (*Tilia americana*), and Ash (*Fraxinus* spp.).
5	Willow Mineral Deciduous Swamp (SWD4-1)	Small, treed area surrounding a dug pond comprised of Crack Willow (Salix fragilis), Siberian Elm (*Ulmus pumila*), Trembling Aspen (*Populus tremuloides*) with a dense community of Reed Canary Grass (*Phalaris arundinacea*) and some Red-osier Dogwood (*Cornus sericea*).
6	Cultural Thicket (CUT1)	This community is dominated by Common Buckthorn with lesser amounts of hawthorn (*Crataegus* sp.). Ground covers include Thicket Creeper (*Parthenocissus vitacea*), Enchanter's Nightshade (*Circaea lutetiana*), grasses, Tall Goldenrod, Wild Strawberry (*Fragaria virginiana*), and Zig Zag Goldenrod (*Solidago flexicaulis*).
7	Reed Canary Grass Mineral Meadow Marsh (MAM2-2)	Meadow marsh communities dominated by Reed Canary Grass in association with other wetland forbs and graminoids such as Panicled Aster (*Symphyotrichum lanceolatum*), Purple-stemmed Aster (*Symphyotrichum puniceum*), Field Horsetail (*Equisetum arvense*), Purple Loosestrife (*Lythrum salicaria*), Fowl Bluegrass (*Poa palustris*), and sedges (*Carex* spp.).
8	Cattail Mineral Shallow Marsh (MAS2-1)	Marsh communities on mineral soil dominated by Narrow-leaved Cattail (*Typha angustifolia*) with lesser amounts of Broad-leaved Cattail (*Typha latifolia*) and other wetland forbs and graminoids such as Panicled Aster, Spotted Jewelweed (*Impatiens capensis*), Purple-stemmed Aster, bulrushes (*Scirpus atrovirens, S. microcarpus*), sedges, and Joe-Pye Weed (*Eutrochium maculatum*).

Unit	Type	Description
9	Cattail Organic Shallow Marsh (MAS3-1)	Marsh communities on organic soil dominated by Narrow-leaved Cattail (*Typha angustifolia*) with lesser amounts of Broad-leaved Cattail (*Typha latifolia*) and other wetland forbs and graminoids such as Reed Canary Grass, Panicled Aster, Spotted Jewelweel, Purple-stemmed Aster, bulrushes (*Scirpus atrovirens, S. microcarpus*), sedges, and Joe-Pye Weed (*Eutrochium maculatum*).
10	Stonewort Submerged Shallow Aquatic (SAS1-3)	Dug ponds with thick layer of Stonewort (*Chara* spp.) and sparse amounts of Lesser Duckweed (*Lemna minor*).
11	Forb Mineral Meadow Marsh (MAM2-10)	Meadow marsh dominated by Panicled Aster, Reed Canary Grass, sedges, and willowherbs *(Epilobium* spp.)
12	Organic Deciduous Swamp (SWD3)	Small swamp on organic soils with a canopy of dead hardwood (ash), White Elm (*Ulmus ameriana*), Yellow Birch (*Betula allegheniensis*), and White Birch (*Betula papyrifera*). The understory consists of Red-osier Dogwood, Black Current (*Ribes americana*), and White Cedar. Dominant ground covers are Spotted Jewelweed, Marsh Marigold (Caltha palustris), horestails (*E. arvensis, E. sylvaticum*), and ferns (*Onoclea sensibilis, Matteucia struthiopteris*).
13	Pondweed Submerged Shallow Aquatic (SAS1-1)	Small shallow aquatic feature dominated by pondweeds (*Potomogeton* spp.), with a small amount of Lesser Duckweed and Reed Canary Grass
14	Open Aquatic (OAO)	Small, dug pond.
15	Dry-Moist Old Field Meadow (CUM1-1)	Meadows dominated by old field forbs and graminoids including Smooth Brome Grass (*Bromus inermis*), Reed Canary Grass, Orchard Grass (*Dactylis glomerata*), Tall Goldenrod (*Solidago altissima*), Tufted Vetch (*Vicia cracca*). Woody regeneration is generally sparse but includes Common Buckthorn (*Rhamnus cathartica*) and Manitoba Maple (Acer negundo), Tatarian Honeysuckle (*Lonicera tatarica*), hawthorns, and Red-osier Dogwood. Through restoration efforts, some of the old fields (3d, 3e) have been planted with various trees and shrubs including White Cedar (*Thuja occidentalis*), White Spruce (*Picea glauca*), Freeman's Maple (*Acer x freemanii*), Nannyberry (*Viburnum lentago*), and Basswood (*Tilia americana*).
16	Willow Mineral Thicket Swamp (SWT2-2)	Small thicket swamp dominated by Pussy Willow (*Salix discolor*), Reed Canary Grass, Purple Loosestrife, Panicled Aster, and Tall Goldenrod.
17	Mineral Meadow Marsh (MAM2)	Wetland disturbed by agricultural activity dominated by Barnyard Grass (*Echinocloa crus-galli*), Creeping Bent Grass (*Agrosits stolonifera*), Foxtail grasses (*Setaria* spp.), and smartweeds (*Persicaria* sp.)
18	Cultural Plantation (CUP)	Former meadows with well-established planted native trees and shrubs including Eastern Cottonwood (*Populus deltoides*), White Cedar, White Spruces, Freeman's Maple, Gray dogwood, Red-osier Dogwood, Nannyberry, and Speckled Alder. Ground covers include grasses, Tall Goldenrod, Wild Carrot, and Creeping Thistle.

3.3.2.1 Draft Plans of Subdivision

Vegetation communities associated with individual Draft Plan areas are identified in **Figures 6A-6D**.

3.3.3 Wetland Boundary Delineation

Wetlands W1 through W8 were staked with the Ministry of Natural and Forestry (MNRF) on June 1, 2016. The staked limits were surveyed by an OLS and geodetic data were used to prepare the ELC mapping (refer to **Figure 6**).

Wetland features located outside of the Secondary Plan Area but within the Final CEISMP Study Area (ELC Units 5, 7e, 7f, 7h, 7i, 7j, 7l, 8l, 13, 14a, and 14b) within the Study Area and downstream wetland features (ELC Units 8h and 8i) were delineated by Beacon based on field studies, drone photography, and aerial orthophotography.

With the exception of Wetland Unit W9, all wetlands on and adjacent to the Caledon Station Secondary Plan Area have been evaluated by Beacon in accordance with the Ontario Wetland Evaluation System (OWES; MNRF 2022) and determined to be non-provincially significant. The OWES evaluation, which was completed by a Certified Wetland Evaluator, confirmed that the evaluated wetlands do not meet the scoring requirements for a PSW. Under the 4th edition of OWES, the official status of these wetlands is made at the time of the evaluation. MNRF has updated their mapping and database to reflect the Beacon evaluation, which is provided in **Appendix C**.

3.3.3.1 Argo Macville Draft Plan of Subdivision

The wetland community south of King Street, on other lands owned by the proponent which are required for servicing, was staked by a Beacon wetland evaluator on April 25, 2023. These staked limits were surveyed to a precision of approximately 20 cm and reflected in the Final CEISMP mapping. These wetlands were included in the Beacon (2023) OWES evaluation, which confirmed that the evaluated wetlands do not meet the scoring requirements for a PSW. Under the 4th edition of OWES, the official status of these wetlands is made at the time of the evaluation. MNRF has updated their mapping and database to reflect the Beacon evaluation, which is provided in **Appendix C**.

3.3.4 Floristics

A total 171 vascular plant species were documented by Beacon in support of the Final CEISMP between 2016 and 2020. A plant list is included in **Appendix D.** Of these, 78 (46%) are non-native to Ontario, which is reflective of the agricultural land use history of the Study Area. Most of the species (161) are considered provincially and regionally common/secure (ranked S5 or S4 provincially by NHIC and L5 or L4 regionally by TRCA). Ten (10) of the species recorded are of regional conservation concern (ranked L3 by TRCA). These species are listed in **Table 12**. Of these species, four (4) species, Balsam Fir (*Abies balsamea*), Tamarack (*Larix larcina*), White Spruce (*Picea glauca*), and Speckled Alder (*Alnus incana* ssp. *rugosa*) have been introduced through plantings.

Table 12. Vegetation Species of Regional Conservation Concern

Species	Common Name	S-Rank[1]	L-Rank[2]	Location
*Abies balsamea**	Balsam Fir	S5	L3	ELC Unit 5
*Alnus incana ssp. rugosa**	Speckled Alder	S5	L3	ELC Units 18a, 18b
Carex laevivaginata	Smooth-sheathed Sedge	S4	L3	ELC Unit 12
Epilobium leptophyllum	Narrow-leaved Willowherb	S5	L3	ELC Unit 8a
Equisetum sylvaticum	Woodland Horsetail	S5	L3	ELC Unit 12
*Larix laricina**	Tamarack	S5	L3	ELC Unit 11, 16, 18a, 18b
Lemna trisulca	Star Duckweed	S5	L3	ELC Unit 10c
*Picea glauca**	White Spruce	S5	L3	ELC Unit 11, 16
Ribes triste	Swamp Red Currant	S5	L3	ELC Unit 12
Triosteum aurantiacum	Orange-fruit Horse-gentian	S4S5	L3	ELC Unit 6a

*planted
[1]Provincial Rank (NHIC): S4=Apparently Secure, S5=Secure
[2]Local Rank (TRCA): L3=Regional conservation concern

3.3.5 Tree Resources

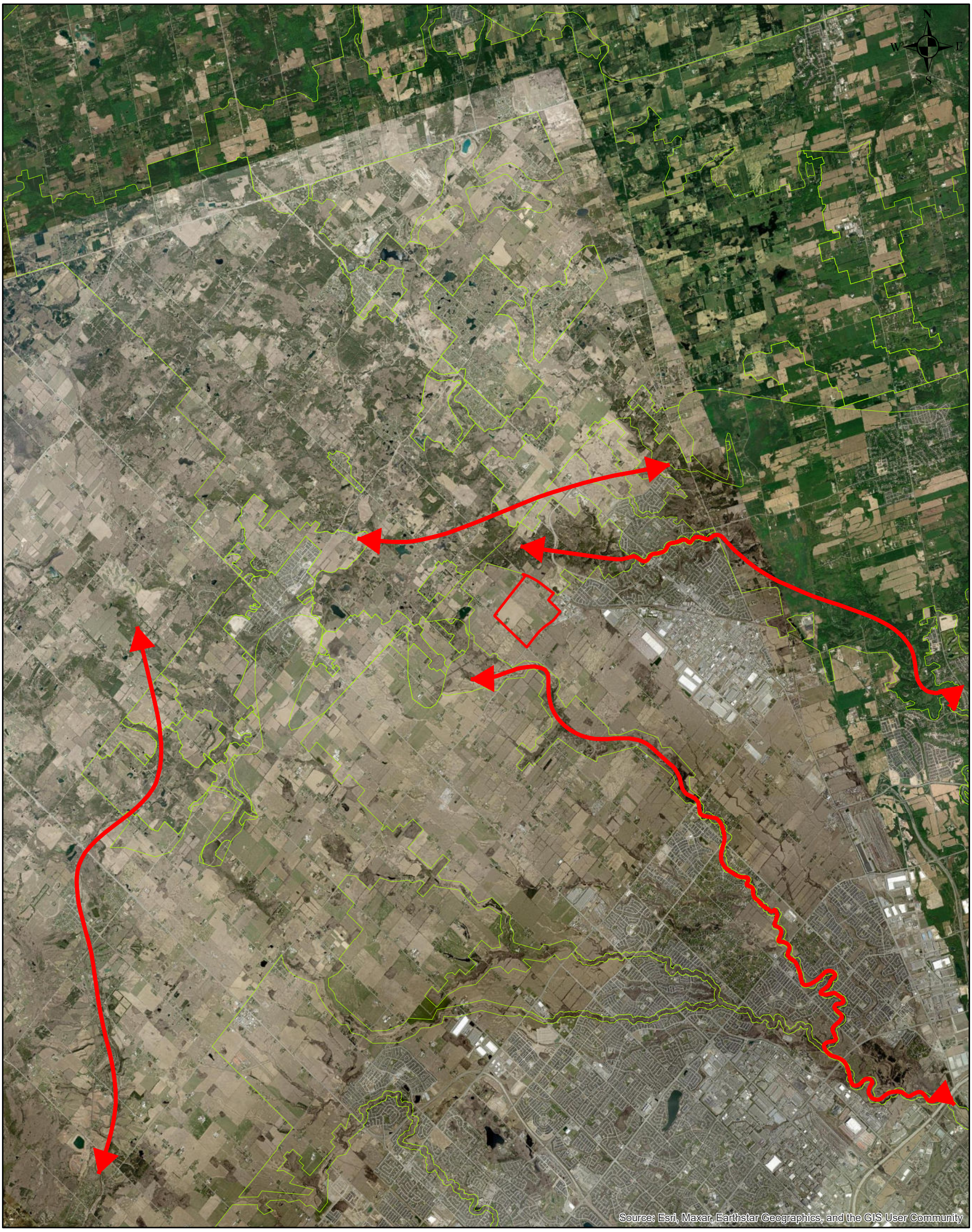
Beacon characterized the treed resources in the Final CEISMP. An inventory and evaluation of the existing individual trees and tree groupings was conducted on June 12, June 18, and August 20, 2020 by an Arborist certified by the International Society of Arboriculture.

Where trees occur in groupings such as hedgerows, rather than tag and assess all trees individually, the number, species, size, and condition of the trees in each group were recorded. The trees that were inventoried individually or as group are illustrated on **Figure 7**. These results are detailed in **Appendix E**.

3.3.5.1 Draft Plans of Subdivision

Treed resources associated with individual Draft Plan areas are identified in **Figures 7A-7D**. Arborist Reports completed for each Draft Plan area are provided in **Appendix E**. In general, individual trees ≥10 cm DBH (diameter at breast height, measured 1.4 m above grade) were tagged with numbered aluminum forestry tags and their locations were recorded with dGPS (SBAS). Trees located on adjacent properties were not tagged but were assessed based on observations. For each tree, the following information was recorded:

- Species;
- Trunk DBH (diameter at breast height, measured 1.4 m above grade);
- Health condition; and
- Structural condition rating.



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- PROVINCIAL AND REGIONAL SCALE NATURAL HERITAGE SYSTEM
- LINKAGES

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FIGURE 5

LANDSCAPE LEVEL NATURAL HERITAGE SYSTEM

June 2024 Scale 1:100,000

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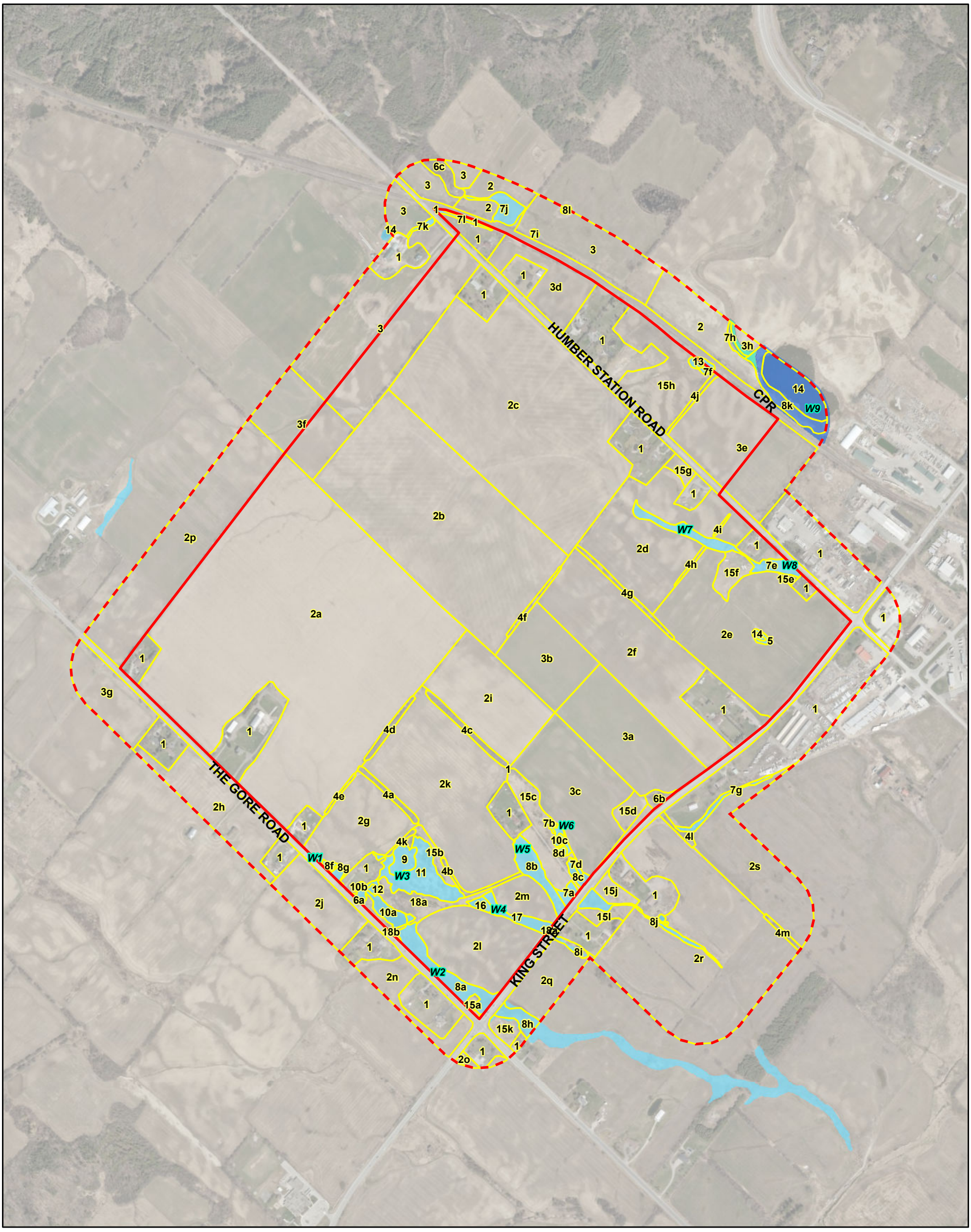

Legend

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- ECOLOGICAL COMMUNITIES
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- PROVINCIALLY SIGNIFICANT WETLANDS (NOT STAKED BY MNRF)
- W1 WETLAND NUMBER

Unit	Vegetation Type
1	Anthropogenic
2	Agriculture - Row Crops
3	Agiculture - Hay
4	Hedgerow (H)
5	Willow Mineral Deciduous Swamp (SWD4-1)
6	Cultural Thicket (CUT1)
7	Reed Canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Cattail Organic Shallow Marsh (MAS3-1)
10	Stonewort Submerged Shallow Aquatic (SAS1-3)
11	Forb Mineral Meadow Marsh (MAM2-2)
12	Organic Deciduous Swamp (SWD3)
13	Pondweed Submerged Shallow Aquatic
14	Open aquatic
15	Dry-Moist Old Field Meadow (CUM1-1)
16	Willow Mineral Thicket Swamp (SWT2-2)
17	Mineral Meadow Marsh (MAM2)
18	Cultural Plantation (CUP)

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FIGURE 6

ECOLOGICAL COMMUNITIES

June 2024 Scale 1:9,000

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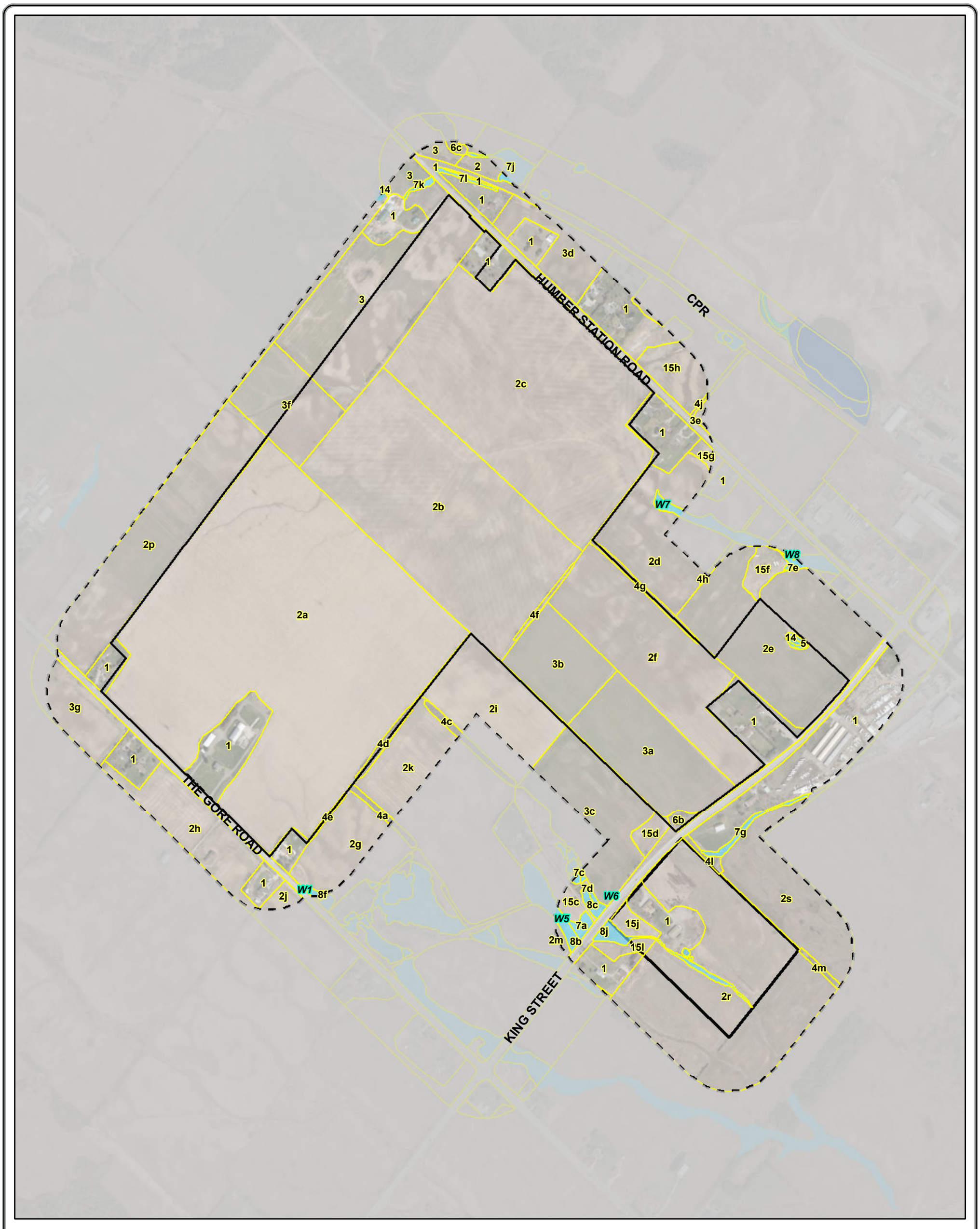

Legend

- ARGO MACVILLE DRAFT PLAN AREA
- STUDY AREA
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- ECOLOGICAL COMMUNITIES
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- PROVINCIALLY SIGNIFICANT WETLANDS (NOT STAKED BY MNRF)
- W1 WETLAND NUMBER

Unit	Vegetation Type
1	Anthropogenic
2	Agriculture - Row Crops
3	Agiculture - Hay
4	Hedgerow (H)
5	Willow Mineral Deciduous Swamp (SWD4-1)
6	Cultural Thicket (CUT1)
7	Reed Canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Cattail Organic Shallow Marsh (MAS3-1)
10	Stonewort Submerged Shallow Aquatic (SAS1-3)
11	Forb Mineral Meadow Marsh (MAM2-2)
12	Organic Deciduous Swamp (SWD3)
13	Pondweed Submerged Shallow Aquatic
14	Open aquatic
15	Dry-Moist Old Field Meadow (CUM1-1)
16	Willow Mineral Thicket Swamp (SWT2-2)
17	Mineral Meadow Marsh (MAM2)
18	Cultural Plantation (CUP)

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FIGURE 6A

ECOLOGICAL COMMUNITIES ARGO MACVILLE DRAFT PLAN AREA

June 2024 Scale 1:8,000

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Legend

- ARGO HUMBER STATION DRAFT PLAN AREA
- STUDY AREA
- ECOLOGICAL COMMUNITIES
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- PROVINCIALLY SIGNIFICANT WETLANDS (NOT STAKED BY MNRF)
- W1 WETLAND NUMBER

Unit	Vegetation Type
1	Anthropogenic
2	Agriculture - Row Crops
3	Agiculture - Hay
4	Hedgerow (H)
5	Willow Mineral Deciduous Swamp (SWD4-1)
6	Cultural Thicket (CUT1)
7	Reed Canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Cattail Organic Shallow Marsh (MAS3-1)
10	Stonewort Submerged Shallow Aquatic (SAS1-3)
11	Forb Mineral Meadow Marsh (MAM2-2)
12	Organic Deciduous Swamp (SWD3)
13	Pondweed Submerged Shallow Aquatic
14	Open aquatic
15	Dry-Moist Old Field Meadow (CUM1-1)
16	Willow Mineral Thicket Swamp (SWT2-2)
17	Mineral Meadow Marsh (MAM2)
18	Cultural Plantation (CUP)

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FIGURE 6B

ECOLOGICAL COMMUNITIES ARGO HUMBER STATION DRAFT PLAN

June 2024 Scale 1:3,000

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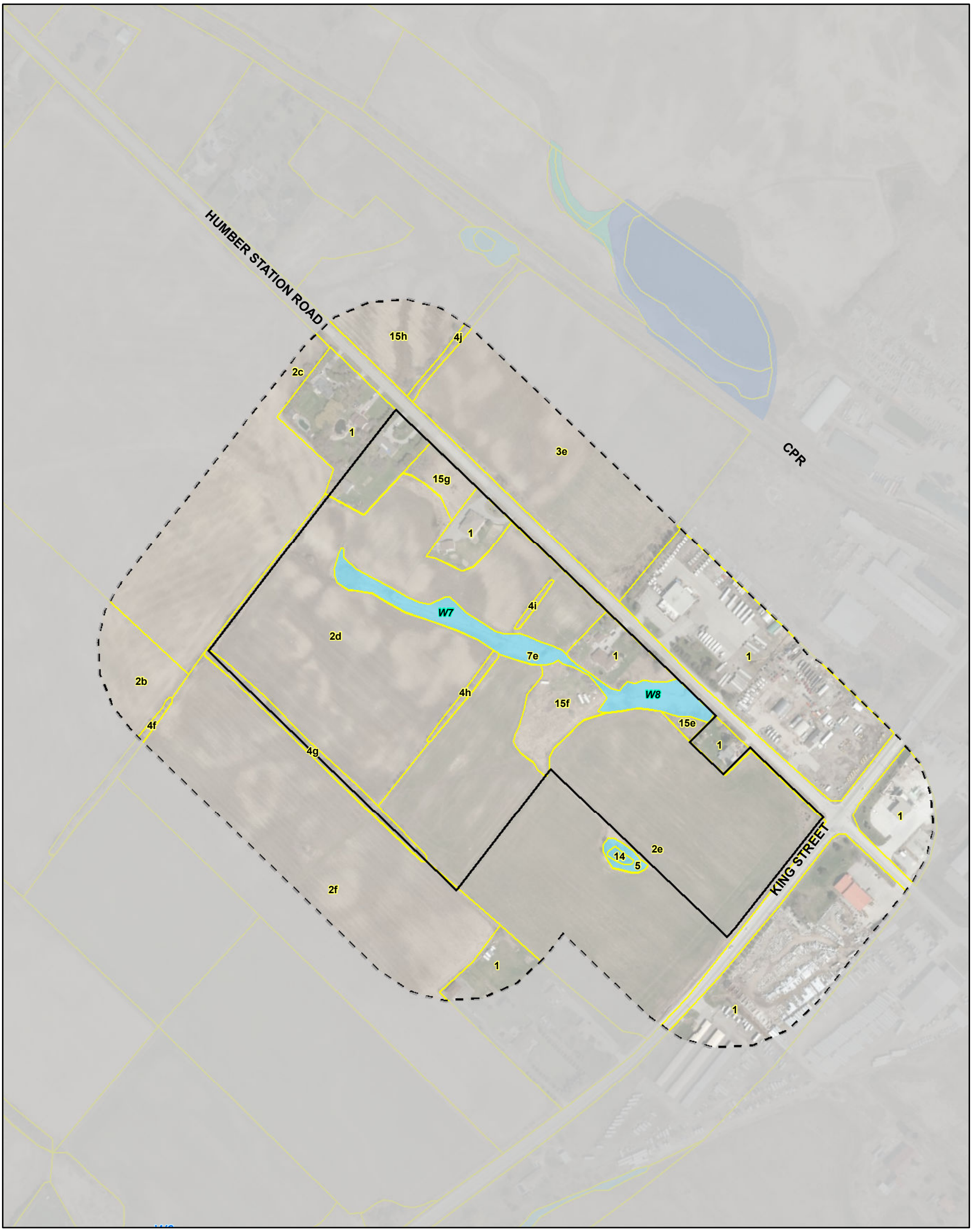

Legend

- HUMBERKING WEST DRAFT PLAN AREA
- STUDY AREA
- ECOLOGICAL COMMUNITIES
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- PROVINCIALLY SIGNIFICANT WETLANDS (NOT STAKED BY MNRF)
- W1 WETLAND NUMBER

Unit	Vegetation Type
1	Anthropogenic
2	Agriculture - Row Crops
3	Agiculture - Hay
4	Hedgerow (H)
5	Willow Mineral Deciduous Swamp (SWD4-1)
6	Cultural Thicket (CUT1)
7	Reed Canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Cattail Organic Shallow Marsh (MAS3-1)
10	Stonewort Submerged Shallow Aquatic (SAS1-3)
11	Forb Mineral Meadow Marsh (MAM2-2)
12	Organic Deciduous Swamp (SWD3)
13	Pondweed Submerged Shallow Aquatic
14	Open aquatic
15	Dry-Moist Old Field Meadow (CUM1-1)
16	Willow Mineral Thicket Swamp (SWT2-2)
17	Mineral Meadow Marsh (MAM2)
18	Cultural Plantation (CUP)

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FIGURE 6C

ECOLOGICAL COMMUNITIES HUMBERKING WEST DRAFT PLAN

June 2024 Scale 1:4,000

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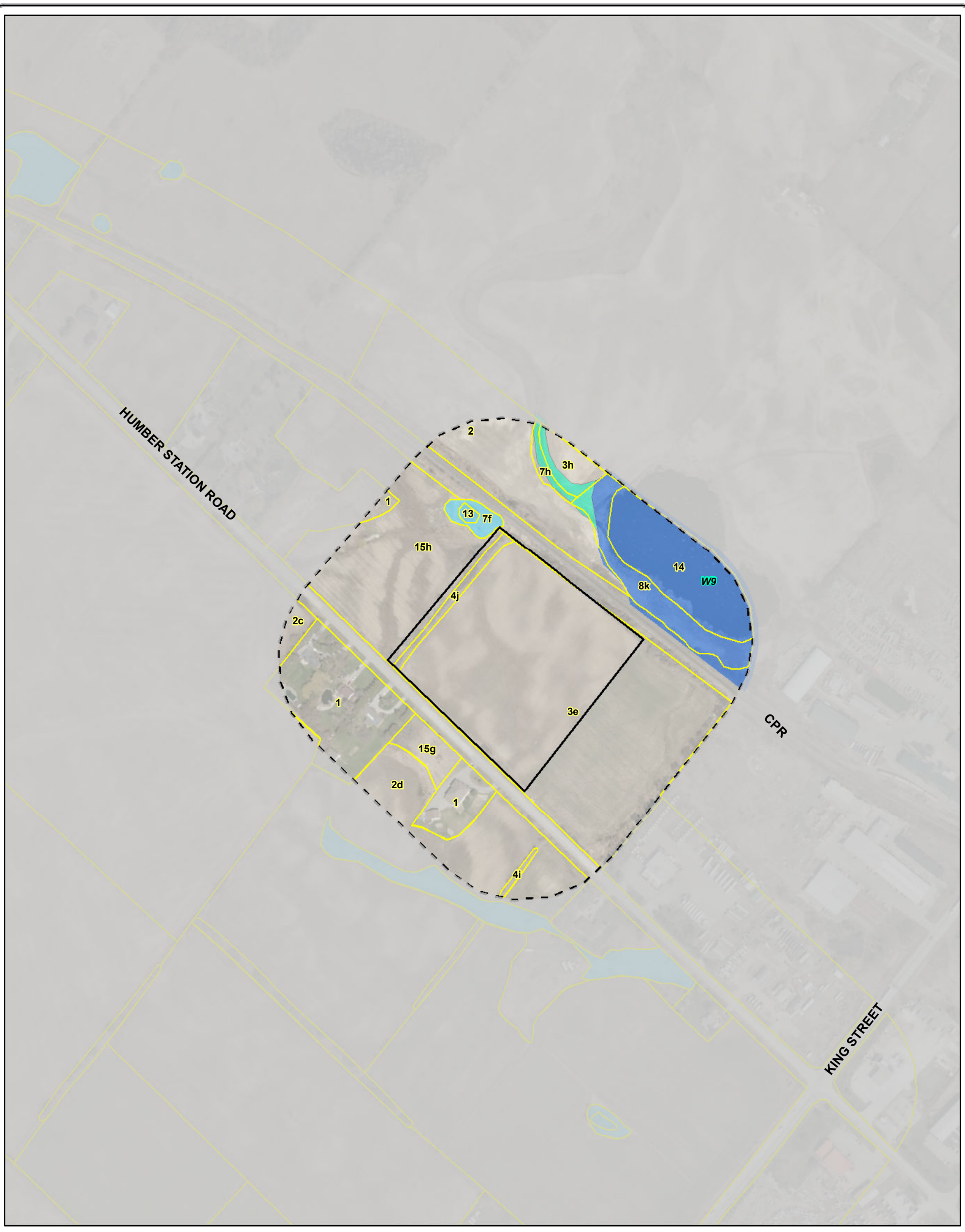

Legend

- HUMBERKING EAST DRAFT PLAN AREA
- STUDY AREA
- ECOLOGICAL COMMUNITIES
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- PROVINCIALLY SIGNIFICANT WETLANDS (NOT STAKED BY MNRF)
- W1 WETLAND NUMBER

Unit	Vegetation Type
1	Anthropogenic
2	Agriculture - Row Crops
3	Agiculture - Hay
4	Hedgerow (H)
5	Willow Mineral Deciduous Swamp (SWD4-1)
6	Cultural Thicket (CUT1)
7	Reed Canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Cattail Organic Shallow Marsh (MAS3-1)
10	Stonewort Submerged Shallow Aquatic (SAS1-3)
11	Forb Mineral Meadow Marsh (MAM2-2)
12	Organic Deciduous Swamp (SWD3)
13	Pondweed Submerged Shallow Aquatic
14	Open aquatic
15	Dry-Moist Old Field Meadow (CUM1-1)
16	Willow Mineral Thicket Swamp (SWT2-2)
17	Mineral Meadow Marsh (MAM2)
18	Cultural Plantation (CUP)

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FIGURE 6D

ECOLOGICAL COMMUNITIES HUMBERKING EAST DRAFT PLAN AREA

June 2024 Scale 1:4,000

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Each tree was assigned a condition rating of good, fair, poor, or dead, based on the following criteria:

- Poor – Severe dieback, significant lean, missing leader, major defects, significant decay and/or disease presence;
- Fair – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress;
- Good – Healthy vigorous growth, minor visible defects or damage; and
- Dead – No live growth.

Tree condition was assessed based on presence and severity of flaws, damage, evidence of pests or diseases, structural condition, dead or dying branches, or other decline indicators. Where trees occur in clusters or groupings (i.e., in hedgerows) were proposed for removal, they were not individually tagged and assessed, but rather, the number, species, size, and condition of the trees in each group was recorded.

Argo Macville

An inventory and evaluation of individual trees and tree groupings on the subject lands was completed on June 12, June 18, and August 20, 2020, April 16, 2021, and May 16, 2023 by Arborists certified by the International Society of Arboriculture (ISA). A total of 306 individual trees were documented and assessed on or adjacent to the Draft Plan area. The findings of the tree inventory and assessment are provided in **Appendix E**.

Argo Humber Station

An inventory and evaluation of the existing individual trees and tree groupings on the subject lands was conducted on August 20, 2020, and May 16, 2023 by Arborists certified by the International Society of Arboriculture (ISA). A total of 79 individual trees were documented and assessed on and adjacent to the subject lands. Two of the trees are located within the municipal road allowance along Humber Station Road. Most of the inventoried trees are on adjacent properties. The findings of the tree inventory and assessment are provided in **Appendix E**.

Humberking West

Tree inventory data were collected on September 15 and 29, 2023 by a Beacon arborist certified by the International Society of Arboriculture (ISA). Of the 233 individually tagged trees located within the Humberking West property, 157 are located on the subject lands, 12 are located within the adjacent private properties (0 and 14206 Humber Station Road, and 0 King Street), 22 are co-owned with adjacent private properties, 17 are located within the MRA (Humber Station Road), and 25 are co-owned with the MRA. The findings of the tree inventory and assessment are provided in **Appendix E**.

Humberking East

Tree inventory data were collected on September 15 and 29, 2023 by a Beacon arborist certified by the International Society of Arboriculture (ISA). Of the 52 individually tagged trees located within Humberking East property, 28 are located on the subject lands, one (1) is located on an adjacent private

property (0 Humber Station Road), eight (8) are located within the MRA (Humber Station Road), one (1) is co-owned between the subject lands and MRA, seven (7) are located within the Canadian Pacific Railway Right-of-Way, and seven (7) are co-owned between the subject lands and Canadian Pacific Railway Right-of-Way. The findings of the tree inventory and assessment are provided in **Appendix E**.

3.3.6 Avifauna

A total of 48 bird species were recorded during the 2013 and 2014 surveys completed by Dougan & Associates *et al*. (2014a and 2014b). Most species observed were noted as common and widespread in Ontario and representative of open habitats. A species list was not included in the report; however, it was noted that the following avian SAR were recorded:

- Barn Swallow (Hirundo rustica) - 14 individuals were seen in six locations;
- Bank Swallow (Riparia riparia) - one individual was seen flying over Humber Station Road on July 13, 2013, although given the habitat in this location and the surrounding areas, Dougan & Associates et al. (2014b) assumed it was not likely breeding locally;
- Bobolink (Dolichonyx oryzivorus) - at least 42 individuals were seen in six general locations; and
- Eastern Meadowlark (Sturnella magna) - six individuals (which were all single birds singing) were seen in six locations.

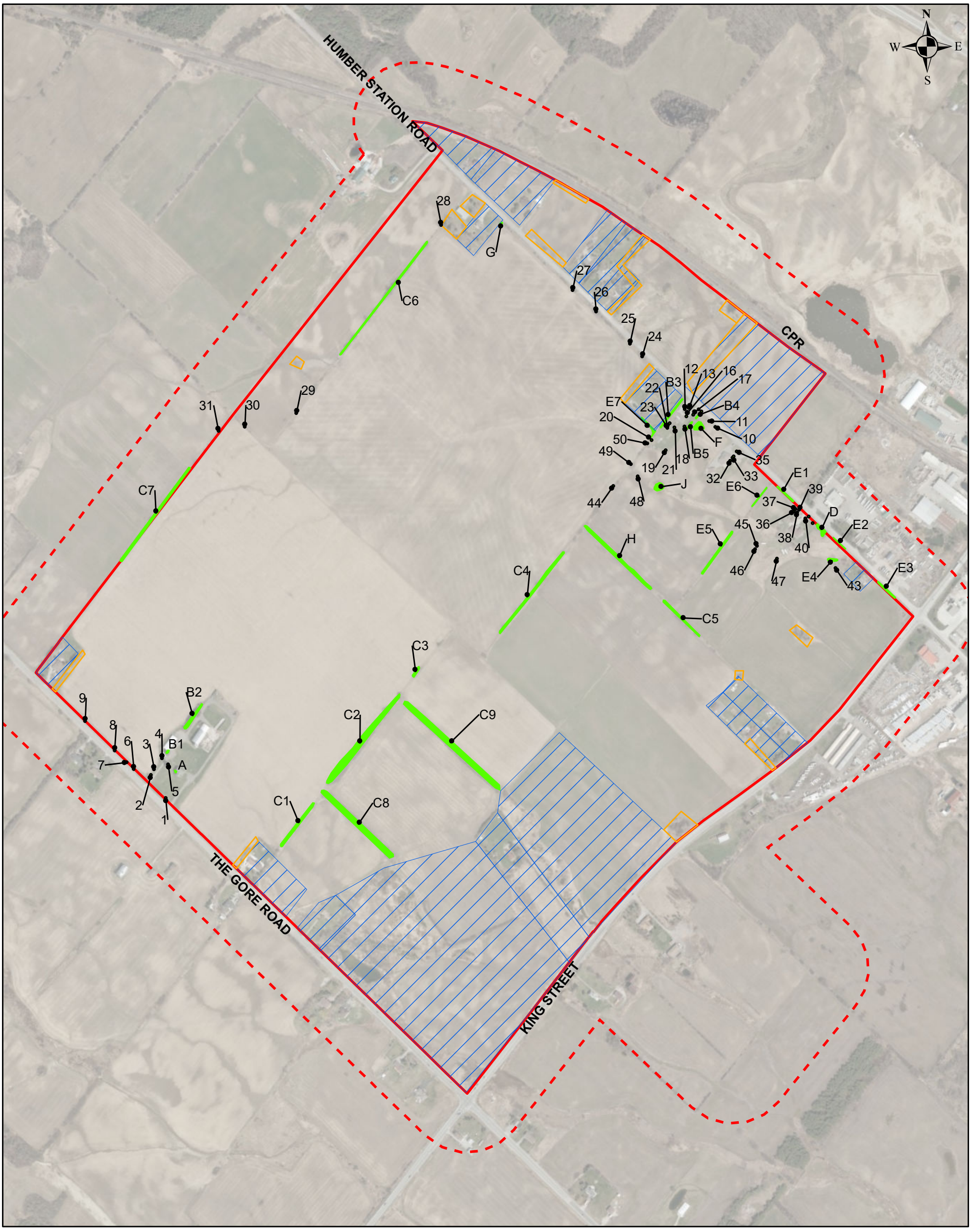
The Final CEISMP presented results of breeding bird surveys completed by Beacon in 2020 (**Figure 8**). Surveys took place in the early morning on days with low winds (3 or less on the Beaufort scale), temperatures within 5°C of normal and minimal precipitation. The Final CEISMP Study Area was walked such that all singing birds could be heard or observed and recorded on an aerial photograph; field notes are provided in **Appendix F**, survey details are presented in **Table 13**.

Table 13. Breeding Bird Survey Details - 2020

Details	Survey 1	Survey 2	Survey 3
Date:	May 28, 2020	June 19, 2020	July 4, 2020
Start Time:	4:45	6:20	4:45
End Time:	8:15	9:10	8:30
Temperature (˚C):	16-18	19-20	18-21
Wind speed (km/h):	0	0	0
Cloud cover (%):	100	20-75	0
Precipitation:	None	None	None

A total of 47 species were documented (**Appendix G**) in 2020. Of the 47 species documented, 42 exhibited evidence of breeding. Species that were observed only flying or foraging over the Final CEISMP Study Area included: Great Blue Heron (*Ardea herodias*), Peregrine Falcon (*Falco peregrinus*), Ring-billed Gull (*Larus delawarensis*), Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), and Tree Swallow (*Tachycineta bicolor*).

Species observed were generally associated with the following three habitat types: agriculture/hedgerow, house/garden and wetland/early successional habitats. Field notes from the breeding bird surveys in 2020 indicated where each species has been recorded, and has been included as **Appendix F**.



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION); PLEASE REFERENCE ARBORIST REPORTS FOR ARGO-MACVILLE AND ARGO-HUMBER STATION

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FIGURE 7

TREED RESOURCES

June 2024 Scale 1:7,500

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LEGEND

- ARGO MACVILLE DRAFT PLAN AREA
- STUDY AREA
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- • INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

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FIGURE 7A

TREED RESOURCES
ARGO MACVILLE DRAFT PLAN AREA

June 2024 Scale 1:8,000

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N
W
E
S

HUMBER STATION ROAD

CPR

G
27
26
25
24
12
13
16
17
B3
22
E7
23
B4
11
10
F
B5
18
21

LEGEND

- ARGO HUMBER STATION DRAFT PLAN AREA
- STUDY AREA
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

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FIGURE 7B

TREED RESOURCES
ARGO HUMBER STATION DRAFT PLAN

June 2024 Scale 1:3,000

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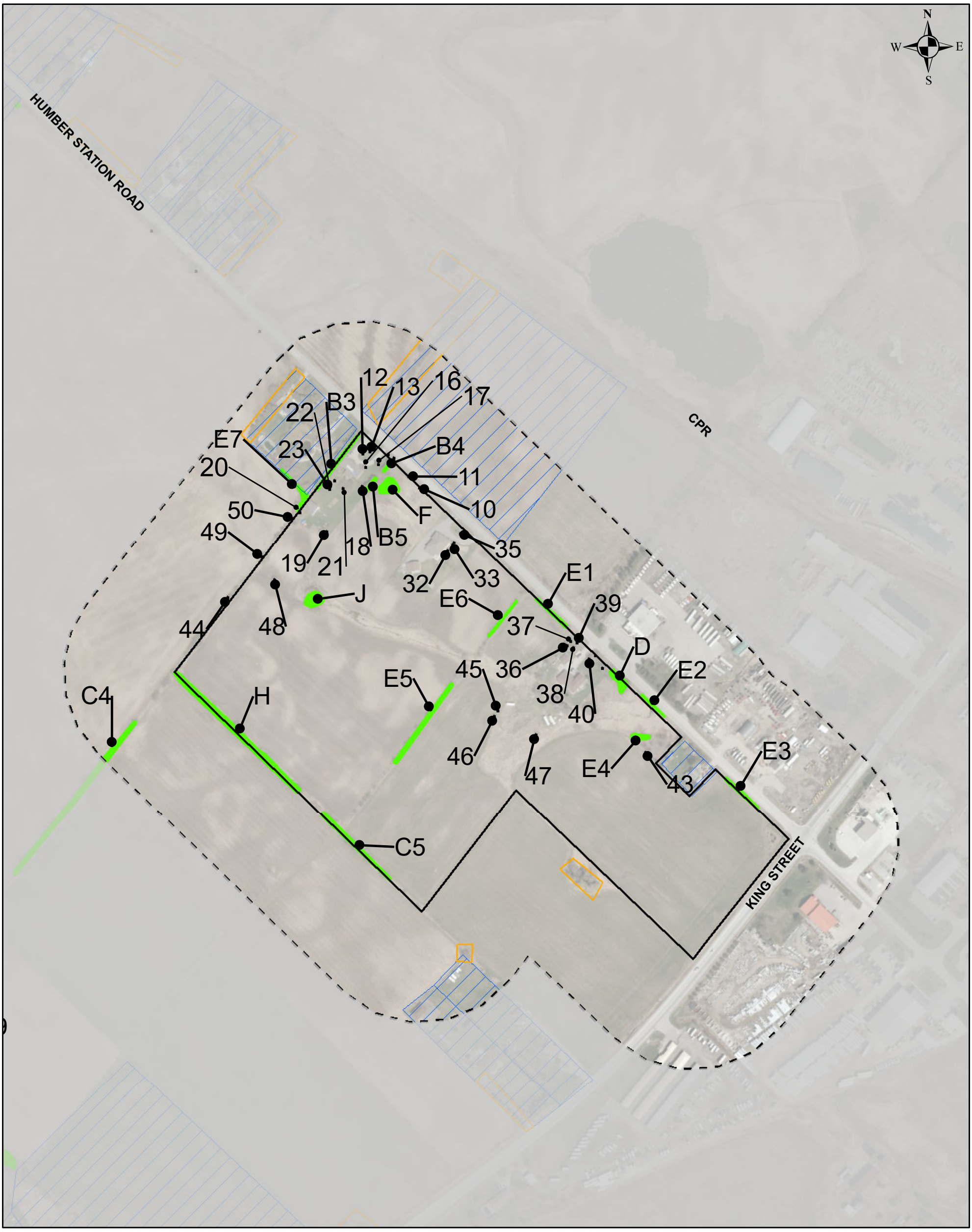

LEGEND

- HUMBERKING WEST DRAFT PLAN AREA
- STUDY AREA
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

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FIGURE 7C

TREED RESOURCES HUMBERKING WEST DRAFT PLAN

June 2024 Scale 1:4,000

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N
W
E
S

HUMBER STATION ROAD

CPR

KING STREET

24
12
13
16
17
B3
22
E7
23
B4
11
10
F
B5
18
21
35
32
33
E6
E1

LEGEND

- HUMBERKING EAST DRAFT PLAN AREA
- STUDY AREA
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

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FIGURE 7D

TREED RESOURCES HUMBERKING EAST DRAFT PLAN AREA

June 2024 Scale 1:4,000

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The avian community is comprised of species that are indicative of agricultural and rural settings. This is consistent with existing land usage. Three of the most abundant species recorded included Red-winged Blackbird (*Agelaius phoeniceus*), Song Sparrow (*Melospiza melodia*) and Savannah Sparrow (*Passerculus sandwichensis*).

Other species observed that are also tolerant of anthropogenically modified habitats include America Robin (*Turdus migratorius*), House Wren (*Troglodytes aedon*), European Starling (*Sturnus vulgaris*), Northern Cardinal (*Cardinalis cardinalis*), Indigo Bunting (*Passerina cyanea*), Brown-headed Cowbird (*Molothrus ater*) and American Goldfinch (*Spinus tristis*).

Other than the Red-winged Blackbird, which as discussed is an anthropogenic tolerant bird, a small number of species generally considered to be wetland associates were observed. A single Swamp Sparrow (*Melospiza georgiana*) and a few Common Yellowthroat (*Geothlyphis trichas*) were observed in the W1-W6 wetland habitats.

Of the 42 species that exhibited breeding evidence, all have a conservation rank of S5 (Secure) or S4 (Apparently Secure) (NHIC 2020). However, two avian species breeding are listed as Threatened under the *Endangered Species Act* (2007): Bobolink and Eastern Meadowlark.

Bobolink is an area sensitive open country grassland species that requires large blocks of open habitat such as pasturelands and older hay fields. It is estimated that there are 700,000 Bobolink that breed in southern Ontario (Cadman *et al*. 2007). The preferred breeding habitat of Bobolink in eastern North America is confined to open grasslands, particularly hayfields and pastures (McCracken *et al.* 2013, COSEWIC 2010). The species has an affinity for hayfields older than eight years (McCracken *et al*. 2013). It generally avoids habitats that are subject to flooding as well as early successional habitats with tree and shrub growth. However, throughout its range it can also be found in wet prairie, graminoid peatlands, abandoned fields with tall grass, native tall grass prairie, no-till cropland, and reed beds (COSEWIC 2010). On the Subject Lands, Bobolink were observed in Agriculture - Hay (ELC Unit 3c) and Agriculture - Row Crop (ELC Units 2b and 2i) on May 28, 2020 and in Agriculture - Hay (ELC Unit 3c) on June 19, 2020. No Bobolink were observed during the third breeding bird survey on July 4, 2020 as suitable habitat was no longer present due to cropping. As lands are regularly farmed and crops rotated, the area does not provide suitable habitat for these species. Utilization of the fields by this species is highly variable and ephemeral.

Eastern Meadowlark is also considered an area sensitive species that breeds in large hay fields, pastures and old field meadows (COSEWIC 2011b). While this species has similar habitat preference to Bobolink, it can also be found in more successional habitats that contain sparse tree and shrub cover as well as a higher proportion of forbs. Eastern Meadowlark were observed in Agriculture - Row Crops (ELC Units 2c and 2d) on May 28, 2020 and in Agriculture - Hay (ELC Unit 3d) on July 4, 2020. Eastern Meadowlark was also observed west of The Gore Road on June 19, 2020.

Historically, in eastern North America, open country species such as Bobolink and Eastern Meadowlark have benefited from human alteration of the landscape for agriculture. However, like many other open country species, their populations in Ontario and other jurisdictions are thought to have declined. Bobolink and Eastern Meadowlark are area-sensitive, which are species that either require a larger block of suitable habitat in which to breed or which are more productive in large habitat blocks. The Savannah Sparrow is also considered a grassland area-sensitive species. It is very common and widespread and breeds in a variety of open field situations from agricultural fields to large cultural meadows.

TRCA ranks species of regional conservation concern and ranks them from L1 (highest concern) to L5 (least concern) (TRCA 2016). Seven species are of regional concern and have rank of L1 to L3. Species include: Bobolink, Eastern Meadowlark, Wild Turkey (*Meleagris gallopavo*), Black-billed Cuckoo (*Coccyzus erythropthalmus*), Horned Lark (*Eremophila alpestris*), Brown Thrasher (*Toxostoma rufum*) and Vesper Sparrow (*Pooecetes gramineus*) which are ranked L1. Eastern Meadowlark are ranked as L2, meaning they typically occur in high-quality habitats and are of regional concern. The remaining five species are ranked L3, meaning they can withstand minor disturbance, are generally secure in the natural matrix but are of regional concern.

3.3.6.1 Draft Plans of Subdivision

Breeding bird surveys associated with individual Draft Plan areas are identified in **Figures 8A-8D**.

Argo Macville

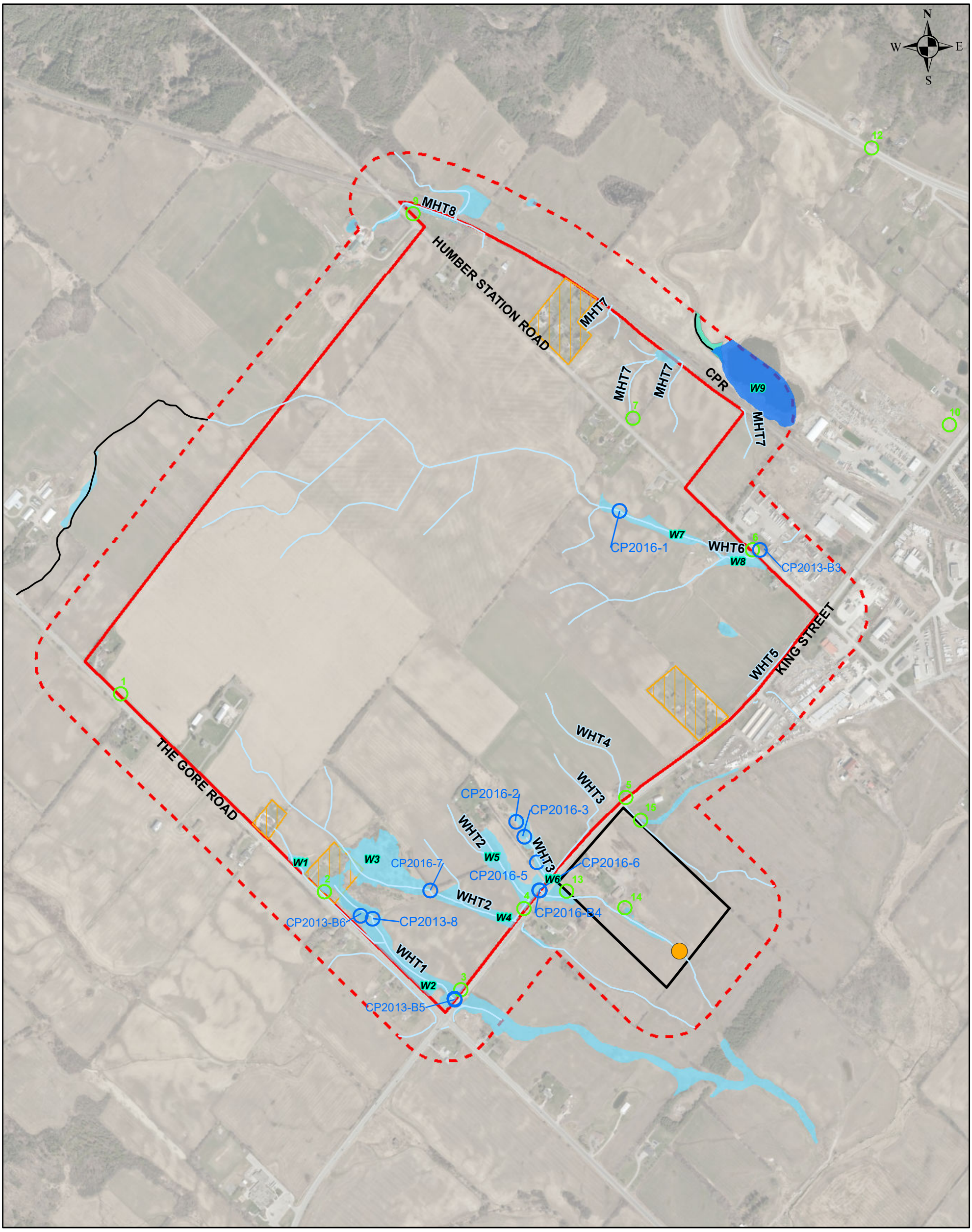
Breeding bird surveys are being conducted in 2024 for other lands owned by the proponent that are required for servicing.

3.3.7 Herpetofauna

Anurans

Dougan & Associates *et al.* (2014a and 2014b) conducted nocturnal amphibian breeding surveys on April 25, May 27, and June 24, 2014. Five species of amphibians were recorded during these surveys, including Spring Peeper (*Pseudacris crucifer*), Wood Frog (*Lithobates sylvaticus*), Gray Tree Frog (*Hyla versicolor*), Green Frog (*Rana clamitans*), and American Toad (*Anaxyrus americanus*). All observations were associated with wetlands and ponds within the Final CEISMP Study Area; however, the precise locations of amphibian observations were not included in their reporting.

In 2020, Beacon completed additional amphibian surveys by establishing monitoring stations in locations similar to those used by Dougan & Associates *et al.* (2014a and 2014b). Call surveys are the primary method for identifying breeding habitats for anurans (frogs and toads) as this is when they are vocalizing and most detectable as different species breed at different times in the spring three surveys were completed in order to detect the full range of anuran species present on a site. Surveys focussed on potential anuran breeding habitat such as wetlands and ponds. The locations of the call survey stations are illustrated in **Figure 8**.



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- PORTIONS OF STUDY AREA NOT ACCESSED DURING BREEDING BIRD SURVEYS
- CP20XX-XX — FISH COMMUNITY SAMPLING SITES (C. PORTT & ASSOCIATES [YEAR-SAMPLING REACH NUMBER])
- 1 — AMPHIBIAN CALL STATION
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DETAILED GEOMORPHIC FIELD SITE
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 8

BIOLOGICAL SAMPLING

June 2024 Scale 1:9,000

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The surveys were conducted after dusk during suitable weather conditions between April and June, a minimum of 15 days apart. Weather details (i.e., air temperature, precipitation, wind speed, and cloud cover) at the time of survey were recorded (see **Table 14**). Surveys were conducted using the point count method whereby the surveyor stands at a set point for a specific period and record all species that can be heard calling over that time from within a 100 m radius sample area. Each survey station was surveyed for a minimum of three minutes. The approximate locations of calling anurans were noted on a standard MMP data sheet and chorus activity for each species was assigned a call code as follows:

- Code 0 - no calls;
- Code 1: individual calls do not overlap and calling individuals can be discretely counted;
- Code 2: calls of individuals sometimes overlap, but numbers of individuals can still be estimated; and
- Code 3: overlap among calls seems continuous (full chorus), and a count estimate is impossible.

Table 14. Anuran Survey Details 2020

Details	Round 1	Round 2	Round 3
Date:	April 27, 2020	May 27, 2020	June 22, 2020
Start time:	20:49	21:36	22:13
Temp (°C):	10	26	23-25
Wind (km/h):	1-11	0	0
Cloud cover (%):	<10	15	90-100
Precipitation	None	None	None/Fog

Five anuran species were recorded from ten stations (**Figure 8**) during the 2020 nocturnal amphibian call surveys. Species recorded included American Toad, Green Frog, Gray Tree Frog, Spring Peeper and Wood Frog (**Table 15**). These findings are consistent with the previous surveys completed by Dougan & Associates *et al.* (2014a and 2014b). It should be noted that Station 8 was not accessed in 2020, and that there is no Station 11.

Table 15. Anuran Survey Results 2020

Station	Round 1	Round 2	Round 3
1	-	GRTR 2(4)*	-
2	-	-	**GRFR 1(1)** **GRTR 2(5)** GRTR 2(4)*
3	-	-	-
4	-	-	GRTR 1(2)*
5	-	GRTR 1(2)*	-
6	-	-	-
7	**SPPE 3** SPPE *	**SPPE 2(10)** GRTR 3 SPPE 3	**AMTO 1(2)** **GRFR 1(1)** GRTR 2(3)
9	SPPE 3 WOFR 1(1) SPPE 3*	GRTR 3 SPPE 2(12) GRTR 3*	GRFR 1(1) GRTR 2(7) AMTO 1(1)* GRTR 2(5)*
10	SPPE 3	GRTR 2(8)	GRTR 2*

Station	Round 1	Round 2	Round 3
	SPPE 3*	SPPE 2(10) GRTR * SPPE 3*	
12	SPPE 3	GRTR 2(10) SPPE 3 GRTR 2* SPPE 2*	AMTO 1(1) GRFR 1(2) GRTR 2(5)*

*= Call recorded from outside of station area
Results in **bold** are recorded within the Subject Lands
AMTO = American Toad, GRFR = Green Frog, GRTR = Gray Tree Frog, SPPE = Spring Peeper, WOFR = Wood Frog
Code 0 - No calling
Code 1 - Individuals can be counted; calls not simultaneous. Estimated number of individuals indicated in brackets
Code 2 - Calls distinguishable, some simultaneous calling. Estimated number of individuals indicated in brackets
Code 3 - Full chorus; calls continuous and overlapping.

As shown on **Figure 8**, the amphibian monitoring stations cover the Secondary Plan Area. The results of the surveys completed to date indicate that most of the breeding is associated with the Provincially Significant Wetland (PSW) east of the Subject Lands. On the Subject Lands, there was only one station (Station 7)) were a call level code of three (3) was recorded on one occasion. This observation corresponds with Spring Peeper during the first round (April 27, 2020). Station 7 includes a Reed Canary Grass Mineral Meadow Marsh (ELC Unit 7f) and Pondweed Submerged Shallow Aquatic (ELC Unit 13).

Reptiles

Dougan & Associates *et al.* (2014b) completed incidental surveys for reptiles in 2013 and 2014. During these surveys, they recorded observations of Midland Painted Turtle (*Chrysemys picta marginata*) and Snapping Turtle (*Chelydra serpentina*) in a small, unevaluated wetland approximately 350 m outside of the Study Area.

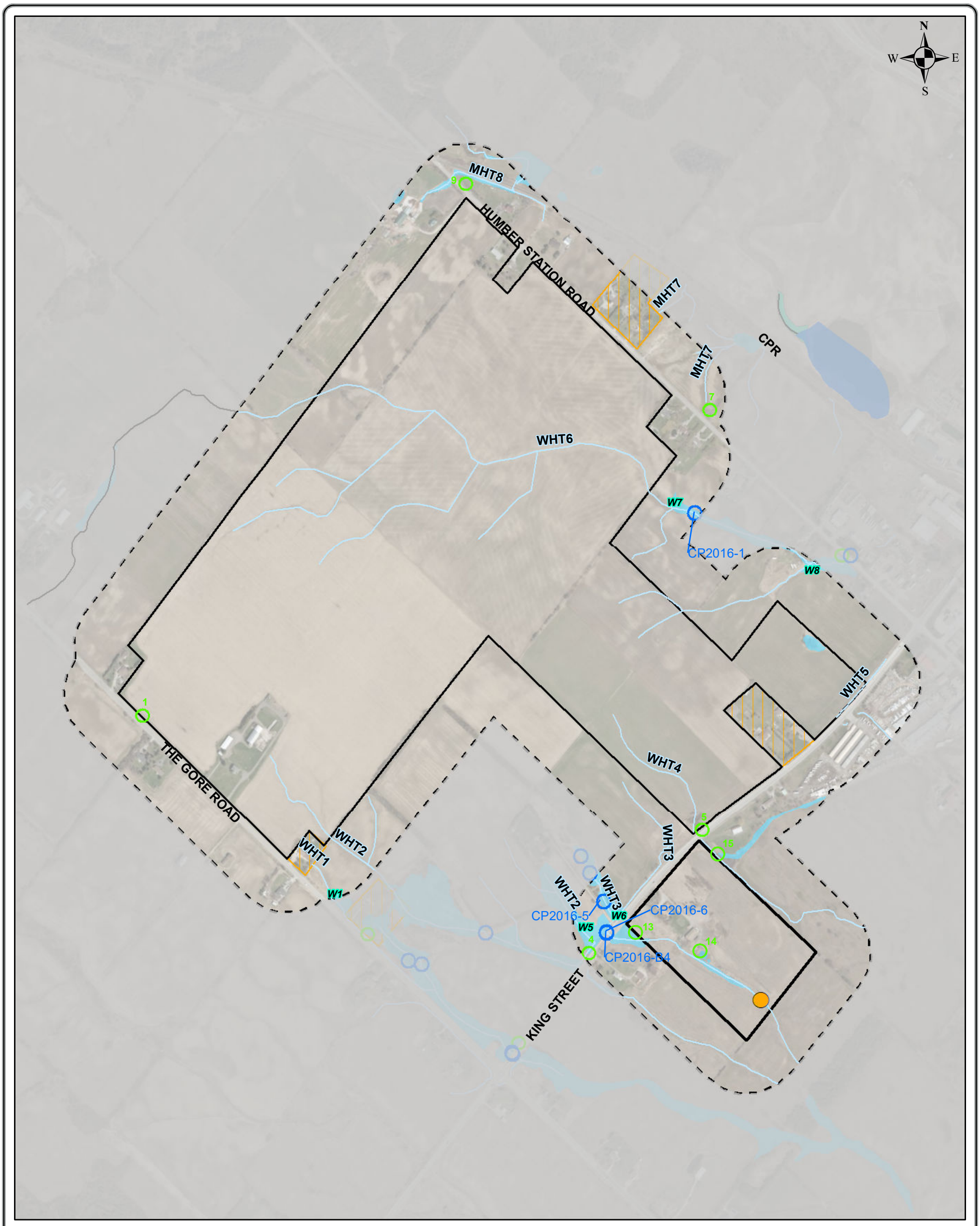
Midland Painted Turtle is not considered significant in Ontario; although, in April 2018 it was designated Special Concern in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) due to loss of wetlands in Ontario; the *Species at Risk Act* has not created a schedule yet for Midland Painted Turtle. However, Snapping Turtle was assigned “Special Concern” status in Canada in 2008 and Ontario in 2009.

No formal surveys for reptiles were undertaken in 2020, however, on October 5, 2020, a juvenile Snapping Turtle was noted incidentally east of the railroad tracks adjacent to the Wetland W9 PSW unit. Surveys for basking turtles are being undertaken in 2024 for ponds within the Final CEISMP Study Area.

3.3.7.1 Draft Plans of Subdivision

Anurans

Breeding amphibian survey stations associated with individual Draft Plan areas are identified in **Figures 8A-8D**.



LEGEND

- ARGO MACVILLE DRAFT PLAN AREA
- STUDY AREA
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- PORTIONS OF STUDY AREA NOT ACCESSED DURING BREEDING BIRD SURVEYS
- CP20XX-XX — FISH COMMUNITY SAMPLING SITES (C. PORTT & ASSOCIATES [YEAR-SAMPLING REACH NUMBER])
- 1 — AMPHIBIAN CALL STATION
- NON-PSW WETLANDS
- DETAILED GEOMORPHIC FIELD SITE
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 8A

BIOLOGICAL SAMPLING
ARGO MACVILLE DRAFT PLAN AREA

June 2024 Scale 1:8,000

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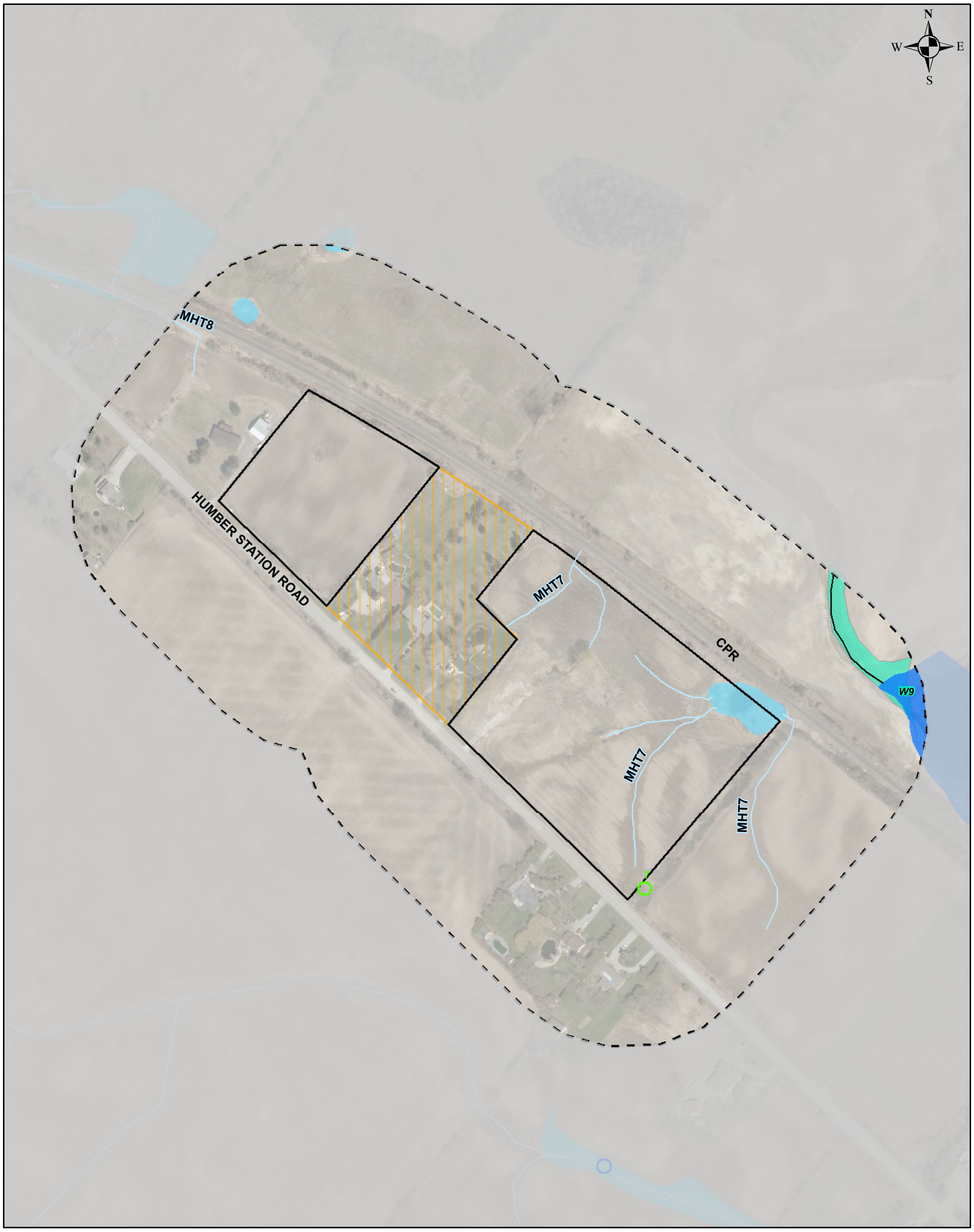

LEGEND

- ARGO HUMBER STATION DRAFT PLAN AREA
- STUDY AREA
- PORTIONS OF STUDY AREA NOT ACCESSED DURING BREEDING BIRD SURVEYS
- FISH COMMUNITY SAMPLING SITES (C. PORTT & ASSOCIATES [YEAR-SAMPLING REACH NUMBER]) — CP20XX-XX
- AMPHIBIAN CALL STATION — 1
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 8B

BIOLOGICAL SAMPLING
ARGO HUMBER STATION DRAFT PLAN

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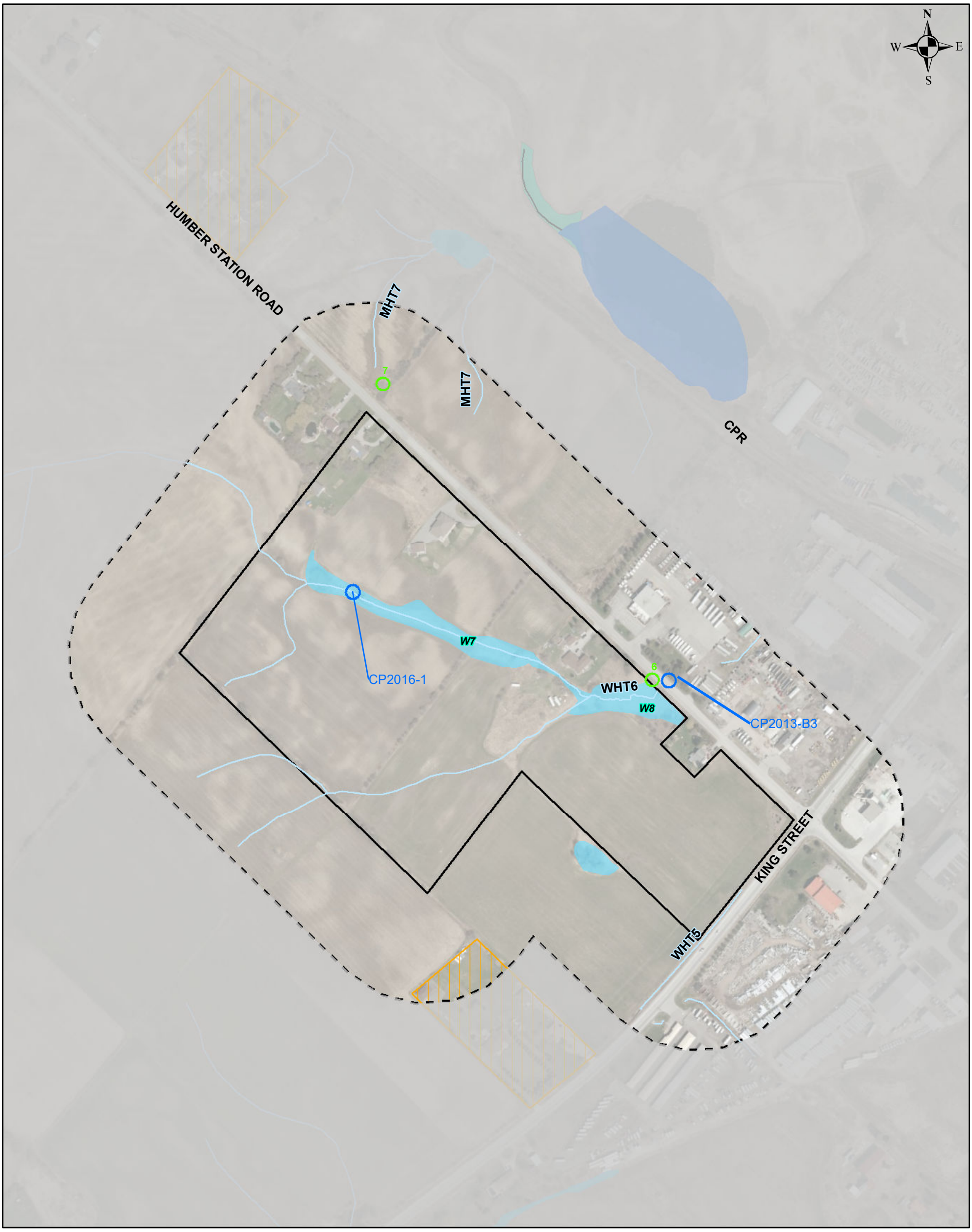

LEGEND

- HUMBERKING WEST DRAFT PLAN AREA
- STUDY AREA
- PORTIONS OF STUDY AREA NOT ACCESSED DURING BREEDING BIRD SURVEYS
- CP20XX-XX — FISH COMMUNITY SAMPLING SITES (C. PORTT & ASSOCIATES [YEAR-SAMPLING REACH NUMBER])
- 1 — AMPHIBIAN CALL STATION
- NON-PSW WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
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FIGURE 8C

BIOLOGICAL SAMPLING HUMBERKING WEST DRAFT PLAN

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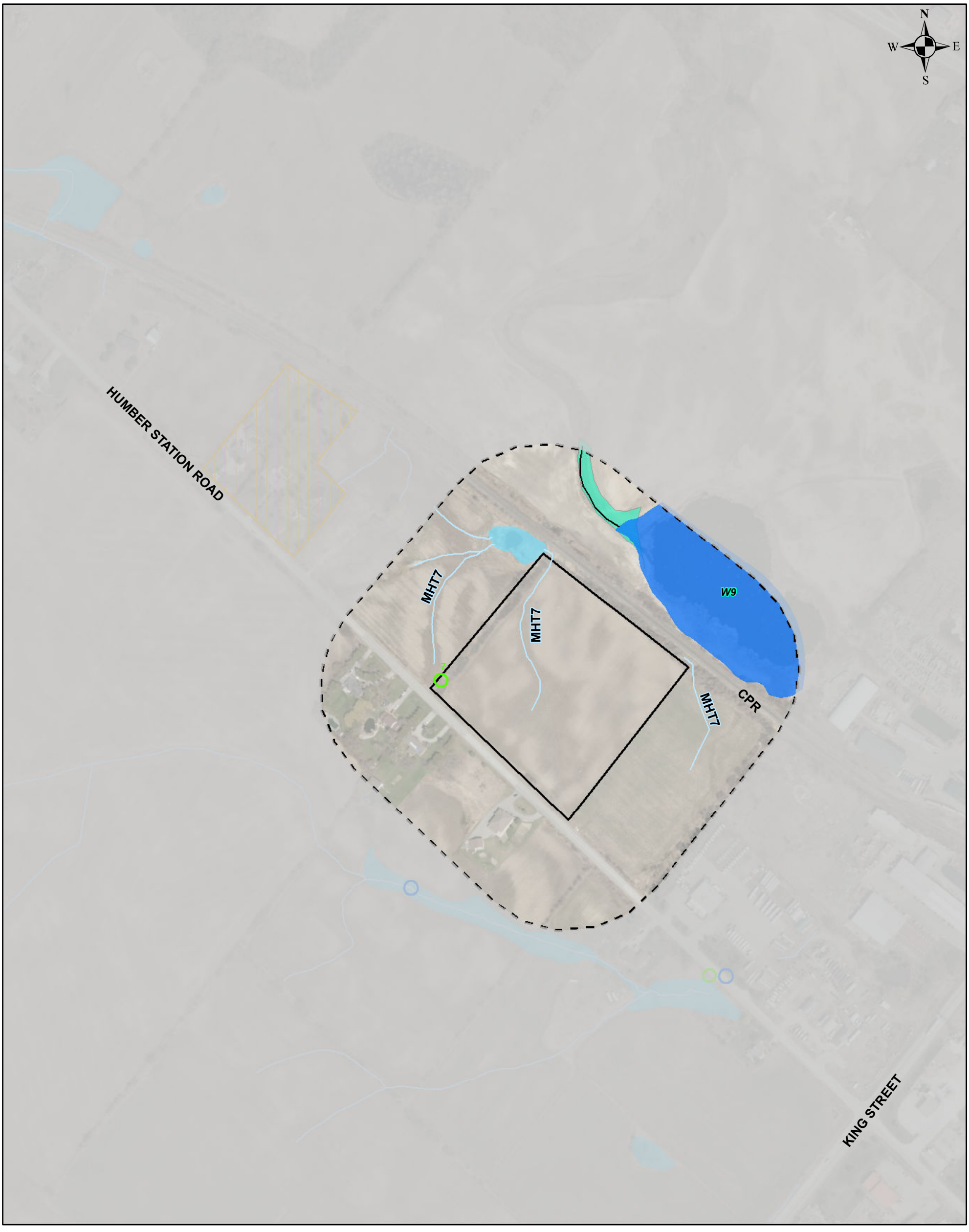

LEGEND

- HUMBERKING EAST DRAFT PLAN AREA
- STUDY AREA
- PORTIONS OF STUDY AREA NOT ACCESSED DURING BREEDING BIRD SURVEYS
- CP20XX-XX — FISH COMMUNITY SAMPLING SITES (C. PORTT & ASSOCIATES [YEAR-SAMPLING REACH NUMBER])
- 1 — AMPHIBIAN CALL STATION
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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FIGURE 8D

BIOLOGICAL SAMPLING HUMBERKING EAST DRAFT PLAN AREA

June 2024

Scale 1:4,000

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Reptiles

To determine whether snake hibernacula habitat could be present, Beacon followed the *Survey Protocol for Ontario's Species at Risk Snakes* (MNRF 2016) to assess the presence of snakes during emergence periods (early spring). Due to the nature of snakes as ectothermic species, snakes hibernate through winter seasons and will become active typically in April or May. During the active seasons, snakes regulate their body temperatures to be between 25-34 °C which is why snakes are most likely to bask on sunny days when ambient temperature is lower than preferred body temperatures (MNRF 2016). Assessing microhabitats for heat conductive features such as rock piles, open grassy fields, hedgerows, concrete pads and leaf piles will assist in the determining the presence of snake species. The Significant Wildlife Habitat Technical Guide (MNRF 2000) considers overwintering habitats for snake to be significant if the hibernacula are used by at least five individuals of the same species or if used by two or more species.

Argo Macville

Breeding amphibian surveys are being conducted in 2024 for other lands owned by the proponent that are required for servicing.

The Argo Macville Draft Plan lands have the potential to support snake hibernacula, a type of Significant Wildlife Habitat (SWH). This is due to the presence of structures such as building foundations, barns and rodent holes / dens (ref. **Photograph 1** below for an example of snake habitat within the residential yard). Beacon assessed all potential basking locations, including rock piles, existing foundations, culverts, ditches, anthropogenic items, and gardens in April 2021. A habitat suitability assessment was completed by Beacon on May 16, 2023. Survey details are summarized in **Table 16**.

No snakes were observed during any of these surveys which suggests that hibernacula are not present.

Table 16. Survey Details for Snake Hibernaculum Surveys – Argo Macville

	Survey 1	Survey 2	Survey 3	Survey 4
Date	April 7, 2021	April 8, 2021	April 19, 2021	May 16, 2023
Start time	13:45	10:05	10:10	10:30
End time	15:30	11:45	11:45	13:30
Temperature	18-19 °C	16-19 °C	15-18 °C	16-20 °C
Wind	0-11 km/h	0-11 km/h	0-11 km/h	20-30 km/h
Cloud cover	0%	0%	0%	100%
Precipitation	None	None	None	None

Photograph 1. Potential Snake Basking Area on the Argo Macville lands (April 7, 2021)

Argo Humber Station

The Argo Humber Station Draft Plan lands have the potential to support snake hibernacula due to the presence of structures such as remnant building foundations and rodent holes / dens. A habitat suitability assessment was completed by Beacon on May 16, 2023 to assess the presence of snakes during emergence periods (early spring) and to locate potential snake hibernacula. Details of this survey are summarized in **Table 17**. An old building foundation (ref. **Photograph 2**) and wetland community were identified as potential habitat. No snakes were observed during this survey.

Table 17. Survey Details for Snake Hibernaculum Surveys – Argo Humber Station

	Survey 1
Date	May 16, 2023
Start time	9:30
End time	10:30
Temperature	16-17 °C
Wind	20-30 km/h
Cloud cover	100%
Precipitation	None

Photograph 2. Potential Snake Habitat at an Old Foundation – Argo Humber Station (May 17, 2023)

Humberking West

Beacon assessed all potential basking locations within the Humberking West property, including rock piles, existing foundations, culverts, ditches, anthropogenic items, and gardens in search of any snakes in April 2021. Three surveys were completed to detect the presence of snakes and details of this survey are summarized in **Table 15**. The Humberking West property supports a variety of habitats that could be used by snakes such as wetlands, rock and brush piles. No snakes were observed during the surveys.

Humberking East

A habitat suitability assessment was completed by Beacon on May 16, 2023 for lands abutting the Humberking East property to assess for potential basking locations in search of snakes (**Table 18**). No snakes were observed during this survey.

Table 18. Survey Details for Snake Hibernaculum Surveys – Humberking East and West

	Survey 1	Survey 2	Survey 3	Survey 4
Date	April 7, 2021	April 8, 2021	April 19, 2021	May 16, 2023
Start time	13:45	10:05	10:10	10:30
End time	15:30	11:45	11:45	13:30
Temperature	18-19 °C	16-19 °C	15-18 °C	16-20 °C
Wind	0-11 km/h	0-11 km/h	0-11 km/h	20-30 km/h
Cloud cover	0%	0%	0%	100%
Precipitation	None	None	None	None

3.3.8 Aquatic Habitat & Fish Communities

MNRF and TRCA fish collection records are not available for the Caledon Station Secondary Plan lands. The MNRF Aquatic Resource Area (ARA) database does however note the following fishes as being associated with the broader Humber River system:

- American Brook Lamprey;
- Blacknose Dace;
- Bluntnose Minnow;
- Brook Trout;
- Brown Trout;
- Common Shiner;
- Creek Chub;
- Fantail Darter;
- Fathead Minnow;
- Johnny Darter x Tessellated Darter;
- Longnose Dace;
- Northern Hog Sucker;
- Rainbow Darter;
- Redside Dace;
- Rock Bass;
- Stonecat; and
- White Sucker.

Aquatic assessments were completed by C. Portt & Associates in 2013 and 2016. The purpose of these assessments was to characterize the fish communities under spring and early summer conditions and to search for migratory spawning fish species. On August 23, 2013 C. Portt & Associates completed an assessment of all drainage features entering or exiting the Secondary Plan Area. The assessment recorded the amount of water, flow and instream habitat conditions during this typically dry season. The results of the aquatic assessment found that the drainage features were considered HDFs and did not have complex function or aquatic communities that were noted to occur downstream of the Secondary Plan Area where flows are seasonal or permanent (Dougan & Associates *et al*. 2014b).

C. Portt & Associates noted that the lower reaches of WHT1 and WHT6 support standing water with intermittent flows and considered these reaches to provide seasonal habitat. To characterize the fish community, C. Portt & Associates completed electrofishing along drainage features at seven stations (**Figure 8**). Fish were captured at two stations corresponding with HDF reaches WHT6-A and WHT1-B. Brook Stickleback (*Culaea inconstans*) was observed at both reaches (stations CP2013-B3, CP2013-B6 and CP2016-1), and Fathead Minnow (*Pimephales promelas*) was observed at WHT1-B (station CP2016-8). For this reason, additional fish community sampling was not undertaken by Beacon.

Brook Stickleback is a coolwater species commonly associated with HDFs throughout southern Ontario (OFFLHD 2020). This species is regularly found in warmwater habitats including man-made drainage ditches, stormwater management ponds and other habitats that go dry in the summer (Stewart and Watkinson 2004).

Fathead Minnow is a warmwater species that prefers still waters of ponds, lakes, creeks and small rivers with muddy substrate (OFFLHD 2020). This species is common in Southern Ontario and is tolerant to anthropogenic activities.

The ARA database classifies all drainage features within the Secondary Plan Area as supporting a warmwater fishery. A review of the DFO's Aquatic Species at Risk online mapping tool, indicates that the are no aquatic species at risk or critical habitat identified within the Study Area. Habitat for endangered Redside Dace is however mapped approximately 1.5 km downstream of the Subject Lands along Lindsay Creek (West Humber) immediately west of The Gore Road. Redside Dace is listed both federally and provincially as endangered and is regulated by DFO under the *Species at Risk Act* and by MECP under the *Endangered Species Act*. Through reviewing MNRF comments on the Background Environmental Study (Dougan & Associates *et al.* 2014b) dated March 11, 2016, it was suggested that "the watercourses within these lands [Option 3 lands] are considered 'contributing' habitat for Redside Dace".

Beacon reviewed aquatic habitat conditions in 2020 and confirmed that conditions are generally consistent with observations made by C. Portt and Associates and the HDFA prepared by Aquafor Beech Limited (2013). Surface water monitoring completed by DS Consultants Ltd. in 2020 indicated that HDF reaches WHT1-A and WHT1-B do receive some baseflow inputs. Additionally, Beacon observed iron staining and watercress within HDF reach WHT1-B which suggests potential groundwater contributions. It is Beacon's opinion that HDF reaches WHT1-A, WHT1-B and WHT6-A provide seasonal fish habitat while the other HDF's, which are dry outside of the spring freshet, provide indirect support to fish habitat and a warmwater thermal regime.

3.3.9 Evaluation of Significant Natural Heritage Resources

The protection, maintenance, enhancement and restoration of ecosystems and their function in the landscape is necessary to maintain ecosystem integrity. This goal has been adopted in the Town's ecosystem principles and ecosystem planning strategy and is to be achieved through implementation of the policies outlined in Ecosystem Planning and Management section of the Town of Caledon Official Plan. All development within the Town of Caledon is required to satisfy the Environmental Performance Measure policies. Significant natural heritage resources within the Secondary Plan Area are illustrated on **Figure 9**.

3.3.9.1 Draft Plans of Subdivision

To determine which biophysical resources and ecological functions are considered significant, significance criteria outlined in the PPS (2020) and associated Natural Heritage Reference Manual (2010), Region of Peel's Greenlands System policies and Town of Caledon's Environmental Performance Measures policies were referenced. Environmental Performance Measures applicable to each Draft Plan Area are listed in **Table 19**.

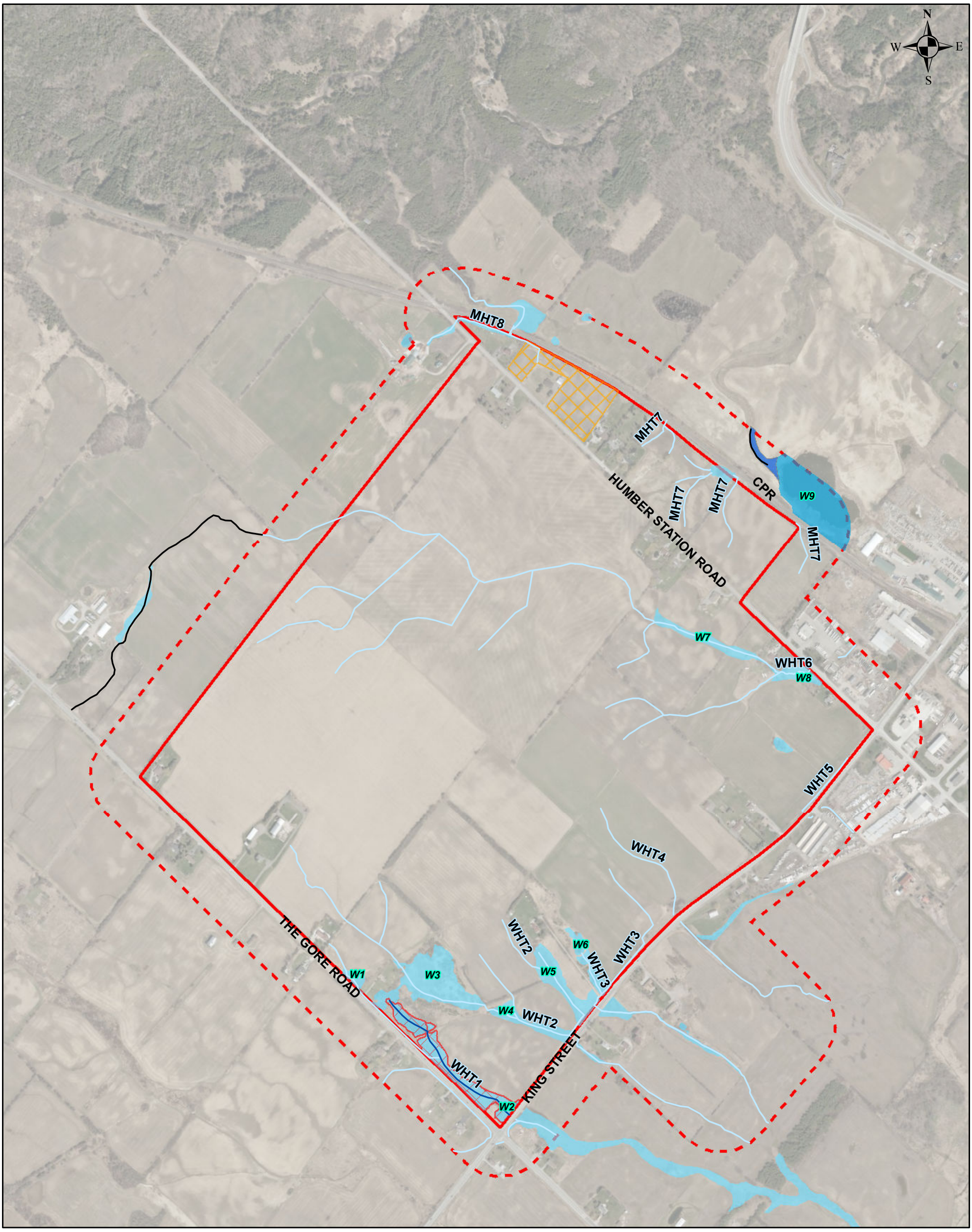
Table 19. Town of Caledon Environmental Performance Measures

Environmental Performance Measure	Draft Plan Area			
	Argo Macville	Argo Humber Station	Humberking	
			West Lands	East Lands
Woodlands	×	×	×	×
Wetlands	✓	✓	✓	×
Areas of Natural and Scientific Interest (ANSIs)	×	×	×	×
Environmentally Significant Areas (ESAs)	×	×	×	×
Niagara Escarpment Natural Areas	×	×	×	×
Niagara Escarpment Protection Areas	×	×	×	×
Habitat of Threatened and Endangered Species	✓	✓	✓	×
Fisheries	×	×	✓	×
Wildlife Habitat	✓	×	✓	×
Valley and Stream Corridors	✓	×	✓	×
Groundwater	✓	✓	✓	✓
Wellhead Protection Areas	×	×	×	×
Soils	✓	✓	✓	✓
Natural Slopes	×	×	×	×
Oak Ridges Moraine Key Natural Heritage Features	×	×	×	×
Oak Ridges Moraine Hydrologically Sensitive Features	×	×	×	×
Greenbelt Key Natural Heritage and Key Hydrologic Features	×	×	×	×

The following subsections describe how the significance of the various Environmental Performance Measures has been evaluated and what criteria have been applied. Significant natural heritage resources within each Draft Plan Area are illustrated on **Figures 9A-9D**.

3.3.9.2 Wetlands

With the exception of Wetland Unit W9, all wetlands on and adjacent to the Caledon Station Secondary Plan Area have been evaluated by Beacon in accordance with the Ontario Wetland Evaluation System (OWES; MNRF 2022) and determined to be non-provincially significant (**Appendix C**). The criteria and definitions included in the PPS (2020) and Region of Peel and Town of Caledon official plans were used to establish the significance of these wetland features.



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- WETLAND CORE AREAS (i.e., PROVINCIALLY SIGNIFICANT WETLANDS)
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- FISH HABITAT

W1 WETLAND NUMBER

WHT1/MHT1 TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HABITAT OF ENDANGERED AND THREATENED SPECIES

- EASTERN MEADOWLARK HABITAT
- REDSIDE DACE CONTRIBUTING HABITAT

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FIGURE 9

SUMMARY OF SIGNIFICANT NATURAL HERITAGE RESOURCES

June 2024 Scale 1:9,000

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Both the PPS and ROP describe “Significant Wetlands” as follows:

> *…an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time.*

Based on the application of the provincial and regional significance criteria, only Wetland Unit W9 (ELC Units 8k & 14b, PSW) located east of the rail line would be considered significant. Significant Wetlands are defined as “Core Areas” in the ROP. The unevaluated wetland at ELC Unit 7h would qualify as “Potential Natural Areas and Corridors” (PNACs) and form part of the Regional Greenlands System. The ROP defers to local municipal plans regarding protection and management of PNACs; however, the Town does not have policies pertaining to PNACs.

The Town of Caledon Official Plan defines Significant Wetlands as “Wetland Core Areas”. New development is generally prohibited in Wetland Core Areas. The Town of Caledon Official Plan defines wetlands other than Significant Wetlands as “Other Wetlands”. Under the Town’s Environmental Ecosystem Framework, Wetland Core Area as included within “Natural Core Areas” and Other Wetlands are included under “Supportive Natural Systems”. Irrespective of these categorizations, the Town’s Environmental Performance Measures policies require all wetlands and their functions to be maintained so as not to compromise ecosystem integrity. While the Town’s policies prohibit any development within Wetland Core Areas (i.e., PSWs), they do permit development within Other Wetlands, provided it can be demonstrated to the satisfaction of the Town and applicable review agencies that such development will not compromise ecosystem integrity.

Based on the evaluation of the provincial, regional and local significance criteria pertaining to wetlands, only Wetland Unit W9 meets the definition of significant wetland. All wetlands within the Secondary Plan Area are not considered significant. Irrespective of their significance status, all wetlands are subject to Town’s Environmental Performance Measures policies.

3.3.9.3 Woodlands

The PPS (2020) defines Significant Woodlands as follows:

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

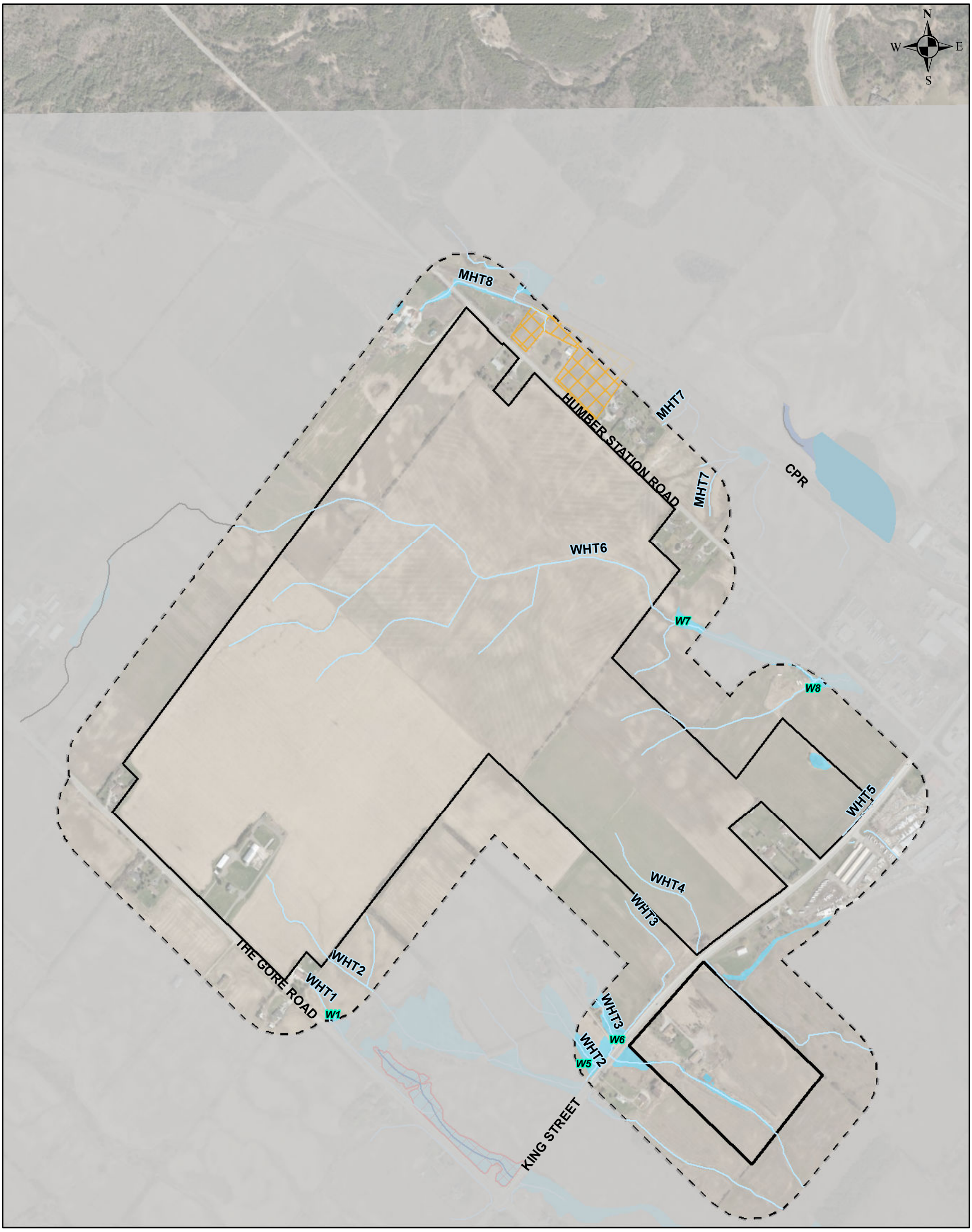
The Region’s Official Plan defines Significant Woodlands as follows:

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

Prior to application of the significant woodland criteria, it is necessary to first identify which treed features meet the definition of a "woodland" as per the Town of Caledon Official Plan.

Town of Caledon Official Plan Glossary of Terms (Section 6.7) defines "woodlands" as follows:

> *Woodlands, shall mean ecosystems comprised of treed areas and the immediate biotic and abiotic environmental conditions on which they depend. Woodlands provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, the provision of clean air and the long-term storage of carbon, the provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include woodlots, cultural woodlands, cultural savannahs, plantations and forested areas and may also contain remnants of old growth forests.*
>
> *Woodlands are further defined as any area greater than 0.5 hectares that has:*
> - *a) A tree crown cover of over 60% of the ground, determinable from aerial photography, or*
> - *b) A tree crown cover of over 25% of the ground, determinable from aerial photography, together with on-ground stem estimates of at least:*
>   - *i) 1,000 trees of any size per hectare, or*
>   - *ii) 750 trees measuring over five centimetres in diameter at breast height (1.37m), per hectare, or*
>   - *iii) 500 trees measuring over 12 centimetres in diameter at breast height (1.37m), per hectare, or*
>   - *iv) 250 trees measuring over 20 centimetres in diameter at breast height (1.37m), per hectare (densities based on the Forestry Act of Ontario, 1998),*
>
> *and, which have a minimum average width of 40 metres or more measured to crown edges.*
>
> *Treed portions with less than the required stocking level will be considered part of the woodland as long as the combination of all treed units in the overall connected treed area meets the required stocking level. Woodlands experiencing changes such as harvesting, blowdown or other tree mortality are still considered woodlands. Such changes are considered temporary whereby the forest still retains its long-term ecological value.*
>
> *Woodlands do not include plantations that are:*
> - *a) Managed for production of fruits, nuts, Christmas trees or nursery stock;*
> - *b) Managed for tree products with an average rotation of less than twenty (20) years (e.g. hybrid willow or poplar); or,*
> - *c) Established and continuously managed for the sole purpose of complete removal at rotation, as demonstrated with documentation acceptable to the Region or area municipality, without a woodland restoration objective.*
>
> *Additional exclusions may be considered for treed communities which are dominated by invasive non-native tree species such as buckthorn (Rhamnus species) and Norway maple (Acer platanoides), or others deemed to be highly invasive, that threaten the ecological functions or biodiversity of native communities. Such exceptions should be supported by site-specific studies that consider 1) the degree of threat posed; 2) any*



LEGEND

- ARGO MACVILLE DRAFT PLAN AREA
- STUDY AREA
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- WETLAND CORE AREAS (i.e., PROVINCIALLY SIGNIFICANT WETLANDS)
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- FISH HABITAT

W1 WETLAND NUMBER

WHT1/MHT1 TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HABITAT OF ENDANGERED AND THREATENED SPECIES

- EASTERN MEADOWLARK HABITAT
- REDSIDE DACE CONTRIBUTING HABITAT

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FIGURE 9A

SUMMARY OF SIGNIFICANT NATURAL HERITAGE RESOURCES ARGO MACVILLE DRAFT PLAN AREA

June 2024 Scale 1:8,000

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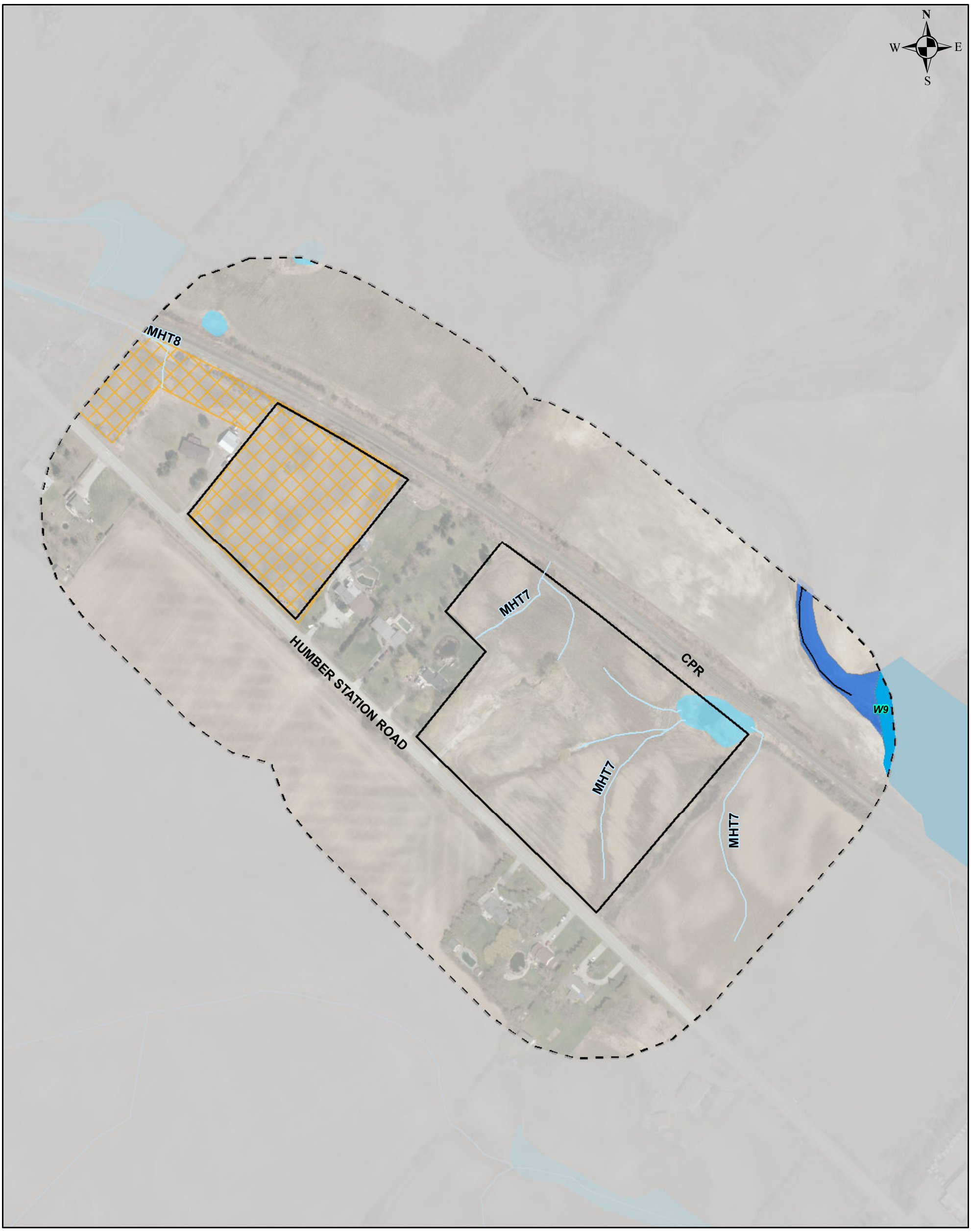

LEGEND

- ARGO HUMBER STATION DRAFT PLAN AREA
- STUDY AREA
- WETLAND CORE AREAS (i.e., PROVINCIALLY SIGNIFICANT WETLANDS)
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- FISH HABITAT

W1 WETLAND NUMBER

WHT1/MHT1 TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HABITAT OF ENDANGERED AND THREATENED SPECIES

- EASTERN MEADOWLARK HABITAT
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FIGURE 9B

SUMMARY OF SIGNIFICANT NATURAL HERITAGE RESOURCES ARGO HUMBER STATION DRAFT PLAN AREA

June 2024 Scale 1:3,000

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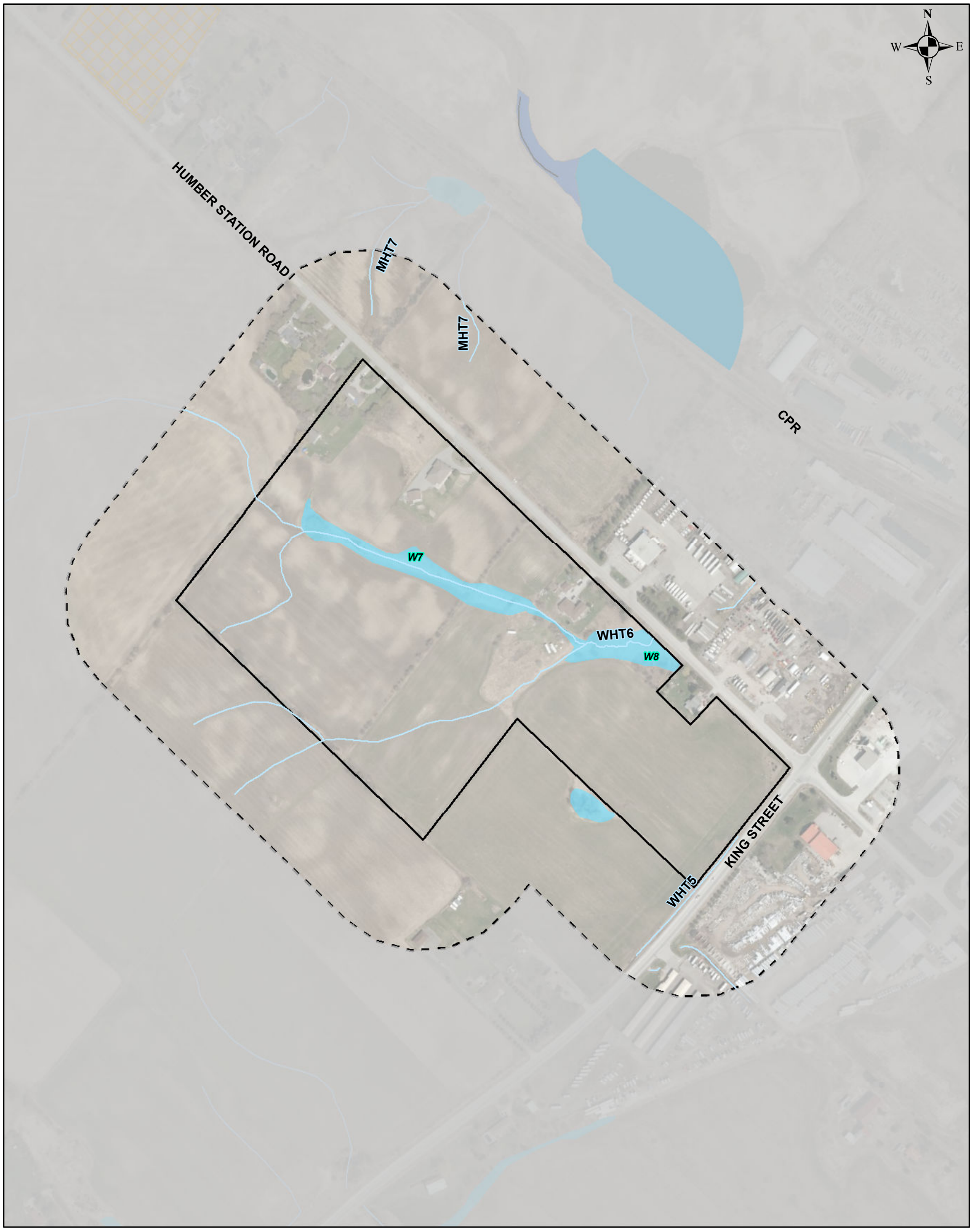

LEGEND

- HUMBERKING WEST DRAFT PLAN AREA
- STUDY AREA
- WETLAND CORE AREAS (i.e., PROVINCIALLY SIGNIFICANT WETLANDS)
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- FISH HABITAT

W1 WETLAND NUMBER

WHT1/MHT1 TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HABITAT OF ENDANGERED AND THREATENED SPECIES

- EASTERN MEADOWLARK HABITAT
- REDSIDE DACE CONTRIBUTING HABITAT

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FIGURE 9C

SUMMARY OF SIGNIFICANT NATURAL HERITAGE RESOURCES HUMBERKING WEST DRAFT PLAN AREA

June 2024 Scale 1:4,000

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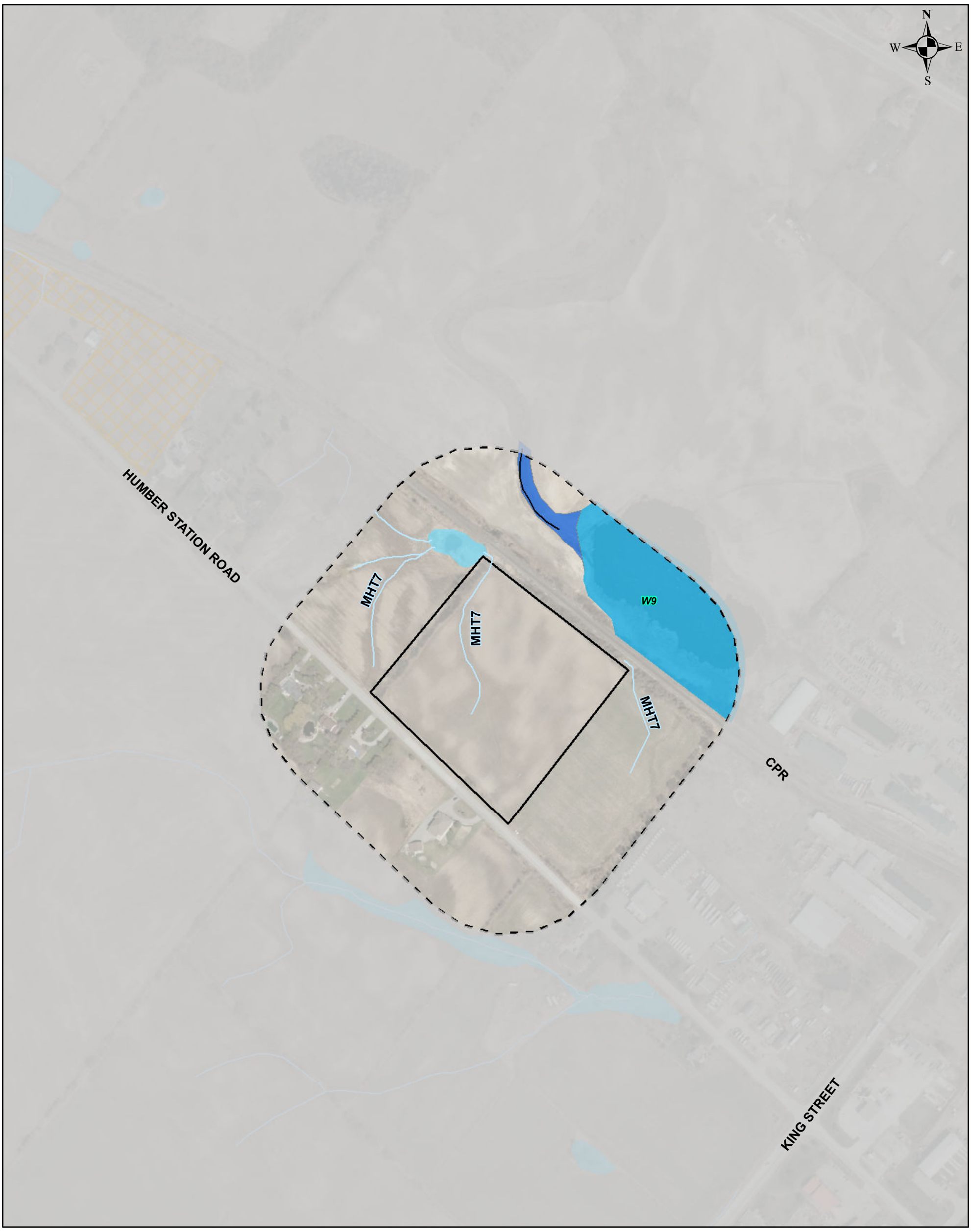

LEGEND

- HUMBERKING EAST DRAFT PLAN AREA
- STUDY AREA
- WETLAND CORE AREAS (i.e., PROVINCIALLY SIGNIFICANT WETLANDS)
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- UNASSESSED DRAINAGE FEATURES
- FISH HABITAT

W1 WETLAND NUMBER

WHT1/MHT1 TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HABITAT OF ENDANGERED AND THREATENED SPECIES

- EASTERN MEADOWLARK HABITAT
- REDSIDE DACE CONTRIBUTING HABITAT

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FIGURE 9D

SUMMARY OF SIGNIFICANT NATURAL HERITAGE RESOURCES HUMBERKING EAST DRAFT PLAN AREA

June 2024 Scale 1:4,000

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> *potential positive and/or negative impact on the ecological functions or biodiversity of nearby or adjacent native communities; and 3) the projected natural succession of the community. Communities where native tree species comprise approximately 10 percent or less of the tree crown cover and approximately 100 or fewer stems of native tree species of any size per hectare would be candidates for exclusion*.

Four (4) treed communities are located within the Final CEISMP Study Area:

- Cultural Woodland (ELC Unit 5) – 0.08 ha;
- Organic Deciduous Swamp (ELC Unit 12) – 0.04 ha;
- Cultural Plantation (ELC Unit 18a) – 0.96 ha; and
- Cultural Plantation (ELC Unit 18b) – 0.21 ha.

It should be noted that the ELC system for classifying treed features differs from the woodland definitions provided in the official plans. ELC Units 5,12 and 18b are less than 0.5 ha and too small to qualify as woodlands. ELC Unit 18a is larger than 0.5 ha but does not meet the minimum density requirements to qualify as a woodland under the ROP and Town of Caledon Official Plan definitions. None of the treed features meet the definitions of a woodland.

3.3.9.4 Valley and Stream Corridors

The PPS (2020) does not include a natural heritage category for Valley and Stream Corridors. It does however have include a category for Significant Valleylands, however determination of significance is the responsibility of the municipality or partner agencies.

The PPS defines valleylands as follows:

> *Means a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year*

Significance as it relates to valleylands is interpreted as follows:

> *Ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system;*

The Region of Peel recognizes Valley and Stream Corridors as part of the Regional Greenlands System and defines them as follows:

> *Valley and stream corridors are the natural resources associated with river systems and are characterized by their landform, features and functions, and include associated ravines. Valley corridors and their associated ravines are distinguished from stream corridors by the presence of a distinct landform. Due to the inherent hazards of valley lands they have remained mainly undeveloped and vegetated. Valley and stream corridors are natural linkages in the landscape having important ecological functions, providing habitat for fish and wildlife and acting as corridors for movement.*

While the Regional Official Plan does not define valley and Stream Corridors as significant, it includes criteria and thresholds by which they are to be evaluated for inclusion as Core Areas of the Regional Greenlands System. However, the criteria exclude portions of tributaries contained within designated Rural Service Centres and rural settlements of the Rural System, so would not apply to the Subject Lands.

The Town of Caledon considers Valleylands and Stream Corridors to be a component of their Ecosystem Framework where they are recognized as Natural Corridors. The Town of Caledon defines Valley and Stream Corridors as follows:

> *Valley and Stream Corridor, shall mean continuous water-based ecosystems which are centred on watercourses, their associated floodplains, valley systems, vegetative communities and functionally-related tableland features.*

Using the definitions listed above, Stream Corridors are limited to HDF reach WHT6, as it has an associated floodplain.

3.3.9.5 Fish Habitat

The PPS (2020) defines Fish Habitat as follows:

> *Fish habitat: as defined in the Fisheries Act, means spawning grounds and any other areas, including nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes.*

It is Beacon's opinion that HDF reaches WHT1-A, WHT1-B and WHT6-A provide fish habitat.

3.3.9.6 Habitats of Endangered and Threatened Species

Significance, as it relates to the habitat of endangered species and threatened species is defined by the PPS (2020) as:

> *…the habitat, as approved by the Ontario Ministry of Natural Resources, that is necessary for the maintenance, survival, and/or the recovery of naturally occurring or reintroduced populations of endangered species or threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle…*

In the *Bolton Residential Expansion Study Phase 3 Technical Memorandum* prepared by Dougan & Associates *et al*. (2014a), it is noted that a SAR screening letter was received from the MNRF on January 2, 2014 that included records of the following SAR within the BRES Study Area (Options 1 and 3 lands):

- Bobolink (*Dolichonyx oryzivorus*) - Threatened;
- Butternut (*Juglans cinerea*) - Endangered;
- Eastern Meadowlark (*Sturnella magna*) - Threatened; and
- Redside Dace (*Clinostomus elongatus*) - Endangered.

Based on Beacon's review of available background information pertaining to SAR, it was determined that there is potential for seven (7) endangered and threatened species in the vicinity of the Secondary Plan Area (**Appendix I**).

3.3.10 Habitat of Threatened and Endangered Species – Draft Plans of Subdivision

3.3.10.1 Argo Macville

In April of 2021, visual surveys were undertaken by Beacon to determine if buildings proposed for relocation or demolition provided potential maternity roosting habitat for SAR bats. Based on a review of each individual building, it was determined that three buildings could potentially provide habitat for bats. Specifically, there were three areas on the existing farmhouse where bats could access the attic for roosting or hibernation. Similarly, the large barn (northeast of the residential house) and the small shed (northwest of the house) also had entry points which could accommodate roosting bats. Refer to **Photograph 3** below for an example of potential bat maternity roosting habitat within the residential house.

Photograph 3. Potential Bat Maternity Roosting Habitat: Cracks in the Soffit of the Residential Home (April 7, 2021)

Species of Special Concern

A habitat suitability assessment was completed by Beacon on May 16, 2023 for potential Monarch young (Milkweed plants) habitat. While Milkweed was present, it appeared to be sparsely distributed and limited to the property margins or hedgerows between farm fields. It was determined that no suitable habitable habitat for Monarch is present.

3.3.10.2 Argo Humber Station

Breeding bird surveys by Beacon identified Eastern Meadowlark within ELC Unit 3d on the north parcel.

Species of Special Concern

A habitat suitability assessment was completed by Beacon on May 16, 2023 for potential Monarch young (Milkweed plants) habitat. While Milkweed was present, it appeared to be sparsely distributed and limited to the property margins or hedgerows between farm fields. It was determined that no suitable habitable habitat for Monarch is present.

3.3.10.3 Humberking West

On September 12, 2023, visual surveys were undertaken by Beacon to determine if buildings proposed for relocation or demolition provided potential maternity roosting habitat for SAR bats. Based on a review of each individual building, it was determined that six (6) could potentially provide habitat for bats. Specifically, areas were identified on existing houses where bats could access the attic for roosting or hibernation. Similarly, several shed structures also had entry points which could accommodate roosting bats. Refer to **Photograph 4** below for an example of potential bat maternity roosting habitat on the Humberking West lands.

Photograph 4. Potential Bat Maternity Roosting Habitat: Multiple Gaps in Roof (September 12, 2023)

Species of Special Concern

A habitat suitability assessment was completed by Beacon on May 16, 2023 for potential Monarch young (Milkweed plants) habitat. While Milkweed was present, it appeared to be sparsely distributed and limited to the property margins or hedgerows. It was determined that no suitable habitable habitat for Monarch is present.

3.3.11 Greenbelt Key Natural Heritage and Hydrologic Features

While the Greenbelt policies do not apply to the Caledon Station Secondary Plan Area, these policies apply east of the CPKC rail line. This portion of the Final CEISMP Study Area is designated as Greenbelt Natural Heritage System and Protected Countryside. Identified features in this area include PSW (Wetland Unit W9) and Other Wetlands. Wetlands are defined as both Key Natural Heritage Features and Key Hydrologic Features.

3.3.12 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) includes those natural areas, features, attributes and functions that represent the best examples of wildlife habitat within a municipality. The PPS (2020) defines SWH as follows:

> *Significant means: in regard to other features and areas, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system…*

The responsibility for confirming SWH is assigned to the local or regional planning authority; however, municipalities often also rely upon proponents to identify "candidate SWH" through studies such as this CEISMP. Ultimately, it is the responsibility of the municipality to confirm SWH.

According to the *Significant Wildlife Habitat Technical Guidelines* (MNR 2000), there are four broad categories of SWH:

- Seasonal Concentration Areas of Animals;
- Rare Vegetation Communities or Specialized Habitat for Wildlife;
- Habitat for Species of Conservation Concern; and
- Animal Movement Corridors.

Within each of these categories, there are multiple subcategories of SWH, each of which is intended to capture a specialized type of habitat that may or may not be captured by other existing feature-based categories (e.g., significant wetlands, significant woodlands).

To determine whether the Secondary Plan Area supports any wildlife habitat features, attributes or functions that could potentially qualify as candidate SWH, Beacon relied upon the provincial evaluation criteria provided in the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF 2015). A summary of this evaluation is presented in **Appendix H**.

In addition to applying the provincial criteria, Beacon also considered the evaluation criteria contained in the *Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study* (NSEI *et al*. 2009). An evaluation using the regional criteria is presented in **Table 20**. It should be noted that, because these evaluation criteria pre-date the provincial criteria and have not been formally adopted in the Region of Peel's policies, greater weight has been placed on the provincial criteria as they more current and comprehensive.

Table 20. List of Regional Significant Wildlife Habitat Criteria

Significant Wildlife Habitats Criteria*	Secondary Plan Area	Final CEISMP Study Area	Not Present	Not Applicable
A1. Deer Wintering Area			✓	
A2. Colonial Bird Nesting Sites (e.g., heronry, gull colony)			✓	
A3. Waterfowl Nesting Habitat			✓	
A4i. Migratory Landbird Stopover Areas				✓
A4ii. Migratory Bat Stopover Areas			✓	
A4iii. Migratory Butterfly Stopover Areas				✓
A4iv. Migratory Waterfowl Stopover and/or Staging (Terrestrial)			✓	
A4v. Migratory Waterfowl Stopover and/or Staging (Aquatic)			✓	
A4vi. Migratory Shorebirds Stopover Areas			✓	
A5. Raptor Wintering Areas (i.e., used for feeding and/or roosting)			✓	
A6. Snake Hibernacula	✓	✓		
A7. Bat Maternal Roosts and Hibernacula			✓	
A8. Bullfrog Concentration Areas			✓	
A9. Wild Turkey Winter Range				✓
A10. Turkey Vulture Summer Roosting Areas			✓	
B1. Rare Vegetation Communities			✓	
B2. Forests Providing a High Diversity of Habitats (captured by Significant Woodlands)			✓	
B3. Old-growth or Mature Forest Stands (captured by Significant Woodlands)			✓	
B4. Foraging Areas with Abundant Mast (i.e., nut bearing trees)			✓	
B5. Highly Diverse Areas			✓	
B6. Cliffs and Caves			✓	
B7. Seeps and Springs			✓	
B8i. Amphibian Breeding Habitat - Forested Sites (e.g., vernal pools)			✓	
B8ii. Amphibian Breeding Habitats - Non-forested Sites (e.g., marshes)			✓	
B9. Turtle Nesting Habitat and Turtle Overwintering Areas	✓	✓		
B10. Habitat for Area-Sensitive Forest Interior Breeding Bird Species			✓	
B11. Habitat for Open Country and Early Successional Breeding Bird Species			✓	
B12. Habitat for Wetland Breeding Bird Species			✓	
B13i. Raptor Nesting Habitat - Wetlands, Pond and Rivers			✓	
B13ii. Raptor Nesting Habitat - Woodland Habitats			✓	
B14. Mink, River Otter, Marten and Fisher Denning Sites			✓	
B15. Mineral Licks				✓
C1. Species identified as Nationally Endangered or Threatened by COSEWIC which are not listed as Endangered or Threatened under Ontario's *Endangered Species Act*			✓	

Significant Wildlife Habitats Criteria*	Secondary Plan Area	Final CEISMP Study Area	Not Present	Not Applicable
C2. Species identified as Special Concern based on Species at Risk in Ontario List that is periodically updated by the MNRF/MECP	✓	✓		
C3. Species that are listed as rare (S1-S3) or historical in Ontario based on Records kept by the Natural Heritage Information Centre in Peterborough	✓	✓		
C4. Species whose populations appear to be experiencing substantial declines in Ontario	✓	✓		
C5. Species that have a high percentage of their global population in Ontario and are rare to uncommon in the Regional Municipality of Peel			✓	
C6. Species that are rare to uncommon in the Regional Municipality of Peel, even though they may not be provincially rare	✓	✓		
C7. Species that are subject of recovery programs			✓	
C8. Species considered important to the Regional Municipality of Peel, based on recommendation from a local Conservation Advisory Committee				✓
D1. Animal Movement Corridors	✓	✓		

*Criteria provided in the *Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study* (North-South Environmental Inc., Dougan & Associates, and Sorensen Gravely Lowes 2009).

Based on the application of the evaluation criteria contained in the *Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study* (NSEI *et al*. 2009), it was determined that the Secondary Plan Area and associated Final CEIMSP Study Area could support seasonal wildlife concentration areas, specialized habitats for wildlife, habitat for species of conservation concern and animal movement corridors. Most of the areas identified as supporting potential candidate SWH are associated with natural features that will be protected.

The findings of the SWH evaluation based on the application of provincial and regional criteria are summarized below.

3.3.12.1 Seasonal Concentration Areas of Animals

Based on a review of evaluation criteria related to Seasonal Concentration Areas of Animals, it was determined that the Final CEISMP Study Area could potentially host Snake Hibernacula. While no snake observations have been reported to date, it is highly likely that snakes hibernation sites are present. Common snake species known to occur in the area can utilize building foundations, railway beds, barns and rodent holes and dens, all of which are present.

3.3.12.2 Rare Vegetation Communities or Specialized Habitats for Wildlife

The Secondary Plan Area and Final CEIMSP Study Area does not support any rare vegetation communities. In terms of specialized habitat for wildlife, candidate SWH for overwintering and nesting turtles is present. Dougan & Associates *et al*. (2014b) also noted Midland Painted Turtle and Snapping Turtle in the ponds and wetlands to the east of the CPKC rail line. Given the size and depth of these ponds, it is likely that they support overwintering and nesting habitat for these species and would therefore qualify as candidate SWH for this category. It is also likely that this local population could also utilize the pond associated with Wetland Unit W2 (ELC Unit 10a) for overwintering and nesting. For this reason, ELC Unit 10a should also be considered SWH. Turtle basking surveys are being undertaken by Beacon in 2024 to confirm presence.

3.3.12.3 Habitat for Species of Conservation Concern

Based on a review of evaluation criteria related to Habitat for Species of Conservation Concern, it was determined that the Study Area supports potential habitat the following listed Special Concern species:

- Barn Swallow (*Hirundo rustica*): Potentially suitable foraging habitat is present within meadow habitats. This species was observed foraging over ELC Units 2e and 3c in 2020. Nesting was observed at 7675 King Street (other lands owned by Argo Macville that are required for servicing); and
- Snapping Turtle (*Chelydra serpentina)*: Potentially suitable habitat is present within the Wetland Unit W9 to the east, as well as ELC Units 10a and 13. Turtle surveys are being undertaken by Beacon in 2024 to confirm presence.

3.3.12.4 Animal Movement Corridor

Animal movement corridors are limited to the wetland communities associated with HDF WHT1. This linear feature likely supports local scale animal movements, however its function as a linkage is impaired by the presence of King Street. Nevertheless, it has been identified as potential candidate SWH. Several hedgerow features are present; however, these features are generally too narrow and discontinuous to provide any significant linkage functions for wildlife.

3.3.12.5 Summary of Significant Wildlife Habitat

Candidate SWH identified within the Caledon Station Secondary Plan Area is limited to features that have been identified for protection and form part of the natural heritage system (NHS) as discussed below.

4. Constraints and Opportunity Analysis

The purpose of this constraint and opportunity analysis is to identify key features to be included as components of the natural heritage system (NHS) and to identify potential enhancement opportunities to strengthen and support NHS functions.

4.1 Natural Heritage System

The Secondary Plan NHS (**Figure 10**) as presented in the approved Final CEISMP was designed to include key natural heritage features and is comprised of two separate blocks to be designated as Environmental Policy Area.

In the southwest corner of the Secondary Plan Area (**Figure 10A**), the NHS is comprised of the following features:

- Non-Provincially Significant Wetland Units W1, W2, W3, W4, W5 and W6;
- HDF Reaches WHT1-A to WHT1-E, WHT2-A, WHT2-By, WHT2-F, WHT3-A and WHT3-B;
- Direct Fish Habitat (WHT1-A; WHT1-B; WHT6-A);
- Contributing Habitat for Endangered Redside Dace (WHT1-A; WHT1-B); and
- Significant Wildlife Habitat – (potential turtle overwintering and nesting – ELC Unit 10a).

The remaining natural heritage resources within the Secondary Plan Area consist of small, isolated, non-provincially significant wetlands and headwater drainage features. Due to the fragmented and isolated nature of the wetland features (ELC Units 5, 7e, 7f, 7l, 13 and 14a), retaining these features would result in a fragmented NHS with minimal function. Instead, the wetland units will be consolidated within an enhanced corridor/greenway system on the Humberking West lands (see **Section 4.1.2** below).

4.1.1 Proposed NHS Enhancements

Figure 10 illustrates enhancement area opportunities that have been identified within the Caledon Station Secondary Plan Area. These areas have been characterized in accordance with the Scoped SWS enhancement categories as follows:

- Defined Enhancements:
  - Shape, Size Contiguity (Out of System) – Areas located outside of the 10 m buffer to the wetland feature limits lacking natural cover (southwest NHS block) have been identified for enhancement; and
  - Floodplain – Areas where the regulatory floodplain lacks natural cover have been identified for enhancement (Humberking West Greenway Corridor);
- Undefined Enhancement Areas:
  - Unmapped Enhancements: The Scoped SWS did not identify most of the natural heritage features within the Secondary Plan Area and did not identify any areas within the Secondary Plan Area as enhancement opportunities.

As NHS limits were accepted through the Secondary Plan process, a quantitative analysis to show conformance with Scoped SWS enhancement targets has not been included in this report. That stated, the proposed NHS captures all key and supporting natural heritage features, as well as the floodplain enhancement opportunity mapped in the Scoped SWS. As previously discussed, the Scoped SWS did not identify any potential Linkage Enhancements within the Secondary Plan Area.

4.1.2 Argo Macville

In support of the Secondary Plan process, a constraints analysis was undertaken for the additional lands owned by the proponent south of King Street that are required for servicing. The preliminary NHS (**Figure 10A**) is comprised of the following features:

- Non-Provincially Significant Wetland Units;
- HDF Reach WHT3-A1;
- Regulatory floodplain; and
- Meander belt.

4.1.2.1 Meander Belt

The meander belt of a watercourse is generally defined as the lateral extent that a meandering channel has historically occupied and will likely occupy in the future. In general, watercourses with drainage areas less than one square kilometer (100 ha) and do not generate sufficient hydraulic energy to initiate migration and the associated risk of potential erosion for property and infrastructure (TRCA 2015). Typically, these watercourses are vegetation controlled.

Due to the poorly defined, vegetated nature of the HDFs within the Secondary Plan Area, and overall lack of evidence of active geomorphic processes (i.e., erosion, aggradation or migration), it is our opinion that the regulatory floodline represents a more appropriate tool for delineating the watercourse hazard limit for applicable HDFs. That stated, to ensure a conservative approach, meander belts were delineated for HDFs where a regulatory floodplain was identified.

A meander belt dimension of 22 m was recommended for Reach WHT3-A1. This dimension was determined based on field observations of existing geomorphic conditions, lateral extent of wetland vegetation and floodplain dimensions. This dimension was then reviewed relative to aerial imagery to ensure that it captured areas of frequent inundation/saturation along the drainage feature.

Should development land use planning for the BRES Option 4 lands south of King Street move forward, the comprehensive evaluation of all natural heritage features within those lands will incorporate the findings of this study. It is anticipated that this evaluation will consider potential opportunities to consolidate features to create a more robust and continuous NHS, that connects to the Caledon Station NHS.

4.1.3 Humberking West Greenway Corridor

The Caledon Station Land Use Plan identifies an open/space enhanced Greenway Corridor associated with Tributary WHT6 west of Humber Station Road (**Figure 10B**). This corridor will create a single contiguous NHS block that will provide enhanced ecosystem functions relative to the existing isolated wetland features within the Caledon Station Secondary Plan area.

Consistent with the management classification of 'Conservation', the proposed corridor design is centred roughly on existing HDF Reaches WHT6-A to WHT6-C, replicating the flow conveyance and riparian vegetation functions of WHT6, as well as seasonal fish habitat. The corridor was sized to accommodate the creation of 1.27 ha of wetland habitat to ensure no net loss of these features. The corridor incorporates the following design elements:

- Conveyance of the Regional Storm;
- Meander belt width of 12 m;
- Low flow channel with a naturalized, sinuous planform and design elements (gravel bars) to enhance aquatic and terrestrial habitat conditions;
- Creation of wetland habitat area (1.27 ha) with amphibian habitat features;
- Minimum 30 m bottom width;
- Minimum 59.5 m top width;
- 2.5H:1V – 3H:1V (horizontal to vertical) side slopes;
- 2-3 m wide trail system along the top of slope abutting developable lands; and
- Stone core enhanced outlet channel to convey drainage from the adjacent stormwater facility.

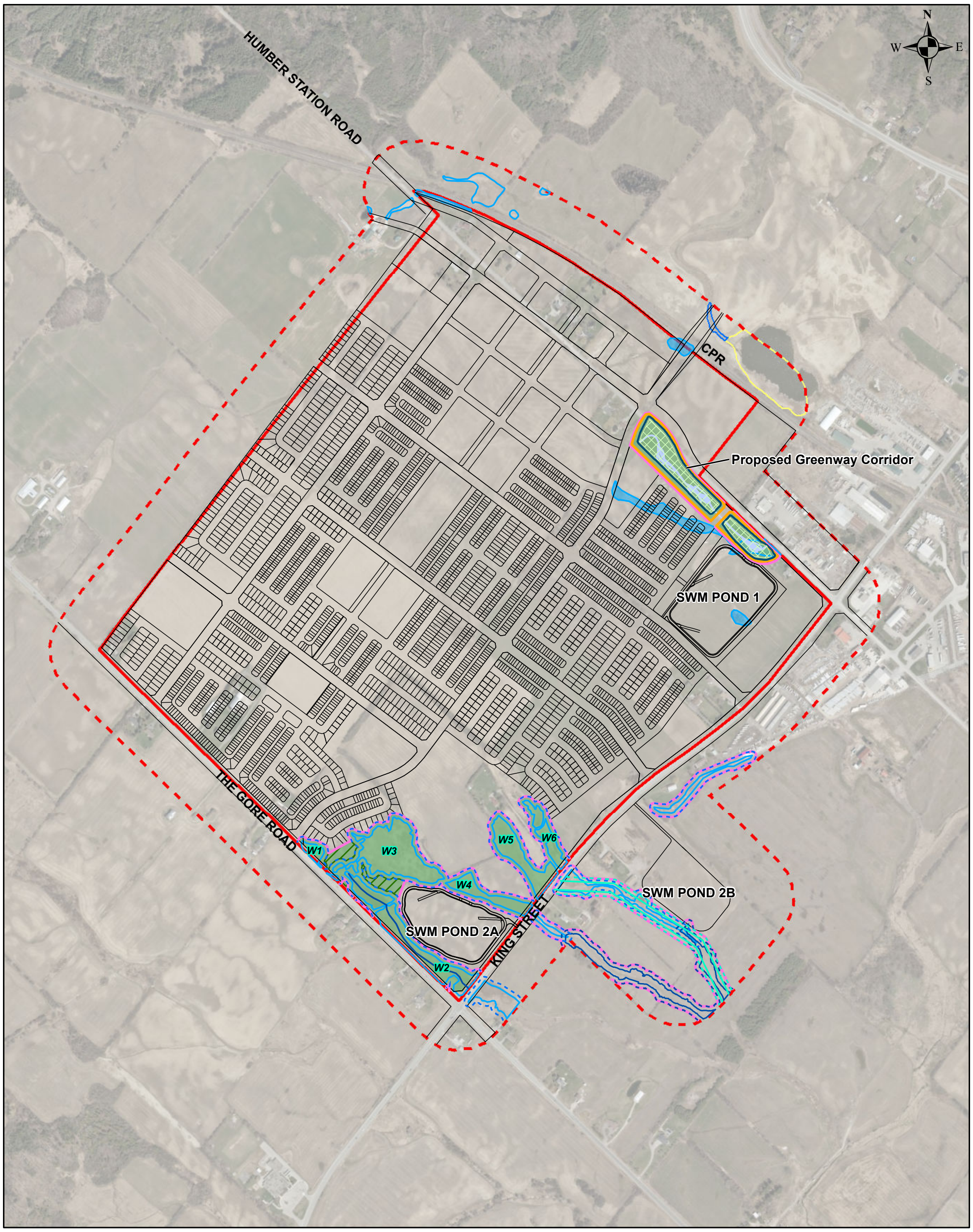
Additional details to address Draft Plan of Subdivision requirements for the Greenway Corridor are provided in **Section 5**. A detail design engineering submission will be submitted for the Greenway Corridor in support of the future permit application process.

4.2 Buffer Dimensions

The primary purpose of a buffer is to provide protection to Key Feature(s) and ecological functions by mitigating potential adverse impacts from development or site alteration. The Final CEISMP identified a 10 m buffer to wetland features limits in the southwest corner of the Secondary Plan Area (**Figure 10A**). This 10 m buffer dimension is consistent with the Living City Policies (TRCA 2014), Regional and Local Municipal policies (as applicable), and was established through detailed study.

The Greenway Corridor incorporates a 5 m setback to the proposed long-term top of slope along the western corridor boundary. This setback incorporates the 2-3 m wide trail system. A 3 m setback to the proposed long-term stable top of slope is provided on the east side of the corridor along Humber Station Road. The overall corridor dimension affords a 10 m buffer to wetland communities to be created within the corridor to compensate for removals. The Greenway Corridor limits, including associated setbacks and adjacent land uses were developed in consultation with Town of Caledon and TRCA staff.

It is our opinion that a 10 m buffer is ecologically appropriate. The following sections provide additional rationale to support this statement in accordance with buffer design considerations as outlined in the Region's Scoped SWS.



LEGEND

- CALEDON STATION SECONDARY PLAN AREA
- SECONDARY PLAN CEISMP STUDY AREA (120m)
- CALEDON STATION FRAMEWORK PLAN (GERRARD DESIGN 2023)
- COMPREHENSIVE ULTIMATE CONSTRAINT LIMIT
- EXISTING FLOODPLAIN
- FLOODPLAIN + 10 m
- FISH HABITAT
- UNEVALUATED WETLAND (MNRF 2023)
- PROVINCIALLY SIGNIFICANT WETLAND (MNRF 2023)
- W1 WETLAND NUMBER
- WETLAND
- WETLANDS + 10 m
- WETLANDS TO BE REMOVED
- PROPOSED WETLAND CREATION
- PROPOSED LONG-TERM STABLE TOP OF BANK
- PROPOSED FLOODPLAIN
- MBW + 10 m
- MBW (INCL. FOS - 22 m)
- PROPOSED NHS ENHANCEMENTS
- PROPOSED NHS

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Community-Wide Comprehensive Environmental Impact Study

PROJECT No. 214476

FIGURE 10

COMPREHENSIVE CONSTRAINTS MAP

June 2024 Scale 1:9,000

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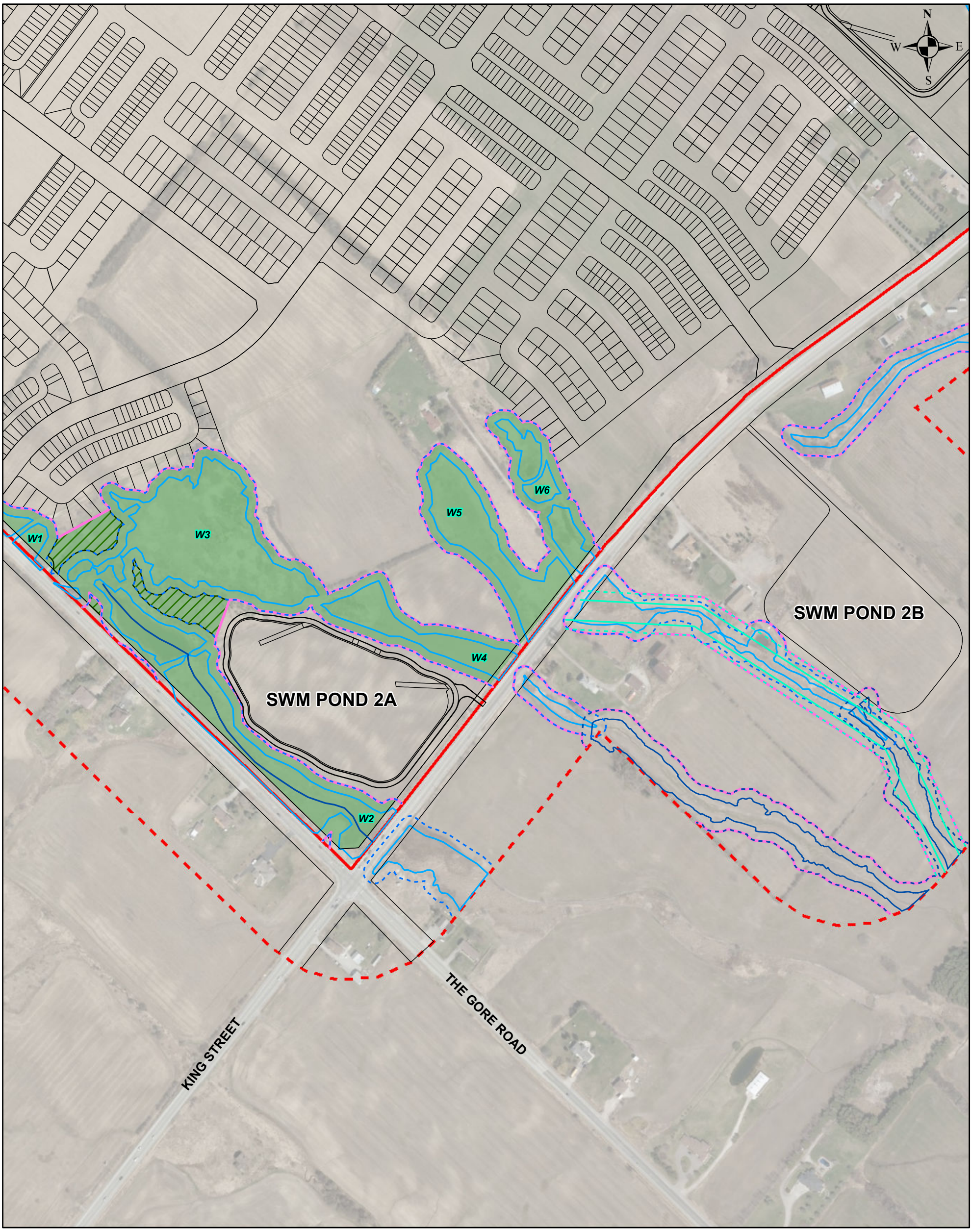

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- MBW (INCL. FOS - 22 m)
- MBW + 10 m
- PROPOSED NHS ENHANCEMENTS
- PROPOSED NHS

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FIGURE 10A

COMPREHENSIVE CONSTRAINTS MAP

June 2024 Scale 1:4,000

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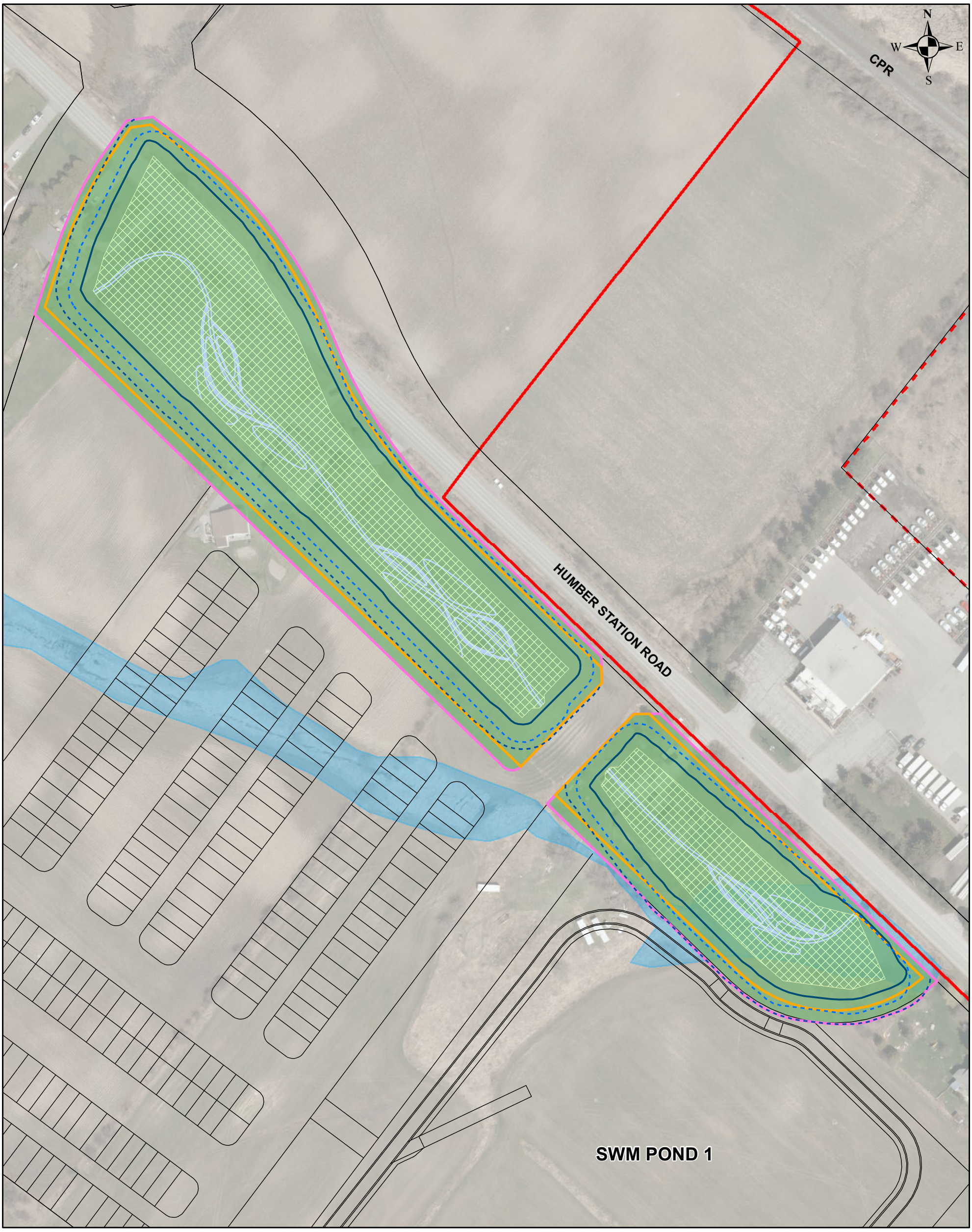

LEGEND

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- SECONDARY PLAN CEISMP STUDY AREA (120m)
- CALEDON STATION FRAMEWORK PLAN (GERRARD DESIGN 2023)
- COMPREHENSIVE ULTIMATE CONSTRAINT LIMIT
- WETLAND
- WETLANDS TO BE REMOVED
- PROPOSED FLOODPLAIN
- FLOODPLAIN + 10 m
- PROPOSED WETLAND CREATION
- WETLANDS + 10 m
- PROPOSED LONG-TERM STABLE TOP OF BANK
- PROPOSED NHS (GREENWAY CORRIDOR)

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FIGURE 10B

COMPREHENSIVE CONSTRAINTS MAP (PROPOSED GREENWAY CORRIDOR)

June 2024 Scale 1:1,500

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4.2.1 Feature Hydrology

Site and feature-based water analyses were undertaken to confirm how the proposed stormwater management plan and LID strategy for the Secondary Plan Area lands will mitigate potential impacts to natural heritage features and the species they support by meeting water budget and water quality objectives under interim and post-development conditions. Buffer area will be restored to a natural cover condition, providing additional pervious landscape and water quality contributions to the proposed NHS.

4.2.2 Habitat Requirements

Key factors to be considered when prescribing ecologically appropriate buffers to natural features include:

a) The sensitivities of the habitats and species present;
b) The nature of the proposed land use change or activity and associated stressors; and
c) The ability of the buffer to mitigate adverse impacts to adjacent natural features and their ecological functions.

4.2.2.1 Key Features – Wetlands

The wetlands associated with the Caledon Station Secondary Plan Area and other lands owned by the proponent that are required for servicing were evaluated by Beacon using the 4th Edition of the OWES (MNRF 2022) and found to be not provincially significant. Under current conditions, no buffer is provided to active farming practices that occur adjacent to these wetland units. It is our opinion that a 10 m buffer is sufficient to protect the natural heritage features and functions of the wetland units to be retained, as well as the wetland units to be created within the Greenway Corridor. That stated, **Figure 10A** illustrates areas of proposed enhancement that will benefit wetland habitat functions.

4.2.2.2 Significant Wildlife Habitat

The Final CEISMP determined that the subject lands could potentially support the following Significant Wildlife Habitat (SWH) types:

- Bat maternity colony habitat within existing structures;
- Turtle overwintering habitat within wetlands containing open water (ELC Unit 10a); and
- Snake Hibernacula within natural, semi-natural communities and areas with evidence of anthropogenic foundations.

While there are no buffer requirements associated with Significant Wildlife Habitat, a 10 m buffer is considered appropriate. That stated, ELC Unit 10a will be retained within the proposed NHS, and buffers in excess of 10 m are provided withing the EPA.

4.2.2.3 Species Behaviour

It is expected that the proposed development will introduce new noise and light sources to the Secondary Plan Area. The incremental effects of these sources are impossible to quantify and must be viewed within the context of existing ambient conditions, which already include light and noise sources as a result of the surrounding urban matrix. Effects on species behaviour due to additive noise and light from the proposed development is not expected. That stated, standard mitigation measures that could be considered at detailed design stages can include the downward direction of exterior lighting on residential dwellings.

The behavioural traits of species present within the subject lands have adapted to the existing agricultural land uses, as well as residential and other adjacent urban land uses, including noise and light impacts from the surrounding roads and commercial development. On this basis, provision of a 10 m buffer is considered sufficient to mitigate risk of further impacts on existing species utilizing the Secondary Plan Area and their tolerance to human activities.

4.2.2.4 Fragmentation

The proposed NHS also meets Scoped SWS targets and objectives by consolidating natural heritage features within the Caledon Station Secondary Plan area and avoiding fragmentation of the system.

4.2.2.5 Constraint Mapping

The consolidating constraint mapping provided in **Figures 10, 10A** and **10B** reflect the response submission prepared to address comments issued by TRCA (dated February 2024).

5. Proposed Development

5.1 Caledon Station Secondary Plan Area

The approved Caledon Station Secondary Plan is the outcome of years of land use planning which initially commenced in 2010 when the Town of Caledon adopted Official Plan Amendment 226 (OPA 22) to update population and employment forecasts and allocations for the 2031 planning horizon. Since 2010, the planning process has included the Bolton Residential Expansion Study (BRES) which was undertaken by the Town of Caledon to identify a recommended expansion area to accommodate the allocated growth. Through this process, the Secondary Plan lands (BRES Option 3) were identified as the preferred option for this growth based on several screening criteria that consider the existing natural heritage features. All of the Secondary Plan lands are now included in the Region of Peel's 2051 Urban Area.

The Secondary Plan Land Use Plan (**Figure 11**) has been designed to establish a transit-oriented community, including an active transportation strategy with cycling infrastructure throughout, integration of the environmental policy area, mixed housing types, high quality architecture, walkability and a main street with central character. Land Use Designations on the Secondary Plan Land Use Schedule include Low Density Residential, Medium Density Residential, Mixed Use, GO Transit Hub, Commercial/Mixed

Use, Institutional, Employment, Open Space Policy Area, Environmental Policy Area, and Stormwater Pond Facility. These Land Use Designations have been implemented through the Framework Plan (**Figure 12**), where various types of residential built forms at varying densities, as well as mixed uses, institutional uses and GO Transit Hub uses have been integrated into the Plan layout.

5.1.1 Draft Plans of Subdivision

5.1.1.1 Argo Macville

The Argo Macville applications for Draft Plan of Subdivision (21T-22001, **Figure 13**) and for Amendment to the Zoning By-Law (RZ 2022-0002) were originally submitted in March 2022 and were resubmitted in May 2023. These applications seek planning approvals to implement redevelopment of the lands legally described as Part of Lots 11, 12 and 13, Concession 4 (Albion), Town of Caledon.

The Draft Plan area consists of approximately 107.19 ha (264.87 acres) and is located entirely within the Region of Peel's Urban Area (ROP, Nov 2022), with the eastern portion being within the Region's Major Transit Station Area (MTSA). The Argo Macville Draft Plan of Subdivision and Zoning By-Law Amendment will ensure the creation of a compact, pedestrian and transit-oriented development through implementation of the Secondary Plan policies.

It is also important to note that on March 5, 2021, the Province of Ontario issued a Ministerial Zoning Order ('MZO') under Ontario Regulation 171 / 21 ('O. Reg. 171 / 21') for the eastern portion of the Draft Plan area. This MZO established zoning for as a 'Mixed Use Residential Zone'. This Zone permits a range of detached, semi-detached and townhouse dwellings as well as a range of mid-rise residential and commercial uses. A proposed Zoning By-Law Amendment is being advanced that seeks to amend the zoning to include those lands subject to the MZO. The proposed Zoning By-Law Amendment reflects discussions with Town staff and seeks to implement the proposed Draft Plan of Subdivision which consists of a mixture of land uses, various built forms and densities.

5.1.1.2 Argo Humber Station

The Argo Humber Station Draft Plan of Subdivision (21T-22002, **Figure 14**) and Amendment to the Zoning By-Law (RZ 2022-0003) were originally submitted in March 2022 and were resubmitted in May 2023. These applications seek planning approvals to implement redevelopment of the lands legally described as Part of Lots 11 and 12, Concession 5 (Albion), Town of Caledon.

The Draft Plan area consists of 5.61 ha (13.86 ac) and is entirely within the Region of Peel's Urban Area (ROP, Nov 2022) and the Region's Major Transit Station Area (MTSA). The effect of the Secondary Plan will be to apply land use designations, including Mixed Use/High Density and GO Transit Hub. The Draft Plan of Subdivision and Zoning By-Law Amendment will ensure the creation of a Mixed Use/High Density and Transit Hub Blocks of lands that will contribute towards the ultimate compact, pedestrian and transit-oriented development through implementation of the Secondary Plan policies.

It is also important to note that on March 5, 2021, the Province of Ontario issued a Ministerial Zoning Order ('MZO') under Ontario Regulation 171 / 21 ('O. Reg. 171 / 21') for the Argo Humber Station lands. This MZO established zoning as a 'Mobility Transit Hub Zone'. This Zone permits a public transit depot with accessory parking and service buildings as well as a variety of commercial, retail services and public uses. Through this application, a proposed Zoning By-Law Amendment is being advanced that

seeks to amend the zoning, including the portion subject to the MZO. The proposed Zoning By-Law Amendment reflects discussions with Town staff and seeks to implement the proposed Draft Plan of Subdivision, which consists of a sliver of an abutting Medium Density Block, Mixed Use Blocks, and GO Transit Hub Blocks.

5.1.1.3 Humberking

Humberking (I) Developments Limited and Humberking (IV) Developments Limited have filed one Draft Plan of Subdivision application that has been divided into the east (**Figure 15**) and west (**Figure 16**) lands for review purposes. The Humberking East lands are 4.04 ha in area and are legally described as parts of lots 11 and 12, concession 5, Town of Caledon. The Humberking West lands are 16.37 ha in area and are legally described as the east half of lot 11, concession 4, Town of Caledon.

5.2 Stormwater Management Strategy

As described in the Final Community-Wide FSR (Urbantech Consulting 2024), the overall stormwater (SWM) strategy for the Caledon Station Secondary Plan Area maintains the approximate pre-development watershed divide between the West Humber River and Main Humber River, as well as the individual subcatchments/outlets within each watershed. This approach ensures that, with appropriate SWM controls, the proposed development minimizes change to the overall drainage patterns and sources of drainage to each outlet aside from associated with increased imperviousness.

The proposed SWM strategy aims to satisfy the TRCA SWM Criteria (2012) and the more recent Town of Caledon's Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) SWM Criteria as follows:

1. Water Quantity & Flood Control – Control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm and Regional Storm for the West Humber River. Quantity control is not required for the Main Humber River.
2. Water Quality Control – Control the 90th percentile storm event and if conventional methods are necessary, then the 80% total suspended solids (TSS) removal to achieve an Enhanced level of protection.
3. Erosion Control – Detain at a minimum, the runoff volume generated from a 25mm storm event over 24 to 48 hours.
4. Water Balance – Control the recharge to meet pre-development conditions on property or control the runoff from the 90th percentile storm event.

For the West Humber River watershed, three (3) end-of-pipe stormwater management facilities (wet ponds) are proposed to provide water quantity, quality, and erosion controls for the post-development drainage areas. SWM Pond 1 is situated northwest of the intersection of King Street & Humber Station Road adjacent to the Greenway Corridor (**Figure 10B**). SWM Pond 2A is situated between Wetlands Units W2 and W4 (**Figure 10A**). SWM Pond 2B is located south of King Street within other lands owned by the proponent.

Schedule C-8

(A Subschedule to Schedule "C")

CALEDON STATION SECONDARY PLAN: LAND USE PLAN

TOWN OF CALEDON

- Low Density Residential Areas
- Medium Density Residential Areas
- Mixed-Use/High Density Areas
- GO Transit Hub
- Open Space Policy Area
- Environmental Policy Area
- Institutional
- Major Transit Area Boundary
- Secondary Plan Area
- Bolton Settlement
- Boundary of Greenbelt Plan Area
- Conceptual Road Network
- Local Road
- Railway
- Potential Future Railway Grade Separation
- Elementary Schools
- Conceptual Stormwater Management Facility
- Cultural Heritage Resource
- Conceptual Fire Station Location

Base Data Source: Town of Caledon

0 50 100 200 300 400 500 m

KING ST

THE GORE RD

HUMBER STATION RD

CPKC RAILWAY

SAVED: 20 March 2024

FILE: P:\D22-Digital Mapping\Official_plan\Official Plan Amendments

SAVED BY: ctennako

LEGEND:

- MEDIUM DENSITY RESIDENTIAL
- MIXED-USE RESIDENTIAL (AT GRADE COMMERCIAL)
- GO TRANSIT LANDS
- SCHOOL
- PARK
- PROPOSED ENVIRONMENTAL PROTECTION AREA
- ENVIRONMENTAL ENHANCEMENT AREA
- SWM POND

UNIT SPECIFIC USES

- REAR LANE TOWNHOUSE
- DUAL FRONTAGE TOWNHOUSES
- BACK-TO-BACK TOWNHOUSES
- STACKED TOWNHOUSES
- SHALLOW TOWNHOUSES
- STANDARD TOWNHOUSES
- SHALLOW SINGLE DETACHED
- STANDARD SINGLE DETACHED

ROAD CLASSIFICATIONS

- MULTI-MODAL LOOP ROAD
- COLLECTOR ROADS

- MTSA LIMITS

DRAFT

- All Units In Metric Unless Otherwise Noted.
- Base Information Obtained From Various Sources And Is Approximate.
- Schedule / Plan Information Is Conceptual And Requires Verification by Appropriate Agency.

DRAFT

GERRARD DESIGN

MACVILLE | Caledon, Ontario

BLOCK PLAN CONCEPT

MAY 23, 2024

PROJECT 1420

SCALE 1:8000

CP-46

P:\792-020\4. Drawings\2024 05 May\DP Macville May 24 24.dwg

DRAFT PLAN OF SUBDIVISION

ARGO MACVILLE I CORPORATION, ARGO MACVILLE II CORPORATION, ARGO MACVILLE III CORPORATION, ARGO MACVILLE V CORPORATION, ARGO HUMBERKING CORPORATION,

FILE# 21T-22001

PART OF LOTS 11,12 AND 13, CONCESSION 4 (TOWNSHIP OF ALBION)
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED _____ DATE: MAY 29, 2024

MONIKA BUDZIAK, OLS
J. D. BARNES LIMITED
EMAIL: mbudziak@jdbarnes.com

ADDITIONAL INFORMATION

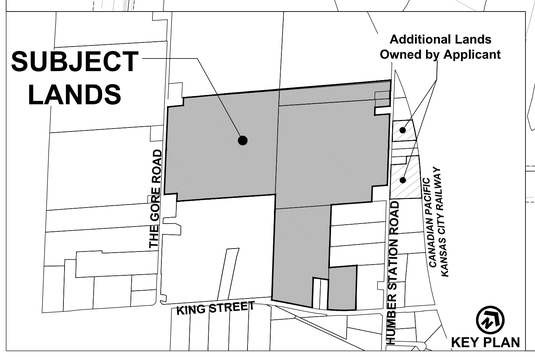
(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G,J & L ARE SHOWN ON THE DRAFT AND KEY PLANS.
H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) SANDY LOAM AND CLAY LOAM
K) SANITARY AND STORM SEWERS TO BE PROVIDED

LAND USE SCHEDULE

LAND USE	LOTS / BLOCKS	AREA (ha)	AREA (ac)	UNITS
SINGLE DETACHED - 15.24m (50') (18.8m DEPTH)	1-539,714	1.28	3.16	44
SINGLE DETACHED - 12.8m (42')		3.95	9.76	110
SINGLE DETACHED - 12.8m (42') (18.8m DEPTH)		2.88	7.12	112
SINGLE DETACHED - 11.0m (36')		8.60	21.25	273
HERITAGE HOUSE		0.08	0.20	1
STREET TOWNHOUSES - 7.3m (24') (22.0m DEPTH)	540-559	1.91	4.72	106
STREET TOWNHOUSES - 6.1m (20')	560-614	5.64	13.94	297
BACK-TO-BACK TOWNHOUSES - 6.4m (21')	615-649	3.95	9.76	428
BACK-TO-BACK TOWNHOUSES - 5.6m (18')	650-677	2.29	5.66	270
DUAL FRONTAGE TOWNHOUSES - 6.1m (20')	678-685	0.72	1.78	46
REAR LANE TOWNS - 6.1m (20') (23.0m DEPTH)	686-702	1.41	3.48	82
REAR LANE TOWNHOUSES - 6.1m (20')	703-713,715-828	8.43	20.83	621
STACKED TOWNHOUSES - 6.1m (20')	829-836	0.74	1.83	
MEDIUM DENSITY RESIDENTIAL	837-849	9.87	24.39	
MIXED USE	850-852	2.04	5.04	
RESIDENTIAL RESERVE	853-904	1.21	2.99	
ELEMENTARY SCHOOL	905-907	6.90	17.05	
PARK	908-914	4.93	12.18	
WALKWAYS	915-927	0.17	0.42	
SWM POND	928	2.17	5.36	
ROAD WIDENING	929-931	0.57	1.41	
0.3m RESERVE	932-977	0.06	0.15	
22.0m R.O.W. - (Length - 4,850m)		10.14	25.06	
20.0m R.O.W. - (Length - 32m)		0.07	0.17	
18.0m R.O.W. - (Length - 12,137m)		23.45	57.95	
16.0m R.O.W. - (Length - 280m)		0.44	1.09	
14.0m R.O.W. - (Length - 520m)		0.75	1.85	
8.0m Laneway - (Length - 3,053m)		2.54	6.28	
TOTAL	**977**	**107.19**	**264.87**	**2,390**

NOTES

-EDWARD ELLIOT AVENUE/THE GORE ROAD DAYLIGHT TRIANGLE: 15m x 15m
-KESWICK STREET/THE GORE ROAD DAYLIGHT TRIANGLE: 15m x 15m
-ARGONAUT AVENUE/KING STREET DAYLIGHT TRIANGLE: 15m x 15m
-GODBOLT AVENUE/KING STREET DAYLIGHT TRIANGLE: 15m x 15m
-COLLECTOR/COLLECTOR DAYLIGHT TRIANGLE: 10m x 10m
-LOCAL/COLLECTOR DAYLIGHT TRIANGLE: 7.5m x 7.5m
-PUBLIC LANE/TO COLLECTOR/LOCAL DAYLIGHT TRIANGLE: 3m x 3m
-LOCAL / COLLECTOR DAYLIGHT ROUNDINGS: 5m
-INSIDE ELBOWS FOR LANEWAYS: 9m
-ALL INTERSECTIONS ARE 90 DEGREES UNLESS OTHERWISE NOTED

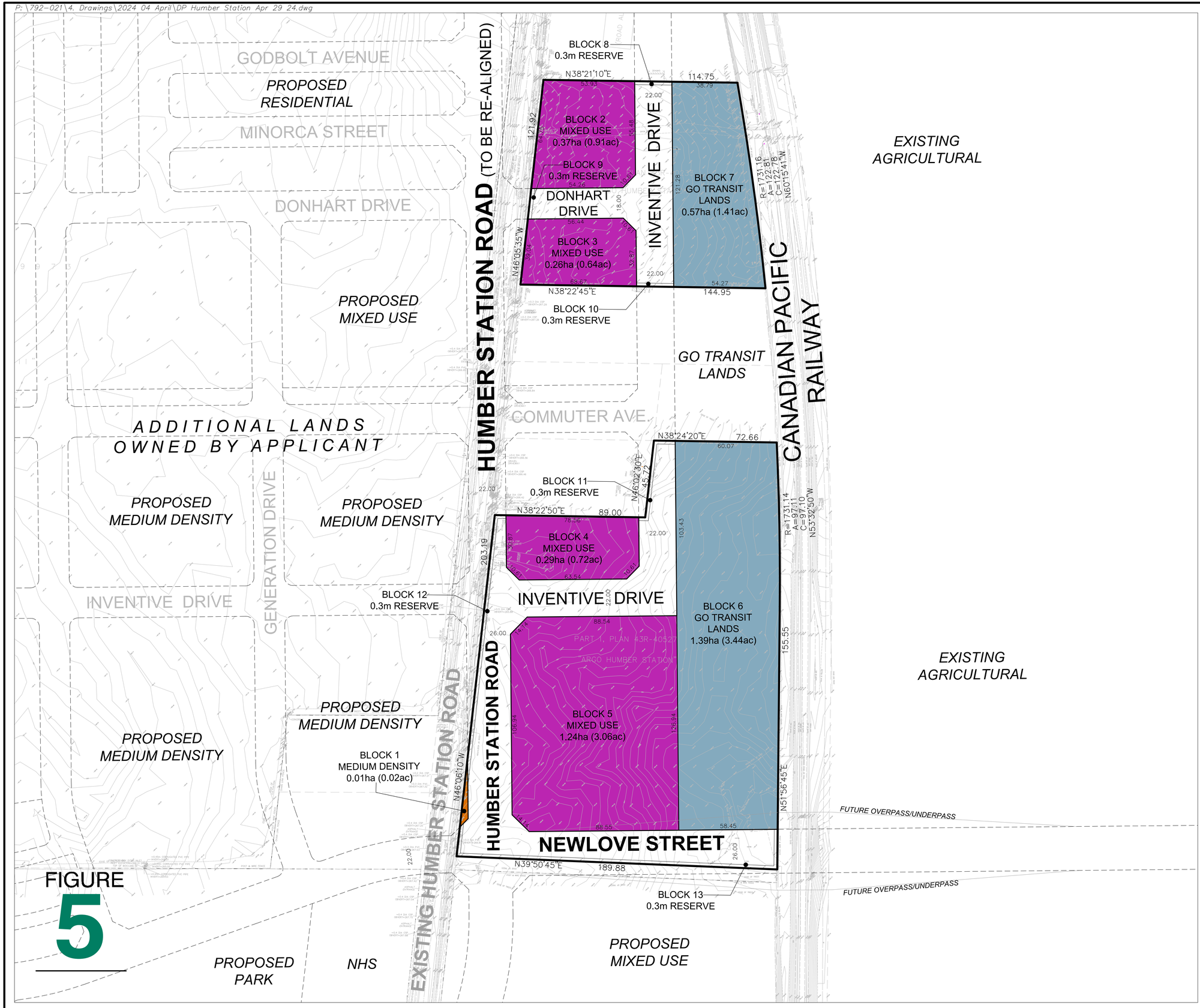


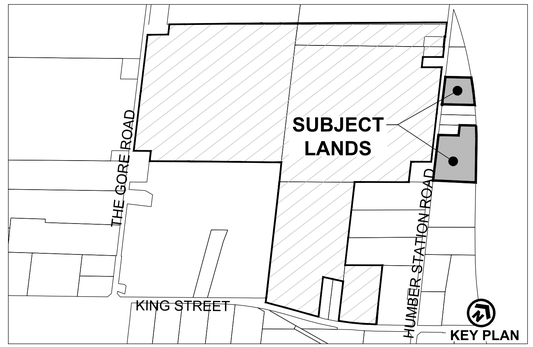
SCALE 1:2500
(24 x 36)
MAY 24, 2024

ARGO DEVELOPMENT CORP

GSAI

P:\792-021\4. Drawings\2024 04 April\DP Humber Station Apr 29 24.dwg





DRAFT PLAN OF SUBDIVISION
ARGO HUMBER STATION LIMITED
FILE# 21T-22002

PART OF THE WEST HALF OF LOT 12,
CONCESSION 5
(TOWNSHIP OF ALBION)
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED _____ DATE: MAY 2, 2024

MONIKA BUDZIAK, OLS
J. D. BARNES LIMITED
EMAIL: mbudziak@jdbarnes.com

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G,J, & L ARE SHOWN ON THE DRAFT AND KEY PLANS.

H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) SANDY LOAM AND CLAY LOAM
K) SANITARY AND STORM SEWERS TO BE PROVIDED

LAND USE SCHEDULE

LAND USE	LOTS / BLOCKS	AREA (ha)	AREA (ac)	UNITS
MEDIUM DENSITY RESIDENTIAL	1	0.01	0.02	
MIXED USE	2-5	2.16	5.34	
GO TRANSIT LANDS	6,7	1.96	4.84	
0.3m RESERVE	8-13	0.01	0.02	
26.0m R.O.W. (Length - 300m)		0.67	1.66	
22m R.O.W. (Length - 312m)		0.68	1.68	
18.0m R.O.W. (Length - 63m)		0.12	0.30	
TOTAL	**13**	**5.61**	**13.86**	

NOTES

-McDAVIDS STREET/ HUMBER STATION ROAD DAYLIGHT TRIANGLE: 10m x 10m
-ALL OTHER DAYLIGHT TRIANGLES: 7.5m x 7.5m
-ALL INTERSECTIONS ARE 90 DEGREES UNLESS OTHERWISE NOTED

FIGURE
5

SCALE 1:1000
(24 x 36)
APRIL 29, 2024

ARGO DEVELOPMENT CORP
GSAI

SWM facility design criteria were established based on the TRCA SWM Criteria (2012) and the TRCA pre-development hydrologic model presented in the Humber River Hydrology Update (2018), in addition to meeting the following requirements:

- Ensure that existing flow rates downstream of the subject lands do not vary for the larger storm events during post-development conditions, thereby providing flood protection for properties downstream of the CSSP area;
- Provide adequate drawdown time / erosion control to protect the form and function of watercourses downstream of the SWM facilities;
- Ensure that the MECP-recommended stormwater quality treatment of runoff is provided;
- Maintain recharge volumes through the use of low impact development and other practices as required based on hydrogeological assessments; and
- Maintain water balance to wetland features.

5.2.1 Water Quality

The SWM pond permanent pool volume was designed to meet the Enhanced (Level 1) water quality protection criteria as per the MOE SWM Planning and Design Manual (March 2003) for the West Humber River. Additional low impact developments and SWM measures are proposed where possible to provide a “treatment train” approach.

Water quality for Main Humber River catchments will be addressed through the proposed treatment train approach:

- Onsite quality controls imposed on residential and GO transit blocks to achieve a minimum of 80% TSS removal (e.g., Isolator row or Jellyfish Filter upstream or downstream of the storage tanks);
- CB Shields to provide 50% TSS removal for the road right-of-way; and
- Downstream Oil-Grit Separator to provide 50% to 60% TSS removal prior to discharge.

5.2.2 Erosion Control

SWM pond extended detention volume for erosion control is based on detention of the 25 mm storm event for a minimum 48 hours for controlled release. An average release rate of 0.72 L/s/ha was utilized in accordance with the Town of Caledon Bolton Residential Expansion Study.

5.2.2.1 Stormwater Erosion Control Exceedance Analysis

The following exceedance results are provided as an update to the Caledon Station Community Stormwater Erosion Analysis completed by Beacon (2023; **Appendix J**). Updated hydrologic model data was provided by Urbantech Consulting. Raw exceedance analysis results for the available 20 years of continuous hydrologic data under both existing and post-development conditions are presented in **Table 21**. These raw values were then converted to a percent difference to allow a quantitative comparison of pre-development and post-development hydraulic conditions; associated results are presented in **Table 22**. The representative erosion threshold determined for Reach WHT3-A1 was used to undertake the exceedance analysis for all three stormwater management facilities.

While the exceedances noted between all scenarios and existing conditions are larger than desirable, it is anticipated that this increase is largely a function of the relatively low threshold condition associated with the receiving drainage features. Consequently, while the stormwater facilities are effectively meeting or exceeding the Town of Caledon Bolton Residential Expansion Study unitary rates, the extended detention release of these flows still falls above the threshold condition.

To further evaluate the relative risk associated with this increase in exceedance, a sensitivity analysis was undertaken. A revised shear stress threshold target of 18 N/m^2 was determined for the sensitivity analysis by increasing the average water depth within the representative cross-section used in the model by approximately 2 cm. This increase in average water depth was considered to be within the tolerances of the modelling exercise. A critical discharge threshold of 0.12 m^3/s was then back calculated based on this revised average water depth. This target discharge fell below the bankfull flow estimated for Reach WHT3-A1 and deemed suitable to inform an evaluation of erosion potential.

As illustrated in **Table 21**, exceedance analysis results under the sensitivity analysis threshold condition for SWM Pond 1, cumulative effective stream power discharge, velocity and shear stress exceedance results remained larger, in the range of 18-105% above existing conditions. That stated, SWM Pond 1 will release flows to a stone core enhanced outlet and low flow channel designed for post-development modelled flow rates.

Sensitivity results for SWM Ponds 2A and 2B remained larger than desirable. However, it should be noted that continuous modelling results for both of these ponds incorporate uncontrolled flows that are being released to Wetlands W1, W3, W5, and W6. These clean water contributions that are required to replicate existing runoff conditions and address feature-based water balance requirements are contributing to the exceedances. Considering that the receiving drainage features downstream of King Street have generally been characterized as stable and are supported by riparian wetland communities that provide enhanced stability and retention/detention functions, the risk of an increase in erosion under post-development conditions due to released stormwater is estimated to be low.

Table 21. SWM Pond 1 Exceedance Analysis – Continuous Modelling Results

Development Condition	Detention Time	Pre-Development vs. Post-Development Conditions				
		Time (hr)	Discharge (m^3/s)	Velocity (m/s)	Shear Stress (N/m^2)	Work/ Stream Power (N/m)
SWM Pond 1						
Pre (Threshold - 15 N/m^2)	--	24796	26414985	26228871	988246730	1122262342
Post (Threshold - 15 N/m^2)	~100 hr	56837	34105059	42686469	1565254843	1624327596
Pre (Sensitivity Analysis - 18 N/m^2)	--	20185	23634359	19109603	747031736	879382413
Post (Sensitivity Analysis - 18 N/m^2)	~100 hr	41422	28038046	27112896	1037927849	1138325917
SWM Pond 2A						
Pre (Threshold - 15 N/m^2)	--	5969	2011778	3429976	122524223	115022784

Development Condition	Detention Time	Pre-Development vs. Post-Development Conditions				
		Time (hr)	Discharge (m^3/s)	Velocity (m/s)	Shear Stress (N/m^2)	Work/ Stream Power (N/m)
Post (Threshold - 15 N/m^2)	~100 hr	8206	3195530	4512844	164257057	165450831
Pre (Sensitivity Analysis - 18 N/m^2)		3878	1404471	1869539	69700138	68922308
Post (Sensitivity Analysis - 18 N/m^2)	~100 hr	3988	2506304	2728600	103968335	111354954
SWM Pond 2B						
Pre (Threshold - 15 N/m^2)	--	8458	4190630	6131832	222744229	222182443
Post (Threshold - 15 N/m^2)	~100 hr	14442	5219593	7124930	258962923	260801261
Pre (Sensitivity Analysis - 18 N/m^2)		6211	3287213	3816979	144328885	150463755
Post (Sensitivity Analysis - 18 N/m^2)	~100 hr	6321	4003304	3969966	152408805	167916190

Table 22. Stormwater Exceedance Analysis – Percent Difference (Pre to Post)

Threshold Condition	Percent Exceedance Pre-Development vs. Post-Development Conditions				
	Time (hr)	Discharge (m^3/s)	Velocity (m/s)	Shear Stress (N/m^2)	Work/Stream Power (N/m)
SWM Pond 1					
Erosion Threshold (15 N/m^2)	129.2%	29.1%	62.6%	58.4%	44.7%
Sensitivity Analysis (18 N/m^2)	105.2%	18.6%	41.9%	38.9%	29.5%
SWM Pond 2A					
Erosion Threshold (15 N/m^2)	5.2%	58.8%	31.6%	34.1%	43.8%
Sensitivity Analysis (18 N/m^2)	-5.8%	78.5%	46.0%	49.2%	61.6%
SWM Pond 2B					
Erosion Threshold (15 N/m^2)	-3.6%	24.6%	16.2%	16.3%	17.4%
Sensitivity Analysis (18 N/m^2)	-16.5%	21.8%	4.0%	5.6%	11.6%

5.2.3 Quality Control

Unit Flow Relationships for the Humber River Watershed as identified in the TRCA SWM Criteria (2012) provided the equations to determine the quantity control unit flow rates for the 2-year to 100-year storm events within the West Humber River watershed. In addition to development areas being directed to SWM ponds, a portion of drainage areas 105 and 106 will be directed to wetlands W1-W6 to maintain existing rainfall volumes. Release rates have been overcontrolled to account for the uncontrolled flows to the wetlands.

In accordance with TRCA SWM Criteria (2012), quantity control is not required within the Main Humber River watershed. However, on-site storage is proposed on private property to mitigate impacts on the CPKC culverts. A post development 100-year flow rate of 125 L/s/ha has been applied to the areas draining to the Main Humber. This flow rate will be refined based on the exact culvert capacity available as the design advances.

5.3 Greenway Corridor

The following sections outline design elements associated with the proposed Greenway Corridor. Preliminary design drawings are provided in **Appendix K**.

5.3.1 Clean Water Pipe

To replicate existing surface drainage conveyance functions of WHT6, drainage from the existing external area north of Secondary Plan Area will be directed to Greenway Corridor via a clean water pipe (Urbantech Consulting 2024). Stabilized interceptor swales are proposed along the north limit of the Argo Macville boundary to direct drainage to the clean water pipe via a headwall structure. The clean water pipe is sized to convey the Regional flows from the external area. The clean water pipe will be accommodated within different right of way cross sections.

5.3.2 Floodplain

The proposed Greenway (floodplain) contains the Regional Storm with sufficient freeboard to private property (minimum 0.30 m).

5.3.3 Low Flow Channel

The Greenway Corridor preliminary design incorporates a 1.5 m wide low flow channel ranging 0.20-0.30 m in depth (maximum depth). These dimensions were determined based on the modelled post-development flows for the 25 mm (0.017 m^3/s) storm event as provided by Urbantech Consulting, as well as the governing downstream gradient of the enhanced corridor identified in the corridor grading plan. Design parameters for the bankfull channel are provided in **Table 23**.

FUTURE DEVELOPMENT

LOT 12

PART 1, PLAN 43R – 5176
P.I.N. 14329 – 0054

26.00

22.00

26.00

STREET 'B' (McDOUGALL STREET)

BLOCK 2
Natural Heritage System
0.10 ha

26.00

STREET 'A'
(HUMBER STATION RD.)

BLOCK 1
Mixed Use
3.10 ha

P.I.N. 14329 – 0055

OPEN SPACE

KNOWN AS HUMBER STATION ROAD
(ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 4 AND 5)
P.I.N. 14329 – 0105

CONCESSION 5

LOT 11

CANADIAN PACIFIC RAILWAY
P.I.N. 14329 – 0047

RURAL

20

STREET 'C'

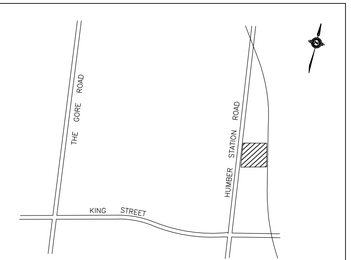
LOT

PART 1, PLAN 43R – 37362
P.I.N. 14329 – 0056

FUTURE DEVELOPMENT

PART 1,
PLAN 43R – 13589

KEY PLAN



N.T.S.

HUMPHRIES PLANNING GROUP INC.
190 PIPPIN ROAD, SUITE A, VAUGHAN, ONTARIO, L4K 4X9
TEL (905)264-7678, FAX (905)264-8073
www.humphriesplanning.com

DEVELOPMENT STATISTICS:

LAND USE	BLOCK #	AREA (ha)
Mixed Use	1	3.10
Natural Heritage System	2	0.10
Roads		0.85
TOTAL		4.05

OWNER'S CERTIFICATE:

I authorize Humphries Planning Group Inc. to prepare and submit this plan for draft approval.

Date: _____

SURVEYOR'S CERTIFICATE:

I hereby certify that the boundaries of the lands being subdivided and their correct relationship to the adjacent lands are accurately and correctly shown on this plan.

Date: _____

WAHBA SURVEYING
285 Vaughan Valley Blvd.
Woodbridge ON L4H3B5 Tel. 905.851.1300
Tel. 905.851.1300 www.wahbasurveying.com
www.wahbasurveying.com

ADDITIONAL INFORMATION:

[Section 51(17) of the Planning Act, R.S.O. 1990, c. P. 13, as amended to April 11, 1997]
a), b), e), f), g), & j) – on plan.
c) – on key plan
d) – see statistics
h) – piped water to be installed by developer
i) – loam, sandy loam
k) – all services to be made available by developer
l) – none

DRAFT PLAN OF SUBDIVISION

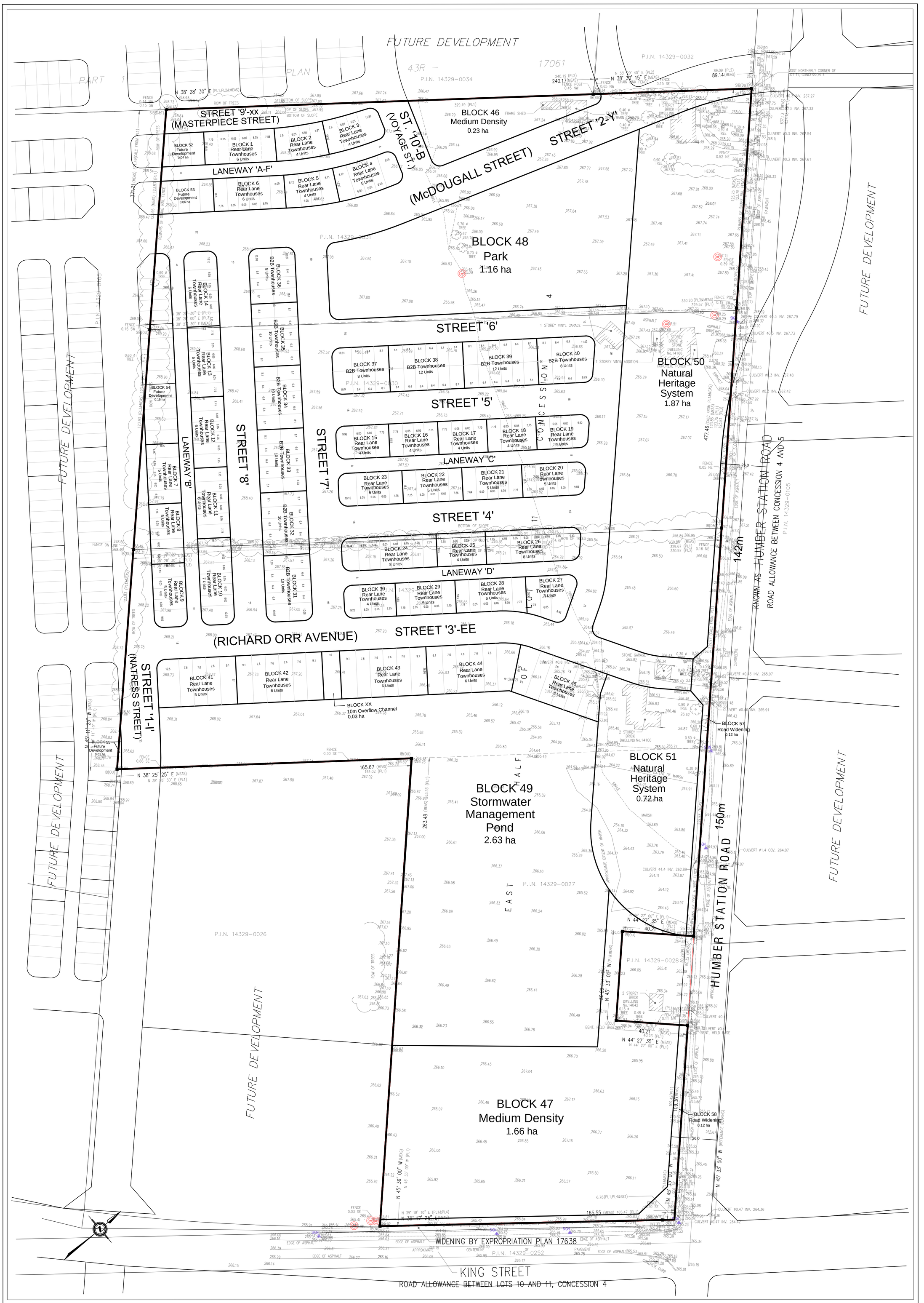
PART OF LOTS 11 AND 12,
CONCESSION 5,
(GEOGRAPHIC TOWNSHIP OF ALBION)
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

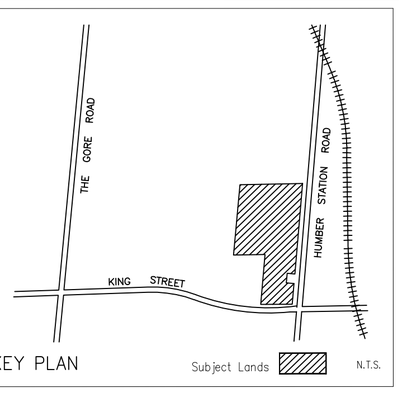
SCALE 1:500

10m 5 0 10 20 30m 40 50 60 m

HUMPHRIES PLANNING GROUP INC.
190 PIPPIN ROAD, SUITE A, VAUGHAN, ONTARIO, L4K 4X9
TEL (905)264-7678, FAX (905)264-8073
www.humphriesplanning.com

File Number:	Drawing Number: A1
Date Drawn: 6 FEB 23	
Drawn By: BT	
Checked By: R.H.	
Date Revised: 1 DEC 23	
CAD File No. :	





DEVELOPMENT STATISTICS:

LAND USE	BLK #s	UNITS	AREA (ha)
Rear Lane Townhouses	1–30	153	1.95
Back–to–Back Townhouses	31–40	98	0.92
Street Townhouses	41–45	29	0.65
Medium Density	46–47		1.89
Park	48		1.16
SWM Pond	49		2.63
NHS	50–51		2.59
Future Development	52–55		0.26
Overflow Channel	56		0.03
Road Widening	57–58		0.24
Roads			4.05
TOTAL		280	16.37

OWNER'S CERTIFICATE:

I authorize Humphries Planning Group Inc. to prepare and submit this plan for draft approval.

Date: _____

SURVEYOR'S CERTIFICATE:

I hereby certify that the boundaries of the lands being subdivided and their correct relationship to the adjacent lands are accurately and correctly shown on this plan.

Date: _____

WAHBA SURVEYING
285 Vaughan Valley Blvd.
Woodbridge ON L4H3B5 Tel. 905.851.1300
Tel. 905.851.1300 www.wahbasurveying.com
www.wahbasurveying.com

ADDITIONAL INFORMATION:

[Section 51(17) of the Planning Act, R.S.O. 1990, c. P. 13, as amended to April 11, 1997]
a), b), e), f), g), & j) – on plan.
c) – on key plan
d) – see statistics
h) – piped water to be installed by developer
i) – loam, sandy loam
k) – all services to be made available by developer
l) – none

SCALE 1:1000

0 20 40 60m

DRAFT PLAN OF SUBDIVISION

THE EAST HALF OF LOT 11,
CONCESSION 4
(GEOGRAPHIC TOWNSHIP OF ALBION)
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

HUMPHRIES PLANNING GROUP INC.
216 CHRISLEA ROAD, SUITE 103, VAUGHAN, ONTARIO, L4L 8S5
TEL (905)264-7678, FAX (905)264-8073
www.humphriesplanning.com

File Number:	Drawing Number: A1
Date Drawn: 13 FEB 23	
Drawn By: BT	
Checked By: R.H.	
Date Revised: 1 DEC 23	
CAD File No. :	

Table 23. Bankfull Channel Design Parameters

Design Parameter	Upstream		Downstream	
	Riffle	Pool	Riffle	Pool
Gradient (%)	0.10	0.10	0.30	0.30
Roughness (Manning's n)	0.038	0.038	0.038	0.038
Bankfull width (m)	1.50	1.50	1.50	1.50
Average bankfull depth (m)	0.17	0.20	0.17	0.20
Maximum bankfull depth (m)	0.22	0.30	0.22	0.30
Discharge to accommodate (m^3/s)	0.17	0.17	0.17	0.17
Mean bankfull velocity (m/s)	0.24	0.27	0.41	0.46
Calc. Bankfull discharge (m^3/s)	0.06	0.08	0.10	0.14
Maximum shear (bed) (N/m^2)	2.2	2.9	6.5	8.8
Stream power (W/m)	0.6	0.8	3.0	4.1
Unit stream power (W/m^2)	0.4	0.5	2.0	2.7
Max. grain size entrained (m)	0.002	0.003	0.007	0.010
Max. grain material	Gravel-Very Fine	Gravel-Very Fine	Gravel-Fine	Gravel-Medium
Mean grain size entrained (m)	0.002	0.002	0.006	0.007
Mean grain material	Gravel-Very Fine	Gravel-Very Fine	Gravel-Fine	Gravel-Fine

5.3.3.1 Substrate Sizing

The riffle stone mix of Granular 'B' and 50-100 mm stone was determined referencing the maximum engrained stone sizing identified in **Table 23**, incorporating a factor of safety.

5.3.4 Amphibian Habitat Features

Riparian amphibian habitat features (depressional areas) are proposed within the corridor to provide enhanced terrestrial habitat relative to existing conditions and a more natural floodplain form. Microtopography (hummock features) will be integrated along the features to support the temporary retention of flow within the floodplain to promote the success of riparian wetland communities.

5.3.5 Wood Debris Habitat Features

Wood debris structures using salvaged materials are proposed within the riparian zone. These features will provide enhanced terrestrial habitat diversity.

5.3.6 Riparian Zone

To replicate the existing wetland vegetation community along WHT6, and compensate for wetland removals within the Secondary Plan Area, a combination of shrub species and wetland/wet meadow seed mix is proposed. A comprehensive landscape planting plan will be developed for the Greenway Corridor at the detail design stage.

5.4 NHS Infrastructure Crossings

Two crossings of the NHS are proposed:

- Street EE crossing of the WHT6 Greenway Corridor. The crossing will consist of an earthen embankment with roadwork and utilities, and a 1500 mm diameter circular pipe to convey the Regional flow under minor surcharge; and
- A storm sewer crossing between Wetlands Units W3 and W4. The crossing will consist of a 1.2 m x 2.4 m concrete box culvert in the location of former farm infrastructure and a former railway corridor. This location will result in the removal of unnatural features and restoration to a more natural state.

Refer to Drawings 602A and 402 of the Final Community-Wide FSR for details.

6. Impact Assessment

6.1 Approach

The CEISMP TOR requires that an impact assessment for the natural features associated with the Secondary Plan Area. More specifically:

> *Through an analysis of the dynamics and interrelationships of the ecosystem, the study will assess the potential environmental impacts of locating residential uses and the associated infrastructure within the respective study areas, and their compatibility with the Town's ecosystem goals, objectives, policies and performance measures.*

One of the primary objectives followed in designing the Framework Plan for the Caledon Station community was to protect existing natural heritage features and functions within an enhanced NHS and to locate development outside of natural hazards. Since impact avoidance is generally the most effective means of reducing the risk of development impacts on the natural environment, the Final CEISMP recommended that the future development limits be established outside of any significant natural heritage features and natural hazards . Therefore, the impacts are generally limited to those that are indirect, which can be mitigated.

The impact assessment presented in the Final CEISMP was based on:

- The most detailed level of information available related to biophysical resources based on primary and secondary data and analyses; and
- The findings of the constraint analysis.

The impact assessment matrix (**Table 24**) is structured to:

- Identify the specific development activity (impact source);
- Describe the potential effect on environmental receptors (features and functions);
- Recommend mitigation measures to address potential impacts; and
- Describe the net effect on the biophysical environment.

The impact assessment matrix is organized according to ecosystem components (e.g., geology, landforms, hydrogeology, hydrology, aquatic systems, terrestrial systems, etc.). The matrix describes the impact source(s) (development/ site alteration activity), the potential impact to the impact receptor(s) (features, attributes and functions), the recommended mitigation (including special monitoring or management needs), and the anticipated residual impacts.

As the community has been designed to avoid direct impacts to most natural heritage features and ecological functions, the impact assessment is focussed primarily on addressing indirect impacts.

Table 24. Impact Assessment Matrix

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation/Management	EMP Section	Effect
Geology	**Bedrock Geology**	Grading and Servicing	Bedrock is at least 10 m below ground surface and will not be impacted by grading and servicing.	None	7.4	Neutral
	Surficial Geology/ Physiography/ Topography	Site Preparation, Grading, Servicing	Grading is proposed to accommodate future development. Based grading plans provided in the Final Community-Wide FSR, it is not anticipated that the magnitude of these grade changes will alter the character of the landform, however topographic relief will be affected at a local scale.	• Maintain a cut and fill balance to the extent feasible to minimize importing and exporting. • Match grades at outer property limits. • Match grades at EPA feature limits.	7.4	Neutral
Soils	**Topsoil**	Site Preparation, Grading, Servicing	Site preparation will require topsoil striping and stockpiling to facilitate grading and servicing. Topsoil resources can be lost through mixing with sub soils and exposure to sun, wind, and water erosion.	• Protect and reuse topsoil resources by minimizing exportation or importation. • Implement Best Management BMP's such as proper separation, stockpiling and erosion control measures, amendment and reapplication to the site following construction. • Develop Soil Management Plans in accordance with TRCA's *Preserving and Restoring Healthy Soil: Best Practices for Urban Construction* (TRCA 2012b). • Conform to the requirements of the Town of Caledon Fill By-Law (2007-59)	7.5	Neutral
Air Quality	**Air**	Site Preparation, Grading, Servicing	Dust from the construction activities could degrade local air quality and have localized short-term negative impacts on vegetation resources in the adjacent EPA.	• Prepare and implement a Dust Management Plan (DMP) prior to site preparation. • Dust should be monitored and managed throughout the construction period and dust suppression measures implemented. • Conform to the requirements of the Town of Caledon Fill By-Law (2007-59)	7.5	Neutral
Groundwater	**Groundwater Flows**	Grading, Servicing and Development	It is expected that the trenching and excavation earthwork during the construction period will extend below the groundwater table in certain areas of the Site and groundwater control and dewatering will be required to ensure the excavation area remains dry and safe. There will be a requirement to lower the groundwater table to an elevation of 0.5 m below the base of excavation. Based on the highest groundwater level at each proposed SWM Pond, the excavations for the SWM Ponds will extend below the groundwater table. For this reason, groundwater control and dewatering during the construction period will be required to maintain a dry and safe excavation.	• Implement Best Management Practices (BMPs) for servicing construction. • Utilize trench plugs or anti-seepage collars along installed services to prevent redirection of groundwater flows and water table lowering. • All excavations for site servicing and/or underground levels should be backfilled with soil material of similar permeabilities to the excavated parent native soil to minimize disruption to the groundwater flow regime. It is recommended that backfilling of all excavations or trenches, where necessary, be completed using the excavated native soil.	7.2	Neutral
	Groundwater Quality	Grading, Servicing and Development	Under the interim and post-development scenario, contaminants such as oil, sand, salt and other debris may also affect the water quality of the groundwater system.	• Implement the Erosion and Sediment Control Plan (ESC Plan) as detailed in the FSR (Urbantech Consulting 2024). • Implement the Stormwater Management Strategy as detailed in the FSR (Urbantech Consulting 2024). • Implement Low Impact Development (LID) Plan as detailed in the FSR (Urbantech Consulting 2024).	7.3	Neutral
	Dewatering	Grading, Servicing and Development	The following dewatering activities have the potential for impacts to existing natural surface water features and/or users of groundwater in the area: • Temporary dewatering operations during the construction period. • All low-rise residential blocks, institutional and commercial zones are not anticipated to require any permanent groundwater drainage control. • The proposed SWM pond designs will require permanent groundwater control. This is required to prevent hydrostatic pressure from up lifting the base of the pond during both normal operation and maintenance events. Due to the high-water level/hydrostatic pressure at the pond location the use of a conventional weeping tile drainage system will not be adequate in controlling the amount groundwater required to protect the base of the ponds.	Develop and implement a Contingency Plan at the detailed design stage to ensure groundwater is managed appropriately. Pumped water from temporary construction dewatering activities should be managed to avoid direct discharge of potentially impacted water into sensitive features such as the wetlands.	7.6	Neutral

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation/Management	EMP Section	Effect
Surface Water	**Drainage Patterns**	Grading, Servicing and Development	Construction and development activities may have the potential for impacts to natural surface water features: • Groundwater control and dewatering operations during the construction period; • Reduction of groundwater recharge and possibly groundwater contributions to surface water features as a result of impervious surfaces following construction; and, • Reduction of runoff available to natural features as a result of changes to Site drainage.	• A combination of mitigation measures (SWM, LIDs, etc.) will be implemented so as not adversely affect flows and habitat functions. • See FSR and Hydrogeological Investigation	7.3, 7.4	Neutral
	Headwater Drainage Features	Grading, Servicing and Development	Development activities will result in the removal and replication of Conservation and Protection reaches of WHT6 within the Secondary Plan Area.	Replicate and enhance the functions of WHT6 through design elements of the Greenway Corridor.	7.1, 7.3	Neutral-Positive
	Surface Water Runoff	Grading, Servicing and Development	Stormwater runoff captured by the proposed stormwater infrastructure could exacerbate the transitional/adjustment erosion processes in downstream reaches without appropriate quantity control.	Implement SWM Strategy (refer to FSR; Urbantech Consulting 2024)	7.3, 7.4, 7.5	Neutral
	Geomorphological Processes	Grading, Servicing and Development	Grading and development will increase the overall area of impervious surfaces which will result in decreased infiltration and increased runoff. These increases can result in more frequent short duration high flow events, leading to increased erosion.	SWM pond release rates have been designed to minimize potential impacts to downstream receiving watercourses as a result of post-development drainage contributions.	7.3	Neutral
	Water Quality	Grading, Servicing and Development	Stormwater runoff captured by the proposed stormwater infrastructure could affect water quality in downstream reaches if released without quality control.	Refer to Community-Wide FSR (Urbantech Consulting 2024) Implement BMPs outlined in the Guidance for Development Activities in Redside Dace Protected Habitat (MNRF 2016), as applicable.	7.3, 7.4	Neutral
	Temperature	Grading, Servicing and Development	Stormwater runoff captured by the proposed stormwater infrastructure could affect water quality in downstream reaches if released without thermal control.	Refer to FSR (Urbantech Consulting 2024)	7.3	Neutral
	Site Water Balance	Grading and Development	Based on the results of the pre-development and post-development water balance completed, the proposed development is expected to produce a decrease in annual infiltration of 96,414 m3/year and an increase in annual runoff of 648,812 m3/year. The effects are the result of increased impervious areas replacing pervious areas of the Site.	Considering the high groundwater elevations across the Site, lot level mitigation was considered the best approach for improving infiltration in the post-development condition. The current LID plan includes connecting about 11.2 ha of impervious surfaces with 24.3 ha of pervious area to maximize infiltration potential. The areas considered include impervious roofs and paved areas to rear yards and pervious areas of parks, channels and SWM ponds from Catchments 101, 102, 104, 105, 106, Channels, Pond 2A and Pond 2B. With mitigation, the post development infiltration deficit is reduced to 34,803 m^3/yr from pre-development conditions. Best efforts were made to incorporate low impact developments (LIDs) throughout the site to reduce the post-development infiltration deficit.	7.2	TBD
	Feature Based Water Balance Analysis	Grading and Development	Potential hydrologic changes to wetland catchments may occur as a result of the proposed development.	Uncontrolled flows from the development are being directed to Wetlands W1, W3, W5, and W6. Additionally, clean roof runoff up to the 5 mm event will be directed via a dedicated pipe to W3. Although the annual runoff volumes to the wetlands are not maintained to predevelopment, best efforts were made to maintain the target hydroperiods and PTI. A preconstruction wetland monitoring program by DS is currently underway and will be ongoing for a minimum of a 1-year period to establish baseline conditions throughout the hydroperiods for Wetlands 1 to 6. The results of the baseline wetland monitoring will be used in combination with the continuous modeling to assess the actual risk to the wetlands. Based on the findings of the water balance results, a wetland mitigation plan will be developed.	TBD	TBD
Natural Heritage System	**Linkages**	Grading, Servicing and Development	The SABE Scoped SWS did not identify linkages within the Secondary Plan Area. The proposed NHS replicates and enhances the level of function existing features provide in their current state.	Encourage wildlife passage through the NHS and parks as a means of reducing the potential for vehicular impacts.	7.1	Neutral

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation/Management	EMP Section	Effect
	Significant Woodlands	Grading, Servicing and Development	There are no significant woodlands on or adjacent to the Secondary Plan Area.	None.	N/S	Neutral
	Wetlands	Grading, Servicing and Development	Wetlands W1 through W6 are non-provincially significant (other) and will be protected within the proposed natural heritage system. As some wetland features are very small and isolated (ELC Units 5, 7e, 7f, 7l, 13 and 14a), it is proposed that these be consolidated and enhanced within an enhanced corridor/greenway along a re-aligned Tributary WHT6. The proposed corridor has been sized to ensure that an equivalent area of wetland habitat can be accommodated.	Potential impacts to wetlands can be reduced by implementing the following impact avoidance and mitigation measures: • Naturalize buffers and enhancement areas using native species; • Avoid directing untreated runoff to the wetlands; • Implement ESC Plan as detailed in the FSR (Urbantech Consulting 2024). • Implement 1:1 compensation for wetland removals and implement design features to enhance wetland form and function.	7.1	Positive
	Valleylands	Grading, Servicing and Development	There are no valleylands.	None.	N/A	Neutral
	Trees	Grading, Servicing and Development	The majority of the Secondary Plan Area is comprised of agricultural land and is relatively open. It is anticipated that all trees situated in areas to be developed will be removed.	The Town of Caledon requires compensation for trees removed in relation to draft plan and site plan applications. Compensation for removed trees is determined based on the cost to replace the trees that will be removed due to development. If there is in insufficient room to plant the required number of replacement trees on-site, then financial compensation (cash-in-lieu) may be accepted at rate (per tree) as determined by the Town.	7.1	Neutral
Wildlife	**Birds**	Grading, Servicing and Development	Development activities will result in the removal of habitat. All the wetland and edge species that occur within the NHS are expected to remain subject to the usual annual variation.	• Undertake vegetation / tree clearing between August and April so as not to impact breeding birds and not contravene the *Migratory Birds Convention Act.* • Establish buffers and fencing at development limits adjacent to the NHS to reduce human encroachments and predation by pets. • Post signage to keep pets and people out of the NHS	7.1	Neutral
	Reptiles	Grading, Servicing and Development	No snakes were observed within the Draft Plan areas, however potential habitat is present. No such habitats will be removed from the proposed NHS which contains meadows and wetlands. No overwintering habitat for turtles will be removed.	• The loss of potential foraging habitats for snakes can be mitigated by retaining meadow and other types of habitats within the NHS and through the creation of the greenway corridor. • The nearby PSW will be protected from development, which provides great habitat for reptile use.	7.1	Neutral
	Amphibians	Grading, Servicing and Development	No significant amphibian habitats (i.e., breeding sites) have been identified on the Secondary Plan Area. In the adjacent lands, the protected Bolton PSW provides amphibian habitat. No such habitats will be removed.	• The loss of potential habitats for amphibians can be mitigated by retaining wetlands and other types of habitats within the NHS and through the creation of the greenway corridor. • The nearby PSW will continue to provide habitat.	7.1	Neutral
	Mammals	Grading, Servicing and Development	All the mammal species that are currently present are urban tolerant species and expected to remain in the post development environment. Like the birds, it is anticipated there will be a slight shift in species assemblages toward a greater number of species that are more tolerant of urban environments. For example, Deer use is expected to decrease, while Raccoon and Striped Skunk populations could increase. Wildlife movement patterns in the general vicinity are expected to change as landscape resistance will increase as a result of development. It is expected that future wildlife movement will be more concentrated to the north and east in the Humber River valleylands.	• Encourage wildlife passage through the NHS and parks as a means of reducing the potential for vehicular impacts.	7.1	Neutral
	Significant Wildlife Habitat (SWH)	Grading, Servicing and Development	Candidate SWH identified through this CEISMP is primarily located in the Natural Heritage System that will be protected from development.	• Implement and naturalize Buffers as recommended in this EIS. • Install fencing between rear lots and the NHS to limit encroachments.	7.1	Neutral-Positive
Fish Habitat	**Fish Habitat**	Grading, Servicing and Development	The CEISMP has identified that HDF reaches WHT1-A, WHT1-B and WHT6-A provide fish habitat. No development or site alteration is proposed within the	Potential impacts to fish habitat can be reduced by implementing the following measures:	7.1, 7.3, 7.5	Positive

Category	Feature/Function	Proposed Activity	Potential Impacts	Recommended Mitigation/Management	EMP Section	Effect
			HDF reaches WHT1-A and WHT1-B, however HDF reach WHT6-A will be restored through the proposed enhanced corridor/greenway.	• Develop and implement ESC plan. • Minimize non-essential vegetation clearing and grading, and integrate a phasing workplan for grading and construction; • Stabilize soils that will be exposed for long periods of time; and • During site preparation and construction ensure surface water is properly managed and treated using approved BMPs.		
Provincially Threatened and Endangered Species	**Eastern Meadowlark**	Grading, Servicing and Development	Eastern Meadowlark is a Provincially Threatened bird species that breeds in grasslands of various types. Eastern Meadowlark has been recorded in various locations, and habitat remaining for this species during the last breeding bird survey in 2020 was ELC Unit 3d as the results of the last breeding bird survey provide a higher level of confidence of actual breeding locations. Other areas where Eastern Meadowlark had been recorded are now farmed and no longer provide suitable habitat.	Should removal of Eastern Meadowlark habitat be identified through the detail design process, it will require consultation with MECP in accordance with the *Endangered Species Act* and regulations pertaining to this species.	7.1	Neutral
	SAR Bats		There are four endangered bat species in Ontario: Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis and Tricoloured Bat. Potential bat maternity roost habitat is present.	Should the removal of the SAR Bat habitat be identified through the detail design process, it will require consultation with MECP under the *Endangered Species Act* and regulations pertaining to this species.	7.1	Neutral
	Redside Dace	Site Preparation, Grading, Servicing and Development	This CEISMP has identified potential for contributing habitat for Redside Dace habitat along two reaches of Tributary WHT1 (WHT1-A & WHT1-B). No development or site alteration is proposed within the HDF reaches WHT1-A and WHT1-B and their associated wetlands. All grading, servicing and development will occur outside potential contributing habitat for this species and will therefore not have a direct impact on the identified habitat. Furthermore, a wetland buffer has been proposed that will mitigate indirect impacts the habitat. Potential residual indirect impacts that may result from the proposed development are outlined below: **Grading** • Potential to introduce sediments and nutrients into the drainage features. • Alterations to existing drainage catchment areas has the potential to temporally and spatially alter surface water inputs which can affect flows, erosion rates and water temperatures. **Development:** • Development will create impervious surfaces that will increase overall runoff volumes and decrease infiltration within the catchment areas of features. • Decreases to infiltration can reduce base flow contributions to these HDFs and impact fisheries through reduced flow and elevated temperatures.	Mitigation measures will be implemented in accordance with the *Guidance for Development Activities in Redside Dace Protected Habitat* (MNRF 2016): • Develop and implement ESC plan. • Minimize non-essential vegetation clearing and grading, and integrate a phasing workplan for grading and construction; • Stabilize soils that will be exposed for long periods of time and store stockpiled soil outside of the potential Contributing Redside Dace habitat; • During site preparation and construction ensure surface water is properly managed and treated using approved BMPs.	7.1, 7.3, 7.5	Neutral

7. Environmental Management Plan

The CEISMP TOR requires that an environmental management strategy be created as part of this report. More specifically:

> *The study will outline an environmental management strategy for the preferred development locations which will recommend measures for the management, enhancement, restoration and monitoring of the ecosystem.*

The Caledon Station Land Use Plan and Framework Plan were designed with the objective or protecting, maintaining and enhancing the natural heritage system, thereby avoiding directly impacting natural heritage features. The following sections describe mitigation measures that are to be implemented during development to ensure that natural heritage features and their associated ecological functions are protected, maintained and enhanced. Implementation of these management plans will ensure that the Town's environmental performance measures can be satisfied while developing this community.

7.1 Natural Heritage Resource Management Plan

Protection of the natural heritage features and ecological functions associated with the natural heritage system can be achieved by:

- Prohibiting development and site alteration within the natural heritage features;
- Maintaining the existing water balances of the natural heritage features by implementing the recommendations in the SWM Management Plan and LID Management Plan;
- Applying as 10 m buffer to the limits of W1-W6; and
- Placing the natural heritage features and associated buffers within an EPA designation.

Maintenance and enhancement of the ecological integrity of the natural heritage features of their ecological functions can be achieved by:

- Removing foreign waste and debris from the natural heritage features;
- Controlling populations of invasive species;
- Restoring native species diversity to the habitats by planting appropriate native vegetation;
- Enhancing wildlife habitat through plantings and design elements (e.g., bird/bat boxes snake hibernacula, turtle nesting area);
- Enhance fish habitat by providing more diverse riparian cover;
- Enhancing hydrologic connectivity of Macville Area Wetlands at abandoned rail line (e.g., W3 to W4 culvert) by replacing with a naturalized channel following construction of the storm sewer;
- Integrating formal trails within buffers;
- Naturalizing buffers with native plantings;
- Incorporating LIDs within buffers to maximize their effectiveness;
- Installing fencing at the limits of development;
- Posting educational signage in the buffer to discourage encroachments into the natural heritage features; and

- Monitoring the health and condition of the natural heritage features and performance of environmental protection and management systems.

7.1.1 Tributary WHT6 Greenway Corridor

Through the detail design process, a construction staging plan should be developed which includes details on:

- How construction activities will adhere to relevant timing windows for vegetation removal and inwater works;
- Opportunities for salvage and stockpile of existing wetland seedbanks for use in the corridor;
- Minimizing areas of disturbance through construction phasing to mitigate risk of erosion and release of sediment to downstream portions of watercourse;
- Dewatering plans to ensure the maintenance of flow contributions to downstream systems during construction and ensure works are undertaken in the dry; and
- Erosion and sediment control measures to isolate the work area.

7.1.2 Tree Removal Compensation – Draft Plans of Subdivision

The Town of Caledon requires compensation for trees removed in relation to draft plan and site plan applications as outlined in the *Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation* (Town of Caledon 2020). Compensation for removed trees is determined based on the cost to replace the trees that will be removed due to development. The Town of Caledon has developed a formula for calculating compensation values that is based on tree size. If there is in insufficient room to plant the required number of replacement trees on-site, then financial compensation (cash-in-lieu) may be accepted at rate (per tree) as determined by the Town.

7.1.2.1 Argo Macville

The Argo Macville Draft Plan of Subdivision Arborist Report (**Appendix E**) determined that the removal of the 214 trees, 182 of which are in fair or better condition, would require 446 replacement trees. This number of replacement trees identified does not account for the removal of several trees located at 0 King Street, which will be removed and compensated for by others (Humberking Draft Plan of Subdivision - West Lands). It also does not account for 10 shared boundary trees located on the property line with the Humberking Draft Plan of Subdivision lands. The number of replacement trees required for these boundary trees is 24; therefore, an additional 12 replacement trees are required for Argo Macville Draft Plan of Subdivision, bringing the total to 458.

7.1.2.2 Argo Humber Station

The Argo Humber Station Draft Plan of Subdivision Arborist Report (**Appendix E**) determined that the removal of 57 trees, of which 47 are in fair or better condition, would require 97 replacement trees.

7.1.2.3 Humberking

Humberking East

The Humberking Draft Plan of Subdivision Arborist Report (**Appendix E**) determined that a total of 102 replacement trees are required for the removal of 54 trees (includes individually tagged and tallied trees) that are 10 cm DBH or greater, and in fair to good condition within Humberking East.

Humberking West

The Humberking Draft Plan of Subdivision Arborist Report (**Appendix E**) determined that a total of 495 replacement trees are required for the removal of 318 trees (includes individually tagged and tallied trees) that are 10 cm DBH or greater, and in fair to good condition within Humberking West. This number of replacement trees does not account for the removal of several trees (NT7-NT13) located at 0 King Street, which will be removed by others (Argo Macville). It also does not account for 10 shared boundary trees located on the property line with 0 King Street (Argo Macville). The removal of these shared boundary trees is required to accommodate both development proposals; therefore, it is understood that replacement of these trees is a shared responsibility. The number of replacement trees required for these boundary trees is 24; therefore, an additional 12 replacement trees are required for Humberking West, bringing the total to 507.

7.2 Groundwater Resource Management Plan

7.2.1 Site Water Balance

To understand existing hydrologic conditions, a Thornthwaite site level water balance assessment was completed by DS Consultants Ltd (2024). The assessment was completed to provide a baseline for the volume of infiltration, runoff, evapotranspiration and evaporation. A post-development water balance was also completed to predict hydrologic changes as a result of proposed conditions. Based on the results of the pre-development and post-development water balance completed, the proposed development is expected to produce a decrease in annual infiltration of 96,414 m^3/year and an increase in annual runoff of 648,812 m^3/year. The effects are the result of increased impervious areas replacing pervious areas.

Groundwater elevations are high across the Secondary Plan Area and present a challenge for mitigating infiltration deficits. As such, a best-efforts approach has been proposed to reduce the infiltration deficit using lot level, passive Low Impact Development (LID) measures. The location and design of the LIDs are provided in the Final Community-Wide FSR (Urbantech 2024).

Considering the high groundwater elevations across the Site, lot level mitigation was considered the best approach for improving infiltration in the post-development condition. The current LID plan includes connecting about 11.2 ha of impervious surfaces with 24.3 ha of pervious area to maximize infiltration potential. The areas considered include impervious roofs and paved areas to rear yards and pervious areas of parks, channels and SWM ponds from Catchments 101, 102, 104, 105, 106, Channels, Pond 2A and Pond 2B. The effectiveness of connecting the impervious and pervious areas is estimated to provide and infiltration benefit of 6,467 m^3/year.

The Silva Cell is a patented modular suspended pavement system that holds unlimited amounts of lightly compacted soil while supporting traffic loads. That soil serves to provide stormwater treatment and storage for on-site infiltration. Areas considered as contributing catchments for the Silva Cells includes approximately 5.2 ha impervious area and about 5.1 ha pervious area, from road ROWs and parks in Catchment 101, 102, 103, 104, 105 and 106. The Silva Cells are designed to capture a 25mm storm event for each respective catchment. As a result, it is expected that the Cells are capable of storing and infiltrating a maximum of 90% annual rainfall depth. The effectiveness of the Silva Cells is estimated to provide an infiltration benefit of 41,947 m^3/year.

With mitigation, the post-development infiltration deficit is reduced to 34,803 m^3/yr from pre-development conditions.

It should be noted that the detailed design of the LID facilities at the Site during the post-construction period have not been finalized. Changes or additions to the LID plan should include a revised water balance. The Final Community-Wide FSR provides further information regarding the LIDs under consideration.

7.2.2 Feature Based Water Balance

7.2.2.1 Wetland Water Balance Risk Evaluation

To aid in determining the level of risk and evaluation requirements for retained wetlands (W1 through W6), an assessment was completed using the Wetland Water Balance Risk Evaluation guidelines provided by the TRCA (2017). The guideline provides a four-step process as follows:

1. *Determine which retained wetland(s) may be impacted by the proposal.*
2. *Determine the magnitude of potential hydrological change.*
3. *Determine the sensitivity of the wetland and its associated flora and fauna to hydrological change.*
4. *Integrate information from step 1, 2, and 3 to assign a level of risk to the proposal.*

The Hydrogeological Investigation (DS Consultants Ltd. 2024) provides the Wetland Water Balance Risk Evaluation based on the magnitude of potential hydrological impact to Wetlands W1 through W6. The analysis demonstrates that there is a low magnitude of hydrological change as a result of impervious cover score and a high magnitude of hydrological change as a result of change to catchment size for each of the wetland units.

7.2.2.2 Continuous Hydrology Modelling

The Final Community-Wide FSR (Urbantech 2024) provides the results continuous hydrologic modelling that was completed to assess and mitigate the impacts on the hydroperiods of the wetlands. The analysis was conducted for rainfall data from 1986 to 2007 from the Buttonville station as recommended by the TRCA. Fluctuation of the wetland water depths and inundated areas over the analysis period was extracted from 2D HEC-RAS and analyzed.

A proposed scenario (without mitigation) was developed reflecting the change in drainage catchments to the wetlands. A comparison of the existing versus proposed scenarios shows that hydroperiods and percent time inundation (PTI) of the wetlands without mitigation measures were much lower than the set targets.

To address feature-based water balance requirements, the following mitigation measures are proposed:

- Diversion pipe in drainage area 105 to supply clean water to Wetland W3;
- Collection of rear yard drainage from catchments 105 and 106 to supply clean water to Wetland W5;
- Local drainage from catchment 105 where Street E intersects The Gore Road will be directed to Wetland W1; and
- Local drainage from rear yards and front yards(roofs) in catchment 106 will be directed to Wetland W6.

Although the annual runoff volumes to the wetlands are not maintained to predevelopment, best efforts were made to maintain the target hydroperiods and PTI. The reduced post-development runoff volume is justified by the sloped nature of the wetlands and lack of defined depressions, where most surface runoff is conveyed via sheet flow without significant storage. Hence, the amount of runoff required to maintain the wetland hydrologic and ecological function is determined to be considerably lower than the runoff volumes it receives under existing conditions.

7.2.3 Construction and Permanent Dewatering

It is expected that trenching and excavation earthwork during the construction period will extend below the groundwater table in certain areas and groundwater control and dewatering will be required. To assess the requirements for groundwater control and dewatering during the construction period, DS Consultants Ltd. prepared a conceptual site model assuming the worst-case scenario with respect to the depth of excavation below the ground water table. On this basis, the excavation will be advanced to a depth of 2.5 m below the ground surface. There will be a requirement to lower the groundwater table to an elevation of 0.5 m below the base of excavation. The total unit dewatering rate (including a 50% factor of safety and the contribution from an incidental precipitation event) during the construction period was estimated as follows:

- 346,830 L per day for one (1) residential low-rise block development;
- 186,705 L per day for one (1) townhouse and single detached unit; and
- 15,500 L per day for one (1) trench segment.

Permanent and temporary dewatering rates were also presented for stormwater management facilities. The total volumetric pumping rate to control groundwater from the aquifer during construction was estimated to be approximately 365 L/min or 525,600 L/day and 29 L/min or 41,760 L/day (for SWM Pond 1 and SWMP Pond 2B, respectively. To manage storm water collected within areas of open excavations, the estimated daily discharge volume for storm water (including a 10 mm storm event) was estimated to be 590,000 L/day and 95,690 L/day (pumped over a 48-hour period) for SWM Pond 1 and SWM Pond 2B, respectively. A range of permanent drainage values was presented for SWM Pond 2A, with interim drainage estimated to be 45,000 L/day.

The Hydrogeological Investigation (DS Consultants Ltd. 2024) provides detailed information regarding construction and permanent dewatering requirements.

7.2.4 Low Impact Development (LID) Plan

Best efforts were made to incorporate low impact developments (LIDs) throughout the Secondary Plan Area to reduce the post-development infiltration deficit. Modular soil cells are proposed within the wider road right-of-way sections along the Linear Park. These modular cells were sized to capture and infiltrate the 25 mm rainfall volume, which equates to the 90th percentile of the total annual precipitation, and can be installed within the constrained road right-of-way as well as green spaces and park frontages. The water balance plan includes about 10.24 ha of impervious and pervious areas.

In addition to LIDs, water balance requirements are recommended for the site plan blocks (medium density and mixed use). The total site plan blocks area is approximately 24.43 hectares. On-site retention or reuse of the 1 mm rainfall event on these site plan blocks can provide 22,972 m^3 of annual volume. If a high groundwater table impedes infiltration, filtration of the 1mm runoff can be implemented towards water balance requirements. LID feasibility and design will be further refined throughout the detailed design stage.

To meet feature-based water balance requirements, the proposed drainage plan was designed to promote drainage of clean sources of water (vegetated areas and roof drainage) towards the wetlands to mitigate the impacts post-development. Uncontrolled flows from the development are being directed to Wetlands W1, W3, W5, and W6. Additionally, clean roof runoff up to the 5 mm event will be directed via a dedicated pipe to W3. Although the annual runoff volumes to the wetlands are not maintained to predevelopment, best efforts were made to maintain the target hydroperiods and PTI.

7.3 Erosion and Sediment Control Plan

Rigorous erosion and sediment control measures will be designed, implemented and maintained throughout the construction period. At detailed design, an Erosion and Sediment Control Plan will be prepared and designed in conformance with the Town and Conservation Authority guidelines. Erosion and sediment control will be implemented for all construction activities including topsoil stripping, earthworks, foundation excavation and stockpiling of materials and will remain in place and functional until bare surfaces are stabilized.

The following erosion and sediment control measures should be considered for use during construction:

- Natural features will be staked and temporary fencing provided to keep machinery out of sensitive areas;
- Sediment control fence and snow fence will be placed prior to earthworks;
- Logistics/construction plan will be implemented to limit the size of disturbed areas, minimizing the non-essential clearing and grading areas;
- Temporary sediment ponds;
- Rock check-dams and cut-off swales will be provided, where required, in order to control, slow down and direct runoff to sediment basins;
- Sediment traps will be provided;
- Gravel mud mats will be installed at construction vehicle access points to minimize off-site tracking of sediments;
- All temporary erosion and sediment control measures will be routinely inspected / monitored and repaired during construction. Temporary controls will not be removed until the areas they serve are restored and stable;

- The “multiple barrier approach” will be applied to all construction stages to ensure erosion is prevented rather than reduced. Recommended measures are to be installed prior to the initiation of the earthworks and grading; and
- Reference will be made to the Guidelines for Erosion and Sediment Control for Urban Construction Sites prepared by the Greater Toronto Conservation Authorities (2020) when preparing Erosion and Sediment Control Plans.

7.4 Climate Change

Pratus Group (2024) prepared a Climate Adaptation Plan (CAP) to satisfy the requirements of the Region of Peel Official Plan and the Town of Caledon’s Terms of Reference for the Caledon Station Secondary Plan Area. The CAP provided the following:

- A summary of climate-related risks and vulnerabilities relevant to the Secondary Plan Area;
- A summary of climate adaptation strategies and actions identified by the Region of Peel and the Town of Caledon that were considered for application within the Secondary Plan Area; and
- Specific climate adaptation considerations that were implemented within the Secondary Plan Area to reduce risk and vulnerability due to changing climate conditions.

Key climate adaptation themes identified for the Caledon Station Secondary Plan Area included:

- Floodplain and Wetland Integrity;
- Overland Flooding;
- Operations and Maintenance;
- Water and Power Availability;
- Social Vulnerabilities; and
- Ecological Integrity.

Appendix B of the CAP identifies a recommended approach for the implementation of Climate Adaptation Considerations at site plan and detailed design stages.

8. Long Term Environmental Monitoring Plan and Comprehensive Adaptive Management Plan

The CEISMP TOR requires that both a Long-Term Environmental Monitoring Plan (LTEMP) and a Comprehensive Adaptive Management Plan (CAMP) be prepared. From the descriptions provided in the CEISMP TOR, the LTEMP and CAMP are highly interrelated. These have been combined into **Table 25** below.

Table 25. Long Term Environmental Monitoring Plan (LTEMP) and Comprehensive Adaptive Management Plan (CAMP)

Monitoring Period	Monitoring Parameter	Monitoring Location	Monitoring Frequency	Methods	Triggers for Mitigation	Response
Pre-Construction (Baseline)	Groundwater Levels	Existing monitoring wells	Continuous for one week	Develop hydrographs to document baseline groundwater levels	N/A	N/A
	Surface Water Levels (Wetlands)	Existing surface water stations (including staff gauges and nested piezometers)	Continuous for one year	Develop hydrographs to document baseline water levels	N/A	N/A
During Construction	Groundwater Levels	Existing monitoring wells	Daily until drawdown target level achieved.		Target drawdown not reached or exceeded	Increased / reduced pumping; if pumping is approaching 400 m3/day, a PTTW will be required
	Groundwater Discharge (Volumes)	Groundwater discharge locations	Daily		Discharge exceeds predicted volumes	Reduce to maximum allowable volume or obtain a PTTW
	Groundwater Discharge (Quality)	Groundwater discharge locations	Once at start of dewatering	Sample for PWQO criteria	Discharge quality exceeds PWQO criteria	Consider more frequent monitoring
	Groundwater Discharge (Turbidity)	Groundwater discharge locations	Weekly from dewatering system for first month of active dewatering	Field monitoring of TSS/Turbidity for PWQO criteria	Discharge turbidity exceeds PWQO criteria	Consider enhanced treatment of discharged groundwater
	Surface Water Levels (Wetlands)	Existing surface water stations (including staff gauges and nested piezometers)	Continuous	Compare data with baseline water levels	Target drawdown water levels in wetlands exceeded	To be confirmed once baseline monitoring is complete
	Wetland Surface Water (Quality)	Existing surface water stations	Monthly	Sample for PWQO criteria	Discharge quality exceeds PWQO criteria	Coordinate with the Contract Administrator to confirm that ESC measures are performing as intended Consider more frequent monitoring.
	Wetland Surface Water (Turbidity)	Existing surface water stations (W1-W6)	Monthly	Visual inspection and sampling for TSS/Turbidity	TSS/Turbidity elevated relative to baseline conditions	Coordinate with the Contract Administrator to confirm that ESC measures are performing as intended Consider more frequent monitoring.
	Erosion and Sediment Control	Erosion and sediment control measures	Weekly and following major storm events	Manual inspection of all temporary erosion and sediment control measures	Identification of erosion and sediment control deficiencies	Contract Administrator to coordinate with contractor to ensure that deficiencies are addressed in a timely manner
	Greenway Corridor (Fluvial Geomorphology)	Constructed low flow channel	Once immediately following construction	Undertake as-built survey to evaluate conformity of the low flow channel with design specifications and to obtain reference data for comparison with subsequent surveys. Establish control points for longitudinal profile, four detailed cross-sections and photo locations	Constructed channel does not conform with approved design drawings	Coordinate with contractor to address deficiencies
Post Construction	Groundwater Levels (Site Water Balance)	Existing monitoring wells	Weekly until 90% of original static level	Compare with baseline data	N/A	N/A
	Surface Water Levels (Wetlands - FBWB)	Existing surface water stations	Continuous until target levels are reached	Compare data with baseline water levels	Target drawdown water levels in wetlands exceeded	Target levels will be established from baseline monitoring data

Monitoring Period	Monitoring Parameter	Monitoring Location	Monitoring Frequency	Methods	Triggers for Mitigation	Response
	Surface Water Levels	Existing surface water stations	Weekly for one month or until 90% of original static level	Compare with baseline water levels	N/A	N/A
	Stormwater Management Facilities	SWM Pond Performance	In accordance with ECA	Confirm that SWM Pond is performing as intended	N/A	N/A
		SWM Pond Outfalls	Annually (spring or fall)	Manual inspection of SWM Pond outfalls for evidence of erosion	Identification of active erosion associated with released stormwater	Consider adaptive management measures, such as plantings to mitigate erosion
		SWM Pond Forebay	Once prior to Town assumption	Disk/Rod Method or Town-Approved Method to determine forebay sediment depths.	Sediment depths exceed Town criteria	Undertake pond cleanout to remove sediment from forebay
	Wetland Buffer/Enhancement Area (Restoration Plantings)	W1-W6 buffer areas, NHS enhancement area	Once annually within warranty period	Manual inspection of planting survival and health	Warranty replacement threshold	Undertake replacement plantings in accordance with warranty
	Wetland Buffer/Enhancement Area (Invasive Encroachment)	W1-W6 buffer areas, NHS enhancement area	Once annually for a period of three (3) years	Manual inspection for changes in distribution and abundance and extent of invasive plant species.	N/A	Consider the need to develop an invasive management plan
	Greenway Corridor (Fluvial Geomorphology)	Constructed low flow channel	Once annually for a period of three (3) years.	Longitudinal profile of the channel centreline and four detailed cross-sections. Repeated photographs from a known vantage point	Compare to as-built survey for general conformance	Consider implementing repair measures if deficiencies are identified
	Greenway Corridor (Restoration Plantings)	Corridor restoration plantings	Once annually within warranty period	Manual inspection of planting survival and health	Warranty replacement threshold	Undertake replacement plantings in accordance with warranty
	Greenway Corridor (Invasive Encroachment)	Greenway Corridor	Once annually for a period of three (3) years	Manual inspection for changes in distribution and abundance and extent of invasive plant species.	N/A	Consider the need to develop an invasive management plan
	Greenway Corridor (Wildlife, Reptiles and Amphibians)	Corridor amphibian habitat features	Annually for a period of three (3) years	Breeding amphibian monitoring during seasonally appropriate conditions to confirm presence/absence. Manual inspection for evidence of wildlife and reptile use of corridor.	N/A	N/A

9. Recommendations for Future Work

Table 26 summarizes ongoing and future work that should be undertaken on specific properties in support of site plans and the permit/approvals process.

Table 26. Summary of Potential Future Work

Study Type	Study Purpose	Stage	Draft Plan Area
Ongoing Groundwater Monitoring	To inform LID design	Detailed Design	All
Infiltration Testing	To inform LID design	Detailed Design	Argo Macville and Humberking West
SWM Pond Dewatering Requirement Testing	To inform SWM design	Detailed Design	Argo Macville and Humberking West
Ongoing Surface Water Level Monitoring (Wetlands W1-W6)	To inform monitoring thresholds for response	Detailed Design	EPA Wetlands
ESC Plans	To manage sediment laden runoff and protect the environment	Site Plan/Detailed Design	All
Landscape Planting Plans	Restoration and enhancement of buffer and enhancement areas, Greenway Corridor	Detailed Design	Argo Macville, Argo Humberking West
Greenway Corridor Design	Engineering design submission for permits/approvals	Detailed Design	Humberking West
Turtle Basking and Nesting Surveys	Confirmation whether pond and wetlands are used for overwintering and/or nesting.	Draft Plan (To be completed by August 2024)	EPA Wetlands
Breeding Amphibian Surveys	Confirmation whether wetlands are used for amphibian breeding.	Draft Plan (To be completed by August 2024)	Argo Macville – other lands required for servicing
Breeding Bird Surveys	Confirmation whether wetlands are used by breeding birds.	Draft Plan (To be completed by August 2024)	Argo Macville – other lands required for servicing
Bat Maternity Colony Surveys	To confirm presence of potential bat maternity colonies for the purposes of conforming with the *Endangered Species Act*.	Prior to site alteration and building demolition.	All properties with suitable habitat - buildings and structures

10. Policy Conformity Assessment

The CEISMP TOR requires that the report addresses applicable environmental planning policies. It states that *the CEISMP is intended to clearly reference relevant policy, legislative and technical requirements and describe how the CEISMP meets or exceeds these requirements*.

It is our opinion that this Final Community-Wide CEISMP, and the proposed Draft Plans conform with relevant federal, provincial, and municipal environmental legislation and policies, provided that development proceeds as indicated, and recommendations are followed.

11. Summary and Conclusions

This Community-Wide CEISMP has been prepared in support of Draft Plan of Subdivision Applications for the following Draft Plan areas:

- Argo Macville I Corporation, Argo Macville II Corporation, Argo Macville III Corporation, Argo Macville V Corporation and Argo Humberking Corporation (Argo Macville) Draft Plan of Subdivision;
- Argo Humber Station Limited (Argo Humber Station) Draft Plan of Subdivision;
- Humberking Developments Limited Humberking East Draft Plan of Subdivision; and
- Humberking Developments Limited Humberking West Draft Plan of Subdivision.

The purpose of this report was to integrate relevant findings from submissions made to address Secondary Plan requirements, to address information gaps identified in the Final CEISMP, and fulfill Draft Plan of Subdivision application requirements for each of the subject properties.

It is the opinion of Beacon that the Draft Plans conform to the environmental protection and management strategies outlined in the Caledon Station Final CEISMP and Final FSR. The proposed Draft Plans are also consistent with the Caledon Station Land Use Plan and Framework Plan.

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Appendix A

Terms of Reference for Final CEISMP

APPENDIX 1

Bolton Residential Expansion Study

Recommended Terms of Reference for Phase 3 Comprehensive Environmental Impact Study and Management Plan (CEISMP)

Prepared by TRCA and Region of Peel Staff

August 20, 2013

1.0 STUDY PURPOSE AND OBJECTIVE

The purpose of the Comprehensive Environmental Impact Study and Management Plan (CEISMP) is to conduct an impact assessment and develop a management plan for the natural environment potentially affected by urban development associated with the expansion of the Bolton Rural Service Centre to accommodate future residential growth to 2031. The management plan will inform planning and decision making so that changes in land use are compatible with natural systems and consistent with the Provincial Policy Statement (PPS) and applicable Region of Peel and Town of Caledon Official Plan policies.

The CEISMP shall include the completion of impact modeling based on land use scenario(s) developed and refined in the first phases of the Study (Parts A and B). The CEISMP will provide a sufficient level of detail and give clear direction for the implementation of development in accordance with the PPS, the Region of Peel Official Plan and the Town of Caledon Official Plan. The CEISMP study may be completed in a phased manner that will provide appropriate documentation of the municipal comprehensive review requirements for both the Regional and Town of Caledon Official Plan Amendments. The study will be completed in accordance with applicable Provincial, Conservation Authority, Regional and Municipal requirements.

1.1 Addressing Regional MCR Requirements in 7.9.2.12 e) and p)

The policy in 7.9.2.12 e) and p) requiring the demonstration of environmental protection shall be addressed through the completion of a CEISMP as outlined below. This study will address environmental and resource protection and enhancement including the identification of a conceptual natural heritage system, at a Regional scale, in accordance with the ROP policies. Requirements to enable a Regional Official Plan Amendment to proceed will be satisfied through:

1. Completion of all of the Part A Existing Conditions and Characterization;

2. Substantial completion of the Part B Impact Assessment and Detailed Studies components of the CEISMP terms of reference;
3. Identification of Core Areas of the Greenlands System, if any; and
4. Identification of a conceptual natural heritage system to the satisfaction of the Region and Town of Caledon, in consultation with the TRCA and other agency staff (e.g. Ministry of Natural Resources).

The substantial completion of the Part B component must **at a minimum** include setting the detailed targets for each discipline (e.g. ecology, surface water, groundwater, etc.) based on the detailed existing characterization of conditions completed in Part A; and establishing the conceptual plans/measures to meet those targets. For example, establishing a conceptual Low Impact Development (LID) plan that demonstrates mitigation measures that would be appropriate for meeting the site water balance targets would be required; and the detailed plan would be finalized through the completion of the CEISMP. Finalization of the CEISMP to the end of Part C and detailed refinement and finalization of natural heritage system boundaries will not be necessary for the purposes of satisfying Regional level approvals for a ROPA.

Additional direction to address Regional MCR requirements are outlined below:

- The CEISMP study component will identify a conceptual natural heritage system utilizing existing available inventories of natural features and areas supplemented by additional information collected through the completion of Parts A and B as outlined above. The identification of the conceptual natural heritage system will consider the natural heritage system policies contained in the Regional Official Plan and the Town of Caledon Official Plan.
- This study will apply the criteria for identification of the Core Areas of the Greenlands System and confirm, as appropriate, if any Core Areas exist in the recommended boundary expansion area. Spatial data and mapping of refined Core Areas of the Greenlands System boundaries shall be provided in a format satisfactory to the Region. Criteria for identifying Core Areas of the Greenlands System in Policy 2.3.2.2 of the Regional Official Plan should be applied for this purpose.
- The consultant should also utilize existing and ongoing studies and inventories and supplementary field work if necessary and appropriate.
- The Regional MCR environmental study results for the Regional ROPA shall be documented and submitted in a separate report in a format acceptable to the Region.

1.2 Preparation of a Detailed Workplan

These terms of reference provide overall guidance and a framework for carrying out a Comprehensive EIS and MP (CEISMP). It is intended that the Consultant(s) will prepare a detailed workplan with a proposed starting date of September 2013. The workplan should describe, in a more specific technical manner, how the Consultant(s) will fulfill the requirements of the terms of reference. The detailed workplan shall identify all necessary tasks, including but not limited to: a preliminary listing of all literature and background data to be relied upon; a detailed methodology for carrying out environmental characterization; monitoring and technical studies, including required technical expertise; the proposed approach to modeling urban land use scenarios and related impact assessments; the identification of anticipated deliverables; the methods of consulting with relevant agencies, stakeholders and the public; and, the timelines related to all key steps in the process. The detailed workplan is to be approved by the Town of Caledon, Region of Peel and TRCA.

TRCA will provide background data and information to the Town and consultant to inform the CEISMP. However, further consultation with the TRCA will be required to verify the extent and usability of the models/datasets, as well as to gather any additional data not initially provided.

1.3 Study Approach and Structure

To meet the objectives of Phase 1 of the Bolton Residential Expansion Study (BRES), TRCA will compile their existing environmental data (terrestrial and aquatic) related to the potential expansion area and produce screening mapping and GIS data. This will include a review of secondary sources, such as the South Albion-Bolton Boundary Expansion CEISMP. The consultant will be responsible for reviewing the mapping and data provided by the TRCA and provide a memorandum to the principle consultant setting out what known environmental features exists within the expansion areas and what constraints these features and their location may have on the potential for development.

To meet the objectives of Phase 3 and 4 of the BRES, a CEIMP will be required, which consists of fifteen (15) steps generally structured into three parts as outlined in Table 1 (these steps are described in more detail later in the terms of reference).

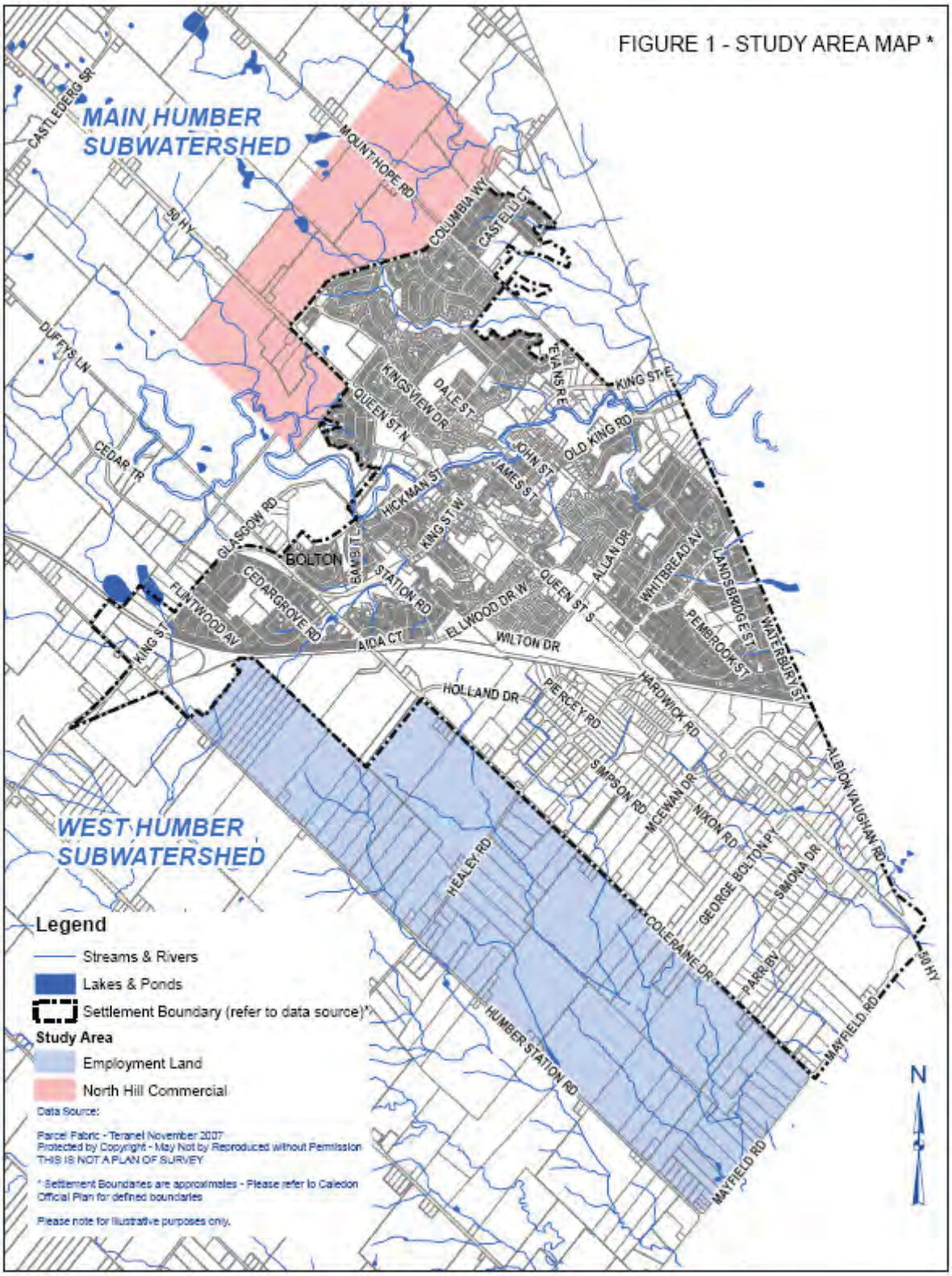
Part A characterizes the environmental resources of the study area. Background and supplemental field data is assessed within each discipline (hydrology/hydraulics, hydrogeology, water quality, stream morphology, aquatics and terrestrial and wildlife) and integrated across disciplines. Key deliverables of Part A include the identification of data gaps and resultant detailed studies required in Part B, and the establishment of initial goals and objectives.

Part B identifies and evaluates the potential impacts of urban land use scenarios within the study area. Required detailed studies identified in Part A will be carried out to fill data gaps. Goals and objectives will be finalized and key targets and strategies for meeting the finalized goals and objectives will be developed.

Based on the results of Parts A and B, Part C identifies all necessary components of an implementation strategy which will ensure that all goals, objectives, targets and other related recommendations and management measures are implemented. This will include the establishment of guidelines for the preparation of required site specific environmental studies, including but not limited to site specific Environmental Impact Study & Management Plans (EIS & MPs).

Table 1: Contents of a Comprehensive Environmental Impact Study and Management Plan

Part A **Existing Conditions and Characterization**	1. Introduction to the Study Area 2. Background Information 3. Baseline Monitoring 4. Existing Conditions Characterization and Initial Constraints and Opportunities Mapping 5. Part A Report
Part B **Impact Assessment and Detailed Studies**	6. Detailed Studies 7. Land Use Evaluation and Impact Assessment 8. Part B Report
Part C **Implementation**	9. Conclusions, Recommendations, Strategies and Management Measures 10. Long Term Monitoring Plan 11. Comprehensive Adaptive Management Plan 12. Policy Conformity Assessment and Recommendations 13. Guidelines for Site Specific Environmental Studies 14. Executive Summary 15. Final Report and Reporting Format



*Note: The study area boundary may be refined through the detailed workplan to incorporate other lands determined to be functionally connected to the study area through Parts A and B of the study.

2.0 PART A – EXISTING CONDITIONS AND CHARACTERIZATION

2.1 Introduction to the Study Area

The purpose of this section is to provide a general introduction and overview of the study area to provide context for readers of the document. This shall include but not be limited to textual description and relevant base mapping. Examining the impacts of the residential boundary expansion on the natural environment will require a sub-watershed approach, rather than only focusing on the boundaries of the preferred expansion options. Therefore, the broader study area must be defined and the assessment of impacts will apply to the full study area. The Town of Caledon, Region of Peel and TRCA will provide further guidance to the consultant regarding the delineation of the broader study area. If through the study process, other expansion area options are identified, the scope of the CEISMP may need to be revised to include any additional work.

2.2 Background Information

This section shall list all literature, background reports, mapping, technical data and all other information sources to be relied upon in the study.

2.3 Baseline Monitoring

The purpose of the baseline monitoring is to establish the baseline conditions within the study area and existing environmental trends against which future monitoring results will be compared. This will allow the projected impacts of future land uses to be monitored as land uses change over time and will link to the Adaptive Management Plan.

Information to be collected shall include but not be limited to:

(a) Surface water quality and quantity;
(b) Aquatic resources;
(c) Hydrology;
(d) Surface water - groundwater interconnections;
(e) Groundwater quality, quantity and flow patterns;
(f) Feature and Site Water budget/balance;
(g) Stream morphology; and

(h) Terrestrial resources – woodlots, wetlands, wildlife, Environmentally Sensitive Areas, Areas of Natural or Scientific Interest.

When preparing a baseline monitoring plan, it is important to ensure that many different disciplines are being monitored at the same sampling site where possible and appropriate. For example, fisheries and water quality monitoring should take place at the same site.
The monitoring plan should include an explanation of how the indicator parameters were established, e.g. what criteria were used when deciding what to monitor.

2.4 Existing Conditions Characterization and Initial Constraint & Opportunities Mapping

Field work should be carried out to better define the existing ecosystem forms, functions, and linkages within the study areas shown on Figure 1. Any areas identified as having potential functional connections that are outside the limits of the study areas shown on Figure 1 shall be addressed, as appropriate. Detailed constraint mapping (1:5,000 min. specified in step 15) will be prepared which highlights the environmental resources within the study area, as well as agency and municipal constraints (i.e. Fisheries Act, Official Plan designations, valley land setbacks). Initial objectives, which complement and build upon the subwatershed and related studies, will be developed based on the information and data inferences.

The mapping shall include but not be limited to:

(a) All hydrologic features including watercourses, swales, ponds, depression areas, springs, seepage areas and existing stormwater management facilities. Headwater features should be classified and mapped according to the CA's headwater drainage feature assessment guidelines;
(b) Existing hydrology, hydraulics, floodlines and floodline estimates as per TRCA Flood Plain Management Policies;
(c) Present day land use;
(d) Vegetation communities using Ecological Land Classification (ELC) mapping;
(e) Wildlife species locations and relative abundance (including amphibian and bird breeding);
(f) Terrestrial corridors (existing and potential), taking into consideration lands that have been targeted for the restoration of natural cover using TRCA's Terrestrial Natural Heritage System Strategy methodology and relevant subwatershed studies;
(g) Aquatic habitat, including water quality;
(h) Feature and Site Water balance/water budget assessment;

(i) Aquatic communities and habitat (with inventory sites), reach delineation, and appropriate setbacks;
(j) Valley slopes, top of bank, ecological considerations, geomorphic and geotechnical hazard areas, including stable slope lines, as per the CA's technical guidelines;
(k) Groundwater recharge and discharge areas, the linkages between them and existing condition groundwater recharge rates determined through a water budget assessment;
(l) Aquifer vulnerability to surface sources of contamination;
(m) Groundwatersheds (extending outside the study area – if applicable);
(n) Stream morphology, channel sensitivity and setbacks required to allow natural channel functions (migration, flooding, erosion);
(o) Preliminary channel classifications based on CA's technical guidelines;
(p) Refined municipal constraint limits (Town of Caledon EPA and Supportive Natural Systems and Linkages);
(q) Existing soils and geology;
(r) Significant landforms;
(s) Flora and Fauna species (based upon assessments using accepted protocols and seasonal sensitivities);
(t) Restoration or enhancement opportunity areas; and
(u) Ecological buffers.

Data deficiencies and information gaps need to be summarized and a workplan developed for filling gaps through detailed studies to be carried out in Part B. It is anticipated that this will include the review of regional groundwater models for the area (that will be provided by the TRCA), and extrapolate data from the models in combination with monitoring data to explain the groundwater conditions in the study area.

2.5 Part A Report

Once the requirements of steps 1 to 4 have been fulfilled, a Part A Report will be submitted in draft form to the Town of Caledon, Region of Peel and TRCA for review and approval prior to proceeding to Part B of the CEISMP.

3.0 PART B – IMPACT ASSESSMENT AND DETAILED STUDIES

3.1 Detailed Studies

It is anticipated that certain detailed studies will be required to complete the constraint mapping, confirm the areas functionally connected to the study area, carry out required detailed impact assessments and/or develop protection, restoration and enhancement plans for the area. In addition, the evaluation and refinement of land use options and impact assessment described in step 6 above may provide direction regarding detailed study requirements. A number of watershed and sub-watershed scale studies that are relevant to the study areas have been completed or are in progress. These studies provide strategies, guidance, targets and recommended actions to guide land use decisions and new development and should be considered when completing the detailed study components of the Comprehensive EIS and MP.

The EIS and MP must be completed in a manner such that the findings of each component study and analysis are integrated throughout the document. In addition, each aspect of the component studies must recognize the principle of adaptive management and incorporate an appropriate level of flexibility into the design. In doing this, interrelationships between components will be more fully considered and a proactive management approach may result. For example, the potential impacts of modifications to surface and/or groundwater on natural features and systems must be considered to determine the feasibility of the proposed land use changes and if/what mitigation and adaptive design measures may be required. In this regard, natural and built systems should not be considered in isolation but as integrated and adaptive units.

The need for, and scope of, the detailed studies are to be confirmed with the Town of Caledon, in consultation with the Region of Peel and TRCA, and they may include but are not limited to:

(a) Surface Water and Groundwater Resources studies;
(b) Aquatic Resources and Water Quality Study;
(c) Stream Morphology Study;
(d) Natural Heritage Study;
(e) Stormwater Management Study;
(f) Water Budget / Balance Study; and
(g) Geotechnical and Slope Stability Assessment.

The following subsections outline the potential contents of the above-referenced detailed studies, if it is determined they are required.

a) Surface Water and Groundwater Resources

The initial constraint mapping will have identified known hydrologic features within and adjacent to the study area, however, the overall hydrologic system must be described and features/functions confirmed. The components of the system to be addressed by the detailed studies include but are not limited to:

(i) Identification of flow characteristics of watercourses and swales, and a description of the feature and site water balance within the study area;
(ii) Characterization of all hydrologic features (watercourse, swales, natural areas providing flood storage/attenuation, depression storage, recharge areas, seepage areas and springs). Particular emphasis should be placed upon headwater tributaries and the functions that they perform within the system;
(iii) Identification of volume and distribution patterns of the major discharge areas and a representative location used for monitoring; and
(iv) Description of the relationship and dependencies between these features and the surrounding terrestrial, wetland and aquatic resources.

Since the study areas may include wetlands, watercourses, fishery resources and other features of potential sensitivity to changes to groundwater resources, a detailed hydrogeological impact assessment will likely be required. This may include but not be limited to:

(i) The general groundwater setting and linkages between the local and surrounding groundwater system;
(ii) Sensitivity of the natural environment and the function of the groundwater related to natural features such as the fishery, aquatic system, terrestrial resources, geomorphology, surface water, water quality and water quantity etc.;
(iii) Approximate high water table location;
(iv) Regional groundwater flow and direction and the general geologic setting;
(v) Potential recharge and discharge areas within the study areas;
(vi) Local groundwater resource usage within the study areas;
(vii) Projected post-development groundwater recharge rates including any anticipated deficits;

(viii) Location and usage of water wells within 1 km of the study areas;
(ix) Detailed description of the local geologic conditions and the function of the geologic units from a hydrogeologic perspective;
(x) Detailed assessment of the groundwater flow system, local flow direction, linkages to surface water and the regional groundwater flow system;
(xi) Delineate major and local aquifers in the area and interpret the connection to the study area;
(xii) Studies on springs, surface water courses or discharge to surface water that focus on groundwater/surface water interaction, determining linkages to recharge and discharge areas through baseflow assessment, vertical gradients, and water table location. This information should be incorporated into the water balance;
(xiii) Contamination risk assessment that considers aquifer vulnerability and proposed land use changes and identification of a risk management strategy; and,
(xiv) Assessment of potential impacts on groundwater flow and volume from required servicing.

b) Aquatic Resources and Water Quality

The initial constraint mapping will have identified fish habitat and water quality classification for the tributaries. The detailed study is to provide the following information in support of the habitat classifications and planned land use change conditions:

(i) Confirm the fish habitat and water quality classifications of all watercourses and fish habitat within the study area;
(ii) The direct and indirect physical and bio-physical impacts of the land use scenarios on water bodies, water quality and quantity;
(iii) The fish species present, and the direct and indirect biological impacts of the physical impacts;
(iv) The life stages of aquatic organisms supported by the impacted habitat; and
(v) Opportunities for maintaining and enhancing aquatic habitat and species through the land use scenarios.

c) Stream Morphology

The study will describe the physical form of the watercourse. The following information will be included:

(i) Characterization of geomorphic features including sensitive reaches, areas of erosion and aggradation, channel migration, etc;
(ii) Determine the relationship between hydrology of the stream and geomorphology, aquatic resources and water quality, using a continuous simulation modeling approach;
(iii) A meander belt width analysis and delineation of the 100 year erosion limit; and
(iv) Assessment of stream bank erosion and the potential for such erosion within the 100 year timeframe, with consideration for potential impacts on the morphology of the valley or stream corridor.

d) Natural Heritage

The study will describe the physical form and function of the ecological systems and features within the study area, and identify any functional relationships to broader systems (e.g. regional wildlife corridors), define what additional issues must be examined (i.e. opportunities for linkages) and demonstrate how the land use scenarios will affect the ecological features and functions of the study area. This shall include but not be limited to:

(i) Identification and design of a natural heritage system that enhances the form, function and integrity of ecological features within and surrounding the study area and maintains or enhances connectivity amongst ecological features. This will also include ecological buffers as well as enhancement and restoration opportunity areas;
(ii) Strategies to avoid and/or mitigate anticipated impacts of land use changes on the form and function of ecological features; and
(iii) Consideration of conservation authority 'target' natural heritage systems, and opportunities to (re)establish linkages between natural features and systems. This may include enhancing the form and maintaining the function of linkages that currently exist prior to development.

e) Stormwater Management

This study will address stormwater management considerations, including but not limited to:

(i) Evaluation of stormwater management options and selection of a preferred stormwater management strategy that includes lot level, conveyance, and end-of-pipe solutions, with emphasis placed on at source controls, and as per TRCA's Stormwater Management Criteria;

(ii) Identification of preliminary locations of stormwater management ponds and infrastructure outside of the natural system (including ecological buffers);
(iii) Identification of major and minor system flow routes;
(iv) Identification of proposed road crossing locations and criteria;
(v) Implementation strategy for inclusion on the overall Study Environmental Management Plan (e.g. phasing, interim works, roles, etc.);
(vi) Identification of erosion and sediment control requirements to be implemented, integrating conservation authority guidelines;
(vii) Methods for mitigating any projected groundwater recharge deficits associated with proposed land use changes;
(viii) Updating the CA's relevant hydrology models, based on the preferred stormwater management strategy and proposed land uses;
(ix) Methods for maintaining the seasonal water budget of hydrologically sensitive terrestrial features (i.e. wetlands and wet forests) affected by proposed land use changes; and,
(x) Updated floodplain mapping within the study area, as well as the surrounding area, if affected.

f) Water Budget / Balance

One component of achieving the sustainability and adaptive management objectives for the community is the integration of best management practices pertaining to maintaining as closely as possible, pre-development ground water conditions post-development. With changes in impervious areas, and potential changes to surface and ground water quality and quantity, best management practices which serve to promote post-development groundwater infiltration/recharge, and maintain pre-development water balance conditions to the greatest feasible extent are required. This report (to be completed by a Professional Engineer or Professional Geoscientist with expertise in this area of practice) should include the development of a detailed water balance on a catchment area basis under existing and post-development conditions.

The investigation should provide definitive, factual information that verifies the final recommendations and should include the components listed below:

1. Introduction.

(i) Background;

(ii) Hydrogeological setting, geological setting; and

(iii) Site location and proposed land use.

2. Methodology.

(i) Report and water balance objectives;

(ii) Background data studies and information utilized and considered; and

(iii) Data and considerations.

3. Water Balance Methodology.

(i) Provided on a catchment basis (existing and proposed);

(ii) Appropriate long-term water budget assessment (e.g. AES Thormewaite, minimum monthly); and

(iii) Groundwater recharge contributions to natural features must be quantified.

For preparing the Feature Based Water Balance study methodology, please refer to TRCA's Water Balance Guidelines for the Protection of Natural Features, which can be downloaded at: http://www.sustainabletechnologies.ca/Portals/_Rainbow/Documents/Water%20Balance%20for%20the%20Protection%20of%20Natural%20Features%20Guideline%20.pdf

4. Predevelopment water balance analysis.

5. Post-development water balance analysis.

(i) Land use considerations.

6. Comparison of pre- and post-development water balances.

(i) Proposed mitigation measures (if required);

(ii) Potential measures (above and beyond traditional lot level controls) that may be considered in the analysis include:

- Rain water harvesting from roof-top water collection on commercial or employment lands, which may be used for irrigation purposes;
- Infiltration galleries;
- Exfiltration galleries;
- Biofiltration measures;

- Green roofs;
- Porous pavement;
- Additional non-compacted topsoil;
- 'third pipe' systems; and
- Additional evapotranspiration measures.

(iii) Preliminary assessment based upon hydrogeological assessment of areas in which enhanced ground water recharge measures may be employed;
(iv) Establish specific targets, thresholds, and objectives for water balance in these areas;
(v) Provide alternative measures that may be employed to meet these objectives – utilizing best management practices;
(vi) Design (may consider interflow, baseflow contributions, downstream erosion and thermal impacts mitigation);
(vii) Provide locations in which these measures would be optimized;
(viii) Implementation (including funding, fiscal implications, technical feasibility, long-term maintenance, cost sharing and landownership considerations if applicable);
(ix) Maintenance; and
(x) Monitoring of water balance enhancement measures.

7. Conclusions and Recommendations.

g) Geotechnical and Slope Stability

A geotechnical investigation will be required to identify areas in which potential slope instability exists. Existing Top-of-Slope (ETOS) and the Long-Term-Stable Top-of-Slope (LTSTOS) should be assessed in areas where they are not coincident with the physical crest of slope. Because of the complexities of site development and soil conditions, comprehensive assessments are required for development projects close to major features, while less detail may be required for minor works near shallower slopes. The assessment of the LTSTOS is to be completed following the MNR's Technical Guide on River and Stream Systems: Erosion Hazard Limit (2002) and should be accompanied by a detailed slope stability analysis.

Where required, a solution based on sound technical data should be recommended to minimize or eliminate the impact of the development and associated activity, and at the same time ensure that the development will be safe for a design period of 100 years. Alternatives should be considered,

and a final solution recommended and justified by comparing it to the alternatives. The basic requirements are as follows (more specific components should be discussed with conservation authority and Town staff):

(i) Determine the existing subsoil conditions and pertinent geotechnical parameters for the entire height of the slope;
(ii) Model the slope conditions and assess its stability. Determine the stable slope inclination corresponding to a minimum Factor of Safety of 1.5; and
(iii) Provide and assess mitigation strategies, where required.

The TRCA will provide specific guidelines for the required structure of the assessment giving a general guide for the documentation and calculations required. The level of detail required for a specific submission will depend on factors such as:

(i) Slope characteristics (e.g., height, angle, and distance from watercourse);
(ii) Distance of development from the slope;
(iii) Local soil conditions; and
(iv) The type of development proposed.

3.2 Land Use Evaluation and Impact Assessment

Through an analysis of the dynamics and interrelationships of the ecosystem, the study will assess the potential environmental impacts of locating residential uses and the associated infrastructure within the respective study areas, and their compatibility with the Town's ecosystem goals, objectives, policies and performance measures.

The study will recommend environmental protection and enhancement measures for use in assessing the environmental impacts and enhancement opportunities of the residential land use options. The study will consider the impacts of development adjacent to the natural system and identified enhancement opportunities, and will discuss approaches to avoiding or minimizing impacts of adjacent land uses. The location of infrastructure, including roads adjacent to the natural system, will need to be considered with the design eliminating or minimizing any proposed crossings of the natural system.

The study will outline an environmental management strategy for the preferred development locations which will recommend measures for the management, enhancement, restoration and monitoring of the ecosystem.

It is expected that an iterative relationship will exist between steps 6 and 7.

3.3 Part B Report

Once the requirements of steps 6 and 7 have been fulfilled, a report on Part B will be submitted in draft form to the Town of Caledon, Region of Peel and TRCA for review and approval prior to proceeding to Part C of the CEISMP. Based on the results of Steps 6 and 7, the Part B report will recommend finalized goals and objectives and key targets and strategies for meeting the finalized goals and objectives.

4.0 PART C – IMPLEMENTATION

4.1 Conclusions, Recommendations, Strategies and Management Measures

This section will synthesize the results of Parts A and B of the study and provide all related conclusions, recommendations, and management/mitigation strategies. This shall include but not be limited to:

(a) A comparative evaluation of alternative management options leading to the selection of the preferred option;
(b) Conclusions and recommendations; and
(c) Strategies and Management Measures – if impacts are expected or may occur, what plans are in place to maintain ecosystem features and functions?

It is expected that key components of Part C will include a long term monitoring program, an adaptive management plan, policy recommendations and guidelines for site specific environmental studies, as generally outlined in Steps 10 to 13 below.

4.2 Long Term Monitoring plan

Monitoring is to continue after baseline conditions are established. The monitoring plan should be designed in such a way that impacts can be distinguished from natural trends at an early stage. If impacts are detected:

(a) A more aggressive type of monitoring should take place that determines where, why and how fast the change is occurring;
(b) Establish cause-effect relationships between environmental resources and land use change;
(c) Be able to deal with change by proposing appropriate mitigative measures (as per adaptive management plan); and
(d) Focus on evaluating ongoing or proposed management practices.

Items that should be monitored over the long term include but are not limited to:

(i) Water quality and quantity, including stormwater system performance (including any best management practice measures and/or designs used);
(ii) Fisheries and aquatic resources;
(iii) Hydrology and hydraulics;
(iv) Groundwater quality and quantity;
(v) Stream morphology and slope stability;
(vi) Terrestrial resources – woodlots, wetlands, flora and fauna, Environmentally Sensitive Areas, Areas of Natural or Scientific Interest, terrestrial linkages, buffer areas, invasive species, natural system encroachments, natural system edge management, and vernal pools; and
(vii) Feature Based and Site Water balance and the effectiveness of groundwater recharge enhancement measures.

It is essential that long term monitoring be included in the final study report, and that the costs and responsibilities for long term monitoring be addressed. The length of time for monitoring will be determined during the study, and may depend upon the feature to be monitored (i.e. different features may need different lengths of time).

4.3 Comprehensive Adaptive Management Plan

The broad objective of the Comprehensive Adaptive Management Plan (CAMP) is to provide direction for monitoring the performance of the recommended aquatic and terrestrial resource mitigation strategies, and to provide a flexible mitigation system that can be adjusted in response to monitoring results. For the CAMP to be effective, flexible measures must be accommodated at the initial stages of all aspects of the community design (e.g. stormwater management infrastructure, open space system, transportation network, landscaping etc.) to allow for an adaptive system that can react to required change. The CAMP is a management framework that encompasses and provides for the following:

(a) Identify key Study Area features and functions and associated protection goals and objectives;
(b) Management targets required to meet goals and objectives;
(c) Mitigation measures to address the performance targets;
(d) Monitoring requirements to monitor the success of the mitigation measures in relation to the targets;
(e) Evaluation of the monitoring results in relation to the management targets; and
(f) Long term adjustment of the overall Plan/CAMP as needed.

Specifically, the CAMP will include a framework for long-term environmental monitoring to measure the performance of the recommended mitigation/management strategies. Recommendations for long-term monitoring of surface water, groundwater, water quality, fisheries, stream morphology and terrestrial/wetland resources will be provided. The data collected as part of the Study will form a baseline for monitoring change over time and for evaluating proposed management practices. Monitoring frequency, parameters and responsibility will also be addressed. The monitoring program will be designed in a way that will help to distinguish between natural variation in ecosystem function and potential land use development impacts.

In keeping with the adaptive management plan approach, the CAMP will discuss responses to changing conditions or anticipated impacts. This might include more aggressive monitoring necessary to determine the cause and effect relationship associated with the change or anticipated impact as well as providing general directions for consideration of impact contingency measures that might be considered as adjustments to the plan where necessary after taking into account monitoring results.

The CAMP will provide the framework linking the site specific studies and CAMPs into the broad management plan or CAMP for the study area management, to ensure mitigation and monitoring plans, as well as enhancement and restoration, are consistent and integrated and address the identified resource protection targets, within the context of the broader ecological and water resources context as documented through the Study.

In areas of widespread development, the conservation authority may undertake long-term environmental monitoring (should funding be provided) to reduce overall costs and to achieve better consistency.

4.4 Policy Conformity Assessment and Recommendations

As previously stated, the CEISMP is required to not only address the policy requirements of the Caledon Official Plan, but also the applicable policies and requirements of other relevant agencies, including the Provincial Policy Statement, Provincial Acts, the Region of Peel and TRCA. Step 12 of the CEISMP is intended to clearly reference relevant policy, legislative and technical requirements and describe how the CEISMP meets or exceeds these requirements.

4.5 Guidelines for Site Specific Environmental Studies

It is anticipated that one of the products of the CEISMP will be guidelines for carrying out future site specific environmental studies, including site specific Environmental Impact Study & Adaptive Management Plans to be prepared by individual applicants in support of development proposals in the study area. These site specific studies will assess the merits of the application and will apply findings, recommendations and strategies contained in the CEISMP. Establishing guidelines for the preparation of site specific environmental studies will assist future applicants in determining the scope and content of such studies.

4.6 Executive Summary

Include a summary at the front of the final report (step 15 below) that summarizes the results of Parts A, B and C, highlighting key findings, recommendations and strategies.

4.7 Final Report and Reporting Format

A complete description of all the work and conclusions involved in the Comprehensive EIS & MP (Parts A, B, and C) is to be included in the final report.

Reports should be submitted in hard copy along with an electronic copy in Word for Windows 2007 Office and Portable Document Format (PDF) on a CD. Ten copies of all draft and final reports, each with a full set of graphics, artwork and maps shall be submitted to the Town of Caledon.

Graphics

Graphics should be submitted in Microsoft PowerPoint format on a CD separately from the main report as well as incorporated into the main report.

Artwork

Artwork should be submitted in JPG format on a CD separately from the main report as well as incorporated into the main report.

Mapping

Mapping should be in a scale of 1:5000 or less. It should be noted that Arc GIS 9.x is the GIS software currently used in the Town of Caledon, and as such, ArcView shape files are required. In general, digital graphic data:

(a) **must** be georeferenced in UTM using NAD 83;
(b) **must** be clean, i.e. polygons should be closed, dangles eliminated, polygons with common borders should not overlap, etc.;
(c) should be packaged/organized into logical layers, for example, a soils layer, a wetlands layer, etc.; and
(d) **must** be in vector as opposed to raster format, unless otherwise specified.

Tabular Attribute Data

Attribute data should be provided in Excel format files (preferred), dBase IV format files, or in formatted (i.e. with defined columns) ASCII files.

Textual Data for Graphics

Text should be provided in Word for Windows 2003 Office. Please be aware that any tabular data to be referenced to actual map features should **not** be provided as tables in a Word document.

Digital Photos

Digital photos, whether they are scanned photographs or computer-generated artwork, should be provided in JPG format.

Spatial Data Requirements

Spatial data provided by the Vendor to the Agency will be in ESRI Shapefile format. All spatial data will be geo-referenced and projected in 6 Degree Universal Transverse Mercator (UTM), Zone 17, North American Datum 1983 (NAD83). Mapping (cartographic) templates may be provided to the Vendor upon request.

Spatial data will be topologically correct. Polygon features will not overlap and gaps (slivers) will not be present (areas of no data accepted). Linear features will not have dangles, self intersects or self overlaps. Sample data may be provided to the Vendor upon request.

Metadata will be provided with all data. The metadata will include an abstract, purpose and process steps used to create the data. Attribute field definitions will also be provided. Metadata will be attached to the GIS data through a metadata record and/or as a Readme file. Sample metadata may be provided to the Vendor upon request.

The successful Vendor will be responsible for entering into a Digital Data Use Agreement (DDUA) with the Agency. A template of the DDUA is attached.

All data created by the Vendor will become the property of the Agency. Data may become available to the Public through open data initiatives.

Appendix B

Headwater Drainage Feature Assessment Photo Log

HDFA Photolog

Photograph 1.
Reach WHT6-A (June 8, 2020)
Facing west (upstream). Feature flowing at time of assessment. Wetland riparian vegetation.

Photograph 2.
Reach WHT6-B (June 8, 2020)
Facing north east (downstream). Feature was dry at the time of assessment. Wetland riparian vegetation.

Photograph 3.
Reach WHT6-C (June 8, 2020)
Facing east (upstream). Feature was dry at the time of assessment. Wetland riparian vegetation.

Photograph 4.
Reach WHT6-D (June 8, 2020)
Facing east (downstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 5.
Reach WHT6-E (June 8, 2020)
Facing west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 6.
Reach WHT6-F (June 8, 2020)
Facing north west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 7.
Reach WHT6-G (June 8, 2020)
Facing south west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 8.
Reach WHT6-H (June 8, 2020)
Facing north west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 9.
Reach WHT6-I (June 8, 2020)
Facing west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 10.
Reach WHT-J (June 8, 2020)
Facing north east (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 11.
Reach WHT6-K (June 8, 2020)
Facing south west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 12.
Reach WHT6-L (June 8, 2020)
Facing north west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 13.
Reach WHT6-M (June 8, 2020)
Facing west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 14.
Reach WHT6-N (June 8, 2020)
Facing north east (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 15.
Reach MHT7-C (June 8, 2020)
Facing north east (downstream). Feature was dry at the time of assessment. Meadow riparian vegetation.

Photograph 16.
Reach MHT7-D (June 8, 2020)
Facing east (downstream). Feature was dry at the time of assessment. Meadow riparian vegetation.

Photograph 17.
Reach MHT8-A (June 8, 2020)
Facing north east (downstream). Feature was dry at the time of assessment. Meadow riparian vegetation.

Photograph 18.
Reach WHT5-A (June 8, 2020)
Facing south west (upstream). Feature was dry at the time of assessment. Meadow riparian vegetation.

Photograph 19.
Reach WHT2-A (June 8, 2020)
Facing north west (upstream). Feature was dry at the time of assessment. Meadow marsh riparian vegetation.

Photograph 20.
Reach WHT2-B (June 8, 2020)
Facing north west (upstream). Feature was dry at the time of assessment. Meadow marsh riparian vegetation.

Photograph 21.
Reach WHT2-C (June 8, 2020)
Facing north west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 22.
Reach WHT2-E (June 8, 2020)
Facing south west (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation

Photograph 23.
Reach WHT2-G (June 8, 2020)
Facing north (upstream). Feature was dry at the time of assessment. Agricultural riparian vegetation.

Photograph 24.
Reach WHT3-A (June 8, 2020)
Facing north east (downstream). Feature was dry at the time of assessment. Wetland riparian vegetation.

Photograph 25.
Reach WHT3-B (June 8, 2020)
Facing north west (upstream). Feature was dry at the time of assessment. Wetland riparian vegetation.

Photograph 26.
Reach WHT3-C June 8, 2020
Facing north west (upstream). Feature was dry at the time of assessment. Meadow riparian vegetation.

Photograph 27.
Reach WHT1-A (June 8, 2020)
Facing north west (upstream). Feature was flowing at the time of assessment. Wetland riparian vegetation.

Photograph 28.
Reach WHT1-B (June 8, 2020)
Facing north east (upstream). Feature was flowing at the time of assessment. Wetland riparian vegetation.

Appendix C

Beacon (2023) OWES Evaluation

Memorandum

To: Mr. Carmine Caruso
Senior Planner
Town of Caledon

From: Ken Ursic, M.Sc.; Said Mohamed, B.Sc., Beacon Environmental Limited

Date: May 17, 2023

Ref.: Town of Caledon: POPA 2021-0002
Beacon Environmental Limited: 214476

Re: **Final Wetland Evaluation and Mapping Update for the Macville Area Wetlands, Town of Caledon, Region of Peel**

Beacon Environmental Limited ("Beacon") were retained by the Caledon Community Partners to evaluate previously unevaluated wetlands in the Caledon Station Community Secondary Plan Area in Bolton, Ontario. The Caledon Station Community Secondary Plan Area (herein referred to as the "Subject Lands") include approximately 182 hectares (450 acres) of primarily agricultural land that is generally located north of King Street, east of The Gore Road and west of the CP Railway tracks. The Subject Lands and surrounding 120-metre study area contain one (1) Provincially Significant Wetland ("PSW") and 16 unevaluated wetland units (**Figure 1**).

The Town of Caledon requires that unevaluated wetlands be studied and evaluated as per Official Plan Policy 3.2.4.4.4:

> *Unevaluated wetlands shall be studied and evaluated through joint initiatives potentially involving the Town, the Conservation Authority, the Ministry of Natural Resources and Forestry, the Region of Peel, a development proponent or other appropriate parties.*

To confirm the significance status of these previously unevaluated wetlands ("Subject Wetlands"), a Certified Wetland Evaluator has completed an evaluation in accordance with the Ontario Wetland Evaluation System (OWES) Southern Manual, 4th edition (MNRF 2022), as described in **Section 2**. Note that the PSW east of the Canadian Pacific Railway was not included as part of the current evaluation.

The Subject Wetlands have been studied between 2013 and 2020 by Beacon as well as the Ministry of Natural Resources and Forestry ("MNRF") and Dougan & Associates on behalf of the Town of Caledon ("Town"). These studies were conducted in accordance with various provincial standards, as outlined in the Comprehensive Environmental Impact Study and Management Plan (CEISMP) (Beacon 2023).

In addition, the boundaries of most of these wetlands were staked by MNRF staff in 2016. A listing of key studies and investigations that were relied upon for the wetland evaluation is presented in **Table 1**.

Table 1. Studies of the Subject Lands

Date	Study Type	Author/Party
2013 June 16	Preliminary Natural Heritage Study: Birds, Amphibians, and Flora	Dougan & Associates
2013 June 19	Headwater Drainage Feature Assessment	Aquafor Beech Limited
2013 August 23	Fish Habitat Assessment	C. Portt & Associates
2013 October 15	Fish Community Sampling	C. Portt & Associates
2014 April 25, May 27, and June 24	Amphibian Breeding Surveys	Dougan & Associates
2016 June 1	Wetland Boundary Delineation, Flora, and Fauna	MNRF (Steve Varga, Alex Kissel), Ontario Streams (Agneta Szabo), Beacon, Town of Caledon
2016 June 13	Fish Community Sampling	C. Portt & Associates
2020 October 5	Floristics in Subject Wetlands	Beacon
2020 April 27, May 27, and June 22	Amphibian Breeding Surveys	Beacon
2020 May 28, June 19, and July 4	Breeding Bird Surveys	Beacon
2020 October 22-23	Headwater Drainage Feature and Fish Habitat Confirmatory Assessment	Beacon
2023 April 25	Wetland #105 Mapping Update on properties south of King Street.	Beacon

OWES requires consideration of landscape context of the wetland, wetland area, form, hydrology, flora, and fauna, in evaluating whether the wetland is to be considered Provincially Significant or Other. The OWES manual provides instructions for evaluating wetlands. As the 4th edition of OWES has numerous changes relative to the 3rd edition, it is important to highlight the approach used for this evaluation:

- Under the current OWES, there are no criteria for complexing wetlands; therefore, unevaluated wetlands can not be complexed;
- Where wetlands are very closely grouped (e.g., 30 metres (m) from each other) and function together as one, such groups of wetlands can be evaluated as one wetland under OWES;
- Wetlands smaller than 2 hectares (ha) are generally not evaluated. A wetland smaller than 2 ha can be evaluated provided there is ecological, hydrological, hydrogeological, or social rationale for doing so; and
- To be Provincially Significant, a wetland must either achieve a total score 600 points or more or achieve a score of 200 or more in either the Biological component or the Special Features component.

Five (5) Subject Wetlands form a group of very close wetlands that function as one. This group, referred to as the “Macville Area Wetlands” cover a total area of 8.5 ha includes wetland units 105, 106, 107, 108, and 109, as per MNRF records, which correspond to the CEISMP wetlands W1 through W6. The Macville Area Wetlands were evaluated as one and scored as per **Table 2** and the Wetland Evaluation

Data and Scoring Record (**Attachment A**). The score for the Macville Area Wetlands does not exceed 200 points in the biological or special features categories, or a exceed a total score of 600 points; therefore, this wetland group is not Provincially significant.

Table 2. Wetland Evaluation Scoring Summary for the Macville Area Wetlands

Wetland Evaluation Scoring Component	Score
Biological	101.5
Social	74
Hydrological	208
Special Features	162
Total	**545.5**

Nine (9) of the remaining Subject Wetlands are either isolated from each other (i.e., far greater than 30 m spaced apart) or are smaller than 2 ha. Due to their location and being less than 2 ha, they do not qualify for evaluation under OWES, however for the purposes of satisfying policy 3.2.4.4.4, these wetlands have been studied and confirmed to be non-Provincially Significant. These wetlands are assigned a class of "Other" and are summarized in **Table 3**.

Mapping updates to MNRF wetlands were completed on five wetlands based on field observations and 2023 orthophotography. Three of these five wetlands were also evaluated and classified as "Other" in **Table 3**. It should be noted that three (3) wetlands that were previously mapped as being within 120 m of the Subject Lands were no longer present within the area: Wetland #131, Wetland 1-2023, and Wetland 210-2016.

Table 3. Evaluation and Mapping Update of Very Small Wetlands

Wetland ID (MNRF)	Wetland ID or ELC Unit (CEISMP)	Area (ha)	Evaluated Status	Mapping Update
131	—	0.28	Other	Yes
1-2020	7j, 7l, 7k, and 14	0.70	Other	No
2-2020	7i	0.03	Other	No
3-2020	8l	0.04	Other	No
4-2020	7f, 13	0.17	Other	Yes
88	W8	0.91	Other	No
3-2016	5, 14a	0.11	Other	Yes
6-2020	7g	0.24	Other	No
210-2016	—	0.00	Not present	Not present

The remaining two unevaluated wetlands (5-2020 and 1-2023) are associated with existing PSW #1 and will require further study to be evaluated as per OWES.

The OWES manual (MNRF 2022) provides the requirements for completion of a wetland evaluation or mapping update.

These requirements are as follows:

- The relevant planning authority (i.e., the Town of Caledon) receives the final evaluation, which includes wetland boundary mapping;
- The Certified Wetland Evaluator notifies the affected wetland owners of the final wetland boundary and wetland status (i.e., provincially significant or other); and
- The Certified Wetland Evaluator forwards a copy of the final digital wetland boundary mapping and wetland status to the MNRF within 30 days to be uploaded to Land Information Ontario (LIO).

To fulfill the above requirements, we are enclosing a copy the Macville Area Wetland Evaluation which was completed by an OWES certified wetland evaluator.

Beacon will also be submitting to MNRF digital mapping of the wetlands and their status and will notify landowners of properties with wetlands that are affected by the evaluation and remapping.

Should you have any questions, please contact the undersigned.

Prepared by:
Beacon Environmental

Said Mohamed, B.Sc., Cert. Env. Assessment
Ecologist

Reviewed by:
Beacon Environmental

Ken Ursic, B.Sc., M.Sc.
Principal, Senior Ecologist

References

Beacon Environmental Limited (Beacon). 2023.
Comprehensive Environmental Impact Study and Management Plan. May 2023.

Ministry of Natural Resources and Forestry (MNRF). 2022.
Ontario Wetland Evaluation System — Southern Manual. King's Printer for Ontario. (4th ed.).

Legend

- Wetland Evaluation Area
- Limit of Macville Area Wetlands
- Evaluated Wetlands - Not Provincially Significant (MNRF 2023; Beacon 2023)
- Wetland not Present (Beacon 2023)
- Unevaluated Wetland (MNRF 2023)
- Provincially Significant Wetland (MNRF 2023)
- Drainage Features
- Watercourse (MNRF 2023)

Wetland Boundaries | **Figure 1**

Macville Area Wetland Evaluation

BEACON ENVIRONMENTAL

Project: 214476
Last Revised: May, 2023

Client: Caledon Community Partners

Prepared by: BD
Checked by: JS

1:7,650

0 110 220 m

C:\ODB\OneDrive - Beacon Environmental\GeoSpatial\Geo Projects\2014\214476\MXD\2023-04-24_Figure01_WetlandBoundaries_214476.mxd

Attachment A

WETLAND EVALUATION DATA AND SCORING RECORD

Wetland Name: Macville Area Wetlands

Geographic Location (municipality, lot/concession, etc):

Town of Caledon; Lot 11/Concession 4

Map / Photo Locational Reference (e.g., latitude/longitude, NTS map, UTM):

See Figure 1 for location

Eco-District: 6E-7 (Oak Ridges)

Wetland Size (hectares): 8.54

Vegetation Form	FA
h	0.00
c	
dh	
dc	
ts	0.00
ls	
ds	
gc	0.18
m	
ne	0.24
be	
re	0.48
ff	0.01
f	
su	0.02
u	0.07

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

1.1.1 Growing Degree-Days/Soils *(max: 30 pts)*

Refer to page 36 of manual for further explanation.

1. Determine the correct GDD value for your wetland (use Figure 5).
2. Circle the appropriate GDD value from the evaluation table below.
3. Determine the Fractional Area (FA) of the wetland for each soil type.
4. Multiply the fractional area of each soil type by the applicable score-factor in the evaluation table.
5. Sum the scores for each soil type to obtain the final score (maximum score is 30 points).

Growing Degree-Days	Clay-Loam	Silt-Marl	Lime-stone	Sand	Humic-Mesic	Fibric	Granite
<2800	15	13	11	9	8	7	5
2800-3200	18	15	13	11	9	8	7
3200-3600	**22**	18	15	13	11	9	7
3600-4000	26	21	18	15	13	10	8
>4000	30	25	20	18	15	12	8

Soil Type	FA of wetland in soil type	Enter appropriate score-factor from above table	
Clay/Loam	1.00	x 22	= 22
Silt/Marl:		x	=
Limestone:		x	=
Sand:		x	=
Humic/Mesic:		x	=
Fibric:		x	=
Granite:		x	=
Total			22

GDD/Soils Score *(maximum 30 points)* 22

Loam was observed by OWES evaluators despite geotechnical studies classifying the presence of silt

1.1.2 Wetland Type

(Fractional Areas = area of wetland type/total wetland area)

	Fractional Area		Score
Bog		x 3 =	
Fen		x 6 =	
Swamp	0.00	x 8 =	0
Marsh	1.00	x 15 =	15
Total		=	15

Wetland Type Score *(maximum 15 points)* 15

1.1.3 Site Type

(Fractional Area = area of site type/total wetland area)

	Fractional Area		Score
Isolated	0.00	x 1 =	
Palustrine (permanent or intermittent flow)	1.00	x 2 =	2
Riverine		x 4 =	
Riverine (at rivermouth)		x 5 =	
Lacustrine (at rivermouth)		x 5 =	
Lacustrine (with barrier beach)		x 3 =	
Lacustrine (exposed to lake)		x 2 =	
Total		=	2

Site Type Score *(maximum 5 points)* 2

1.2 BIODIVERSITY

1.2.1 Number of Wetland Types

(Check only one)

✓	One	=	9 points
	Two	=	13
	Three	=	20
	Four	=	30

Number of Wetland Types Score
(maximum 30 points) 9

1.2.2. Vegetation Communities

Use the data sheet provided in Appendix 4 to record and score vegetation communities (the completed form must be attached to this data record)

Scoring *(circle only one option for each of the columns below):*

Total # of communities with **1-3 forms**	
1 =	1.5 pts
2 =	2.5
3 =	3.5
4 =	4.5
5 =	5
6 =	5.5
7 =	6
8 =	6.5
9 =	7
10 =	7.5
11 =	8
+ 0.5 *for each additional community*	
11 =	8.5

Total # of communities with **4-5 forms**	
1 =	2 pts
2 =	3.5
3 =	5
4 =	6.5
5 =	7.5
6 =	8.5
7 =	9.5
8 =	10.5
9 =	11.5
10 =	12.5
11 =	13
+ 0.5 *for each additional community*	
1 =	2

Total # of communities with **6 or more forms**	
1 =	3 pts
2 =	5
3 =	7
4 =	9
5 =	10.5
6 =	12
7 =	13.5
8 =	15
9 =	16.5
10 =	18
11 =	19
+ 1.0 *for each additional community*	
=	0

Vegetation community mapping can be provided upon request

Vegetation Communities Score
(maximum 45 points) 10.5

1.2.3 Diversity of Surrounding Habitat

Check all appropriate items. Only habitat within 1.5 km of the wetland boundary and at least 0.5 ha in size are to be scored.

✓	row crop
	pasture
	abandoned agricultural land
✓	deciduous forest
✓	coniferous forest
✓	mixed forest*
	abandoned pits and quarries
	open lake or deep river
✓	fence rows with deep cover, or shelterbelts
	terrain appreciably undulating, hilly or with ravines
	creek flood plain

* *"Mixed forest" is defined as either 25% coniferous trees distributed singly or in clumps in deciduous forest, or 25% deciduous trees distributed singly or in clumps in coniferous forest. Note that Forest Resource Inventory (FRI) maps can be misleading since 25% conifer within a unit could be entirely concentrated around a lake.*

Score 1 point for each feature checked, up to a maximum of 7 points.

Diversity of Surrounding Habitat Score
(maximum 7 points) 5

1.2.4 Proximity to Other Wetlands

Check highest appropriate category. (Note: if the wetland is lacustrine, score option #1 at 8 points).

✓		Points
✓	Hydrologically connected by surface water to other wetlands (different dominant wetland type), or to open lake or deep river within 1.5 km	8
	Hydrologically connected by surface water to other wetlands (same dominant wetland type) within 0.5 km	8
	Hydrologically connected by surface water to other wetlands (different dominant wetland type), or to open lake or deep river from 1.5 to 4 km away	5
	Hydrologically connected by surface water to other wetlands (same dominant wetland type) from 0.5 to 1.5 km away	5
	Within 0.75 km of other wetlands (different dominant wetland type) or open water body, but not hydrologically connected by surface water	5
	Within 1 km of other wetlands, but not hydrologically connected by surface water	2
	No wetland within 1 km	0

Name and distance (from wetland) of wetlands/waterbodies scored above:
Downstream swamp (unevaluated), 800 m away, west of Gore Road

Proximity to other Wetlands Score
(maximum 8 points) 8

1.2.5 Interspersion

Number of Intersections = 99

✓	Number of Intersections *(Check one only)*	Points
	26 or less	= 3
	27 to 40	= 6
	41 to 60	= 9
	61 to 80	= 12
✓	81 to 100	= 15
	101 to 125	= 18
	126 to 150	= 21
	151 to 175	= 24
	176 to 200	= 27
	>200	= 30

Interspersion Score *(maximum 30 points)* 15

1.2.6 Open Water Types

NOTE: *this attribute is only to be scored for permanently flooded open water within the wetland (adjacent lakes do not count). Check one option only.*

Open water occupies 3.6% of wetland area

✓	Open Water Type	Characteristic	Points
✓	Type 1	Open water occupies < 5 % of wetland area	= 8
	Type 2	Open water occupies 5-25% of wetland (occurring in central area)	= 8
	Type 3	Open water occupies 5-25% (occurring in various-sized ponds, dense patches of vegetation or vegetation in diffuse stands)	= 14
	Type 4	Open water occupies 26-75% of wetland (occurring in a central area)	= 20
	Type 5	Open water occupies 26-75% of wetlands (small ponds and embayments are common)	= 30
	Type 6	Open water occupies 76%-95% of wetland (occurring in large central area; vegetation is peripheral)	= 8
	Type 7	Open water occupies 76-95% of wetland (vegetation in patches or diffuse open stands)	= 14
	Type 8	Open water occupies more than 95% of wetland area	= 3
	No open water		= 0

Open Water Type Score *(maximum 30 points)* 8

1.3 SIZE (BIOLOGICAL COMPONENT)

Total Size of Wetland = 8.5 ha

Sum of scores from Biodiversity Subcomponent

1.2.1	9
+ 1.2.2	10.5
+ 1.2.3	5
+ 1.2.4	8
+ 1.2.5	15
+ 1.2.6	8
	55.5

Circle the appropriate score from the table below.

Wetland size (ha)	Total Score for Biodiversity Subcomponent									
	<37	37-47	48-60	61-72	73-84	85-96	97-108	109-120	121-132	>132
<20 ha	1	5	7	8	9	17	25	34	43	50
20-40	5	7	8	9	10	19	28	37	46	50
41-60	6	8	9	10	11	21	31	40	49	50
61-80	7	9	10	11	13	23	34	43	50	50
81-100	8	10	11	13	15	25	37	46	50	50
101-120	9	11	13	15	18	28	40	49	50	50
121-140	10	13	15	17	21	31	43	50	50	50
141-160	11	15	17	19	23	34	46	50	50	50
161-180	13	17	19	21	25	37	49	50	50	50
181-200	15	19	21	23	28	40	50	50	50	50
201-400	17	21	23	25	31	43	50	50	50	50
401-600	19	23	25	28	34	46	50	50	50	50
601-800	21	25	28	31	37	49	50	50	50	50
801-1000	23	28	31	34	40	50	50	50	50	50
1001-1200	25	31	34	37	43	50	50	50	50	50
1201-1400	28	34	37	40	46	50	50	50	50	50
1401-1600	31	37	40	43	49	50	50	50	50	50
1601-1800	34	40	43	46	50	50	50	50	50	50
1801-2000	37	43	47	49	50	50	50	50	50	50
>2000	40	46	50	50	50	50	50	50	50	50

Size Score (Biological Component)
(maximum 50 points) 7

2.0 SOCIAL COMPONENT

2.1 ECONOMICALLY VALUABLE PRODUCTS

2.1.1 Wood Products

Check the option that best reflects the total area (ha) of forested wetland (i.e., areas where the dominant vegetation form is h or c). Note that this is the area of all the forested vegetation communities, not total wetland size. Do not include areas where harvest is not permitted. Check only one option.

Area of wetland used for scoring 2.1.1: 0 ha

✓	< 5 ha	=	0 pts
	5 - 25 ha	=	3
	26 – 50 ha	=	6
	51 – 100 ha	=	9
	101 – 200 ha	=	12
	> 200 ha	=	18

Source of information:
Wetland staking with Town, MNRF, Beacon

Wood Products Score *(maximum 18 points)* 0

2.1.2 Wild Rice

Check only one.

	Present (min. size 0.5 ha)	=	6 pts
✓	Absent	=	0
	Harvest not permitted	=	0

Source of information:
Comprehensive Environmental Impact Study and Management Study (CEISMP) by Beacon for Macville Community Secondary Plan

Wild Rice Score *(maximum 6 points)* 0

2.1.3 Commercial Baitfish

Check only one.

✓	Present	=	12 pts
	Absent	=	0
	Fishing not permitted	=	0

Source of information:
C. Portt & Associates (2013, 2016) fish community sampling in Wetland #107, Community reM18-B (Brook Stickleback and Fathead Minnow)

Commercial Fish Score *(maximum 12 points)* 12

2.1.4 Furbearers

Only species recognized as furbearers under the Fish & Wildlife Conservation Act may be scored here. Score 3 *points for each furbearer species listed, up to a maximum of 12 points. Score 0 points if trapping is prohibited.*

	Name of furbearer	Source of information
1.	Coyote	Scat observed during field surveys
2.		
3.		
4.		
5.		
6.		

Furbearer Score *(maximum 12 points)* 3

2.2 RECREATIONAL ACTIVITIES

Sources of information and reasons for scoring a wetland under high or moderate use below, must be included below.

Circle one score for each of the activities listed. Score is cumulative – add score for hunting, nature enjoyment and fishing together for final score.

Intensity of Use	Type of Wetland-Associated Use: Hunting	Nature Enjoyment/ Ecosystem Study	Fishing
High	40 points	40 points	40 points
Moderate	20	20	20
Low	8	8	8
Not Possible/ No evidence	(0)	(0)	(0)

Sources of information (include evidence/criteria forming basis for score and any relevant reference used to obtain that information):

Hunting: Land privately owned; no evidence of this activity

Nature: Land privately owned; no evidence of this activity

Fishing: Land privately owned; no evidence of this activity

Recreational Activities Score
(maximum 80 points) 0

2.3 LANDSCAPE AESTHETICS

2.3.1 Distinctness

Check only one.

✓	Clearly Distinct	=	3 pts
	Indistinct	=	0

Landscape Distinctness Score
(maximum 3 points) 3

2.3.2 Absence of Human Disturbance

Check only one.

	Human disturbances absent or nearly so	=	7 pts
	One or several localized disturbances	=	4
	Moderate disturbance; localized water pollution	=	2
✓	Wetland intact but impairment of ecosystem quality intense in some areas	=	1
	Extreme ecological degradation, or water pollution severe and widespread	=	0

Details regarding type, extent and location of disturbance scored:
Agricultural tiling in some areas. An old rail bed bisects the wetland north of King Street and is associated with several culverts. Proximal to highways and agricultural runoff. Ponds in the wetland are artificial and historically dug-out

Source of information:
CEISMP studies by Beacon

Absence of Human Disturbance Score
(maximum 7 points) 1

2.4 EDUCATION AND PUBLIC AWARENESS

2.4.1 Educational Uses

Check highest appropriate category.

	Frequent	=	20 pts
	Infrequent	=	12
✓	No visits	=	0

Details regarding the type and frequency of education uses scored above:
Land is privately owned

Source of information:
CEISMP field studies

Educational Uses Score *(maximum 20 points)* 0

2.4.2 Facilities and Programs

Check all appropriate options, score highest category checked.

	Staffed interpretation centre	=	8 pts
	No interpretation centre or staff, but a system of self-guiding trails or brochures available	=	4
	Facilities such as maintained paths (e.g., woodchips), boardwalks, boat launches or observation towers, but no brochures or other interpretation	=	2
✓	No facilities or programs	=	0

Additional Notes/Comments:
No maintained trails or public facilities

Source of information:
CEISMP field studies

Facilities and Programs Score
(maximum 8 points) 0

2.4.3 Research and Studies

Check all that apply; score highest category checked.

	Long term research has been done	=	12 pts
	Research papers published in refereed scientific journal or as a thesis	=	10
✓	One or more (non-research) reports have been written on some aspect of the wetland's flora, fauna, hydrology, etc.	=	5
	No research or reports	=	0

List of reports, publications, research studies etc. scored above:

Aquafor Beech Limited. June 16, 2013. Headwater Drainage Features Assessment: In Support of the Bolton Residential Expansion Study.

Dougan & Associates. June 19, 2013. Bolton Residential Expansion Study: Phase 2, Technical Memorandum - Natural Heritage. Prepared for the Town of Caledon.

Dougan & Associates, Aquafor Beech Ltd., Cam Portt & Associates, BluePlan Engineering Consultants Ltd. and Meridian Planning. June 16, 2014. Bolton Residential Expansion Study: Phase 3, Technical Memorandum - Development of a Preliminary Natural Heritage System. Revised . Prepared for the Town of Caledon.

DS Consultants Ltd. February 3, 2021. Preliminary Hydrogeological Investigation Proposed Development Macville Community in Connection with LOPA Application to Establish the Macville Community Secondary Plan Area, Bolton, Ontario. Prepared for Bolton Option 3 Landowners Group.

CEISMP by Beacon in support of Macville Community Secondary Plan

Research and Studies Score
(maximum 12 points) 5

2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT

Name of Settlement: Bolton

Distance of wetland from settlement: Approximately 300 m

Population of settlement: 26,000 (Source: Town of Caledon Population Distribution (June 30, 2006))

Circle only the highest score applicable

Distance of wetland to settlement	population >10,000	population 2,500-10,000	population <2,500 or cottage community
within or adjoining settlement	40 points	26 points	16 points
0.5 to 10 km from settlement	26	16	10
10 to 60 km from settlement	12	8	4
>60 km from nearest settlement	5	2	0

Proximity to Human Settlement Score
(maximum 40 points) 40

2.6 OWNERSHIP

FA of wetland held by or held under a legal contract by a conservation body (as defined by the *Conservation Land Act*) for wetland protection	_____ x 10 = _____
FA of wetland occurring in provincially or nationally protected areas (e.g., parks and conservation reserves)	_____ x 10 = _____
FA of wetland area in Crown/public ownership, not as above	_____ x 8 = _____
FA of wetland area in private ownership, not as above	1.00 x 4 = 4

Source of information:
CEISMP studies

Ownership Score *(maximum 10 points)* 4

2.7 SIZE (SOCIAL COMPONENT)

Total Size of Wetland = 8.5 ha Sum of scores from Subcomponents 2.1, 2.2, and 2.5 = 55

Circle the appropriate score from the table below.

	Total for Size Dependent Social Features									
	<31	31-45	46-60	61-75	76-90	91-105	106-120	121-135	136-150	>150
<2 ha	1	2	4	8	10	12	14	14	14	15
2-4	1	2	4	8	12	13	14	14	15	16
5-8	2	2	5	9	13	14	15	15	16	16
9-12	3	3	6	10	14	15	15	16	17	17
13-17	3	4	7	10	14	15	16	16	17	17
18-28	4	5	8	11	15	16	16	17	17	18
29-37	5	7	10	13	16	17	18	18	19	19
38-49	5	7	10	13	16	17	18	18	19	20
50-62	5	8	11	14	17	17	18	19	20	20
63-81	5	8	11	15	17	18	19	20	20	20
82-105	6	9	11	15	18	18	19	20	20	20
106-137	6	9	12	16	18	19	20	20	20	20
138-178	6	9	13	16	18	19	20	20	20	20
179-233	6	9	13	16	18	20	20	20	20	20
234-302	7	9	13	16	18	20	20	20	20	20
303-393	7	9	14	17	18	20	20	20	20	20
394-511	7	10	14	17	18	20	20	20	20	20
512-665	7	10	14	17	18	20	20	20	20	20
666-863	7	10	14	17	19	20	20	20	20	20
864-1123	8	12	15	17	19	20	20	20	20	20
1124-1460	8	12	15	17	19	20	20	20	20	20
1461-1898	8	13	15	18	19	20	20	20	20	20
1899-2467	8	14	16	18	20	20	20	20	20	20
>2467	8	14	16	18	20	20	20	20	20	20

Total Size Score (Social Component) 6

2.8 ABORIGINAL VALUES AND CULTURAL HERITAGE

Either or both Aboriginal or Cultural Values may be scored. However, the maximum score permitted for 2.8 is 30 points.

Full documentation of sources must be attached to the data record.

2.8.1 Aboriginal Values

	Significant	=	30 pts
	Not Significant	=	0
✓	Unknown	=	0

Additional Comments/Notes:
No known significance based on Stage 1 Archaeological Assessment of The Region of Peel Settlement Area Boundary Expansion Study, by ASI services, and dated August 24, 2020. This report has been shared with the First Nations communities whose traditional territories include this wetland.

2.8.2 Cultural Heritage

	Significant	=	30 pts
✓	Not Significant	=	0
	Unknown	=	0

Additional Comments/Notes:
No significant heritage features identified in Stage 1 Archaeological Assessment (ASI services, 2020)

Aboriginal Values/Cultural Heritage Score
(maximum 30 points) 0

3.0 HYDROLOGICAL COMPONENT

3.1 FLOOD ATTENUATION

Check one of the following options.

	If wetland is a coastal wetland, ➡ score 0 points for this section.
	If wetland is entirely isolated in site type, ➡ score 100 points automatically.
✓	Wetland not as above – proceed through 'steps' A through F below.

(A) Total wetland area = 8.54 ha

(B) Size of wetland's catchment = 133.23 ha

(C) Size of other detention areas in catchment = 0 ha

(D) Total area of upstream detention areas = {A + C } = 8.54 ha

(E) Upstream Detention Factor = {(A/D) x 2} = 1.0 (maximum 1.0)

(F) Attenuation Factor = {(A/B) x 10} = 0.64 (maximum 1.0)

Flood Attenuation Final Score = {(E + F) /2) x 100 = 82

Wetland catchment mapping can be provided upon request

Flood Attenuation Score *(maximum 100 points)* 82

3.2 WATER QUALITY IMPROVEMENT

3.2.1 Short Term Water Quality Improvement

Step 1: Determination of maximum initial score

	Wetland on one of the 5 defined large lakes or 5 major rivers (Go to Step 5A)
✓	All other wetlands (Go through Steps 2, 3, 4, and 5B)

Step 2: Determination of Watershed Improvement Factor (WIF)

Calculation of WIF is based on the fractional area (FA) of each site type that makes up the total area of the wetland.

(FA = area of site type/total area of wetland)

FA of isolated wetland	=		x 0.5 =	
FA of riverine wetland	=		x 1.0 =	
FA of palustrine wetland with no inflow	=	0.07	x 0.7 =	0.049
FA of palustrine wetland with inflows	=	0.93	x 1.0 =	0.93
FA of lacustrine on lake shoreline	=		x 0.2 =	
FA of lacustrine at lake inflow or outflow	=		x 1.0 =	

Sum (*WIF cannot exceed 1.0)* 0.979

Step 3: Determination of Catchment Land Use Factor (LUF)

(Choose the first category that fits upstream land use in the catchment.)

✓	Over 50% agricultural and/or urban	=	1.0
	Between 30 and 50% agricultural and/or urban	=	0.8
	Over 50% forested or other natural vegetation	=	0.6

LUF *(maximum 1.0)* 1

Step 4: Determination of Pollutant Uptake Factor (PUF)

Calculation of PUF is based on the fractional area (FA) of each vegetation type that makes up the total area of the wetland. Base assessment on the dominant vegetation form for each community except where dead trees or shrubs dominate. In that case base assessment on the dominant live vegetation type.

(FA = area of vegetation type/total area of wetland)

FA of wetland with live trees, shrubs, herbs or mosses (c, h, ts, ls, gc, m)	= 0.18	x	0.75 =	0.135
FA of wetland with emergent, submergent or floating vegetation (re, be, ne, su, f, ff)	= 0.75	x	1.0 =	0.75
FA of wetland with little or no vegetation (u)	= 0.07	x	0.5 =	0.035

Sum *(PUF cannot exceed 1.0)* 0.92

Step 5: Calculation of final score

☐	Wetland on defined 5 major lakes or 5 major rivers	0
✓	All other wetlands – calculate as follows	
	Initial score	60
	Watershed Improvement Factor (WIF)	0.979
	Land Use Factor (LUF)	1
	Pollutant Uptake Factor (PUF)	0.92
	Final score: 60 x WIF x LUF x PUF =	54.0

Short Term Water Quality Improvement Score
(maximum 60 points) 54

3.2.2 Long Term Nutrient Trap

Step 1:

☐	Wetland on defined 5 major lakes or 5 major rivers = 0 points
✓	All other wetlands (Proceed to Step 2)

Step 2: Choose only one of the following settings that best describes the wetland being evaluated

	Wetland located in a river mouth	=	10 pts
	Wetland is a bog, fen, or swamp with more than 50% of the wetland being covered with organic soil	=	10
	Wetland is a bog, fen, or swamp with less than 50% of the wetland being covered with organic soil	=	3
	Wetland is a marsh with more than 50% of the wetland covered with organic soil	=	3
✓	None of the above	=	0

0.88 ha of wetland with organic soil (11% total wetland area)

Long Term Nutrient Trap Score
(maximum 10 points) 0

3.2.3 Groundwater Discharge

Circle the characteristics that best describe the wetland being evaluated and then sum the scores. If the sum exceeds 30 points, assign the maximum score of 30). Note: for wetland type, wetland type scored does not have to the dominant type in the wetland.

Wetland Characteristics	Potential for Discharge		
	None to Little	Some	High
Wetland type	Bog = 0	Swamp/Marsh = 2	Fen = 5
Topography	Flat/rolling = 0	Hilly = 2	Steep = 5
Wetland area: Upslope catchment area	Large (>50%) = 0	Moderate (5-50%) = 2 (6.4%)	Small (<5%) = 5
Lagg development	None found = 0	Minor = 2	Extensive = 5
Seeps	None = 0	≤ 3 seeps = 2	> 3 seeps = 5
Surface marl deposits	None = 0	≤ 3 sites = 2	> 3 sites = 5
Iron precipitates	None = 0	≤ 3 sites = 2	> 3 sites = 5
Located within 1 km of a major aquifer	N/A = 0	N/A = 0	Yes = 10 No = 0

Additional Comments/Notes:

Gently sloping topography; several wells in the area that do not produce drinkable water. Area mapped as highly vulnerable aquifer in Schedule A-2 of Peel Region Official Plan (ROP). Not mapped as a wellhead protection area in Schedule A-5 of the ROP

Groundwater Discharge Score
(maximum 30 points) 18

3.3 CARBON SINK

Check only one of the following:

	Bog, fen or swamp with more than 50% coverage by organic soil	=	5 pts
	Bog, fen or swamp with between 10 to 50% coverage by organic soil	=	2
	Marsh with more than 50% coverage by organic soil	=	3
✓	Wetlands not in one of the above categories	=	0

Source of information:
Various studies

Carbon Sink Score
(maximum 5 points) 0

3.4 SHORELINE EROSION CONTROL

From the wetland vegetation map determine the dominant vegetatino type within the erosion zone for lacustrine and riverine site type areas only. Score according to the factors listed below.

Step 1:

✓	Wetland entirely isolated or palustrine	=	0 pts
	Any part of the wetland is riverine or lacustrine	=	Go to step 2

Step 2: *Choose the one characteristic that best describes the shoreline vegetation (see page 109 for description of "shoreline".)*

	Trees and shrubs	=	15 pts
	Emergent vegetation	=	8
	Submergent vegetation	=	6
	Other shoreline vegetation	=	3
	No vegetation	=	0

N/A - wetland not coastal

Shoreline Erosion Control Score
(maximum 15 points) 0

3.5 GROUNDWATER RECHARGE

3.5.1 Site Type

Wetland > 50% lacustrine (by area) or located on one of the five major rivers			= 0 pts	
Wetland not as above. Calculate final score as follows:				
■ FA of isolated or palustrine wetland	=	1.00	x 50 =	50
■ FA of riverine wetland	=		x 20 =	
■ FA of lacustrine wetland (not dominant site type)	=		x 0 =	

Groundwater Recharge/Wetland Site Type Score *(maximum 50 points)* 50

3.5.2 Soil Recharge Potential

*Circle only one choice that **best** describes the soils in **the area surrounding the wetland** being evaluated (the soils within the wetland are not scored here).*

Silt soils are identified in the geotechnical study

Dominant Wetland Type	Group A, B, C (sands, gravels, loams)	Group D (clays, substrates in high water tables, shallow substrates over impervious materials such as bedrock)
Lacustrine or major river	0	0
Isolated	10	5
Palustrine	7	**4**
Riverine (not on a major river)	5	2

Groundwater Recharge/Wetland Soil Recharge Potential Score *(maximum 10 points)* 4

4.0 SPECIAL FEATURES COMPONENT

4.1 RARITY

4.1.1 Wetland Types

Ecodistrict	Rarity within the Landscape (4.1.1.1)	Rarity of Wetland Type (4.1.1.2)			
		Marsh	Swamp	Fen	Bog
6E-1	60	40	0	80	80
6E -2	60	40	0	80	80
6E-4	60	40	0	80	80
6E-5	20	40	0	80	80
6E-6	40	20	0	80	80
6E-7	60	10	0	80	80
6E-8	20	20	0	80	80
6E-9	0	20	0	80	80
6E-10	20	0	20	80	80
6E-11	0	30	0	80	80
6E-12	0	30	0	60	80
6E-13	60	10	0	80	80
6E-14	40	20	0	40	80
6E-15	40	0	0	80	80
6E-16	60	20	0	80	60
6E-17	40	10	0	30	80
7E-1	60	0	60	80	80
7E-2	60	0	0	80	80
7E-3	60	00	0	80	80
7E-4	80	0	0	80	80
7E-5	60	20	0	80	80
7E-6	80	30	0	80	80

4.1.1.1 Rarity within the Landscape

Choose appropriate score from 2nd column above.

Score *(maximum 80 points)* 60

4.1.1.2 Rarity of Wetland Type

Score is cumulative, based on presence/absence. Circle all appropriate scores from above table and sum.

Score *(maximum 80 points)* 10

4.1.2 Species

4.1.2.1 Provincially Significant Animal Species

Common Name	Scientific Name	Activity	Dates Observed	Info Source
Digger Crayfish	Creaserinus fodiens	Burrow in W106 neM5-A	2016-06-01	Field survey by MNRF and Beacon

Additional Notes/Comments:

Barn Swallow, Bobolink, and Peregrine Falcon have been found adjacent to the wetland in 2015, 2016, and 2020 surveys by Beacon

As per OWES 4, wildlife species can only be scored if they are found within the wetland boundaries or depend on the wetland to complete life processes.

Bluet damselfy species - status unknown

One species = 50 pts	9 species = 140 pts	17 species = 160 pts
2 species = 80	10 species = 143	18 species = 162
3 species = 95	11 species = 146	19 species = 164
4 species = 105	12 species = 149	20 species = 166
5 species = 115	13 species = 152	21 species = 168
6 species = 125	14 species = 154	22 species = 170
7 species = 130	15 species = 156	23 species = 172
8 species = 135	16 species = 158	24 species = 174
		25 species = 176

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Animal Species
(no maximum) 50

4.1.2.2 Provincially Significant Plant Species

Common Name	Scientific Name	Activity	Dates Observed	Info Source
None				

Additional Notes/Comments:

No provincially tracked species observed

One species	=	50 pts	9 species	=	140 pts	17 species	=	160 pts
2 species	=	80	10 species	=	143	18 species	=	162
3 species	=	95	11 species	=	146	19 species	=	164
4 species	=	105	12 species	=	149	20 species	=	166
5 species	=	115	13 species	=	152	21 species	=	168
6 species	=	125	14 species	=	154	22 species	=	170
7 species	=	130	15 species	=	156	23 species	=	172
8 species	=	135	16 species	=	158	24 species	=	174
						25 species	=	176

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Plant Species
(no maximum) 0

4.1.2.3 Regionally Significant Species

Common Name	Scientific Name	Activity	Dates Observed	Info Source
None				

One species= 20 pts	4 species = 45 pts	7 species = 58 pts
2 species = 30	5 species = 50	8 species = 61
3 species = 40	6 species = 55	9 species = 64
		10 species = 67

For each significant species over 10 in wetland, add 1 point.

Regionally Significant Species Score
(no maximum score) 0

4.1.2.4 Locally Significant Species

Common Name	Scientific Name	Activity	Dates Observed	Info Source
Grey Treefrog	Hyla versicolor	Males calling	2022-05-27, 2022-06-22	Field surveys by Beacon

One species= 10 pts	4 species = 31 pts	7 species = 43 pts
2 species = 17	5 species = 38	8 species = 45
3 species = 24	6 species = 41	9 species = 47
		10 species = 49

For each significant species over 10 in wetland, add 1 point.

Locally Significant Species Score
(no maximum score) 10

Local Significance of Flora species were evaluated using the Ecodistrict 6E-7 list from Varga et al. (2005).
Local Significance of Fauna were taken from TRCA rankings.

Although Great Blue Heron is ranked as L3 by TRCA (locally significant species), it was only observed flying over the area

4.2 SIGNIFICANT FEATURES AND HABITATS

4.2.1 Colonial Waterbirds

Record all available information. Score the highest applicable category. Include additional information as possible (e.g., nest locations, etc).

Activity	Species	Info Source	Points
Currently nesting			= 50
Known to have nested within the past 5 years			= 25
Active feeding area (great blue heron excluded)			= 15
None known	✓	Various field surveys	= 0

Additional Notes/Comments:

There is a LIO record of a mixed wader colony within the 1 km grid, and this is assumed to be associated with the wetland east of the Canada Pacific Railway (out of study area). Avifaunal surveys conducted by Beacon in 2015, 2016, and 2020 have not found evidence of colonial waterbird nesting or feeding.

Colonial Waterbird Nesting Score
(maximum 50 points) 0

4.2.2 Winter Cover for Wildlife

Score highest appropriate category. Include rationale/sources of information.

	Provincially significant	=	100 pts
	Significant in Ecoregion	=	50
	Significant in Ecodistrict	=	25
	Locally significant	=	10
✓	Little or poor winter cover	=	0

Species/habitat/vegetation community scored *(e.g., winter deer cover in hemlock swamp, S3 and S4b)*:

No evidence suggesting winter cover use

Source of information:

Various field surveys

Winter Cover for Wildlife Score
(maximum 100 points) 0

4.2.3 Waterfowl Staging and/or Moulting Areas

Check highest level of significance for both staging and moulting; add scores for staging and for moulting together for final score. However, maximum score for evaluation under this section is 150 points.

	Staging	Moulting
Nationally/internationally significant	= 150 pts	= 150 pts
Provincially significant	= 100	= 100
Significant in the Ecoregion	= 50	= 50
Significant in Ecodistrict	= 25	= 25
Known to occur	= [10]	= 10
Not possible/Unknown	= 0	= [0]

Species/habitat/vegetation community scored *(e.g., approx 20 mallards in W3)*:
2 Mallards and 2 Canada Geese staging in Wetland 107, Community reM15-C

Source of information:
Site visit by evaluators

Waterfowl Staging/Moulting Score
(maximum 150 points) 10

4.2.4 Waterfowl Breeding

Check highest level of significance.

	Nationally/internationally significant	= 150 pts
	Provincially significant	= 100
	Significant in the Ecoregion	= 50
	Significant in Ecodistrict	= 25
✓	Habitat Suitable	= 10
	Habitat not suitable	= 0

Species/habitat/vegetation community scored *(e.g., mallard in W3)*:
Habitat suitable for nesting; however, waterfowl were not observed within 120 m of the wetland

Source of information:
Breeding bird surveys by Beacon

Waterfowl Breeding Score
(maximum 150 points) 10

4.2.5 Migratory Passerine, Shorebird or Raptor Stopover Area

Check highest level of significance.

	Nationally / internationally significant	= 150 pts
	Provincially significant	= 100
	Significant in Ecoregion	= 50
	Significant in Ecodistrict	= 25
✓	Known to occur	= 10
	Not possible / Unknown	= 0

Species/habitat/vegetation community scored:
Peregrine Falcon have been observed 120 m from the wetland; however, their use of the wetland was not observed

Dozens of Redwing Blackbirds observed migrating

Source of information:
Breeding bird surveys by Beacon, particularly on June 19, 2020

Passerine, Shorebird or Raptor Stopover Score
(maximum 100 points) 10

4.2.6 Fish Habitat

4.2.6.1 Spawning and Nursery Habitat

Area Factors for Low Marsh, High Marsh and Swamp Communities.

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5 – 4.9	0.2
5.0 – 9.9	0.4
10.0 – 14.9	0.6
15.0 – 19.9	0.8
20.0 +	1.0

0.35 ha associated with Wetland 107, Community reM18-B

Step 1:

	Fish habitat is not present within the wetland	Go to Step 7, Score 0 points
✓	Fish habitat is present within the wetland	Go to Step 2

Step 2: *Choose only one option*

	Significance of the spawning and nursery habitat within the wetland is known	Go to Step 3
✓	Significance of the spawning and nursery habitat within the wetland is not known	Go through Steps 4, 5 and 6

Step 3: *Select the highest appropriate category below, attach documentation:*

Significant in Ecoregion	Go to Step 7, Score 100 points
Significant in Ecodistrict	Go to Step 7, Score 50 points
Locally Significant Habitat (5.0+ ha)	Go to Step 7, Score 25 points
Locally Significant Habitat (<5.0 ha)	Go to Step 7, Score 15 points

Source of information:

Step 4: Low Marsh = the '**permanent**' marsh area, from the existing water line out to the outer boundary of the wetland.

	Low marsh not present	Go to Step 5
✓	Low marsh present	Continue through Step 4, scoring as noted below

Scoring of Low Marsh:

1. Check the appropriate **Vegetation Group** (see Appendix 7) for each Low Marsh community. (Based on the one most clearly dominant plant species of the dominant form in each Low Marsh vegetation community.)
2. Sum the areas (ha) of the vegetation communities assigned to each **Vegetation Group**.
3. Use these areas to assign an **Area Factor** (from Table 7) for each checked **Vegetation Group**.
4. Multiply the **Area Factor** by the **Multiplication Factor** for each row to calculate **Score**.
5. Sum all numbers in Score column to get **Total Score for Low Marsh**.

Scoring for Presence of Key Vegetation Groups – Low Marsh

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (from Table 7)	Multiplication Factor	Score
1	Tallgrass				6	
2	Shortgrass-Sedge				11	
3	Cattail-Bulrush-Burreed	✓	0.14	0.1	5	0.5
4	Arrowhead-Pickerelweed				5	
5	Duckweed				2	
6	Smartweed-Waterwillow				6	
7	Waterlily-Lotus				11	
8	Waterweed-Watercress				9	
9	Ribbongrass				10	
10	Coontail-Naiad-Watermilfoil				13	
11	Narrowleaf Pondweed	✓	0.23	0.1	5	0.5
12	Broadleaf Pondweed				8	
	Total Score for Low Marsh (*maximum 75 points*)					1

Continue to Step 5

Step 5: High Marsh = the 'seasonal' marsh area, from the water line to the inland boundary of marsh wetland type. This is essentially what is commonly referred to as a wet meadow, in that there is insufficient standing water to provide fisheries habitat except during flood or high water conditions.

	High marsh not present	Go to Step 6
✓	High marsh present	Continue through Step 5, scoring as noted below

Scoring of High Marsh:

1. Check the appropriate **Vegetation Group** (see Appendix 7) for each High Marsh community. (Based on the one most clearly dominant plant species of the dominant form in each High Marsh vegetation community.)
2. Sum the areas (ha) of the vegetation communities assigned to each **Vegetation Group**.
3. Use these areas to assign an **Area Factor** (from Table 7) for each checked **Vegetation Group**.
4. Multiply the **Area Factor** by the **Multiplication Factor** for each row to calculate **Score**.
5. Sum all numbers in Score column to get **Total Score for High Marsh**.

Scoring for Presence of Key Vegetation Groups – High Marsh

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (from Table 7)	Multiplication Factor	Score
1	Tallgrass				6	
2	Shortgrass-Sedge				11	
3	Cattail-Bulrush-Burreed	✓	0.03	0.1	5	0.5
4	Arrowhead-Pickerelweed				5	
	Total Score for High Marsh (*maximum 25 points*)					1

Continue to Step 6

Step 6:

✓	Swamp containing fish habitat not present	Go to Step 7
	Swamp containing fish habitat present	Continue through Step 6, scoring as follows

Scoring of Swamp:

1. Determine the total area (ha) of seasonally flooded swamp communities within the wetland containing fish habitat and record below.
2. Determine the total area (ha) of permanently flooded swamp communities within the wetland containing fish habitat and record below.
3. Use these areas to assign an **Area Factor** (from Table 7).
4. Multiply the Area Factor by the **Multiplication Factor** for each row to calculate **Score**.
5. Sum all numbers in Score column to get **Total Score for Swamp**.

Scoring Swamps for Fish Habitat (Seasonally flooded; Permanently flooded)

Swamp Containing Fish Habitat	Present (check)	Total Area (ha)	Area Factor (from Table 7)	Multiplication Factor	Score
Seasonally Flooded Swamp				10	
Permanently Flooded Swamp				10	
			Total Score for Swamp (*maximum 20 points*)		

Continue to Step 7

Step 7: CALCULATION OF FINAL SCORE

NOTE: Scores for Steps 4, 5 and 6 are only recorded if Steps 1 and 3 have not been scored.

A. Score from Step 1 (fish habitat not present) = 0
B. Score from Step 3 (significance known) = 0
C. Score from Step 4 (Low Marsh) = 1
D. Score from Step 5 (High Marsh) = 1
E. Score from Step 6 (Swamp) = N/A

Calculation of Final Score for Spawning and Nursery Habitat = A or B or Sum of C, D, and E

Score for Spawning and Nursery Habitat
(maximum 100 points) 2

4.2.6.2 Migration and Staging Habitat

Step 1:

✓	Staging or Migration Habitat is not present in the wetland	Go to Step 4, Score 0 points
	Staging or Migration Habitat is present in the wetland, significance of the habitat is known	Go to Step 2
	Staging or Migration Habitat is present in the wetland, significance of the habitat is not known	Go to Step 3

Step 2: Select the highest appropriate category below. Ensure that documentation is attached to the data record.

	Significant in Ecoregion	Score 25 points in Step 4
	Significant in Ecodistrict	Score 15 points in Step 4
	Locally Significant	Score 10 points in Step 4
	Fish staging and/or migration habitat present, but not as above	Score 5 points in Step 4

Source of information:
Aquatic habitat surveys by Beacon and C. Portt

Step 3: Select the highest appropriate category below based on presence of the designated site type (i.e. does not have to be the dominant site type). Refer to Site Types recorded earlier (section 1.1.3). Attach documentation.

	Wetland is riverine at rivermouth or lacustrine at rivermouth	Score 25 points in Step 4
	Wetland is riverine, within 0.75 km of rivermouth	Score 15 points in Step 4
	Wetland is lacustrine, within 0.75 km of rivermouth	Score 10 points in Step 4
	Fish staging and/or migration habitat present, but not as above	Score 5 points in Step 4

Step 4: Enter a score from only one of the three above Steps.

Score for Staging and Migration Habitat
(maximum 25 points) 0

4.3 ECOSYSTEM AGE

		Fractional Area		Score
Bog	=		x 25 =	
Fen, on deeper soils; floating mats or marl	=		x 20 =	
Fen, on limestone rock	=		x 5 =	
Swamp	=		x 3 =	
Marsh	=	1.00	x 0 =	0
	Total		=	0

Ecosystem Age Score *(maximum 25 points)* 0

4.4 GREAT LAKES COASTAL WETLANDS

Choose one only.

	Wetland < 10 ha	=	10 pts
	Wetland 10-50 ha	=	25
	Wetland 51-100 ha	=	50
	Wetland > 100 ha	=	75

N/A - wetland not coastal

Great Lakes Coastal Wetland Score
(maximum 75 points) 0

GENERAL INFORMATION

Wetland Evaluator(s)

Name: Ken Ursic, M.Sc. Affiliation: Beacon Environmental Limited

Signature: 

(by signing, I confirm that this evaluation has been undertaken and completed in accordance with the Ontario Wetland Evaluation System Southern Manual 4th Edition ~~/ Northern Manual 2nd Edition~~)

Name: Said Mohamed, B.Sc. Affiliation: Beacon Environmental Limited

Signature: 

(by signing, I confirm that this evaluation has been undertaken and completed in accordance with the Ontario Wetland Evaluation System Southern Manual 4th Edition ~~/ Northern Manual 2nd Edition~~)

Name: _____ Affiliation: _____

Signature: _____

(by signing, I confirm that this evaluation has been undertaken and completed in accordance with the Ontario Wetland Evaluation System Southern Manual 4th Edition / Northern Manual 2nd Edition)

Name: _____ Affiliation: _____

Signature: _____

(by signing, I confirm that this evaluation has been undertaken and completed in accordance with the Ontario Wetland Evaluation System Southern Manual 4th Edition / Northern Manual 2nd Edition)

Name: _____ Affiliation: _____

Signature: _____

(by signing, I confirm that this evaluation has been undertaken and completed in accordance with the Ontario Wetland Evaluation System Southern Manual 4th Edition / Northern Manual 2nd Edition)

2013.10.15, 2013.11.29, 2014.04.25, 2014.04.28, 2014.05.27, 2014.06.24, 2015.04.16, 2015.05.05, 2015.05.26, 2015.06.05, 2016.04.16, 2016.05.06, 2016.06.04, 2016.06.14, 2016.06.15, 2016.10.07, 2020.04.27, 2020.05.02, 2020.05.20, 2020.05.27, 2020.05.28, 2020.06.01, 2020.06.08, 2020.06.12, 2020.06.18, 2020.06.19, 2020.06.22, 2020.07.04, 2020.08.20, 2023.04.25

Date(s) wetland visited (in field): _____

Date evaluation completed: 2023.04.25

Estimated time devoted to completing the field survey in person hours: 71

Weather Conditions

i) at time of field work: Cloudy-sunny, above freezing temperatures, no precipitation

ii) summer conditions in general: Cloudy-sunny, warm-hot

WETLAND EVALUATION SCORING RECORD

WETLAND NAME: Macville Area Wetlands

1.0 BIOLOGICAL COMPONENT

	1.1 PRODUCTIVITY
22	1.1.1 Growing Degree-Days/Soils
15	1.1.2 Wetland Type
2	1.1.3 Site Type
39	

	1.2 BIODIVERSITY
9	1.2.1 Number of Wetland Types
10.5	1.2.2 Vegetation Communities
5	1.2.3 Diversity of Surrounding Habitat
8	1.2.4 Proximity to Other Wetlands
15	1.2.5 Interspersion
8	1.2.6 Open Water Type
55.5	

7	1.3 SIZE (Biological Component)
101.5	TOTAL (Biological Component)

2.0 SOCIAL COMPONENT

	2.1 ECONOMICALLY VALUABLE PRODUCTS
0	2.1.1 Wood Products
0	2.1.2 Wild Rice
12	2.1.3 Commerical Baitfish
3	2.1.4 Furbearers
15	Total for Economically Valuable Products
0	2.2 RECREATIONAL ACTIVITIES
	2.3 LANDSCAPE AESTHETICS
3	2.3.1 Distinctness
1	2.3.2 Absence of Human Disturbance
4	Total for Landscape Aesthetics
	2.4 EDUCATION AND PUBLIC AWARENESS
0	2.4.1 Educational Uses
0	2.4.2 Facilities and Programs
5	2.4.3 Research and Studies
5	Total for Education and Public Awareness
40	2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT
4	2.6 OWNERSHIP
6	2.7 SIZE (Social Component)
	2.8 ABORIGINAL VALUES AND CULTURAL HERITAGE
0	2.8.1 Aboriginal Values
0	2.8.2 Cultural Heritage
74	TOTAL (Social Component)

3.0 HYDROLOGICAL COMPONENT

82	3.1 FLOOD ATTENUATION
	3.2 WATER QUALITY IMPROVEMENT
54	3.2.1 Short Term Water Quality Improvement
0	3.2.2 Long Term Nutrient Trap
18	3.2.3 Groundwater Discharge
72	Total for Water Quality Improvement
0	3.3 CARBON SINK
0	3.4 SHORELINE EROSION CONTROL
	3.5 GROUNDWATER RECHARGE
50	3.5.1 Site Type
4	3.5.2 Soil Recharge Potential
54	Total for Groundwater Recharge
208	TOTAL (Hydrological Component)

4.0 SPECIAL FEATURES COMPONENT

4.1 RARITY

4.1.1 Wetlands

60	4.1.1.1 Rarity within the Landscape
10	4.1.1.2 Rarity of Wetland Type
70	Total for Wetland Rarity

4.1.2 Species

50	4.1.2.1 Provincially Significant Animals
0	4.1.2.2 Provincially Significant Plants
0	4.1.2.3 Regionally Significant Species
10	4.1.2.4 Locally Significant Species
60	Total for Species Rarity

4.2 SIGNIFICANT FEATURES AND HABITATS

0	4.2.1 Colonial Waterbirds
0	4.2.2 Winter Cover for Wildlife
10	4.2.3 Waterfowl Staging and/or Moulting Areas
10	4.2.4 Waterfowl Breeding
10	4.2.5 Migratory Passerine, Shorebird or Raptor Stopover Area
	4.2.6 Fish Habitat
2	4.2.6.1 Spawning and Nursery Habitat
0	4.2.6.2 Migration and Staging Habitat
32	Total for Significant Features and Habitats

0	4.3 ECOSYSTEM AGE
0	4.4 GREAT LAKES COASTAL WETLANDS
162	TOTAL FOR SPECIAL FEATURES COMPONENT (*not to exceed 250*)

SUMMARY OF EVALUATION RESULT

Wetland Macville Area Wetlands

101.5	1.0 TOTAL FOR BIOLOGICAL COMPONENT
74	2.0 TOTAL FOR SOCIAL COMPONENT
208	3.0 TOTAL FOR HYDROLOGICAL COMPONENT
162	4.0 TOTAL FOR SPECIAL FEATURES COMPONENT
545.5	TOTAL WETLAND SCORE

APPENDIX 4 – WETLAND DATA SUMMARY FORM

Complete versions of the data form in this appendix should be attached to the wetland data record and included within the wetland evaluation file.

Wetland Name Macville Area Wetlands Page 1 of 2

Wetland #	Map Code	Field Code	GPS Coordinate (UTM Zone 17)	Dominant Form	Forms	# Forms	Dominant Species	Area (ha)	% Open Water			Open Water (ha)	Soil (ha)	Site Type	Fish Habitat			
									Low (ha)	High Est.	Mean Est.				% Fish Habitat	Area (ha)	Habitat Type	Key Veg Group
105	reM7-E	14-2016	598 030 mE; 4 857 380 mN	re	gc, re, ne	3	Typha angustifolia	0.45				0	L	Pi				
105	reM5-A	15-2016	598 130 mE; 4 857 310 mN	re	gc, ne	2	Phalaris arundinacea	0.44				0	L	Pi				
105	neM10-A	16-2016	598 140 mE; 4 857 360 mN	ne	gc, re, ne	3	Phalaris arundinacea	0.18				0	L	Pi				
105	reM23-A	17-2016	598 100 mE; 4 857 430 mN	re	gc, re, ne, ff, su	5	Typha latifolia	0.23			30	0.07	L	Pi				
105	reM15-A	136-2016	598 360 mE; 4 857 230 mN	re	re, ne	1	Typha x glauca	0.52				0	L	Pi				
106	ffW16-B	5-2016	597 615 mE; 4 857 330 mN	ff	re, ff	2	Lemna minor	0.03			90	0.027	Om	I				
106	gcM3-A	7-2016	597 770 mE; 4 857 340 mN	gc	gc, ne	2	Symphyotrichum lanceolatum	1.25				0	L	Pi				
106	reM17	8-2016	597 720 mE; 4 857 390 mN	re	re, gc	2	Typha x glauca	0.44				0	Om	P				
106	tsS15-A	9-2016	597 655 mE; 4 857 335 mN	ts	h, ts, gc	3	Cornus sericea, Thuja occidentalis	0.04				0	Om	Pi				
106	reM15-A	134-2016	598 130 mE; 4 857 190 mN	re	re	1	Typha x glauca	0.08				0	L	Pi				
106	neM5-A	13-2016	597 950 mE; 4 857 270 mN	ne	gc, ne	2	Phalaris arundinacea	0.54				0	L	Pi				
107	reM15-C	10-2016	597 740 mE; 4 857 250 mN	re	re	1	Typha latifolia, Typha x glauca	0.14				0	Om	Pi	100	0.14	LM	3
107	suW27-D	11-2016	597 700 mE; 4 857 250 mN	su	su	1	Potamogeton foliosus	0.23			100	0.23	Om	Pi	100	0.23	LM	11

APPENDIX 4 – WETLAND DATA SUMMARY FORM

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Wetland Name Macville Area Wetlands Page 2 of 2

Wetland #	Map Code	Field Code	GPS Coordinate (UTM Zone 17)	Dominant Form	Forms	# Forms	Dominant Species	Area	% Open Water			Open Water	Soil	Site Type	Fish Habitat			
									Low (ha)	High Est.	Mean Est.		(ha)		% Fish Habitat	Area (ha)	Habitat Type	Key Veg Group
107	reM18-B	12-2016	597 810 mE; 4 857 115 mN	re	re, ne	2	Typha angustifolia	1.10				0	L	Pi	3	0.03	HM	3
107	reM15-A	133-2016	598 310 mE; 4 856 910 mN	re	re	1	Typha x glauca	2.84				0	L	Pi				
108	neM5-A	6-2016	597 610 mE; 4 857 300 mN	ne	gc, ne	2	Phalaris arundinacea	0.02				0	L	Pi				
109	reM18-B	4-2016	597 555 mE; 4 857 370 mN	re	re, ne	2	Typha angustifolia	0.15			30	0.05	L	Pi				

Attachment B

APPENDIX 4 – WETLAND DATA SUMMARY FORM

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Wetland Name Macville Area Wetlands Page 1 of 2

Wetland #	Map Code	Field Code	GPS Coordinate (UTM Zone 17)	Dominant Form	Forms	# Forms	Dominant Species	Area (ha)	% Open Water			Open Water (ha)	Soil (ha)	Site Type	Fish Habitat			
									Low (ha)	High Est.	Mean Est.				% Fish Habitat	Area (ha)	Habitat Type	Key Veg Group
105	reM7-E	14-2016	598 030 mE; 4 857 380 mN	re	gc, re, ne	3	Typha angustifolia	0.45				0	L	Pi				
105	reM5-A	15-2016	598 130 mE; 4 857 310 mN	re	gc, ne	2	Phalaris arundinacea	0.44				0	L	Pi				
105	neM10-A	16-2016	598 140 mE; 4 857 360 mN	ne	gc, re, ne	3	Phalaris arundinacea	0.18				0	L	Pi				
105	reM23-A	17-2016	598 100 mE; 4 857 430 mN	re	gc, re, ne, ff, su	5	Typha latifolia	0.23			30	0.07	L	Pi				
105	reM15-A	136-2016	598 360 mE; 4 857 230 mN	re	re	1	Typha x glauca	0.45				0	L	Pi				
105	suW27	209-2016	598 350 mE; 4 857 250 mN	su	su	1		0.009			100	0.009	L	Pi				
106	ffW16-B	5-2016	597 615 mE; 4 857 330 mN	ff	re, ff	2	Lemna minor	0.03			90	0.027	Om	I				
106	gcM3-A	7-2016	597 770 mE; 4 857 340 mN	gc	gc, ne	2	Symphyotrichum lanceolatum	1.25				0	L	Pi				
106	reM17	8-2016	597 720 mE; 4 857 390 mN	re	re, gc	2	Typha x glauca	0.44				0	Om	P				
106	tsS15-A	9-2016	597 655 mE; 4 857 335 mN	ts	h, ts, gc	3	Cornus sericea, Thuja occidentalis	0.04				0	Om	Pi				
106	reM15-A	134-2016	598 130 mE; 4 857 190 mN	re	re	1	Typha x glauca	0.08				0	L	Pi				
106	neM5-A	13-2016	597 950 mE; 4 857 270 mN	ne	gc, ne	2	Phalaris arundinacea	0.54				0	L	Pi				
107	reM15-C	10-2016	597 740 mE; 4 857 250 mN	re	re	1	Typha latifolia, Typha x glauca	0.14				0	Om	Pi	100	0.14	LM	3
107	suW27-D	11-2016	597 700 mE; 4 857 250 mN	su	su	1	Potamogeton foliosus	0.23			100	0.23	Om	Pi	100	0.23	LM	11

APPENDIX 4 – WETLAND DATA SUMMARY FORM

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Wetland Name Macville Area Wetlands Page 2 of 2

Wetland #	Map Code	Field Code	GPS Coordinate (UTM Zone 17)	Dominant Form	Forms	# Forms	Dominant Species	Area	% Open Water			Open Water	Soil	Site Type	Fish Habitat			
									Low (ha)	High Est.	Mean Est.		(ha)		% Fish Habitat	Area (ha)	Habitat Type	Key Veg Group
107	reM18-B	12-2016	597 810 mE; 4 857 115 mN	re	re, ne	2	Typha angustifolia	1.10				0	L	Pi	3	0.03	HM	3
107	reM15-A	133-2016	598 310 mE; 4 856 910 mN	re	re	1	Typha x glauca	2.84				0	L	Pi				
108	neM5-A	6-2016	597 610 mE; 4 857 300 mN	ne	gc, ne	2	Phalaris arundinacea	0.02				0	L	Pi				
109	reM18-B	4-2016	597 555 mE; 4 857 370 mN	re	re, ne	2	Typha angustifolia	0.15			30	0.05	L	Pi				

Appendix D

Flora Checklist for Caledon Station Secondary Plan

Appendix D

Flora Checklist for Caledon Station Secondary Plan

Common Name	Scientific Name	S-Rank [a]	TRCA Rank [b]	Native Status
Abies balsamea	Balsam Fir	S5	L3	N
Abutilon theophrasti	Velvetleaf	SE5	L+	I
Acer negundo	Manitoba Maple	S5	L+?	N
Acer platanoides	Norway Maple	SE5	L+	I
Acer x freemanii	Freeman Maple	SNA	L4	N
Aesculus hippocastanum	Horse Chestnut	SE2	L+	I
Agrostis gigantea	Redtop	SE5	L+	I
Agrostis stolonifera	Creeping Bentgrass	SE5	L+?	I
Alisma triviale	Northern Water-plantain	S5	L5	N
Alliaria petiolata	Garlic Mustard	SE5	L+	I
Alnus glutinosa	European Black Alder	SE4	L+	I
Alnus incana ssp. rugosa	Speckled Alder	S5	L3	N
Arctium lappa	Great Burdock	SE5	L+	I
Asclepias syriaca	Common Milkweed	S5	L5	N
Betula alleghaniensis	Yellow Birch	S5	L4	N
Betula papyrifera	Paper Birch	S5	L4	N
Betula pendula	Weeping Birch	SE4	L+	I
Bidens frondosa	Devil's Beggarticks	S5	L5	N
Bromus inermis	Smooth Brome	SE5	L+	I
Caltha palustris	Yellow Marsh Marigold	S5	L4	N
Calystegia sepium	Hedge False Bindweed	S5	L5	N
Carex bebbii	Bebb's Sedge	S5	L5	N
Carex hystericina	Porcupine Sedge	S5	L4	N
Carex laevivaginata	Smooth-sheathed Sedge	S4	L3	N
Carex pseudocyperus	Cyperus-like Sedge	S5	L5	N
Carex stipata	Awl-fruited Sedge	S5	L5	N
Carex vulpinoidea	Fox Sedge	S5	L5	N
Catalpa speciosa	Northern Catalpa	SE1	L+	I

Common Name	Scientific Name	S-Rank [a]	TRCA Rank [b]	Native Status
Ceratophyllum demersum	Common Hornwort	S5	L4	N
Cichorium intybus	Wild Chicory	SE5	L+	I
Cicuta bulbifera	Bulbous Water-hemlock	S5	L5	N
Circaea canadensis ssp. canadensis	Canada Enchanter's Nightshade	S5	L5	N
Cirsium arvense	Canada Thistle	SE5	L+	I
Clematis virginiana	Virginia Clematis	S5	L5	N
Cornus sericea	Red-osier Dogwood	S5	L5	N
Crataegus monogyna	English Hawthorn	SE4	L+	I
Crataegus punctata	Dotted Hawthorn	S5	L5	N
Dactylis glomerata	Orchard Grass	SE5	L+	I
Daucus carota	Wild Carrot	SE5	L+	I
Digitaria sanguinalis	Hairy Crabgrass	SE5	L+	I
Echinochloa crus-galli	Large Barnyard Grass	SE5	L+	I
Echinocystis lobata	Wild Cucumber	S5	L5	N
Eleocharis erythropoda	Red-stemmed Spikerush	S5	L5	N
Elymus repens	Quackgrass	SE5	L+	I
Epilobium ciliatum ssp. ciliatum	Northern Willowherb	S5	L5	N
Epilobium coloratum	Purple-veined Willowherb	S5	L5	N
Epilobium hirsutum	Hairy Willowherb	SE5	L+	I
Epilobium leptophyllum	Narrow-leaved Willowherb	S5	L3	N
Epilobium parviflorum	Small-flowered Hairy Willowherb	SE4	L+	I
Equisetum arvense	Field Horsetail	S5	L5	N
Equisetum sylvaticum	Woodland Horsetail	S5	L3	N
Erigeron philadelphicus var. philadelphicus	Philadelphia Fleabane	S5	L5	N
Eupatorium perfoliatum	Common Boneset	S5	L5	N
Euthamia graminifolia	Grass-leaved Goldenrod	S5	L5	N
Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed	S5	L5	N
Fraxinus pennsylvanica	Red Ash	S4	L5	N
Galium palustre	Common Marsh Bedstraw	S5	L5	N
Galium verum	Yellow Bedstraw	SE4	L+	I
Geum aleppicum	Yellow Avens	S5	L5	N
Geum canadense	Canada Avens	S5	L5	N
Geum urbanum	Wood Avens	SE3	L+	I
Glechoma hederacea	Ground-ivy	SE5	L+	I
Glyceria grandis	Tall Mannagrass	S5	L5	N

Common Name	Scientific Name	S-Rank [a]	TRCA Rank [b]	Native Status
Glyceria striata	Fowl Mannagrass	S5	L5	N
Hesperis matronalis	Dame's Rocket	SE5	L+	I
Impatiens capensis	Spotted Jewelweed	S5	L5	N
Inula helenium	Elecampane	SE5	L+	I
Juglans nigra	Black Walnut	S4?	L5	N
Juncus dudleyi	Dudley's Rush	S5	L5	N
Juncus effusus	Soft Rush	S5	L5	N
Juniperus virginiana	Eastern Red Cedar	S5	L5	N
Larix laricina	Tamarack	S5	L3	N
Leersia oryzoides	Rice Cutgrass	S5	L5	N
Lemna minor	Small Duckweed	S5?	L5	N
Lemna trisulca	Star Duckweed	S5	L3	N
Leonurus cardiaca ssp. cardiaca	Common Motherwort	SE5	L+	I
Leucanthemum vulgare	Oxeye Daisy	SE5	L+	I
Lolium perenne	Perennial Ryegrass	SE4	L+	I
Lolium pratense	Meadow Ryegrass	SE5	L+	I
Lonicera tatarica	Tatarian Honeysuckle	SE5	L+	I
Lotus corniculatus	Garden Bird's-foot Trefoil	SE5	L+	I
Lycopus americanus	American Water-horehound	S5	L4	N
Lycopus uniflorus	Northern Water-horehound	S5	L5	N
Lysimachia arvensis	Scarlet Pimpernel	SE4	L+	I
Lysimachia nummularia	Creeping Yellow Loosestrife	SE5	L+	I
Lythrum salicaria	Purple Loosestrife	SE5	L+	I
Malus pumila	Common Apple	SE4	L+	I
Malva neglecta	Common Mallow	SE5	L+	I
Matteuccia struthiopteris var. pensylvanica	Ostrich Fern	S5	L5	N
Medicago lupulina	Black Medick	SE5	L+	I
Medicago sativa ssp. sativa	Alfalfa	SE5	L+	I
Melilotus albus	White Sweet-clover	SE5	L+	I
Mentha aquatica	Water Mint	SE1	L+	I
Morus alba	White Mulberry	SE5	L+	I
Nepeta cataria	Catnip	SE5	L+	I
Onoclea sensibilis	Sensitive Fern	S5	L5	N
Panicum capillare	Common Panicgrass	S5	L5	N
Parthenocissus vitacea	Thicket Creeper	S5	L5	N

Common Name	Scientific Name	S-Rank [a]	TRCA Rank [b]	Native Status
Phalaris arundinacea	Reed Canarygrass	S5	L+?	N
Phleum pratense	Common Timothy	SE5	L+	I
Phragmites australis ssp. australis	European Reed	SE5	L+	I
Picea abies	Norway Spruce	SE3	L+	I
Picea glauca	White Spruce	S5	L3	N
Picea pungens	Blue Spruce	SE1	L+	I
Pilosella caespitosa	Meadow Hawkweed	SE5	L+	I
Pinus nigra	Austrian Pine	SE3	L+	I
Pinus sylvestris	Scots Pine	SE5	L+	I
Poa palustris	Fowl Bluegrass	S5	L5	N
Poa pratensis ssp. pratensis	Kentucky Bluegrass	SE5	L+	I
Polygonum aviculare ssp. aviculare	Prostrate Knotweed	SE5	L+	I
Populus deltoides	Eastern Cottonwood	S5	L5	N
Populus tremuloides	Trembling Aspen	S5	L5	N
Potamogeton foliosus	Leafy Pondweed	S5	L4	N
Potentilla recta	Sulphur Cinquefoil	SE5	L+	I
Prunella vulgaris ssp. lanceolata	Lance-leaved Self-heal	S5	L5	N
Prunus avium	Sweet Cherry	SE4	L+	I
Prunus virginiana var. virginiana	Chokecherry	S5	L5	N
Pyrus communis	Common Pear	SE4	L+	I
Quercus rubra	Northern Red Oak	S5	L4	N
Ranunculus acris	Common Buttercup	SE5	L+	I
Ranunculus sceleratus	Cursed Buttercup	S5	L5	N
Rhamnus cathartica	European Buckthorn	SE5	L+	I
Ribes americanum	American Black Currant	S5	L5	N
Ribes rubrum	European Red Currant	SE5	L+	I
Ribes triste	Swamp Red Currant	S5	L3	N
Robinia pseudoacacia	Black Locust	SE5	L+	I
Rubus idaeus ssp. strigosus	North American Red Raspberry	S5	L5	N
Rubus occidentalis	Black Raspberry	S5	L5	N
Rumex crispus	Curled Dock	SE5	L+	I
Salix amygdaloides	Peach-leaved Willow	S5	L4	N
Salix bebbiana	Bebb's Willow	S5	L4	N
Salix discolor	Pussy Willow	S5	L4	N
Salix x fragilis	Crack Willow	SNA	L+	I

Common Name	Scientific Name	S-Rank [a]	TRCA Rank [b]	Native Status
Salix x sepulcralis	Weeping Willow	SNA	L+	I
Scirpus atrovirens	Dark-green Bulrush	S5	L5	N
Scirpus microcarpus	Red-tinged Bulrush	S5	L5	N
Scutellaria galericulata	Marsh Skullcap	S5	L5	N
Setaria faberi	Giant Foxtail	SE4	L+	I
Setaria pumila	Yellow Foxtail	SE5	L+	I
Setaria verticillata	Bristly Foxtail	SE4	L+	I
Setaria viridis	Green Foxtail	SE5	L+	I
Solanum dulcamara	Bittersweet Nightshade	SE5	L+	I
Solidago altissima	Tall Goldenrod	S5	L5	N
Solidago canadensis var. canadensis	Canada Goldenrod	S5	L5	N
Solidago flexicaulis	Zigzag Goldenrod	S5	L5	N
Sonchus arvensis ssp. arvensis	Glandular Sow-thistle	SE5	L+	I
Sonchus asper	Prickly Sow-thistle	SE5	L+	I
Spiraea alba	White Meadowsweet	S5	L4	N
Spirodela polyrhiza	Great Duckweed	S5	L4	N
Symphyotrichum lanceolatum ssp. lanceolatum	Eastern Panicled Aster	S5	L5	N
Symphyotrichum puniceum var. puniceum	Purple-stemmed Aster	S5	L5	N
Syringa vulgaris	Common Lilac	SE5	L+	I
Taraxacum officinale	Common Dandelion	SE5	L+	I
Thuja occidentalis	Eastern White Cedar	S5	L5	N
Tilia americana	Basswood	S5	L5	N
Trifolium hybridum	Alsike Clover	SE5	L+	I
Trifolium pratense	Red Clover	SE5	L+	I
Trifolium repens	White Clover	SE5	L+	I
Triosteum aurantiacum	Orange-fruit Horse-gentian	S4S5	L3	N
Tripleurospermum inodorum	Scentless Chamomile	SE	L+	I
Tussilago farfara	Coltsfoot	SE5	L+	I
Typha angustifolia	Narrow-leaved Cattail	SE5	L+	I
Typha latifolia	Broad-leaved Cattail	S5	L4	N
Typha x glauca	Hybrid Cattail	SNA	L+	N
Ulmus americana	White Elm	S5	L5	N
Urtica dioica ssp. gracilis	Slender Stinging Nettle	S5	L5	N
Verbena hastata	Blue Vervain	S5	L5	N

Common Name	Scientific Name	S-Rank [a]	TRCA Rank [b]	Native Status
Veronica americana	American Speedwell	S5	L4	N
Viburnum lentago	Nannyberry	S5	L5	N
Vicia cracca	Tufted Vetch	SE5	L+	I
Vitis riparia	Riverbank Grape	S5	L5	N

a – S-Rank (from Natural Heritage Information Centre) for breeding status: S1 (Extremely Rare), S2 (Very Rare), S3 (Rare to Uncommon) (S4 (Common), S5 (Very Common) SNA (Not applicable…'because the species is not a suitable target for conservation activities'; includes non-native species)

b – TRCA Rank (Toronto and Region Conservation Authority) for breeding status: L5 (Able to withstand high levels of disturbance; generally secure throughout the jurisdiction, including the urban matrix; may be of very localized concern in highly degraded areas), L4 (Able to withstand some disturbance; generally secure in rural matrix; of concern in urban matrix), and L+ (non-native species)

Appendix E

Caledon Station Tree Inventory and Draft Plan Arborist Reports

Appendix E

Tree Inventory for Caledon Station Secondary Plan

Table E-1. Tree Inventory of Individual Trees for Caledon Station Secondary Plan

Tag Number	Species	DBH (cm)	Condition	Structure			Comments	Preservation Priority
				Root Flare	Trunk	Crown/Branches		
71	*Acer negundo*	14	Good	Good	Good	Fair	None	Low
45	*Acer negundo*	20	Good	Good	Good	Fair	None	Low
43	*Acer negundo*	21	Good	Good	Good	Fair-Good	None	Low
42	*Acer negundo*	22	Good	Good	Good	Fair-Good	None	Low
55	*Acer negundo*	25	Good	Good	Fair	Poor	None	Low
44	*Acer negundo*	31	Good	Good	Good	Fair-Good	None	Low
37	*Acer negundo*	32	Good	Good	Good	Fair	None	Low
60	*Acer negundo*	78	Fair	Good	Good	Poor	Branch dieback, unbalanced crown	Low
74	*Acer negundo*	14,15,15,14,12	Good	Good	Fair	Fair	None	Low
41	*Acer negundo*	17,14,14	Fair	Fair	Good	Fair-Poor	None	Low
72	*Acer negundo*	20,10,10,10	Good	Good	Good	Fair	None	Low
62	*Acer negundo*	22,22	Good	Good	Good	Fair	None	Low
73	*Acer negundo*	32,31,20	Good	Good	Good	Fair	None	Low
68	*Acer negundo*	40,20	Good	Good	Good	Fair	None	Low
59	*Acer platanoides*	27	Good	Fair	Good	Fair-Good	Girdling root, included bark in some unions	Moderate
54	*Acer platanoides*	17,14	Poor	Good	Good	Poor	Branch dieback, trunk half dead	Low
21	*Aesculus hippocastanea*	50	Fair	Fair	Poor	Poor	Top cut off, hollow trunk with extensive decay	Low
22	*Aesculus hippocastanea*	50	Fair	Fair	Poor	Poor	Top cut off, hollow trunk with extensive decay	Low
20	*Aesculus hippocastanea*	52	Good	Good	Good	Poor	Top cut off due to overhead wires	Low
15	*Aesculus hippocastanea*	53	Good	Good	Fair	Fair	Several cavities with decay in trunk, uneven crown due to pruning for adjacent power lines	Low
16	*Aesculus hippocastanea*	62	Good	Good	Good	Good	Several cavities at branch stubs	Moderate
17	*Aesculus hippocastanea*	65	Fair	Good	Fair	Fair	Minor dieback, cavities at branch stubs	Moderate
18	*Aesculus hippocastanea*	48,48	Fair	Fair	Poor	Poor	Branch dieback, hollow trunk with multiple cavities, poor form	Low
53	*Betula papyrifera*	19,20	Good	Good	Fair	Good	Fused trunks	Moderate
58	*Betula* sp.	22,27	Good	Good	Good	Good	None	Moderate
38	*Catalpa* sp.	63	Good	Good	Good	Fair-Good	Slight lean	Low
23	*Crataegus* sp.	40,20	Fair	Good	Good	Fair	Branch dieback	Low
36	*Fraxinus americana*	43	Dead	N/A	N/A	N/A	None	Low
40	*Juglans nigra*	52	Good	Good	Good	Fair-Good	3 leaders	Moderate
19	*Picea abies*	78	Good	Good	Good	Fair	Codominant leaders with included bark	Moderate
50	*Picea glauca*	20	Good	Good	Good	Good	None	Moderate
51	*Picea glauca*	20	Good	Good	Good	Good	None	Moderate
33	*Picea glauca*	28	Fair	Good	Good	Good	Twig dieback, lean	Moderate
56	*Picea glauca*	28	Good	Good	Good	Good	None	Moderate
49	*Picea pungens*	16	Good	Good	Good	Good	None	Moderate
57	*Picea pungens*	16	Good	Good	Good	Good	None	Moderate
48	*Picea pungens*	21	Good	Good	Good	Good	None	Moderate
46	*Picea pungens*	22	Good	Good	Good	Good	None	Moderate
47	*Picea pungens*	22	Good	Good	Good	Good	None	Moderate

Tag Number	Species	DBH (cm)	Condition	Structure			Comments	Preservation Priority
				Root Flare	Trunk	Crown/Branches		
52	*Picea pungens*	40	Fair	Fair	Good	Good	Large exposed surface roots	Moderate
35	*Picea pungens*	29,34	Good	Good	Good	Fair-Good	Codominant trunks	Moderate
61	*Prunus avium*	38	Good	Good	Good	Fair-Good	3 codominant leaders	Low
39	*Quercus rubra*	47	Good	Good	Good	Good	Small dead branches	High
63	*Salix alba*	100	Good	Poor	Poor	Fair	Massive wound in lower trunk with extensive decay as a result of fallen trunk	Low
65	*Salix alba*	19,15,10,10,8	Good	Good	Good	Fair	None	Low
69	*Tilia americana*	74	Poor	Poor	Poor	Poor	Branch dieback, brown leaves, poor form, hollow trunk	Low
70	*Ulmus americana*	28	Fair-Poor	Good	Fair	Fair	In decline, sparse foliage	Low
64	*Ulmus americana*	50	Good	Good	Fair-Good	Fair-Good	Embedded fence, codominant leaders with included bark	Moderate
66	*Ulmus americana*	35,32,38,36	Good	Good	Good	Fair	Stems fused at base, branch unions with included bark	Moderate
67	*Ulmus americana*	35,40	Fair-Good	Good	Good	Fair-Good	None	Moderate

Table E-2. Tree Inventory of Tree Grouping for Caledon Station Secondary Plan

Species	DBH (cm)	Condition	Form/Structure	Comments
Tree Group A				
Juninperus sp.	20	Good	Good	None
Juninperus sp.	15	Good	Fair	Significant lean
Juninperus sp.	20	Good	Poor	No leader, bushy
Tree Group B1				
Thuja occidentalis	59	Good	Poor	Codominant leaders with included bark, split in crotch between leaders
Thuja occidentalis	20	Good	Fair	Crowded
Thuja occidentalis	21	Fair	Fair	Crowded
Thuja occidentalis	64	Good	Poor	Codominant leaders with included bark, crack below crotch
Thuja occidentalis	30,35	Good	Poor	Cavity in crotch with decay into trunk
Tree Group B2				
Thuja occidentalis	26,26	Good	Fair	None
Thuja occidentalis	32	Fair	Fair	None
Thuja occidentalis	23,17,14	Fair	Fair	None
Thuja occidentalis	27,26	Fair	Fair	Rocks piled against base
Thuja occidentalis	30,19	Fair	Fair-Good	Split in crotch, rocks piled against base
Thuja occidentalis	16	Fair	Fair	Rocks piled against base
Thuja occidentalis	16,18	Fair	Fair	Rocks piled against base
Thuja occidentalis	15,10	Fair	Fair	Rocks piled against base
Thuja occidentalis	17,29	Good	Poor	Large open wound in root flare/lower trunk
Thuja occidentalis	50	Good	Fair	Codominant leaders with included bark
Thuja occidentalis	22	Good	Fair	Crowded
Thuja occidentalis	43	Good	Fair	Codominant leaders with included bark
Thuja occidentalis	35	Good	Fair	None
Thuja occidentalis	27,27	Fair	Fair-Good	None
Thuja occidentalis	22,22	Good	Fair	None
Thuja occidentalis	21	Fair	Poor	None
Thuja occidentalis	32,32	Fair	Poor	Codominant leaders, split in crotch
Thuja occidentalis	59	Good	Fair	Multiple codominant leaders
Thuja occidentalis	22	Fair	Poor	None
Thuja occidentalis	26,26	Poor	Poor	Codominant leaders , split in crotch through trunk
Thuja occidentalis	30,35	Fair	Poor	Large old wound in trunk, poor form
Thuja occidentalis	25,14	Fair	Fair	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Thuja occidentalis	16	Fair	Poor	None
Thuja occidentalis	20,24,24,20	Fair	Poor	None
Prunus avium	16	Good	Fair	Lean
Thuja occidentalis	30	Fair	Poor	Large decaying stump at base
Thuja occidentalis	30,35	Fair	Fair	Multiple codominant leaders
Thuja occidentalis	26,26	Good	Fair	None
Thuja occidentalis	27	Fair	Good	None
Thuja occidentalis	24,21	Fair	Fair	None
Prunus avium	13,11	Good	Fair-Good	Twisted trunk, lean
Thuja occidentalis	17	Good	Fair	Lean, uneven crown
Thuja occidentalis	16,18,18	Good	Fair	Codominant stems with included bark
Thuja occidentalis	25,25	Good	Fair-Poor	None
Thuja occidentalis	18	Fair	Poor	None
Thuja occidentalis	20	Fair	Poor	Large wound in trunk
Thuja occidentalis	11,13,13,14	Good	Fair	None
Acer negundo	18	Good	Poor	None
Thuja occidentalis	32,19	Good	Fair	Codominant
Thuja occidentalis	30	Good	Fair	Large wound in trunk
Thuja occidentalis	32	Good	Fair	Lean
Tree Group B3				
Thuja occidentalis	22,14	Good	Fair	None
Robinia psuedo-acacia	10	Good	Fair	None
Thuja occidentalis	11	Good	Good	None
Thuja occidentalis	17,14,12	Good	Fair	None
Thuja occidentalis	10	Fair	Fair	None
Thuja occidentalis	10	Fair	Fair	None
Thuja occidentalis	11	Fair	Fair	None
Thuja occidentalis	15	Good	Fair	None
Thuja occidentalis	17	Fair	Fair	None
Thuja occidentalis	14	Good	Fair	None
Thuja occidentalis	13	Good	Fair	None
Thuja occidentalis	15	Good	Fair	None
Thuja occidentalis	13	Good	Fair	None
Thuja occidentalis	13	Good	Fair	None
Thuja occidentalis	13	Good	Fair	None
Thuja occidentalis	15	Good	Fair	None
Thuja occidentalis	11,13	Good	Fair	None
Thuja occidentalis	13	Good	Fair	None
Robinia psuedo-acacia	39	Good	Fair	None
Thuja occidentalis	11	Good	Fair	None
Thuja occidentalis	10	Good	Fair	None
Thuja occidentalis	13	Good	Fair	None
Acer platanoides	16	Good	Fair	None
Thuja occidentalis	13	Good	Fair	None
Thuja occidentalis	10	Good	Fair	None
Thuja occidentalis	12	Good	Fair	None
Populus deltoides	55	Dead	N/A	None
Thuja occidentalis	10	Good	Fair	None
Thuja occidentalis	11	Good	Fair	None
Thuja occidentalis	12	Good	Fair	None
Thuja occidentalis	14	Good	Fair	None
Thuja occidentalis	15	Good	Fair	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Thuja occidentalis	12	Good	Fair	None
Thuja occidentalis	15	Good	Fair	None
Thuja occidentalis	12	Good	Fair	None
Thuja occidentalis	10	Good	Fair	None
Populus deltoides	65	Fair	Fair	None
Thuja occidentalis	21	Good	Fair	None
Thuja occidentalis	20	Good	Fair	None
Thuja occidentalis	17	Good	Fair	None
Thuja occidentalis	17	Good	Fair	None
Robinia psuedo-acacia	41	Fair	Fair	None
Thuja occidentalis	19	Fair	Fair	None
Thuja occidentalis	15	Fair	Fair	None
Thuja occidentalis	29	Good	Fair	None
Thuja occidentalis	17	Good	Fair	None
Thuja occidentalis	27	Good	Fair	None
Thuja occidentalis	21	Good	Fair	None
Thuja occidentalis	22	Good	Fair	None
Thuja occidentalis	15	Good	Fair	None
Thuja occidentalis	29	Good	Fair	None
Thuja occidentalis	16	Good	Fair	None
Thuja occidentalis	16	Good	Fair	None
Thuja occidentalis	23	Good	Fair	None
Thuja occidentalis	41	Good	Fair	None
Thuja occidentalis	42	Fair	Fair	None
Thuja occidentalis	40	Good	Fair	None
Thuja occidentalis	42	Fair	Fair	None
Thuja occidentalis	40	Good	Fair	None
Thuja occidentalis	30,12,18,15	Good	Fair	None
Thuja occidentalis	40	Good	Fair	None
Thuja occidentalis	32,13,13	Good	Fair	None
Tree Group B4				
Thuja occidentalis	18,12	Good	Fair	None
Thuja occidentalis	14	Good	Fair	None
Thuja occidentalis	16	Good	Good	None
Thuja occidentalis	12	Good	Good	None
Thuja occidentalis	11	Good	Good	None
Thuja occidentalis	12	Good	Good	None
Thuja occidentalis	14	Good	Good	None
Thuja occidentalis	16	Good	Good	None
Thuja occidentalis	10	Good	Good	None
Thuja occidentalis	12	Good	Good	None
Thuja occidentalis	11	Good	Good	None
Thuja occidentalis	17	Good	Good	None
Thuja occidentalis	19,15	Good	Good	None
Tree Group B5				
Thuja occidentalis	19,20,13	Good	Fair	None
Thuja occidentalis	21,11	Good	Good	None
Thuja occidentalis	15	Good	Good	None
Thuja occidentalis	20,12	Good	Good	None
Thuja occidentalis	20	Good	Good	None
Thuja occidentalis	15	Good	Good	None
Thuja occidentalis	13	Good	Good	None
Thuja occidentalis	18	Good	Good	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Thuja occidentalis	15	Good	Poor	None
Thuja occidentalis	15	Good	Good	None
Thuja occidentalis	16	Good	Good	None
Thuja occidentalis	29	Good	Good	None
Thuja occidentalis	17	Good	Good	None
Thuja occidentalis	18	Good	Good	None
Thuja occidentalis	23	Good	Good	None
Thuja occidentalis	15	Good	Good	None
Acer platanoides	15,21	Good	Fair-Poor	None
Acer negundo	22	Good	Poor	None
Acer negundo	27,24	Good	Poor	None
Tree Group C1				
Malus pumila	20,20,15,15	Fair	Fair	None
Malus pumila	50	Good	Poor	Crack in branch unions, cavity at base
Malus pumila	12	Good	Fair	None
Tree Group C2				
Pyrus communis	14,14	Good	Fair	None
Fraxinus pennsylvanica	30	Dead	N/A	None
Malus pumila	25,24,25,20	Good	Poor	None
Crataegus sp.	15	Good	Fair	None
Crataegus sp.	25	Poor	N/A	Nearly dead
Fraxinus pennsylvanica	50	Dead	N/A	None
Crataegus sp.	40,22,20	Good	Poor	Split at base
Crataegus sp.	28	Good	Fair	Bulges in root flare
Crataegus sp.	15,20	Fair	Poor	Cavities in lower trunk
Malus pumila	50	Fair	Poor	Twisted trunk, dead branches, poor form
Malus pumila	25,20	Poor	Poor	None
Crataegus sp.	40,20	Fair	Poor	Poor form, cavities in trunk
Fraxinus pennsylvanica	38	Dead	N/A	None
Crataegus sp.	15,15,16,18	Good	Fair	None
Crataegus sp.	12	Poor	Poor	None
Malus pumila	20	Fair	Poor	None
Malus pumila	40	Poor	Poor	None
Crataegus sp.	14,12	Good	Fair	None
Malus pumila	50,35,25,30,25	Fair	Poor	None
Crataegus sp.	40	Fair	Poor	Cavities in trunk large broken branches
Malus pumila	35,45	Fair-Good	Poor	Branch dieback, poor form, extensive epicormics
Malus pumila	25,25,20,28	Fair	Poor	None
Crataegus sp.	11,14,15,12	Good	Poor	None
Malus pumila	45	Poor	Poor	Extensive dieback, poor form
Crataegus sp.	15	Fair	Poor	None
Crataegus sp.	20,22,14	Good	Fair	None
Malus pumila	30,30	Poor	Poor	One stem broken
Malus pumila	13	Poor	Poor	None
Crataegus sp.	20,12,20,18	Good	Fair	None
Crataegus sp.	18,15,22	Good	Fair	None
Malus pumila	17,20,15	Fair	Fair-Good	None
Ulmus americana	16	Good	Fair	None
Crataegus sp.	22	Good	Fair	None
Quercus macrocarpa	10	Good	Good	None
Crataegus sp.	27	Poor	Poor	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Crataegus sp.	20,25,35	Poor	Poor	Poor form, large cavities, extensive decay
Malus pumila	38	Fair	Fair	Damage to base
Malus pumila	25	Fair	Fair	None
Crataegus sp.	25	Poor	Poor	None
Malus pumila	20,18,20,20	Good	Poor	None
Crataegus sp.	20,18,30,20,20	Fair	Poor	Fused trunks
Crataegus sp.	20,35,22,20	Good	Fair	None
Crataegus sp.	45,26,30	Good	Fair	None
Crataegus sp.	25,20,17	Good	Fair-Good	None
Crataegus sp.	26,25	Good	Fair	None
Malus pumila	40,40	Fair	Fair-Good	None
Malus pumila	25	Good	Poor	None
Prunus serotina	30	Good	Fair	Damage to trunk, codominant stems
Prunus serotina	20,20	Good	Fair	Codominant stems with included bark
Crataegus sp.	20,25,22,20	Good	Fair	None
Tree Group C3				
Crataegus sp.	18,18,14	Good	Fair	None
Malus pumila	15,12	Good	Poor	None
Malus pumila	20	Good	Fair	None
Malus pumila	17	Good	Fair	None
Malus pumila	45,30	Fair	Fair-Good	None
Tree Group C4				
Crataegus sp.	12,8,8,8	Good	Fair-Poor	None
Crataegus sp.	25,15,10,25,10,10	Good	Fair-Good	None
Crataegus sp.	8,8,12	Good	Good	None
Crataegus sp.	11,11	Good	Good	None
Crataegus sp.	11,9	Good	Good	None
Crataegus sp.	13	Good	fair	None
Crataegus sp.	10,10,10,10	Good	fair	None
Crataegus sp.	13,15	Good	Fair	None
Crataegus sp.	15,10	Good	Fair	None
Malus pumila	22,16	Fair	Poor	None
Crataegus sp.	14,10	Fair	Poor	None
Crataegus sp.	20	Good	Good	None
Tree Group C5				
Malus pumila	20,20,25	Good	Fair	None
Malus pumila	47,20,40	Fair	Poor	Large dead branch
Crataegus sp.	30	Fair	Fair-Good	Wound in lower trunk, dead branches
Malus pumila	35,25,25	Good	Poor	None
Malus pumila	25,20,20	Fair	Poor	None
Ulmus americana	10	Fair	Fair-Good	None
Ulmus americana	15	Good	Fair-Poor	None
Tree Group C6				
Crataegus sp.	16,13,20	Good	Fair	None
Crataegus sp.	11,12,12,10	Good	Fair	None
Ulmus americana	18	Good	Good	None
Crataegus sp.	14,10,10	Good	Fair	None
Crataegus sp.	12,10,10	Good	Fair	None
Acer negundo	12,15	Fair	Poor	None
Crataegus sp.	14,14,10	Good	Fair	None
Ulmus americana	55	Fair	Fair-Good	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Crataegus sp.	15,16	Good	Poor	None
Crataegus sp.	18, 21,14,14,	Poor	Poor	None
Crataegus sp.	10,10,10,10	Good	Fair	None
Tilia americana	16	Good	Good	None
Ulmus americana	50	Good	Fair-Poor	None
Tilia americana	11	Good	Fair-Poor	None
Tilia americana	28,15,16	Good	Poor	None
Crataegus sp.	20,20,11	Good	Fair	None
Tree Group C7				
Malus pumila	14,10,10	Fair	Fair-Good	None
Crataegus sp.	26,13,14,12,18	Poor	Poor	None
Malus pumila	20,25,20	Fair	Fair	None
Malus pumila	15,16,18,13	Good	Fair	None
Malus pumila	15,16	Good	Fair	None
Malus pumila	13,15,20	Good	Fair-Good	None
Malus pumila	16,16,22	Fair	Fair	None
Tree Group C8				
Fraxinus americana	30,25	Dead	N/A	None
Fraxinus americana	13	Poor	Poor	None
Fraxinus americana	10	Poor	Poor	None
Fraxinus americana	15	Dead	N/A	None
Crataegus sp.	20	Fair	Fair	None
Crataegus sp.	20	Fair	Fair	None
Crataegus sp.	12,10,10,12	Fair	Poor	None
Fraxinus americana	20,26	Dead	N/A	None
Fraxinus americana	24	Dead	N/A	None
Malus pumila	22	Poor	Poor	None
Fraxinus americana	35	Dead	N/A	None
Crataegus sp.	10	Fair	Fair	None
Crataegus sp.	14	Fair	Fair	None
Fraxinus americana	12	Dead	N/A	None
Crataegus sp.	20	Fair	Poor	None
Crataegus sp.	18	Fair	Poor	None
Fraxinus americana	30	Dead	N/A	None
Quercus macrocarpa	20	Fair	Fair	None
Fraxinus americana	27	Dead	N/A	None
Fraxinus americana	12	Dead	N/A	None
Fraxinus americana	35	Dead	N/A	None
Ulmus americana	25	Dead	N/A	None
Fraxinus americana	30	Dead	N/A	None
Crataegus sp.	14	Good	Fair	None
Fraxinus americana	32.24	Dead	N/A	None
Crataegus sp.	10	Fair	Fair	None
Crataegus sp.	20	Fair	Fair	None
Fraxinus americana	32	Dead	N/A	None
Fraxinus americana	32	Dead	N/A	None
Fraxinus americana	14	Dead	N/A	None
Crataegus sp.	20,20,20	Fair	Poor	None
Fraxinus americana	28	Dead	N/A	None
Crataegus sp.	17,20,17	Fair	Fair	None
Malus pumila	25,22,30	Fair	Poor	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Crataegus sp.	14,18	Fair	Poor	None
Crataegus sp.	10,10,10,10	Fair	Fair	None
Fraxinus americana	14	Dead	N/A	None
Fraxinus americana	10	Dead	N/A	None
Fraxinus americana	17,17	Dead	N/A	None
Fraxinus americana	14	Dead	N/A	None
Fraxinus americana	15	Dead	N/A	None
Fraxinus americana	38	Dead	N/A	None
Malus pumila	15	Dead	N/A	None
Malus pumila	16,17,34,20	Dead	N/A	None
Fraxinus americana	10	Dead	N/A	None
Malus pumila	40	Fair	Poor	None
Fraxinus americana	10	Dead	N/A	None
Fraxinus americana	15	Dead	N/A	None
Crataegus sp.	10,16	Fair	Poor	None
Crataegus sp.	15,15,15,15	Fair	Fair	None
Crataegus sp.	23,23,20	Fair	Poor	None
Fraxinus americana	10	Fair	Fair	None
Crataegus sp.	14,15,11,11,15	Good	Fair	None
Tree Group C9				
Malus pumila	50	Dead	N/A	None
Prunus serotina	15	Fair	Poor	None
Fraxinus americana	22,14	Dead	N/A	None
Malus pumila	50	Poor	Poor	None
Fraxinus americana	31	Dead	N/A	None
Malus pumila	46,38	Fair	Poor	None
Malus pumila	28, 28,34	Poor	Poor	None
Crataegus sp.	22,16,15	Fair	Poor	None
Malus pumila	23,27,32	Poor	Poor	None
Malus pumila	20	Dead	N/A	None
Crataegus sp.	17,20,14,14,15	Poor	Poor	None
Malus pumila	25	Fair	Poor	None
Crataegus sp.	30	Poor	Poor	None
Malus pumila	43	Poor	Poor	None
Crataegus sp.	16	Fair	Poor	None
Crataegus sp.	20	Fair	Poor	None
Malus pumila	26,26,14	Poor	Poor	None
Malus pumila	29,18	Poor	Poor	None
Malus pumila	26,25,32,30	Poor	Poor	None
Crataegus sp.	15,28	Poor	Poor	None
Crataegus sp.	22,15	Fair	Fair	None
Prunus serotina	25	Poor	Poor	None
Crataegus sp.	30,30	Poor	Poor	None
Malus pumila	28,50	Fair	Poor	None
Crataegus sp.	17,10	Fair	Fair	None
Malus pumila	28	Poor	Poor	None
Crataegus sp.	11	Fair	Fair	None
Crataegus sp.	16,16,20	Fair	Poor	None
Malus pumila	60	Poor	Poor	None
Crataegus sp.	12	Fair	Poor	None
Prunus serotina	17	Good	Fair	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Crataegus sp.	33,22,30	Fair	Poor	None
Prunus serotina	25	Good	Fair	None
Crataegus sp.	26,30	Fair	Fair	None
Malus pumila	30	Fair	Fair	None
Crataegus sp.	20,20	Fair	Poor	None
Fraxinus americana	15	Dead	N/A	None
Prunus serotina	65,50	Fair	Poor	None
Crataegus sp.	24,22,22,20	Fair	Fair	None
Crataegus sp.	11	Fair	Fair	None
Crataegus sp.	12,15	Fair	Fair	None
Prunus serotina	15	Good	Fair	None
Prunus serotina	25,40,34,28	Fair	Poor	None
Prunus serotina	12	Poor	Poor	None
Prunus serotina	22	Fair	Fair	None
Prunus serotina	20	Dead	Poor	None
Malus pumila	20	Poor	Poor	None
Malus pumila	37,28,37	Poor	Poor	None
Malus pumila	24,24,40	Fair	Poor	None
Crataegus sp.	22,22	Fair	Poor	None
Crataegus sp.	28,23,24,20	Fair	Poor	None
Malus pumila	38,32,36,26,26	Poor	Poor	None
Crataegus sp.	18,14,17	Fair	Fair	None
Malus pumila	22,25,20	Poor	Poor	None
Crataegus sp.	12	Dead	N/A	None
Crataegus sp.	24	Poor	Poor	None
Crataegus sp.	15,16,18,19,21	Fair	Poor	None
Crataegus sp.	22,15,14	Fair	Poor	None
Crataegus sp.	17,18	Fair	Poor	None
Crataegus sp.	22,14,14,14	Fair	Fair	None
Crataegus sp.	19	Fair	Fair	None
Crataegus sp.	24	Fair	Poor	None
Malus pumila	30,16,22,15	Fair	Poor	None
Acer negundo	40	Good	Fair	None
Tree Group D				
Juglans nigra	17	Good	Fair	None
Juglans nigra	13	Good	Fair-Good	Crowded
Juglans nigra	15	Good	Fair	Crowded
Juglans nigra	11	Good	Fair	Crowded
Juglans nigra	29	Good	Fair	None
Acer saccharinum	16,18	Fair	Poor	Large cavity at base, codominant stems with included bark
Acer saccharinum	32,22,40	Fair	Poor	Wound at base, leaning
Pinus sylvestris	20	Dead	N/A	None
Acer saccharinum	14,18	Fair	Fair	Smaller trunk dead
Acer saccharinum	20	Good	Fair	None
Acer saccharinum	36	Dead	N/A	None
Pinus sylvestris	22	Poor	Poor	Poor form, extensive dieback
Pinus sylvestris	36	Fair-Poor	Fair	Embedded fence
Pinus sylvestris	13	Fair-Poor	Fair	Embedded fence
Pinus sylvestris	15	Fair	Fair	None
Pinus sylvestris	22	Good	Fair-Good	None
Pinus sylvestris	30	Good	Good	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Pinus sylvestris	34	Good	Fair-Poor	Uneven crown
Pinus sylvestris	25	Good	Fair-Poor	Uneven crown
Malus pumila	50	Good	Poor	Hollow trunk
Tree Group E1				
Acer negundo	10,10,10	Fair	Fair	None
Acer negundo	13	Fair	Fair	None
Acer negundo	17	Fair	Poor	None
Acer negundo	17,19	Fair	Fair	None
Acer negundo	10,13,8	Fair	Fair	None
Acer negundo	17,11	Fair	Fair	None
Acer negundo	23	Fair	Fair	None
Acer negundo	15,12,16	Fair	Fair	None
Acer negundo	19	Fair	Fair	None
Acer negundo	15,24	Fair	Fair	None
Fraxinus pennslyvanica	13,13,10	Dead	Fair	None
Acer negundo	15,13,19, 10,10	Fair	Fair	None
Tree Group E2				
Acer negundo	12	Fair	Fair	None
Acer negundo	10,11	Fair	Fair	None
Acer negundo	11	Fair	Fair	None
Acer negundo	16,14	Fair	Fair	None
Acer negundo	16	Fair	Fair	None
Tree Group E3				
Acer negundo	14,14	Good	Fair-Good	Severe bend at base of trunk
Acer negundo	11,8	Good	Fair	None
Acer negundo	9,9	Good	Fair	None
Acer negundo	15,15	Good	Fair	None
Acer negundo	12	Good	Fair	None
Acer negundo	14	Good	Fair-Poor	None
Acer negundo	18,18	Good	Fair-Poor	None
Acer negundo	20	Good	Fair	None
Acer negundo	8,8	Fair	Fair	None
Acer negundo	15	Good	Fair	None
Acer negundo	17	Good	Fair	None
Tree Group E4				
Acer negundo	13,12,26	Good	Poor	Damage at base, sprawling form
Acer negundo	30	Good	Fair	None
Acer negundo	24,19,12,13	Fair-Good	Fair-Good	None
Acer negundo	20	Fair	Fair	None
Tree Group E5				
Acer negundo	10	Good	Fair	Embedded fence
Acer negundo	16,18	Fair	Fair	None
Acer negundo	14	Fair	Fair	None
Acer negundo	12,15	Fair	Fair	Wound at base
Acer negundo	12,10	Fair	Fair	None
Acer negundo	12,10	Fair	Poor	Split in crotch
Acer negundo	23,20	Good	Fair	None
Acer negundo	12,12,11,10	Good	Fair	Embedded fence
Acer negundo	10,12	Fair	Fair	None
Acer negundo	11,10,14	Fair	Fair	None
Tree Group E6				

Species	DBH (cm)	Condition	Form/Structure	Comments
Acer negundo	16	Good	Fair	None
Acer negundo	12	Fair-Poor	Fair-Poor	None
Acer negundo	12	Good	Good	None
Acer negundo	10	Poor	Fair-Good	None
Acer negundo	11,11	Fair	Fair	None
Acer negundo	10	Fair	Fair	None
Acer negundo	14	Fair	Fair	None
Acer negundo	15,10,10	Good	Fair-Poor	None
Tree Group E7				
Acer negundo	12	Good	Poor	None
Acer negundo	15,16,16	Good	Fair	None
Acer negundo	24,15	Good	Fair	None
Acer saccharinum	11	Good	Fair	None
Acer negundo	12	Good	Fair	None
Acer negundo	22,16	Good	Fair	None
Acer negundo	20,15	Good	Fair	None
Acer negundo	20,20,23,14	Fair	Fair	None
Acer negundo	30	Good	Poor	None
Acer negundo	20	Good	Poor	None
Acer negundo	19,20	Good	Poor	None
Acer negundo	16,16	Fair	Poor	None
Acer negundo	18,16	Fair	Poor	None
Acer negundo	16	Good	Poor	None
Tree Group F				
Populus tremulodies	8	Good	Good	None
Populus tremulodies	8	Good	Fair	None
Populus tremulodies	8	Good	Good	None
Populus tremulodies	8	Poor	Fair	None
Populus tremulodies	8	Good	Poor	None
Populus tremulodies	8	Good	Fair	None
Populus tremulodies	8	Good	Fair	None
Populus tremulodies	8	Good	Good	None
Populus tremulodies	8	Good	Fair	None
Populus tremulodies	8	Good	Fair	None
Populus tremulodies	8	Poor	Poor	None
Populus tremulodies	9	Good	Good	None
Populus tremulodies	9	Good	Good	None
Populus tremulodies	9	Good	Fair	None
Populus tremulodies	9	Good	Poor	None
Populus tremulodies	9	Good	Fair	None
Populus tremulodies	9	Good	Fair	None
Populus tremulodies	9	Good	Fair	None
Populus tremulodies	9	Good	Good	None
Populus tremulodies	10	Good	Good	None
Populus tremulodies	10	Good	Fair	None
Populus tremulodies	10	Good	Fair	None
Populus tremulodies	10	Good	Fair	None
Populus tremulodies	10	Good	Fair-Good	None
Populus tremulodies	10	Good	Good	None
Populus tremulodies	10	Good	Fair	None
Populus tremulodies	10	Good	Fair	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Populus tremulodies	11	Good	Fair	None
Populus tremulodies	11	Good	Fair	None
Populus tremulodies	11	Fair	Poor	None
Populus tremulodies	11	Fair	Fair	None
Populus tremulodies	11	Good	Fair	None
Populus tremulodies	11	Good	Fair	None
Populus tremulodies	11	Good	Fair	None
Populus tremulodies	11	Good	Fair-Poor	None
Populus tremulodies	12	Good	Fair	None
Populus tremulodies	12	Good	Fair	None
Populus tremulodies	12	Good	Fair	None
Populus tremulodies	13	Good	Good	None
Populus tremulodies	13	Good	Good	None
Populus tremulodies	14	Dead	N/A	None
Populus tremulodies	14	Fair	Fair	None
Populus tremulodies	14	Good	Fair	None
Populus tremulodies	15	Good	Fair	None
Populus tremulodies	15	Fair	Fair	None
Populus tremulodies	15	Good	Good	None
Populus tremulodies	16	Good	Good	None
Populus tremulodies	16	Poor	Poor	None
Populus tremulodies	17	Good	Good	None
Populus tremulodies	17	Poor	Poor	None
Populus tremulodies	18	Dead	N/A	None
Populus tremulodies	18	Fair	Poor	None
Populus tremulodies	18	Fair	Poor	None
Populus tremulodies	19	Fair-Good	Fair-Good	None
Populus tremulodies	20	Good	Fair	None
Populus tremulodies	20	Poor	Poor	None
Populus tremulodies	30	Fair	Fair	None
Tree Group G				
Acer x *fremanii*	11	Good	Fair	None
Acer x *fremanii*	8	Good	Fair	None
Acer x *fremanii*	14,10	Good	Fair	None
Acer x *fremanii*	12,10	Good	Fair	None
Acer x *fremanii*	11	Good	Fair	None
Acer x *fremanii*	8	Good	Fair	None
Tree Group H				
Tilia americana	15,15	Good	Fair-Poor	Codominant with included bark
Tilia americana	15	Good	Good	None
Tilia americana	20,29,29,35,35	Good	Fair-Poor	Codominant with included bark
Tilia americana	43	Good	Fair	None
Tilia americana	22,23,20,15,15	Good	Fair-Poor	Codominant with included bark
Tilia americana	21	Good	Good	None
Tilia americana	24	Good	Good	None
Crataegus sp.	14,10,10,10	Good	Good	None
Tilia americana	47,44,37,52	Good	Fair	Multiple stems with included bark, crossing trunks
Tilia americana	15	Good	Fair	None
Tilia americana	15	Good	Good	None
Tilia americana	15	Good	Good	None
Tilia americana	15	Good	Good	None
Tilia americana	18	Good	Good	None

Species	DBH (cm)	Condition	Form/Structure	Comments
Acer negundo	20,12,12	Good	Poor	None
Crataegus sp.	15,12	Good	Fair	None
Ulmus americana	70	Fair-Poor	Fair	Codominant leaders, unbalanced crown
Tilia americana	12	Good	Good	None
Ulmus americana	10	Good	Good	None
Ulmus americana	15	Good	Fair	None
Ulmus americana	20	Good	Fair-Poor	None
Crataegus sp.	10,10	Good	Fair	None
Crataegus sp.	15,12,10	Good	Good	None
Crataegus sp.	12,10,10	Good	Good	None
Tree Group I				
Salix x sepulcralis	100,60	Good	Poor	Main stem fallen, hollow trunk
Salix x sepulcralis	>100	Good	Poor	One stem fallen
Acer negundo	30	Good	Fair	None

Argo Macville Draft Plan of Subdivision Arborist Report

Prepared For:

Argo Macville I Corporation
Argo Macville II Corporation
Argo Macville III Corporation
Argo Macville V Corporation
Argo Humberking Corporation

Prepared By:

Beacon Environmental Limited

Date:	*Project:*
2024-07-02	**214476.1**

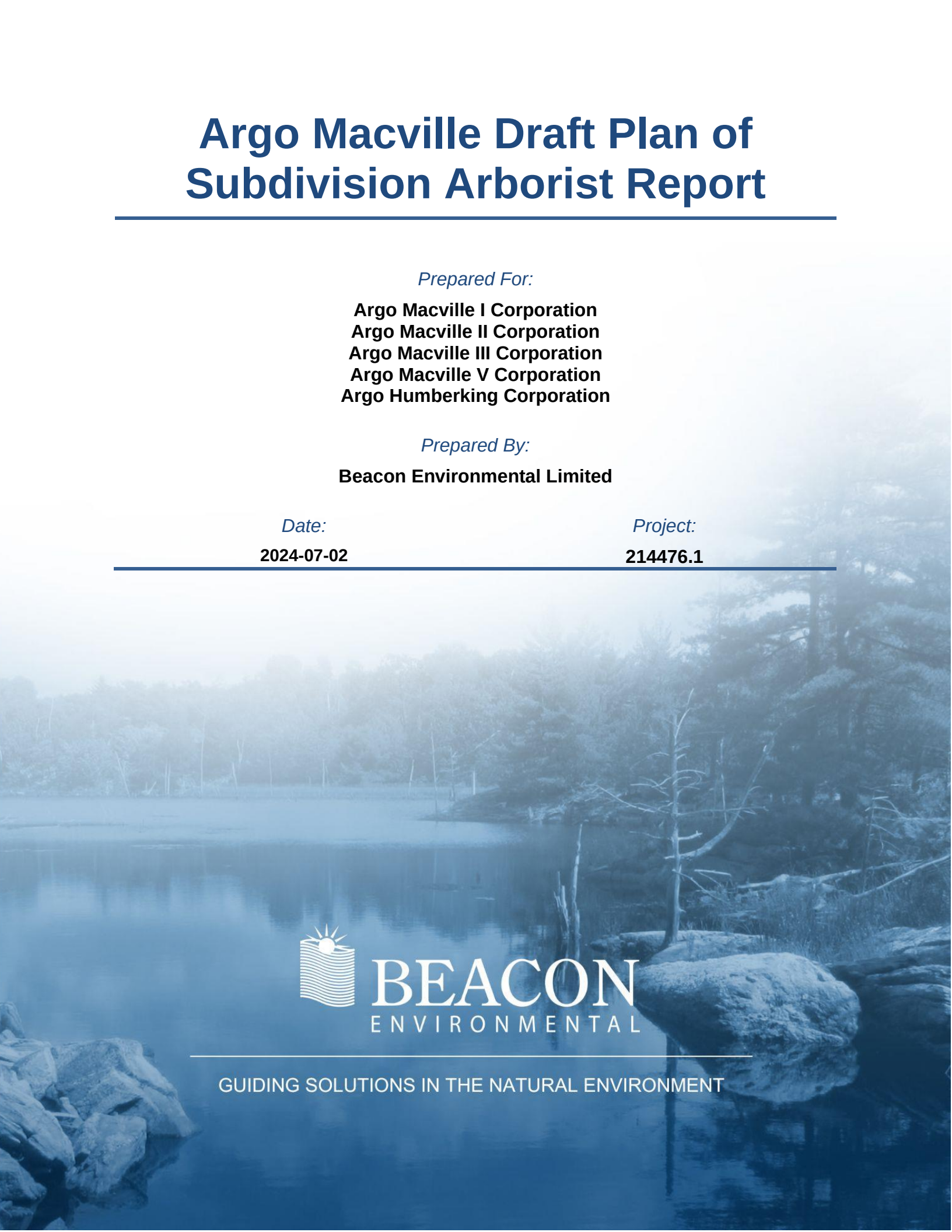


Table of Contents

Figures

Tables

Appendices

Report Versions Issued

Version	Date	Revisions
1.	May 2023	First Submission
2.	July 2024	Second Submission

1. Introduction

Beacon Environmental Limited (Beacon) was retained to prepare an Arborist Report in support of a Draft Plan of Subdivision Application for the following Draft Plan area in the Town Caledon, hereafter referred to as the subject lands (**Figure 1**):

- **Argo Macville Draft Plan of Subdivision (21T-22001):** Argo Macville I Corporation, Argo Macville II Corporation, Argo Macville III Corporation, Argo Macville V Corporation and Argo Humberking Corporation.

This Arborist Report builds upon the tree inventory undertaken by Beacon in support of the 2023 Caledon Station Final Comprehensive Environmental Impact Study and Management Plan (CEISMP; **Figure 1**). This Report was prepared in accordance with the Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation (Town of Caledon 2020).

The purpose of this Arborist Report is to:

- Identify and describe individual trees and tree groupings on the subject lands;
- Assess potential impacts to individual trees and tree groupings resulting from the proposed development including requirements for tree removals; and
- Provide recommendations for tree preservation and protection.

2. Methods

An inventory and evaluation of individual trees and tree groupings on the subject lands was completed on June 12, June 18, and August 20, 2020, April 16, 2021, and May 16, 2023 by Arborists certified by the International Society of Arboriculture (ISA).

In general, individual trees ≥10 cm DBH (diameter at breast height, measured 1.4 m above grade) were tagged with numbered aluminum forestry tags and their locations were recorded with dGPS (SBAS). Trees located on adjacent properties were not tagged but were assessed based on observations from the subject lands. For each tree, the following information was recorded:

- Species;
- Trunk DBH (diameter at breast height, measured 1.4 m above grade);
- Health condition; and
- Structural condition rating.

Each tree was assigned a condition rating of good, fair, poor, or dead, based on the following criteria:

- Poor – Severe dieback, significant lean, missing leader, major defects, significant decay and/or disease presence;
- Fair – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress;
- Good – Healthy vigorous growth, minor visible defects or damage; and
- Dead – No live growth.

Tree condition was assessed based on presence and severity of flaws, damage, evidence of pests or diseases, structural condition, dead or dying branches, or other decline indicators.

Where trees occur in clusters or groupings (i.e., in hedgerows) were proposed for removal, they were not individually tagged and assessed, but rather, the number, species, size, and condition of the trees in each group was recorded.

Limitations of the assessment are summarized in **Appendix A**.

3. Findings

A total of 337 trees were documented and assessed on or adjacent to the subject lands, including 129 individual trees and 208 trees within groupings. The findings of the tree inventory and assessment are summarized in **Appendix B**. The locations of individual trees and tree groupings are illustrated on the Tree Inventory and Preservation Plan (**Appendix C**).

Of the 129 individual trees inventories, 29 are on adjacent private property, 68 are on-site, 19 are estimated to be boundary trees with adjacent private properties, and eight are within the road allowance along The Gore and Humber Station Road. Trees range in size from 8 cm to 102 cm DBH. The four most abundant species, in descending order are Hawthorn (*Crataegus*) species, Eastern White Cedar (*Thuja occidentalis*), White Spruce (*Picea glauca*) and Common Apple (*Malus pumila*).

A total of 15 tree groupings were identified on or adjacent to the subject lands, collectively containing 208 of the 337 inventoried trees. The following are brief summaries of the tree groupings. General descriptions of tree groupings are provided below. Detailed summaries are provided in **Appendix B**.

3.1 Group A

This grouping consists of three Red Cedar (*Juniperus virginiana*) trees adjacent to the existing farmhouse.

LEGEND

- ARGO MACVILLE DRAFT PLAN AREA
- STUDY AREA
- OTHER LANDS OWNED BY PROPONENT REQUIRED FOR SERVICING
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

BEACON ENVIRONMENTAL · URBANTECH · DS CONSULTANTS LTD. Geotechnical ❖ Environmental ❖ Materials ❖ Hydrogeology · GSAI Glen Schnarr & Associates Inc.

Arborist Report
Argo Macville Draft Plan of Subdivision
Caledon Station Secondary Plan Area

PROJECT No. 214476

FIGURE 1

SITE LOCATION AND TREED RESOURCES ARGO MACVILLE DRAFT PLAN AREA

June 2024 Scale 1:8,000

C:\ODB\OneDrive - Beacon Environmental\GeoSpatial\Geo Projects\2014\214476\MXD\Draft Plan Areas\20240603_Figure07A_Treed ResourcesMacville_214476.mxd

3.2 Group B – White Cedar Hedgerows

Groups B1-B2 are hedgerows dominated by Eastern White Cedar, with occasional hardwoods mixed in.

3.3 Group C – Hawthorn/Apple/Buckthorn Hedgerows

Groups C1-C4, C6 and C7 are hedgerows dominated by Buckthorn (*Rhamnus cathartica*), Hawthorns, and Apple. Buckthorn, an invasive shrub, was not included in the inventory. Other trees that occur sporadically in these hedgerows include Basswood (*Tilia americana*), White Ash (typically dead or dying), White Elm (*Ulmus americana*), and Black Cherry (*Prunus serotina*). Trees in these groupings tend be in fair condition but exhibit poor structure.

3.4 Group G – Freeman's Maple Patch

This group is small patch of Freeman's Maple (*Acer x freemanii*) located at the corner of an agricultural field along Humber Station Road.

3.5 Group J – Blue Spruce Hedgerow

This grouping is a hedgerow that consists of young Blue Spruce, located along the property line.

3.6 Group K – Austrian Pine Hedgerow

This grouping is a hedgerow that consists of Austrian Pine located along the property line.

3.7 Group L – White Spruce Hedgerow

This grouping is a hedgerow that consists predominantly of White Spruce and Manitoba Maples located along the property line.

3.8 Group N3 – Green Ash Patch

This group is small patch of Green Ash (*Fraxinus pennsylvanica*), Manitoba Maple, and Buckthorn located in the south corner of an agricultural field along King Street.

4. Impact Assessment and Recommendations

4.1 Tree Removals

Based on a review of the proposed development and grading plans, the majority of trees will need to be removed to facilitate development of the subject lands. Individual trees and tree groupings identified for removal are illustrated on the Tree Inventory and Preservation Plan (**Appendix C**).

Eight trees from the municipal road allowance along the Gore Road and Humber Station Road will require removal, subject to approval from the Region and Town.

In addition, a number of trees and tree groupings are located on adjacent private property or in close proximity to the property line, which will require removal or may be injured by development or site alteration occurring on the subject lands. Permission form adjacent landowners must be obtained prior to removing or harming trees located on the property line or adjacent properties. Tree locations illustrated in **Figures TP-1** and **TP-2** are approximate; therefore, it recommended that tree locations be surveyed by an Ontario Land Surveyor to confirm tree ownership and recommendations.

There are no rare, endangered, or threatened tree species on record for the subject lands, nor were any observed during the inventory.

The federal *Migratory Birds Convention Act* (1994) and provincial *Fish and Wildlife Conservation Act* (1997) protect the nests, eggs and young of most bird species from harm or destruction. As the peak breeding bird season in southern Ontario is generally from mid-May to early-July, and the more general breeding bird season is between early April and late August, vegetation clearing should occur outside of these periods (i.e., April 1st to August 31st) whenever possible. For any proposed clearing of vegetation within these dates, or where birds may be suspected of nesting outside of these dates, an Ecologist or Avian Biologist should undertake detailed nest searches immediately prior to site alteration to ensure that no active nests are present. If active nests are confirmed, removal of the tree / vegetation will need to be delayed until the nest is no longer actively used.

4.2 Tree Protection

Seventy-eight (78) trees, including 20 individual trees and 58 in four tree groupings, located on adjacent private properties have been identified for preservation. While these trees are identified for preservation at this time, development reserve blocks are illustrated on these adjacent parcels; therefore, the trees will likely require removal in the future as development is phased in over time. Tree removal and preservation recommendation will be subject to further review and consultation from the Town and adjacent landowners, as necessary.

Tree locations illustrated in **Figures TP-1** and **TP-2** are approximate; therefore, it recommended that tree locations be surveyed by an Ontario Land Surveyor.

There is potential for damage to occur to trees during construction if proper precautions and protection measures are not implemented. Trees can be negatively impacted through grade changes, soil compaction, root cutting, and mechanical damage to trunks and branches resulting from the operation of construction equipment.

Trees to be preserved shall be protected by establishing a minimum Tree Protection Zone (TPZ) based on the tree DBH as indicated in **Table 1**. If it is determined that work must take place within the minimum TPZ of trees identified for preservation, the management of such trees should be reassessed by a Certified Arborist.

Table 1. Minimum Tree Protection Zones

Trunk Diameter (DBH)	Minimum Protection Distances Required
10-29 cm	1.8 m
30-39 cm	2.4 m
40 - 49 cm	3.0 m
50 – 59 cm	3.6 m
60 – 69 cm	4.2 m
70 – 79 cm	4.8 m
80 – 89 cm	5.4 m
90 – 100 cm	6 m

The location of tree protection fencing is illustrated in **Appendix C** and follows the dripline of existing trees identified for preservation. In general, the placing fencing at the dripline results in a larger TPZ than the minimum shown in **Table 1**. As such, field fit (± 1 m) of tree protection fencing should not compromise the preservation of a tree. Fencing shall be installed before any construction or site alteration takes place.

No grading, soil disturbance, or surface treatments shall occur within the TPZ. No equipment or materials shall be stored inside the TPZ.

The following activities are prohibited within the TPZ:

- Construction;
- Altering of grade by adding fill, excavating, trenching, scraping, dumping or disturbance of any kind;
- Storage of construction materials, equipment, soil, construction waste or debris;
- Disposal of any liquids e.g., concrete sleuth, gas, oil, paint;
- Movement of vehicles, equipment or pedestrians; and
- Parking of vehicles or machinery.

In addition to the establishment of the TPZ, the following measures are recommended to ensure the health and survival of any retained trees:

- Any root damage occurring to retainable trees during construction should be cut cleanly with a handsaw or pruners;
- Any injury caused to a retainable tree during construction should be evaluated by a qualified arborist; and
- Any pruning of trees for construction clearance should be performed by qualified individuals following standard best management practices.

5. Tree Replacement

The Town of Caledon requires compensation for trees removed in relation to draft plan and site plan applications as outlined in the *Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation* (Town of Caledon 2020). Compensation for removed trees is determined based on the cost to replace the trees that will be removed due to development. The Town of Caledon has developed a formula for calculating compensation values that is based on tree size. An analysis has been completed for the tree removals on this site using this formula, and it has been determined that the removal of the 214 trees, 182 of which are in fair or better condition, would require planting 446 trees as summarized in **Table 2**.

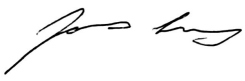
Table 2. Calculation of Tree Compensation

Diameter at Breast Height (cm)	Number of Trees in Fair or Good Condition to be Removed	Compensation Ratio	Number of Compensation Trees Required
10-20	60	1:1	60
21-35	63	2:1	126
36-50	44	3:1	132
51-65	17	4:1	68
>65	12	5:1	60
Total:	**182**	**Total:**	**446**

The number of replacement trees identified in **Table 2** does not account for the removal of several trees (1032-1041, 1044, 1045) located at 0 King Street, which will be removed and compensated for by others (Humberking Draft Plan of Subdivision - West Lands). It also does not account for 10 shared boundary trees located on the property line with the Humberking Draft Plan of Subdivision lands, including 1031, 1042, 1043, 1046-1054. The removal of these shared boundary trees is required to accommodate both development proposals; therefore, it is understood that replacement of these trees is a shared responsibility. The number of replacement trees required for these boundary trees is 24; therefore, an additional 12 replacement trees are required for Argo Macville Draft Plan of Subdivision, bringing the total to **458**.

If there is in insufficient room to plant the required number of replacement trees on-site, then financial compensation (cash-in-lieu) may be accepted at rate (per tree) as determined by the Town.

Report prepared by:
Beacon Environmental



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6. References

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Government of Canada. 1994.
Migratory Birds Convention Act, 1994 (S.C. 1994, c.22).

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Town of Caledon. April 2020.
Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation. April 2020.

Appendix A

Arborist Report Methods

Appendix A

Limitations of Tree Assessment

It is the policy of Beacon Environmental Limited to attach the following clause regarding limitations of the tree assessment. The intent is to ensure that the client is aware of what is technically and professionally realistic in assessing and/or retaining trees.

The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These techniques include a visual examination of the above-ground parts of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, crown dieback, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the proximity of property and people. Except where specifically noted in the report, none of the trees examined were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms and their health and vigour constantly change over time. They are not immune to changes in site conditions, pests, or variations in the weather conditions including severe storms with high-speed winds. Furthermore, some symptoms may only be visible seasonally; the extent of observations that can be made may be limited by the time of year in which the inspection took place.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy unless stated otherwise within the report, no warranty or guarantees are offered, or implied, that these trees, or any parts of them, will have continued health or structure as noted in the report. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree or group of trees or their component parts in all circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential for failure if provided with the necessary combinations of stresses and elements. This risk can only be eliminated if the tree is removed.

Although every effort has been made to ensure that this assessment is reasonably accurate, it is recommended that trees be re-assessed periodically to identify changes in condition. Design or site plan changes may also necessitate re-assessment and/or revisions to this report. **The assessment presented in this report is valid at the time of the inspection and is intended for sole use of the client.** Any use of this report by a third party, and any decision based on this report, is the singular responsibility of the third party.

Appendix B

Tree Inventory Data

Appendix B

Tree Inventory Data

Table B-1. Summary of Individual Trees

Species	Common Name	DBH (cm)	Health	Comments	Management Recommendation	Location
Aesculus hippocastanum	European Horse-Chestnut	53	Fair	several cavities with decay in trunk, uneven crown due to pruning for adjacent power lines	Remove	On-site
Aesculus hippocastanum	European Horse-Chestnut	62	Good	several cavities at branch stubs	Remove	On-site
Aesculus hippocastanum	European Horse-Chestnut	65	Fair	minor dieback, cavities at branch stubs	Remove	On-site
Aesculus hippocastanum	European Horse-Chestnut	48,48	Poor	branch dieback, hollow trunk with multiple cavities, poor form	Remove	On-site
Picea abies	Norway Spruce	78	Good	codominant leaders with included bark	Remove	On-site
Aesculus hippocastanum	European Horse-Chestnut	52	Fair	top cut off due to overhead wires	Remove	Gore ROW
Aesculus hippocastanum	European Horse-Chestnut	50	Poor	top cut off, hollow trunk with extensive decay	Remove	Gore ROW
Aesculus hippocastanum	European Horse-Chestnut	50	Poor	top cut off, hollow trunk with extensive decay	Remove	Gore ROW
Crataegus sp.	Hawthorn	40,20	Fair	branch dieback	Remove	Gore ROW
Acer negundo	Manitoba Maple	20	Good		Remove	Boundary
Salix alba	White Willow	100	Poor	massive wound in lower trunk with extensive decay as a result of fallen trunk	Remove	Adjacent Private
Ulmus americana	American Elm	50	Fair	embedded fence, codominant leaders with included bark	Remove	Humber Station ROW
Salix alba	White Willow	19, 15, 10, 10, 8	Good		Remove	Humber Station ROW
Ulmus americana	American Elm	35, 32, 38, 36	Fair	stems fused at base, branch unions with included bark	Remove	Humber Station ROW
Ulmus americana	American Elm	35, 40	Good		Remove	Humber Station ROW
Acer negundo	Manitoba Maple	40, 20	Good		Remove	On-site
Tilia americana	Basswood	74	Poor	branch dieback, brown leaves, poor form, hollow trunk	Remove	On-site
Ulmus americana	American Elm	28	Poor	in decline, sparse foliage	Remove	On-site
Acer negundo	Manitoba Maple	32, 31, 20	Good		Remove	Adjacent Private
Salix alba	White Willow	70, 30	Good		Remove	On-site
Populus sp.	Cottonwood	30	Fair	codominant leaders, extensive epicormics along trunk	Remove	On-site
Acer platanoides	Norway Maple	40	Good		Preserve	Adjacent Private
Salix x fragilis	Crack Willow	40, 40, 40	Good		Preserve	Adjacent Private
Acer negundo	Manitoba Maple	20	Poor		Preserve	Adjacent Private
Salix x sepulcralis	Weeping Willow	120 @ 0.5	Fair		Remove	Boundary
Acer negundo	Manitoba Maple	20, 15, 15, 10	Poor	leader fallen; multistem at base	Remove	On-site
Salix x sepulcralis	Weeping Willow	65	Fair-Good		Remove	On-site

Species	Common Name	DBH (cm)	Health	Comments	Management Recommendation	Location
Abies balsamea	Balsam Fir	20	Good		Remove	On-site
Salix alba	White Willow	26	Poor	Crown dieback extensive	Remove	On-site
Populus tremuloides	Trembling Aspen	12	Fair		Remove	On-site
Salix x sepulcralis	Weeping Willow	68	Poor	Crown snapped. Good vigour otherwise	Remove	On-site
Populus tremuloides	Trembling Aspen	15	Good		Remove	On-site
Populus tremuloides	Trembling Aspen	20	Good		Remove	On-site
Populus tremuloides	Trembling Aspen	14	Fair		Remove	On-site
Populus tremuloides	Trembling Aspen	21, 14	Good		Remove	On-site
Abies balsamea	Balsam Fir	16	Good		Remove	On-site
Populus tremuloides	Trembling Aspen	14, 12, 10	Poor	Dieback and decay in upper crown	Remove	On-site
Ulmus pumila	Siberian Elm	11	Fair		Remove	On-site
Abies balsamea	Balsam Fir	18	Poor	Extensive dieback	Remove	On-site
Abies balsamea	Balsam Fir	21	Good		Remove	On-site
Ulmus pumila	Siberian Elm	13	Good		Remove	On-site
Ulmus pumila	Siberian Elm	31 @ 0.5	Fair	Low fork	Remove	On-site
Abies balsamea	Balsam Fir	22	Good		Remove	On-site
Populus tremuloides	Trembling Aspen	10	Poor	Trunk snapped 3 m above ground	Remove	On-site
Ulmus pumila	Siberian Elm	34	Fair		Remove	On-site
Ulmus pumila	Siberian Elm	42	Good		Remove	On-site
Ulmus pumila	Siberian Elm	16	Fair		Remove	On-site
Ulmus pumila	Siberian Elm	24	Good		Remove	On-site
Ulmus pumila	Siberian Elm	16	Fair		Remove	On-site
Ulmus pumila	Siberian Elm	24	Good		Remove	On-site
Ulmus pumila	Siberian Elm	17	Fair-Good		Remove	On-site
Salix alba	White Willow	37, 28, 23	Good		Remove	On-site
Salix alba	White Willow	94 @ 0.5 m	Fair	Hollow trunk below union; good vigour and for otherwise	Remove	On-site
Salix alba	White Willow	20	Good		Remove	On-site
Tilia americana	Basswood	50, 50, 48, 45, 40, 35	Fair	Multistem, braced with deck boards and screws	Remove	On-site
Salix alba	White Willow	23	Good	Possible boundary tree; trunk overlaps with fence line	Remove	Boundary
Salix alba	White Willow	52	Fair		Remove	Boundary
Picea glauca	White Spruce	50	Fair-Good	Minor dieback and thinning.	Remove	On-site
Picea glauca	White Spruce	31, 33	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Remove	On-site
Acer saccharinum	Silver Maple	39	Good	Good form and vigour.	Remove	On-site
Acer saccharinum	Silver Maple	45	Good	Good form and vigour.	Remove	On-site
Acer saccharinum	Silver Maple	73	Fair	Full healthy crown; Large cavity above breast height; Wound wood present.	Remove	On-site
Picea abies	Norway Spruce	49	Good	Good form and vigour.	Remove	On-site
Acer saccharinum	Silver Maple	67	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Remove	On-site
Pinus sylvestris	Scots Pine	42	Good	Good form and vigour.	Remove	On-site
Picea glauca	White Spruce	33	Fair-Good	Minor dieback and thinning.	Remove	On-site

Species	Common Name	DBH (cm)	Health	Comments	Management Recommendation	Location
Acer saccharinum	Silver Maple	102	Fair	Minor dieback and thinning; Stems fork above breast height; Included bark; Large stem removed, decay at prune wound.	Remove	On-site
Picea glauca	White Spruce	30	Fair-Good	Minor dieback and thinning.	Remove	On-site
Picea abies	Norway Spruce	23	Good	Good form and vigour.	Remove	On-site
Picea abies	Norway Spruce	21	Good	Good form and vigour.	Remove	On-site
Picea abies	Norway Spruce	23, 8	Good	Good vigour; Stems fork below breast height; Included bark.	Remove	On-site
Picea abies	Norway Spruce	12	Good	Good form and vigour.	Remove	On-site
Picea abies	Norway Spruce	23, 13	Good	Good vigour; Stems fork below breast height; Included bark.	Remove	On-site
Picea abies	Norway Spruce	50	Good	Good form and vigour.	Remove	On-site
Picea abies	Norway Spruce	52	Good	Good form and vigour.	Remove	On-site
Picea abies	Norway Spruce	24	Fair	Moderate dieback and thinning; Flush cuts to stem; Sap ooze.	Remove	On-site
Picea abies	Norway Spruce	31	Fair-Good	Minor dieback and thinning; Sap ooze.	Remove	On-site
Acer saccharinum	Silver Maple	76	Fair-Good	Minor dieback and thinning; Stems fork above breast height; Included bark.	Remove	On-site
Pinus sylvestris	Scots Pine	30	Good	Good form and vigour.	Remove	On-site
Picea glauca	White Spruce	21	Good	Good form and vigour.	Remove	On-site
Ulmus americana	White Elm	52	Poor	Significant dieback and thinning; Almost dead, only one live branch and epicormic shoots along stem.	Remove	On-site
Tilia americana	Basswood	17	Good	Good vigour; Full healthy crown; Adventitious shoots at base.	Remove	Boundary
Ulmus americana	American Elm	77	Good	Good form and vigour; Full healthy crown; Good root flare; Notable tree.	Remove	Adjacent Private
Acer negundo	Manitoba Maple	21, 10, 10, (25)	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Remove	Adjacent Private
Tilia americana	Basswood	23	Good	Good vigour; Full healthy crown; Adventitious shoots at base.	Remove	Adjacent Private
Tilia americana	Basswood	18	Good	Good form and vigour.	Remove	Adjacent Private
Tilia americana	Basswood	18	Good	Good form and vigour.	Remove	Adjacent Private
Tilia americana	Basswood	12, 3, (12)	Good	Good vigour; Stems fork near ground; Included bark.	Remove	Adjacent Private
Tilia americana	Basswood	10	Good	Good form and vigour.	Remove	Adjacent Private
Tilia americana	Basswood	51, 33, 57, 50, 50, 50, (120)	Good	Good vigour; Full healthy crown; Large spreading branches; Good root flare; Notable tree.	Remove	Adjacent Private
Tilia americana	Basswood	10	Good	Good form and vigour.	Remove	Adjacent Private
Tilia americana	Basswood	27	Good	Good form and vigour.	Remove	Adjacent Private
Tilia americana	Basswood	23	Good	Good form and vigour.	Remove	Boundary
Tilia americana	Basswood	9, 26, 28, 11, 10, 18, 25, (52)	Good	Good vigour; Full healthy crown; Stems fork below breast height; Included bark.	Remove	Boundary
Tilia americana	Basswood	11	Good	Good form and vigour.	Remove	Adjacent Private
Tilia americana	Basswood	17	Good	Good form and vigour.	Remove	Adjacent Private
Tilia americana	Basswood	20, 22, 40, 38, 32, 10, 11, 10, (73)	Good	Good vigour; Full healthy crown; Large spreading branches; Stems fork below breast height; Included bark.	Remove	Boundary
Tilia americana	Basswood	16	Good	Good form and vigour.	Remove	Boundary
Tilia americana	Basswood	19, 18, 10, (28)	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Remove	Boundary
Tilia americana	Basswood	10, 8, (13)	Good	Good vigour; Stems partially fused together below breast height.	Remove	Boundary

Species	Common Name	DBH (cm)	Health	Comments	Management Recommendation	Location
Tilia americana	Basswood	15, 10, 8, 5, (20)	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Remove	Boundary
Ulmus americana	American Elm	14	Good	Good form and vigour.	Remove	Boundary
Malus pumila	Common Apple	50, 35, (61)	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Remove	Boundary
Malus pumila	Common Apple	55, 55, 25, (82)	Fair	Moderate dieback and thinning; Stems fork near ground; Fruiting at time of inventory; Large mature tree.	Remove	Boundary
Malus pumila	Common Apple	30, 40, (50)	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Fruiting at the time of inventory.	Remove	Boundary
Picea pungens	Blue Spruce	17	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea pungens	Blue Spruce	15	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea pungens	Blue Spruce	20	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea pungens	Blue Spruce	22	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea pungens	Blue Spruce	24	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Ulmus americana	American Elm	28	Good	Good form and vigour.	Remove	On-site
Ulmus americana	American Elm	18	Good	Good form and vigour.	Remove	On-site
Tilia americana	Basswood	17, 16, (23)	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	Remove	On-site
Tilia americana	Basswood	17	Good	Good vigour; Uneven crown.	Remove	On-site
Tilia americana	Basswood	11	Good	Good form and vigour.	Remove	On-site
Acer saccharinum	Silver Maple	65	Fair-Good	Minor dieback and thinning; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Ulmus americana	American Elm	22	Good	Good form and vigour.	Remove	On-site
Ulmus americana	American Elm	22	Good	Good form and vigour.	Remove	On-site
Malus pumila	Common Apple	20, 20, (28)	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of inventory; Inaccessible to tag and measure.	Remove	Boundary
Abies balsamea	Balsam Fir	15	Good	Planted	Preserve	Adjacent Private
Pinus sylvestris	Scots Pine	15	Fair		Preserve	Adjacent Private
Pinus nigra	Austrian Pine	25	Fair	Topped	Preserve	Adjacent Private
Salix alba	White Willow	32	Good	Next to fence; Possible boundary tree	Preserve	Boundary
Salix alba	White Willow	100	Fair		Remove	Boundary
Pinus sylvestris	Scots Pine	25	Fair		Remove	Adjacent Private
Picea glauca	White Spruce	35	Fair-Good	Minor dieback and thinning; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Acer saccharinum	Silver Maple	67	Fair-Good	Minor dieback and thinning; Stems fork at breast height; Included bark; Off property tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea glauca	White Spruce	25, 25	Good	Good vigour; Stems fork at breast height; Included bark; Off property tree, DBH measurement estimated.	Preserve	Adjacent Private
Quercus macrocarpa	Bur Oak	22	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea pungens	Blue Spruce	18	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea pungens	Blue Spruce	22	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private
Picea pungens	Blue Spruce	15	Good	Good form and vigour; Off site tree, DBH measurement estimated.	Preserve	Adjacent Private

Table B-2. Summary of Trees in Group A

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Comments	Recommendation

Juniperus virginiana	Red Cedar	20	Good	Good		Remove
Juniperus virginiana	Red Cedar	15	Good	Fair-Good		Remove
Juniperus virginiana	Red Cedar	20	Good	Fair-Good		Remove

Table B-3. Summary of Trees in Group B1

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Comments	Recommendation
Thuja occidentalis	White Cedar	59	Good	Poor	codominant leaders with included bark, split in crotch between leaders	Remove
Thuja occidentalis	White Cedar	20	Good	Fair	Crowded	Remove
Thuja occidentalis	White Cedar	21	Fair	Fair	Crowded	Remove
Thuja occidentalis	White Cedar	64	Good	Poor	Codominant leaders with included bark, crack below crotch	Remove
Thuja occidentalis	White Cedar	30,35	Good	Poor	cavity in crotch with decay into trunk	Remove

Table B-4. Summary of Trees in Group B2

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Comments	Recommendation
Thuja occidentalis	White Cedar	26,26	Good	Fair		Remove
Thuja occidentalis	White Cedar	32	Fair	Fair		Remove
Thuja occidentalis	White Cedar	23,17,14	Fair	Fair		Remove
Thuja occidentalis	White Cedar	27,26	Fair	Fair	rocks piled against base	Remove
Thuja occidentalis	White Cedar	30,19	Fair	Fair-Good	split in crotch, rocks piled against base	Remove
Thuja occidentalis	White Cedar	16	Fair	Fair	rocks piled against base	Remove
Thuja occidentalis	White Cedar	16,18	Fair	Fair	rocks piled against base	Remove
Thuja occidentalis	White Cedar	15,10	Fair	Fair	rocks piled against base	Remove
Thuja occidentalis	White Cedar	17,29	Good	Poor	large open wound in root flare/lower trunk	Remove
Thuja occidentalis	White Cedar	50	Good	Fair	codominant leaders with included bark	Remove
Thuja occidentalis	White Cedar	22	Good	Fair	Crowded	Remove
Thuja occidentalis	White Cedar	43	Good	Fair	codominant leaders with included bark	Remove
Thuja occidentalis	White Cedar	35	Good	Fair		Remove
Thuja occidentalis	White Cedar	27,27	Fair	Fair-Good		Remove
Thuja occidentalis	White Cedar	22,22	Good	Fair		Remove
Thuja occidentalis	White Cedar	21	Fair	Poor		Remove
Thuja occidentalis	White Cedar	32,32	Fair	Poor	codominant leaders, split in crotch	Remove
Thuja occidentalis	White Cedar	59	Good	Fair	multiple codominant leaders	Remove
Thuja occidentalis	White Cedar	22	Fair	Poor		Remove
Thuja occidentalis	White Cedar	26,26	Poor	Poor	codominant leaders , split in crotch through trunk	Remove
Thuja occidentalis	White Cedar	30,35	Fair	Poor	large old wound in trunk, poor form	Remove
Thuja occidentalis	White Cedar	25,14	Fair	Fair		Remove
Thuja occidentalis	White Cedar	16	Fair	Poor		Remove
Thuja occidentalis	White Cedar	20,24,24,20	Fair	Poor		Remove
Prunus avium	Sweet Cherry	16	Good	Fair	Lean	Remove
Thuja occidentalis	White Cedar	30	Fair	Poor	large decaying stump at base	Remove
Thuja occidentalis	White Cedar	30,35	Fair	Fair	multiple codominant leaders	Remove
Thuja occidentalis	White Cedar	26,26	Good	Fair		Remove
Thuja occidentalis	White Cedar	27	Fair	Good		Remove
Thuja occidentalis	White Cedar	24,21	Fair	Fair		Remove
Prunus avium	Sweet Cherry	13,11	Good	Fair-Good	twisted trunk, lean	Remove
Thuja occidentalis	White Cedar	17	Good	Fair	lean, uneven crown	Remove
Thuja occidentalis	White Cedar	16,18,18	Good	Fair	codominant stems with included bark	Remove

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Comments	Recommendation
Thuja occidentalis	White Cedar	25,25	Good	Fair-Poor		Remove
Thuja occidentalis	White Cedar	18	Fair	Poor		Remove
Thuja occidentalis	White Cedar	20	Fair	Poor	large wound in trunk	Remove
Thuja occidentalis	White Cedar	11,13,13,14	Good	Fair		Remove
Acer negundo	Manitoba Maple	18	Good	Poor		Remove
Thuja occidentalis	White Cedar	32,19	Good	Fair	Codominant	Remove
Thuja occidentalis	White Cedar	30	Good	Fair	large wound in trunk	Remove
Thuja occidentalis	White Cedar	32	Good	Fair	Lean	Remove

Table B-5. Summary of Trees in Group C1

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Comments	Recommendation
Malus pumila	Apple	20,20,15,15	Fair	Fair		Remove
Malus pumila	Apple	50	Good	Poor	crack in branch unions, cavity at base	Remove
Malus pumila	Apple	12	Good	Fair		Remove

Table B-6. Summary of Trees in Group C2

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Comments	Recommendation
Pyrus communis	Pear	14,14	Good	Fair		Remove
Fraxinus pennsylvanica	Green Ash	30	Dead			Remove
Malus pumila	Apple	25,24,25,20	Good	Poor		Remove
Crataegus sp.	Hawthorn	15	Good	Fair		Remove
Crataegus sp.	Hawthorn	25	Poor		nearly dead	Remove
Fraxinus pennsylvanica	Green Ash	50	Dead			Remove
Crataegus sp.	Hawthorn	40,22,20	Good	Poor	split at base	Remove
Crataegus sp.	Hawthorn	28	Good	Fair	bulges in root flare	Remove
Crataegus sp.	Hawthorn	15,20	Fair	Poor	cavities in lower trunk	Remove
Malus pumila	Apple	50	Fair	Poor	twisted trunk, dead branches, poor form	Remove
Malus pumila	Apple	25,20	Poor	Poor		Remove
Crataegus sp.	Hawthorn	40,20	Fair	Poor	poor form, cavities in trunk	Remove
Fraxinus pennsylvanica	Green Ash	38	Dead			Remove
Crataegus sp.	Hawthorn	15,15,16,18	Good	Fair		Remove
Crataegus sp.	Hawthorn	12	Poor	Poor		Remove
Malus pumila	Apple	20	Fair	Poor		Remove
Malus pumila	Apple	40	Poor	Poor		Remove
Crataegus sp.	Hawthorn	14,12	Good	Fair		Remove
Malus pumila	Apple	50,35,25,30,25	Fair	Poor		Remove
Crataegus sp.	Hawthorn	40	Fair	Poor	cavities in trunk large broken branches	Remove
Malus pumila	Apple	35,45	Fair-Good	Poor	branch dieback, poor form, extensive epicormics	Remove
Malus pumila	Apple	25,25,20,28	Fair	Poor		Remove
Crataegus sp.	Hawthorn	11,14,15,12	Good	Poor		Remove
Malus pumila	Apple	45	Poor	Poor	extensive dieback, poor form	Remove
Crataegus sp.	Hawthorn	15	Fair	Poor		Remove
Crataegus sp.	Hawthorn	20,22,14	Good	Fair		Remove
Malus pumila	Apple	30,30	Poor	Poor	one stem broken	Remove
Malus pumila	Apple	13	Poor	Poor		Remove
Crataegus sp.	Hawthorn	20,12,20,18	Good	Fair		Remove
Crataegus sp.	Hawthorn	18,15,22	Good	Fair		Remove

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Comments	Recommendation
Malus pumila	Apple	17,20,15	Fair	Fair-Good		Remove
Ulmus americana	White Elm	16	Good	Fair		Remove
Crataegus sp.	Hawthorn	22	Good	Fair		Remove
Quercus macrocarpa	Bur Oak	10	Good	Good		Remove
Crataegus sp.	Hawthorn	27	Poor	Poor		Remove
Crataegus sp.	Hawthorn	20,25,35	Poor	Poor	poor form, large cavities, extensive decay	Remove
Malus pumila	Apple	38	Fair	Fair	damage to base	Remove
Malus pumila	Apple	25	Fair	Fair		Remove
Crataegus sp.	Hawthorn	25	Poor	Poor		Remove **Recommendation**
Malus pumila	Apple	20,18,20,20	Good	Poor		Remove
Crataegus sp.	Hawthorn	20,18,30,20,20	Fair	Poor	fused trunks	Remove
Crataegus sp.	Hawthorn	20,35,22,20	Good	Fair		Remove
Crataegus sp.	Hawthorn	45,26,30	Good	Fair		Remove
Crataegus sp.	Hawthorn	25,20,17	Good	Fair-Good		Remove
Crataegus sp.	Hawthorn	26,25	Good	Fair		Remove
Malus pumila	Apple	40,40	Fair	Fair-Good		Remove
Malus pumila	Apple	25	Good	Poor		Remove
Prunus serotina	Black Cherry	30	Good	Fair	damage to trunk, codominant stems	Remove
Prunus serotina	Black Cherry	20,20	Good	Fair	codominant stems with included bark	Remove
Crataegus sp.	Hawthorn	20,25,22,20	Good	Fair		Remove

Table B-7. Summary of Trees in Group C3

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Recommendation
Crataegus sp.	Hawthorn	18,18,14	Good	Fair	Remove
Malus pumila	Apple	15,12	Good	Poor	Remove
Malus pumila	Apple	20	Good	Fair	Remove
Malus pumila	Apple	17	Good	Fair	Remove
Malus pumila	Apple	45,30	Fair	Fair-Good	Remove

Table B-8. Summary of Trees in Group C4

Scientific Name	Common Name	DBH (cm)	Condition	Structure/Form	Recommendation
Crataegus sp.	Hawthorn	12,8,8,8	Good	Fair-Poor	Remove
Crataegus sp.	Hawthorn	25,15,10,25,10,10	Good	Fair-Good	Remove
Crataegus sp.	Hawthorn	8,8,12	Good	Good	Remove
Crataegus sp.	Hawthorn	11,11	Good	Good	Remove
Crataegus sp.	Hawthorn	11,9	Good	Good	Remove
Crataegus sp.	Hawthorn	13	Good	fair	Remove
Crataegus sp.	Hawthorn	10,10,10,10	Good	fair	Remove
Crataegus sp.	Hawthorn	13,15	Good	Fair	Remove
Crataegus sp.	Hawthorn	15,10	Good	Fair	Remove
Malus pumila	Apple	22,16	Fair	Poor	Remove
Crataegus sp.	Hawthorn	14,10	Fair	Poor	Remove
Crataegus sp.	Hawthorn	20	Good	Good	Remove

Table B-9. Summary of Trees in Group C6

Scientific Name	Common Name	DBH (cm)	Condition	Form/Structure	Recommendation
Crataegus sp.	Hawthorn	16,13,20	Good	Fair	Remove
Crataegus sp.	Hawthorn	11,12,12,10	Good	Fair	Remove
Ulmus americana	White Elm	18	Good	Good	Remove
Crataegus sp.	Hawthorn	14,10,10	Good	Fair	Remove
Crataegus sp.	Hawthorn	12,10,10	Good	Fair	Remove
Acer negundo	Manitoba Maple	12,15	Fair	Poor	Remove
Crataegus sp.	Hawthorn	14,14,10	Good	Fair	Remove
Acer negundo	Manitoba Maple	12,15	Fair	Poor	Remove
Crataegus sp.	Hawthorn	14,14,10	Good	Fair	Remove
Ulmus americana	White Elm	55	Fair	Fair-Good	Remove
Crataegus sp.	Hawthorn	15,16	Good	Poor	Remove
Crataegus sp.	Hawthorn	18, 21,14,14,	Poor	Poor	Remove
Crataegus sp.	Hawthorn	10,10,10,10	Good	Fair	Remove
Tilia americana	Basswood	16	Good	Good	Remove
Ulmus americana	White Elm	50	Good	Fair-Poor	Remove
Tilia americana	Basswood	11	Good	Fair-Poor	Remove
Tilia americana	Basswood	28,15,16	Good	Poor	Remove
Crataegus sp.	Hawthorn	20,20,11	Good	Fair	Remove

Table B-10. Summary of Trees in Group C7

Scientific Name	Common Name	DBH (cm)	Condition	Form/Structure	Recommendation
Malus pumila	Apple	14,10,10	Fair	Fair-Good	Remove
Crataegus sp.	Hawthorn	26,13,14,12,18	Poor	Poor	Remove
Malus pumila	Apple	20,25,20	Fair	Fair	Remove
Malus pumila	Apple	15,16,18,13	Good	Fair	Remove
Malus pumila	Apple	15,16	Good	Fair	Remove
Malus pumila	Apple	13,15,20	Good	Fair-Good	Remove
Malus pumila	Apple	16,16,22	Fair	Fair	Remove

Table B-11. Summary of Trees in Group G

Scientific Name	Common Name	DBH (cm)	Condition	Form/Structure	Recommendation
Acer x freemanii	Freeman's Maple	11	Good	Fair	Remove
Acer x freemanii	Freeman's Maple	8	Good	Fair	Remove
Acer x freemanii	Freeman's Maple	14,10	Good	Fair	Remove
Acer x freemanii	Freeman's Maple	12,10	Good	Fair	Remove
Acer x freemanii	Freeman's Maple	11	Good	Fair	Remove
Acer x freemanii	Freeman's Maple	8	Good	Fair	Remove

Table B-12. Summary of Trees in Group J

Scientific Name	Common Name	DBH (cm)	Condition	Form/Structure	Recommendation
Picea pungens	Blue Spruce	15	Fair-Good	Fair	Preserve
Picea pungens	Blue Spruce	15	Dead		Preserve
Picea pungens	Blue Spruce	15	Dead		Preserve
Picea pungens	Blue Spruce	15	Dead		Preserve
Picea pungens	Blue Spruce	15	Dead		Preserve
Picea pungens	Blue Spruce	15	Fair-Good	Good	Preserve
Picea pungens	Blue Spruce	18	Good	Good	Preserve
Picea pungens	Blue Spruce	18	Fair-Good	Good	Preserve
Picea pungens	Blue Spruce	18	Fair-Good	Good	Preserve
Picea pungens	Blue Spruce	15	Fair-Good	Good	Preserve

Table B-13. Summary of Trees in Group K

Scientific Name	Common Name	DBH (cm)	Condition	Form/Structure	Comments	Recommendation
Pinus nigra	Austrian Pine	20	Good	Fair		Preserve
Pinus nigra	Austrian Pine	30	Good	Fair		Preserve
Pinus nigra	Austrian Pine	20	Good	Poor		Preserve
Pinus nigra	Austrian Pine	20	Good	Fair-Poor	lean/uneven crown	Preserve
Pinus nigra	Austrian Pine	30	Good	Fair		Preserve
Pinus nigra	Austrian Pine	25	Good	Fair	codominant leaders, minor needle dieback	Preserve
Pinus nigra	Austrian Pine	25	Good	Fair	minor needle dieback	Preserve
Pinus nigra	Austrian Pine	30	Good	Fair	codominant leaders, minor needle dieback	Preserve
Pinus nigra	Austrian Pine	28	Good	Fair	minor needle dieback	Preserve
Pinus nigra	Austrian Pine	28	Good	Fair	codominant leaders, minor needle dieback	Preserve
Pinus nigra	Austrian Pine	30	Good	Fair	codominant leaders, minor needle dieback	Preserve
Pinus nigra	Austrian Pine	30	Good	Fair	minor needle dieback	Preserve
Pinus nigra	Austrian Pine	25	Good	Fair	minor needle dieback	Preserve
Pinus nigra	Austrian Pine	30	Good	Fair	minor needle dieback	Preserve

Table B-14. Summary of Trees in Group L

Scientific Name	Common Name	DBH (cm)	Condition	Structure			Recommendation
				Root Flare	Trunk	Crown/Branches	
Acer negundo	Manitoba Maple	10	Good	Fair	Fair	Poor	Preserve
Acer negundo	Manitoba Maple	13	Good	Fair	Fair	Fair	Preserve
Acer negundo	Manitoba Maple	25	Good	Good	Good	Fair-Good	Preserve
Picea glauca	White Spruce	40	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	40	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	25	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	40	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	25	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	20	Fair	Good	Good	Fair	Preserve
Picea glauca	White Spruce	25	Fair	Good	Good	Fair	Preserve
Picea glauca	White Spruce	40	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	15	Fair			Fair	Preserve
Picea glauca	White Spruce	15	Fair-Poor	Good	Good	Fair-Poor	Preserve
Picea glauca	White Spruce	15	Fair	Good	Good	Fair	Preserve
Picea glauca	White Spruce	40	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	25	Fair	Good	Good	Fair	Preserve
Picea glauca	White Spruce	25	Fair	Good	Good	Fair	Preserve
Picea glauca	White Spruce	25	Good	Good	Good	Fair	Preserve
Picea glauca	White Spruce	30	Fair	Good	Good	Good	Preserve
Picea glauca	White Spruce	40	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	35	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	25	Fair-Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	25	Fair	Good	Good	Good	Preserve
Picea glauca	White Spruce	25	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	30	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	15	Good	Good	Good	Good	Preserve

Scientific Name	Common Name	DBH (cm)	Condition	Structure			Recommendation
				Root Flare	Trunk	Crown/Branches	
Picea glauca	White Spruce	30	Good	Good	Good	Good	Preserve **Recommendation**
Picea glauca	White Spruce	30	Good	Good	Good	Good	Preserve
Picea glauca	White Spruce	10,15	Fair	Good	Good	Fair	Preserve
Picea glauca	White Spruce	15	Good	Good	Good	Poor	Preserve

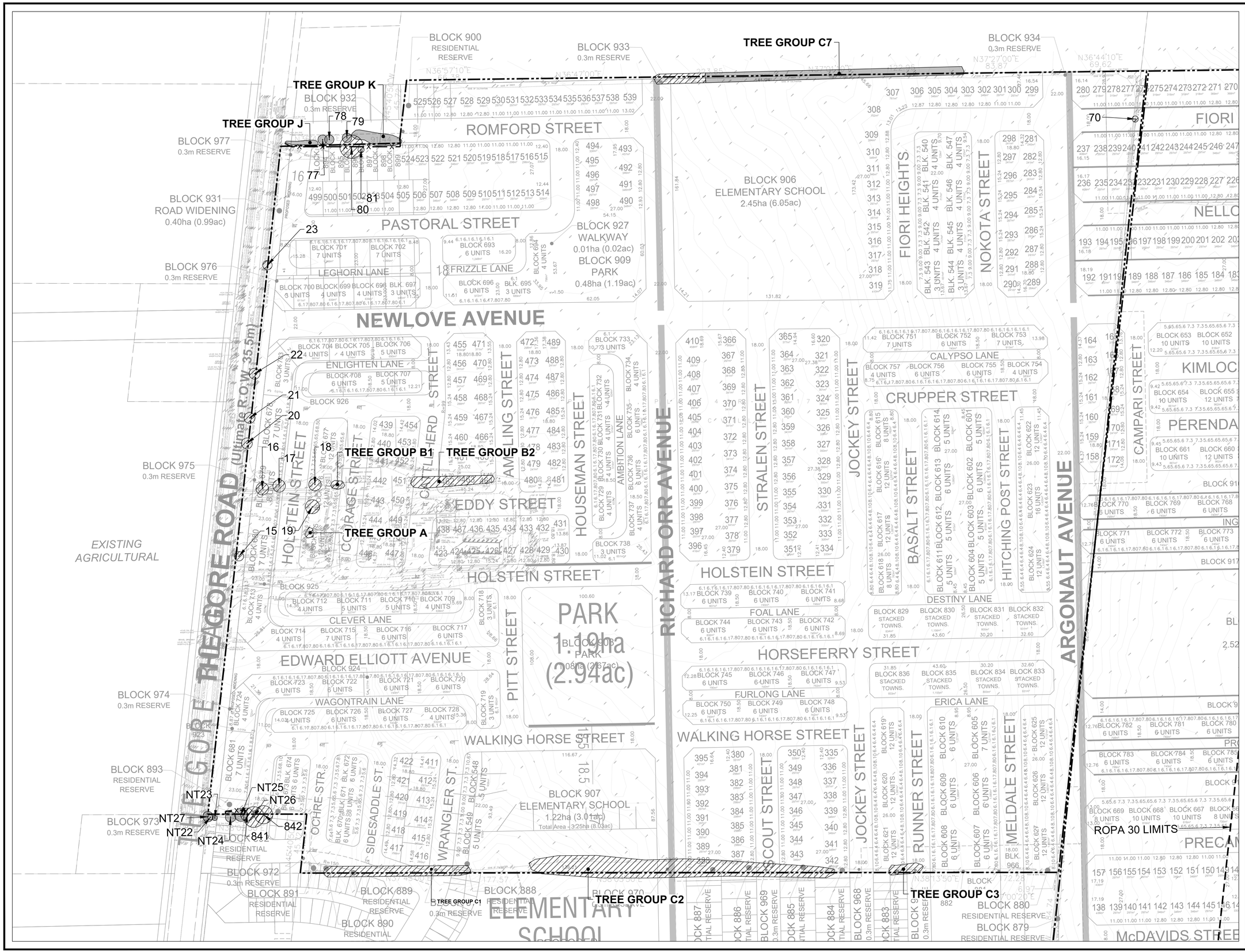
Table B-15. Summary of Trees in Group N3

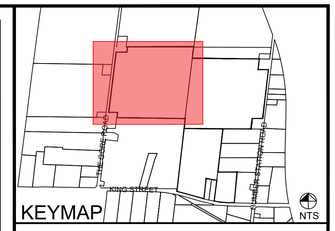
Scientific Name	Common Name	DBH (cm)	Crown Radius (m)	Condition	Comments	Recommendation
Fraxinus pennsylvanica	Green Ash	35	N/A	Dead	Standing snag.	Remove
Acer negundo	Manitoba Maple	25, 25	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Remove
Acer negundo	Manitoba Maple	35	7	Fair-Good	Minor dieback and thinning.	Remove
Fraxinus pennsylvanica	Green Ash	29	6	Poor	Significant dieback and thinning; Almost dead, likely due to EAB infestation.	Remove
Fraxinus pennsylvanica	Green Ash	14	N/A	Dead	Standing snag.	Remove
Fraxinus pennsylvanica	Green Ash	20, 25	N/A	Dead	Standing snag; Stems fork near ground.	Remove

BEACON ENVIRONMENTAL

Appendix C

Tree Inventory and Preservation Plan





LEGEND

- Property Boundary
- ROPA 30 Limits
- Tree Preservation Fencing
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone
- Tree Location
- Tree to be Preserved
- Tree to be Removed

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

N°	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	DW
1	ISSUED FOR DRAFT PLAN OF SUBDIVISION	2023/05/17	JS

SCALE
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0 20 40 80 m

NORTH ARROW

JAMES SEERY
#ON-2350A

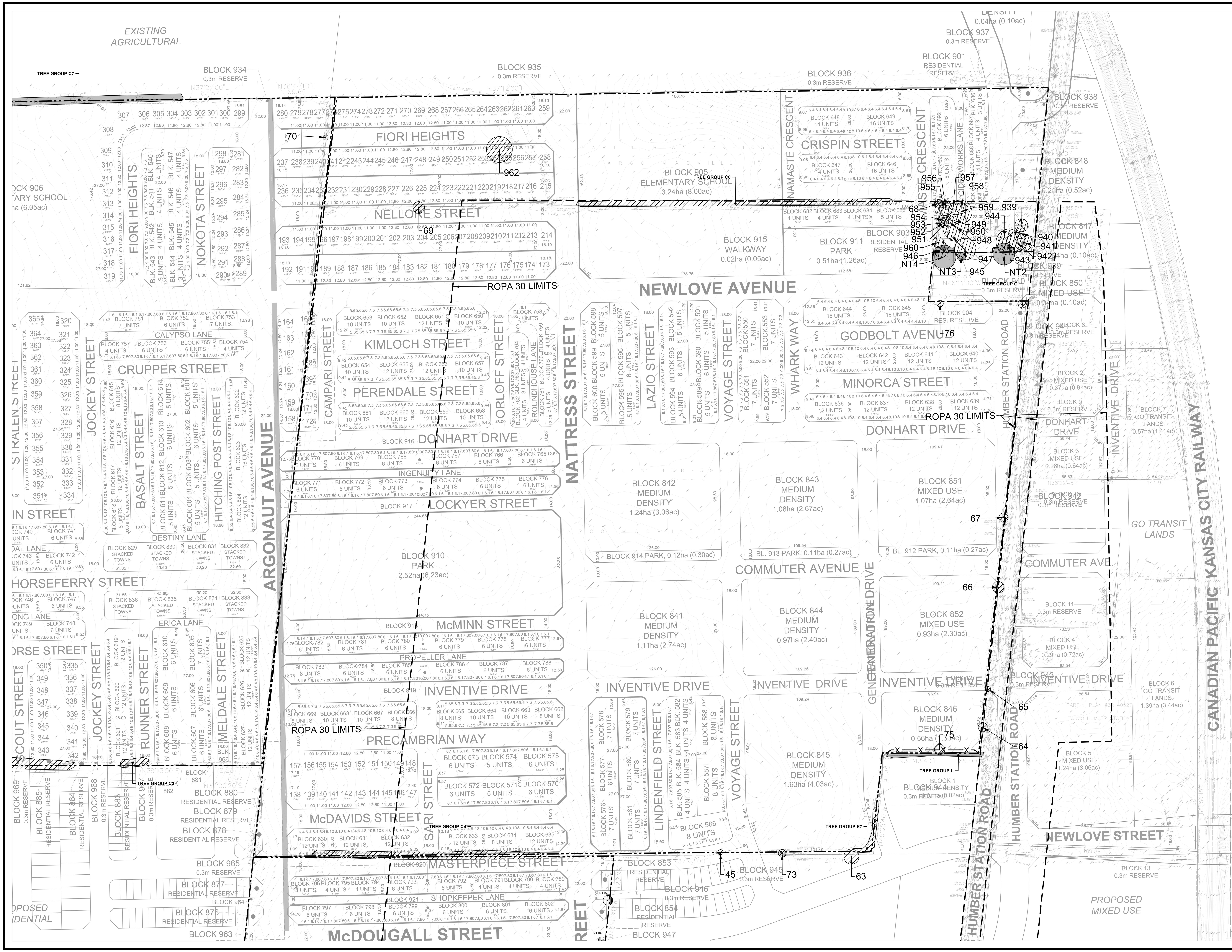
BEACON ENVIRONMENTAL

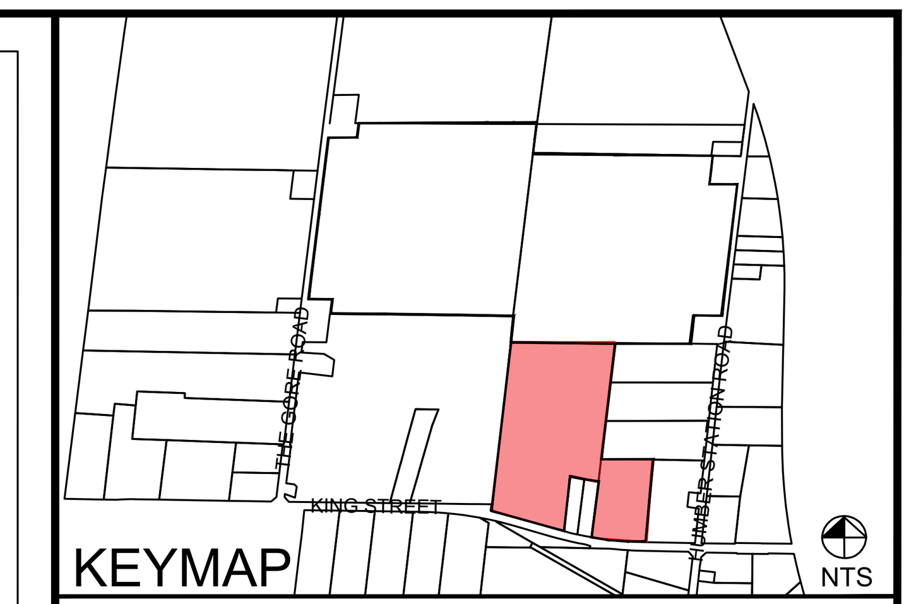
CLIENT
ARGO MACVILLE I

PROJECT
14275 THE GORE ROAD, LOT 12, CONC. 4, TWP., ALB

SHEET TITLE
TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY: --	PROJECT N°: 221164/5
DRAWN BY: AD	FIGURE N°: TP-1
CHECKED BY: JS	
DATE: 27 June 2024	





LEGEND

- Property Boundary
- ROPA 30 Limits
- Tree Preservation Fencing
- Tree tag (1678)
- Tree Crown
- Minimum Tree Protection Zone
- Tree Location
- Tree to be Preserved
- Tree to be Removed

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	DW
1	ISSUED FOR DRAFT PLAN OF SUBDIVISION	2023/05/17	JS

SCALE 1:1500 (0 20 40 80 m)

NORTH ARROW

CERTIFIED ARBORIST ISA
JAMES SEERY
#ON-2350A

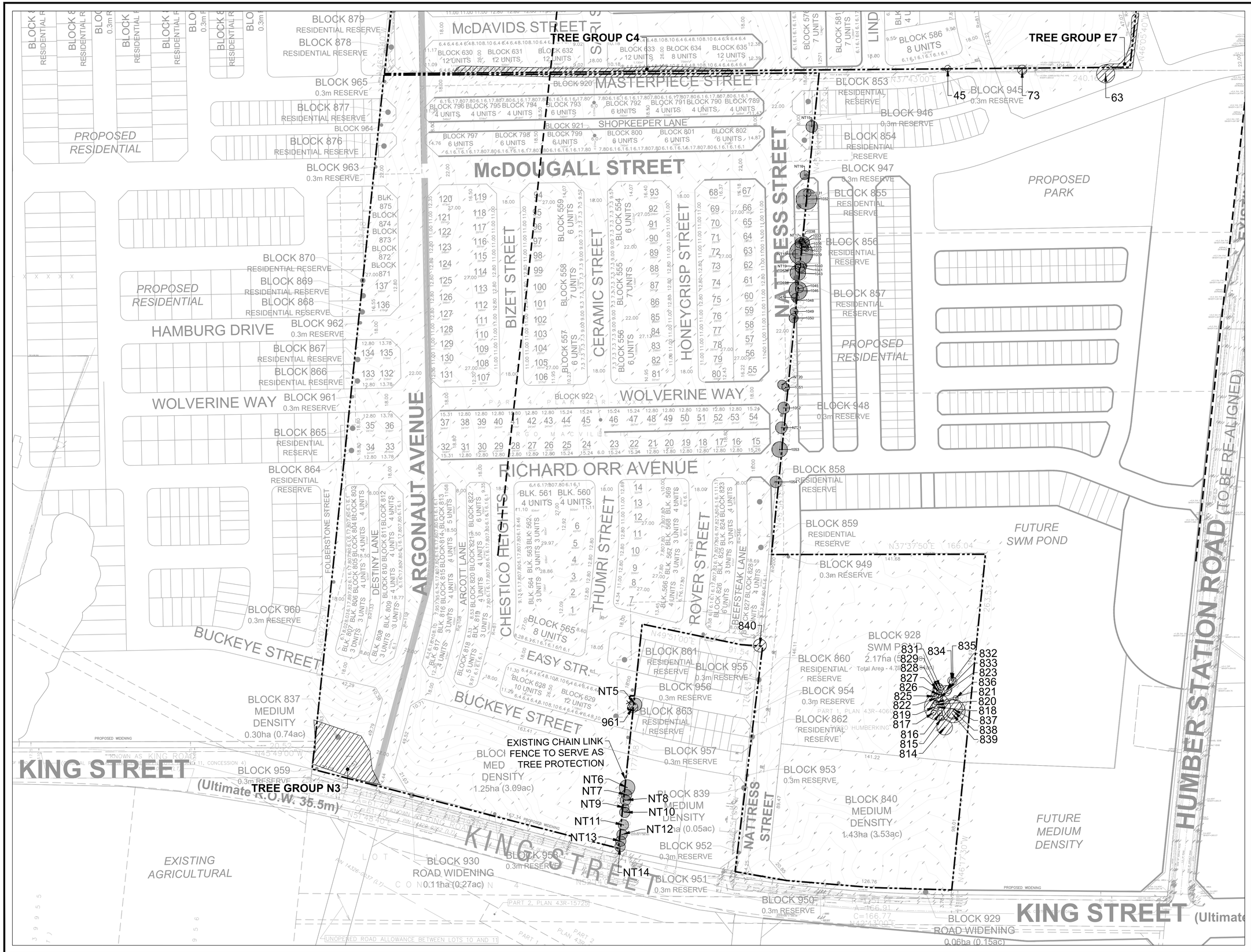
BEACON ENVIRONMENTAL

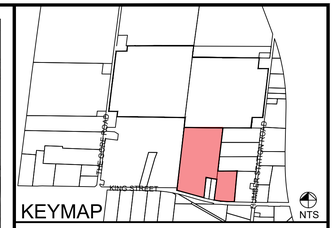
CLIENT
ARGO MACVILLE II, ARGO MACVILLE V

PROJECT
0 HUMBER STATION ROAD, LOT 12 & 13,CONC. 4, TWP., ALB

SHEET TITLE
TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY:	--	PROJECT Nº:	221164/5
DRAWN BY:	AD	FIGURE Nº:	TP-2
CHECKED BY:	JS		
DATE:	27 June 2024		





LEGEND

- Property Boundary
- ROPA 30 Limits
- Tree Preservation Fencing
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone
- Tree Location
- Tree to be Preserved
- Tree to be Removed

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	DW
1	ISSUED FOR DRAFT PLAN OF SUBDIVISION	2023/05/17	JS

SCALE 1:1250 (0 20 40 80 m)

NORTH ARROW

CERTIFIED ARBORIST ISA
JAMES SEERY
#ON-2350A

BEACON ENVIRONMENTAL

CLIENT
ROBERT SPEIRS, ARGO HUMBERKING

PROJECT
0 KING STREET, LOT 11, CONC. 4, TWP., ALB

SHEET TITLE
TREE INVENTORY AND PRESERVATION PLAN

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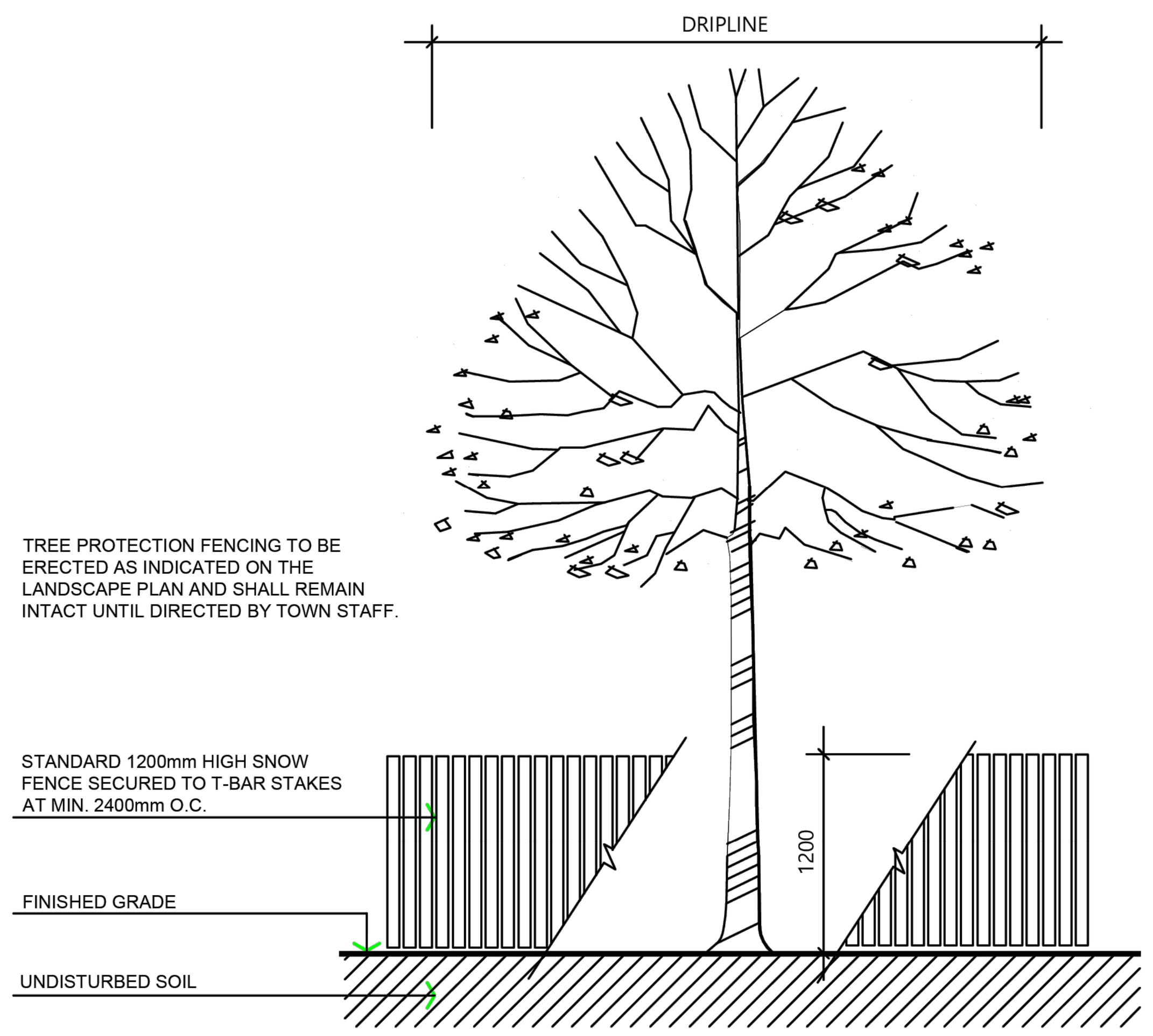
DRAWN BY: AD	FIGURE Nº: TP-3
CHECKED BY: JS	
DATE: 27 June 2024	



SPECIFICATIONS FOR THE PROTECTION AND PRESERVATION OF EXISTING VEGETATION:

1. PRIOR TO ISSUANCE OF THE GRADING AND SERVICING OR BUILDING PERMIT, ALL EXISTING TREES THAT ARE TO BE PRESERVED SHALL BE FULLY PROTECTED WITH HOARDING (IE SNOW FENCING) OUTSIDE THEIR 'DRIPLINES', OR AS DIRECTED THROUGH ADDITIONAL GOVERNING DOCUMENTS,TO THE SATISFACTION OF THE TOWN.
2. GROUPS OF TREES AND OTHER EXISTING PLANTINGS TO BE PROTECTED SHALL BE TREATED IN A LIKE MANNER WITH HOARDING AROUND THE ENTIRE CLUMP(S).
3. TREE PRESERVATION FENCE IS TO BE INSPECTED BY THE CONSULTING ARBORIST OR LANDSCAPE ARCHITECT AND APPROVED BY THE TOWN PRIOR TO CONSTRUCTION COMMENCING.
4. SILTATION CONTROL FENCING MAY BE USED AS A TREE PRESERVATION FENCING SUBSTITUTE IF REQUIRED BY ENGINEERING AT THE DISCRETION OF THE TOWN.
5. AREAS WITHIN PROTECTIVE FENCING SHALL REMAIN UNDISTURBED AND SHALL NOT BE USED FOR THE STORAGE OF BUILDING MATERIALS OR EQUIPMENT. NO CONTAMINANTS SHALL BE DUMPED OR FLUSHED WHERE FEEDER ROOTS OF TREES EXIST. NO GARBAGE OR BUILDING MATERIALS ARE TO BE PLACED ON OR AGAINST THE TREE PRESERVATION FENCE.
6. PRUNE BRANCHES TO REMOVE DAMAGED LIMBS ONLY. DO NOT DAMAGE LEADERS. ALL CUTS OVER 25mm SHALL BE TREATED IN ACCORDANCE WITH APPROPRIATE HORTICULTURAL PRACTICES AS APPROVED BY THE TOWN. NO MORE THAN 20% OF THE TREE SHALL BE PRUNED UNLESS DIRECTED BY THE TOWN.
7. CUTTING OF ROOTS OR CHANGING OF GRADES AROUND EXISTING TREES TO BE PRESERVED WILL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE PUBLIC WORKS AND ENGINEERING DEPARTMENT.
8. IF TREES ARE BEING ADVERSELY AFFECTED BY CONSTRUCTION, A WATERING AND FERTILIZING PROGRAM IS TO BE SET UP TO THE SATISFACTION OF THE TOWN.
9. PRIOR TO FINAL APPROVAL TREES THAT HAVE DIED OR HAVE BEEN DAMAGED BEYOND REPAIR PRIOR DURING OR POST CONSTRUCTION SHALL BE REMOVED AND REPLACED WITH TREES OF A SIZE AND SPECIES APPROVED BY THE TOWN, AT THE SOLE COST OF THE DEVELOPER.

TOWN OF CALEDON

TREE PRESERVATION

NO.	REVISION	APR'D	DATE
3	STANDARD 707 NOW 606		JAN 18
2	STANDARD No. 1135 NOW 707, NOTES EDIT		JUNE 08
1	NOTE NO. 9 ADDED		MARCH 08

APR'D: C.C. DATE: JUNE 08
DRAWN: abal SCALE: NTS
STANDARD No. 606

SPECIFICATIONS

A. General

The following Tree Preservation and Protection Measures will be undertaken to help eliminate and/or significantly reduce construction injury to all trees recommended for preservation. All temporary tree protection measures cited for retained trees must comply with the Town of Caledon Tree Protection Specifications and Details. Any variation from the standard tree protection measures must be approved in writing by the Town of Caledon.

B. Pre-Construction Phase

1. Prior to construction, the trees to be preserved shall be protected with a Tree Protection Barrier. The barrier shall consist of 1.2m (4ft) high orange plastic snow fence wired to T-bars (see Town of Caledon Tree Preservation Fencing, STD 606).
2. If applicable, attach a filter cloth 600mm high to the construction side of the hoarding to act as sediment control. Sediment control fencing shall meet or exceed OPSD-219.110, and be installed to the satisfaction of the Town of Caledon.
3. All supports and bracing used to safely secure the barrier should be located outside the Tree Protection Zone (TPZ). All supports and bracing should minimize damage to roots.
4. The TPZ fence is to be installed along the edge of the tree protection zones. This hoarding is to remain in place and remain in good condition throughout the entire duration of the project. Dismantling the tree protection barrier prior to approval by the Town of Caledon staff may constitute a contravention.
5. The applicant shall notify the Town of Caledon and the consulting certified arborist or landscape architect to confirm that the tree protection barriers are in place.
6. Where fill or excavated material must be temporarily located near a TPZ, a wooden barrier must be used to ensure no material enters the TPZ.
7. Remove any garbage and foreign debris from the tree protection zones, daily.
8. For the trees that were recommended for removal and/or crown pruning that are within the TPZ limits, these activities are to be performed by a qualified ISA certified arborist prior to the installation of the Tree Protection Zone barriers and prior to the commencement of any construction activities. Install the Tree Protection Zone barrier as per Tree Preservation Fencing, STD 606 at the limits shown on the tree inventory and protection plan after the tree removal, whichever is greater, and crown pruning activities are completed.
9. A **Tree Protection Zone** sign must be mounted on all sides of the tree protection barrier for the duration of site construction. The sign should be a minimum of 40cm x 60cm and made of white gator board or equivalent material.
10. The sign must be similar to the illustration shown below, or as directed by the Town of Caledon.

> **TREE PROTECTION ZONE**
> **No work is permitted in the Tree Protection Zone**
> This includes construction works, grading, storage of trash or materials.
> The tree protection barrier must not be removed without written authorization of the Town of Caledon.

11. All contractors and site visitors should be informed of the tree preservation and protection measures at a pre-construction meeting.

specifications continued on next panel...

TOWN OF CALEDON

TREE PRESERVATION STANDARD NOTES - PART 1

NO.	REVISION	APR'D	DATE

APR'D: B.B. DATE: AUGUST 17
DRAWN: B.M. SCALE: NTS
STANDARD No. 710

SPECIFICATIONS continued from previous panel

C. During Construction Phase

1. All areas within the TPZ shall remain undisturbed for the duration of construction. There will be no grade changes, dumping, and storage of any materials, structures or equipment within these areas. The Tree Protection Barrier must not be removed without the written authorization of the Town of Caledon.
2. Minor grading works will be permitted at the edge of the preservation zone as required to correct localized depressions, and blend to existing grades.This work to be undertaken under the direct supervision of an ISA certified arborist.
3. A certified ISA arborist will undertake proper root pruning in accordance with acceptable arboriculture practices when and if roots of retained trees are to be exposed, damaged, or severed by construction work. The exposed roots will be backfilled with appropriate material as soon as possible to prevent desiccation. Root pruning prior to excavation will help prevent necessary damage to tree roots.The use of low pressure hydrovac to expose roots is recommended, at no additional cost.
4. The Town of Caledon must be notified for all work that impacts the TPZ for temporary removal of a section of hoarding to gain access for fine grading or other works. All works are to be supervised by the Town of Caledon.
5. No cables, wire or ropes of any kind shall be wrapped around or installed in trees to be preserved.
6. No contaminants will be dumped or flushed in the TPZ areas or where feeder roots of trees exist (generally beyond the TPZ areas).
7. Irrigate tree protection zones during drought conditions, June to September to reduce drought stress.
8. Inspect the site daily to ensure hoarding is in place and in good condition. Inspect trees to monitor condition.

D. Post Construction Phase

1. Following the completion of all site works including landscaping, and after review and approval by the Town of Caledon staff, the protective hoarding may be removed.
2. After removal of the protective hoarding, the Tree Preservation Zones shall be inspected by the Town of Caledon staff. Any remaining dead, diseased, or hazardous limbs or trees are to be removed by an ISA certified arborist as directed by the consulting arborist or Town of Caledon staff.

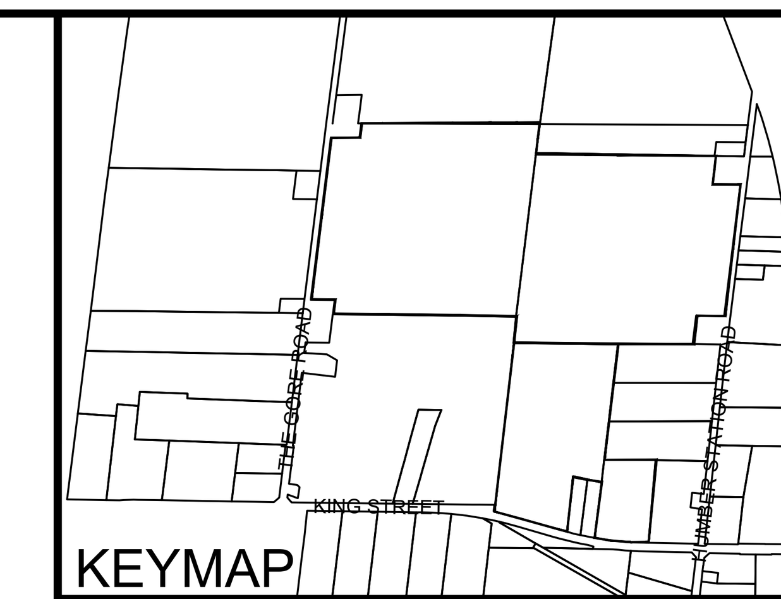
end of specifications

TOWN OF CALEDON

TREE PRESERVATION STANDARD NOTES - PART 2

NO.	REVISION	APR'D	DATE

APR'D: B.B. DATE: AUGUST 17
DRAWN: B.M. SCALE: NTS
STANDARD No. 711



KEYMAP NTS

LEGEND

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	DW
1	ISSUED FOR DRAFT PLAN OF SUBDIVISION	2023/05/17	JS

SCALE

NORTH ARROW

CERTIFIED ARBORIST ISA®
JAMES SEERY
#ON-2350A

BEACON ENVIRONMENTAL

CLIENT

PROJECT

SHEET TITLE

NOTES AND DETAILS

DESIGN BY:	--	PROJECT Nº:	221164/5
DRAWN BY:	AD	FIGURE Nº:	TP-4
CHECKED BY:	JS		
DATE:	27 June 2024		

Argo Humber Station Draft Plan of Subdivision Arborist Report

Prepared For:

Argo Humber Station Limited

Prepared By:

Beacon Environmental Limited

Date:	*Project:*
2024-07-02	**214476.1**

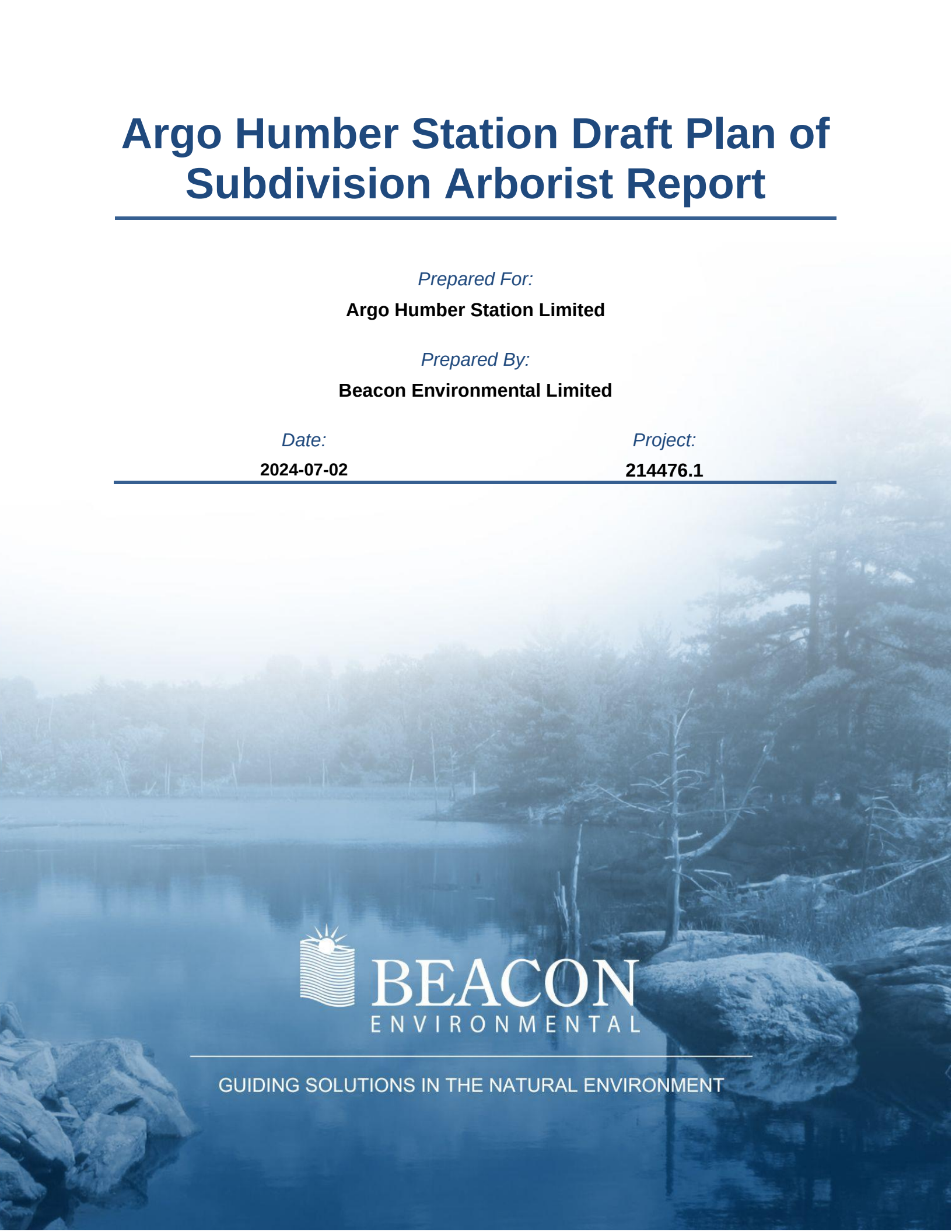


Table of Contents

Figures

Tables

Appendices

Report Versions Issued

Version	Date	Revisions
1.	May 2023	First Submission
2.	July 2024	Second Submission

1. Introduction

This Arborist Report has been prepared by Beacon Environmental Limited (Beacon) in support of a Draft Plan of Subdivision Application for the following Draft Plan area (**Figure 1**):

- **Argo Humber Station Draft Plan of Subdivision (21T-22002):** Argo Humber Station Limited (subject lands).

This Arborist Report builds upon the tree inventory undertaken by Beacon in support of the 2023 Caledon Station Final Comprehensive Environmental Impact Study and Management Plan (CEISMP; **Figure 1**). This Report was prepared in accordance with the *Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation* (Town of Caledon 2020).

The purpose of this Arborist Report is to:

- Identify and describe individual trees and tree groupings on the subject lands;
- Assess potential impacts to individual trees and tree groupings resulting from the proposed development including requirements for tree removals; and
- Provide recommendations for tree preservation and protection.

2. Methods

An inventory and evaluation of the existing individual trees and tree groupings on the subject lands was conducted on August 20, 2020, and May 16, 2023 by Arborists certified by the International Society of Arboriculture (ISA).

In general, individual trees ≥10 cm DBH (diameter at breast height, measured 1.4 m above grade) were tagged with numbered aluminum forestry tags and their locations were recorded with dGPS (SBAS). Trees located on adjacent properties were not tagged but were assessed based on observations from the subject lands. For each tree, the following information was recorded:

- Species;
- Trunk DBH (diameter at breast height, measured 1.4 m above grade);
- Health condition; and
- Structural condition rating.

Each tree was assigned a condition rating of good, fair, poor, or dead, based on the following criteria:

- Poor – Severe dieback, significant lean, missing leader, major defects, significant decay and/or disease presence;
- Fair – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress;
- Good – Healthy vigorous growth, minor visible defects or damage; and
- Dead – No live growth.

Tree condition was assessed based on presence and severity of flaws, damage, evidence of pests or diseases, structural condition, dead or dying branches, or other decline indicators.

Where trees occur in clusters or groupings (i.e., hedgerows) were proposed for removal, they were not individually tagged and assessed, but rather, the number, species, size, and condition of the trees in each group was recorded.

Limitations of the assessment are summarized in **Appendix A**.

3. Findings

A total of 79 individual trees were documented and assessed on and adjacent to the subject lands. Two of the trees are located within the municipal road allowance along Humber Station Road. Most of the inventoried trees are on adjacent properties. The findings of the tree inventory and assessment are provided in **Appendix B**.

4. Impact Assessment and Recommendations

4.1 Tree Removals

Based on consultation and review of the proposed development and grading plans, all trees will need to be removed to facilitate development of the subject lands. Trees identified for removal are illustrated on the Tree Inventory and Preservation Plan (**Appendix C)**. Several trees are located on adjacent properties; therefore, approval must be obtained from the owner to remove the trees.

There are no Provincially Endangered or Threatened tree species on record for the subject lands, nor were any observed during the inventory.

The federal *Migratory Birds Convention Act* (1994) and provincial *Fish and Wildlife Conservation Act* (1997) protect the nests, eggs and young of most bird species from harm or destruction. As the peak breeding bird season in southern Ontario is generally from mid-May to early-July, and the more general breeding bird season is between early April and late August, vegetation clearing should occur outside of these periods (i.e., April 1st to August 31st) whenever possible. For any proposed clearing of vegetation within these dates, or where birds may be suspected of nesting outside of these dates, an Ecologist or Avian Biologist should undertake detailed nest searches immediately prior to site alteration to ensure that no active nests are present. If active nests are confirmed, removal of the tree / vegetation will need to be delayed until the nest is no longer actively used.

4.2 Tree Protection

No trees have been identified for preservation due to their locations conflicting with grading and development.

N
W
E
S

HUMBER STATION ROAD

CPR

G
27
26
25
24
12
13
16
17
B3
22
E7
23
B4
11
10
F
B5
18
21
45

LEGEND

- ARGO HUMBER STATION DRAFT PLAN AREA
- STUDY AREA
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

BEACON ENVIRONMENTAL
URBANTECH
DS CONSULTANTS LTD. Geotechnical ❖ Environmental ❖ Materials ❖ Hydrogeology
GSAI Glen Schnarr & Associates Inc.

Arborist Report
Argo Humber Station Draft Plan of Subdivision
Caledon Station Secondary Plan Area

PROJECT No. 214476

FIGURE 1

SITE LOCATION AND TREED RESOURCES
ARGO HUMBER STATION DRAFT PLAN

June 2024 Scale 1:3,000

C:\ODB\OneDrive - Beacon Environmental\GeoSpatial\Geo Projects\2014\214476\MXD\Draft Plan Areas\20240603_Figure07B_Treed ResourcesHumberStation_214476.mxd

5. Tree Replacement

The Town of Caledon requires compensation for trees removed in relation to draft pan and site plan applications as outlined in the *Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation* (Town of Caledon 2020). Compensation for removed trees is determined based on the cost to replace the trees that will be removed due to development. The Town of Caledon has developed a formula for calculating compensation values that is based on tree size. An analysis has been completed for the tree removals on this site using this formula, and it has been determined that the removal of 57 trees, of which 47 are in fair or better condition, would require planting 97 trees as seen in **Table 1**.

Table 1. Calculation of Tree Compensation

Diameter at Breast Height (cm)	Number of Trees in Fair or Good Condition to be Removed	Compensation Ratio	Number of Compensation Trees Required
10-20	22	1:1	22
21-35	10	2:1	20
36-50	8	3:1	24
51-65	4	4:1	16
>65	3	5:1	15
		Total:	**97**

The number of replacement trees identified in **Table 1** does not account for the removal of 22 trees from Group N1 located on adjacent lands to the south, which will be removed by and compensated for others (Humberking Draft Plan of Subdivision – East Lands).

If there is in insufficient room to plant the required number of replacement trees on-site, then financial compensation (cash-in-lieu) may be accepted at rate (per tree) as determined by the Town.

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6. References

Beacon Environmental, Urbantech Consulting, Glen Schnarr & Associates Inc., DS Consultants Ltd. 2023.
Comprehensive Environmental Impact Study and Management Plan Caledon Station Community Secondary Plan. May 2023.

Government of Canada. 1994.
Migratory Birds Convention Act, 1994 (S.C. 1994, c.22).

Government of Ontario. 1997.
Fish and Wildlife Conservation Act, 1997 (S.O 1997, c. 41)

Town of Caledon. April 2020.
Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation. April 2020.

Appendix A

Arborist Report Methods

Appendix A

Tree Inventory and Assessment Methodology*

**Note that not all the tree descriptors contained herein may be used in a tree assessment and report.*

DBH (cm): Diameter at breast height, 1.4 m above ground, measured in centimeters. Two or more numbers denotes the DBH of each stem/trunk for trees with multiple stems/trunks. For multi-stemmed trees, for the purpose of determining the minimum tree protection zone DBH is calculated as the square root of the sum of the square DBH of each stem.

Crown Reserve/Diameter (metres): Crown diameter (tree's canopy) measured at intervals of 1 metre.

Condition: General Condition is recorded for standard tree inventories and assessments. For detailed tree inventories and assessments, when required the assessment of tree condition evaluates factors of Biological Health and Structural Condition separately.

The descriptors of health and structure attributed to a tree evaluate the individual specimen to what could be considered typical for that species growing in its location under current site and climatic conditions. For example, some species can display inherently poor branching architecture, such as multiple acute branch attachments with included bark. Whilst these structural defects may technically be considered arboriculturally poor, they are typical for the species and may not constitute an increased risk of failure. These trees may be assigned an intermediate structural rating of fair – poor (rather than poor) at the discretion of the assessor.

General Condition: Outlined below are the detailed guidelines utilized for the classification of general condition rating:

- **Excellent**: (Healthy)
  No major branch mortality: crown is typical with less than 10% branch or twig mortality; no signs of decay.
- **Good**: (Light Decline)
  Branch mortality, twig dieback in 11-25% of the crown: broken branches or crown missing based on presence of old snags is less than 26%; minor evidence of decay.
- **Fair**: (Moderate Decline)
  Branch mortality, twig dieback in 26-50% of the crown: broken branches or crown area missing based on presence of old snags is 50% or less; decay evident.
- **Poor**: (Severe Decline)
  Branch mortality, 50% or more of the crown dead: broken branches or crown area missing based on presence of old snags in more than 50%; decay resulting in high hazard assessment.
- **Dead**: (due to Natural or Human Causes)
  Tree is dead, either standing or down: phloem under bark has brown streaks: few epicormic shoots may be present.

Biological Health: Related to presence and extent of various attributes to describe the overall health and vigour of the tree.

Biological Health Category*	Vigour, Extension, & Growth	Decline symptoms, Deadwood, & Dieback	Foliage density, colour, size, & intactness	Pests and/or Disease
Excellent	Above typical. Excellent. Full canopy density.	None or negligible.	Above typical. No deficiencies or defects detected.	None or negligible.
Good	Above typical. Full canopy density.	Negligible.	Typical. Minor deficiencies or defects could be present.	Negligible.
Fair	Typical vigour. >80% canopy density.	More than typical. Small sub-branch dieback.	Exhibiting deficiencies. Could be thinning, or foliage smaller.	Minor, within damage thresholds.
Poor	Below typical or minimal – declining.	Excessive, large, and/or prominent amount and size of dead wood.	Exhibiting severe deficiencies. Thinning foliage, generally smaller or deformed.	Exceeds damage thresholds and contributing to decline.
Dead	Tree is dead	n/a	n/a	n/a

*Note that intermediate ratings can be applied, at the discretion of the arborist, in cases where biological health attributes fall within closely related categories, e.g. Good-Fair.

Structural Condition: Related to defects in a tree's structure, (i.e., lean, codominant trunks). Structural rating will also consider general branching architecture, stem taper, live crown ratio, crown symmetry, and crown position such as a tree being suppressed by more dominant trees. Tree structure zones listed below are adapted from Coder, Construction damage assessments: trees and sites, 1996 University of Georgia, USA.

Structure Category*	Root plate & Lower stem	Trunk	Primary branch support	Outer crown & Roots
Good	No obvious damage, disease or decay; obvious basal flare / stable in ground.	No obvious damage, disease, or decay; well tapered.	Well formed, attached, spaced and tapered. No history of failure.	No obvious damage, disease, decay, or structural defect. No history of failure.
Fair	Moderate-Minor damage or decay. Basal flare present.	Minor damage or decay.	Generally well-attached, spaced and tapered branches. Minor structural deficiencies may be present or developing. No history of branch failure.	Minor damage, disease, or decay; minor branch end-weight or over-extension. No history of branch failure.
Poor	Moderate - major damage, disease or decay; fungal fruiting bodies present. Excessive lean placing pressure on root plate.	Moderate - major damage, disease, or decay; exceeds recognized thresholds; fungal fruiting bodies present. Acute lean. Stump re-sprout.	Weak, decayed, cavities or has acute branch attachments with included bark; excessive compression flaring; failure likely. Evidence of major branch failure.	Moderate - major damage, disease or decay; fungal fruiting bodies present; major branch end-weight or over-extension. Branch failure evident.

*Note that intermediate ratings can be applied, at the discretion of the arborist, in cases where biological health attributes fall within closely related categories, e.g. Good-Fair.

Height (metres): Height of tree from ground to top of crown. Height is estimated from visual ground observations.

Position on Site: AP - above-ground planter; **ED** - Edge, e.g., forest, woodland; **IN** - Interior, e.g., forest, woodland; **HR** - hedgerow, row/linear group of trees; **OG** - open-grown; **PI** - planting island; **GP** - group/cluster

On-site Tree: Tree trunk located completely within the property boundary of the subject property.

Off-site Tree: Tree trunk located completely outside of the property boundary of the subject property.

Public Tree: Tree is located on the property of the municipality/region, e.g., within Right-of-Way.

Shared Tree: Tree shared between the subject property and adjacent private or public property (i.e. tree trunk located partially within the boundary of the subject property). Documented as '**S**' in off-site tree or municipal tree data columns.

Recommended Action: A recommendation of the following three categories is assigned to preserve or remove a tree:

i. The tree's current biological health and structural condition
ii. The anticipated impacts from proposed development
iii. The summary of the previous two categories.

Note: Only trees having a recommendation of preserve for both health and structure, and impacts from the proposed development are assigned a final recommendation of preserve.

P (Preserve) - Tree has a moderate to high biological health AND moderate to high structural condition, AND is likely to survive impact from the proposed development (if present). The tree is likely to survive for at least 3 to 5 years.

R (Remove) - Tree has low biological health, AND/OR low structural condition, AND/OR will not survive the proposed development impacts (if present). The tree is not likely to survive more than 1-3 years.

C (Conditional) - In some situations a tree's preservation or removal is related to potential relocation/modification of the limit of construction, and/or known arboricultural treatments that will likely improve the biological health and/or structural condition of the tree. This may include review of a tree's condition, e.g., roots, at time of construction/excavation.

Site Development Impact: Impact to tree is anticipated from proposed development (e.g., road, building) at or near the tree, and/or grade changes (cut/fill).

Transplant Potential: A transplantation recommendation of **Y**es or **N**o based on a tree's size, species, and condition, and present and future site conditions (e.g. near adjacent trees/objects, on slopes, soil type).

Codes of Damage Descriptions
BA - branch attachment poor
BB - burlap, basket, wire present on/in tree/root ball
BC - bark crack
BI - bark included
BN - bark necrosis
BS - basal trunk sprouts
CA – crown asymmetrical
CB - crown broken
CD - crown dieback
CK - canker (abnormal growth from disease or damage)
CL - crown live, CL20 - 20% live crown
CS - crown sprouts
CT - crown thin (having reduced foliage)
CV - crown vines
DW - deadwood
ES - Epicormic sprouts
FB - fungal bodies present
LC - leaves chlorotic (yellow)
LD - leaves defoliated
LP - leader poor/problem
MB - multiple branches from same point of attachment
ML - multiple leaders
PH - planted high
PI - improper pruning
PL - planted low
RC - root crown damage/abnormality
RE - roots exposed
RG - roots girdling
SC - stems co-dominant
SG - stem girdled
ST - soil on trunk
TB - trunk bent
TC - trunk cavity
TK - trunk crooked
TD - trunk decay
TE - trunk base enlarged abnormally
TF - trunk basal flair lacking / abnormal
TG - trunk/stem girdling
TL - trunk lean (L< 5°), (M 5-20°), (H>20°)
TM - trunks multiple from at or below ground level
TS - trunk split
TT - trunk twisted
TW - trunk wound
WW - wet wood

Quantified Tree Conditions (defects, diseases)
L (low, minor), M (moderate), H (high, severe)
e.g. TK(H) = severe crooked trunk
TD(L) = minor trunk decay
TF(H) = severely poor basal trunk flare

Cardinal Coordinates (N, S, E, W)
e.g., LN(L-S) = minor lean to the south

Codes of Recommendations
A - Add mulch
B - Remove attachments (burlap, wire, stake, guard)
C - Cable
F - Fertilize
L - lower soil level
M - Monitor
N - None Needed
P - Prune
R - Remove
S - Soil bulk density (compaction) lower
V - soil volume (increase)
W - Water

Priority: An action priority schedule (i.e. general timing) to provide arboricultural treatment(s).
E - Extremely Urgent (within a week)
U - Urgent (within 3 months)
H - High (within a year)
M - Moderate (within 3 years)
L - Low (little or no action required for at least 5 years)

Limitations of Tree Assessment

It is the policy of Beacon Environmental Ltd. to attach the following clause regarding limitations of the tree assessment. The intent is to ensure that the client is aware of what is technically and professionally realistic in assessing and/or retaining trees.

The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These techniques include a visual examination of the above-ground parts of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, crown dieback, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the proximity of property and people. Except where specifically noted in the report, none of the trees examined were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms and their health and vigour constantly change over time. They are not immune to changes in site conditions, pests, or variations in the weather conditions including severe storms with high-speed winds. Furthermore, some symptoms may only be visible seasonally; the extent of observations that can be made may be limited by the time of year in which the inspection took place.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy unless stated otherwise within the report, no warranty or guarantees are offered, or implied, that these trees, or any parts of them, will have continued health or structure as noted in the report. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree or group of trees or their component parts in all circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential for failure if provided with the necessary combinations of stresses and elements. This risk can only be eliminated if the tree is removed.

Although every effort has been made to ensure that this assessment is reasonably accurate, it is recommended that trees be re-assessed periodically to identify changes in condition. Design or site plan changes may also necessitate re-assessment and/or revisions to this report. **The assessment presented in this report is valid at the time of the inspection and is intended for sole use of the client.** Any use of this report by a third party, and any decision based on this report, is the singular responsibility of the third party.

Appendix B

Tree Inventory Data

Appendix B

Tree Inventory Data

Table B-1. Summary of Individual Trees

Tree No.	Scientific Name	Common Name	DBH (cm)	Condition	Comments	Location	Recommendation
928	*Salix x sepulcralis*	Weeping Willow	13	Good	Good form and vigour.	On site	Remove
929	*Salix x sepulcralis*	Weeping Willow	26	Good	Good form and vigour; Active bird nest.	On site	Remove
930	*Salix x sepulcralis*	Weeping Willow	13, 8	Good	Good vigour; Stems fork near ground; Included bark.	On site	Remove
931	*Salix x sepulcralis*	Weeping Willow	27	Fair	Full healthy crown; Wire fence gridling stem.	On site	Remove
931B	*Salix x sepulcralis*	Weeping Willow	35, 35	Fair	Leaders broken off; Stems fork near ground; Included bark; Inaccessible due to standing water, DBH measurement estimated.	On site	Remove
932	*Salix x sepulcralis*	Weeping Willow	15	Good	Good vigour.	On site	Remove
933	*Salix x sepulcralis*	Weeping Willow	10	Good	Good vigour.	On site	Remove
934	*Salix x sepulcralis*	Weeping Willow	39	Fair	Moderate dieback and thinning; Epicormic shoots along stem.	On site	Remove
935	*Salix x sepulcralis*	Weeping Willow	40	Fair	Leader broken off; Epicormic shoots along stem; Tree growing in standing water.	On site	Remove
936	*Populus tremuloides*	Trembling Aspen	14	Good	Good form and vigour.	On site	Remove
937	*Malus pumila*	Common Apple	25, 25, 23, 15, 15	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	On site	Remove
938	*Morus alba*	White Mulberry	18	Good	Good form and vigour.	On site	Remove
NT15	*Salix x sepulcralis*	Weeping Willow	70 @ 1 m	Fair		Boundary/ Adjacent Private	Remove
NT16	*Salix x sepulcralis*	Weeping Willow	30, 25	Fair		Boundary/	Remove
NT17	*Salix x sepulcralis*	Weeping Willow	45	Poor	Rot at base and strong lean	Adjacent Private	Remove
NT18	*Salix x sepulcralis*	Weeping Willow	60	Fair-Good	Fork	Boundary/	Remove
NT19	*Salix x sepulcralis*	Weeping Willow	50, 40	Fair	Split in upper crown	Adjacent Private	Remove
NT20	*Salix x sepulcralis*	Weeping Willow	80	Fair	Dead limb with cavities	Boundary/	Remove

Table B-2. Summary of Trees in Group M1

Scientific Name	Common Name	DBH (cm)	Crown Radius (m)	Condition	Comments	Recommendation
Picea glauca	White Spruce	20	2	Good	On neighbouring property; Good form and vigour.	Remove
Picea abies	Norway Spruce	40	3	Good	On neighbouring property; Good form and vigour.	Remove
Fraxinus pennsylvanica	Green Ash	30	3	Dead	On neighbouring property; Standing snag.	Remove
Fraxinus pennsylvanica	Green Ash	40	3	Dead	On neighbouring property; Standing snag.	Remove
Picea glauca	White Spruce	20	3	Good	On neighbouring property; Good form and vigour.	Remove
Picea glauca	White Spruce	35	3	Good	On neighbouring property; Good form and vigour.	Remove
Picea pungens	Blue Spruce	20	2	Good	On neighbouring property; Good form and vigour.	Remove
Fraxinus pennsylvanica	Green Ash	30	3	Dead	On neighbouring property; Standing snag.	Remove
Fraxinus pennsylvanica	Green Ash	40	3	Dead	On neighbouring property; Standing snag.	Remove
Pinus nigra	Austrian Pine	15	2	Poor	On neighbouring property; Thin crown	Remove
Picea abies	Norway Spruce	20	2	Good	On neighbouring property; Good form and vigour.	Remove
Pinus nigra	Austrian Pine	20	2	Fair	On neighbouring property; Crown with some dieback.	Remove

Table B-3. Summary of Trees in Group M2

Scientific Name	Common Name	DBH (cm)	Crown Radius (m)	Condition	Comments	Recommendation
Acer platanoides	Norway Maple	20	3	Good	On neighbouring property; Good form and vigour.	Remove
Thuja occidentalis	Eastern White Cedar	Approx 20 stems 10–15	2	Good	On neighbouring property; Dense hedge	Remove
Acer platanoides	Norway Maple	12	2	Fair	On neighbouring property; Included bark in unions; good vigour otherwise.	Remove
Thuja occidentalis	Eastern White Cedar	15	2	Good	On neighbouring property; Good form and vigour.	Remove

Table B-4. Summary of Trees in Group M3

Scientific Name	Common Name	DBH (cm)	Crown Radius (m)	Condition	Comments	Recommendation
Fraxinus pennsylvanica	Green Ash	35	3	Dead	On neighbouring property; Standing snag.	Remove
Picea glauca	White Spruce	15	2	Good	On neighbouring property; Good form and vigour.	Remove

Table B-5. Summary of Trees in Group N1

Scientific Name	Common Name	DBH (cm)	Crown Radius (m)	Condition	Comments	Recommendation
Carya cordiformis	Bitternut Hickory	15	4	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	15	4	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	10	3	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	12	4	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	23	6	Good	Good form and vigour.	Remove
Carya cordiformis	Bitternut Hickory	22	5	Good	Good form and vigour.	Remove
Carya cordiformis	Bitternut Hickory	25	6	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	30	8	Good	Good form and vigour, Boundary tree.	Remove
Carya cordiformis	Bitternut Hickory	26	6	Good	Good form and vigour, Boundary tree.	Remove
Carya cordiformis	Bitternut Hickory	35	8	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	36	8	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	32	7	Good	Good form and vigour, Off site.	Remove
Carya cordiformis	Bitternut Hickory	31	6	Good	Good form and vigour, Boundary tree.	Remove
Ulmus americana	American Elm	35	N/A	Dead	Standing snag.	Remove
Ulmus americana	American Elm	44	N/A	Dead	Standing snag.	Remove
Malus pumila	Common Apple	12	4	Good	Good vigour.	Remove
Malus pumila	Common Apple	22	6	Fair-Good	Minor dieback and thinning, Off site.	Remove
Malus pumila	Common Apple	32	8	Fair-Good	Minor dieback and thinning, Off site.	Remove
Malus pumila	Common Apple	33	7	Fair-Good	Minor dieback and thinning, Off site.	Remove
Malus pumila	Common Apple	34	7	Fair-Good	Minor dieback and thinning, Off site.	Remove
Tilia americana	Basswood	30, 45	8	Good	Good vigour; Stems for near ground; Included bark.	Remove
Ulmus americana	American Elm	33	N/A	Dead	Standing snag.	Remove
Tilia americana	Basswood	38, 38	9	Good	Good vigour; Stems for near ground; Included bark, Off site.	Remove
Malus pumila	Common Apple	37	8	Good	Good vigour, Off site.	Remove
Prunus serotina	Black Cherry	45	8	Good	Good form and vigour, Off site.	Remove
Acer negundo	Manitoba Maple	45, 35	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark, Off site.	Rem **Recommendation** ove

Scientific Name	Common Name	DBH (cm)	Crown Radius (m)	Condition	Comments	Recommendation
Tilia americana	Basswood	55, 50	11	Good	Good vigour; Stems for near ground; Included bark; Full healthy crown.	Remove
Tilia americana	Basswood	36	7	Good	Good form and vigour.	Remove
Tilia americana	Basswood	37	8	Fair-Good	Minor dieback and thinning.	Remove
Tilia americana	Basswood	50, 55, 44	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Full healthy crown, Off site.	Remove
Tilia americana	Basswood	22	5	Good	Good form and vigour, Off site.	Remove
Tilia americana	Basswood	35	8	Good	Good form and vigour, Off site.	Remove
Tilia americana	Basswood	55	10	Good	Good form and vigour, Off site.	Remove
Tilia americana	Basswood	53	9	Good	Good form and vigour, Off site.	Remove
Tilia americana	Basswood	28	5	Good	Good form and vigour, Off site.	Remove

Table B-6. Summary of Trees in Group N2

Scientific Name	Common Name	DBH (cm)	Crown Radius (m)	Condition	Comments	Recommendation
Morus alba	White Mulberry	13	4	Good	Good vigour.	Remove
Malus pumila	Common Apple	13	3	Fair-Good	Minor dieback and thinning.	Remove
Malus pumila	Common Apple	13	3	Fair-Good	Minor dieback and thinning.	Remove
Malus pumila	Common Apple	12	3	Fair-Good	Minor dieback and thinning, Boundary tree.	Remove
Ulmus pumila	Siberian Elm	18, 15	7	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Remove
Acer negundo	Manitoba Maple	35, 38	10	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark.	Remove
Populus tremuloides	Trembling Aspen	18, 6	7	Good	Good vigour; Stems for near ground; Included bark, Boundary tree.	Remove
Populus tremuloides	Trembling Aspen	23, 6	6	Good	Good vigour; Stems for near ground; Included bark, Boundary tree.	Remove

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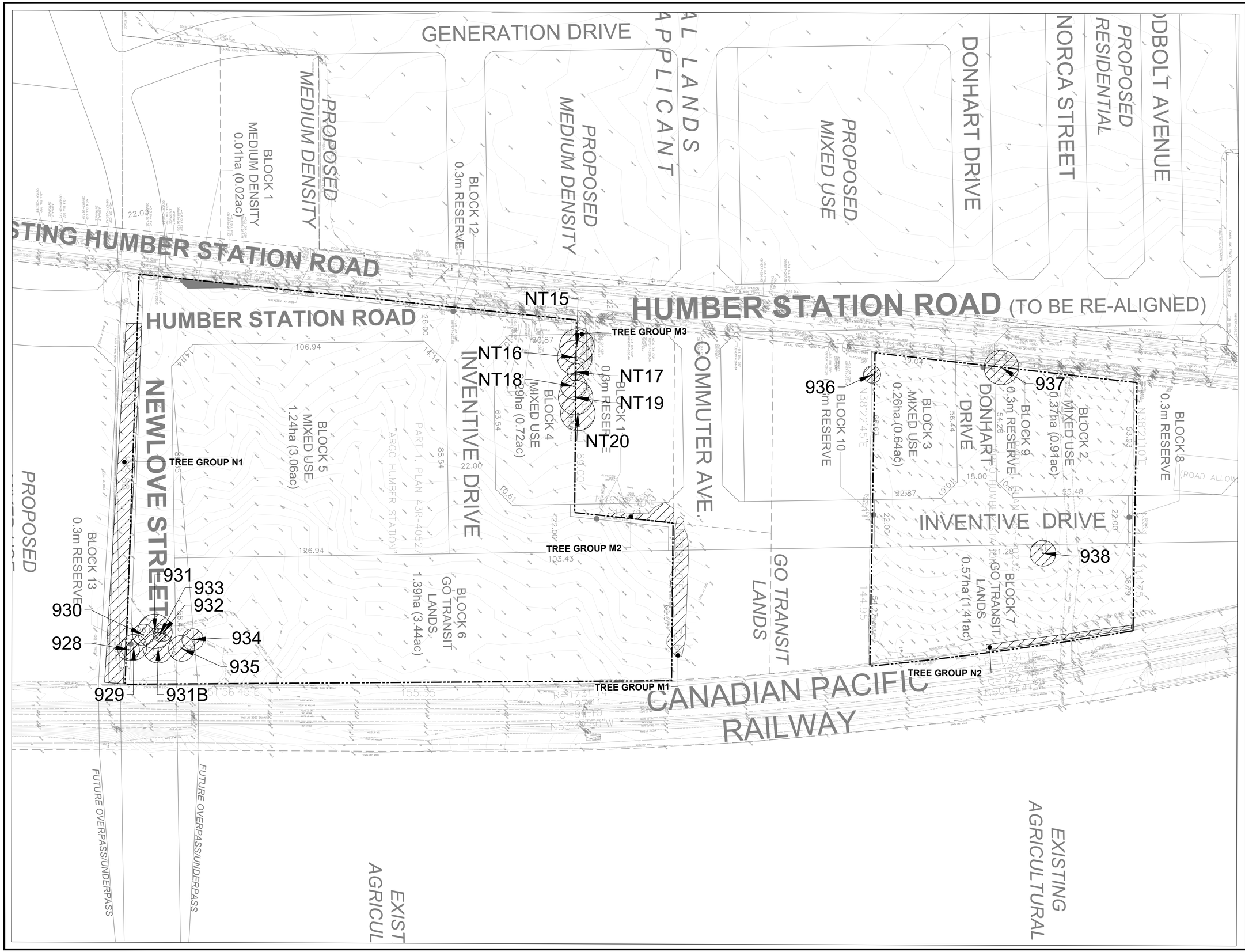
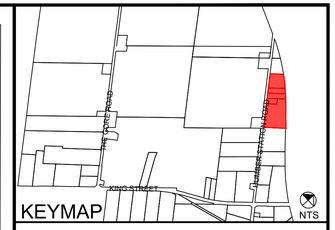
Appendix C

Tree Inventory and Preservation Plan





LEGEND

- Property Boundary
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone
- Tree Location
- Tree to be Preserved
- Tree to be Removed

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2			
1	ISSUED FOR DRAFT PLAN OF SUBDIVISION	2023/05/17	JS

SCALE 1:750 (0 10 20m)

NORTH ARROW

JAMES SEERY #ON-2350A

BEACON ENVIRONMENTAL

CLIENT
ARGO HUMBER STATION LIMITED

PROJECT
0 HUMBER STATION ROAD, LOT 12, CONC. 5, TWP., ALB

SHEET TITLE
TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY: --	PROJECT Nº: 214476
DRAWN BY: AD	FIGURE Nº: TP-1
CHECKED BY: DW	
DATE: 27 June 2024	

Humberking Draft Plan of Subdivision Arborist Report

Prepared For:

Humberking (I) Developments Limited
Humberking (IV) Developments Limited

Prepared By:

Beacon Environmental Limited

Date:	*Project:*
2024-07-02	**214476.1**

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Table of Contents

page

Figures

Tables

Appendices

1. Introduction

Beacon Environmental Limited (Beacon) was retained by Humberking (I) Developments Limited and Humberking (IV) Developments Limited to prepare an Arborist Report in support of a Draft Plan of Subdivision Application for the following Draft Plan area, hereafter referred to as the subject lands (**Figures 1A and 1B**):

- **Humberking Draft Plan of Subdivision (PRE-2023-0080) East and West Lands:** Humberking (I) Developments Limited and Humberking (IV) Developments Limited.

The subject lands are legally described as the East Half of Lot 11 Concession 4 and Part of Lots 11 and 12, Concession 5 respectively. The subject lands are generally located along Humber Station Road north of King Street.

This Arborist Report builds upon the tree inventory undertaken by Beacon in support of the 2023 Caledon Station Final Comprehensive Environmental Impact Study and Management Plan (CEISMP; **Figures 1A and 1B**). This Report was prepared in accordance with the *Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation* (Town of Caledon 2020).

The purpose of this Arborist Report is to:

- Identify and describe individual trees and tree groupings on the subject lands;
- Assess potential impacts to individual trees and tree groupings resulting from the proposed development including requirements for tree removals; and
- Provide recommendations for tree preservation and protection.

2. Methods

Tree inventory data were collected on September 15 and 29, 2023 by a Beacon arborist certified by the International Society of Arboriculture (ISA). In accordance with the Towns guidelines, the inventory included trees with a minimum of 10 cm DBH (diameter measured at breast height) on the subject lands and neighbouring private properties, and all trees (i.e., any size) located within the Municipal Road Allowance (MRA) or otherwise public lands (i.e., Canadian Pacific Railway Right-of-Way) on and within 6 m of proposed development limits. In instances where trees occurred in naturalized clumps, hedgerows or groups, trees were tallied by species and size class (i.e., 5 cm to 10 cm, and 11 cm to 20 cm DBH). The diameter for multi-stemmed trees that split below DBH was determined by taking the square root of the sum-of-squares of each stem's DBH.

In general, individual trees ≥10 cm DBH were tagged with numbered aluminum forestry tags and their locations were recorded using an EOS Arrow 100 GNSS Receiver with submeter accuracy. Trees located on adjacent properties were not tagged but were assessed based on observations from the subject lands. For each tree, the following information was recorded:

- Species;
- Trunk DBH (measured 1.4 m above grade);
- Health condition; and
- Structural condition rating.

Each tree was assigned a condition rating of good, fair, poor, or dead, based on the following criteria:

- ***Poor*** – Severe dieback, significant lean, missing leader, major defects, significant decay and/or disease presence;
- ***Fair*** – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress;
- ***Good*** – Healthy vigorous growth, minor visible defects or damage; and
- ***Dead*** – No live growth.

Tree condition was assessed based on the presence and severity of flaws, damage, evidence of pests or diseases, structural condition, dead or dying branches, or other indicators of decline. Limitations of the assessment are summarized in **Appendix A**.

3. Results

A total of 475 trees were inventoried and assessed on and adjacent to the subject lands. All inventoried tree data (i.e., individual trees and tree groups) are presented in the tree inventory tables provided in **Appendix B**. Locations of all inventoried trees are shown in **Appendix C** (TIPP).

The 475 trees include 285 individually tagged trees and 190 tallied trees distributed among six (6) tree groups (Tree Groups A to F).

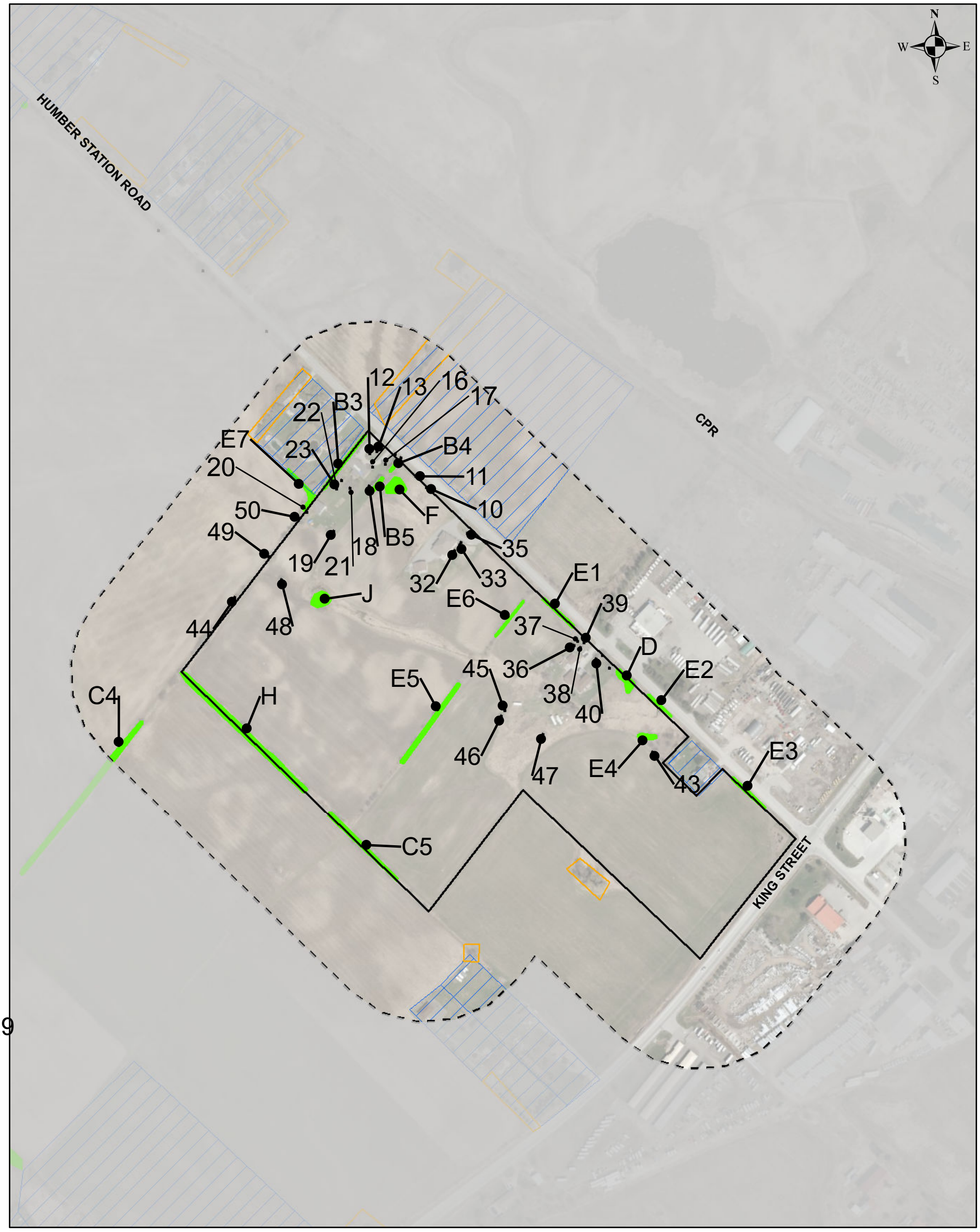
Of the 285 individually tagged trees, 233 are located within the Humberking West property and 52 are located within the Humberking East property. Of the 190 tallied trees, 167 (Tree Groups A to D) are located within Humberking West property and 23 (Tree Groups E and F) are located within Humberking East property.

3.1 Humberking West

Of the 233 individually tagged trees located within the Humberking West property, 160 are located on the subject lands, 12 are located within the adjacent private properties (0 and 14206 Humber Station Road, and 0 King Street), 19 are co-owned with adjacent private properties, 17 are located within the MRA (Humber Station Road), and 25 are co-owned with the MRA.

3.1.1 Individually Tagged Trees

Individually tagged trees located on the Humberking West property are presented in **Table 1**.



LEGEND

- HUMBERKING WEST DRAFT PLAN AREA
- STUDY AREA
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

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URBANTECH

Arborist Report
Humberking Draft Plan of Subdivision
Caledon Station Secondary Plan Area

PROJECT No. 214476

FIGURE 1A

SITE LOCATION AND TREED RESOURCES HUMBERKING WEST

June 2024 Scale 1:4,000

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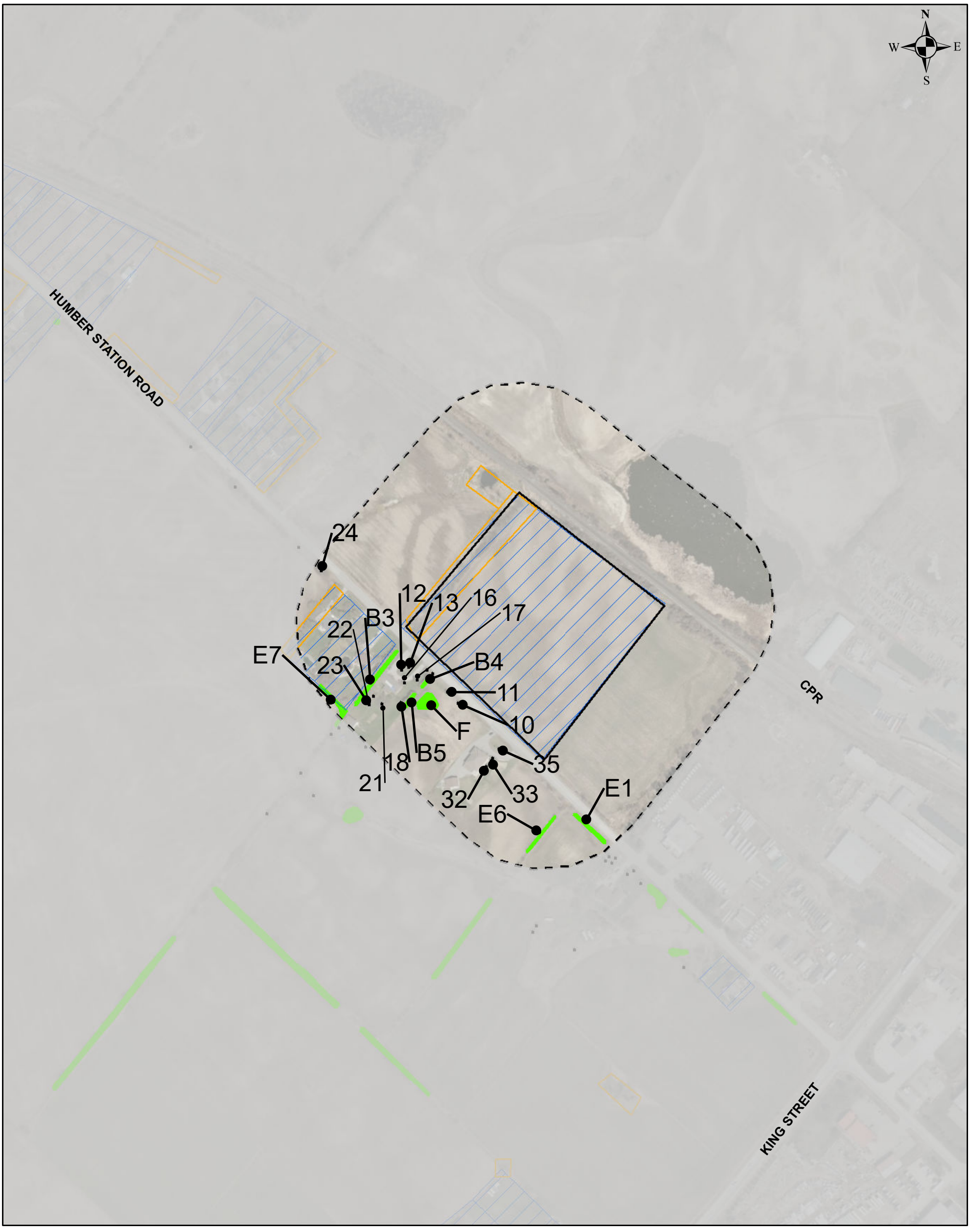

LEGEND

- HUMBERKING EAST DRAFT PLAN AREA
- STUDY AREA
- PARCELS NOT ACCESSIBLE
- TREE GROUPINGS
- • INDIVIDUAL TREES (APPROXIMATE LOCATION) (FOR TAG NUMBER - PLEASE SEE ARBORIST REPORTS)
- C1 TREE GROUPING NUMBER
- ADDITIONAL TREES INVENTORIED IN SUPPORT OF DRAFT PLAN OF SUBDIVISION (APPROXIMATE LOCATION)

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Arborist Report
Humberking Draft Plan of Subdivision
Caledon Station Secondary Plan Area

PROJECT No. 214476

FIGURE 1B

SITE LOCATION AND TREED RESOURCES HUMBERKING EAST

June 2024 Scale 1:4,000

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Table 1. Humberking West – Individually Tagged Trees

Botanical Name	Common Name	Quantity
Acer negundo	Manitoba Maple	86
Tilia americana	Basswood	13
Juglans nigra	Black Walnut	7
Picea pungens	Colorado Blue Spruce	7
Populus tremuloides	Trembling Aspen	6
Acer saccharinum	Silver Maple	5
Picea glauca	White Spruce	4
Acer platanoides	Norway Maple	4
Fraxinus pennsylvanica	Green Ash	4
Pinus sylvestris	Scots Pine	4
Robinia pseudoacacia	Black Locust	3
Malus pumila	Common Apple	2
Morus alba	White Mulberry	2
Populus deltoides	Eastern Cottonwood	2
Salix euxina	Crack Willow	2
Salix babylonica	Weeping Willow	2
Prunus avium	Sweet Cherry	2
Salix alba	White Willow	1
Quercus rubra	Northern Red Oak	1
Betula papyrifera	Paper Birch	1
Pyrus communis	Common Pear	1
Catalpa speciosa	Northern Catalpa	1
	Total	**160**

As per the results presented in **Table 1**, over half (~54%) of the inventoried trees within the Humberking West property consist of Manitoba Maple (*Acer negundo*). A little less than one quarter (~24%) of individually tagged trees consist of Basswood (*Tilia americana*), Black Walnut (*Julgans nigra*), Colorado Blue Spruce (*Picea pungens*), Trembling Aspen (*Populus tremuloides*), and Silver Maple (*A. saccharinum).* The remaining trees (~22%) consist of several to single individuals of White Spruce (*P. glauca*), Norway Maple (*A. platanoides*), Green Ash (*Fraxinus pennsylvanica*), Scots Pine (*Pinus sylvestris*), Black Locust (*Robinia pseudoacacia*), Common Apple (*Malus pumlia*), White Mulberry (*Morus alba*), Eastern Cottonwood (*P. deltoides*), Crack Willow (*Salix euxina*), Weeping Willow (*S. babylonica*), Sweet Cherry (*Prunus avium*), White Willow (*S. alba*), Northern Red Oak (*Quercus rubra*), Paper Birch (*Betula papyrifera*), Common Pear (*Pryus communis*), and Northern Catalpa (*Catalpa speciosa*).

3.1.2 Trees Located on Adjacent Private Properties

The 12 trees located on adjacent private properties (0 Humber Station Road, 14206 Humber Station Road, and 0 King Street) are listed below in decreasing order of abundance:

- Three (3) American Elm that range from 18 cm to 28 cm DBH and that are all in good condition;
- Three (3) Basswood that range from 11 cm to 23 cm DBH and that are all in good condition;
- Two (2) Manitoba Maple that are 25 cm and 35 cm DBH and in fair to good condition;
- One (1) Corkscrew Willow (*Salix matsudana*) that is 35 cm DBH and in fair to good condition;
- One (1) multi-stemmed White Willow with an aggregate DBH of 78 cm DBH that is in good condition;
- One (1) Norway Maple that is 45 cm DBH and in good condition; and
- One (1) Eastern Cottonwood that is 44 cm DBH and dead.

3.1.3 Trees Co-owned Between subject lands and Adjacent Private Properties

The 19 trees co-owned with adjacent private properties (0 Humber Station Road, 14042 Humber Station Road, and 0 King Street) are listed below in descending order of abundance:

- Eight (8) Basswood that range from 10 cm to 52 cm DBH and that are all in good condition;
- Four (4) multi-stemmed Common Apple that range from 28 cm to 61 cm in aggregate DBH and that are primarily in fair to good condition;
- Four (4) Manitoba Maple that range from 20 cm to 56 cm DBH and from fair-good to good condition;
- Two (2) Eastern White Cedar (*Thuja occidentalis*) that are 21 cm and 25 cm DBH and in good condition;
- Two (2) American Elm (Ulmus americana) that are 14 cm and 77 cm DBH and in good condition;
- One (1) White Spruce that is 55 cm DBH and in good condition; and
- One (1) Norway Maple that is 25 cm DBH and in good condition.

3.1.4 Municipal Road Allowance Trees

The 17 trees located within the MRA of Humber Station Road within Humberking West are composed of 17 Manitoba Maple that range from 8 cm to 28 cm DBH, one is dead, and the remaining range from poor to fair to good condition.

3.1.5 Trees Co-owned between subject lands and Municipal Road Allowance

The 25 trees co-owned between the subject lands and the MRA (Humber Station Road) are listed below in descending order of abundance:

- Sixteen (16) Manitoba Maple that range from 9 cm to 38 cm DBH and that are primarily in fair to good condition;
- Five (5) Scots Pine that range from 15 cm to 46 cm DBH and that are primarily in good condition;
- Two (2) White Spruce that are 23 cm and 25 cm DBH, and in good condition;
- One (1) multi-stemmed Norway Maple with an aggregate DBH of 24 cm that is fair to good condition; and
- One (1) multi-stemmed Green Ash with an aggregate DBH of 23 cm that is in poor condition.

3.2 Humberking East

Of the 52 individually tagged trees located within Humberking East property, 28 are located on the subject lands, one (1) is located on an adjacent private property (0 Humber Station Road), eight (8) are located within the MRA (Humber Station Road), one (1) is co-owned between the subject lands and MRA, seven (7) are located within the Canadian Pacific Railway Right-of-Way, and seven (7) are co-owned between the subject lands and Canadian Pacific Railway Right-of-Way.

3.2.1 Individually Tagged Trees

Individually tagged trees located on the subject lands are presented in **Table 2**.

Table 2. Humberking East – Individually Tagged Trees

Botanical Name	Common Name	Quantity
Carya cordiformis	Bitternut Hickory	9
Acer negundo	Manitoba Maple	6
Ulmus americana	American Elm	6
Malus pumila	Common Apple	4
Tilia americana	Basswood	3
	Total	**28**

As per the results presented in **Table 2**, slightly less than one third (~32%) of the inventoried trees within the Humberking East property consist of Bitternut Hickory (*Carya cordiformis*). Over one third (~43%) of inventoried trees consist of Manitoba Maple and American Elm. The remaining (~25%) consist of several to single individuals of Common Apple and Basswood.

3.2.2 Tree Located Within Adjacent Private Properties

One (1) tree was located on the adjacent private property (0 Humber Station Road). It is a multi-stemmed Manitoba Maple with an aggregate DBH of 37 cm that is in fair to good condition.

3.2.3 Municipal Road Allowance Trees

The eight (8) trees located within the MRA (Humber Station Road) are listed below in descending order of abundance:

- Five (5) multi-stemmed Damson Plum (*Prunus domestica*) that range in size from 6 cm to 16 cm in aggregate DBH, and that are primarily in fair to good condition; and
- Three (3) Eastern Red Cedar (*Juniperus virginiana*) that range in size from 11 cm to 12 cm DBH, and in good condition.

3.2.4 Trees Co-owned between subject lands and Municipal Road Allowance

One (1) tree is co-owned with the MRA (Humber Station Road). It is a Manitoba Maple that is 50 cm DBH and in poor to fair condition.

3.2.5 Canadian Pacific Railway Right-of-Way Trees

The seven (7) trees located within the Canadian Pacific Railway Right-of-Way are listed below in descending order of abundance:

- Four (4) Manitoba Maple that range from 25 cm to 35 cm DBH and that are primarily in fair to good condition;
- Two (2) American Elm that are 20 cm and 21 cm DBH and that are both dead; and
- One (1) multi-stemmed Crack Willow that is 35 cm in aggregate DBH and that is in fair to good condition.

3.2.6 Trees Co-owned between subject lands and Canadian Pacific Railway Right-of-Way

The seven (7) trees that are co-owned with the Canadian Pacific Railway Right-of-Way are listed below in descending order of abundance:

- Five (5) Manitoba Maple that range from 11 cm to 45 cm DBH and that are all fair to good condition;
- One (1) Basswood that is 49 cm DBH and in good condition; and
- One (1) American Elm that is 11 cm DBH and in good condition.

3.3 Tallied Trees

There is a total of 190 tallied trees distributed among six (6) tree groups (Tree Groups A to F) on the subject lands. Individual tree group data are provided in **Appendix B**.

3.3.1 Humberking West

The 167 tallied trees distributed among four (4) tree groups (Tree Groups A to D) located within the Humberking West property are summarized in **Table 3**.

Table 3. Humberking West - Tallied Trees

Botanical Name	Common Name	Size Class (DBH in cm)				Total
		5 – 10	11 - 20	21 - 30	31 - 45	
Populus tremuloides	Trembling Aspen	70	20	0	0	90
Thuja occidentalis	Eastern White Cedar	0	55	15	0	70
Acer negundo	Manitoba Maple	0	7	0	0	7
Total		**70**	**82**	**15**	**0**	**167**

Over half (~54%) of tallied trees that are located within Humberking West consist of Trembling Aspen with the majority (~78%) ranging from 5 cm to 10 cm DBH, and the remaining (~22%) ranging from 11 cm to 20 cm DBH. Approximately (42%) of the tallied trees consist of Eastern White Cedar. The remaining (~4%) of tallied trees consist of Manitoba Maple. Of the 167 tallied trees, 70 (~42%) range from 1 cm to 10 cm DBH, 82 (~49%) range from 11 cm to 20 cm DBH, and the remaining 15 (~9%) range from 21 cm to 30 cm DBH.

3.3.2 Humberking East

The 23 tallied trees distributed among two (2) tree groups (Tree Groups E and F) that are located within the Humberking East property are summarized below in **Table 4**.

Table 4. Humberking East - Tallied Trees

Botanical Name	Common Name	Size Class (DBH in cm)				Total
		5 – 10	11 - 20	21 - 30	31 - 45	
Tilia americana	Basswood	0	0	5	5	10
Prunus domestica	Damson Plum	0	8	0	0	8
Acer negundo	Manitoba Maple	0	4	1	0	5
Total		**0**	**12**	**6**	**5**	**23**

Over one third (~43%) of tallied trees that are located within Humberking East consist of Basswood with half (50%) ranging from 21 cm to 30 cm, and half (50%) ranging from 31 to 45 cm DBH. Approximately (35%) of the tallied trees consist of Damson Plum. The remaining trees (~22%) consist of Manitoba

Maple. Of the 23 tallied trees, 12 (~52%) range from 11 cm to 20 cm DBH, 6 (~26%) range from 11 cm to 20 cm DBH, and the remaining 5 (~21%) range from 21 cm to 45 cm DBH.

4. Impact Assessment and Recommendations

The majority of trees will need to be removed to facilitate development of the subject lands. A total of 475 trees composed of 285 individually tagged trees and 190 tallied trees (Tree Groups A to F) are proposed or recommended for removal on and within 6 m of the proposed development limits.

4.1 Humberking West Tree Removals

4.1.1 Individually Tagged Trees

Of the 233 individually tagged trees proposed for removal located within Humberking West property, 145 are located within the subject lands (**Table 5**), 10 are located within the adjacent private properties (0 and 14206 Humber Station Road and 0 King Street), 14 are co-owned between the subject lands and adjacent private properties (0 Humber Station Road and 0 King Street), 13 are located within the MRA (Humber Station Road), and 20 are co-owned between the subject lands and MRA.

Table 5. Humberking West Tree Removals

Botanical Name	Common Name	Quantity
Acer negundo	Manitoba Maple	81
Tilia americana	Basswood	13
Juglans nigra	Black Walnut	7
Picea pungens	Colorado Blue Spruce	7
Populus tremuloides	Trembling Aspen	4
Acer saccharinum	Silver Maple	4
Picea glauca	White Spruce	4
Acer platanoides	Norway Maple	4
Pinus sylvestris	Scots Pine	3
Robinia pseudoacacia	Black Locust	3
Malus pumila	Common Apple	2
Morus alba	White Mulberry	2
Prunus avium	Sweet Cherry	2
Fraxinus pennsylvanica	Green Ash	1
Populus deltoides	Eastern Cottonwood	1
Salix euxina	Crack Willow	1
Salix babylonica	Weeping Willow	1
Salix alba	White Willow	1
Quercus rubra	Northern Red Oak	1
Betula papyrifera	Paper Birch	1

Botanical Name	Common Name	Quantity
Pyrus communis	Common Pear	1
Catalpa speciosa	Northern Catalpa	1
	Total	**145**

Slightly over half (~56%) of the trees proposed for removal consist of Manitoba Maple. Approximately (29%) of the subject lands trees consist of Basswood, Black Walnut, Colorado Blue Spruce, Trembling Aspen, Silver Maple, White Spruce, and Norway Maple. The remaining trees (~15%) consist of several to single individuals of Scots Pine, Black Locust, Common Apple, White Mulberry, Sweet Cherry, Green Ash, Eastern Cottonwood, Crack Willow, Weeping Willow, White Willow, Northern Red Oak, Paper Birch, Common Pear, and Northern Catalpa.

The ten (10) trees (Tree Nos. NT1, NT3 to NT5, NT7, and NT8 to NT12) located on adjacent private properties (0 and 14206 Humber Station Road, and 0 King Street) are listed below in descending order of abundance:

- Three (3) Basswood that range from 11 cm to 23 cm DBH;
- Three (3) American Elm that range from 18 cm to 28 cm DBH;
- Two (2) Manitoba Maple that are 25 cm and 35 cm DBH;
- One (1) Norway Maple that is 45 cm DBH; and
- One (1) Corkscrew Willow that is 35 cm DBH.

The 14 trees (Tree Nos. 45, 1011, 1032, 1043, 1044, 1047 to 1054, and NT13) co-owned between the subject lands and adjacent private properties (0 Humber Station Road and 0 King Street) are listed in descending order of abundance below:

- Six (6) Basswood that range from 10 cm to 52 cm DBH;
- Four (4) multi-stemmed Common Apple that range from 28 cm to 82 cm in aggregate DBH;
- Two (2) Manitoba Maple that range 32 cm to 37 cm DBH; and
- Two (2) American Elm that are 14 cm and 77 cm DBH.

The 13 trees (Tree Nos. 1027, 1366 to 1372, 1377, 1382 to 1384, and 1387) located within the MRA (Humber Station Road) that are proposed for removal include 13 Manitoba Maple that range from 13 cm to 28 cm DBH.

The 20 trees (Tree Nos. 50, 51, 54, 55, 1091 to 1093, 1095, 1098, 1100, 1302, 1317, 1319 to 1321, 1323, 1373, and 1374 to 1376) co-owned between the subject lands and MRA (Humber Station Road) are listed below in descending order of abundance:

- Twelve (12) Manitoba Maple that range from 9 cm to 38 cm DBH;
- Five (5) Scots Pine that range from 15 cm to 46 cm DBH;
- Two (2) White Spruce that are 23 cm and 25 cm DBH; and
- One (1) multi-stemmed Norway Maple with an aggregate DBH of 24 cm.

Permissions are required from adjacent private property owners and Town prior to the removal of off property and boundary trees.

4.1.2 Tallied Trees

Four tree groups (A, B, C and D), with a total of 167 talled trees (97 of which are >10 cm DBH), are proposed for removal as summarized in **Table 3** and the Tree Inventory Tables in **Appendix B**.

4.2 Humberking East Tree Removals

4.2.1 Individually Tagged Trees

Of the 52 individually tagged trees proposed for removal within Humberking East property, 24 are located within the subject lands (**Table 6**), one (1) is located on adjacent private property (0 Humber Station Road), seven (7) are located within the MRA (Humber Station Road), and two (2) are co-owned between the subject lands and Canadian Pacific Railway Right-of-Way.

Table 6. Humberking East Tree Removals

Botanical Name	Common Name	Quantity
Carya cordiformis	Bitternut Hickory	9
Acer negundo	Manitoba Maple	6
Ulmus americana	American Elm	3
Malus pumila	Common Apple	3
Tilia americana	Basswood	3
	Total	**24**

Slightly over one third (~37%) of the individual trees located within the subject lands for Humberking East proposed for removal consist of Bitternut Hickory. One quarter (25%) of the trees proposed for removal consist of Manitoba Maple. The remaining (~38%) consist of several to single individuals of American Elm, Common Apple, and Basswood.

The one (1) tree (Tree No. 1477) located on the adjacent private property (0 Humber Station Road) proposed for removal within Humberking East is a multi-stemmed Manitoba Maple with an aggregate DBH of 37 cm.

The seven (7) trees (Tree Nos. 1391 to 1397) located within the MRA (Humber Station Road) proposed for removal are listed below in descending order of abundance:

- Four (4) multi-stemmed Damson Plum that range in size from 6 cm to 16 cm in aggregate DBH; and
- Three (3) Eastern Red Cedar that range in size from 11 cm to 12 cm DBH.

There are two (2) trees (Tree Nos. 1399 and 1400) co-owned between the subject lands and Canadian Pacific Railway Right-of-Way that are proposed for removal within Humberking East that include one (1) Basswood that is 49 cm DBH and one (1) Manitoba Maple that is 15 cm DBH.

Permissions are required from the adjacent private property owner and Canadian Pacific Railway prior to the removal of off property and boundary trees.

4.2.2 Tallied Trees

Two tree groups (E and F) with a total of 23 tallied trees (all >10 cm DBH) are proposed for removal as summarized in **Table 4** and the Tree Inventory Tables in **Appendix B**.

4.3 Trees Recommended for Removal Due to Condition

30 trees observed to be dead, in poor condition or in a state of decline that are a potential risk to workers, buildings or vehicles, either during or post-development are recommended for removal (**Appendix C**) due to condition. 24 trees are located within the Humberking West property and six are located within the Humberking East property.

4.3.1 Humberking West Trees Recommended for Removal

Of the 24 trees recommended for removal due to condition located within the Humberking West lands, 14 are located on the subject lands, one (1) is located within the adjacent private property (14206 Humber Station Road), four (4) are located within the MRA (Humber Station Road), and five (5) are co-owned between the subject lands and MRA.

The 14 trees located within the subject lands associated with the Humberking West Draft Plan area are recommended for removal due to condition include five (5) trees that are in a state of decline or in poor condition, and (9) nine trees that are dead.

The five (5) trees (Tree Nos. 1029, 1070, 1077, 1085, and 1086) in a state of decline or poor condition are listed below in descending order below:

- Two (2) multi-stemmed Manitoba Maple that are 21 cm and 25 cm in aggregate DBH;
- Two (2) multi-stemmed Green Ash that are 12 cm and 13 cm in aggregate DBH; and
- One (1) multi-stemmed Weeping Willow with an aggregate DBH of 117 cm.

The nine (9) trees (Tree Nos. 1007, 1019, 1021, 1072, 1301, 1311, 1314, 1345, and 1379) that are located on the subject lands and dead are listed below in descending order:

- Two (2) multi-stemmed Manitoba Maple that are 28 cm and 29 cm in aggregate DBH;
- Two (2) Trembling Aspen that are both 24 cm DBH;
- One (1) Silver Maple that is 39 cm DBH;
- One (1) Eastern Cottonwood that is 58 cm DBH;
- One (1) multi-stemmed Crack Willow that is 38 DBH;
- One (1) Green Ash that is 45 cm DBH; and
- One (1) Scots Pine that is 24 cm DBH.

The one (1) tree (Tree No. NT2) located on the adjacent private property (14206 Humber Station Road) recommended for removal due to condition within the Humberking West lands is an Eastern Cottonwood that is 44 cm DBH and dead.

The four (4) trees (Tree Nos. 1381, 1385, 1386, and 1388) that are located within the MRA recommended for removal due to condition within Humberking West are composed of four (4) Manitoba Maple that range from 8 cm to 25 cm DBH, one (1) is dead and the remaining are in poor condition.

The five (5) trees (Tree Nos. 1090, 1094, 1096, 1097, and 1099) that are co-owned between the subject lands and MRA recommended for removal due to condition within Humberking West are all in a state of decline or in poor condition. The five (5) trees are composed of four (4) multi-stemmed Manitoba Maple that range from 20 cm to 29 cm in aggregate DBH; and one (1) multi-stemmed Green Ash with an aggregate DBH of 23 cm.

Permissions are required from adjacent private property owners and Town prior to the removal of off property and boundary trees.

4.3.2 Humberking East Trees Recommended for Removal

Of the six (6) trees recommended for removal due to condition (i.e., in a state of decline, in poor condition, and/or dead) four (4) are located on the subject lands, one (1) is located within the MRA, and one (1) is located co-owned between the subject lands and MRA.

The four (4) trees (Tree Nos. 1398, 1413, 1419, and NT22) located on the subject lands associated with Humberking East recommended for removal due to condition are composed of three (3) American Elm that range from 34 cm to 50 cm DBH and that are dead, and one (1) multi-stemmed Common Apple with an aggregate DBH of 32 cm and in poor condition.

The one (1) tree (Tree No. 1390) located within the MRA recommended for removal due to condition within Humberking East is one (1) multi-stemmed Damson Plum with an aggregate DBH of 16 cm.

The one (1) tree (Tree No. 1389) that is co-owned between the subject lands and MRA is one (1) Manitoba Maple that is 50 cm and in a state of decline.

Permissions are required from the Town prior to the removal of off property and boundary trees.

4.4 Trees Recommended for Preservation

There are 19 trees recommended for preservation. Of the 19 trees, seven (7) trees (Tree Nos. NT14 to NT19, and NT21) are located within the Draft Plan of Subdivision for Humberking West and 12 trees (Tree Nos. 1401 to 1403, 1406, 1408, NT23 to NT29) are located within the Draft Plan of Subdivision for Humberking East. The trees recommended for preservation are primarily located on the adjacent private properties and Canadian Pacific Railway Right-of-Way. Tree species recommended for preservation consist of Manitoba Maple, Crack Willow, American Elm, Eastern White Cedar, Norway Maple, White Spruce, and White Willow. Further details regarding species, quantities, sizes of trees recommended for preservation can be found in **Appendix B**.

4.5 Tree Protection

There is potential for damage to occur to trees during construction if proper precautions and protection measures are not implemented. Trees can be negatively impacted through grade changes, soil compaction, root cutting, and mechanical damage to trunks and branches resulting from the operation of construction equipment.

Any trees that do not require removal to accommodate construction shall be protected through the establishment of a minimum Tree Protection Zone (TPZ). Prior to construction, tree protection fencing is required to be installed around the tree located a minimum distance as shown in the TPZ column within the tree inventory tables presented in **Appendix B**. The TPZ should be measured from the base of the tree, or to the edge of paved surface. The location of the tree protection barriers in relation to the proposed development is shown in the TIPP (**Appendix C**). As per the Town of Caledon's guidelines, tree protection barriers shall consist of 1.2 m (4 ft) high orange plastic snow fence wired to T-bars. The TPZ barrier should be constructed as per the Town of Caledon's TPZ barrier specifications and tree protection details as shown in **Appendix C**.

A minimum TPZ radius of 6 cm is recommended for every 1 cm of trunk diameter, which is consistent with surrounding local municipalities (City of Toronto, City of Richmond Hill). **Table 7** below outlines TPZs based on tree diameter categories with 6 cm of TPZ radius for every 1 cm of trunk diameter.

Table 7. Minimum TPZ Distances

Trunk Diameter at Breast Height (cm)	Minimum TPZ (m)
≤10	1.2
11-20	1.2
21-30	1.8
31-40	2.4
41-50	3.0
51-60	3.6
61-70	4.2
71-80	4.8
81-90	5.4
91-100	6.0

TPZs that are less than the standard minimum generally require additional arboricultural measures to be applied to trees (i.e. root/branch pruning, soil protection, etc.).

In addition to the establishment of TPZs, the following specifications are recommended:

- Before the beginning of work, the contractor shall meet with Beacon Environmental on site to review work procedures, access routes, storage areas and the TPZ or other tree protection measures;
- Tree protection fencing shall be installed and in good condition prior to the start of construction and is to be maintained in good condition throughout the duration of construction activities;

- Areas within the tree protection fencing of the trees designated for preservation are not to be used for any type of storage;
- Trees shall not have any rigging cables or hardware of any sort attached or wrapped around them, nor shall any contaminants be dumped within the protective areas or flushed where they may come into contact with the feeder roots of the trees;
- In the event that it is necessary to remove additional limbs or portions of trees, after construction has commenced, to accommodate construction, the consulting Arborist or project administrator is to be informed and the removal is to be executed carefully and in full accordance with arboricultural techniques, by a qualified Arborist;
- During excavation operations in which roots are affected, the Contractor is to prune all exposed roots cleanly. Pruned root ends shall point obliquely downwards. The exposed roots should not be allowed to dry out. The Contractor shall discuss watering of the roots with the Owner and Contract Administrator prior to pruning to ensure that so that optimum soil moisture is maintained during construction and backfilling operations. Backfilling must be completed as soon as practical with clean, uncontaminated native topsoil or mulch. Directional drilling is recommended for installing infrastructure servicing within TPZs; and
- Where the access route abuts the tree protection fencing, curb shall be hand-formed to minimize root loss.

4.6 Timing of Tree Removals

The federal *Migratory Bird Convention Act* (1994) and the provincial *Fish and Wildlife Conservation Act* (1997) protect the nests, eggs and young of most bird species from harm or destruction. Environment Canada considers the general nesting period of breeding birds in southern Ontario to be between late March and the end of August. This includes times at the beginning and end of the season when only a few species might be nesting. During the peak period of bird nesting, no vegetation clearing or disturbance to nesting bird habitat should occur (between mid-May and mid-July). In the “shoulder” seasons of April 1 to May 15, and July 16 to August 31, vegetation clearing could occur, but only after an ecologist with appropriate avian knowledge has surveyed the area to confirm an absence of nesting. If nesting is found, then vegetation clearing (in an area around the nest) has to wait until nesting has concluded. From September 1 through to March 31, of any year, vegetation clearing can occur without nest surveys, but the law for nest protection applies at any time (i.e., if an active nest is known it should be protected). Nesting habitat includes grasses, shrubs trees and structures.

5. Tree Replacement

The Town of Caledon requires compensation for the removal of healthy tableland trees as outlined in *Terms of Reference for Arborist Reports, Tree Preservation Plans and Tableland Tree Removal Compensation* (2020). Compensation for removed trees is determined based on the cost to replace the trees that will be removed due to development. The Town of Caledon has developed a formula for calculating compensation values that is based on tree size. An analysis has been completed for using this formula for the Draft Plan East and West properties.

5.1 Humberking West Tree Compensation Calculations

As per the Town's requirements, the tree compensation calculations for Humberking West tree removals are presented in **Table 8** below.

Table 8. Humberking West Compensation Calculations Based on Town Requirements

Diameter at Breast Height (cm)	Number of Trees to be Removed	Compensation Ratio	Number of Compensation Trees
10-20	173	1:1	173
21-35	101	2:1	202
36-50	26	3:1	38
51-65	8	4:1	32
>65	10	5:1	50
Total:	**318**	**Total:**	**495***

*Does not account for shared boundary trees with 0 King Street (Argo Macville)

As per the results in **Table 8**, a total of 495 replacement trees are required for the removal of 318 trees (includes individually tagged and tallied trees) that are 10 cm DBH or greater, and in fair to good condition within Humberking West.

The number of replacement trees identified in **Table 8** does not account for the removal of several trees (NT7-NT13) located at 0 King Street, which will be removed by others (Argo Macville). It also does not account for 10 shared boundary trees located on the property line with 0 King Street (Argo Macville), including 1043, 1044, 1047-1054. The removal of these shared boundary trees is required to accommodate both development proposals; therefore, it is understood that replacement of these trees is a shared responsibility. The number of replacement trees required for these boundary trees is 24; therefore, an additional 12 replacement trees are required for Humberking West, bringing the total to **507**.

5.2 Humberking East Tree Compensation Calculations

As per the Town's requirements, the tree compensation calculations for Humberking East tree removals are presented in **Table 9** below.

Table 9. Humberking East Compensation Calculations Based on Town Requirements

Diameter at Breast Height (cm)	Number of Trees to be Removed	Compensation Ratio	Number of Compensation Trees
10-20	25	1:1	25
21-35	12	2:1	24
36-50	15	3:1	45
51-65	2	4:1	8
>65	0	5:1	0
Total:	**54**	**Total:**	**102**

As per the results in **Table 9**, a total of 102 replacement trees are required for the removal of 54 trees (includes individually tagged and tallied trees) that are 10 cm DBH or greater, and in fair to good condition within Humberking East.

5.3 Tree Replacement Recommendations

As per Section 2.3 of the Town of Caledon's *Development Standard Manual* (2019), replacement trees should be of healthy, balled and burlap caliper stock. Replacement trees should be sized accordingly, deciduous trees 60 mm caliper in size, flowering (specimen trees) 50 mm caliper in size, and coniferous trees 225 cm in height. To avoid a monoculture, a variety of trees should be used and have no more than four (4) to eight (8) of the same species grouped along a street, and no more than 20% of the same species for any streetscape. Trees shall be diverse and hardy to withstand urban conditions. All boulevard trees are required a minimum depth of 300 mm of topsoil and sod.

Recommended replacement tree species are listed in **Table 10**. The planting of invasive species such as Norway Maple, should be avoided entirely.

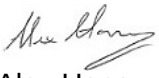
Table 10. List of Recommended Replacement Tree Species for Planting

Scientific Name	Common Name
Acer saccharum	Sugar Maple
Aesculus glabra	Ohio Buckeye
Amelanchier laevis	Smooth Serviceberry
Carya cordiformis	Bitternut Hickory
Carya ovata	Shagbark Hickory
Cercis canadensis	Eastern Redbud
Gymnocladus dioica	Kentucky Coffee-tree
Quercus biocolor	Swamp White Oak
Quercus coccinea	Scarlet Oak
Quercus macrocarpa	Bur Oak
Liriodendron tulipifera	Tulip Tree
Picea glauca	White Spruce
Pinus strobus	White Pine
Tilia americana	Basswood
Thuja occidentalis	Eastern White Cedar
Ulmus 'Frontier'	Frontier Elm

Trees should be planted with adequate soil volume using good quality soil, proper installation, and subsequent maintenance. Furthermore, replacement trees should be watered regularly for at least the first two years.

If there is in insufficient room to plant the required number of replacement trees on-site, then financial compensation (cash-in-lieu) may be accepted at rate (per tree) as determined by the Town.

Prepared by:
Beacon Environmental Ltd.



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Senior Geomorphologist

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Appendix A

Limitations of Tree Assessment

Appendix A

Limitations of Tree Assessment

It is the policy of Beacon Environmental Limited to attach the following clause regarding limitations of the tree assessment. The intent is to ensure that the client is aware of what is technically and professionally realistic in assessing and/or retaining trees.

The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These techniques include a visual examination of the above-ground parts of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, crown dieback, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the proximity of property and people. Except where specifically noted in the report, none of the trees examined were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms and their health and vigour constantly change over time. They are not immune to changes in site conditions, pests, or variations in the weather conditions including severe storms with high-speed winds. Furthermore, some symptoms may only be visible seasonally; the extent of observations that can be made may be limited by the time of year in which the inspection took place.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy unless stated otherwise within the report, no warranty or guarantees are offered, or implied, that these trees, or any parts of them, will have continued health or structure as noted in the report. It is both professionally and practically impossible to predict with absolute certainty the behaviour of any single tree or group of trees or their component parts in all circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential for failure if provided with the necessary combinations of stresses and elements. This risk can only be eliminated if the tree is removed.

Although every effort has been made to ensure that this assessment is reasonably accurate, it is recommended that trees be re-assessed periodically to identify changes in condition. Design or site plan changes may also necessitate re-assessment and/or revisions to this report. **The assessment presented in this report is valid at the time of the inspection and is intended for sole use of the client.** Any use of this report by a third party, and any decision based on this report, is the singular responsibility of the third party.

Appendix B

Tree Inventory Data

Appendix B

Tree Inventory Data

Table 1. Humberking West - Tree Inventory Table

Humberking West - Tree Inventory Table									
Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
33	*Picea glauca*	White Spruce	30	6	Fair-Good	Minor dieback and thinning; Stem leaning towards the east.	Subject Lands	N/A	Remove Due to Development
35	*Picea glauca*	White Spruce	35, 26, (44)	8	Good	Good vigour; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
37	*Acer negundo*	Manitoba Maple	37	12	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
39	*Quercus rubra*	Northern Red Oak	48	12	Fair-Good	Minor dieback and thinning; Large mature tree.	Subject Lands	N/A	Remove Due to Development
40	*Juglans nigra*	Black Walnut	56	14	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
42	*Acer negundo*	Manitoba Maple	36	9	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
45	*Acer negundo*	Manitoba Maple	11, 35, (37)	8	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	Co-owned between Subject Lands and 0 Humber Station Road	N/A	Remove Due to Development
46	*Picea pungens*	Colorado Blue Spruce	27	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
47	*Picea pungens*	Colorado Blue Spruce	27	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
48	*Picea pungens*	Colorado Blue Spruce	27	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
49	*Picea pungens*	Colorado Blue Spruce	21	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
50	*Picea glauca*	White Spruce	25	7	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
51	*Picea glauca*	White Spruce	23	5	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
52	*Picea pungens*	Colorado Blue Spruce	32	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
54	*Acer platanoides*	Norway Maple	15, 19, (24)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
55	*Acer negundo*	Manitoba Maple	29	8	Good	Good vigour; Stem leaning slightly towards southeast; Epicormic shoots at breast height and at base.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
56	*Picea glauca*	White Spruce	30, 20, (36)	8	Good	Good vigour; Full healthy crown; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
57	*Picea pungens*	Colorado Blue Spruce	18	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
58	*Prunus avium*	Sweet Cherry	24, 30, (38)	9	Fair-Good	Good form; Full healthy crown; Stems fork near ground; Included bark; Wounds along smaller stem that are sealing well.	Subject Lands	N/A	Remove Due to Development

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
60	*Acer negundo*	Manitoba Maple	61	16	Fair-Good	Good form; Minor dieback and thinning; Stem girdled slightly by slack line; Wood blocks nailed into stem.	Subject Lands	N/A	Remove Due to Development
61	*Prunus avium*	Sweet Cherry	43	9	Fair-Good	Good form and vigour; Stem being girdled by slack line.	Subject Lands	N/A	Remove Due to Development
62	*Acer negundo*	Manitoba Maple	27, 28, (39)	9	Fair-Good	Good form and vigour; Mechanical wounds to stem; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
63	*Salix alba*	White Willow	80	16	Good	Good form and vigour; Full healthy crown; Large mature tree; Weeping willow species.	Subject Lands	N/A	Remove Due to Development
72	*Acer negundo*	Manitoba Maple	27, 10, 8, 5, 5, 5, (32)	10	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1001	*Betula papyrifera*	Paper Birch	22, 22, (31)	9	Good	Good vigour; Stems fork near ground; Stems partially fused; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1002	*Robinia pseudoacacia*	Black Locust	45	12	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1003	*Morus alba*	White Mulberry	39	8	Good	Good form and vigour; Weeping variety; Canopy pruned to maintain shape.	Subject Lands	N/A	Remove Due to Development
1004	*Morus alba*	White Mulberry	39	8	Good	Good form and vigour; Weeping variety; Canopy pruned to maintain shape.	Subject Lands	N/A	Remove Due to Development
1006	*Populus deltoides*	Eastern Cottonwood	75	14	Fair	Moderate dieback and thinning; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1007	*Populus deltoides*	Eastern Cottonwood	58	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1008	*Acer platanoides*	Norway Maple	22	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1009	*Robinia pseudoacacia*	Black Locust	44	10	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1010	*Robinia pseudoacacia*	Black Locust	20	9	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1011	*Acer negundo*	Manitoba Maple	10, 30, (32)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Stems with significant lean towards the southeast; Canopy extends onto subject property.	Co-owned between Subject Lands and 0 Humber Station Road	N/A	Remove Due to Development
1012	*Acer platanoides*	Norway Maple	77	18	Fair-Good	Good form and vigour; Full healthy crown; Tree house built in canopy; Wooden boards nailed to stem; Retagged previous tag has fallen off.	Subject Lands	N/A	Remove Due to Development
1013	*Picea glauca*	White Spruce	13	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1014	*Acer platanoides*	Norway Maple	21, 24, (32)	10	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1015	*Acer negundo*	Manitoba Maple	24	8	Fair-Good	Good vigour; Minor dieback and thinning; Significant lean towards the southeast.	Subject Lands	N/A	Remove Due to Development
1016	*Acer negundo*	Manitoba Maple	46	10	Good	Good vigour; Full healthy crown; Stems fused together at breast height.	Subject Lands	N/A	Remove Due to Development
1017	*Acer negundo*	Manitoba Maple	17, 21, (27)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark; Significant lean towards the southeast.	Subject Lands	N/A	Remove Due to Development
1018	*Populus tremuloides*	Trembling Aspen	32	8	Fair	Good form; Canker through stem; Wound wood present.	Subject Lands	N/A	Remove Due to Development
1019	*Populus tremuloides*	Trembling Aspen	24	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1020	*Populus tremuloides*	Trembling Aspen	21	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1021	*Populus tremuloides*	Trembling Aspen	24	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1022	*Populus tremuloides*	Trembling Aspen	21	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1023	*Populus tremuloides*	Trembling Aspen	21	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1024	*Acer platanoides*	Norway Maple	20	8	Fair-Good	Good vigour; Stem partially fused into neighbouring tree.	Subject Lands	N/A	Remove Due to Development
1025	*Picea pungens*	Colorado Blue Spruce	12	4	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1026	*Acer negundo*	Manitoba Maple	33	10	Fair-Good	Good vigour; Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1027	*Acer negundo*	Manitoba Maple	13, 10, 8, (18)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1028	*Salix babylonica*	Weeping Willow	100, 35, (106)	18	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1029	*Salix babylonica*	Weeping Willow	100, 60, (117)	20	Poor	Moderate dieback and thinning; Larger stem has partially failed and is laying on ground; Large rotting cavities through out stem and at base; Stems fork near ground; Included bark; Weeping willow species.	Subject Lands	N/A	Remove Due to Condition
1030	*Acer negundo*	Manitoba Maple	37, 36, 21, (56)	12	Fair-Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark; Wire fence fused into stem at base; Retagged previous tag has fallen off.	Subject Lands	N/A	Remove Due to Development
1031	*Tilia americana*	Basswood	17	6	Good	Good vigour; Full healthy crown; Adventitious shoots at base.	Subject Lands	N/A	Remove Due to Development
1032	*Ulmus americana*	American Elm	77	16	Good	Good form and vigour; Full healthy crown; Good root flare; Notable tree.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1033	*Acer negundo*	Manitoba Maple	21, 10, 10, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1034	*Tilia americana*	Basswood	23	7	Good	Good vigour; Full healthy crown; Adventitious shoots at base.	Subject Lands	N/A	Remove Due to Development
1035	*Tilia americana*	Basswood	18	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1036	*Tilia americana*	Basswood	18	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1037	*Tilia americana*	Basswood	12, 3, (12)	4	Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1038	*Tilia americana*	Basswood	10	4	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1039	*Tilia americana*	Basswood	51, 33, 57, 50, 50, 50, (120)	18	Good	Good vigour; Full healthy crown; Large spreading branches; Good root flare; Notable tree.	Subject Lands	N/A	Remove Due to Development
1040	*Tilia americana*	Basswood	10	3	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1041	*Tilia americana*	Basswood	27	9	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1042	*Tilia americana*	Basswood	23	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1043	*Tilia americana*	Basswood	9, 26, 28, 11, 10, 18, 25, (52)	12	Good	Good vigour; Full healthy crown; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1044	*Tilia americana*	Basswood	11	3	Good	Good form and vigour.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1045	*Tilia americana*	Basswood	17	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1046	*Tilia americana*	Basswood	20, 22, 40, 38, 32, 10, 11, 10, (73)	14	Good	Good vigour; Full healthy crown; Large spreading branches; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1047	*Tilia americana*	Basswood	16	6	Good	Good form and vigour.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1048	*Tilia americana*	Basswood	19, 18, 10, (28)	10	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1049	*Tilia americana*	Basswood	10, 8, (13)	6	Good	Good vigour; Stems partially fused together below breast height.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1050	*Tilia americana*	Basswood	15, 10, 8, 5, (20)	7	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1051	*Ulmus americana*	American Elm	14	6	Good	Good form and vigour.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1052	*Malus pumila*	Common Apple	50, 35, (61)	9	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1053	*Malus pumila*	Common Apple	55, 55, 25, (82)	12	Fair	Moderate dieback and thinning; Stems fork near ground; Fruiting at time of inventory; Large mature tree.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1054	*Malus pumila*	Common Apple	30, 40, (50)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Fruiting at the time of inventory.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1055	*Acer negundo*	Manitoba Maple	25, 10, 10, 12, (31)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1056	*Acer negundo*	Manitoba Maple	15, 12, (19)	6	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1057	*Acer negundo*	Manitoba Maple	15, 15, 15, 10, (28)	7	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1058	*Acer negundo*	Manitoba Maple	27, 25, (37)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1059	*Acer negundo*	Manitoba Maple	15, 15, 12, (24)	7	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1060	*Acer negundo*	Manitoba Maple	18, 16, (24)	10	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1061	*Acer negundo*	Manitoba Maple	16, 8, 8, 4, (20)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1062	*Acer negundo*	Manitoba Maple	9, 6, 4, (12)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1063	*Acer negundo*	Manitoba Maple	9, 8, 13, 6, (19)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1064	*Acer negundo*	Manitoba Maple	21, 14, (25)	9	Fair-Good	Good vigour; Stems fork near ground; Included bark; One stem partially fused into wire property fence	Subject Lands	N/A	Remove Due to Development
1065	*Acer negundo*	Manitoba Maple	14, 14, 20, 21, (35)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1066	*Acer negundo*	Manitoba Maple	17, 10, 10, 4, (22)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1067	*Acer negundo*	Manitoba Maple	12, 11, 15, (22)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; One stem partially fused into wire property fence.	Subject Lands	N/A	Remove Due to Development

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1068	*Acer negundo*	Manitoba Maple	11, 4, 4, 5, (13)	7	Fair-Good	Minor dieback and thinning; Steps fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1069	*Acer negundo*	Manitoba Maple	12, 9, 4, (16)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1070	*Fraxinus pennsylvanica*	Green Ash	11, 3, 7, (13)	5	Poor	Main stem has died; Two live stems are epicormic shoots; Stems fork near ground; Included bark; Decline likey due to EAB infestation.	Subject Lands	N/A	Remove Due to Condition
1071	*Acer negundo*	Manitoba Maple	13, 9, 4, (16)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1072	*Salix euxina*	Crack Willow	20, 20, 15, 20, (38)	N/A	Dead	Standing snag; Potential risk tree; Tree inaccessible to measure, DBH measurements estimated.	Subject Lands	N/A	Remove Due to Condition
1073	*Salix euxina*	Crack Willow	29	8	Good	Good form and vigour; Growing in drainage feature.	Subject Lands	N/A	Remove Due to Development
1074	*Fraxinus pennsylvanica*	Green Ash	10, 9, 8, 7, 8, (19)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Evidence of EAB infestation.	Subject Lands	N/A	Remove Due to Development
1075	*Acer negundo*	Manitoba Maple	6, 9, 3, (11)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1076	*Acer negundo*	Manitoba Maple	19, 3, 3, (19)	9	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1077	*Fraxinus pennsylvanica*	Green Ash	8, 8, 3, (12)	6	Poor	Significant dieback and thinning; Larger two stems are dead; Smaller stem is an epicormic shoot; Decline likely due to EAB infestation.	Subject Lands	N/A	Remove Due to Condition
1078	*Acer negundo*	Manitoba Maple	8, 5, (9)	6	Fair-Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1079	*Acer negundo*	Manitoba Maple	22, 10, (24)	10	Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1080	*Acer negundo*	Manitoba Maple	12, 15, (19)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1081	*Acer negundo*	Manitoba Maple	10, 8, (13)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1082	*Acer negundo*	Manitoba Maple	10, 10, (14)	6	Fair-Good	Good vigour; Stems fork below breast height; Mechanical wound on one stem; Wound wood present.	Subject Lands	N/A	Remove Due to Development
1083	*Acer negundo*	Manitoba Maple	11	6	Good	Good vigour; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1084	*Acer negundo*	Manitoba Maple	15, 9, 9, 8, (21)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1085	*Acer negundo*	Manitoba Maple	14, 15, 15, (25)	10	Poor-Fair	Significant dieback and thinning; Stems fork near ground; Included bark; Peeling bark on several stems.	Subject Lands	N/A	Remove Due to Condition
1086	*Acer negundo*	Manitoba Maple	14, 12, 10, (21)	8	Poor-Fair	Significant dieback and thinning; Stems fork near ground; Included bark; Peeling bark on several of the stems.	Subject Lands	N/A	Remove Due to Condition
1087	*Acer negundo*	Manitoba Maple	11	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1088	*Acer negundo*	Manitoba Maple	16	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1089	*Acer negundo*	Manitoba Maple	17, 10, 11, 12, (26)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1090	*Acer negundo*	Manitoba Maple	11, 11, 13, (20)	7	Poor	Significant dieback and thinning; Stems fork near ground; Included bark; Peeling bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1091	*Acer negundo*	Manitoba Maple	16	7	Fair-Good	Minor dieback and thinning.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1092	*Acer negundo*	Manitoba Maple	19	6	Fair	Moderate dieback and thinning.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1093	*Acer negundo*	Manitoba Maple	18, 19, (26)	9	Fair	Moderate dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1094	*Acer negundo*	Manitoba Maple	15, 9, 12, (21)	6	Poor-Fair	Significant dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1095	*Acer negundo*	Manitoba Maple	18, 13, 9, (24)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1096	*Fraxinus pennsylvanica*	Green Ash	12, 11, 10, 8, 10, (23)	8	Poor	Significant dieback and thinning; Larger stems are dead; Smaller stems are epicormic shoots; Decline likely due to EAB infestation.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1097	*Acer negundo*	Manitoba Maple	19, 13, (23)	8	Poor	Significant dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1098	*Acer negundo*	Manitoba Maple	18, 14, 16, (28)	9	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1099	*Acer negundo*	Manitoba Maple	27, 11, (29)	8	Poor	Significant dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1100	*Acer negundo*	Manitoba Maple	27, 16, (31)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1239	*Acer negundo*	Manitoba Maple	19	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1301	*Fraxinus pennsylvanica*	Green Ash	45	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1302	*Acer negundo*	Manitoba Maple	14, 19, 20, 18, 14, (38)	10	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1303	*Catalpa speciosa*	Northern Catalpa	69	12	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1304	*Juglans nigra*	Black Walnut	24	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1305	*Juglans nigra*	Black Walnut	17, 5, (18)	7	Good	Good vigour; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1306	*Juglans nigra*	Black Walnut	13, 10, (16)	7	Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1307	*Juglans nigra*	Black Walnut	19	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1308	*Juglans nigra*	Black Walnut	33	11	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1309	*Acer saccharinum*	Silver Maple	22, 18, 10, 8, (31)	8	Fair	Good vigour; Stems fork near ground; Included bark; Adventitious shoots near base; Rotting cavity near ground; Exposed surface roots.	Subject Lands	N/A	Remove Due to Development
1310	*Acer saccharinum*	Silver Maple	45, 39, 24, (64)	14	Fair-Good	Good vigour; Stems fork near ground; Included bark; One stem with calloused wound below breast height; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1311	*Pinus sylvestris*	Scots Pine	24	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition

Humberking West - Tree Inventory Table									
Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1312	*Acer saccharinum*	Silver Maple	31	8	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1313	*Acer saccharinum*	Silver Maple	23	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1314	*Acer saccharinum*	Silver Maple	39	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1315	*Pinus sylvestris*	Scots Pine	23	7	Fair-Good	Good form and vigour; Stem slightly gridled by wire property fence.	Subject Lands	N/A	Remove Due to Development
1316	*Malus pumila*	Common Apple	70	10	Fair-Good	Good form and vigour; Cavity at breast height; Wound wood; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1317	*Pinus sylvestris*	Scots Pine	46	8	Good	Good vigour; Slight lean towards the east.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1318	*Pinus sylvestris*	Scots Pine	26	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1319	*Pinus sylvestris*	Scots Pine	30	7	Fair-Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1320	*Pinus sylvestris*	Scots Pine	22	6	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1321	*Pinus sylvestris*	Scots Pine	15	5	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1322	*Pinus sylvestris*	Scots Pine	14	4	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1323	*Pinus sylvestris*	Scots Pine	38	8	Good	Good vigour; Stem slightly gridled by wire property fence.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1324	*Acer negundo*	Manitoba Maple	6, 8, 4, 6, 4, (13)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1325	*Juglans nigra*	Black Walnut	11	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1326	*Acer negundo*	Manitoba Maple	15	6	Good	Good vigour; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1327	*Acer negundo*	Manitoba Maple	15, 18, (23)	7	Fair	Horizontal form; Stems leaning significantly towards the east; Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1328	*Acer negundo*	Manitoba Maple	28	10	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1329	*Acer negundo*	Manitoba Maple	19	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1330	*Acer negundo*	Manitoba Maple	35	10	Fair-Good	Minor dieback and thinning; Slight lean towards the east.	Subject Lands	N/A	Remove Due to Development
1331	*Acer negundo*	Manitoba Maple	18	6	Good	Good vigour; Slight lean towards the east.	Subject Lands	N/A	Remove Due to Development
1332	*Acer negundo*	Manitoba Maple	27	7	Fair-Good	Minor dieback and thinning; Stem leaning towards the south.	Subject Lands	N/A	Remove Due to Development
1333	*Acer negundo*	Manitoba Maple	19	6	Good	Good vigour; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1334	*Acer negundo*	Manitoba Maple	25, 23, 14, (37)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Stems with significant lean towards the south.	Subject Lands	N/A	Remove Due to Development
1335	*Acer negundo*	Manitoba Maple	18, 19, (26)	7	Fair	Minor dieback and thinning; Stems fork below breast height; Included bark; Exposed surface roots.	Subject Lands	N/A	Remove Due to Development

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1336	*Acer negundo*	Manitoba Maple	28, 30, (41)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Epicormic shoots at base and breast height.	Subject Lands	N/A	Remove Due to Development
1337	*Acer negundo*	Manitoba Maple	17	7	Fair-Good	Minor dieback and thinning; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1338	*Acer negundo*	Manitoba Maple	17, 17, (24)	8	Fair-Good	Minor dieback and thinning; Stems fork near breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1339	*Acer negundo*	Manitoba Maple	21	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1340	*Acer negundo*	Manitoba Maple	18	7	Fair	Moderate dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1341	*Acer negundo*	Manitoba Maple	25, 23, 17, (38)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1342	*Acer negundo*	Manitoba Maple	32, 22, (39)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1343	*Acer negundo*	Manitoba Maple	17, 28, 10, (34)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1344	*Acer negundo*	Manitoba Maple	24, 15, 15, (32)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1345	*Acer negundo*	Manitoba Maple	20, 20, (28)	N/A	Dead	Standing snag; One stem failed at breast height; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1346	*Acer negundo*	Manitoba Maple	15, 28, (32)	8	Fair	Moderate dieback and thinning; Stems fork below breast height; Significant lean towards the south.	Subject Lands	N/A	Remove Due to Development
1347	*Acer negundo*	Manitoba Maple	24	8	Fair-Good	Minor dieback and thinning; Epicormic shoots at base and along stem at breast height.	Subject Lands	N/A	Remove Due to Development
1348	*Acer negundo*	Manitoba Maple	31	8	Fair-Good	Minor dieback and thinning; Epicormic shoots at base and along stem at breast height.	Subject Lands	N/A	Remove Due to Development
1349	*Acer negundo*	Manitoba Maple	25	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1350	*Acer negundo*	Manitoba Maple	20, 18, (27)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Epicormic shoots at base; Stems leaning towards the south.	Subject Lands	N/A	Remove Due to Development
1351	*Acer negundo*	Manitoba Maple	23	6	Fair	Moderate dieback and thinning; Stem leaning towards the south; Wooden debris piled up against stem.	Subject Lands	N/A	Remove Due to Development
1352	*Acer negundo*	Manitoba Maple	17	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1353	*Acer negundo*	Manitoba Maple	17	7	Fair-Good	Minor dieback and thinning; Stem leaning towards the east.	Subject Lands	N/A	Remove Due to Development
1354	*Acer negundo*	Manitoba Maple	30, 20, 20, 15, 15, (46)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1355	*Acer negundo*	Manitoba Maple	27	8	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1356	*Acer negundo*	Manitoba Maple	35, 20, (40)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Stems leaning towards the northwest.	Subject Lands	N/A	Remove Due to Development
1357	*Pyrus communis*	Common Pear	20, 15, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1358	*Malus pumila*	Common Apple	15, 20, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark; Fruiting at time of inventory; Crown raised.	Subject Lands	N/A	Remove Due to Development
1359	*Acer negundo*	Manitoba Maple	60	12	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1360	*Acer negundo*	Manitoba Maple	35, 35, (49)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1361	*Acer negundo*	Manitoba Maple	25, 15, (29)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1362	*Acer negundo*	Manitoba Maple	25, 25, (35)	9	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1363	*Acer negundo*	Manitoba Maple	25	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1364	*Acer negundo*	Manitoba Maple	27	9	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1365	*Acer negundo*	Manitoba Maple	45	10	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1366	*Acer negundo*	Manitoba Maple	23	6	Fair-Good	Minor dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Development
1367	*Acer negundo*	Manitoba Maple	23, 6, (24)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1368	*Acer negundo*	Manitoba Maple	10, 9, (13)	6	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1369	*Acer negundo*	Manitoba Maple	28	8	Good	Good form and vigour.	Municipal Road Allowance	N/A	Remove Due to Development
1370	*Acer negundo*	Manitoba Maple	23, 23, (33)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1371	*Acer negundo*	Manitoba Maple	18	6	Fair-Good	Minor dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Development
1372	*Acer negundo*	Manitoba Maple	10, 8, (13)	7	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1373	*Acer negundo*	Manitoba Maple	20, 15, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1374	*Acer negundo*	Manitoba Maple	8, 15, (17)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1375	*Acer negundo*	Manitoba Maple	6, 7, (9)	5	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1376	*Acer negundo*	Manitoba Maple	15, 15, (21)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1377	*Acer negundo*	Manitoba Maple	15, 20, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1378	*Acer negundo*	Manitoba Maple	15, 20, 8, (26)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1379	*Acer negundo*	Manitoba Maple	15, 15, 20, (29)	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1380	*Acer negundo*	Manitoba Maple	55, 20, (59)	12	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1381	*Acer negundo*	Manitoba Maple	20, 15, (25)	N/A	Dead	Standing snag; Potential risk tree.	Municipal Road Allowance	N/A	Remove Due to Condition
1382	*Acer negundo*	Manitoba Maple	17, 10, (20)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1383	*Acer negundo*	Manitoba Maple	19, 17, (25)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1384	*Acer negundo*	Manitoba Maple	15, 4, (16)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1385	*Acer negundo*	Manitoba Maple	10, 4, (11)	5	Poor	Significant dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Condition
1386	*Acer negundo*	Manitoba Maple	8	4	Poor	Significant dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Condition
1387	*Acer negundo*	Manitoba Maple	10, 12, 8, (18)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1388	*Acer negundo*	Manitoba Maple	15	6	Poor	Significant dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Condition
NT1	*Acer platanoides*	Norway Maple	45	12	Good	Good form and vigour; Full healthy crown; DBH measurement estimated.	14206 Humber Station Road	N/A	Remove Due to Development
NT2	*Populus deltoides*	Eastern Cottonwood	44	N/A	Dead	Standing snag; Potential risk tree; DBH measurement estimated.	14206 Humber Station Road	N/A	Remove Due to Condition
NT3	*Salix matsudana*	Corkscrew Willow	35	9	Fair-Good	Minor dieback and thinning; Good vigour; DBH measurement estimated.	14206 Humber Station Road	N/A	Remove Due to Development

Humberking West - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
NT4	*Acer negundo*	Manitoba Maple	35	8	Fair-Good	Good vigour; Minor dieback and thinning; Stem leaning towards the southeast; Canopy overhangs onto subject property.	0 Humber Station Road	N/A	Remove Due to Development
NT5	*Acer negundo*	Manitoba Maple	15, 15, 10, 10, (25)	10	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	0 Humber Station Road	N/A	Remove Due to Development
NT6	*Acer negundo*	Manitoba Maple	15, 15, 15, 10, (28)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Tree inaccessible to tag and measure.	Subject Lands	N/A	Remove Due to Development
NT7	*Ulmus americana*	American Elm	28	9	Good	Good form and vigour.	0 King Street	N/A	Remove Due to Development
NT8	*Ulmus americana*	American Elm	18	7	Good	Good form and vigour.	0 King Street	N/A	Remove Due to Development
NT9	*Tilia americana*	Basswood	17, 16, (23)	8	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	0 King Street	N/A	Remove Due to Development
NT10	*Tilia americana*	Basswood	17	7	Good	Good vigour; Uneven crown.	0 King Street	N/A	Remove Due to Development
NT11	*Tilia americana*	Basswood	11	4	Good	Good form and vigour.	0 King street	N/A	Remove Due to Development
NT12	*Ulmus americana*	American Elm	22	7	Good	Good form and vigour.	0 King Street	N/A	Remove Due to Development
NT13	*Malus pumila*	Common Apple	20, 20, (28)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of inventory; Inaccessible to tag and measure.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
NT14	*Salix alba*	White Willow	55, 55, (78)	12	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown; Located off property, DBH measurements estimated; Branches slightly overhang onto subject property.	0 King Street	4.8	Preserve
NT15	*Picea glauca*	White Spruce	55	9	Good	Good form and vigour; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	3.6	Preserve
NT16	*Acer platanoides*	Norway Maple	25	8	Good	Good form and vigour; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.8	Preserve
NT17	*Thuja occidentalis*	Eastern White Cedar	25	6	Good	Good form and vigour; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.8	Preserve
NT18	*Thuja occidentalis*	Eastern White Cedar	15, 15, (21)	6	Good	Good vigour; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.8	Preserve
NT19	*Acer negundo*	Manitoba Maple	25, 15, (29)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Inaccessible to tag; DBH measurement estimated.	Subject Lands	1.8	Preserve
NT20	*Acer negundo*	Manitoba Maple	15	6	Fair-Good	Minor dieback and thinning; Inaccessible to tag; DBH measurement estimated.	Subject Lands	N/A	Remove Due to Development
NT21	*Acer negundo*	Manitoba Maple	20	8	Good	Good vigour; Slight lean towards the south; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.2	Preserve

1. The tree health condition rating was based on factors that could include one or a combination of:

Poor Condition – Severe dieback, significant lean, decayed, missing leader, significant disease presence

Fair Condition – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress

Good Condition – Healthy vigorous growth, no or minor visible defects or damage

2. The TPZ is the minimum distance required for tree preservation determined in accordance with ISA guidelines.

Table 2. Humberking East - Tree Inventory Table

Humberking East - Tree Inventory Table									
Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1389	*Acer negundo*	Manitoba Maple	50	8	Poor-Fair	Large rotting cavity at base; Wound wood; Structurally unsafe; Epicormic shoots at base and along stem at breast height.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1390	*Prunus domestica*	Damson Plum	15, 4, 4, (16)	5	Poor	Significant dieback and thinning; Peeling bark; Stems fork below breast height; Included bark.	Municipal Road Allowance	N/A	Remove Due to Condition
1391	*Prunus domestica*	Damson Plum	8, 4, (9)	5	Fair-Good	Stems fork near ground; Included bark; Minor dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Development
1392	*Prunus domestica*	Damson Plum	13, 8, 4, (16)	5	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Sap ooze.	Municipal Road Allowance	N/A	Remove Due to Development
1393	*Prunus domestica*	Damson Plum	3, 3, 3, 3, 2, (6)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1394	*Prunus domestica*	Damson Plum	5, 3, (6)	4	Good	Good vigour; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1395	*Juniperus virginiana*	Eastern Red Cedar	12	5	Good	Good form and vigour.	Municipal Road Allowance	N/A	Remove Due to Development
1396	*Juniperus virginiana*	Eastern Red Cedar	12	6	Good	Good form and vigour; Wide spreading branches.	Municipal Road Allowance	N/A	Remove Due to Development
1397	*Juniperus virginiana*	Eastern Red Cedar	8, 8, (11)	6	Good	Good vigour; Shrub form; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1398	*Ulmus americana*	American Elm	34	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1399	*Tilia americana*	Basswood	49	12	Good	Good form and vigour; Full healthy crown.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	N/A	Remove Due to Development
1400	*Acer negundo*	Manitoba Maple	15	8	Fair-Good	Minor dieback and thinning.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	N/A	Remove Due to Development
1401	*Acer negundo*	Manitoba Maple	8, 8, (11)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.2	Preserve
1402	*Acer negundo*	Manitoba Maple	15, 5, (16)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.2	Preserve

Humberking East - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1403	*Acer negundo*	Manitoba Maple	15, 15, (21)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.8	Preserve
1404	*Ulmus americana*	American Elm	14	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1405	*Acer negundo*	Manitoba Maple	13	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1406	*Ulmus americana*	American Elm	11	6	Good	Good form and vigour.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.2	Preserve
1407	*Acer negundo*	Manitoba Maple	15, 15, (21)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1408	*Acer negundo*	Manitoba Maple	45	8	Fair-Good	Minor dieback and thinning.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	3	Preserve
1409	*Acer negundo*	Manitoba Maple	10	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1410	*Acer negundo*	Manitoba Maple	15, 15, 5, (22)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1411	*Acer negundo*	Manitoba Maple	14	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1412	*Acer negundo*	Manitoba Maple	40	10	Fair-Good	Minor dieback and thinning; Stems fork above breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1413	*Ulmus americana*	American Elm	40	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1414	*Tilia americana*	Basswood	39	10	Good	Good form and vigour; Stem growing adjacent to wire property fence.	Subject Lands	N/A	Remove Due to Development
1415	*Tilia americana*	Basswood	34	9	Good	Good form and vigour; Stem growing adjacent to wire property fence.	Subject Lands	N/A	Remove Due to Development
1416	*Malus pumila*	Common Apple	30, 25, (39)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of surveys; Overgrown with Common Buckthorn.	Subject Lands	N/A	Remove Due to Development
1417	*Malus pumila*	Common Apple	30, 20, (36)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of surveys; Overgrown with Common Buckthorn.	Subject Lands	N/A	Remove Due to Development
1418	*Malus pumila*	Common Apple	30, 35, 30, (55)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of inventory; Overgrown with Common Buckthorn.	Subject Lands	N/A	Remove Due to Development

Humberking East - Tree Inventory Table

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
1419	*Malus pumila*	Common Apple	20, 25, (32)	7	Poor	Significant dieback and thinning; Rotting cavities in one stem; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Condition
1420	*Ulmus americana*	American Elm	46	14	Good	Good form and vigour; Wide spreading branches; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1421	*Ulmus americana*	American Elm	18	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1422	*Carya cordiformis*	Bitternut Hickory	48	12	Good	Good form and vigour; Full healthy crown; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1423	*Carya cordiformis*	Bitternut Hickory	35, 21, (41)	10	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1424	*Carya cordiformis*	Bitternut Hickory	25	8	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1425	*Carya cordiformis*	Bitternut Hickory	22	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1426	*Carya cordiformis*	Bitternut Hickory	34	12	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1427	*Carya cordiformis*	Bitternut Hickory	35	12	Good	Good form and vigour; Full healthy crown; Good root flare.	Subject Lands	N/A	Remove Due to Development
1428	*Carya cordiformis*	Bitternut Hickory	10	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1429	*Carya cordiformis*	Bitternut Hickory	13	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1430	*Carya cordiformis*	Bitternut Hickory	10	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1477	*Acer negundo*	Manitoba Maple	25, 25, 10, (37)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated; Tag from previous inventory.	0 Humber Station Road	N/A	Remove Due to Development
NT22	*Ulmus americana*	American Elm	50	N/A	Dead	Standing snag; Potential risk tree; Inaccessible to tag; DBH measurement estimated.	Subject Lands	N/A	Remove Due to Condition
NT23	*Ulmus americana*	American Elm	20	N/A	Dead	Standing snag; Inaccessible to tag; DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	N/A	Preserve
NT24	*Ulmus americana*	American Elm	15, 15, (21)	N/A	Dead	Standing snag; Inaccessible to tag, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	N/A	Preserve
NT25	*Salix euxina*	Crack Willow	25, 25, (35)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	2.4	Preserve
NT26	*Acer negundo*	Manitoba Maple	35	9	Good	Good vigour; Located off property, DBH measurement estimated; Branches overhang onto subject property.	Canadian Pacific Railway Right-of-Way	2.4	Preserve
NT27	*Acer negundo*	Manitoba Maple	30	7	Fair-Good	Minor dieback and thinning; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	2.4	Preserve
NT28	*Acer negundo*	Manitoba Maple	25, 25, (35)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	2.4	Preserve

Humberking East - Tree Inventory Table									
Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition[1]	Comments	Ownership	TPZ Radius[2] (m)	Tree Preservation Recommendation
NT29	*Acer negundo*	Manitoba Maple	20, 15, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	1.8	Preserve
NT30	*Tilia americana*	Basswood	35, 35, 25, (55)	10	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark; Inaccessible to tag, DBH measurement estimated.	Subject Lands	N/A	Remove Due to Development

1. The tree health condition rating was based on factors that could include one or a combination of:
   Poor Condition – Severe dieback, significant lean, decayed, missing leader, significant disease presence
   Fair Condition – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress
   Good Condition – Healthy vigorous growth, no or minor visible defects or damage
2. The TPZ is the minimum distance required for tree preservation determined in accordance with ISA guidelines.

Table 3. Humberking West Tree Groups

Humberking West Tree Groups				
Tree Group A		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-30**
Thuja occidentalis	Eastern White Cedar	0	35	10
Tree Group B		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-30**
Thuja occidentalis	Eastern White Cedar	0	20	5
Tree Group C		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-30**
Populus tremuloides	Trembling Aspen	70	20	0
Tree Group D		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-30**
Acer negundo	Manitoba Maple	0	7	0

Table 4. Humberking West Tree Groups

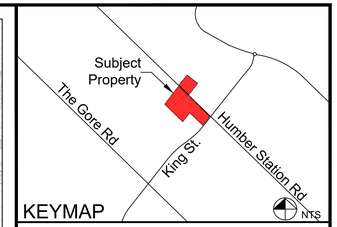
Humberking East Tree Groups				
Tree Group E		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-30**
Prunus domestica	Damson Plum	0	8	0
Acer negundo	Manitoba Maple	0	4	0
Tree Group F		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-45**
Tilla americana	Basswood	0	0	10
Acer negundo	Manitoba Maple	0	0	1

BEACON ENVIRONMENTAL

Appendix C

Tree Inventory Preservation Plan

KEYMAP



LEGEND

- Property Boundary
- Tree Preservation Fence
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone

Tree Location

- Tree to be Preserved
- Tree to be Removed Due to Development
- Tree to be Removed Due to Condition
- Tree Group to be Preserved
- Tree Group to be Removed Due to Development

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

N°	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE

NORTH ARROW

CERTIFIED ARBORIST ISA
ALEX HANEY
#ON-2723A

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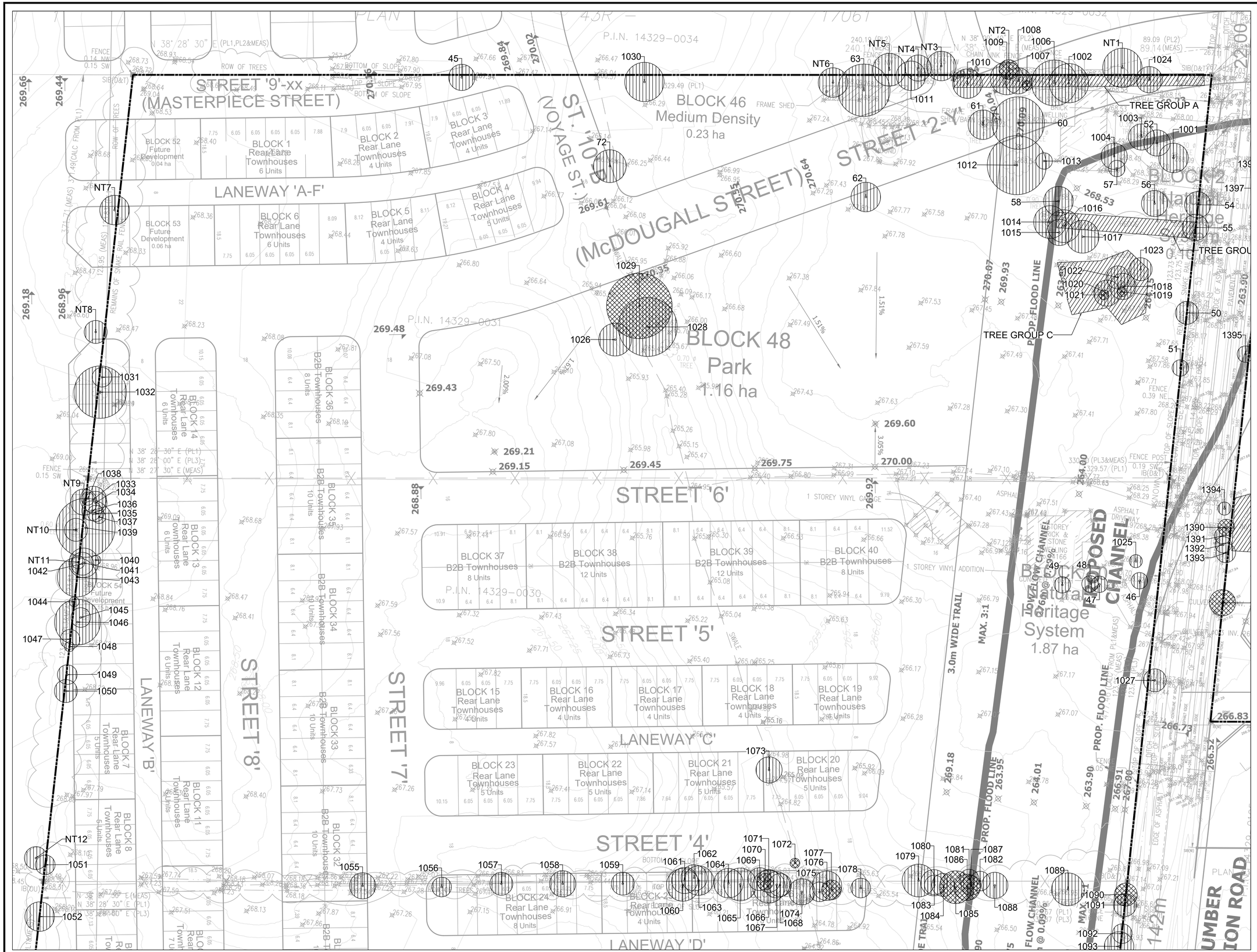
CLIENT
HUMBERKING DEVELOPMENTS LIMITED

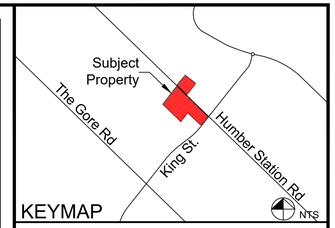
PROJECT
MACVILLE HUMBERKING EAST AND WEST DRAFT PLANS OF SUBDIVISON

SHEET TITLE
TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY: --	PROJECT N°: 223212
DRAWN BY: CS	FIGURE N°: TP-1
CHECKED BY: AH/TS	
DATE: 27 May 2024	



KEYMAP



LEGEND

- Property Boundary
- Tree Preservation Fence
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone

Tree Location

- Tree to be Preserved
- Tree to be Removed Due to Development
- Tree to be Removed Due to Condition
- Tree Group to be Preserved
- Tree Group to be Removed Due to Development

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

N°	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE

1:500 0 5 10 20m

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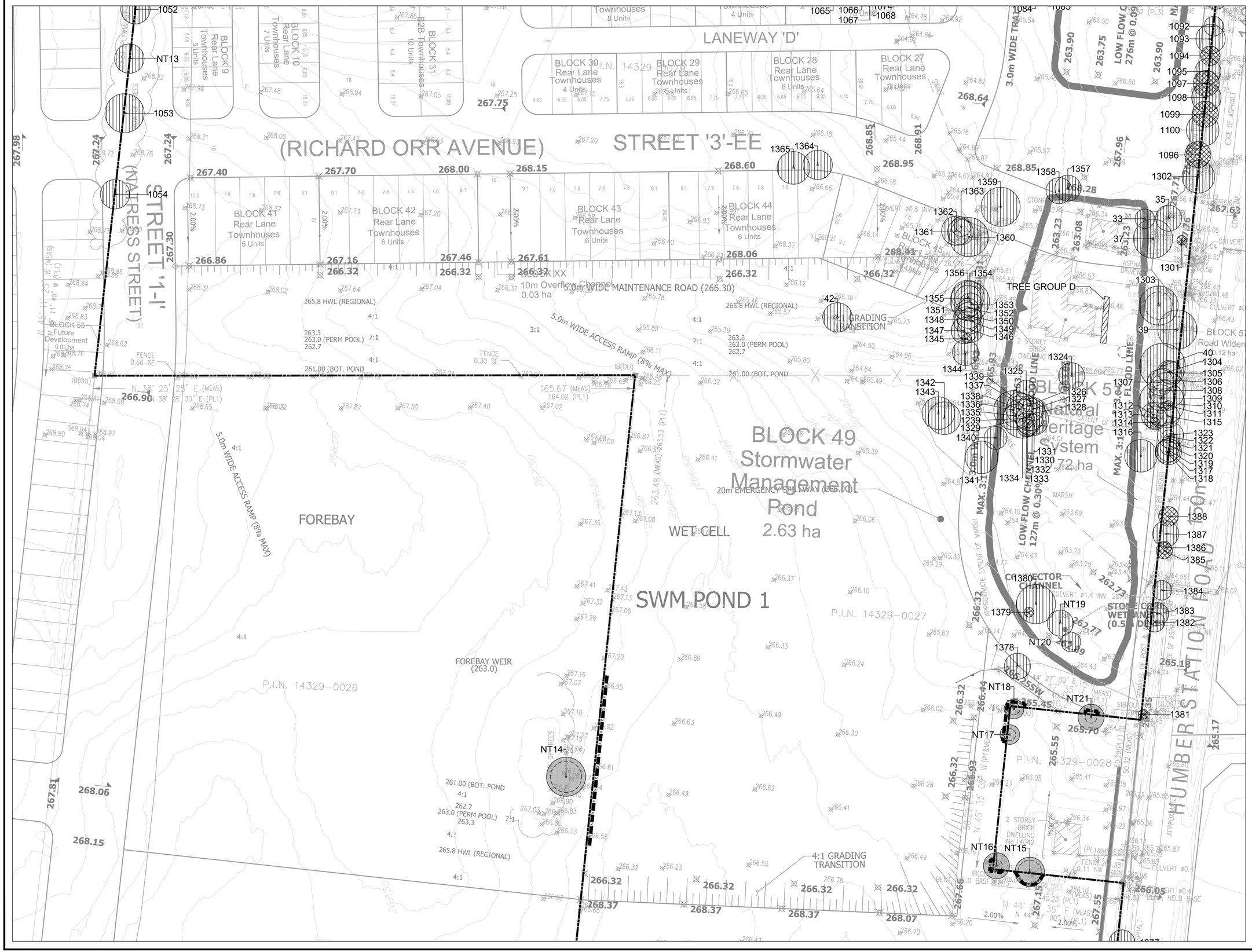
PROJECT

MACVILLE HUMBERKING WEST DRAFT PLAN OF SUBDIVISON

SHEET TITLE

TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY: --	PROJECT N°: 223212
DRAWN BY: CS	FIGURE N°: TP-2
CHECKED BY: AH/TS	
DATE: 27 May 2024	



LEGEND

- Property Boundary
- Tree Preservation Fence
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone

Tree Location

- Tree to be Preserved
- Tree to be Removed Due to Development
- Tree to be Removed Due to Condition
- Tree Group to be Preserved
- Tree Group to be Removed Due to Development

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

N°	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE
1:500 0 5 10 20m

NORTH ARROW

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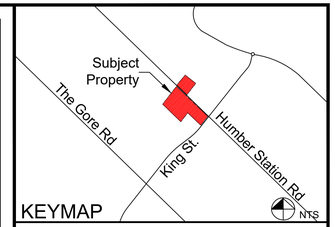
PROJECT
MACVILLE HUMBERKING WEST DRAFT PLAN OF SUBDIVISON

SHEET TITLE
TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY: --	PROJECT N°: 223212
DRAWN BY: CS	FIGURE N°: TP-3
CHECKED BY: AH/TS	
DATE: 27 May 2024	



LEGEND

- Property Boundary
- Tree Preservation Fence
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone

Tree Location

- Tree to be Preserved
- Tree to be Removed Due to Development
- Tree to be Removed Due to Condition
- Tree Group to be Preserved
- Tree Group to be Removed Due to Development

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE

1:500 0 5 10 20m

NORTH ARROW

CERTIFIED ARBORIST ISA

ALEX HANEY
#ON-2723A

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MARKHAM OFFICE
80 MAIN ST NORTH
MARKHAM, ON L3P 1X5
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CLIENT

HUMBERKING DEVELOPMENTS LIMITED

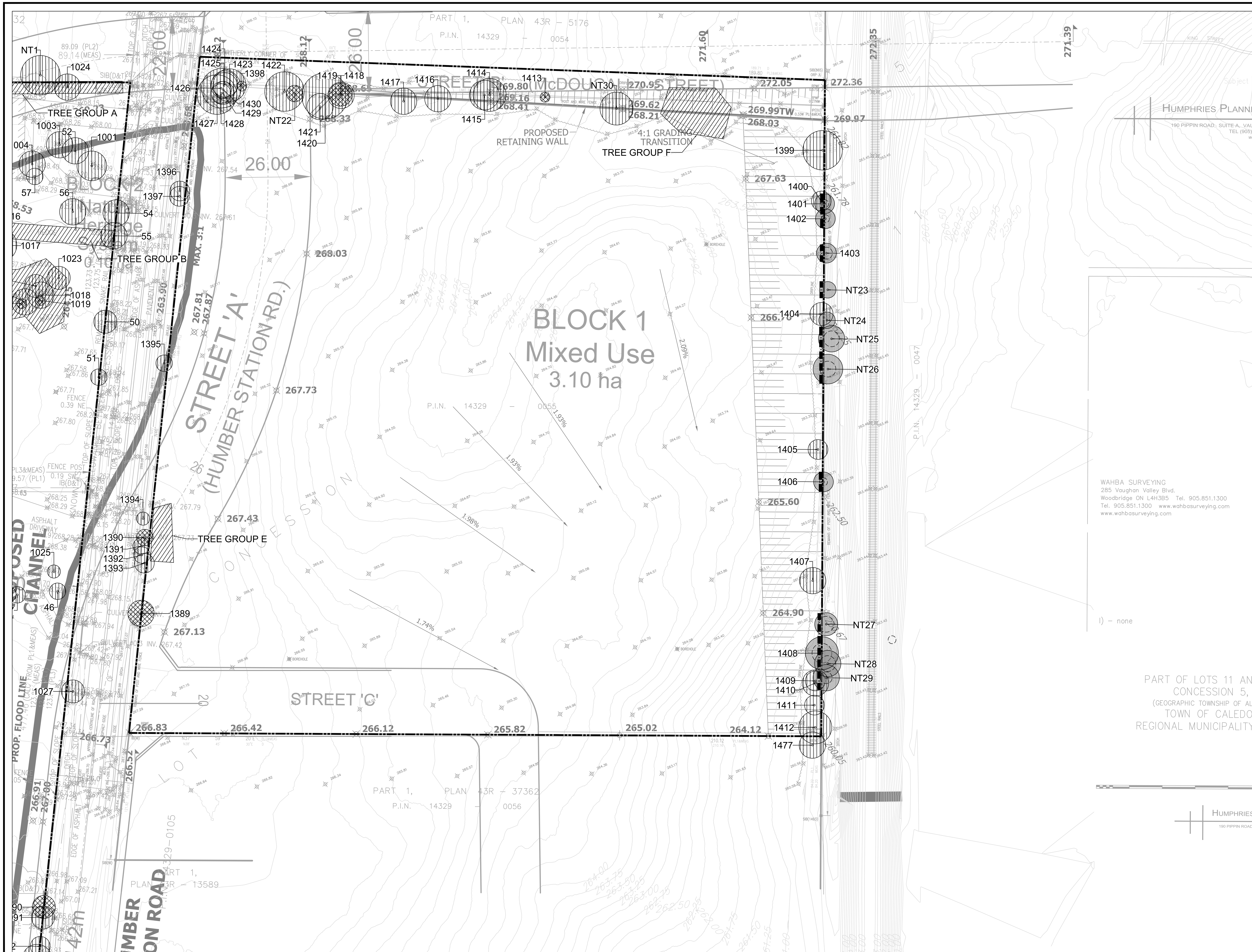
PROJECT

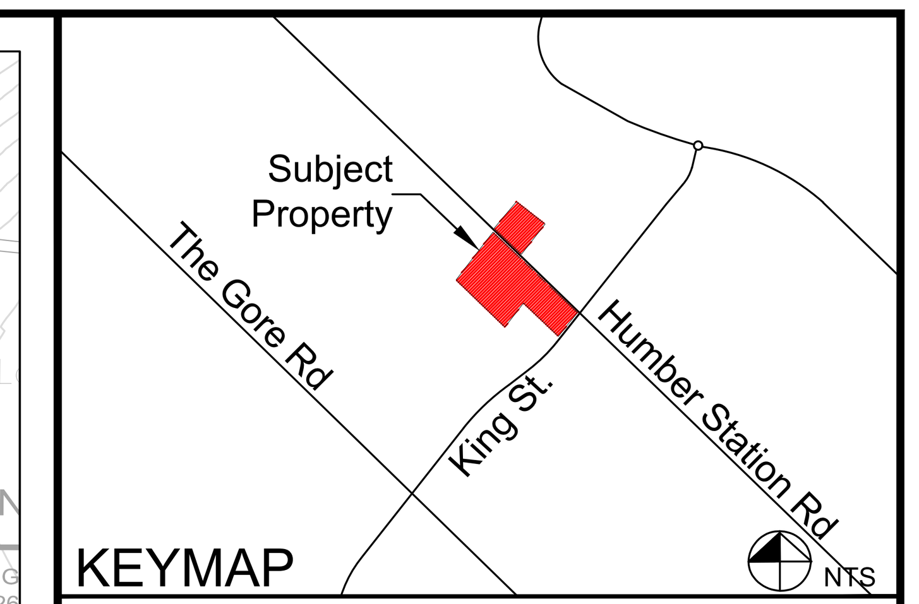
MACVILLE HUMBERKING WEST DRAFT PLAN OF SUBDIVISON

SHEET TITLE

TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY: --	PROJECT Nº: 223212
DRAWN BY: CS	FIGURE Nº: TP-4
CHECKED BY: AH/TS	
DATE: 27 May 2024	





KEYMAP

LEGEND

- Property Boundary
- Tree Preservation Fence
- 1678 Tree tag
- Tree Crown
- Minimum Tree Protection Zone

Tree Location

- Tree to be Preserved
- Tree to be Removed Due to Development
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Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE
1:500 0 5 10 20m

NORTH ARROW

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CLIENT
HUMBERKING DEVELOPMENTS LIMITED

PROJECT
MACVILLE HUMBERKING EAST DRAFT PLAN OF SUBDIVISON

SHEET TITLE
TREE INVENTORY AND PRESERVATION PLAN

DESIGN BY:	--	PROJECT Nº:	223212
DRAWN BY:	CS	FIGURE Nº:	TP-5
CHECKED BY:	AH/TS		
DATE:	27 May 2024		

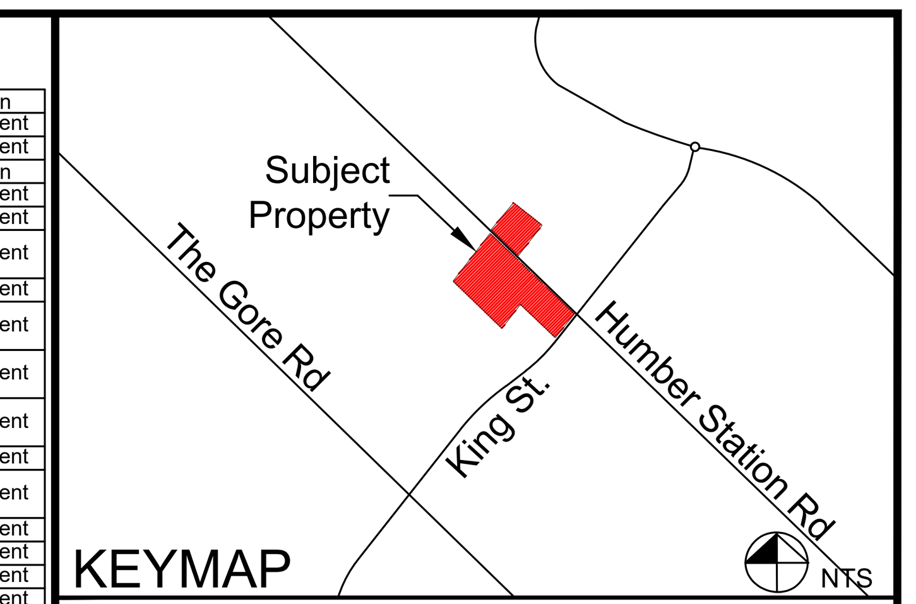
TREE INVENTORY TABLE (WEST SUBDIVISON)

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition1	Comments	Ownership	TPZ Radius2 (m)	Tree Preservation Recommendation
33	*Picea glauca*	White Spruce	30	6	Fair-Good	Minor dieback and thinning; Stem leaning towards the east.	Subject Lands	N/A	Remove Due to Development
35	*Picea glauca*	White Spruce	35, 26, (44)	8	Good	Good vigour; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
37	*Acer negundo*	Manitoba Maple	37	12	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
39	*Quercus rubra*	Northern Red Oak	48	12	Fair-Good	Minor dieback and thinning; Large mature tree.	Subject Lands	N/A	Remove Due to Development
40	*Juglans nigra*	Black Walnut	56	14	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
42	*Acer negundo*	Manitoba Maple	36	9	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
45	*Acer negundo*	Manitoba Maple	11, 35, (37)	8	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	Co-owned between Subject Lands and 0 Humber Station Road	N/A	Remove Due to Development
46	*Picea pungens*	Colorado Blue Spruce	27	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
47	*Picea pungens*	Colorado Blue Spruce	27	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
48	*Picea pungens*	Colorado Blue Spruce	27	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
49	*Picea pungens*	Colorado Blue Spruce	21	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
50	*Picea glauca*	White Spruce	25	7	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
51	*Picea glauca*	White Spruce	23	5	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
52	*Picea pungens*	Colorado Blue Spruce	32	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
54	*Acer platanoides*	Norway Maple	15, 19, (24)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
55	*Acer negundo*	Manitoba Maple	29	8	Good	Good vigour; Stem leaning slightly towards southeast; Epicormic shoots at breast height and at base.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
56	*Picea glauca*	White Spruce	30, 20, (36)	8	Good	Good vigour; Full healthy crown; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
57	*Picea pungens*	Colorado Blue Spruce	18	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
58	*Prunus avium*	Sweet Cherry	24, 30, (38)	9	Fair-Good	Good form; Full healthy crown; Stems fork near ground; Included bark; Wounds along smaller stem that are sealing well.	Subject Lands	N/A	Remove Due to Development
60	*Acer negundo*	Manitoba Maple	61	16	Fair-Good	Good form; Minor dieback and thinning; Stem girdled slightly by slack line; Wood blocks nailed into stem.	Subject Lands	N/A	Remove Due to Development
61	*Prunus avium*	Sweet Cherry	43	9	Fair-Good	Good form and vigour; Stem being girdled by slack line.	Subject Lands	N/A	Remove Due to Development
62	*Acer negundo*	Manitoba Maple	27, 28, (39)	9	Fair-Good	Good form and vigour; Mechanical wounds to stem; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
63	*Salix alba*	White Willow	80	16	Good	Good form and vigour; Full healthy crown; Large mature tree; Weeping willow species.	Subject Lands	N/A	Remove Due to Development
72	*Acer negundo*	Manitoba Maple	27, 10, 8, 5, 5, 5, 5, (32)	10	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1001	*Betula papyrifera*	Paper Birch	22, 22, (31)	9	Good	Good vigour; Stems fork near ground; Stems partially fused; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1002	*Robinia pseudoacacia*	Black Locust	45	12	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1003	*Morus alba*	White Mulberry	39	8	Good	Good form and vigour; Weeping variety; Canopy pruned to maintain shape.	Subject Lands	N/A	Remove Due to Development
1004	*Morus alba*	White Mulberry	39	8	Good	Good form and vigour; Weeping variety; Canopy pruned to maintain shape.	Subject Lands	N/A	Remove Due to Development
1006	*Populus deltoides*	Eastern Cottonwood	75	14	Fair	Moderate dieback and thinning; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1007	*Populus deltoides*	Eastern Cottonwood	58	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1008	*Acer platanoides*	Norway Maple	22	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1009	*Robinia pseudoacacia*	Black Locust	44	10	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1010	*Robinia pseudoacacia*	Black Locust	20	9	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1011	*Acer negundo*	Manitoba Maple	10, 30, (32)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Stems with significant lean towards the southeast; Canopy extends onto subject property.	Co-owned between Subject Lands and 0 Humber Station Road	N/A	Remove Due to Development
1012	*Acer platanoides*	Norway Maple	77	18	Fair-Good	Good form and vigour; Full healthy crown; Tree house built in canopy; Wooden boards nailed to stem; Retagged previous tag has fallen off.	Subject Lands	N/A	Remove Due to Development
1013	*Picea glauca*	White Spruce	13	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1014	*Acer platanoides*	Norway Maple	21, 24, (32)	10	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1015	*Acer negundo*	Manitoba Maple	24	8	Fair-Good	Good vigour; Minor dieback and thinning; Significant lean towards the southeast.	Subject Lands	N/A	Remove Due to Development
1016	*Acer negundo*	Manitoba Maple	46	10	Good	Good vigour; Full healthy crown; Stems fused together at breast height.	Subject Lands	N/A	Remove Due to Development
1017	*Acer negundo*	Manitoba Maple	17, 21, (27)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark; Significant lean towards the southeast.	Subject Lands	N/A	Remove Due to Development
1018	*Populus tremuloides*	Trembling Aspen	32	8	Fair	Good form; Canker through stem; Wound wood present.	Subject Lands	N/A	Remove Due to Development
1019	*Populus tremuloides*	Trembling Aspen	24	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1020	*Populus tremuloides*	Trembling Aspen	21	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1021	*Populus tremuloides*	Trembling Aspen	24	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1022	*Populus tremuloides*	Trembling Aspen	21	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1023	*Populus tremuloides*	Trembling Aspen	21	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1024	*Acer platanoides*	Norway Maple	20	8	Fair-Good	Good vigour; Stem partially fused into neighbouring tree.	Subject Lands	N/A	Remove Due to Development
1025	*Picea pungens*	Colorado Blue Spruce	12	4	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1026	*Acer negundo*	Manitoba Maple	33	10	Fair-Good	Good vigour; Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1027	*Acer negundo*	Manitoba Maple	13, 10, 8, (18)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1028	*Salix babylonica*	Weeping Willow	100, 35, (106)	18	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1029	*Salix babylonica*	Weeping Willow	100, 60, (117)	20	Poor	Moderate dieback and thinning; Larger stem has partially failed and is laying on ground; Large rotting cavities through out stem and at base; Stems fork near ground; Included bark; Weeping willow species.	Subject Lands	N/A	Remove Due to Condition
1030	*Acer negundo*	Manitoba Maple	37, 36, 21, (56)	12	Fair-Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark; Wire fence fused into stem at base; Retagged previous tag has fallen off.	Co-owned between Subject Lands and 0 Humber Station Road	N/A	Remove Due to Development
1031	*Tilia americana*	Basswood	17	6	Good	Good vigour; Full healthy crown; Adventitious shoots at base.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1032	*Ulmus americana*	American Elm	77	16	Good	Good form and vigour; Full healthy crown; Good root flare; Notable tree.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1033	*Acer negundo*	Manitoba Maple	21, 10, 10, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1034	*Tilia americana*	Basswood	23	7	Good	Good vigour; Full healthy crown; Adventitious shoots at base.	Subject Lands	N/A	Remove Due to Development
1035	*Tilia americana*	Basswood	18	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1036	*Tilia americana*	Basswood	18	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1037	*Tilia americana*	Basswood	12, 3, (12)	4	Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1038	*Tilia americana*	Basswood	10	4	Good	Good form and vigour.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1039	*Tilia americana*	Basswood	51, 33, 57, 50, 50, 50, (120)	18	Good	Good vigour; Full healthy crown; Large spreading branches; Good root flare; Notable tree.	Subject Lands	N/A	Remove Due to Development
1040	*Tilia americana*	Basswood	10	3	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1041	*Tilia americana*	Basswood	27	9	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1042	*Tilia americana*	Basswood	23	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1043	*Tilia americana*	Basswood	9, 26, 28, 11, 10, 18, 25, (52)	12	Good	Good vigour; Full healthy crown; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1044	*Tilia americana*	Basswood	11	3	Good	Good form and vigour.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1045	*Tilia americana*	Basswood	17	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1046	*Tilia americana*	Basswood	20, 22, 40, 38, 32, 10, 11, 10, (73)	14	Good	Good vigour; Full healthy crown; Large spreading branches; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1047	*Tilia americana*	Basswood	16	6	Good	Good form and vigour.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1048	*Tilia americana*	Basswood	19, 18, 10, (28)	10	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1049	*Tilia americana*	Basswood	10, 8, (13)	6	Good	Good vigour; Stems partially fused together below breast height.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1050	*Tilia americana*	Basswood	15, 10, 8, 5, (20)	7	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1051	*Ulmus americana*	American Elm	14	6	Good	Good form and vigour.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1052	*Malus pumila*	Common Apple	50, 35, (61)	9	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1053	*Malus pumila*	Common Apple	55, 55, 25, (82)	12	Fair	Moderate dieback and thinning; Stems fork near ground; Fruiting at time of inventory; Large mature tree.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1054	*Malus pumila*	Common Apple	30, 40, (50)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Fruiting at the time of inventory.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
1055	*Acer negundo*	Manitoba Maple	25, 10, 10, 12, (31)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1056	*Acer negundo*	Manitoba Maple	15, 12, (19)	6	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1057	*Acer negundo*	Manitoba Maple	15, 15, 15, 10, (28)	7	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1058	*Acer negundo*	Manitoba Maple	27, 25, (37)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1059	*Acer negundo*	Manitoba Maple	15, 15, 12, (24)	7	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1060	*Acer negundo*	Manitoba Maple	18, 16, (24)	10	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1061	*Acer negundo*	Manitoba Maple	16, 8, 8, 4, (20)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1062	*Acer negundo*	Manitoba Maple	9, 6, 4, (12)	8	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1063	*Acer negundo*	Manitoba Maple	9, 8, 13, 6, (19)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1064	*Acer negundo*	Manitoba Maple	21, 14, (25)	9	Fair-Good	Good vigour; Stems fork near ground; Included bark; One stem partially fused into wire property fence	Subject Lands	N/A	Remove Due to Development
1065	*Acer negundo*	Manitoba Maple	14, 14, 20, 21, (35)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1066	*Acer negundo*	Manitoba Maple	17, 10, 10, 4, (22)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1067	*Acer negundo*	Manitoba Maple	12, 11, 15, (22)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; One stem partially fused into wire property fence.	Subject Lands	N/A	Remove Due to Development
1068	*Acer negundo*	Manitoba Maple	11, 4, 4, 5, (13)	7	Fair-Good	Minor dieback and thinning; Steps fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1069	*Acer negundo*	Manitoba Maple	12, 9, 4, (16)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1070	*Fraxinus pennsylvanica*	Green Ash	11, 3, 7, (13)	5	Poor	Main stem has died; Two live stems are epicormic shoots; Stems fork near ground; Included bark; Decline likey due to EAB infestation.	Subject Lands	N/A	Remove Due to Condition
1071	*Acer negundo*	Manitoba Maple	13, 9, 4, (16)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1072	*Salix euxina*	Crack Willow	20, 20, 15, 20, (38)	N/A	Dead	Standing snag; Potential risk tree; Tree inaccessible to measure, DBH measurements estimated.	Subject Lands	N/A	Remove Due to Condition
1073	*Salix euxina*	Crack Willow	29	8	Good	Good form and vigour; Growing in drainage feature.	Subject Lands	N/A	Remove Due to Development
1074	*Fraxinus pennsylvanica*	Green Ash	10, 9, 8, 7, 8, (19)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Evidence of EAB infestation.	Subject Lands	N/A	Remove Due to Development
1075	*Acer negundo*	Manitoba Maple	6, 9, 3, (11)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1076	*Acer negundo*	Manitoba Maple	19, 3, 3, (19)	9	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1077	*Fraxinus pennsylvanica*	Green Ash	8, 8, 3, (12)	6	Poor	Significant dieback and thinning; Larger two stems are dead; Smaller stem is an epicormic shoot; Decline likely due to EAB infestation.	Subject Lands	N/A	Remove Due to Condition
1078	*Acer negundo*	Manitoba Maple	8, 5, (9)	6	Fair-Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1079	*Acer negundo*	Manitoba Maple	22, 10, (24)	10	Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1080	*Acer negundo*	Manitoba Maple	12, 15, (19)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1081	*Acer negundo*	Manitoba Maple	10, 8, (13)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1082	*Acer negundo*	Manitoba Maple	10, 10, (14)	6	Fair-Good	Good vigour; Stems fork below breast height; Mechanical wound on one stem; Wound wood present.	Subject Lands	N/A	Remove Due to Development
1083	*Acer negundo*	Manitoba Maple	11	6	Good	Good vigour; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1084	*Acer negundo*	Manitoba Maple	15, 9, 9, 8, (21)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1085	*Acer negundo*	Manitoba Maple	14, 15, 15, (25)	10	Poor-Fair	Significant dieback and thinning; Stems fork near ground; Included bark; Peeling bark on several stems.	Subject Lands	N/A	Remove Due to Condition
1086	*Acer negundo*	Manitoba Maple	14, 12, 10, (21)	8	Poor-Fair	Significant dieback and thinning; Stems fork near ground; Included bark; Peeling bark on several of the stems.	Subject Lands	N/A	Remove Due to Condition
1087	*Acer negundo*	Manitoba Maple	11	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1088	*Acer negundo*	Manitoba Maple	16	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1089	*Acer negundo*	Manitoba Maple	17, 10, 11, 12, (26)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1090	*Acer negundo*	Manitoba Maple	11, 11, 13, (20)	7	Poor	Significant dieback and thinning; Stems fork near ground; Included bark; Peeling bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1091	*Acer negundo*	Manitoba Maple	16	7	Fair-Good	Minor dieback and thinning.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1092	*Acer negundo*	Manitoba Maple	19	6	Fair	Moderate dieback and thinning.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1093	*Acer negundo*	Manitoba Maple	18, 19, (26)	9	Fair	Moderate dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1094	*Acer negundo*	Manitoba Maple	15, 9, 12, (21)	6	Poor-Fair	Significant dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1095	*Acer negundo*	Manitoba Maple	18, 13, 9, (24)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1096	*Fraxinus pennsylvanica*	Green Ash	12, 11, 10, 8, 10, (23)	8	Poor	Significant dieback and thinning; Larger stems are dead; Smaller stems are epicormic shoots; Decline likely due to EAB infestation.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1097	*Acer negundo*	Manitoba Maple	19, 13, (23)	8	Poor	Significant dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1098	*Acer negundo*	Manitoba Maple	18, 14, 16, (28)	9	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1099	*Acer negundo*	Manitoba Maple	27, 11, (29)	8	Poor	Significant dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1100	*Acer negundo*	Manitoba Maple	27, 16, (31)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1239	*Acer negundo*	Manitoba Maple	19	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1301	*Fraxinus pennsylvanica*	Green Ash	45	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1302	*Acer negundo*	Manitoba Maple	14, 19, 20, 18, 14, (38)	10	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1303	*Catalpa speciosa*	Northern Catalpa	69	12	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1304	*Juglans nigra*	Black Walnut	24	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1305	*Juglans nigra*	Black Walnut	17, 5, (18)	7	Good	Good vigour; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1306	*Juglans nigra*	Black Walnut	13, 10, (16)	7	Good	Good vigour; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1307	*Juglans nigra*	Black Walnut	19	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1308	*Juglans nigra*	Black Walnut	33	11	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1309	*Acer saccharinum*	Silver Maple	22, 18, 10, 8, (31)	8	Fair	Good vigour; Stems fork near ground; Included bark; Adventitious shoots near base; Rotting cavity near ground; Exposed surface roots.	Subject Lands	N/A	Remove Due to Development
1310	*Acer saccharinum*	Silver Maple	45, 39, 24, (64)	14	Fair-Good	Good vigour; Stems fork near ground; Included bark; One stem with calloused wound below breast height; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1311	*Pinus sylvestris*	Scots Pine	24	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1312	*Acer saccharinum*	Silver Maple	31	8	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1313	*Acer saccharinum*	Silver Maple	23	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1314	*Acer saccharinum*	Silver Maple	39	N/A	Dead	Standing snag.	Subject Lands	N/A	Remove Due to Condition
1315	*Pinus sylvestris*	Scots Pine	23	7	Fair-Good	Good form and vigour; Stem slightly gridled by wire property fence.	Subject Lands	N/A	Remove Due to Development
1316	*Malus pumila*	Common Apple	70	10	Fair-Good	Good form and vigour; Cavity at breast height; Wound wood; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1317	*Pinus sylvestris*	Scots Pine	46	8	Good	Good vigour; Slight lean towards the east.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1318	*Pinus sylvestris*	Scots Pine	26	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1319	*Pinus sylvestris*	Scots Pine	30	7	Fair-Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1320	*Pinus sylvestris*	Scots Pine	22	6	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1321	*Pinus sylvestris*	Scots Pine	15	5	Good	Good form and vigour.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1322	*Pinus sylvestris*	Scots Pine	14	4	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1323	*Pinus sylvestris*	Scots Pine	38	8	Good	Good vigour; Stem slightly gridled by wire property fence.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1324	*Acer negundo*	Manitoba Maple	6, 8, 4, 6, 4, (13)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1325	*Juglans nigra*	Black Walnut	11	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1326	*Acer negundo*	Manitoba Maple	15	6	Good	Good vigour; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1327	*Acer negundo*	Manitoba Maple	15, 18, (23)	7	Fair	Horizontal form; Stems leaning significantly towards the east; Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1328	*Acer negundo*	Manitoba Maple	28	10	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1329	*Acer negundo*	Manitoba Maple	19	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1330	*Acer negundo*	Manitoba Maple	35	10	Fair-Good	Minor dieback and thinning; Slight lean towards the east.	Subject Lands	N/A	Remove Due to Development
1331	*Acer negundo*	Manitoba Maple	18	6	Good	Good vigour; Slight lean towards the east.	Subject Lands	N/A	Remove Due to Development
1332	*Acer negundo*	Manitoba Maple	27	7	Fair-Good	Minor dieback and thinning; Stem leaning towards the south.	Subject Lands	N/A	Remove Due to Development
1333	*Acer negundo*	Manitoba Maple	19	6	Good	Good vigour; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1334	*Acer negundo*	Manitoba Maple	25, 23, 14, (37)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Stems with significant lean towards the south.	Subject Lands	N/A	Remove Due to Development
1335	*Acer negundo*	Manitoba Maple	18, 19, (26)	7	Fair	Minor dieback and thinning; Stems fork below breast height; Included bark; Exposed surface roots.	Subject Lands	N/A	Remove Due to Development
1336	*Acer negundo*	Manitoba Maple	28, 30, (41)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Epicormic shoots at base and breast height.	Subject Lands	N/A	Remove Due to Development
1337	*Acer negundo*	Manitoba Maple	17	7	Fair-Good	Minor dieback and thinning; Asymetical crown.	Subject Lands	N/A	Remove Due to Development
1338	*Acer negundo*	Manitoba Maple	17, 17, (24)	8	Fair-Good	Minor dieback and thinning; Stems fork near breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1339	*Acer negundo*	Manitoba Maple	21	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1340	*Acer negundo*	Manitoba Maple	18	7	Fair	Moderate dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1341	*Acer negundo*	Manitoba Maple	25, 23, 17, (38)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1342	*Acer negundo*	Manitoba Maple	32, 22, (39)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1343	*Acer negundo*	Manitoba Maple	17, 28, 10, (34)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1344	*Acer negundo*	Manitoba Maple	24, 15, 15, (32)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1345	*Acer negundo*	Manitoba Maple	20, 20, (28)	N/A	Dead	Standing snag; One stem failed at breast height; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1346	*Acer negundo*	Manitoba Maple	15, 28, (32)	8	Fair	Moderate dieback and thinning; Stems fork below breast height; Significant lean towards the south.	Subject Lands	N/A	Remove Due to Development
1347	*Acer negundo*	Manitoba Maple	24	8	Fair-Good	Minor dieback and thinning; Epicormic shoots at base and along stem at breast height.	Subject Lands	N/A	Remove Due to Development
1348	*Acer negundo*	Manitoba Maple	31	8	Fair-Good	Minor dieback and thinning; Epicormic shoots at base and along stem at breast height.	Subject Lands	N/A	Remove Due to Development
1349	*Acer negundo*	Manitoba Maple	25	7	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1350	*Acer negundo*	Manitoba Maple	20, 18, (27)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Epicormic shoots at base; Stems leaning towards the south.	Subject Lands	N/A	Remove Due to Development
1351	*Acer negundo*	Manitoba Maple	23	6	Fair	Moderate dieback and thinning; Stem leaning towards the south; Wooden debris piled up against stem.	Subject Lands	N/A	Remove Due to Development
1352	*Acer negundo*	Manitoba Maple	17	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1353	*Acer negundo*	Manitoba Maple	17	7	Fair-Good	Minor dieback and thinning; Stem leaning towards the east.	Subject Lands	N/A	Remove Due to Development
1354	*Acer negundo*	Manitoba Maple	30, 20, 20, 15, 15, (46)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1355	*Acer negundo*	Manitoba Maple	27	8	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1356	*Acer negundo*	Manitoba Maple	35, 20, (40)	10	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Stems leaning towards the northwest.	Subject Lands	N/A	Remove Due to Development
1357	*Pyrus communis*	Common Pear	20, 15, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1358	*Malus pumila*	Common Apple	15, 20, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark; Fruiting at time of inventory; Crown raised.	Subject Lands	N/A	Remove Due to Development
1359	*Acer negundo*	Manitoba Maple	60	12	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1360	*Acer negundo*	Manitoba Maple	35, 35, (49)	12	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1361	*Acer negundo*	Manitoba Maple	25, 15, (29)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1362	*Acer negundo*	Manitoba Maple	25, 25, (35)	9	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1363	*Acer negundo*	Manitoba Maple	25	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1364	*Acer negundo*	Manitoba Maple	27	9	Fair-Good	Minor dieback and thinning; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1365	*Acer negundo*	Manitoba Maple	45	10	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1366	*Acer negundo*	Manitoba Maple	23	6	Fair-Good	Minor dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Development
1367	*Acer negundo*	Manitoba Maple	23, 6, (24)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1368	*Acer negundo*	Manitoba Maple	10, 9, (13)	6	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1369	*Acer negundo*	Manitoba Maple	28	8	Good	Good form and vigour.	Municipal Road Allowance	N/A	Remove Due to Development
1370	*Acer negundo*	Manitoba Maple	23, 23, (33)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1371	*Acer negundo*	Manitoba Maple	18	6	Fair-Good	Minor dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Development
1372	*Acer negundo*	Manitoba Maple	10, 8, (13)	7	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1373	*Acer negundo*	Manitoba Maple	20, 15, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1374	*Acer negundo*	Manitoba Maple	8, 15, (17)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1375	*Acer negundo*	Manitoba Maple	6, 7, (9)	5	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1376	*Acer negundo*	Manitoba Maple	15, 15, (21)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Development
1377	*Acer negundo*	Manitoba Maple	15, 20, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1378	*Acer negundo*	Manitoba Maple	15, 20, 8, (26)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1379	*Acer negundo*	Manitoba Maple	15, 15, 20, (29)	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1380	*Acer negundo*	Manitoba Maple	55, 20, (59)	12	Fair-Good	Minor dieback and thinning; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1381	*Acer negundo*	Manitoba Maple	20, 15, (25)	N/A	Dead	Standing snag; Potential risk tree.	Municipal Road Allowance	N/A	Remove Due to Condition
1382	*Acer negundo*	Manitoba Maple	17, 10, (20)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1383	*Acer negundo*	Manitoba Maple	19, 17, (25)	7	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1384	*Acer negundo*	Manitoba Maple	15, 4, (16)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1385	*Acer negundo*	Manitoba Maple	10, 4, (11)	5	Poor	Significant dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Condition
1386	*Acer negundo*	Manitoba Maple	8	4	Poor	Significant dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Condition
1387	*Acer negundo*	Manitoba Maple	10, 12, 8, (18)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1388	*Acer negundo*	Manitoba Maple	15	6	Poor	Significant dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Condition
NT1	*Acer platanoides*	Norway Maple	45	12	Good	Good form and vigour; Full healthy crown; DBH measurement estimated.	14206 Humber Station Road	N/A	Remove Due to Development
NT2	*Populus deltoides*	Eastern Cottonwood	44	N/A	Dead	Standing snag; Potential risk tree; DBH measurement estimated.	14206 Humber Station Road	N/A	Remove Due to Condition
NT3	*Salix matsudana*	Corkscrew Willow	35	9	Fair-Good	Minor dieback and thinning; Good vigour; DBH measurement estimated.	14206 Humber Station Road	N/A	Remove Due to Development
NT4	*Acer negundo*	Manitoba Maple	35	8	Fair-Good	Good vigour; Minor dieback and thinning; Stem leaning towards the southeast; Canopy overhangs onto subject property.	0 Humber Station Road	N/A	Remove Due to Development
NT5	*Acer negundo*	Manitoba Maple	15, 15, 10, 10, (25)	10	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark.	0 Humber Station Road	N/A	Remove Due to Development
NT6	*Acer negundo*	Manitoba Maple	15, 15, 15, 10, (28)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Tree inaccessible to tag and measure.	Subject Lands	N/A	Remove Due to Development
NT7	*Ulmus americana*	American Elm	28	9	Good	Good form and vigour.	0 King Street	N/A	Remove Due to Development
NT8	*Ulmus americana*	American Elm	18	7	Good	Good form and vigour.	0 King Street	N/A	Remove Due to Development
NT9	*Tilia americana*	Basswood	17, 16, (23)	8	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark.	0 King Street	N/A	Remove Due to Development
NT10	*Tilia americana*	Basswood	17	7	Good	Good vigour; Uneven crown.	0 King Street	N/A	Remove Due to Development
NT11	*Tilia americana*	Basswood	11	4	Good	Good form and vigour.	0 King street	N/A	Remove Due to Development
NT12	*Ulmus americana*	American Elm	22	7	Good	Good form and vigour.	0 King Street	N/A	Remove Due to Development
NT13	*Malus pumila*	Common Apple	20, 20, (28)	9	Fair-Good	Good vigour; Minor dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of inventory; Inaccessible to tag and measure.	Co-owned between Subject Lands and 0 King Street	N/A	Remove Due to Development
NT14	*Salix alba*	White Willow	55, 55, (78)	12	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown; Located off property, DBH measurements estimated; Branches slightly overhang onto subject property.	0 King Street	4.8	Preserve
NT15	*Picea glauca*	White Spruce	55	9	Good	Good form and vigour; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	3.6	Preserve
NT16	*Acer platanoides*	Norway Maple	25	8	Good	Good form and vigour; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.8	Preserve
NT17	*Thuja occidentalis*	Eastern White Cedar	25	6	Good	Good form and vigour; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.8	Preserve
NT18	*Thuja occidentalis*	Eastern White Cedar	15, 15, (21)	6	Good	Good vigour; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.8	Preserve
NT19	*Acer negundo*	Manitoba Maple	25, 15, (29)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Inaccessible to tag; DBH measurement estimated.	Subject Lands	N/A	Remove Due to Development
NT20	*Acer negundo*	Manitoba Maple	15	6	Fair-Good	Minor dieback and thinning; Inaccessible to tag; DBH measurement estimated.	Subject Lands	N/A	Remove Due to Development
NT21	*Acer negundo*	Manitoba Maple	20	8	Good	Good vigour; Slight lean towards the south; Located off property, DBH measurement estimated.	Co-owned between Subject Lands and 14042 Humber Station Road	1.2	Preserve

1. The tree health condition rating was based on factors that could include one or a combination of:
   - Poor Condition – Severe dieback, significant lean, decayed, missing leader, significant disease presence
   - Fair Condition – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress
   - Good Condition – Healthy vigorous growth, no or minor visible defects or damage
2. The TPZ is the minimum distance required for tree preservation determined in accordance with ISA guidelines.

Humberking West Trees Groups

Tree Group A		Size Class (DBH in cm)		
Scientific Name	Common Name	5-10	11-20	21-30
Thuja occidentalis	Eastern White Cedar	0	35	10
Tree Group B		**Size Class (DBH in cm)**		
Scientific Name	Common Name	5-10	11-20	21-30
Thuja occidentalis	Eastern White Cedar	0	20	5
Tree Group C		**Size Class (DBH in cm)**		
Scientific Name	Common Name	5-10	11-20	21-30
Populus tremuloides	Trembling Aspen	70	20	0
Tree Group D		**Size Class (DBH in cm)**		
Scientific Name	Common Name	5-10	11-20	21-30
Acer negundo	Manitoba Maple	0	7	0



KEYMAP

LEGEND

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE

NORTH ARROW

CERTIFIED ARBORIST ISA
ALEX HANEY
#ON-2723A

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CLIENT
HUMBERKING DEVELOPMENTS LIMITED

PROJECT
MACVILLE HUMBERKING WEST DRAFT PLAN OF SUBDIVISON

SHEET TITLE
TREE INVENTORY TABLE (WEST SUBDIVISION)

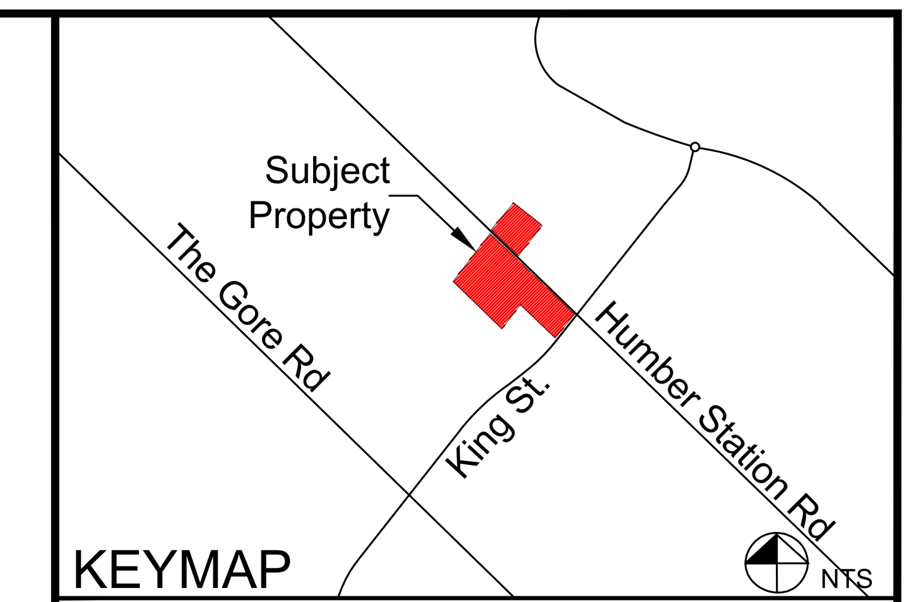
DESIGN BY:	--	PROJECT Nº:	223212
DRAWN BY:	CS	FIGURE Nº:	TP-6
CHECKED BY:	AH/TS		
DATE:	27 May 2024		

TREE INVENTORY TABLE (EAST SUBDIVISION)

Tag/Tree No.	Scientific Name	Common Name	DBH (cm)	Crown Diameter (m)	Condition1	Comments	Ownership	TPZ Radius2 (m)	Tree Preservation Recommendation
1389	*Acer negundo*	Manitoba Maple	50	8	Poor-Fair	Large rotting cavity at base; Wound wood; Structurally unsafe; Epicormic shoots at base and along stem at breast height.	Co-owned between Subject Lands and Municipal Road Allowance	N/A	Remove Due to Condition
1390	*Prunus domestica*	Damson Plum	15, 4, 4, (16)	5	Poor	Significant dieback and thinning; Peeling bark; Stems fork below breast height; Included bark.	Municipal Road Allowance	N/A	Remove Due to Condition
1391	*Prunus domestica*	Damson Plum	8, 4, (9)	5	Fair-Good	Stems fork near ground; Included bark; Minor dieback and thinning.	Municipal Road Allowance	N/A	Remove Due to Development
1392	*Prunus domestica*	Damson Plum	13, 8, 4, (16)	5	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Sap ooze.	Municipal Road Allowance	N/A	Remove Due to Development
1393	*Prunus domestica*	Damson Plum	3, 3, 3, 3, 2, (6)	6	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1394	*Prunus domestica*	Damson Plum	5, 3, (6)	4	Good	Good vigour; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1395	*Juniperus virginiana*	Eastern Red Cedar	12	5	Good	Good form and vigour.	Municipal Road Allowance	N/A	Remove Due to Development
1396	*Juniperus virginiana*	Eastern Red Cedar	12	6	Good	Good form and vigour; Wide spreading branches.	Municipal Road Allowance	N/A	Remove Due to Development
1397	*Juniperus virginiana*	Eastern Red Cedar	8, 8, (11)	6	Good	Good vigour; Shrub form; Stems fork near ground; Included bark.	Municipal Road Allowance	N/A	Remove Due to Development
1398	*Ulmus americana*	American Elm	34	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1399	*Tilia americana*	Basswood	49	12	Good	Good form and vigour; Full healthy crown.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	N/A	Remove Due to Development
1400	*Acer negundo*	Manitoba Maple	15	8	Fair-Good	Minor dieback and thinning.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	N/A	Remove Due to Development
1401	*Acer negundo*	Manitoba Maple	8, 8, (11)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.2	Preserve
1402	*Acer negundo*	Manitoba Maple	15, 5, (16)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.2	Preserve
1403	*Acer negundo*	Manitoba Maple	15, 15, (21)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.8	Preserve
1404	*Ulmus americana*	American Elm	14	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1405	*Acer negundo*	Manitoba Maple	13	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1406	*Ulmus americana*	American Elm	11	6	Good	Good form and vigour.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	1.2	Preserve
1407	*Acer negundo*	Manitoba Maple	15, 15, (21)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark.	Subject Lands	N/A	Remove Due to Development
1408	*Acer negundo*	Manitoba Maple	45	8	Fair-Good	Minor dieback and thinning.	Co-owned between Subject Lands and Canadian Pacific Railway Right-of-Way	3	Preserve
1409	*Acer negundo*	Manitoba Maple	10	6	Fair-Good	Minor dieback and thinning.	Subject Lands	N/A	Remove Due to Development
1410	*Acer negundo*	Manitoba Maple	15, 15, 5, (22)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Epicormic shoots at base.	Subject Lands	N/A	Remove Due to Development
1411	*Acer negundo*	Manitoba Maple	14	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1412	*Acer negundo*	Manitoba Maple	40	10	Fair-Good	Minor dieback and thinning; Stems fork above breast height; Included bark.	Subject Lands	N/A	Remove Due to Development
1413	*Ulmus americana*	American Elm	40	N/A	Dead	Standing snag; Potential risk tree.	Subject Lands	N/A	Remove Due to Condition
1414	*Tilia americana*	Basswood	39	10	Good	Good form and vigour; Stem growing adjacent to wire property fence.	Subject Lands	N/A	Remove Due to Development
1415	*Tilia americana*	Basswood	34	9	Good	Good form and vigour; Stem growing adjacent to wire property fence.	Subject Lands	N/A	Remove Due to Development
1416	*Malus pumila*	Common Apple	30, 25, (39)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of surveys; Overgrown with Common Buckthorn.	Subject Lands	N/A	Remove Due to Development
1417	*Malus pumila*	Common Apple	30, 20, (36)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of surveys; Overgrown with Common Buckthorn.	Subject Lands	N/A	Remove Due to Development
1418	*Malus pumila*	Common Apple	30, 35, 30, (55)	8	Fair	Moderate dieback and thinning; Stems fork near ground; Included bark; Fruiting at time of inventory; Overgrown with Common Buckthorn.	Subject Lands	N/A	Remove Due to Development
1419	*Malus pumila*	Common Apple	20, 25, (32)	7	Poor	Significant dieback and thinning; Rotting cavities in one stem; Stems fork below breast height; Included bark.	Subject Lands	N/A	Remove Due to Condition
1420	*Ulmus americana*	American Elm	46	14	Good	Good form and vigour; Wide spreading branches; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1421	*Ulmus americana*	American Elm	18	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1422	*Carya cordiformis*	Bitternut Hickory	48	12	Good	Good form and vigour; Full healthy crown; Large mature tree.	Subject Lands	N/A	Remove Due to Development
1423	*Carya cordiformis*	Bitternut Hickory	35, 21, (41)	10	Good	Good vigour; Stems fork near ground; Included bark; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1424	*Carya cordiformis*	Bitternut Hickory	25	8	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1425	*Carya cordiformis*	Bitternut Hickory	22	8	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1426	*Carya cordiformis*	Bitternut Hickory	34	12	Good	Good form and vigour; Full healthy crown.	Subject Lands	N/A	Remove Due to Development
1427	*Carya cordiformis*	Bitternut Hickory	35	12	Good	Good form and vigour; Full healthy crown; Good root flare.	Subject Lands	N/A	Remove Due to Development
1428	*Carya cordiformis*	Bitternut Hickory	10	6	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1429	*Carya cordiformis*	Bitternut Hickory	13	7	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1430	*Carya cordiformis*	Bitternut Hickory	10	5	Good	Good form and vigour.	Subject Lands	N/A	Remove Due to Development
1477	*Acer negundo*	Manitoba Maple	25, 25, 10, (37)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated; Tag from previous inventory.	0 Humber Station Road	N/A	Remove Due to Development
NT22	*Ulmus americana*	American Elm	50	N/A	Dead	Standing snag; Potential risk tree; Inaccessible to tag; DBH measurement estimated.	Subject Lands	N/A	Remove Due to Condition
NT23	*Ulmus americana*	American Elm	20	N/A	Dead	Standing snag; Inaccessible to tag; DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	N/A	Preserve
NT24	*Ulmus americana*	American Elm	15, 15, (21)	N/A	Dead	Standing snag; Inaccessible to tag, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	N/A	Preserve
NT25	*Salix euxina*	Crack Willow	25, 25, (35)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	2.4	Preserve
NT26	*Acer negundo*	Manitoba Maple	35	9	Good	Good vigour; Located off property, DBH measurement estimated; Branches overhang onto subject property.	Canadian Pacific Railway Right-of-Way	2.4	Preserve
NT27	*Acer negundo*	Manitoba Maple	30	7	Fair-Good	Minor dieback and thinning; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	2.4	Preserve
NT28	*Acer negundo*	Manitoba Maple	25, 25, (35)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	2.4	Preserve
NT29	*Acer negundo*	Manitoba Maple	20, 15, (25)	8	Fair-Good	Minor dieback and thinning; Stems fork near ground; Included bark; Located off property, DBH measurement estimated.	Canadian Pacific Railway Right-of-Way	1.8	Preserve
NT30	*Tilia americana*	Basswood	35, 35, 25, (55)	10	Good	Good vigour; Full healthy crown; Stems fork near ground; Included bark; Inaccessible to tag, DBH measurement estimated.	Subject Lands	N/A	Remove Due to Development

1. The tree health condition rating was based on factors that could include one or a combination of:
   - Poor Condition – Severe dieback, significant lean, decayed, missing leader, significant disease presence
   - Fair Condition – Moderate dieback and/or lean, limb defects, multiple stems, moderate foliage damage from stress
   - Good Condition – Healthy vigorous growth, no or minor visible defects or damage
2. The TPZ is the minimum distance required for tree preservation determined in accordance with ISA guidelines.

Humberking East Tree Groups				
Tree Group E		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-30**
Prunus domestica	Damson Plum	0	8	0
Acer negundo	Manitoba Maple	0	4	0
Tree Group F		**Size Class (DBH in cm)**		
Scientific Name	**Common Name**	**5-10**	**11-20**	**21-45**
Tilla americana	Basswood	0	0	10
Acer negundo	Manitoba Maple	0	0	1



KEYMAP

LEGEND

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE

NORTH ARROW

CERTIFIED ARBORIST ISA

ALEX HANEY
#ON-2723A

BEACON ENVIRONMENTAL

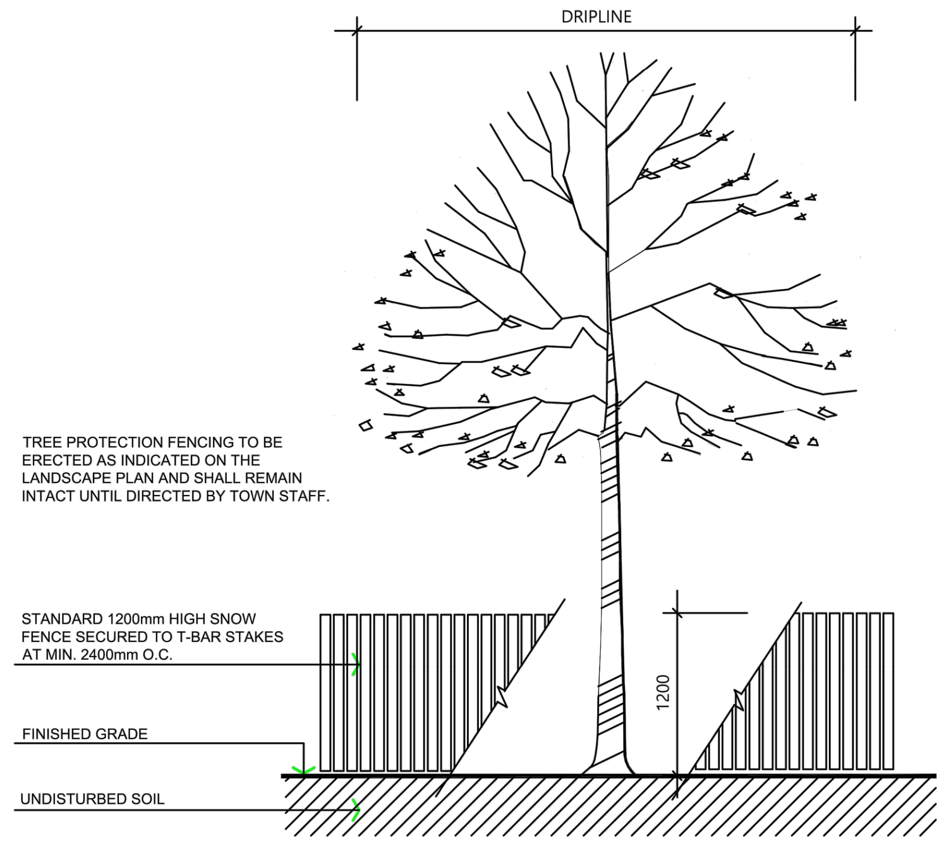
MARKHAM OFFICE
80 MAIN ST NORTH
MARKHAM, ON L3P 1X5
T) 905.201.7622
F) 905.201.0639

CLIENT
HUMBERKING DEVELOPMENTS LIMITED

PROJECT
MACVILLE HUMBERKING EAST DRAFT PLAN OF SUBDIVISON

SHEET TITLE
TREE INVENTORY TABLE (EAST SUBDIVISION)

DESIGN BY:	--	PROJECT Nº:	223212
DRAWN BY:	CS	FIGURE Nº:	TP-7
CHECKED BY:	AH/TS		
DATE:	27 May 2024		



SPECIFICATIONS FOR THE PROTECTION AND PRESERVATION OF EXISTING VEGETATION:

1. PRIOR TO ISSUANCE OF THE GRADING AND SERVICING OR BUILDING PERMIT, ALL EXISTING TREES THAT ARE TO BE PRESERVED SHALL BE FULLY PROTECTED WITH HOARDING (IE SNOW FENCING) OUTSIDE THEIR 'DRIPLINES', OR AS DIRECTED THROUGH ADDITIONAL GOVERNING DOCUMENTS,TO THE SATISFACTION OF THE TOWN.
2. GROUPS OF TREES AND OTHER EXISTING PLANTINGS TO BE PROTECTED SHALL BE TREATED IN A LIKE MANNER WITH HOARDING AROUND THE ENTIRE CLUMP(S).
3. TREE PRESERVATION FENCE IS TO BE INSPECTED BY THE CONSULTING ARBORIST OR LANDSCAPE ARCHITECT AND APPROVED BY THE TOWN PRIOR TO CONSTRUCTION COMMENCING.
4. SILTATION CONTROL FENCING MAY BE USED AS A TREE PRESERVATION FENCING SUBSTITUTE IF REQUIRED BY ENGINEERING AT THE DISCRETION OF THE TOWN.
5. AREAS WITHIN PROTECTIVE FENCING SHALL REMAIN UNDISTURBED AND SHALL NOT BE USED FOR THE STORAGE OF BUILDING MATERIALS OR EQUIPMENT. NO CONTAMINANTS SHALL BE DUMPED OR FLUSHED WHERE FEEDER ROOTS OF TREES EXIST. NO GARBAGE OR BUILDING MATERIALS ARE TO BE PLACED ON OR AGAINST THE TREE PRESERVATION FENCE.
6. PRUNE BRANCHES TO REMOVE DAMAGED LIMBS ONLY. DO NOT DAMAGE LEADERS. ALL CUTS OVER 25mm SHALL BE TREATED IN ACCORDANCE WITH APPROPRIATE HORTICULTURAL PRACTICES AS APPROVED BY THE TOWN. NO MORE THAN 20% OF THE TREE SHALL BE PRUNED UNLESS DIRECTED BY THE TOWN.
7. CUTTING OF ROOTS OR CHANGING OF GRADES AROUND EXISTING TREES TO BE PRESERVED WILL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE PUBLIC WORKS AND ENGINEERING DEPARTMENT.
8. IF TREES ARE BEING ADVERSELY AFFECTED BY CONSTRUCTION, A WATERING AND FERTILIZING PROGRAM IS TO BE SET UP TO THE SATISFACTION OF THE TOWN.
9. PRIOR TO FINAL APPROVAL TREES THAT HAVE DIED OR HAVE BEEN DAMAGED BEYOND REPAIR PRIOR DURING OR POST CONSTRUCTION SHALL BE REMOVED AND REPLACED WITH TREES OF A SIZE AND SPECIES APPROVED BY THE TOWN, AT THE SOLE COST OF THE DEVELOPER.

TOWN OF CALEDON	NO.	REVISION	APR'D	DATE		
TREE PRESERVATION	3	STANDARD 707 NOW 606		JAN 18	APR'D: C.C.	DATE: JUNE 08
	2	STANDARD No. 1135 NOW 707, NOTES EDIT		JUNE 08	DRAWN: abal	SCALE: NTS
	1	NOTE NO. 9 ADDED		MARCH 08	STANDARD No. 606	

SPECIFICATIONS

A. General

The following Tree Preservation and Protection Measures will be undertaken to help eliminate and/or significantly reduce construction injury to all trees recommended for preservation. All temporary tree protection measures cited for retained trees must comply with the Town of Caledon Tree Protection Specifications and Details. Any variation from the standard tree protection measures must be approved in writing by the Town of Caledon.

B. Pre-Construction Phase

1. Prior to construction, the trees to be preserved shall be protected with a Tree Protection Barrier. The barrier shall consist of 1.2m (4ft) high orange plastic snow fence wired to T-bars (see Town of Caledon Tree Preservation Fencing, STD 606).
2. If applicable, attach a filter cloth 600mm high to the construction side of the hoarding to act as sediment control. Sediment control fencing shall meet or exceed OPSD-219.110, and be installed to the satisfaction of the Town of Caledon.
3. All supports and bracing used to safely secure the barrier should be located outside the Tree Protection Zone (TPZ). All supports and bracing should minimize damage to roots.
4. The TPZ fence is to be installed along the edge of the tree protection zones. This hoarding is to remain in place and remain in good condition throughout the entire duration of the project. Dismantling the tree protection barrier prior to approval by the Town of Caledon staff may constitute a contravention.
5. The applicant shall notify the Town of Caledon and the consulting certified arborist or landscape architect to confirm that the tree protection barriers are in place.
6. Where fill or excavated material must be temporarily located near a TPZ, a wooden barrier must be used to ensure no material enters the TPZ.
7. Remove any garbage and foreign debris from the tree protection zones, daily.
8. For the trees that were recommended for removal and/or crown pruning that are within the TPZ limits, these activities are to be performed by a qualified ISA certified arborist prior to the installation of the Tree Protection Zone barriers and prior to the commencement of any construction activities. Install the Tree Protection Zone barrier as per Tree Preservation Fencing, STD 606 at the limits shown on the tree inventory and protection plan after the tree removal, whichever is greater, and crown pruning activities are completed.
9. A **Tree Protection Zone** sign must be mounted on all sides of the tree protection barrier for the duration of site construction. The sign should be a minimum of 40cm x 60cm and made of white gator board or equivalent material.
10. The sign must be similar to the illustration shown below, or as directed by the Town of Caledon.

TREE PROTECTION ZONE

No work is permitted in the Tree Protection Zone

This includes construction works, grading, storage of trash or materials.

The tree protection barrier must not be removed without written authorization of the Town of Caledon.

11. All contractors and site visitors should be informed of the tree preservation and protection measures at a pre-construction meeting.

specifications continued on next panel...

TOWN OF CALEDON	NO.	REVISION	APR'D	DATE		
TREE PRESERVATION STANDARD NOTES - PART 1					APR'D: B.B.	DATE: AUGUST 17
					DRAWN: B.M.	SCALE: NTS
					STANDARD No. 710	

SPECIFICATIONS continued from previous panel

C. During Construction Phase

1. All areas within the TPZ shall remain undisturbed for the duration of construction. There will be no grade changes, dumping, and storage of any materials, structures or equipment within these areas. The Tree Protection Barrier must not be removed without the written authorization of the Town of Caledon.
2. Minor grading works will be permitted at the edge of the preservation zone as required to correct localized depressions, and blend to existing grades.This work to be undertaken under the direct supervision of an ISA certified arborist.
3. A certified ISA arborist will undertake proper root pruning in accordance with acceptable arboriculture practices when and if roots of retained trees are to be exposed, damaged, or severed by construction work. The exposed roots will be backfilled with appropriate material as soon as possible to prevent desiccation. Root pruning prior to excavation will help prevent necessary damage to tree roots.The use of low pressure hydrovac to expose roots is recommended, at no additional cost.
4. The Town of Caledon must be notified for all work that impacts the TPZ for temporary removal of a section of hoarding to gain access for fine grading or other works. All works are to be supervised by the Town of Caledon.
5. No cables, wire or ropes of any kind shall be wrapped around or installed in trees to be preserved.
6. No contaminants will be dumped or flushed in the TPZ areas or where feeder roots of trees exist (generally beyond the TPZ areas).
7. Irrigate tree protection zones during drought conditions, June to September to reduce drought stress.
8. Inspect the site daily to ensure hoarding is in place and in good condition. Inspect trees to monitor condition.

D. Post Construction Phase

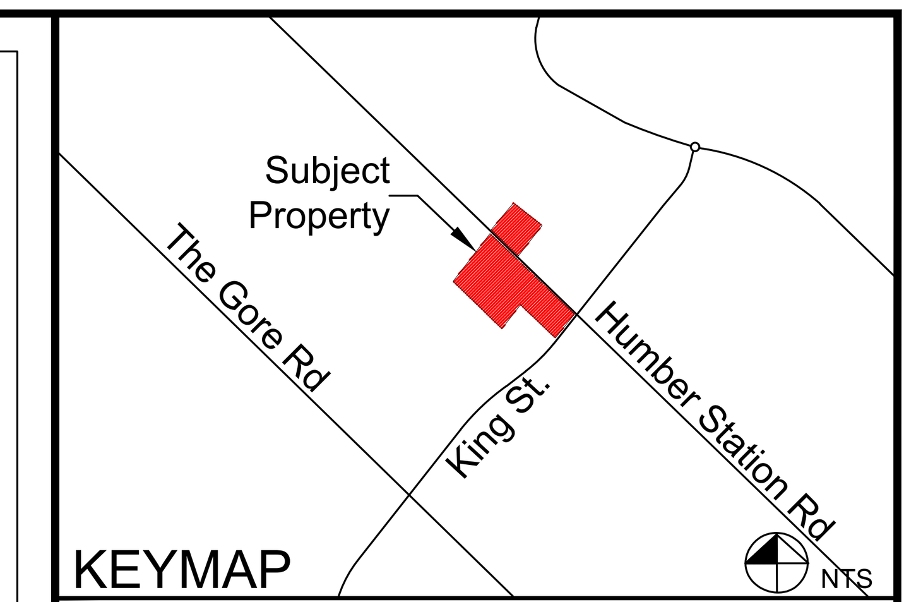
1. Following the completion of all site works including landscaping, and after review and approval by the Town of Caledon staff, the protective hoarding may be removed.
2. After removal of the protective hoarding, the Tree Preservation Zones shall be inspected by the Town of Caledon staff. Any remaining dead, diseased, or hazardous limbs or trees are to be removed by an ISA certified arborist as directed by the consulting arborist or Town of Caledon staff.

end of specifications

TOWN OF CALEDON	NO.	REVISION	APR'D	DATE		
TREE PRESERVATION STANDARD NOTES - PART 2					APR'D: B.B.	DATE: AUGUST 17
					DRAWN: B.M.	SCALE: NTS
					STANDARD No. 711	

1 / TP-8 TREE PROTECTION FENCING DETAIL AND NOTES

NTS



KEYMAP

LEGEND

Notes: Scale shown is for an 36" x 24" page.
For illustrative purposes. Do not scale

Nº	REVISIONS	DATE:	BY:
6			
5			
4			
3			
2	BASE PLAN UPDATED	2024/05/27	AH
1	ISSUED FOR SUBMISSION	2023/11/04	AH

SCALE

NORTH ARROW

CERTIFIED ARBORIST ISA

ALEX HANEY
#ON-2723A

BEACON ENVIRONMENTAL

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80 MAIN ST NORTH
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F) 905.201.0639

CLIENT

HUMBERKING DEVELOPMENTS LIMITED

PROJECT

MACVILLE HUMBERKING EAST AND WEST DRAFT PLANS OF SUBDIVISON

SHEET TITLE

TREE PROTECTION DETAILS

DESIGN BY:	--	PROJECT Nº:	223212
DRAWN BY:	CS	FIGURE Nº:	TP-8
CHECKED BY:	AH/TS		
DATE:	27 May 2024		

Appendix F

Breeding Bird 2020 Field Notes for Caledon Station Secondary Plan

Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpenter Date (use letters for mos.): May 28/20

Project Name: BOLTON - BRES Project #: 21476

Time of Survey (start and finish): 0445 - 0815

Weather (approx. temp., cloud cover, wind, precipitation): overcast, no wind

16 - 18°C

Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

EUST	2-4	RWBL	28-30	EAPH	2
MALL - foraging		BRTH	2	AMCR	1-2
Canada Goose - foraging		NOCA	2	AMRO	6-8
KILL	2	[illegible]		AMGO	3-4
Spot. Sandp	1	[illegible]		GRCA	1
SASP	7-9	CWYE	1	BADR	2
SOSP	10-12	YEWA	3	WAVI	1
BOBO	4 males	SWSP	1	REVI	1
EAME	1	EAKI	2	GBHE - foraging	
CHSP	2	WIFL	3	HOLA	2
BLJA	1	COGR	2-3	MODO	2
HOWR	1	INBU	1		
BARS - foraging					

RFC Apr 2012

2 of 3 (As will be 1st)

Project #: 214476
Project Name: Bolton-BRES Option 3 Lands NH Review
Project Manager: KU

597000 597500 598000 598500

4859500 4859000 4858500 4858000 4857500 4857000 4856500

Lumber Station Rd

The Gore Road

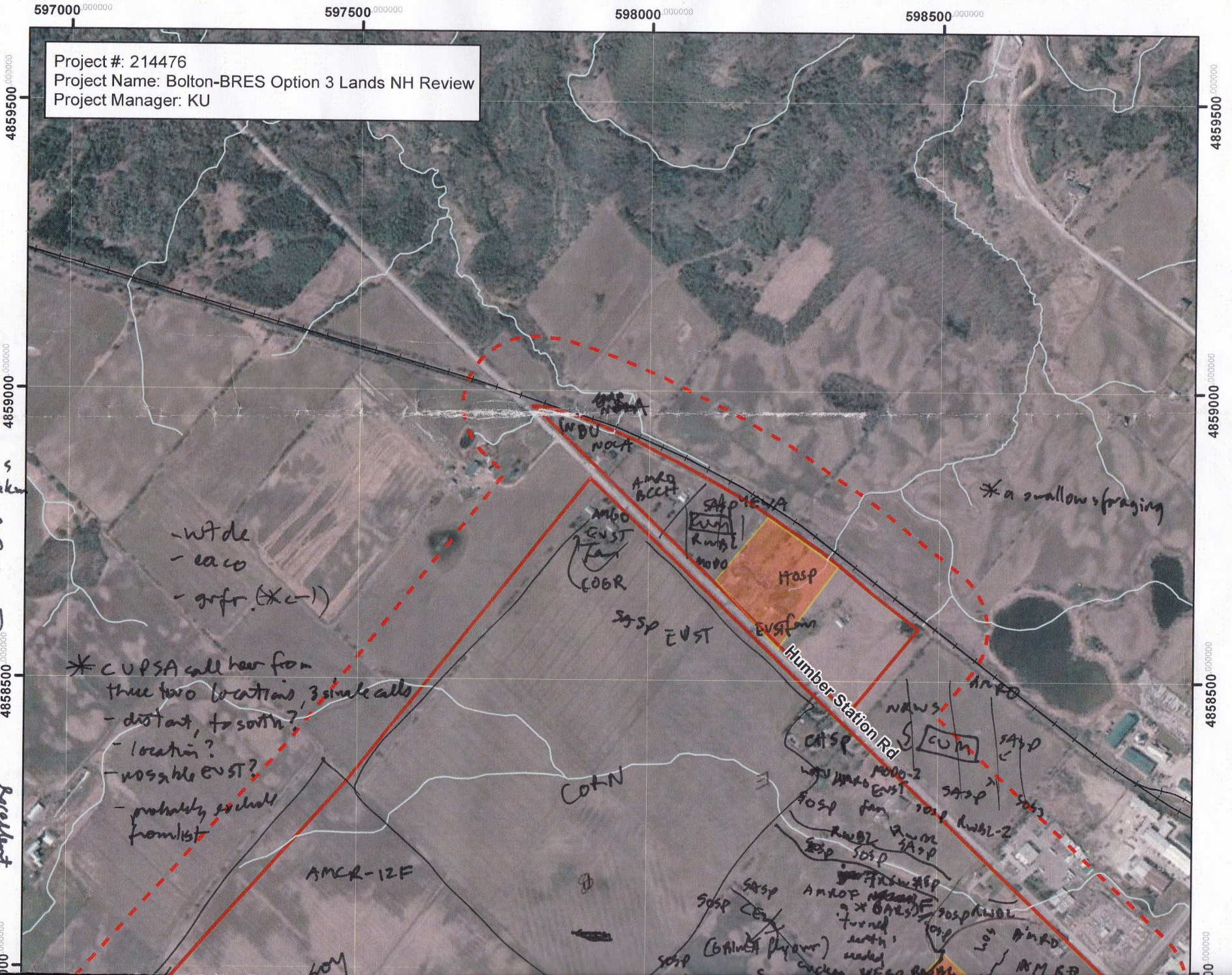
King St

No Access

0 75 150 300 Metres

N W E S

Stochastic urban expansion for Option 3 06




4857000.000000
4857500.000000
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The Gore Road
King St
Humber Station Rd
No Access
4857000.000000
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Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpentier Date (use letters for mos.): July 4/20

Project Name: Bo Han Project #: 214476

Time of Survey (start and finish): 0445 - 0830

Weather (approx. temp., cloud cover, wind, precipitation): Sunny no wind

18 - 21 °C

Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

Green Frog

E. Lotharingia.

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

SOSP	13 -14	AMCR	1	HOWR	2
SASP	11 -12	AMRO	2-3	BBCU	1
CHSP	4	EAKI	2	Spot. Sandp	1
HOSP	1-2	EAPH	2	VIEO	1
WIFL	2	EAST	1-3	HOLA	-1
YEWA	2	MODO	3-4	INBU	1
AMRO	6-7	KILL	2	RCHA	1
COGR	2-3	EAME	1	SWSP	1
RWBL	8	BRTH	1	BAOR	1
COYE	1	BCHI	1	Yellow	
NOCA	3	ARSA	2	WAVI	-1

Project #: 214476
Project Name: Bolton-BRES Option 3 Lands NH Review
Project Manager: KU

597000 597500 598000 598500

4859500 4859000 4858500 4858000 4857500 4857000 4856500

Humber Station Rd

The Gore Road

King St

No Access

0 75 150 300 Metres

N W E S

Notice Required.

221166 + 221164 to be done together

Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpenter Date (use letters for mos.): May 29/23

Project Name: The Gore Rd Bolton Project #: 221164

Time of Survey (start and finish): 0715 - 1015

Weather (approx. temp., cloud cover, wind, precipitation): 18 - 21°c sunny no wind

Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

groundhog

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

HOLA - 3-4
VESP - 2
SASP - 1
HOWR - 3
EAPH - 2
AMRO - 2
MODO - 2
COGR - 1
SOSP - 2
KILL - 1
BRTH - 1

RWBL - 1
[redacted]
AMGO - 1
EUST 1-2
CORA
AMCR
CANG
} foraging

RFC Apr 2012

Notice Required.

221166 + 221164 to be done together

Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpenter Date (use letters for mos.): June 11/23

Project Name: The Gore Rd. Bolton Project #: 221164

Time of Survey (start and finish): 0630-0915

Weather (approx. temp., cloud cover, wind, precipitation): overcast 18°C no wind

Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

groundhog

raccoon

eastern cottontail

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

HOLA - 2

UESP - 2

JASP - 2

SOSP - 2

AMRO - 2-3

CHSP - 1

COGR - 1

RWBL - 1

AMCO - 1

KILL - 1

EAPH - 2

BRTH - 1

AMCR > foraging

CANA

HOWR - 1

Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpenter Date (use letters for mos.): June 20/23

Project Name: The Gore Rd @ King, Bo Hon Project #: 221164

Time of Survey (start and finish): 0530 - 0830

Weather (approx. temp., cloud cover, wind, precipitation): 20°C sunny no wind

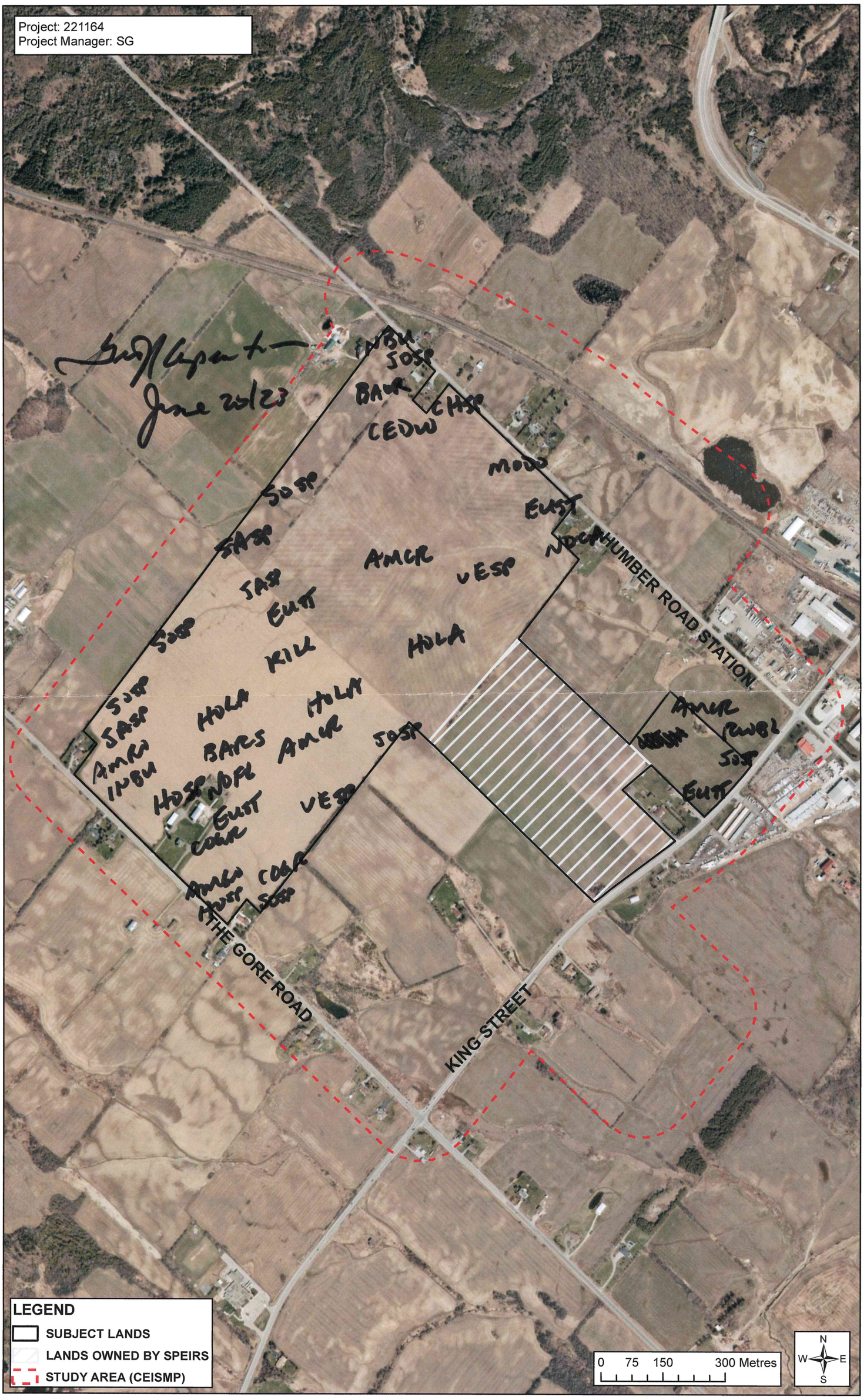
Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

- WT Deer
- Coyote

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

VESP - 2
SOSP 7
CHSP - 1
SASP - 3
HOLA - 3
AMCR - foraging
BARS foraging
AMRO 2-3
AMGO 1-2
NOCA - 1
COGR 1-2
RWBL - 1
EAST 1-2
INBU - 2
BAOR - 1
CEDW - 1
KILL - 1
HOSP 1-2


Project: 221164
Project Manager: SG
June 23/23
HUMBER ROAD STATION
THE GORE ROAD
KING STREET
LEGEND
SUBJECT LANDS
LANDS OWNED BY SPEIRS
STUDY AREA (CEISMP)
0 75 150 300 Metres
N
W
E
S


Project: 221164
Project Manager: SG
HUMBER ROAD STATION
THE GORE ROAD
KING STREET
LEGEND
SUBJECT LANDS
LANDS OWNED BY SPEIRS
STUDY AREA (CEISMP)
0 75 150 300 Metres
N
W
E
S

Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpenter Date (use letters for mos.): May 28/23

Project Name: Humber Street Station Project #: 221166

Time of Survey (start and finish): 0545 - 0715

Weather (approx. temp., cloud cover, wind, precipitation): 17°C sunny very light breeze

Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

E. Chipmunk

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

BAOR - 1
RWBL - 4
CANG - foraging
EUST - 1
AMRO - 3
NOCA - 1
MODO - 1
BHCO - 1
COGR - 1
HOWR - 1
NOFL - 1

ROPI - foraging
KILL - 1
SOSP - 1


Project: 221166
Project Manager: SG
HUMBER STREET STATION
LEGEND
SUBJECT LANDS
STUDY AREA (CEISMP)
0 15 30 60 Metres
N
W
E
S

Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpenter Date (use letters for mos.): June 11/23

Project Name: Humber Street Station P.O. Hub Project #: 221166

Time of Survey (start and finish): 0500 - 0630

Weather (approx. temp., cloud cover, wind, precipitation): overcast no wind 18°C

Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

HOWR - 2

BAOR - 2

COYE - 1

EAST - 1-2

KILL - 1

AMCR - 1

SOSP - 2

MODO - 2

RWBL - 3

HOFI - 1

AMRO 2-3

221166 + 221167
to be done together

Breeding Bird Survey Summary Form

Surveyor Name: Geoff Carpentier Date (use letters for mos.): June 20/23

Project Name: Humber Street Station Project #: 221166

Time of Survey (start and finish): 0830 - 1000

Weather (approx. temp., cloud cover, wind, precipitation): Sunny, no wind 18°c

Additional notes on birds (nests, uncertainties, unusual observations, habitat comments etc.) :

Incidental Observations

Anything welcome (mammals, herps, fish presence, insects, plants esp. unusual spp. etc.). For herps, rare plants, occurrence of fish, please also mark location on map. For herps, number observed. Thanks!

EUST - 1

BADR - 1

HOWR - 2

NOCA - 1

AMRO 2-3

AMCO - 1

AMCR - foraging

COYE - 2

MODO - 1

SOSP - 2

COGR - 2

RWBL - 3

CEDW - 1


Project: 221166
Project Manager: SG
HUMBER STREET STATION
June 20/23
LEGEND
SUBJECT LANDS
STUDY AREA (CEISMP)
0 15 30 60 Metres
N
W
E
S

Appendix G

Breeding Bird Checklist for Caledon Station Secondary Plan

Appendix G

Breeding Bird Checklist for Caledon Station Secondary Plan

Common Name	Scientific Name	National Species at Risk COSEWIC[a]	Species at Risk in Ontario Listing [b]	Provincial breeding season SRANK [c]	TRCA Status [d]	Area-sensitive [d]	May 28, 2020		June 19, 2020		July 4, 2020	
							Subject Property	120 m Buffer Study Area	Subject Property	120 m Buffer Study Area	Subject Property	120 m Buffer Study Area
Great Blue Heron	*Ardea herodias*	-	-	S4	L3	-	1F	-	1F	-	-	-
Canada Goose	*Branta canadensis*	-	-	S5	L5	-	2	-	-	-	-	-
Mallard	*Anas platyrhynchos*	-	-	S5	L5	-	2	-	1	-	-	-
Red-tailed Hawk	*Buteo jamaicensis*	-	-	S5	L5	-	-	-	-	-	1	-
Peregrine Falcon	*Falco peregrinus*	-	SC	S3	L4	-	-	-	1F	-	-	-
Wild Turkey	*Meleagris gallopavo*	-	-	S5	L3	-	-	-	1	-	-	-
Killdeer	*Charadrius vociferus*	-	-	S5	L4	-	1	-	1	-	2	-
Spotted Sandpiper	*Actitis macularia*	-	-	S5	L4	-	1	-	1	-	1	-
Ring-billed Gull	*Larus delawarensis*	-	-	S5	L4	-	-	-	2F	-	-	-
Rock Pigeon	*Columba livia*	-	-	SNA	L+	-	-	-	3	-	-	-
Mourning Dove	*Zenaida macroura*	-	-	S5	L5	-	2	-	7 + 12F	-	4	-
Black-billed Cuckoo	*Coccyzus erythropthalmus*	-	-	S5	L3	-	-	-	-	-	1	-
Cuckoo sp.	*Coccyzus sp.*	-	-	n/a	n/a	-	-	-	1	-	-	-
Willow Flycatcher	*Empidonax traillii*	-	-	S5	L4	-	3	-	3	-	1	1
Eastern Phoebe	*Sayornis phoebe*	-	-	S5	L5	-	3	-	-	-	2	-
Eastern Kingbird	*Tyrannus tyrannus*	-	-	S4	L4	-	2	-	1	1	2	-
Horned Lark	*Eremophila alpestris*	-	-	S5	L3	-	2	-	3	-	1	-
Tree Swallow	*Tachycineta bicolor*	-	-	S4	L4	-	-	-	1F	-	-	-
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	-	-	S4	L4	-	-	-	-	1F	-	-
Barn Swallow	*Hirundo rustica*	THR	THR	S4	L4	-	1F (ELC Unit 2e)	1	1F (ELC Unit 2j)	1	-	-
Blue Jay	*Cyanocitta cristata*	-	-	S5	L5	-	1	-	1	-	-	-
American Crow	*Corvus brachyrhynchos*	-	-	S5	L5	-	4	-	2 + 12F	-	1	-
Black-capped Chickadee	*Poecile atricapillus*	-	-	S5	L5	-	-	-	2	-	1	-
House Wren	*Troglodytes aedon*	-	-	S5	L5	-	1	-	1	-	2	-
American Robin	*Turdus migratorius*	-	-	S5	L5	-	1	-	5+1F	2	6	1
Gray Catbird	*Dumetella carolinensis*	-	-	S4	L4	-	2	-	2	-	2	-
Brown Thrasher	*Toxostoma rufum*	-	-	S4	L3	-	2	-	-	-	1	-
Cedar Waxwing	*Bombycilla cedrorum*	-	-	S5	L5	-	-	-	5	-	-	-
European Starling	*Sturnus vulgaris*	-	-	SE	L+	-	3	-	9	2	2	1
Warbling Vireo	*Vireo gilvus*	-	-	S5	L5	-	1	-	1	-	1	-
Red-eyed Vireo	*Vireo olivaceus*	-	-	S5	L4	-	1	-	-	-	-	-
Yellow Warbler	*Setophaga petechia*	-	-	S5	L5	-	3	-	2	1	2	-
Common Yellowthroat	*Geothlyphis trichas*	-	-	S5	L4	-	2	-	1	-	1	-
Northern Cardinal	*Cardinalis cardinalis*	-	-	S5	L5	-	1	-	2	-	3	-
Indigo Bunting	*Passerina cyanea*	-	-	S4	L4	-	1	-	2	-	1	-
Chipping Sparrow	*Spizella passerina*	-	-	S5	L5	-	2	-	1	1	4	-
Vesper Sparrow	*Pooecetes gramineus*	-	-	S4	L3	-	-	-	1	-	1	-
Savannah Sparrow	*Passerculus sandwichensis*			S4	L4	A	8	-	14	3	12	-
Song Sparrow	*Melospiza melodia*			S5	L5		6	-	16	15	14	-
Swamp Sparrow	*Melospiza georgiana*			S5	L4		1	-	3	-	1	-
Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4	L2	A	4 (ELC Unit 2b, 2i, 2j)	-	3 (ELC Unit 2j)	1	-	-

Common Name	Scientific Name	National Species at Risk COSEWIC[a]	Species at Risk in Ontario Listing [b]	Provincial breeding season SRANK [c]	TRCA Status [d]	Area-sensitive [d]	May 28, 2020		June 19, 2020		July 4, 2020	
							Subject Property	120 m Buffer Study Area	Subject Property	120 m Buffer Study Area	Subject Property	120 m Buffer Study Area
Red-winged Blackbird	*Agelaius phoeniceus*			S4	L5		31	-	21	7	8	-
Eastern Meadowlark	*Sturnella magna*	THR	THR	S4	L3	A	1 (ELC Unit 2c, 2d)	-	-	1	1 (ELC Unit 2o)	-
Common Grackle	*Quiscalus quiscula*			S5	L5		3	-	2	2	3	-
Baltimore Oriole	*Icterus galbula*			S4	L5		1	1		1	1	-
American Goldfinch	*Spinus tristis*			S5	L5		4	1	6	-	3	-
House Sparrow	*Passer domesticus*			SNA	L+		2	-	3	-	2	-

= Maximum number of breeding pairs recorded on subject property, F = species foraging on / flying over the subject property

a - COSEWIC = Committee on the Status of Endangered Wildlife in Canada: END = Endangered, THR = Threatened, SC = Special Concern

b - Species at Risk in Ontario List (as applies to ESA) as designated by COSSARO (Committee on the Status of Species at Risk in Ontario): END = Endangered, THR = Threatened, SC = Special Concern

c - SRANK (from Natural Heritage Information Centre) for breeding status if: S1 (Critically Imperiled), S2 (Imperiled),S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure) SNA (Not applicable…'because the species is not a suitable target for conservation activities'; includes non-native species)

d - Toronto and Region Conservation Authority L rank (2016): L1 to L3 Regional species of concern from highest to lowest; L4 Urban concern; L5 Secure through region; L+ Non-native

e - Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.

Appendix H

Significant Wildlife Habitat (SWH) Screening for Caledon Station

Appendix H

Significant Wildlife Habitat (SWH) Screening for Caledon Station Secondary Plan

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
Seasonal Concentration Areas					
1. Waterfowl Stopover and Staging Areas (Terrestrial)					
American Black Duck Wood Duck Mallard Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler	CUM1 CUT1 Plus evidence of annual spring flooding from malt water or run-off within these Ecosites.	*Suitable Habitat* • Fields with sheet water during Spring (mid-March to May) *Suggested Criteria* Studies carried out and verified presence of an annual concentration of any listed species	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘
2. Waterfowl Stopover and Staging Areas (Aquatic)					
Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	*Suitable Habitat* • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration • Sewage treatment ponds and storm water ponds do not qualify as SWH, however a reservoir managed as a large wetland or pond/lake does qualify • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) *Suggested Criteria* Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH • Wetland area and shorelines associated with sites identified within the Significant Wildlife Habitat Technical Guide (SWHTG) (MNRF 2000) Appendix K are SWH	All marshes with open water and shallow aquatic ecosites on the Subject Lands are too small to potentially support the required aggregations to be considered Confirmed SWH. Additionally, the Bolton PSW Complex within the Study Area is not productive or large enough to support considered suitable habitat.	✘	✘
3. Shorebird Migratory Stopover Area					
Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2	*Suitable Habitat* • Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH *Suggested Criteria*	No suitable habitat identified on the Subject Lands or within the Study Area, and none would be expected to occur.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	MAM3 MAM4 MAM5	• Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100 m radius area			
4. Raptor Wintering Area					
Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Short-eared Owl Bald Eagle	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM, CUT, CUS, CUW. <u>Bald Eagle:</u> Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC on shoreline areas adjacent to large rivers to adjacent to lakes with open water (hunting area).	*Suitable Habitat* • The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors • Raptor wintering (hawk/owl) sites need to be > 20 ha with a combination of forest and upland *Suggested Criteria* Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One of more Bald Eagles or at least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘
5. Bat Hibernacula					
Big Brown Bat Tri-colored Bat	Bat Hibernacula may be in the Ecosites: CCR1 CCR2 CCA1 CCA2	*Suitable Habitat* • Hibernacula may be found in caves, mine shafts, underground foundations and Karsts *Suggested Criteria* • All sites with confirmed hibernating bats are SWH • The area includes 200m radius around the entrance of the hibernaculum for most development types and for wind farms (Note: buildings are not to be considered SWH)	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘
6. Bat Maternity Colonies					
Big Brown Bat Silver-haired Bat	Maternity Colonies considered for SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	*Suitable Habitat* • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH) • 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 *Suggested Criteria* • Maternity colonies with confirmed use by; – >10 Big Brown Bats – >5 Adult Female Silver-haired Bats	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
		The area of the habitat includes the entire woodland or the forest stand ELC ecosite or an ecoelement containing the maternity colonies			
7. Turtle Wintering Areas					
Midland Painted Turtle Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO. Northern Map Turtles: Open Water areas such as deeper rivers, or streams and lakes with current can also be used as over-wintering habitat.	*Suitable Habitat* • For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH *Suggested Criteria* • Presence of 5 over-wintering Midland Painted Turtles is significant • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant • The mapped ELC ecosite area with the over wintering turtles is the SWH If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH	Midland Painted Turtle and Snapping Turtle have been documented in ponds near the Bolton PSW Complex (Dougan et al. 2014b) and west of the Bolton PSW Complex, east of the railroad tracks within the Study Area, although none have been observed on the Subject Lands. Candidate SWH includes the Bolton PSW Complex and other wetlands or ponds with permanent open water on the Subject Lands. Surveys for this category of SWH were not conducted as part of the CEISMP, and some wetlands were not accessible at the time of this CEISMP. Surveys will be conducted at the draft plan stage to confirm the status of this SWH category.	✓ **Wetlands with Permanent Open Water. While no turtles have been observed on the Subject Lands, we recommend conducting basking surveys in the future.**	✓ **Bolton PSW Complex**
8. Reptile Hibernaculum					
Eastern Gartersnake Northern Water Snake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Milksnake Eastern Ribbonsnake Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Tock Barren, Crevice, Cave and Alvar 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 ecosite: FOC1 and FOC3.	*Suitable Habitat* • For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural 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 and fissured rock are particularly valuable since they provide access to subterranean sites below the frost • 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 • For five-lined Skink, Community Series FOD and FOM, and FOC1 and FOC3 should be considered. They prefer mixed forests with rock outcrop openings with cover rock overlaying granite bedrock with fissures *Suggested Criteria* 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	Suitable habitat may be present on the Subject Lands or within the Study Area in sites such as animal burrows within margins of agricultural fields and wetlands, and wetlands that go below the frost line. Additionally, suitable habitat may be present in areas with old, anthropogenic foundations (such as old barns or former railbeds. To date, no snakes have been incidentally recorded on the Subject Lands or within the Study Area. Surveys for this category of SWH were not conducted as part of the CEISMP. Surveys will be conducted at the draft plan stage to confirm the status of this SWH category.	✓ **Natural, Semi-Natural Communities and Areas with Old Anthropogenic Foundations. While no snakes have been observed on the Subject Lands, we recommend conducting basking surveys in the future.**	✓ **Natural and Semi-Natural Communities**
9. Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)					
Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, steep slopes and sand piles. Cliff faces, bridge abutments, silos and barns. Habitat found in the following ecosites: CUM1 CLO1 CUT1 CLS1 CUS1 CLT1 BLO1 BLS1 BLT1	*Suitable Habitat* • Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles • Does not include a licensed/permitted Mineral Aggregate Operation *Suggested Criteria* Studies confirming: • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs or 50 Bank Swallow and/or Rough-winged Swallow pairs during the breeding season	No suitable habitat identified on the Subject Lands or within the Study Area. Bank Swallow was noted by Dougan et al. (2014b) in 2013/2014 within the Study Area, and they assumed that it was simply foraging due to lack of suitable nesting habitat.	✗	✗

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
		A colony identified as SWH will include a 50m radius habitat area from the peripheral nests			
10. Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs)					
Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	*Suitable Habitat* • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used • Most nests in trees are 11 to 15 m from ground, near the top of the tree *Suggested Criteria* Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other listed species The habitat extends from the edge of the colony and a minimum 300m radius or extent of the forest ecosite containing the colony or any island <15.0 ha with a colony is the SWH	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘
11. Colonially-Nesting Bird Breeding Habitat (Ground)					
Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island to peninsula (natural or artificial) with a lake or larger river. Close proximity or watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird). MAM1-6 MAS1-3 CUM CUT CUS	*Suitable Habitat* • Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands *Suggested Criteria* Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant • Presence of 5 or more pairs for Brewer's Blackbird • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘
12. Migratory Butterfly Stopover Areas					
Painted Lady Red Admiral Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: <u>Field:</u> CUM CUT CUS <u>Forest:</u> FOC FOD COM CUP A candidate site will have a history of butterflies being observed.	*Suitable Habitat* • A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario or Lake Erie • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest *Suggested Criteria* Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. • Numbers of butterflies can range from 100-500/day - significant variation can occur between years and multiple years of sampling should occur MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admirals is to be considered significant	Suitable habitat not identified on the Subject Lands or the Study Area due to its distance from Lake Ontario and Lake Erie.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
13. Landbird Migratory Stopover Areas					
All migratory songbirds	All Ecosites associated with the ELC Community Series; FOC FOM FOD SWC SWM SWD	*Suitable Habitat* • Woodlots >10 ha in size and within 5 km of Lake Ontario and Lake Erie • If multiple woodlands are located along the shoreline those Woodlands <2 km from Lake Erie or Ontario are more significant • Sites have a variety of habitats; forest, grassland and wetland complexes • The largest sites are more significant • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH *Suggested Criteria* Studies confirm: • Use of the woodlot by >200 birds/day and with >35 species with at least 10 bird spp. recorded on at least 5 different survey dates This abundance and diversity of migrant bird species is considered above average and significant	Suitable habitat not identified on the Subject Lands or the Study Area due to its distance from Lake Ontario and Lake Erie.	✘	✘
14. Deer Yarding Areas					
White-tailed Deer	*Note: MNRF to determine this habitat.* ELC Community Series providing a thermal cover component for a deer yard would include: FOD, FOC, SWM and SWC. Or ELC Ecosites: CUP2, CUP3, FOD3 and CUT	*Suitable Habitat* • Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. Deer establish traditional use areas with two areas called Stratum I and Stratum II • Stratum II covers entire winter yard and is usually in FOD or FOM (or agricultural lands) where browsing can occur. Deer move here in early winter, and will continue to stay here until snow depths reach about 30 cm. • Stratum I is the core of a deer yard, and is found within the Stratum II, and is critical for deer survival in areas where winter is severe. It is primarily coniferous trees with a canopy cover of at least 60% *Suggested Criteria* Studies confirm: • Snow depth and temperature or the greatest influence on deer use of winter yards. Snow depths of >40 cm for more than 60 days are minimum criteria for a deer yard to be considered as SWH • Deer management is an MNRF responsibility, and they field investigations (by aircraft over a series of winters to establish boundaries of Stratum I and II. Deer yarding areas considered significant will be mapped by MNRF If SWH is determined for deer wintering area or if a proposed development is within Stratum II yard areas, then movement corridors are to be considered	No suitable habitat identified on the Subject Lands or the Study Area by MNRF.	✘	✘
15. Deer Winter Congregation Areas					
White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer Plantations much smaller than 50 ha may also be used.	*Suitable Habitat* • Woodlots >100 ha in size. Woodlots <100 ha may be considered significant based on MNRF studies or assessment • Deer movement during winter in Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands • Large woodlots > 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha • Woodlots with high densities of deer due to artificial feeding are not significant *Suggested Criteria* Studies confirm:	No suitable habitat identified on the Subject Lands or the Study Area by MNRF.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
		• Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF If SWH is determined for deer wintering area or if a proposed development is within Stratum II yard areas, then movement corridors are to be considered			
Rare Vegetation Communities					
16. Cliffs and Talus Slopes					
ELC Communities: TAO, TAS, TAT, CLO, CLS, CLT		• A Cliff is vertical to near vertical bedrock >3m in height • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris • Most cliff and talus slopes occur along the Niagara Escarpment	Does not occur on the Subject Lands or within the Study Area.	✘	✘
17. Sand Barren					
ELC Communities: SBO1, SBS1, BT1		• Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion • Usually located within other types of natural habitat such as forest or savannah • Vegetation can vary from patchy and barren to tree covered but less than 60% *Suggested Criteria* • A sand barren area >0.5ha in size • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics).	Does not occur on the Subject Lands or within the Study Area.	✘	✘
18. Alvar					
Field studies identify four of the five Alvar indicator species within ELC communities: ALO1, ALS, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2		• An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil • The hydrology of alvars is complex, with alternating periods of inundation and drought • Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant • Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species • Vegetation cover varies from patchy to barren with a less than 60% tree cover *Suggested Criteria* • An Alvar site > 0.5 ha in size • Five indicator species specific to alvars within Ecoregion 6E: *1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema brachiatum* • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics) • The Alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses	Does not occur on the Subject Lands or within the Study Area.	✘	✘
19. Old Growth Forest					
ELC Communities: FOD FOC FOM SWD SWC SWM		• Old-growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris *Suggested Criteria* • Woodland area is >30 ha with at least 10 ha of interior habitat • If dominant trees species of the ecosite are >140 years old, then stand is SWH • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present)	Does not occur on the Subject Lands or within the Study Area.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
		• The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH			
20. Savannah					
ELC Communities: TPS1 TPS2 TPW1 TPW2 CUS2		• A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60% *Suggested Criteria* • No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH • Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)	Does not occur on the Subject Lands or within the Study Area.	✘	✘
21. Tallgrass Prairie					
ELC Communities: TPO1 TPO2		• A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover • In ecoregion 6E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario) *Suggested Criteria* • No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH • ELC communities TPO1, TPO2 • Field studies confirm one or more of the Prairie indicator species listed in Appendix N in SWHTG (MNRF 2000) should be present. Prairie plant spp. list from Ecoregion 6E should be used • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)	Does not occur on the Subject Lands or within the Study Area.	✘	✘
22. Other Rare Vegetation Communities					
		• Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG (MNRF 2000) • Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps • ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in SWHTG (MNRF 2000) Appendix M • The MNRF/NHIC will have up to date listing for rare vegetation communities	Does not occur on the Subject Lands or within the Study Area.	✘	✘
Specialized Habitat for Species					
23. Waterfowl Nesting Area					
American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3 SAS1, SAM1, SAF1 MAM1, MAM2, MAM3, MAM4, MAM5, MAM6 SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 Note: Includes adjacency to Provincially Significant Wetlands	*Suitable Habitat* • A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5 ha) with small wetlands (<0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur • Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests *Suggested Criteria* Studies confirm: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or presence of 10 or more nesting pairs for listed species including Mallards • Any active nesting site of an American Black Duck is considered significant	Suitable habitat is present on the Subject Lands and within the Study Area in the vicinity of ponds, however surveys conducted as part of the CEISMP did not document adequate numbers of listed species.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
		Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites			
24. Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Osprey Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM, SWC directly adjacent to riparian areas - rivers, lakes, ponds and wetlands.	*Suitable Habitat* • Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms) *Suggested Criteria Studies confirm the use of these nests by:* • One or more active Osprey or Bald Eagle nests in an area • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH [ccvii], maintaining undisturbed shorelines with large trees within this area is important • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘
25. Woodland Raptor Nesting Habitat					
Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in: SWC SWM SWD CUP3	*Suitable Habitat* • All natural or conifer plantation woodland/forest stands combined >30ha or with >4 ha of interior habitat; interior habitat determined with a 200 m buffer • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore island • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest *Suggested Criteria* Studies confirm: • Presence of 1 or more active nests from species list is considered significant • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28 ha of suitable habitat is the SWH. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest)	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
		• Barred Owl – a 200m radius around the nest is the SWH • Broad-winged Hawk and Coopers Hawk,– a 100m radius around the nest is the SWH Sharp-Shinned Hawk – a 50m radius around the nest is the SWH			
26. Turtle Nesting Areas					
Midland Painted Turtle Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) to within the following Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	*Suitable Habitat* • Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas • Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used *Suggested Criteria* Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH Travel routes from wetland to nesting area are to be considered within the SWH	Midland Painted Turtle and Snapping Turtle have been documented in ponds near the Bolton PSW Complex (Dougan et al. 2014b) and west of the Bolton PSW Complex, east of the railroad tracks within the Study Area, although none have been observed on the Subject Lands. Candidate SWH includes the exposed mineral soil adjacent to the Bolton PSW Complex and other wetlands or ponds with permanent open water on the Subject Lands. Surveys for this category of SWH were not conducted as part of the CEISMP, and some wetlands with open water were not accessible at the time of this CEISMP. Surveys will be conducted at the draft plan stage to confirm the status of this SWH category.	✓ **Wetlands with Permanent Open Water. While no turtles have been observed on the Subject Lands, we recommend conducting basking surveys and searches for turtle nests in the future.**	✓ **Bolton PSW Complex**
27. Seeps and Springs					
Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps and springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within headwater areas of a stream could have seeps/springs.	*Suitable Habitat* • Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system (could contain a seep or spring - areas where ground water comes to the surface) • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species • The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat *Suggested Criteria* Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH The area of an ELC forest ecosite containing the seeps/springs is the SWH	According to the work completed by DS Consultant Ltd. (2020), seepage has been observed in three areas within the subject lands. However, none of these seepage areas are associated with a forest. Please refer to DS Consultant Ltd. (2020) for more detail.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
28. Amphibian Breeding Habitat (Woodland)					
Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated within these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD Breeding pools within the woodland or the shortest distance from the forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	*Suitable Habitat* • Presence of a wetland, pond, or woodland pool within or adjacent (within 120m) to a woodland (no minimum size) • Some small wetlands may not be mapped and may be important breeding pools for amphibians • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat *Suggested Criteria* Studies confirm: Presence of breeding population of 1 or more of the listed salamander species or 2 or more of the listed frog species with at least 20 individuals (adults, juveniles, eggs/larval masses) or 2 or more of the listed frog species with Call Level Codes of 3	No suitable habitat identified on the Subject Lands or within the Study Area.	✘	✘
29. Amphibian Breeding Habitat (Wetland)					
Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	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 adjacent to woodland.	*Suitable Habitat* • Wetlands >500 m^2 (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 and concealment from predators • Bullfrogs require permanent water bodies with abundant emergent vegetation *Suggested Criteria* Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog or toad species and with at least 20 individuals (adults, juveniles, eggs/larval masses) or 2 or more of the listed frog species with Call Level Codes of 3 The ELC ecosite wetland area and the shoreline are the SWH	Minimal suitable habitat is present in the southern and eastern portions of the Subject Lands and within the Study Area. Amphibian surveys completed to date have not observed the required threshold of breeding amphibians to classify the habitats as significant.	✘	✘
30. Woodland Area-Sensitive Bird Breeding Habitat					
Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	*Suitable Habitat* • Habitats where interior forest breeding birds are breeding • Typically large mature (>60 yrs old) forest stands or woodlots >30 ha • Interior forest habitat is at least 200 m from forest edge habitat *Suggested Criteria* Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. Any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH	No suitable habitat or associated species identified on the Subject Lands or within the Study Area.	✘	✘
Habitat for Species of Conservation Concern					
31. Marsh Bird Breeding Habitat					

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Black Tern Yellow Rail	MAM 1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	*Suitable Habitat* • Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water *Suggested Criteria* Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns or Yellow Rail is SWH • Area of the ELC ecosite is the SWH	Minimal suitable habitat is present in the southern and eastern portions of the Subject Lands; however, no listed species were recorded on the Subject Lands or within the Study Area.	✘	✘
32. Open Country Bird Breeding Habitat					
Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Short-eared Owl	CUM1 CUM2	*Suitable Habitat* • Large grassland areas (includes natural and cultural fields and meadows) >30 ha • Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years) • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species *Suggested Criteria* Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species • A field with 1 or more breeding Short-eared Owls is to be considered SWH. The area of SWH is the contiguous ELC ecosite field areas	No suitable habitat is present on the Subject Lands or within the Study Area. The majority of the Study Area is row cropped and rotated on an annual basis.	✘	✘
33. Shrub/Early Successional Bird Breeding Habitat					
<u>Indicator Species</u>: Brown Thrasher Clay-coloured Sparrow <u>Common Species:</u> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher <u>Special Concern:</u> Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	*Suitable Habitat* • Large natural field areas succeeding to shrub and thicket habitats >10ha in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years) • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands *Suggested Criteria* Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species • A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat The area of the SWH is the contiguous ELC ecosite field/thicket area	No suitable habitat is present on the Subject Lands or within the Study Area. The majority of the Study Area is row cropped and rotated on an annual basis.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities		Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
34. Terrestrial Crayfish					
Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish (*Cambarus Diogenes*)	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6 MAS1, MAS2, MAS3 SWD, SWT, SWM CUM1 within inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	*Suitable Habitat* • Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish • Constructs burrows in marshes, mudflats, meadows; the ground can't be too moist • Can often be found far from water • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels; usually the soil is not too moist so that the tunnel is well formed *Suggested Criteria* Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites Area of ELC Ecosite polygon is the SWH	No evidence of Terrestrial Crayfish was documented during field studies.	✘	✘
35. Special Concern and Rare Wildlife Species					
		• All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species • When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially rare species • Linking candidate habitat on the site needs to be completed to ELC Ecosites *Suggested Criteria* Studies confirm: • 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 • Habitat form and function needs to be assessed from the assessment of ELC vegetation types and an area of significant habitat that protects the rare or special concern species identified • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH; this must be delineated through detailed field studies • The habitat needs be easily mapped and cover an important life stage component for a species (e.g. specific nesting habitat or foraging habitat)	Suitable habitat occurs on the Subject Lands and within the Study Area for several Special Concern and Provincially Rare (S1-S3, SH): • Snapping Turtle (Special Concern): Potentially suitable habitat is present within the wetland habitat on the Subject Lands and within the Bolton PSW Complex within the Study Area. • Monarch (Special Concern): Potentially suitable habitat may be present within the meadow habitat on the Subject Lands and within the Study Area. Surveys for this category of SWH were not conducted as part of the CEISMP. Surveys will be conducted at the draft plan stage to confirm the status of this SWH category.	✓ **Wetlands and meadows**	✓ **Bolton PSW Complex**
Animal Movement Corridors					
36. Amphibian Movement Corridors					
Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog		• Amphibian movement corridors should only be identified as SWH where a confirmed or Candidate SWH has been identified by MNRF or the planning authority • Movement corridors between breeding habitat and summer habitat • Movement corridors must be considered when amphibian breeding habitat is confirmed as SWH • Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites • Corridors should consist of native vegetation, with several layers of vegetation • Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant • Corridors should be at least 15 m of vegetation on both sides of waterway or be up to 200 m wide of woodland habitat and with gaps <20 m • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat	Amphibian breeding habitat (woodland and wetland) was not a Candidate SWH type found on the Subject Lands or within the Study Area.	✘	✘

Wildlife Habitat Category and Associated Species and Ecological Land Classification (ELC) Communities	Provincial Guidance for SWH in Ecoregion 6E*	Application to the Subject Lands and Study Area	Candidate SWH On Subject Lands	Candidate SWH Within Study Area
37. Deer Movement Corridors				
White-tailed Deer	• Deer movement corridors should only be identified as SWH where a confirmed or Candidate SWH has been identified by MNRF or the planning authority • Corridors follow riparian areas, woodlots, areas of physical geography (ravines or ridges) • Field Studies must be conducted at the time of year when species are expected to be migrating or moving to and from winter concentration areas • Corridors that lead deer to wintering habitat should be unbroken by roads or residential areas • Corridors should be at least 200 m wide with gaps less than 20 m, and if following a riparian area, there must be at least 15 m of vegetation on both sides of the waterway	No deer movement corridors meeting the SWH criteria have been identified by MNRF to date on the Subject Lands or within the Study Area.	✘	✘

* Adapted from the listed species and habitat criteria provided in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015) but updated to reflect any relevant changes in species status. For example, Tri-coloured Bat (*Perimyotis subflavus*) is now listed as Threatened so needs to be addressed as a Species at Risk under the Endangered Species Act (2007) and not under SWH.

Appendix I

Species at Risk (SAR) Screening for Caledon Station Secondary Plan

Appendix I

Species at Risk (SAR) Screening for Caledon Station Secondary Plan

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Potentially Suitable Habitat Present within the Subject Lands or Study Area	Likelihood of Presence
Western Chorus Frog *Pseudacris triseriata*	No Status	THR Schedule 1	THR	Western Chorus Frogs inhabit lowland areas such as marshes and wooded wetland areas. Like most frogs, it needs terrestrial and aquatic habitats near each other to carry out its life cycle. For breeding purposes, Western Chorus Frog utilizes seasonally dry, temporary ponds devoid of predators, such as fish. They are rarely found in permanent ponds. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, loose soil or animal burrows.	In southern Ontario, Western Chorus Frog's range is bounded by the United States border in the south, Georgian Bay in the northwest, and south of Algonquin Park and up the Ottawa River valley to the vicinity of Eganville in the east. This species is divided into two distinct populations: the Carolinian population (southwestern Ontario) and the Great Lakes/St. Lawrence–Canadian Shield population (other regions of Ontario). Only the Canadian Shield population as been listed as Threatened federally.	**Yes** Potentially suitable habitat is present within the wetland habitat on the Subject Lands and within the Bolton PSW complex/other wetlands within the Study Area.	**Not present** (species not located on Subject Lands or within the Study Area during targeted field surveys in 2013, 2014 and 2020)
Acadian Flycatcher *Empidonax virescens*	END	END Schedule 1	END	In Ontario, the Acadian Flycatcher primarily lives in the warmer climate of southern Ontario's Carolinian forests. It needs large, undisturbed forests, often more than 40 hectares in size. It is typically found in mature, shady forests with ravines, or in forested swamps with lots of maple and beech trees. The nest is placed near the tip of a lower limb on a tree, and is loosely woven, with strands of plant material hanging down.	In Canada, the Acadian Flycatcher nests only in southwestern Ontario, mostly in large forests and forested ravines near the shore of Lake Erie. It has also been known to nest at a few sites in the Greater Toronto Area, but this is unusual. The Acadian Flycatcher population in Ontario is very small, with 25 to 75 breeding pairs recorded in 2010.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Bank Swallow *Riparia riparia*	THR	THR Schedule 1	THR	Bank Swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from several to a few thousand pairs.	The Bank Swallow is found across southern Ontario, with sparser populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (which flows into Lake Huron).	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Barn Swallow *Hirundo rustica*	SC	THR Schedule 1	SC	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces.	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.	**Yes** Potentially suitable habitat is present within the buildings on the Subject Lands and within the Study Area.	**Not Present** (species located on the Subject Lands and within the Study Area during targeted field surveys in 2013, 2014 and 2020, and was nesting within the Study Area in 2020; however, no breeding was confirmed on the Subject Lands in 2020)
Bobolink *Dolichonyx oryzivorus*	THR	THR Schedule 1	THR	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping.	The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.	**Yes** Potentially suitable habitat may be present within the field habitat on the Subject Lands or within the Study Area.	**Present** (species located on the Subject Lands and within the Study Area during targeted field surveys in 2013, 2014 and 2020; however, no breeding was

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Potentially Suitable Habitat Present within the Subject Lands or Study Area	Likelihood of Presence
							confirmed on the Subject Lands during the final survey in 2020)
Canada Warbler *Wilsonia canadensis*	SC	THR Schedule 1	THR	The Canada Warbler breeds in a range of deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer. Dense shrub and understory vegetation help conceal Canada Warbler nests that are usually located on or near the ground on mossy logs or roots, along stream banks or on hummocks.	The Canada Warbler only breeds in North America and 80 per cent of its known breeding range is in Canada. Its primary breeding range is in the Boreal Shield, extending north into the Hudson Plains and south into the Mixedwood Plains. Although the Canada Warbler breeds at low densities across its range, in Ontario, it is most abundant along the Southern Shield.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Cerulean Warbler *Dendroica cerulea*	THR	END Schedule 1	END	Cerulean Warblers spend their summers (breeding seasons) in mature, deciduous forests with large, tall trees and an open under storey. In late summer, they begin their long migration to wintering grounds in the Andes Mountains in South America.	In Canada, the Cerulean Warbler's breeding range extends from extreme southwestern Quebec to southern Ontario. In southern Ontario, populations appear to be separated into two distinct bands: one from southern Lake Huron to western Lake Ontario, and further north, the other from the Bruce Peninsula and Georgian Bay area to the Ottawa River.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Chimney Swift *Chaetura pelagica*	THR	THR Schedule 1	THR	Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate.	The Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province but has been detected throughout most of the province south of the 49th parallel. It winters in northwestern South America.	**Yes** Potentially suitable habitat is present within the buildings on the Subject Lands and within the Study Area.	**Not present** (species not located on Subject Lands or within the Study Area during targeted field surveys in 2013, 2014 and 2020)
Common Nighthawk *Chordeiles minor*	SC	THR Schedule 1	SC	Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites.	The range of the Common Nighthawk spans most of North and Central America. In Canada, the species is found in all provinces and territories except Nunavut. In Ontario, the Common Nighthawk occurs throughout the province except for the coastal regions of James Bay and Hudson Bay.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Eastern Meadowlark *Sturnella magna*	THR	THR Schedule 1	THR	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches.	In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield, but it also inhabits the Lake Nipissing, Timiskaming and Lake of the Woods areas.	**Yes** Potentially suitable habitat may be present within the field habitat on the Subject Lands and within the Study Area.	**Present** (species located on the Subject Lands and within the Study Area during targeted field surveys in 2013, 2014 and 2020; breeding confirmed on the Subject Lands during the final survey in 2020)
Eastern Whip-poor-will *Caprimulgus vociferus*	THR	THR Schedule 1	THR	The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands, or openings in more mature, deciduous, coniferous and mixed forests. It forages in these open areas and uses forested areas for roosting (resting and sleeping) and nesting. It lays its eggs directly on the forest floor, where its colouring means it will easily remain undetected by visual predators.	The Eastern Whip-poor-will's breeding range includes two widely separate areas. It breeds throughout much of eastern North America, reaching as far north as southern Canada and also from the southwest United States to Honduras. In Canada, the Whip-poor-will can be found from east-central Saskatchewan to central Nova Scotia and in Ontario they breed as far north as the shore of Lake Superior.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Potentially Suitable Habitat Present within the Subject Lands or Study Area	Likelihood of Presence
Eastern Wood-Pewee *Contopus virens*	SC	SC Schedule 1	SC	The Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation.	The eastern wood-pewee is found across most of southern and central Ontario, and in northern Ontario as far north as Red Lake, Lake Nipigon and Timmins.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Golden-winged Warbler *Vermivora chrysoptera*	SC	THR Schedule 1	THR	Golden-winged Warblers prefer to nest in areas with young shrubs surrounded by mature forest – locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas.	In Ontario the Golden-winged Warbler breed in central-eastern Ontario, as far south as Lake Ontario and the St. Lawrence River, and as far north as the northern edge of Georgian Bay. Golden-winged Warblers have also been found in the Lake of the Woods area near the Manitoba border, and around Long Point on Lake Erie.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Grasshopper Sparrow *Ammodramus savannarum*	SC	SC Schedule 1	SC	It lives in open grassland areas with well-drained, sandy soil. It will also nest in hayfields and pasture, as well as alvars, prairies and occasionally grain crops such as barley. It prefers areas that are sparsely vegetated. Its nests are well-hidden in the field and woven from grasses in a small cup-like shape.	The Grasshopper Sparrow can be found throughout southern Ontario, but only occasionally on the Canadian Shield. It is most common where grasslands, hay or pasture dominate the landscape.	**Yes** Potentially suitable habitat may be present within the field habitat on the Subject Lands and within the Study Area.	**Not present** (species not located on Subject Lands or within the Study Area during targeted field surveys in 2013, 2014 and 2020)
Least Bittern *Ixobrychus exilis*	THR	THR Schedule 1	THR	In Ontario, the Least Bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. This bird builds its nest above the marsh water in stands of dense vegetation, hidden among the cattails. The nests are almost always built near open water, which is needed for foraging. This species eats mostly frogs, small fish, and aquatic insects.	In Ontario, the Least Bittern is mostly found south of the Canadian Shield, especially in the central and eastern part of the province. Small numbers also breed occasionally in northwest Ontario. This species has disappeared from much of its former range, especially in southwestern Ontario, where wetland loss has been most severe. In winter, Least Bitterns migrate to the southern United States, Mexico and Central America.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Prothonotary Warbler *Protonotaria citrea*	END	END Schedule 1	END	In Ontario, the Prothonotary Warbler is found in the warmer climate of the Carolinian deciduous forests. It nests in small, shallow holes, found low in the trunks of dead or dying trees standing in or near flooded woodlands or swamps. They will also readily use properly placed artificial nest boxes. Silver maple, ash, and yellow birch are common trees in these habitats. The Prothonotary is the only warbler in eastern North America that nests in tree cavities, where it typically lays four to six eggs on a cushion of moss, leaves and plant fibres.	In Canada, the Prothonotary Warbler is only known to nest in southwestern Ontario, primarily along the north shore of Lake Erie. Over half of the small and declining population is found in Rondeau Provincial Park. In 2005, it was estimated that there were only between 28-34 individuals in Ontario.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Red-headed Woodpecker *Melanerpes erythrocephalus*	SC	THR Schedule 1	END	The Red-headed Woodpecker lives in open woodland and woodland edges, and is often found in parks, golf courses and cemeteries. These areas typically have many dead trees, which the bird uses for nesting and perching. This woodpecker regularly winters in the United States, moving to locations where it can find sufficient acorns and beechnuts to eat. A few of these birds will stay the winter in woodlands in southern Ontario if there are adequate supplies of nuts.	The Red-headed Woodpecker is found across southern Ontario, where it is widespread but rare. Outside Ontario, it lives in Alberta, Saskatchewan, Manitoba and Quebec, and is relatively common in the United States.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Short-eared Owl *Asio flammeus*	SC	SC Scheudle 1	SC	The Short-eared Owl lives in open areas such as grasslands, marshes and tundra where it nests on the ground and hunts for small mammals, especially voles.	The Short-eared Owl has a world-wide distribution, and in North America its range extends from the tundra south to the central United States. In Ontario, the species has a scattered distribution, found along the James Bay and Hudson Bay coastlines, along the Ottawa River in eastern Ontario, in the far west of the Rainy River District, and elsewhere in southern Ontario, at places such as Wolfe	**Yes** Potentially suitable habitat may be present within the field and wetland habitat on the Subject Lands and within the Study Area.	**Not present** (species not located on Subject Lands or within the Study Area during day/night field surveys in 2013, 2014 and 2020)

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Potentially Suitable Habitat Present within the Subject Lands or Study Area	Likelihood of Presence
					and Amherst Islands near Kingston. Most northern populations are migratory, moving southward in the winter.		
Wood Thrush *Hylocichla mustelina*	SC	THR Schedule 1	THR	The Wood Thrush lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing perches. These birds prefer large forests, but will also use smaller stands of trees. They build their nests in living saplings, trees or shrubs, usually in sugar maple or American beech.	The wood thrush is found all across southern Ontario. It is also found, but less common, along the north shore of Lake Huron, as far west as the southeastern tip of Lake Superior. There is a very small population near Lake of the Woods in northwestern Ontario, and there have been scattered sightings in the mixed forest of northern Ontario.	**No** Potentially suitable habitat is not present on the Subject Lands or within the Study Area.	-
Redside Dace *Clinostomus elongatus*	END	END Schedule 1	END	The Redside Dace is found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. They are generally found in areas with overhanging grasses and shrubs, and can leap up to 10 cm out of the water to catch insects. During spawning, they can be found in shallow parts of streams, which are also popular spawning areas for other minnow species.	In Canada, Redside Dace are found in a few tributaries of Lake Huron, in streams flowing into western Lake Ontario, the Holland River (which flows into Lake Simcoe), and Irvine Creek of the Grand River system (which flows into Lake Erie).	**Yes** Potential suitable habitat is present within the watercourses on the Subject Lands and within the Study Area.	**Present** (Contributing Redside Dace habitat is mapped on the Subject Lands and within the Study Area by the MNRF)
Monarch *Danaus plexippus*	SC	SC Schedule 1	END	Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers.	The Monarch's range extends from Central America to southern Canada. In Canada, Monarchs are most abundant in southern Ontario and Quebec where milkweed plants and breeding habitat are widespread. During late summer and fall, Monarchs from Ontario migrate to central Mexico where they spend the winter months. During migration, groups of Monarchs numbering in the thousands can be seen along the north shores of Lake Ontario and Lake Erie.	**Yes** Potentially suitable habitat may be present within the meadow habitat on the Subject Lands and within the Study Area.	**Moderate** (Milkweed is present on the Subject Lands and within the Study Area)
Eastern Small-footed Myotis (Bat) *Myotis leibii*	END	No Status	No Status	In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year.	The Eastern Small-footed bat has been found from south of Georgian Bay to Lake Erie and east to the Pembroke area. There are also records from the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park. Most documented sightings are of bats in their winter hibernation sites.	**Yes** Potentially suitable habitat is present within the swamp and buildings on the Subject Lands and within the buildings in the Study Area.	**Very Low**
Little Brown Myotis (Bat) *Myotis lucifugus*	END	END Schedule 1	END	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing. This species can typically be associated with any community where suitable roosting (i.e. cavity trees, houses, abandoned buildings, barns, etc.) habitat is available.	The Little Brown Myotis is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake. Outside Ontario, this bat is found across Canada (except in Nunavut) and most of the United States.	**Yes** Potentially suitable habitat is present within the swamp and buildings on the Subject Lands and within the buildings in the Study Area.	**Moderate**
Northern Myotis *(Bat)* *Myotis septentrionalis*	END	END Schedule 1	END	Northern Myotis bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of	The Northern Myotis is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and	**Yes** Potentially suitable habitat is present within the swamp	**Low**

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Potentially Suitable Habitat Present within the Subject Lands or Study Area	Likelihood of Presence
				trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines.	occasionally as far north as Moosonee, and west to Lake Nipigon.	and buildings on the Subject Lands and within the buildings in the Study Area.	
Tricoloured Bat *Perimyotis subflavus*	END	END Schedule 1	END	Tricoloured Bat inhabits a variety of forested communities, and will roost older forests and barns (or other structures). Foraging habitats include areas over water and streams. They hibernate in cave where they typically roost independently rather than in groups.	Tricoloured Bat is found in southern Ontario, where its northern limit is in proximity to Sudbury. Due to its rarity, their distribution is scattered.	**Yes** Potentially suitable habitat is present within the swamp and buildings on the Subject Lands and within the buildings in the Study Area.	**Very Low**
Butternut *Juglans cinerea*	END	END Schedule 1	END	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.	Butternut can be found throughout central and eastern North America. In Canada, Butternut occurs in Ontario, Quebec and New Brunswick. In Ontario, this species is found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	**Yes** Potentially suitable habitat is present within the woodland and hedgerow habitat on the Subject Lands and within the Study Area.	**Not present** (species not located on Subject Lands or within the Study Area during targeted field surveys in 2013, 2014 and 2020)
Blanding's Turtle *Emydoidea blandingii*	THR	THR Schedule 1	END	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April.	The Blanding's Turtle is found in and around the Great Lakes Basin, with isolated populations elsewhere in the United States and Canada. In Canada, the Blanding's Turtle is separated into the Great Lakes-St. Lawrence population and the Nova Scotia population. Blanding's Turtles can be found throughout southern, central and eastern Ontario.	**Yes** Potentially suitable habitat is present within the Bolton PSW complex in the Study Area and could potentially transverse the Subject Lands.	**Not Present** (Species record located far from Study Area; Blanding's Turtle would not be able to travel to Study Area)
Eastern Ribbonsnake *Thamnophis sauritus*	SC	SC Schedule 1	SC	The Eastern Ribbonsnake is usually found close to water, especially in marshes, where it hunts for frogs and small fish. A good swimmer, it will dive in shallow water, especially if it is fleeing from a potential predator. At the onset of cold weather, these snakes congregate in underground burrows or rock crevices to hibernate together.	In Ontario the eastern Ribbonsnake occurs throughout southern and eastern Ontario and is locally common in parts of the Bruce Peninsula, Georgian Bay and eastern Ontario.	**Yes** Potentially suitable habitat is present within the wetland habitat on the Subject Lands and within the Bolton PSW complex within the Study Area.	**Not Present** Species record from 1984.
Snapping Turtle *Chelydra serpentina*	SC	SC Schedule 1	SC	Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	The Snapping Turtle's range extends from Ecuador to Canada. In Canada this turtle can be found from Saskatchewan to Nova Scotia. It is primarily limited to the southern part of Ontario. The Snapping Turtle's range is contracting.	**Yes** Potentially suitable habitat is present within the wetland habitat on the Subject Lands and within the Bolton PSW complex in the Study Area.	**Moderate** (species located within the Study Area close to the Bolton PSW complex by Dougan *et al*. (2014b); species not located in 2020)

Glossary

EXP	ESA - Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere.
	SARA - Extirpated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END	ESA - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.
	SARA - Endangered - a wildlife species that is facing imminent extirpation or extinction.
THR	ESA - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
	SARA - Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

SC	ESA - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events.
	SARA - Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
MNRF	Ontario Ministry of Natural Resources and Forestry
ESA	Endangered Species Act (Provincial)
SARA	Species at Risk Act (Federal)
Schedule 1	The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2	Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3	Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

References

1 - Species at Risk. Ontario Ministry of Natural Resources and Forestry. http://www.mnr.gov.on.ca/en/Business/Species/index.html. © Queens Printer for Ontario, 2013.

2 - Species at Risk Status Reports. Committed on the Status of Endangered Wildlife in Canada. Ottawa. http://www.sararegistry.gc.ca/search/advSearchResults_e.cfm?stype=doc&docID=18.

Appendix J

Caledon Station Community Stormwater Erosion Analysis (Beacon 2023)

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Caledon Station Community Stormwater Erosion Analysis

Prepared For:

Caledon Community Partners

Prepared By:

Beacon Environmental Limited

Date: **November 2023**

Project: **214476**

Table of Contents

Figures

Tables

Appendices

Appendix A. Summary of Detailed Field Data
Appendix B. Erosion Threshold Summary

1. Introduction

Beacon Environmental Limited (Beacon) was retained by the Caledon Community Partners to prepare a Stormwater Erosion Analysis report in support of the Caledon Station Secondary Plan lands in the community of Bolton, Town of Caledon, Ontario. The Caledon Station Secondary Plan lands (herein referred to as the "Subject Lands") include approximately 182 hectares (450 acres) of land generally located north of King Street, east of The Gore Road and west of the CP Railway tracks (**Figure 1**). The Subject Lands are predominantly agricultural with natural heritage features limited to headwater drainage features and non-provincially significant wetlands that are concentrated in the southwestern portion of the Subject Lands.

The Subject Lands are entirely within the Region of Peel's Urban Area (ROP, Nov 2022) with the eastern portion of the Subject Lands being within the Region's Major Transit Station Area (MTSA). As well, the Subject Lands are currently part of the Caledon Station Secondary Plan process (POPA-2021-0002). The effect of the Secondary Plan will be to apply land use designations to the Subject Lands, including Low Density Residential, Medium Density Residential, Mixed Use, Institutional, Open Space Policy Area. The subject Draft Plan of Subdivision and Zoning By-Law Amendment for the Subject Lands will ensure the creation of a compact, pedestrian and transit-oriented development through implementation of the Secondary Plan policies.

The Caledon Station Secondary Plan and associated Land Use Plan, once approved through a Local Official Plan Amendment (LOPA), will serve as a framework for future development of the Subject Lands for the purposes of accommodating residential and mixed-use development with related complimentary uses, such as open spaces, parks, trails, commercial uses, the Bolton GO Station, the Natural Heritage System (NHS), and stormwater management facilities.

Beacon Environmental Limited (Beacon), in collaboration with Glen Schnarr & Associates Inc., Urbantech Consulting and DS Consultants Ltd. prepared a Comprehensive Environmental Impact Study and Management Plan (CEISMP) in support of the Caledon Station Secondary Plan. This CEISMP (Beacon, *et al.* 2023) summarized the findings of detailed biophysical investigations and analyses undertaken for the Subject Lands to characterize the environment, identify constraints and opportunities to future development, as well as the environmental management systems that will be required to support future development while enhancing the environment and local natural heritage system. A community-wide Functional Servicing Report (FSR) was prepared by Urbantech Consulting (2023) in support of the Secondary Plan. This FSR was intended to synchronize the environmental objectives described in the CEISMP with the grading/servicing approach for the Caledon Station Secondary Plan.

In September 2023, comments on the Caledon Station Secondary Plan submission were received from Toronto and Region Conservation Authority (TRCA). This report has been prepared in collaboration with Urbantech Consulting to address TRCA comments requiring a continuous erosion assessment to confirm that the proposed Secondary Plan stormwater management strategy will not have negative impacts on receiving drainage features. The purpose of this report is to present methods, analysis and results of the stormwater erosion analysis undertaken for the Caledon Station Secondary Plan lands.

2. Policy Context

2.1 Regional Municipality of Peel Official Plan (2022)

The Region of Peel Official Plan is a document that outlines policies aimed at protecting, maintaining, and restoring a Regional Greenlands System consisting of "Core Areas", "Natural Areas and Corridors (NACs)", and "Potential Natural Areas and Corridors (PNACs)". Section 2.16 of the Official Plan contains policies that apply to natural and human-made hazards. Specific sections deal with ravines, valleys, rivers, streams and riverine floodplains that are susceptible to flooding, erosion and/or unstable slopes. These policies commit the Region to work in conjunction with area municipalities and Conservation Authorities towards the following four objectives:

- To ensure that development and site alteration are not permitted in areas where site conditions or their location, including on lands containing human-made hazards, may pose a risk to public safety, public health or result in property damage;
- To encourage a coordinated approach to the use of the land and the management of water in areas subject to flooding in order to minimize social disruption, and mitigate risk to public safety, public health and property damage;
- To ensure that methods used to protect existing development at risk from natural hazards, do not negatively impact the ecological integrity of the Greenlands System; and
- To ensure that the impacts of a changing climate are considered in the management of risks associated with natural hazards.

2.2 Town of Caledon Official Plan (Office Consolidation – 2018)

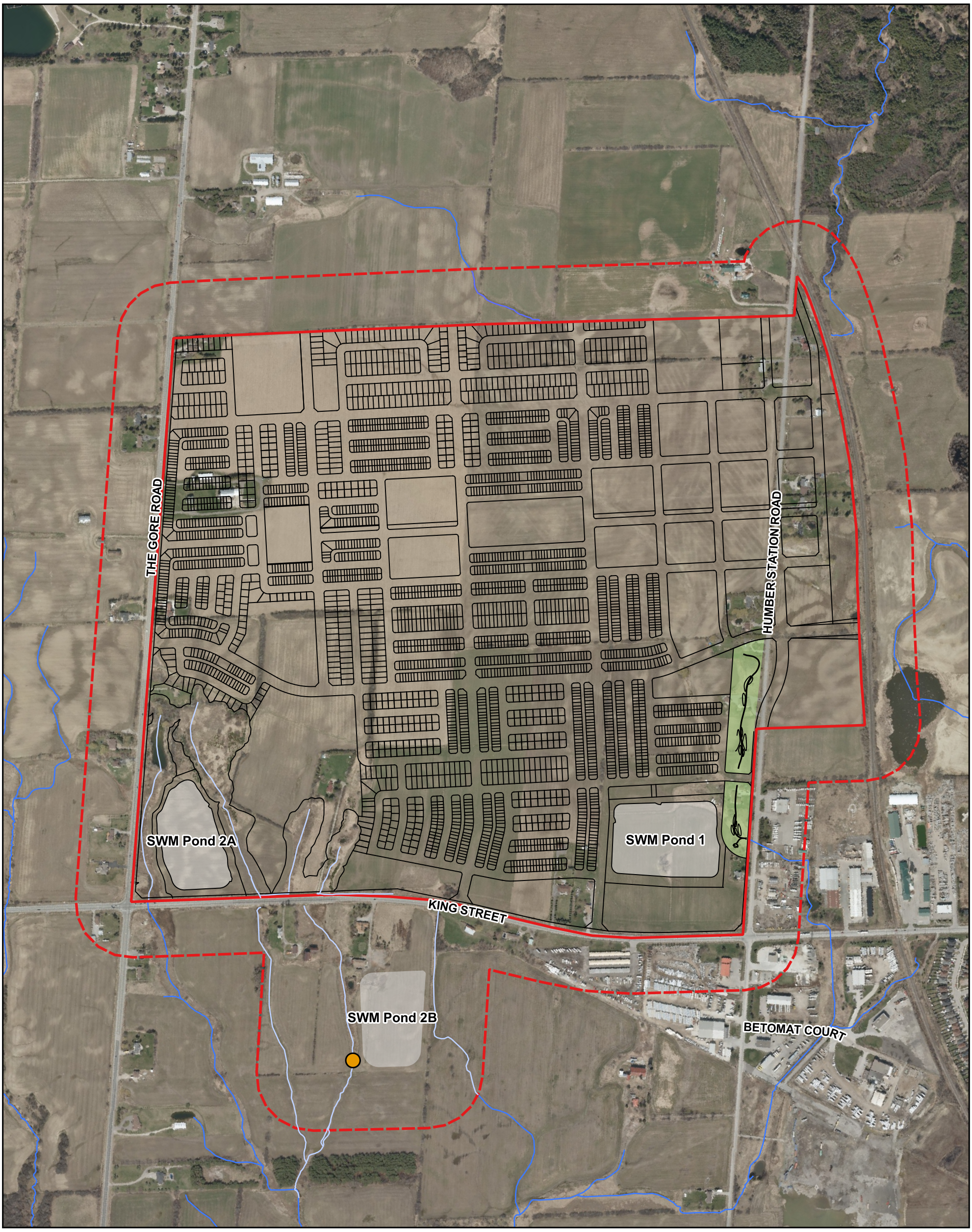
The *Town of Caledon Official Plan* (2018) provides direction as to the land use within the Town. The Town's general policies regarding sustainability commit to implementing sustainable development patterns and sustainable urban design in order to create complete, compact and connected communities. In accordance with Provincial and Regional planning directions and the Town's Official Plan policies, the Town's policies plan for higher density residential and mixed-use neighbourhoods and employment areas, intensification in appropriate locations, the use of energy conservation techniques and alternative energy sources, a wide range of housing types and tenures that address affordability, accessibility and the needs of different age and income groups, recreation opportunities and innovative techniques to manage the quality and quantity of stormwater run-off.

2.3 Toronto and Region Conservation Authority Regulations and Guidelines

2.3.1 Conservation Authorities Act (Ontario Regulation 166/06)

The TRCA regulates land use activities in and adjacent to wetlands, watercourses and valleylands under Ontario Regulation 166/06 (*Regulation for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*) made under the *Conservation Authorities Act.*

Subject to conformity with the municipality's Official Plan, the completion of appropriate studies and application for Conservation Authority permits, TRCA may grant permission for development within



Legend

- CEISMP Study Area
- Subject Lands
- Proposed Development
- Proposed Stormwater Management Pond
- Watercourse (Beacon 2023)
- Watercourse (MNRF 2023)
- Detailed Geomorphic Field Site
- WHT6 Enhanced Corridor

Geomorphic Field Site Location	**Figure 1**
Caledon Station Community Stormwater Erosion Analysis	
BEACON ENVIRONMENTAL	Project: 214476.1 Last Revised: November 2023
Client: Caledon Community Partners	Prepared by: SZ Checked by: MA
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these areas if it can be proven that control of flooding, erosion, pollution or the conservation of land will not be affected by the development.

2.3.2 The Living City Policies (2014)

The TRCA's Living City Policy (LCP) was approved in November 2014 and replaces the Valley and Stream Corridor Management Program (1994). The LCP document, among other matters, implements current federal, provincial and municipal legislation, policies and agreements affecting conservation authorities; and implements the policies for TRCA's updated section 28 of Ontario Regulation 166/06. For purposes of implementing TRCA's Environmental Management Policies:

- Confined River or Stream Valleys are considered **Valley Corridors**; and
- Unconfined River or Stream Valleys are considered **Stream Corridors**.

According to the LCP, the boundaries of a valley or stream corridor generally require a minimum 10 m setback from the greater of:

- Physical top of the valley feature;
- Long term stable top of slope, where geotechnical concerns exist (which must be confirmed through an appropriate geotechnical analysis);
- Regulatory floodplain;
- Meander belt; and
- Limits of significant vegetation which is contiguous with the valley corridor.

Further, it is the policy of TRCA:

> *That all development and site alteration, infrastructure, and recreational use meet TRCA's stormwater management criteria for water quantity, water quality, erosion control, and water balance for groundwater recharge and natural features, as demonstrated through technical reports, and as more specifically described in TRCA's Stormwater Management Criteria Document.*

This policy applies to all stages of the planning and development process, including Master Plans, environmental assessments, official plan amendments, zoning by-law amendments, community/block plans, Master Environmental Servicing Plans (MESPs), draft plans of subdivision, and site plans.

3. Caledon Station Environmental Management Plan

The Caledon Station CEISMP (Beacon *et al.* 2023) provided a detailed characterization of the headwater drainage features (HDFs) of the West Humber River and the Main Humber River that traverse the Study Area (**Figures 2** and **3**). A proposed natural heritage system was developed through the CEISMP that is comprised of two blocks. The larger block is located on the southern portion of the Subject Lands and is comprised of existing wetlands and HDFs (WHT1, WHT2 and WHT3). Associated with these tributaries are a very close grouping of wetland communities W1 to W6, known as the "Macville Area Wetlands". These wetlands are comprised mainly of mineral reed canary grass and cattail marshes, shallow aquatic wetlands associated with a dug pond, and a couple organic marsh and swamp communities. Most of these wetland communities are sustained by surface water, however there

is evidence to suggest that some are seasonally sustained by groundwater discharge. The smaller block located on the eastern portion the Subject Lands is represented by a proposed enhanced corridor/greenway system centred on Tributary WHT6 (**Figure 1**). This corridor has been designed consolidate several small and isolated wetland features into a single contiguous wetland centred on a realigned tributary corridor.

3.1 Stormwater Management

Three (3) end-of-pipe stormwater management facilities (wet ponds) are proposed to treat the post-development drainage areas within the West Humber watershed (**Figure 1**). SWM Pond 1 is situated northwest of the intersection of King Street & Humber Station Road as it abuts King Street to the south and Humber Station Road to the east. SWM Pond 2A is situated in the southwest of the Subject Lands, east of wetland W2 and west of wetland W4. SWM Pond 2B is located south of King Street in future development lands also owned by the Caledon Station Secondary Plan applicant.

The SWM targets / sizing criteria for the Subject Lands were established based on the TRCA SWM Criteria (2012) and the TRCA pre-development hydrologic model presented in the Humber River Hydrology Update (Civica 2018). These studies involved hydrologic modelling for pre- and post-development conditions, resulting in SWM design criteria to control the post-development drainage areas to pre-development flow rates, in addition to meeting the following requirements:

- Ensure that existing flow rates downstream of the subject lands do not vary for the larger storm events during post-development conditions, thereby providing flood protection for properties downstream of the Subject Lands;
- Maintain recharge volumes through the use of low impact development and other practices as required based on hydrogeological assessments; and
- Maintain water balance to wetland features.

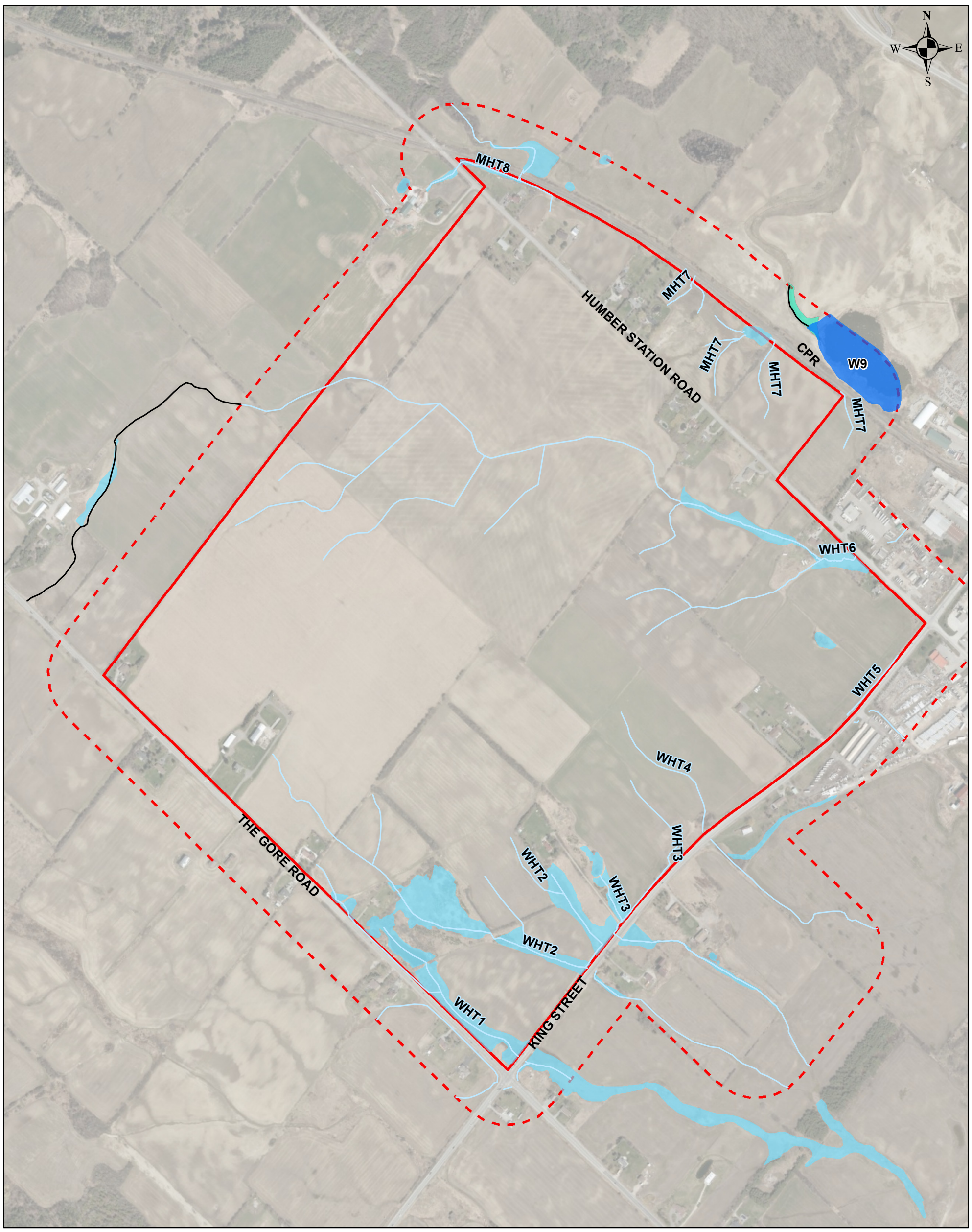
Regional control of post-development flow rates to pre-development levels, as per email correspondence with TRCA dated April 17, 2020, has been provided. Preliminary sizing of these facilities was provided in the FSR (Urbantech Consulting 2023) to ensure:

- MECP-recommended stormwater quality treatment of runoff; and
- Adequate drawdown time / erosion control to protect the form and function of watercourses downstream of the SWM facilities.

The following specific SWM criteria were established, for quality control:

Permanent Pool Volume - each stormwater management facility within Subject Lands must meet the Enhanced (Level 1) criteria as per the MOE SWM Planning and Design Manual (March 2003).

Extended Detention / Erosion Control – The extended detention volume for erosion control is based on detention of the 25 mm storm event from 48 hours to 72 hours for controlled release from the SWM ponds. An average release rate of 0.72 L/s/ha was utilized in accordance with the Town of Caledon Bolton Residential Expansion Study.



LEGEND

- SUBJECT LANDS
- CEISMP STUDY AREA (120m)
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- DRAINAGE FEATURES
- W1 — UNASSESSED DRAINAGE FEATURES
- WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

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URBANTECH

Caledon Station Community-Stormwater Erosion Analysis

PROJECT No. 214476

FIGURE 2

HEADWATER FEATURES

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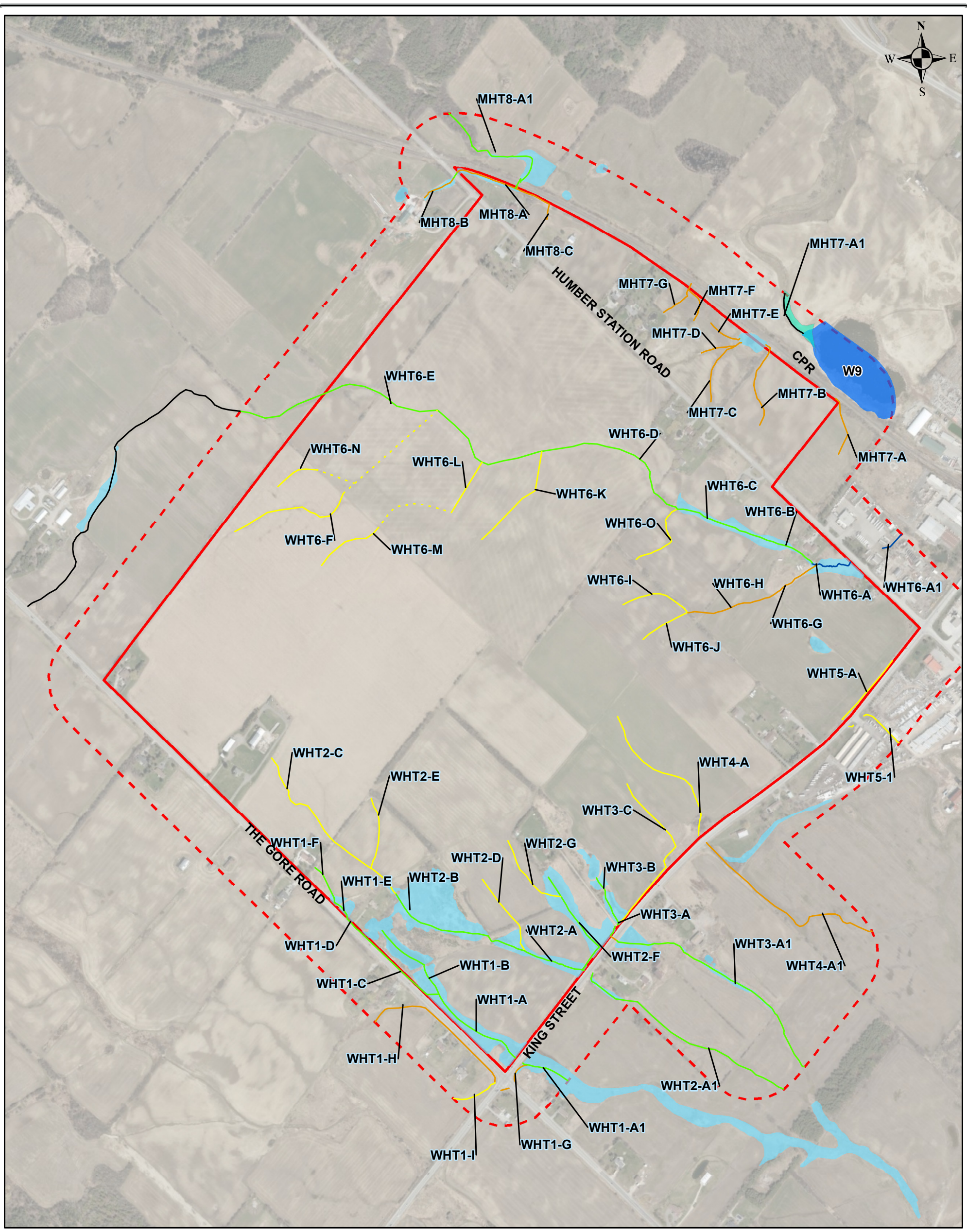

LEGEND

- SUBJECT LANDS
- CEISMP STUDY AREA (120m)
- PROVINCIALLY SIGNIFICANT WETLANDS
- NON-PSW WETLANDS
- UNEVALUATED WETLANDS
- W1 — WETLAND NUMBER
- WHT1/MHT1 — TRIBUTARY NAME AND NUMBER (i.e. WEST HUMBER TRIBUTARY; MAIN HUMBER TRIBUTARY)

HEADWATER FEATURE MANAGEMENT RECOMMENDATIONS

- PROTECTION
- CONSERVATION
- MITIGATION
- NO MANAGEMENT REQUIRED
- NO MANAGEMENT REQUIRED - ENCLOSED
- UNASSESSED DRAINAGE

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PROJECT No. 214476

FIGURE 3

HEADWATER FEATURE MANAGEMENT

November 2023

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3.1.1 Feature Based Water Balance

Stormwater management techniques which aim to mitigate runoff contributions to the natural heritage system wetlands were also considered in the FSR (Urbantech Consulting 2023). To promote drainage of clean sources of water (vegetated areas and roof drainage) towards the wetlands, uncontrolled flows from the development (rooftop and rear yard areas) are being directed to Wetlands W1, W3, W5, and W6 to replicate the existing runoff. The details of this design approach will be reviewed and refined, as appropriate at the Draft Plan stage.

4. Existing Conditions

Detailed geomorphic data field data was collected to determine a threshold for sediment entrainment that was then used to review and refine, as appropriate, extended detention volumes for erosion control for the proposed stormwater management facilities. The selection of the detailed field site location was governed by the following considerations:

- Lands owned by applicant (accessibility);
- Downstream location relative to proposed stormwater management facilities;
- Presence of a (relatively) natural channel form (i.e., defined active channel);
- Location of proposed location of stormwater management facilities (determine which stream reaches will receive stormwater contributions post-development); and
- Existing conditions could be considered representative of headwater drainage features within the Study Area.

Based on these criteria, a detailed geomorphic field site was established at the downstream limit of HDF WHT3-A1 (**Figure 1**). While historically modified (channelized), this reach displayed a defined active channel and will receive drainage from SWM Pond 2B. Based on available mapping and field observations, it was also considered representative of conditions downstream of SWM Pond 2A1 (Reach WHT2-A1) which is located on lands not owned by the applicant. Similarly, the lands immediately downstream of SWM Pond 1 are not owned by the applicant. Further, utilization of a reach with a defined low flow channel represents a conservative approach relative to an undefined swale, as frequent flows will be contained within the low flow channel, resulting in higher velocities and shear stress.

4.1.1 Methods

Detailed data collection was completed by Beacon staff on May 4, 2023 utilizing a Real-Time Kinematic (RTK) surveying unit and Total Station. Four (4) representative cross-sections were surveyed, extending beyond the active (bankfull channel) to include a portion of the adjacent floodplain. Cross-sectional measurements of bankfull or ‘active’ channel dimensions were developed using standard protocols and accepted field indicators. At each cross-section, bed and bank characteristics and composition were noted. Additionally, a longitudinal survey of bed morphology, planform, and bankfull elevations was completed.

4.1.2 Results

The surveyed extent of Tributary WHT3 Reach A1 displayed a governing energy gradient of 1.77%. The channel displayed moderate degree of entrenchment. While bankfull indicators were not well-defined, channel widths were estimated to range from 1.2 to 1.7 m, averaging 1.4 m. The average bankfull depth was 0.10 m, resulting in a width-to-depth ratio of 15. Channel boundary materials were predominantly comprised of clay, silt and sand with some gravel. A summary of reach-based geomorphic characteristics and calculated hydraulic parameters is provided below in **Table 1**, while a detailed summary of data collection results has been provided in **Appendix A**.

Table 1. Summary of Field-based Geomorphic and Calculated Hydraulic Parameters

Field-Based Measurements	Reach WHT3-A1
Bankfull gradient (%)	1.77
Average bankfull width (m)	1.4
Average bankfull depth (m)	0.10
Maximum bankfull depth (m)	0.22
Median grain size (D_{50}) (mm)	fines
Estimated Manning's 'n' value	0.038
Derived Parameters	
Bankfull discharge (m^3/s)	0.13
Bankfull velocity (m/s)	0.75
Bankfull tractive force (N/m^2)	18.5

5. Analysis

5.1 Erosion Threshold Determination

Erosion and deposition are natural processes that are necessary for the maintenance of channel form and function. Changes in land use can result in changes in the magnitude and duration of surface runoff produced by rain events, which can result in increased rates of erosion. Appropriate stormwater management techniques can typically mitigate the impacts associated with land use change by reducing the magnitude of post-development storm events. Surface runoff is collected and detained in stormwater management facilities (SWMF), then released at a prescribed flow rate. Ideally, this controlled release also closely mimics the duration of pre-development storms. The total volume of post-development runoff can also be reduced through the implementation of low impact development techniques (LIDs). The overall objective of these management tools is to match, to the extent possible, pre-development flow conditions.

Erosion thresholds often represent the hydraulic parameter by which pre- and post-development flow conditions are compared. An erosion threshold defines the theoretical hydraulic conditions under which sediment is entrained and transported within the channel. Specifically, the threshold represents a depth, velocity, or discharge at which sediment of a particular size class (usually the median or average grain size material) may potentially be entrained. This does not necessarily imply that systemic erosion (i.e.,

widening or degradation of the channel) will occur if the threshold is exceeded; it simply indicates flow conditions at which sediment entrainment (i.e., initiation of motion of materials) is likely to occur.

The TRCA (2012) Stormwater Management Criteria, provides geomorphologic methodologies for determining erosion thresholds. **Table 2** presents an overview of threshold analysis resources presented in the TRCA guidance document.

Table 2. Overview of Commonly Applied Sediment Entrainment Models

Sediment Entrainment Model	Type	Range of Applicability
Chow (1959)	Critical Shear Stress	Cohesive materials (Clay and Silt)
Fischenich (2001)	Critical Shear Stress	Cohesive and non-cohesive material
Hjulstrom (1967)	Critical Velocity	Non-cohesive material (sand and coarser)
Komar (1987)	Critical Velocity	Non-cohesive material (gravel and larger)
Miller et al. (1977)	Critical Shear Stress	Non-cohesive material (sand and coarser)
Neill (1967)	Critical Velocity	Non-cohesive material (sand and coarser)
Temple (1982)	Tractive Force	Vegetated Channels
vanRijn (1984)	Critical Shear Stress	Non-cohesive material (medium sand and coarser)

It should be noted that, in natural systems, erosion thresholds are exceeded regularly, ensuring the downstream delivery of sediment. As such, the key to maintaining natural channel function of a system is not to prevent exceedance of the threshold, but to ensure that existing rates of erosion are not exacerbated under the future land use scenario.

5.1.1 Results

The recommended erosion threshold for Reach WHT3-A1 is presented in **Table 3**; a detailed summary is provided in **Appendix B**. Based on the channel boundary materials (silty clay loam with very few stones), the recommended erosion threshold-condition hydraulic parameters referenced Fischenich (2001) permissible velocities for sandy loam soils. Associated threshold-condition hydraulic parameters were then back-calculated referencing this threshold condition. Calculated discharge and (maximum) water depth values were then compared to flow conditions observed at the time of assessment and estimated bankfull flow conditions. Based on this approach, the proposed erosion threshold is considered to be reflective of existing geomorphic conditions observed along the assessed watercourse. The threshold discharge condition of 0.09 m^3/s represents approximately 68% of the estimated bankfull flow, at a water depth above flow conditions observed at the time of assessment. Given that sediment transport was not observed during the field investigation, and the feature was generally charactered as stable (minimal evidence of active erosion observed), this threshold flow condition is considered appropriate.

Table 3. Recommended Erosion Threshold – Reach WHT3-A1

Reach	Threshold-Condition Hydraulic Parameters (calculated using representative cross-sections)						Critical Discharge as a Percentage of Bankfull Discharge (%)
	Channel Bed				Channel Banks		
	Critical Depth (m)	Critical Velocity (m/s)	Critical Shear Stress (N/m^2)	Critical Discharge (m^3/s)	Critical Velocity* (m/s)	Critical Shear Stress (N/m^2)	
Tributary WHT3 Reach A1	0.14	0.68	15	0.09	0.51	11	68

* Governing threshold condition (Fischenich (2001) - critical velocity for Sandy Loam)

6. Impact Assessment

Prior to undertaking the continuous erosion analysis, pre- and post-development hydrographs for the 25 mm, 2-year and 5-year synthetic storm events were reviewed in relation to the erosion threshold. Based on this initial calibration, the extended detention volume for erosion control for all stormwater management facilities was refined based on detention of the 25 mm storm event and controlled release for approximately 100 hours.

6.1 Exceedance Analysis Methods

The following methodology was applied for the continuous erosion analysis:

- Integration of pre- and post-development continuous simulation hydrologic model output data (1986-2007, as provided by Urbantech) with a representative surveyed cross-section of the active (bankfull) channel to calculate cumulative exceedance of the erosion threshold. Model outputs included:
  - Time of exceedance;
  - Cumulative effective velocity;
  - Cumulative effective discharge;
  - Cumulative effective work/shear stress; and
- Summary and review of exceedance results.

In addition to the hydrologic model output data provided by Urbantech, the following input parameters were utilized by the exceedance analysis model:

- Representative channel cross-section;
- Energy gradient – the governing (bankfull) gradient (1.77%) as determined through the detailed geomorphic field investigation were used for the exceedance analysis;
- Manning's 'n' roughness coefficient – a roughness coefficient of 0.038 was utilized for the bankfull channel, and a roughness coefficient of 0.08 was utilized for adjacent floodplain and corridor zones; and
- Erosion threshold in the form of a critical shear stress (15 N/m^2) for Reach WHT3-A1.

The model generates a rating curve based on the representative cross-section and routes the hydrograph data through the cross-section, calculating associated hydraulic parameters and summarizing the cumulative exceedance for each hydraulic parameter in relation to the entered erosion threshold value. An illustrative example of a representative cross-section is provided in **Figure 4**. Effectively, the model represents a tool by which the volume, magnitude and duration of post-development hydrologic events can be compared to pre-development conditions. The erosion threshold represents the control point of comparison by which to evaluate difference and, as such, potential impact. Hydraulic parameters associated with the rating curve were validated by comparing generated data with field-based estimates of discharge and flow depths for assessed reaches.

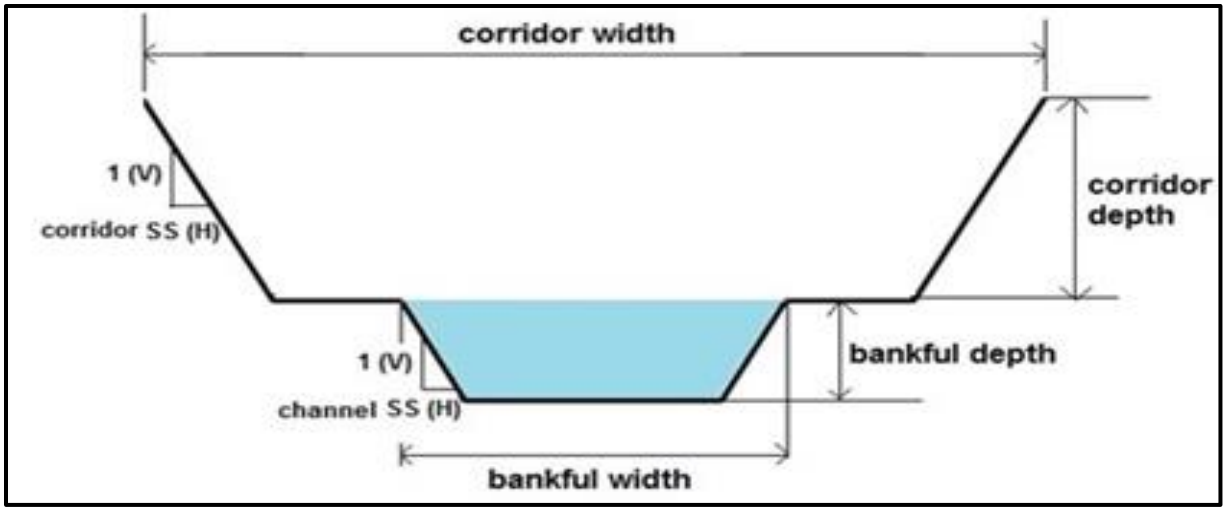

Figure 4. Schematic of Modelled Representative Cross-section

6.2 Exceedance Analysis Results

Raw exceedance analysis results for the available 20 years of continuous hydrologic data under both existing and post-development conditions are presented in **Table 4**. These raw values were then converted to a percent difference to allow a quantitative comparison of pre-development and post-development hydraulic conditions; associated results are presented in **Table 5**. As discussed in **Section 4**, the representative erosion threshold determined for Reach WHT3-A1 was used to undertake the exceedance analysis for all three stormwater management facilities.

While the exceedances noted between all scenarios and existing conditions are larger than desirable, it is anticipated that this increase is largely a function of the relatively low threshold condition associated with the receiving drainage features. Consequently, while the stormwater facilities are effectively meeting or exceeding the Town of Caledon Bolton Residential Expansion Study unitary rates, the extended detention release of these flows still falls above the threshold condition.

To further evaluate the relative risk associated with this increase in exceedance, a sensitivity analysis was undertaken. A revised shear stress threshold target of 18 N/m^2 was determined for the sensitivity analysis by increasing the average water depth within the representative cross-section used in the model by approximately 2 cm. This increase in average water depth was considered to be within the tolerances of the modelling exercise. A critical discharge threshold of 0.12 m^3/s was then back

calculated based on this revised average water depth. This target discharge fell below the bankfull flow estimated for Reach WHT3-A1 and deemed suitable to inform an evaluation of erosion potential.

Table 4. Erosion Threshold Exceedance Analysis - Continuous Modelling Results

Development Condition	Detention Time	Pre-Development vs. Post-Development Conditions				
		Time (hr)	Discharge (m^3/s)	Velocity (m/s)	Shear Stress (N/m^2)	Work/ Stream Power (N/m)
SWM Pond 1						
Pre (Threshold - 15 N/m^2)	--	24893	26673478	26400416	995031964.4	1131263766
Post (Threshold - 15 N/m^2)	~100 hr	49671	28776244	36323892	1330668230	1376046994
Pre (Sensitivity Analysis - 18 N/m^2)	--	20282	23881465	19252162	752833562	887196102
Post (Sensitivity Analysis - 18 N/m^2)	~100 hr	35187	23530731	22849392	874493279	957669100
SWM Pond 2A						
Pre (Threshold - 15 N/m^2)	--	5924	1998304	3380521	120596374	113103354
Post (Threshold - 15 N/m^2)	~100 hr	11277	3370227	5251243	188198540	180526611
Pre (Sensitivity Analysis - 18 N/m^2)		3821	1390996	1834346	68285610	67468266
Post (Sensitivity Analysis - 18 N/m^2)	~100 hr	5428	2379479	2712157	102434642	106993212
SWM Pond 2B						
Pre (Threshold - 15 N/m^2)	--	8410	4171522	6058013	219747823	218932575
Post (Threshold - 15 N/m^2)	~100 hr	16107	5508835	7951428	286720683	281610059
Pre (Sensitivity Analysis - 18 N/m^2)		6159	3265554	3758004	141879522	147757297
Post (Sensitivity Analysis - 18 N/m^2)	~100 hr	7914	4062838	4246285	161563764	173415878

As illustrated in **Table 5**, exceedance analysis results under the sensitivity analysis threshold condition for SWM Pond 1 approximate a match (7.9%) for stream power and indicate an over-control influence on cumulative effective discharge. Cumulative effective velocity and shear stress exceedance results remained larger, in the range of 16-19% above existing conditions. Considering that SWM Pond 1 will release flows to the enhanced corridor, which will incorporate floodplain wetland design features and a low flow channel based on natural channel design principles, an increase in erosion under post-development conditions downstream of SWM Pond 1 is not anticipated.

Sensitivity results for SWM Ponds 2A and 2B remained larger than desirable. However, it should be noted that continuous modelling results for both of these ponds incorporate uncontrolled flows that are being released to Wetlands W1, W3, W5, and W6. These clean water contributions that are required to replicate existing runoff conditions and address feature-based water balance requirements are contributing to the exceedances identified in **Table 5**. Considering that the receiving drainage features downstream of King Street have generally been characterized as stable and are supported by riparian wetland communities that provide enhanced stability and retention/detention functions, the risk of an increase in erosion under post-development conditions due to released stormwater is estimated to be low. That stated, the stormwater management design approach will be reviewed and refined, as appropriate at the Draft Plan stage.

Table 5. Erosion Threshold Exceedance Analysis - Percent Difference (Pre to Post)

Threshold Condition	Percent Exceedance Pre-Development vs. Post-Development Conditions				
	Time (hr)	Discharge (m^3/s)	Velocity (m/s)	Shear Stress (N/m^2)	Work/Stream Power (N/m)
SWM Pond 1					
Erosion Threshold (15 N/m^2)	99.5%	7.9%	37.6%	33.7%	21.6%
Sensitivity Analysis (18 N/m^2)	73.5%	-1.5%	18.7%	16.2%	7.9%
SWM Pond 2A					
Erosion Threshold (15 N/m^2)	90.4%	68.7%	55.3%	56.1%	59.6%
Sensitivity Analysis (18 N/m^2)	42.0%	71.1%	47.9%	50.0%	58.6%
SWM Pond 2B					
Erosion Threshold (15 N/m^2)	91.5%	32.1%	31.3%	30.5%	28.6%
Sensitivity Analysis (18 N/m^2)	28.5%	24.4%	13%	13.9%	17.4%

7. Summary

In September 2023, comments on the Caledon Station Secondary Plan submission were received from TRCA. This report has been prepared in collaboration with Urbantech Consulting to address TRCA comments requiring a continuous erosion assessment to confirm that the proposed Secondary Plan stormwater management strategy will not have negative impacts on receiving drainage features. The purpose of this report was to present methods, analysis and results of the stormwater erosion analysis undertaken for the Caledon Station Secondary Plan lands.

We trust that the submission meets your requirements at this time. If you have any questions or concerns regarding the information as presented, please do not hesitate to contact the undersigned.

Report prepared by:
Beacon Environmental

Maureen Attard, M.Sc.
River Scientist

Report reviewed by:
Beacon Environmental

Shelley Gorenc, M.Sc., P.Geo.
Senior Geomorphologist

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Appendix A

Summary of Detailed Field Data

BEACON ENVIRONMENTAL

Geomorphology Group
Summary of Detailed Field Data

Date:	May 4, 2023	**Project:**	214476
Client:	Caledon Community Partners	**Watercourse:**	West Humber River Tributary WHT3
Location:	Caledon, Ontario	**Reach:**	A1
Length Surveyed:	**68 m**	**Number of Cross Sections:**	**4**

General Site Characteristics

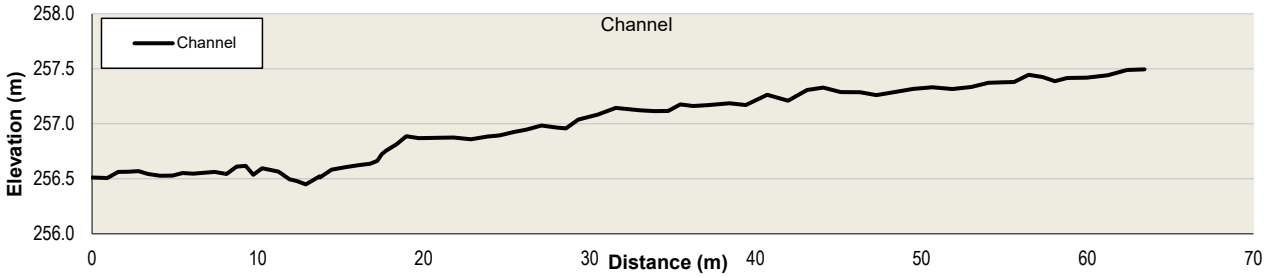
Drainage Area:	**0.26 km² (OWIT 2023)**	Riparian Vegetation:	
Geology/Soils:	**Till Plain**	Dominant Type:	**Grass/Herbaceous (Wetland Species)**
Surrounding Land Use:	**Agriculture and Residential**	Buffer Zone Continuity:	**Continuous**
Channel Disturbances:	**Agricultural Practices**	Channel Encroachment:	**Low**
Aquatic Vegetation:	**N/A**	Large Woody Debris:	**Low**

General Field Observations

Within the extent assesed, Reach A1 was characterized as a poorly defined swale with low sinuousity, situated within a unconfined valley corridor. Riparian vegetation consisted predominantly of grasses and other wetland species. Bank materials consisted of a sandy soil mixed with clay and silt. Bed materials consisted of primarily silt, sand and clay with gravel overlaying consolidated till. Mininal evidence of erosion was observed within the downstream portion of the surveyed extent of the feature.

Planform Characteristics

Profile	Reach		*Meander Geometry*	Profile
Bankfull Gradient:	**1.77**	%	Sinuosity:	**1.00**



Bank Characteristics

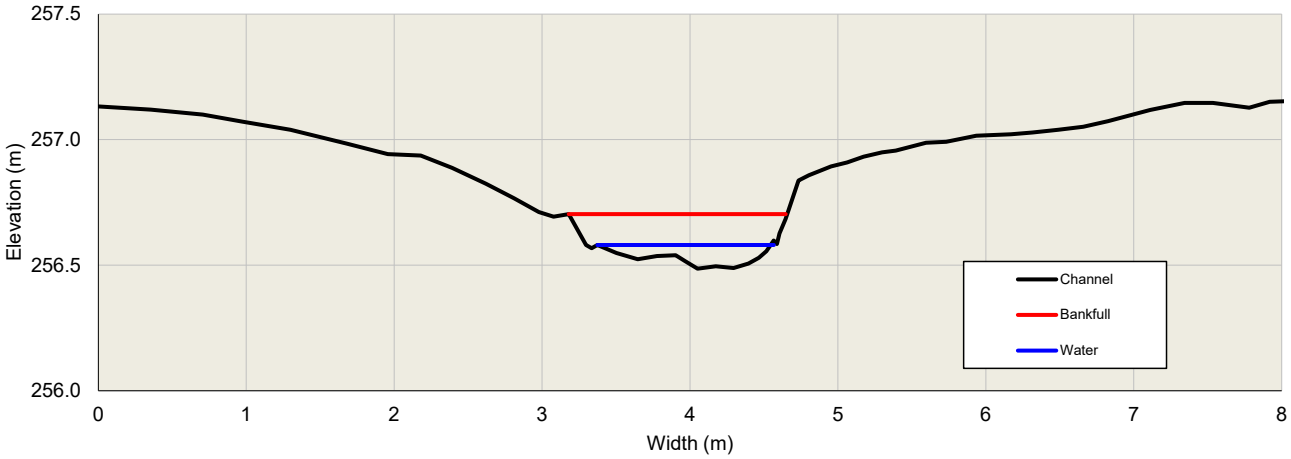
	Minimum	*Maximum*	*Average*
Bank Height (m):	**0.04**	**0.35**	**0.17**
Bank Angle (degrees):	**10**	**70**	**29**
Root Depth (m):	**0.05**	**1.0**	**0.21**
Root Density (%):	**10**	**100**	**51**
Undercut Banks (%)		**N/A**	
Depth of Undercut (m):		**N/A**	

Bank Material (range): **sand, silt/clay**

Cross-sectional Characteristics

	Minimum	*Maximum*	*Average*
Bankfull Width (m):	**1.2**	**1.7**	**1.4**
Average Bankfull Depth (m):	**0.07**	**0.14**	**0.10**
Bankfull Width/Depth:	**10.3**	**23.8**	**14.9**
Wetted Width (m):	**0.9**	**8.3**	**2.9**
Average Water Depth (m):		**0.06**	
Manning's n:		**0.038**	

Representative Cross-Section (#1)



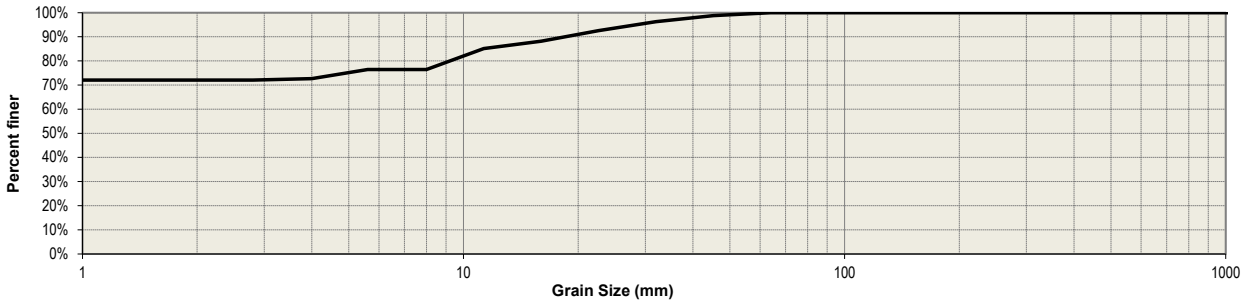
Substrate Characterization

Particle size (mm)

D_{10}	**fines**
D_{50}	**fines**
D_{84}	**11.0**

Subpavement:	**Till**
Particle shape:	**Sub-angular to Sub-rounded**
Embeddedness (%):	**N/A**
Particle range:	**clay, silt and sand**

Cumulative Particle Size Distribution



Appendix B

Erosion Threshold Summary

BEACON ENVIRONMENTAL

Geomorphology Group

Summary of Erosion Threshold Analysis

Survey Date:	May 4, 2023	**Project:**	214476
Client:	Caledon Community Partners	**Watercourse:**	Humber River Tributary WHT3
Location:	Caledon, ON	**Reach:**	A1

Summary of Calculated Hydraulic Parameters (3 Representative Cross-sections)

Bankfull Channel:

Discharge (m^3/s):	**0.13**
Velocity (m/s):	**0.75**
Maximum Depth (m):	**0.16**
Tractive Force (N/m^2):	**18.5**

Erosion Threshold:

Critical Discharge (m^3/s):	**0.09**
Critical Velocity (m/s):	**0.68**
Critical Depth (m):	**0.14**
Apparent Shear Stress (N/m^2):	**15**

Percent of Bankfull:

Critical Discharge/Bankfull Discharge:	**68%**
Critical Shear Stress/Bankfull Shear Stress:	**80%**

Channel Banks

Critical Velocity (m/s)	**0.51**
Critical Shear Stress (N/m^2)	**11**

Cross-Section 1

Channel Bed:

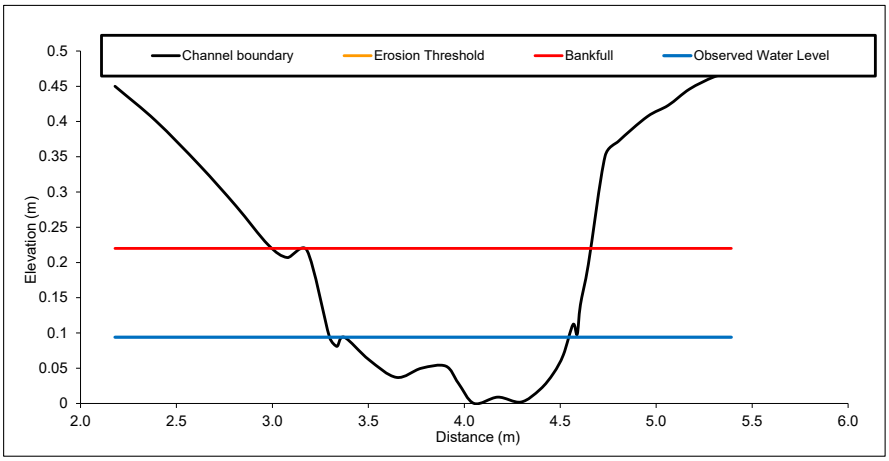
Critical Depth (m)	0.14
Slope (m/m)	0.0177
Manning's n	0.038
Average Water Depth (m)	0.082
Critical Velocity (m/s)	0.69
Critical Discharge (m^3/s)	0.09
** Critical Shear Stress (N/m^2)	14

Substrate

D_{50} (m)	0.0002
D_{84} (m)	0.0050

Channel Banks:

* Critical Velocity (m/s):	0.52
Critical Shear Stress (N/m^2)	10.6



* References Fischenich (2001) Critical Velocity - Sandy Loam

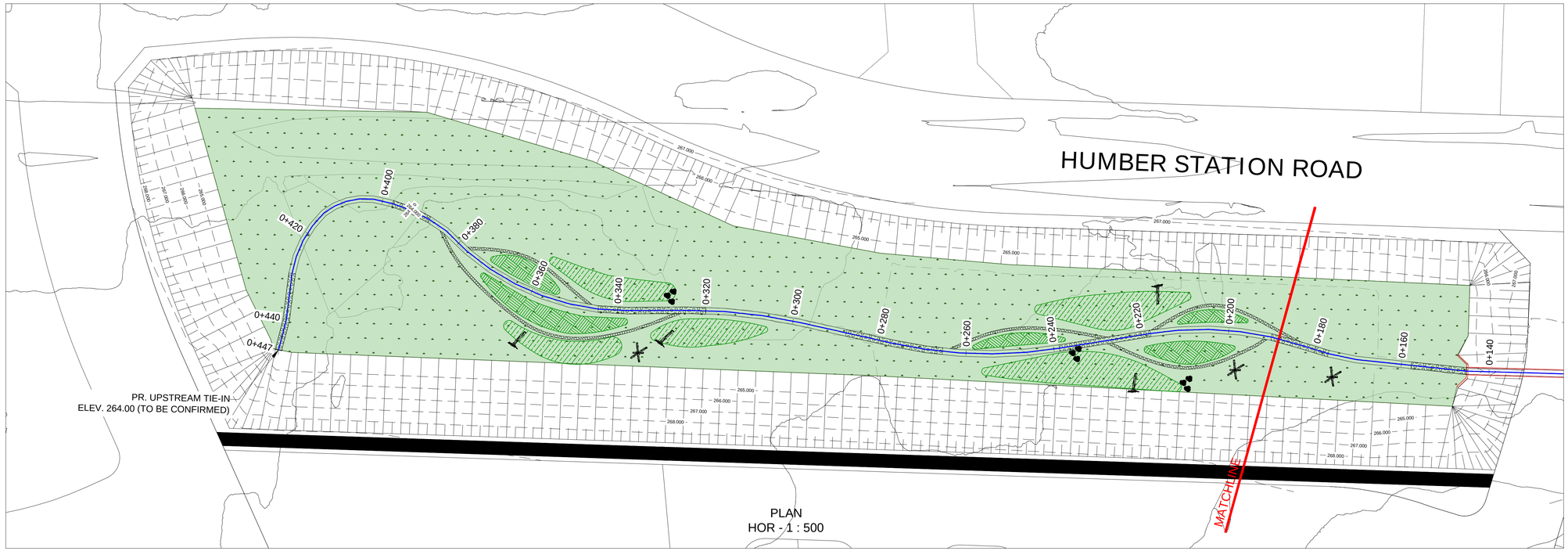
** References Chow (1959) Critical Shear Stress - Lean Clay Soils

Photo 1. Representative photo of WHT3 Reach A1 detailed field site.

BEACON ENVIRONMENTAL

Appendix K

Greenway Corridor Preliminary Design Drawings



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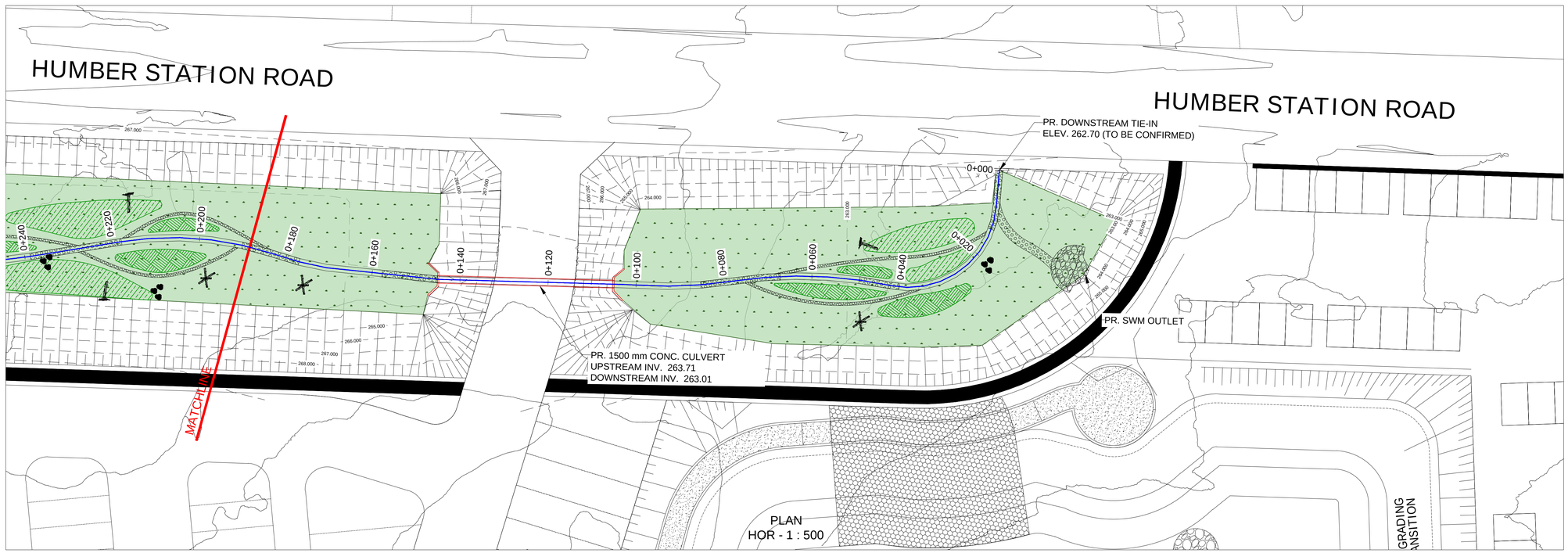

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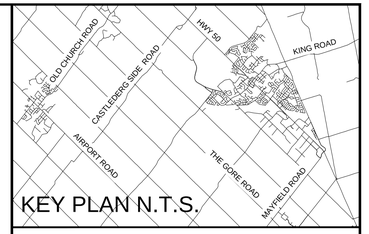

KEY PLAN N.T.S.

LEGEND

- PR. CONTOURS
- PR. CHANNEL CENTRELINE AND BANKS
- PR. RIVERSTONE MIX (REFER TO DETAILS ON D-1)
- PR. SECONDARY OVERFLOW CHANNELS
- PR. WETLAND (REFER TO DETAILS ON D-1)
- PR. HUMMOCK FEATURES
- PR. VERNAL POOLS
- PR. BOULDER CLUSTERS
- PR. BASKING LOGS
- PR. WOOD DEBRIS HABITAT FEATURES

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Notes: Scale shown is for an 36" x 24" page.
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PROJECT

SHEET TITLE

PLANFORM

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PROJECT N°:

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FIGURE N°:

CHECKED BY:

DATE: 19 June 2024

SCALE: 1:500

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G-1

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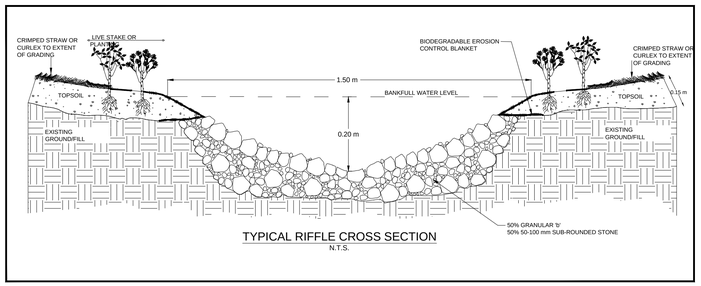
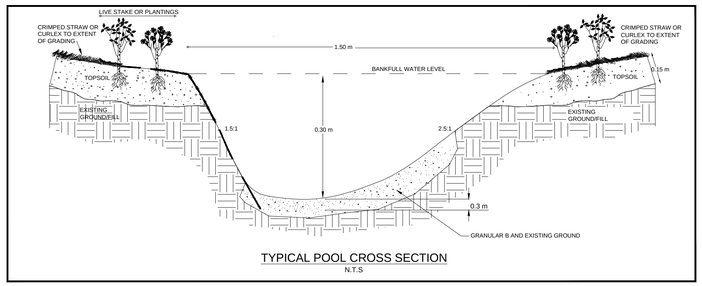
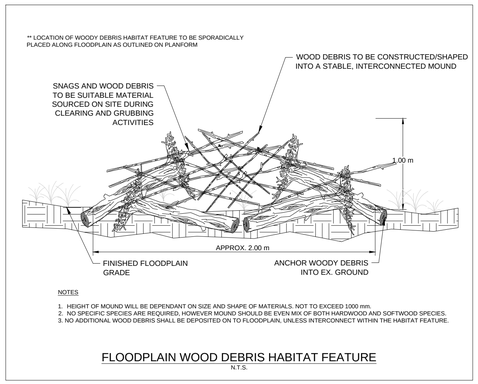
2020-11-25



TYPICAL RIFFLE CROSS SECTION
N.T.S.



TYPICAL POOL CROSS SECTION
N.T.S



FLOODPLAIN WOOD DEBRIS HABITAT FEATURE
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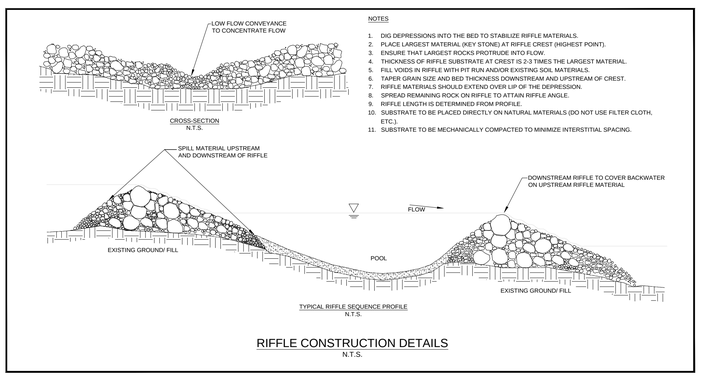
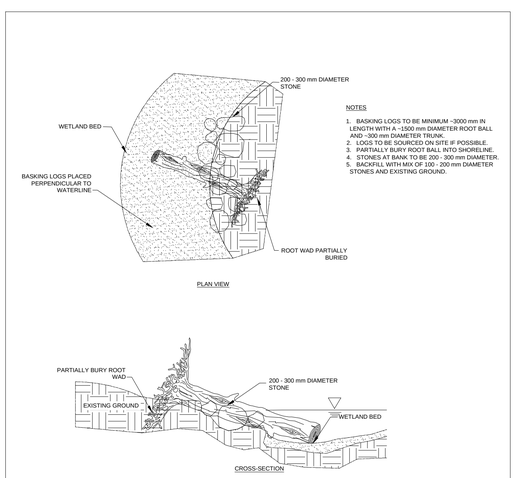


RIFFLE CONSTRUCTION DETAILS
N.T.S.



BASKING LOG
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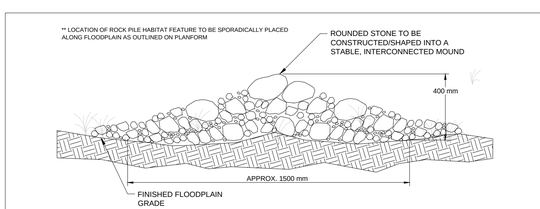

FLOODPLAIN ROCK PILE HABITAT FEATURE
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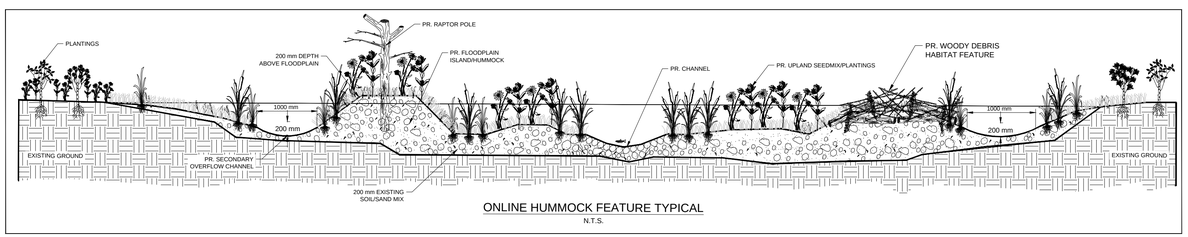

ONLINE HUMMOCK FEATURE TYPICAL
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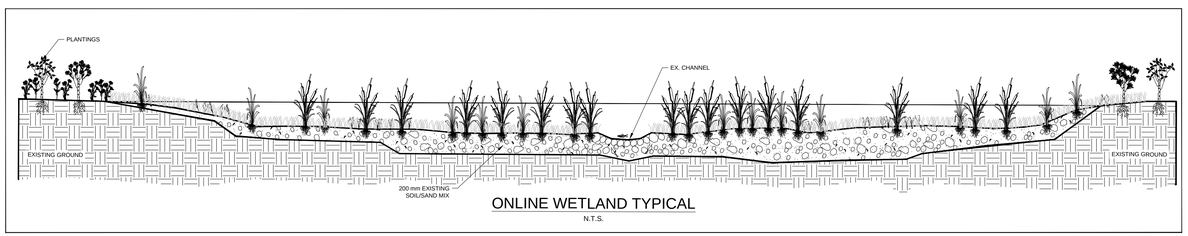

ONLINE WETLAND TYPICAL
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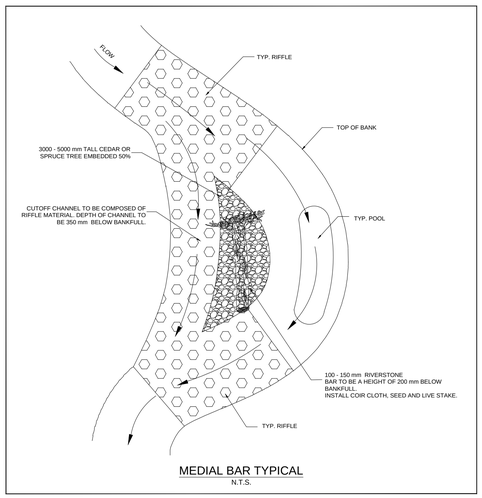
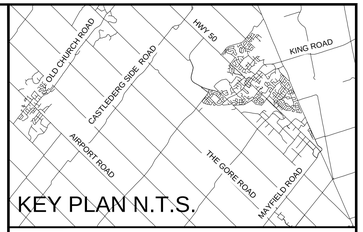


MEDIAL BAR TYPICAL
N.T.S.



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PROJECT

SHEET TITLE

RESTORATION DETAILS

DESIGN BY:

DRAWN BY:

CHECKED BY:

DATE: 19 June 2024

SCALE: N.T.S.

PROJECT N°:

FIGURE N°: D-1

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